DEPARTMENT OF THE INTERIOR
Roy O. West, Secretary

U. S. GEOLOGICAL SURVEY
George Otis Smith, Director

Water-Supply Paper 588

SURFACE WATER SUPPLY OF THE UNITED STATES

1924

PART VIII. WESTERN GULF OF MEXICO BASINS

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Prepared in cooperation with the
STATE OF TEXAS

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ILLUSTRATION

SURFACE WATER SUPPLY OF WESTERN GULF OF MEXICO DRAINAGE BASINS, 1924

AUTHORIZATION AND SCOPE OF WORK

This volume is one of a series of 14 reports presenting records of measurements of flow made on streams in the United States during the year ending September 30, 1924.

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 in the arid West. 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, 1895–1925

1895	$12,500.00	1911–1917	$150,000.00
1896	20,000.00	1918	175,000.00
1897–1900	50,000.00	1919	148,244.10
1901–1902	100,000.00	1920	175,000.00
1903–1906	200,000.00	1921–1923	180,000.00
1907	150,000.00	1924–1925	170,000.00
1908–1910	100,000.00		

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 5,600 points in the United States and also at many points in Alaska and the Hawaiian Islands. In July, 1924, 1,670 gaging stations were being maintained by the Survey and the cooperating 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 depth 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 section or sections of the stream channel below the gage which determine the stage-discharge relation at the gage. It should be noted that the control may not be the same section or sections at all stages.

The "point of zero flow" for a gaging station is that point on the gage—the gage height—at which water ceases to flow over the control.

EXPLANATION OF DATA

The data presented in this report cover the year ending September 30, 1924. At the beginning of January in most parts of the United States much of the precipitation in the preceding three months is stored as ground water, in the form of snow or ice, or in ponds, lakes, and swamps, 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 quan-

tity 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 consists 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. The general methods are 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.

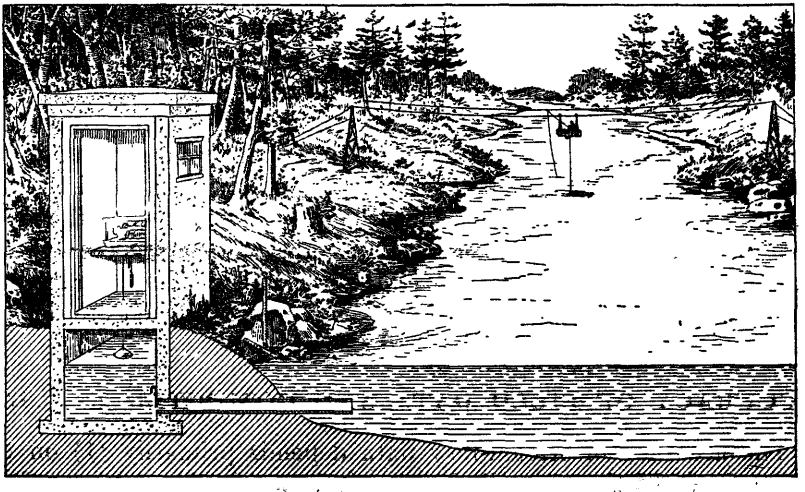

FIGURE 1.—Typical gaging station

From the discharge measurements rating tables are prepared that give the discharge for any stage. 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 giving records of discharge measurements, a table showing the daily discharge of the stream, and a table of monthly and yearly discharge and run-off.

If the base data are insufficient to determine the daily discharge, tables giving daily gage height and records of discharge measurements are published.

The description of the station gives, in addition to statements regarding location and equipment, information in regard to any conditions that may affect the permanence of the stage-discharge relation, covering such subjects as the occurrence of ice, the use of the stream for log driving, shifting of control, and the cause and

effect of backwater; it gives also information as to diversions that decrease the flow at the gage, artificial regulation, maximum and minimum recorded stages, and the accuracy of the records.

The table of daily discharge gives, in general, the discharge in second-feet corresponding to the mean of the gage heights read each day. At stations on streams subject to sudden or rapid diurnal fluctuations 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 at regular intervals during the day or by using the discharge integrator, an instrument operating on the principle of the planimeter and containing as an essential element the rating curve of the station.

In the table of monthly discharge the column headed "Maximum" gives the mean flow for the day when the mean gage height was highest. As the gage height is the mean for the day it does not indicate correctly the stage when the water surface was at crest height and the corresponding discharge was consequently larger than given in the maximum column. Likewise, in the column headed "Minimum" the quantity given is the mean flow for the day when the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet per second during the month. On this average flow computations recorded in the remaining columns, which are defined on page 2, are based.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

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

A paragraph in the description of the station gives information regarding the (1) permanence of the stage-discharge relation, (2) precision with which the discharge rating curve is defined, (3) refinement of gage readings, (4) frequency of gage readings, and (5) methods of applying daily gage height to the rating table to obtain the daily discharge.

For the rating tables "well defined" indicates, in general, that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined," within 15 to 25 per cent. These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

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 noncontribut-

ing 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. All figures representing "second-feet per square mile" and "run-off in inches" published in the earlier reports by the Survey should be used with caution because of possible inherent sources of error not known to the Survey.

Many gaging stations on streams in the irrigated areas 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 stations must first be satisfied. To give an idea of the amount of prior appropriations, a paragraph on diversions is presented in each station description. The figures given can not be considered exact but represent the best information available.

The tables of monthly discharge give only a general idea of the flow at the station and should not be used for other than preliminary estimates; the tables of daily discharge allow 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.

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 powers, 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 I. North Atlantic slope basins (St. John River to York River).
II. South Atlantic slope and eastern Gulf of Mexico basins (James River to the Mississippi).
III. Ohio River basin.
IV. St. Lawrence River basin.
V. Upper Mississippi River and Hudson Bay basins.
VI. Missouri River basin.

PART VII. Lower Mississippi River basin.
VIII. Western Gulf of Mexico basins.
IX. Colorado River basin.
X. Great Basin.
XI. Pacific slope basins in California.
XII. North Pacific slope basins, in three volumes:
A, Pacific slope basins in Washington and upper Columbia River basin.
B, Snake River basin.
C, Lower Columbia River basin and Pacific slope basins in Oregon.

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 of the United States.

3. Complete sets are available for consultation in the local offices of the water-resources branch of the Geological Survey, as follows:

Boston, Mass., 2500 Customhouse.
Albany, N. Y., 904 Home Savings Bank Building.
Trenton, N. J., Statehouse.
Charlottesville, Va., c/o University of Virginia.
Asheville, N. C., 608 City Hall.
Chattanooga, Tenn., 830 Power Building.
Columbus, Ohio, Engineering Experiment Station, Ohio State University.
Madison, Wis., c/o Railroad Commission of Wisconsin.
Chicago, Ill., 1510 Consumers Building.
Rolla, Mo., Rolla Building, School of Mines and Metallurgy.
Helena, Mont., 45–46 Federal Building.
Denver, Colo., 403 Post Office Building.
Tucson, Ariz., 106 College of Law Building, University of Arizona.
Salt Lake City, Utah, 313 Federal Building.
Boise, Idaho, Federal Building.
Idaho Falls, Idaho, 228 Federal Building.
Tacoma, Wash., 404 Federal Building.
Portland, Oreg., 606 Post Office Building.
San Francisco, Calif., 303 Customhouse.
Los Angeles, Calif., 600 Federal Building.
Austin, Tex., Capitol Building.
Honolulu, Hawaii, Territorial Office Building.

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

Stream-flow records have been obtained at about 5,600 points in the United States, and the data obtained have been published in the reports tabulated below:

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 and 1894.
16th A, pt. 2	Descriptive information only	
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also 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 and 1896
W 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	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.
22d 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.
W 301 to 312	do	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.

NOTE.—No data regarding stream flow are given in the 15th and 17th annual reports.

The records at most of the stations discussed in these reports extend over a series of years, and miscellaneous measurements at many points other than regular gaging stations have been made each year. 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 1924. The data for any particular station will be found in the reports covering the years during which the station was maintained. For example, data for Machias River at Whitneyville, Me., 1903 to 1921, are published in Water-Supply Papers 97, 124, 165, 201, 241, 261, 281, 301, 321, 351, 381, 401, 431, 451, 471, 501, and 521, which contain records for the New England streams from 1903 to 1921. Results of miscellaneous measurements are published by drainage basins.

Numbers of water-supply papers containing results of stream measurements, 1899–1924

[For basins included, see p. 5.]

Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII		
												A	B	C
1899 [a]	35	[b] 35, 36	36	36	36	[c] 36, 37	37	37	[d] 37, 38	38, [e] 39	38, [f] 39	38	38	38
1900 [g]	47, [h] 48	48	48, [i] 49	49	49	49, [j] 50	50	50	50	51	51	51	51	51
1901	65, 75	65, 75	65, 75	65, 75	[k] 65, 66, 75	66, 75	[k] 65, 66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75
1902	82	[b] 82, 83	83	[l] 82, 83	[k] 83, 85	84	[k] 83, 84	84	85	85	85	85	85	85
1903	97	[b] 97, 98	98	97	[k] 98, 99, [m] 100	99	[k] 98, 99	99	100	100	100	100	100	100
1904	[n] 124, [o] 125, [p] 126	[p] 126, 127	128	129	[k] 128, 130	130, [q] 131	[k] 128, 131	132	133	133, [r] 134	134	135	135	135
1905	[n] 165, [o] 166, [p] 167	[p] 167, 168	169	170	171	172	[k] 169, 173	174	175, [s] 177	176, [r] 177	177	178	178	[t] 177, 178
1906	[n] 201, [o] 202, [p] 203	[p] 203, 204	205	206	207	208	[k] 205, 209	210	211	212, [r] 213	213	214	214	214
1907–8	241	242	243	244	245	246	247	248	249	250, [r] 251	251	252	252	252
1909	261	262	263	264	265	266	267	268	269	270, [r] 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	332A	332B	332C
1913	351	352	353	354	355	356	357	358	359	360	361	362A	362B	362C
1914	381	382	383	384	385	386	387	388	389	390	391	392	393	394
1915	401	402	403	404	405	406	407	408	409	410	411	412	413	414
1916	431	432	433	434	435	436	437	438	439	440	441	442	443	444
1917	451	452	453	454	455	456	457	458	459	460	461	462	463	464
1918	471	472	473	474	475	476	477	478	479	480	481	482	483	484
1919–20	501	502	503	504	505	506	507	508	509	510	511	512	513	514
1921	521	522	523	524	525	526	527	528	529	530	531	532	533	534
1922	541	542	543	544	545	546	547	548	549	550	551	552	553	554
1923	561	562	563	564	565	566	567	568	569	570	571	572	573	574
1924	581	582	583	584	585	586	587	588	589	590	591	592	593	594

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39. Tables of monthly discharge for 1899 in Twenty-first Annual Report, Part IV.
[b] James River only.
[c] Gallatin River.
[d] Green and Gunnison Rivers and Grand River above junction with Gunnison.
[e] Mohave 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, Part IV.
[h] Wissahickon and Schuylkill Rivers to James River.
[i] Scioto River.
[j] Loup and Platte Rivers near Columbus, Nebr., and all tributaries below junction with Platte.
[k] Tributaries of Mississippi from east.
[l] Lake Ontario and tributaries to St. Lawrence River.
[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] Great Basin in California except Truckee and Carson River basins.
[s] Below junction with Gila.
[t] Rogue, Umpqua, and Siletz Rivers only.

COOPERATION

The work of measuring streams in Texas during the year ended September 30, 1924, was carried on in cooperation with the State through the Board of Water Engineers, consisting of John A. Norris, chairman, C. S. Clark, and A. H. Dunlap, to whom special acknowledgments are due for the efficient and cordial manner in which they represented the State in the cooperative investigations.

The following have aided in the collection of records by furnishing funds or otherwise assisting: United States Weather Bureau; American Section of the International Boundary Commission; United States Engineer Corps; State Tubercular Sanatorium; cities of Corpus Christi, Dallas, Fort Worth, San Antonio, Brownwood, and Lufkin; Louisiana Gravity Canal Co.; Walker-Caldwell Water Co.; Guadalupe Water Power Co.; Medina Valley Irrigation Co.; Planters and Merchants Mills; Ward County Irrigation District No. 1; Brady Chamber of Commerce; Tarrant County Water Improvement District No. 1; Missouri, Kansas & Texas Railway; Texas & Pacific Railway; St. Louis Southwestern Railway; Texas & New Orleans Railroad; International & Great Northern Railway; Galveston, Harrisburg & San Antonio Railway; Gulf, Colorado & Santa Fe Railway; J. A. Clark, Leslie Harrison, Boxley & King, and E. N. Cory.

Acknowledgment is made in the description of gaging stations for records furnished by cooperating parties.

DIVISION OF WORK

Data for stations in Texas were collected and prepared for publication under the direction of C. E. Ellsworth, district engineer, who was assisted by Clarence E. McCashin, A. G. Fiedler, J. William Bones, W. E. Armstrong, Donald S. Wallace, Trigg Twichell, Robert G. West, H. Carr Pritchett, Thomas A. Slack, Ellis H. Morgan, John L. Saunders, Seth D. Breeding, C. C. Crosnoe, E. A. Schlaudt, R. L. Pfau, O. S. L. Talbot, Tate Dalrymple, W. C. Dodd, M. N. Aitken, A. C. Cook, L. M. Hamby, N. C. Magnuson, H. W. McCue, Morris Reedy, J. A. Muncey, M. C. Hankins, C. B. Thames, W. T. Guyton, Kate Casparis, and Katherine E. Hickey.

The records were reviewed and the manuscript assembled by H. C. Troxell.

GAGING-STATION RECORDS

CALCASIEU RIVER BASIN

CALCASIEU RIVER NEAR OBERLIN, LA.

LOCATION.—In NW. ¼ NW. ¼ sec. 7, T. 5 S., R. 4 W., at Oberlin-Mittie highway bridge, 3¼ miles west of Oberlin and 11 miles in an air line above mouth of Whiskey Chitto Creek.

DRAINAGE AREA.—808 square miles (measured on post-route map and project map of Louisiana Gravity Canal Co., scale 1 : 380,000).

RECORDS AVAILABLE.—August 21, 1922, to September 30, 1924.

GAGE.—Gurley 8-day water-stage recorder on downstream side of bridge near left bank.

DISCHARGE MEASUREMENTS.—Made from upstream side of bridge or by wading.

CHANNEL AND CONTROL.—Channel curved. Banks composed of sand; wooded, medium in height, and subject to overflow. Bed composed of clean, fine sand; shifts. One channel at low stages and several channels at high stages. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 17.71 feet at 1 a. m. December 24 (discharge, 27,300 second-feet, determined from extension of rating curve and subject to error). Minimum discharge, 42 second-feet August 16.

1922–1924: Maximum stage from water-stage recorder, 18.48 feet at 6.55 a. m. April 7, 1923 (discharge, 34,700 second-feet, determined from extension of rating curve and subject to error). Minimum discharge that of August 16, 1924.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 14,000 second-feet; extended above. Operation of water-stage recorder satisfactory, except for short breaks in the record as noted in footnote to table of daily discharge. Mean daily gage heights determined from recorder graph by inspection or use of the planimeter. Daily discharge determined by shifting-control method except as noted in footnote to daily-discharge table. Records fair.

Discharge measurements of Calcasieu River near Oberlin, La., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 20	4.74	641	Dec. 14	13.11	5,700	Apr. 12	5.94	763
Nov. 3	10.38	2,740	Jan. 25	12.56	5,380	Apr. 26	7.28	1,120
Nov. 17	4.90	602	Feb. 23	7.10	1,110	May 10	4.27	432
Dec. 1	7.08	1,080	Mar. 15	10.40	2,030	June 21	2.37	117

Daily discharge, in second-feet, of Calcasieu River near Oberlin, La., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	168	299	1,060	3,180	2,370	5,030	704	1,170	147	222	54	65
2	162	454	1,230	3,440	2,430	6,560	582	961	241	118	59	59
3	157	2,480	2,030	4,080	2,310	5,390	544	841	396	86	57	56
4	152	4,450	2,610	4,080	1,930	4,320	525	841	804	82	54	53
5	162	3,850	2,810	3,850	1,490	3,740	506	913	3,440	87	51	53
6	174	3,180	2,950	3,020	1,170	3,540	458	985	4,870	94	51	56
7	191	3,530	3,960		937	3,020	396	985	4,200	88	50	59
8	191	8,020	4,200		817	2,370	362	865	3,540	78	49	62
9	197	6,560			748	2,430	330	642	2,950	72	48	59
0	197	4,720		1,810	726	2,810	370	431	2,490	69	51	54
11	191	3,640	4,290		726	2,880	622	322	2,030	65	66	51
12	185	2,880			817	2,490	771	262	1,650	63	54	50
13	174	2,310			771	2,030	704	241	1,200	66	48	49
14	162	1,730	5,590	1,570	817	1,930	642	222	865	63	46	49
15	157	1,230	5,810	1,460	841	2,030	622	209	422	62	43	48
16	174	817	5,810	2,810	841	2,030	622	197	284	66	42	48
17	301	582	5,030	3,540	841	2,030	642	191	215	76	44	47
18	506	468	4,320	4,200	913	2,030	662	179	174	73	44	46
19	642	396	3,640	4,320	1,320	1,930	683	162	147	68	44	47
20	642	346	3,180	4,200	1,730	1,780	683	157	132	61	46	46
21	642	306	3,960	5,590	1,730	1,690	602	147	127	58	48	49
22	704	276	10,300	5,810	1,380	1,570	487	137	118	56	52	48
23	794	255	24,300	4,720	1,110	1,490	458	132	109	54	58	46
24	913	241	26,000	5,030	1,080	1,420	506	127	100	53	82	46
25	1,060	228	24,800	5,030	1,260	1,320	817	118	93	53	93	46
26	1,290	248	16,600	4,580	2,600	1,260	1,110	122	86	56	88	46
27	1,460	248	10,300	3,960	3,740	1,260	817	127	94		80	48
28	1,320	284	7,400	3,100	4,320	1,290	704	122	82		77	51
29	913	528	5,590	2,430	4,320	1,290	1,380	118	70	54	74	54
30	563	865	4,580	2,130	-------	1,140	1,350	118	87		68	50
31	379	-------	3,740	2,130	-------	913	-------	118	-------		64	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated. Record incomplete Dec. 14, Jan. 6 and 13, and Aug. 1 and 2; discharge estimated.

Monthly discharge of Calcasieu River near Oberlin, La., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,460	152	481	29,600
November	8,020	228	1,850	110,000
December	26,000	1,060	6,880	423,000
January	5,810	-------	3,260	200,000
February	4,320	726	1,590	91,400
March	6,560	913	2,420	149,000
April	1,380	330	655	39,000
May	1,170	118	392	24,100
June	4,870	70	1,040	61,800
July	222	-------	72.9	4,480
August	93	42	57.6	3,540
September	65	46	51.4	3,060
The year	26,000	42	1,570	1,140,000

CALCASIEU RIVER NEAR KINDER, LA.

LOCATION.—In sec. 31, T. 6 S., R. 5 W., at Gulf Coast Railway bridge, three-fourths of a mile below mouth of Whiskey Chitto Creek and 4 miles west of Kinder.

DRAINAGE AREA.—1,760 square miles (measured on post-route map and project map of Louisiana Gravity Canal Co., scale 1:380,000).

RECORDS AVAILABLE.—August 23, 1922, to September 30, 1924.

GAGE.—Gurley eight-day water-stage recorder, attached to downstream side of railroad bridge pier; inspected by Welman Bradford.

DISCHARGE MEASUREMENTS.—Made by wading or from upstream side of railway bridge.

CHANNEL AND CONTROL.—Channel straight for 300 feet above and below station. Banks composed of sand and clay, heavily wooded, medium in height, and subject to overflow. Several channels at high stages. Bed composed of fine sand; clean; fairly permanent. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 21.69 feet at 10 p. m. December 23 (discharge, 68,000 second-feet, determined from extension of rating curve and subject to error); minimum stage, 0.81 foot from 11 a. m. August 9 to 1 p. m. August 10 (discharge, 200 second-feet).

1922–1924: Maximum and minimum discharge; those of year ending September 30, 1924.

ICE.—None.

DIVERSIONS.—Kinder Canal Co.'s pump diverts water 2 miles upstream. About 7,000 acres of rice was irrigated in 1922.

REGULATION.—Kinder Canal Co.'s pump affects flow at low stages.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined from 300 to 40,000 second-feet; extended above and below these limits. Operation of water-stage recorder satisfactory. Mean daily gage heights determined from recorder graph by inspection or by use of planimeter. Daily discharge determined by shifting-control method except as noted in footnote to daily-discharge table. Records fair.

Discharge measurements of Calcasieu River near Kinder, La., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 20	7.86	3,620	Jan. 26	12.89	8,560	Apr. 26	4.88	1,730
Nov. 3	6.42	3,120	Feb. 22	9.35	3,520	May 10	4.49	1,320
Nov. 17	5.00	1,800	Mar. 15	10.06	3,870	June 21	2.10	552
Dec. 1	8.67	[a] 3,970	Mar. 29	6.84	2,430			
Dec. 15	12.65	[a] 9,200	Apr. 12	6.50	2,360			

[a] Surface velocities observed by means of floats for part of measurement and coefficient used to reduce to mean velocity.

Daily discharge, in second-feet, of Calcasieu River near Kinder, La., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	820	1,340	3,990	5,560	3,420	9,360	2,120	4,500	624	536	224	309
2	820	1,380	4,420	5,340	3,360	9,080	1,800	4,060	1,000	536	234	306
3	820	3,110	5,790	6,460	3,360	9,360	1,570	3,280	1,490	536	281	364
4	820	6,600	7,780	7,330	3,240	7,330	1,460	2,280	1,920	536	249	390
5	820	9,950	8,020	6,620	2,930	5,910	1,420	1,800	2,280	536	224	393
6	931	12,200	7,130	5,790	2,590	5,240	1,340	1,730	3,130	553	215	370
7	1,190	13,600	6,620	4,940	2,320	5,040	1,300	1,730	3,780	518	209	345
8	1,190	12,500	6,780	3,920	2,080	4,850	1,230	1,690	4,060	467	237	332
9	1,080	9,650	6,780	3,240	1,880	4,940	1,150	1,610	3,780	416	203	319
10	1,000	8,800	6,170	2,930	1,840	5,340	1,300	1,380	3,360	393	203	306
11	968	6,780	5,910	3,130	1,920	5,670	1,770	1,150	2,930	364	262	300
12	968	5,450	7,130	3,850	1,920	5,560	2,160	1,000	2,500	348	309	300
13	968	4,420	8,530	4,200	1,960	5,240	2,360	894	2,160	341	268	290
14	931	3,720	9,080	4,130	2,080	4,580	2,200	838	1,690	}	249	293
15	968	3,130	9,360	3,850	2,200	4,130	1,840	802	1,230		228	293
16	1,040	2,500	8,800	5,260	2,040	4,060	1,610	784	857	319	252	416
17	1,570	2,000	8,270	7,780	1,880	3,920	1,530	784	712	}	237	467
18	2,590	1,770	7,330	8,530	1,880	3,600	1,490	820	658		228	377
19	3,240	1,610	6,040	8,530	2,590	3,420	1,460	730	587	271	262	332
20	3,600	1,490	5,340	8,800	3,360	3,480	1,460	676	553	281	249	309
21	3,660	1,420	7,320	8,270	3,780	3,720	1,460	641	553	281	265	313
22	3,180	1,380	20,200	7,130	3,660	3,780	1,340	624	553	287	338	316
23	2,240	1,340	61,900	6,310	3,080	3,600	1,190	624	553	274	384	332
24	2,040	1,300	61,900	6,950	2,680	3,180	1,150	571	536	277	370	450
25	2,040	1,270	45,400	8,020	3,150	2,830	1,190	571	536	277	467	624
26	2,160	1,270	32,600	8,530	4,490	2,590	1,570	571	536	281	450	484
27	2,320	1,300	24,200	7,780	7,130	2,460	1,920	571	536	281	407	380
28	2,410	1,300	17,400	6,780	8,530	2,360	1,960	571	536	277	377	332
29	2,240	1,840	12,500	5,690	9,080	2,320	2,690	554	536	271	329	313
30	1,840	3,080	8,800	4,440	-------	2,280	4,200	571	536	259	293	309
31	1,490	-------	6,620	3,720	-------	2,200	-------	588	-------	243	322	-------

NOTE.—Braced figures show estimated mean discharge for period indicated.

Monthly discharge of Calcasieu River near Kinder, La., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	3,660	820	1,680	103,000
November	13,600	1,270	4,250	253,000
December	61,900	3,990	14,100	869,000
January	8,800	2,930	5,930	365,000
February	9,080	1,840	3,270	187,000
March	9,360	2,200	4,560	281,000
April	4,200	1,150	1,710	102,000
May	4,500	554	1,260	77,300
June	4,060	536	1,490	88,700
July	553	243	362	22,300
August	467	203	285	17,500
September	484	290	355	21,200
The year	61,900	203	3,290	2,390,000

SABINE RIVER BASIN

SABINE RIVER NEAR GOLDEN, TEX.

LOCATION.—At highway bridge on main road between Golden and Grand Saline, 50 feet below mouth of Blair Creek, 3 miles above mouth of Grand Saline Creek, and 5½ miles southwest of Golden, Wood County.

DRAINAGE AREA.—1,200 square miles (measured on base map of Texas, scale 1 : 500,000).

RECORDS AVAILABLE.—June 26 to September 30, 1924.

GAGE.—Vertical staff gage attached to piling on downstream side of bridge; read by E. G. Bennett.

DISCHARGE MEASUREMENTS.—Made from upstream side of highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of silt and débris. Channel straight for 2,000 feet above and below station. One channel for low and medium stages; three for high stages. Banks low; subject to overflow. No well-defined control.

EXTREMES OF DISCHARGE.—Maximum stage recorded for period, 12.1 feet at 7 a. m. September 18 (discharge, 809 second-feet); no flow July 17 to August 16 and August 29 to September 12.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage heights to rating table. Records good.

The following discharge measurement was made:
June 28, 1924: Gage height, 0.66 foot; discharge, 0.35 second-foot.

Daily discharge, in second-feet, of Sabine River near Golden, Tex., for the period June 26 to September 30, 1924

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1		0.3			16		0.1		420
2		.3			17			24	586
3		.2			18			20	763
4		.2			19			15	274
5		.2			20			11	134
6		.2			21			3.6	40
7		.2			22			1.2	50
8		.2			23			.4	71
9		.2			24			.2	192
10		.2			25			.2	168
11		.1			26	1.0		.2	128
12		.1			27	1.0		.2	62
13		.1		29	28	.8		.1	32
14		.1		68	29	.7			20
15		.1		234	30	.4			15
					31				

NOTE.—Dry on days for which no discharge is given.

Monthly discharge of Sabine River near Golden, Tex., for the period June 26 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
June 26–30	1.0	0.4	0.78	7.74
July	.3	0	.09	5.55
August	24.0	0	2.45	151
September	763.0	0	110	6,520
The period				6,680

SABINE RIVER NEAR LONGVIEW, TEX.

LOCATION.—At city pumping plant just below International-Great Northern Railroad bridge, 1 mile above Longview-Henderson highway bridge, and 3 miles southwest of Longview, Gregg County.

DRAINAGE AREA.—3,010 square miles (measured on base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—January 1, 1904, to December 31, 1906; October 21, 1923, to September 30, 1924.

GAGE.—Combined inclined and vertical staff gage in three sections on left bank; read by J. B. Parkhill.

DISCHARGE MEASUREMENTS.—Made by wading or from highway bridge 1 mile below gage.

CHANNEL AND CONTROL.—Bed of stream composed of soapstone, sand, and drift; practically permanent. Channel is straight for 300 feet above gage and 600 feet below. Banks high; left bank subject to overflow at extremely high stages. Control is soapstone shallows and drift logs, 200 feet below gage; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 26.5 feet at 7.45 a. m. December 25 (discharge, 9,350 second-feet); minimum stage, 1.30 feet August 13–16 and September 10–12 (discharge, 21 second-feet).

1904–1906; 1924: Maximum stage recorded, 35.05 feet May 19, 1905 (discharge, 19,500 second-feet); minimum stage, that of August 13–16 and September 10–12, 1924.

ICE.—None.

DIVERSIONS.—Negligible.

REGULATION.—Slight effect at extremely low stages by pump just above gage.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined from 20 to 8,000 second-feet; extended above. Gage read to half-tenths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records good.

Discharge measurements of Sabine River near Longview, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 19	2.93	228	Dec. 22	24.22	8,180	Mar. 16	17.04	3,980
Oct. 22	2.36	118	Jan. 8	8.11	1,090	June 25	2.36	111
Nov. 9	2.32	107	Jan. 9	6.33	742	July 18	1.66	38
Dec. 20	19.91	5,280	Jan. 29	15.41	3,360	Sept. 9	1.32	22

Daily discharge, in second-feet, of Sabine River near Longview, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	76	144	8,410	4,520	3,480	7,630	2,140	3,600	81	25	29
2	-------	81	157	8,230	4,820	3,480	7,030	2,500	3,680	76	25	26
3	-------	93	157	7,990	4,920	3,440	5,830	2,920	3,720	70	25	25
4	-------	144	197	7,390	4,620	3,400	4,570	3,440	3,800	70	25	24
5	-------	144	267	6,310	3,640	3,160	3,400	3,760	3,800	65	25	23
6	-------	138	342	4,480	2,170	2,680	7,360	3,850	3,720	65	23	23
7	-------	131	312	2,640	1,140	2,020	1,580	3,320	3,640	60	23	23
8	-------	118	312	1,160	810	1,280	1,250	1,930	3,080	60	23	23
9	-------	112	327	735	717	1,690	1,180	965	1,990	60	23	23
10	-------	105	327	717	663	2,330	1,140	717	1,040	60	23	21
11	-------	93	374	791	663	2,400	1,060	627	609	60	23	21
12	-------	93	1,280	829	867	2,300	945	539	454	56	23	21
13	-------	99	2,170	791	1,140	2,440	829	471	374	56	21	24
14	-------	118	2,720	753	1,250	3,240	735	471	312	51	21	25
15	-------	118	3,080	810	1,380	3,800	699	539	267	47	21	25
16	-------	112	3,280	1,180	1,480	3,980	645	505	225	47	21	37
17	-------	112	3,520	1,480	1,630	4,080	609	645	197	43	22	118
18	-------	112	3,900	1,520	1,870	4,210	573	645	183	42	26	239
19	-------	112	4,570	1,630	1,990	4,390	539	471	170	37	26	522
20	-------	112	5,420	1,660	2,080	4,920	342	358	157	36	25	791
21	118	105	6,790	1,750	2,110	5,420	471	374	144	36	28	925
22	118	105	7,330	1,900	2,080	5,620	454	810	131	33	25	945
23	170	99	8,720	1,960	1,870	5,830	438	965	131	31	25	772
24	150	93	9,280	2,440	2,440	6,190	422	681	118	30	40	471
25	131	93	9,350	2,820	2,640	6,550	406	539	118	30	87	282
26	105	93	9,140	2,890	2,860	6,970	609	791	112	30	70	253
37	93	93	8,860	2,920	3,240	7,390	1,100	1,870	112	29	60	267
28	81	93	8,590	3,080	3,400	7,750	1,380	2,330	105	28	45	422
29	81	105	8,410	3,360	3,440	7,990	1,630	2,470	93	28	37	390
30	81	118	8,410	3,760	-------	8,110	1,870	3,000	93	25	31	282
31	76	-------	8,410	4,210	-------	8,050	-------	3,440	-------	25	30	-------

Monthly discharge of Sabine River near Longview, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 21–31	170	76	109	2,390
November	144	76	107	6,390
December	9,350	144	4,070	250,000
January	8,410	717	2,920	180,000
February	4,920	663	2,290	132,000
March	8,110	1,280	4,470	275,000
April	7,630	342	1,890	113,000
May	3,850	358	1,550	95,400
June	3,800	93	1,210	71,800
July	81	25	47.3	2,910
August	87	21	30.5	1,880
September	945	21	236	14,000
The period				1,140,000

SABINE RIVER AT LOGANSPORT, LA.

LOCATION.—At highway bridge between Logansport, DeSoto Parish, La., and Haslam, Tex., 200 feet above Houston East & West Texas Railway bridge, and 3 miles above mouth of Grand Cane Bayou.

DRAINAGE AREA.—4,860 square miles (measured on base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—July 1, 1903, to December 31, 1906; October 1, 1923, to September 30, 1924. Records of stage have been obtained by the United States Weather Bureau since July 1, 1903.

GAGE.—United States Weather Bureau chain gage attached to upstream handrail of highway bridge; read by J. F. Dry.

DISCHARGE MEASUREMENTS.—Made from upstream side of highway bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of sand and mud; practically permanent. Channel straight for 2,000 feet above and below gage. Banks of sand and earth, high, and not subject to overflow. Control soft rock ledge, 25 miles below gage; permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 26.90 feet at 9 a. m. June 3 to 9 a. m. June 4 (discharge, 14,000 second-feet); minimum stage, −0.32 foot from 10.15 a. m. September 20 to 9.10 a. m. September 21 (discharge, 42 second-feet).

1903–1906; 1924: Maximum stage recorded, 35.8 feet May 26, 1905 (discharge not determined); minimum stage, that of September 20 and 21, 1924.

ICE.—None.

DIVERSIONS.—Negligible.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined from 60 to 12,000 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table except from December 22 to January 3 when the gage heights were corrected for backwater. Records good, except for period affected by backwater for which they are fair.

Discharge measurements of Sabine River at Logansport, La., during the years ending September 30, 1922–1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
1921	*Feet*	*Sec.-ft.*	1923	*Feet*	*Sec.-ft.*	1924	*Feet*	*Sec.-ft.*
Oct. 9	1.40	169	Nov. 25	1.90	228	Jan. 13	20.77	6,820
Do	1.40	168	Dec. 19	16.21	4,800	Jan. 27	22,32	8,650
			Dec. 23	24.47	8,110	June 6	25.35	11,800
1923						July 14	1.26	155
July 3	6.73	881	1924			Sept. 6	.05	62
Oct. 12	2.77	357	Jan. 7	23.22	9,350			
Nov. 10	4.30	512	Jan. 10	22.74	9,110			

Daily discharge, in second-feet, of Sabine River at Logansport, La., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,570	208	1,160	10,700	7,820	10,500	7,500	6,380	10,800	274	76	86
2	1,640	219	895	10,600	6,380	9,930	7,660	6,020	13,100	263	76	82
3	1,460	855	775	10,400	5,960	9,430	7,740	4,600	14,000	252	72	82
4	775	1,400	1,060	10,300	5,600	8,490	7,820	4,100	13,800	241	68	79
5	695	1,500	2,400	10,000	5,450	7,900	7,900	3,630	13,000	219	62	76
6	695	1,460	3,090	9,630	5,300	7,430	7,900	3,580	12,000	208	59	62
7	585	1,220	3,140	9,530	5,150	6,940	7,900	4,950	10,800	208	56	59
8	540	835	2,480	9,230	4,950	6,020	7,740	5,900	9,430	198	56	56
9	392	715	2,680	9,130	4,550	5,960	6,940	6,620	8,580	178	56	53
10	392	484	3,000	8,940	2,960	6,080	6,200	6,500	7,430	168	56	53
11	320	431	3,180	8,670	2,080	6,380	4,450	5,500	6,500	168	53	53
12	308	356	3,580	7,980	1,880	6,500	3,140	4,150	5,000	168	53	50
13	296	320	4,250	7,220	2,040	6,940	2,480	2,880	3,090	158	50	50
14	285	285	4,800	6,560	2,720	7,660	2,080	3,090	1,640	158	50	50
15	241	263	5,250	5,960	2,960	8,490	1,850	3,220	1,260	149	50	48
16	296	241	5,350	7,290	3,320	8,670	1,640	3,000	1,060	149	50	48
17	308	208	5,200	8,940	3,400	8,760	1,500	2,520	855	140	50	46
18	431	208	5,000	9,130	3,630	8,850	1,280	2,360	715	140	86	43
19	444	208	4,750	9,630	5,500	8,850	1,140	2,160	615	132	168	43
20	457	208	5,000	9,730	6,440	8,940	1,060	1,880	526	124	444	43
21	512	208	6,020	9,730	6,500	8,940	990	1,640	457	124	380	43
22	470	198	7,500	8,220	6,500	8,940	895	1,640	392	116	296	178
23	444	198	8,220	7,220	6,500	8,670	855	1,820	380	116	230	344
24	344	198	9,530	7,080	7,150	8,580	795	1,960	368	116	208	512
25	320	219	10,500	7,740	7,220	8,490	775	2,200	356	108	208	715
26	263	198	10,600	8,220	7,980	8,220	3,760	2,880	344	108	188	615
27	252	188	10,800	8,760	9,330	7,980	8,140	4,450	344	93	158	526
28	230	230	10,900	9,130	10,200	7,500	8,850	4,750	320	86	132	444
29	219	585	11,000	9,230	10,400	7,660	7,150	4,850	296	82	100	368
30	219	965	10,800	9,130	------	7,500	6,680	6,620	274	82	93	308
31	208	------	11,000	8,140	------	7,430	------	9,330	------	79	90	------

Monthly discharge of Sabine River at Logansport, La., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,640	208	504	31,000
November	1,500	188	494	29,400
December	11,000	775	5,610	345,000
January	10,700	5,960	8,780	540,000
February	10,400	1,880	5,510	317,000
March	10,500	5,960	8,020	493,000
April	8,850	775	4,490	267,000
May	9,330	1,640	4,040	248,000
June	14,000	274	4,590	273,000
July	274	79	155	9,530
August	444	50	122	7,490
September	715	43	174	10,300
The year	14,000	43	3,540	2,570,000

SABINE RIVER AT SABINETOWN, TEX.

LOCATION.—At ferry, Sabinetown, Sabine County, just below mouth of Palo Gaucho Bayou and 10 miles east of Hemphill.

DRAINAGE AREA.—6,750 square miles (measured on base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—October 9, 1923, to September 30, 1924.

GAGE.—Vertical staff on right bank, just below ferry; read by A. F. Smith.

DISCHARGE MEASUREMENTS.—Made from boat or ferry at the ferry cable.

CHANNEL AND CONTROL.—Bed of stream composed of sand; somewhat shifting. Channel straight above and below station. Banks, wooded, fairly high; right bank subject to overflow at a stage of 25 feet. Control is rock shoals, half a mile below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 28.70 feet from 7.30 a. m. to 4 p. m. June 4 (discharge, 33,500 second-feet); minimum discharge, 110 second-feet August 17, 18, and September 12–19.

ICE.—None.

DIVERSIONS.—Negligible.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve fairly well defined from 200 to 21,000 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table; shifting-control method used October 9 to November 2 and July 14 to September 30. Records good.

Discharge measurements of Sabine River at Sabinetown, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 10	2.56	821	Jan. 2	21.37	19,200	July 10	1.70	338
Nov. 10	4.88	2,250	Jan. 6	19.03	16,000	Aug. 21	1.28	195
Nov. 23	1.89	407	Jan. 11	16.82	13,800			
Dec. 31	21.77	20,200	June 7	26.96	* 29,700			

* Slope measurement.

Daily discharge, in second-feet, of Sabine River at Sabinetown, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	459	9,200	19,800	14,100	20,100	10,800	19,400	25,000	597	150	142
2	-------	3,310	7,140	19,500	13,400	19,500	10,300	19,500	28,500	551	150	125
3	-------	9,400	6,000	19,500	12,100	19,200	10,100	18,100	32,000	528	142	125
4	-------	12,400	11,900	18,100	11,300	18,500	9,900	15,800	33,500	505	134	125
5	-------	11,000	14,100	17,200	10,000	20,100	9,700	13,500	32,700	459	134	125
6	-------	7,700	14,700	16,300	8,700	20,300	9,300	9,500	31,300	438	125	118
7	-------	5,440	12,400	16,500	7,700	18,900	9,300	8,700	29,100	417	125	118
8	-------	4,270	8,600	14,000	7,040	17,200	9,200	9,800	26,600	396	125	118
9	885	3,070	13,200	13,200	6,560	16,600	9,300	10,500	25,600	375	125	118
10	835	2,270	16,500	13,300	6,180	16,400	12,700	9,500	23,700	358	125	118
11	689	1,730	17,600	13,800	4,940	14,900	14,000	9,100	21,900	340	118	118
12	620	1,190	16,400	13,800	4,430	12,700	12,800	8,700	19,800	322	118	110
13	551	940	15,400	13,100	3,950	12,300	8,800	8,300	18,400	305	118	110
14	528	785	14,900	12,600	3,950	13,800	6,560	7,200	13,400	290	118	110
15	689	689	14,000	13,300	3,870	15,100	4,600	6,380	7,520	290	118	110
16	940	643	12,100	17,700	4,430	14,400	4,110	6,000	3,630	276	118	110
17	2,190	574	10,600	17,600	4,850	14,000	2,590	5,800	3,150	276	110	110
18	2,190	482	9,800	19,800	5,620	14,100	2,750	5,800	2,190	262	110	110
19	1,880	459	8,900	18,500	9,500	14,300	2,910	4,430	1,520	247	118	110
20	1,800	459	9,100	17,700	12,200	15,700	2,750	3,790	1,320	247	158	118
21	1,800	438	12,200	17,400	11,900	16,300	2,270	3,470	1,190	235	199	118
22	1,730	438	18,100	16,800	11,500	15,700	1,880	3,150	1,120	235	417	134
23	1,450	417	19,800	16,500	11,800	15,000	1,730	2,830	995	211	643	142
24	1,060	396	21,600	18,600	16,200	14,600	2,510	2,830	885	189	574	150
25	835	396	20,100	19,700	17,900	14,000	4,270	2,910	885	189	396	169
26	643	396	19,500	19,400	20,500	13,400	4,110	2,670	835	189	276	620
27	574	417	19,400	17,700	21,700	13,100	10,100	5,190	735	189	247	735
28	505	1,320	19,500	16,500	21,400	12,700	14,800	6,180	735	189	223	735
29	459	7,520	19,800	16,000	21,100	12,300	19,200	7,610	689	189	199	785
30	885	9,800	19,800	15,200	-------	11,900	19,400	13,200	643	179	159	689
31	505	-------	20,000	14,700	-------	11,400	-------	20,300	-------	150	142	-------

Monthly discharge of Sabine River at Sabinetown, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 9-31	2,190	459	1,050	48,100
November	12,400	396	2,960	176,000
December	21,600	6,000	14,600	897,000
January	19,000	12,600	16,600	1,020,000
February	21,700	3,870	10,600	613,000
March	20,300	11,400	15,400	949,000
April	19,400	1,730	8,090	481,000
May	20,300	2,670	8,710	536,000
June	33,500	643	13,000	773,000
July	597	150	310	19,100
August	643	110	194	11,900
September	785	110	221	13,100
The period				5,540,000

SABINE RIVER NEAR BON WEIR, TEX.

LOCATION.—At Gulf, Colorado & Santa Fe Railway bridge, 1¼ miles east of Bon Weir, Newton County, and 2½ miles above mouth of Caney Creek.

DRAINAGE AREA.—8,390 square miles (measured on base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—October 6, 1923, to September 30, 1924.

GAGE.—United States Weather Bureau chain gage attached to upstream side of railroad bridge; read by Macie Brown or Durham Taylor.

DISCHARGE MEASUREMENTS.—Made from upstream side of railroad bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of sand; shifts. Channel straight for 400 feet above and 150 feet below gage. Banks of earth, heavily wooded, low, and subject to overflow. Two channels at low stages and seven at high stages. Control is sand bar 1,000 feet below gage; shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 20.3 feet on December 25 and 26 (discharge, 41,400 second-feet); minimum stage, 1.50 feet on September 26 (discharge, 580 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined from 800 to 28,000 second-feet; extended above. Gage read to tenths once daily. One reading daily is only fair index to mean daily discharge. Daily discharge determined by applying daily gage height to rating table. Records poor.

Discharge measurements of Sabine River near Bon Weir, Tex., during the period July 6, 1923, to September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
1923	*Feet*	*Sec.-ft.*	1923	*Feet*	*Sec.-ft.*	1924	*Feet*	*Sec.-ft.*
July 6	7.17	4,500	Nov. 9	13.56	12,300	Jan. 4	17.97	20,700
Oct. 6	6.84	4,580	Nov. 22	4.19	1,630	June 13	18.90	26,100
Nov. 8	16.64	17,500				Aug. 20	2.79	1,060

Daily discharge, in second-feet, of Sabine River near Bon Weir, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			13,300	22,000	19,400	30,300	14,500	17,600	16,500			840
2			14,600	21,600	18,400	31,400	14,100	18,200	17,600			804
3			14,800	21,200	17,400	30,300	13,500		20,400			804
4			14,100	21,200	16,700	26,800	12,900		23,100			804
5		9,800	15,000	20,800	16,000	24,800	12,400	24,600	26,800			804
6	4,580		17,000	20,400	15,000	24,200	12,100		31,400			702
7			18,600	19,400	13,500	23,600	12,000		34,900			702
8		17,400	19,700	18,900	12,000	23,600	11,700	18,200	34,900			702
9		12,400	20,400	18,400	11,200	24,200	11,600	15,000	32,500		1,350	702
10		9,000	20,000	17,800	10,300	25,500	11,700	13,500	31,400			702
11	2,150	5,870	20,400	18,000	9,820	25,500	12,700	13,200	28,400			670
12		4,520	21,200	18,600	9,560	24,200	14,600	12,000	28,400			670
13		4,310	22,500	18,900	9,420	23,100	16,100	11,700	26,800			670
14		2,990	24,800	18,600	9,300	21,600	16,500	11,700	24,800			670
15		2,620	25,500	18,000	8,520	19,400	15,300	10,800	23,100			769
16	1,640	2,440	24,200	19,200	7,400	18,600	12,300	9,560	20,400	1,350		769
17		2,100	22,000	21,600	7,160	18,400	9,040	9,040	16,700		1,080	804
18		1,960	20,000	22,500	7,520	18,000	7,280	8,520	11,400		1,220	769
19		1,820	17,400	23,600	9,300	17,600	6,330	8,020	6,800		1,120	804
20		1,960	17,800	25,500	12,400	17,600	5,640	7,040	6,100		1,040	804
21		1,820	20,000	26,100	14,500	18,200	5,070	6,220	5,640		1,080	702
22		1,760	24,200	25,500	15,300	18,400	4,520	5,870	5,520		1,080	702
23		1,760	31,400	22,500	15,100	18,600	4,310	5,640	4,960		1,080	670
24	2,560	1,700	34,900	22,000	15,300	18,400	4,000	5,520	4,520		954	609
25		1,640	41,400	22,500	16,700	18,200	3,890	5,070	4,310		1,040	609
26		1,640	41,400	22,500	19,200	17,600	5,760	5,180	2,990		1,170	580
27		1,580	38,700	23,100	23,100	16,800	7,520	5,640	2,620		1,040	639
28		1,820	33,700	23,600	25,500	16,300	11,400	6,440	2,620		995	702
29		4,420	28,400	23,100	27,600	15,800	14,200	7,900	2,700		915	769
30		9,420	26,100	21,600		15,300	16,300	9,560	2,180		877	1,040
31			23,600	20,800		14,800		11,600			840	

NOTE.—Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Sabine River near Bon Weir, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 6–31			2,460	127,000
November		1,580	5,520	328,000
December	41,400	13,300	23,500	1,440,000
January	26,100	17,800	21,300	1,310,000
February	27,600	7,160	14,200	818,000
March	31,400	14,800	21,200	1,300,000
April	16,500	3,890	10,600	633,000
May		5,070	12,300	757,000
June	34,900	2,180	16,700	993,000
July			1,350	83,000
August		840	1,200	73,600
September	1,040	580	733	43,600
The period				7,910,000

LAKE FORK OF SABINE RIVER NEAR QUITMAN, TEX.

LOCATION.—At highway bridge 1 mile below mouth of Dry Creek, 2 miles south of Quitman, Wood County, and 15 miles above confluence with Sabine River.

DRAINAGE AREA.—586 square miles (measured on base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—June 27 to September 30,1924.

GAGE.—Staff gage on left bank; read by Carl Clark.

DISCHARGE MEASUREMENTS.—Made from upstream side of highway bridge or by wading.

CHANNEL AND CONTROL.—Channel composed of mud and débris; fairly permanent; straight for 300 feet above and below gage. Banks of sand and earth; left bank high; right bank subject to overflow at a stage of about 14 feet. Control consists of sand bar 1,000 feet below gage; subject to shift.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 8.10 feet at 7 p. m. September 16 (discharge, 305 second-feet); no flow August 4, 26. and August 30 to September 12.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined below 1,000 second-feet. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records fair.

The following discharge measurements were made:

June 27, 1924: Gage height, 0.91 foot; discharge, 1.7 second-feet.

July 17, 1924: Gage height, 0.56 foot; discharge, estimated 0.1 second-foot.

Daily discharge, in second-feet, of Lake Fork of Sabine River near Quitman, Tex., for the period June 27 to September 30, 1924

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1		1.2	0.1		16		0.2	0.1	298
2		1.0	.1		17		.2	.2	206
3		.8	.1		18		.2	86	44
4		.7			19		.1	13	19
5		.7	.1		20		.1	1.7	9.4
6		.7	.1		21		.1	.7	17
7		.5	.1		22		.1	.4	98
8		.5	.1		23		.1	.2	126
9		.5	.1		24		.1	.1	98
10		.4	.1		25		.1	.1	57
11		.4	.1		26		.1		22
12		.4	.1		27	1.4	.1	.1	13
13		.3	.1	29	28	1.3	.1	.1	8.9
14		.2	.1	151	29	1.3	.1	.1	5.6
15		.2	.1	240	30	1.2	.2		3.6
					31		.1		

NOTE.—Dry on days for which no discharge is given.

Monthly discharge of Lake Fork of Sabine River near Quitman, Tex., for the period June 27 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
June 27–30	1.4	1.2	1.30	10.3
July	1.2	.1	.34	20.8
August	86	.0	3.36	207
September	298	.0	48.2	2,870
The period				3,110

NECHES RIVER BASIN

NECHES RIVER NEAR REESE, TEX.

LOCATION.—At Texas & New Orleans Railroad bridge, half a mile above mouth of Dead Creek, 1½ miles below mouth of Killough Creek, and 2 miles west of Reese, Cherokee County.

DRAINAGE AREA.—851 square miles (measured on base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—April 10 to September 30, 1924.

GAGE.—Staff gage; read by John Bowden. Scale is inverted so that gage heights give the distance from base of rail to water surface.

DISCHARGE MEASUREMENTS.—Made from upstream side of railroad bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of mud; fairly permanent. Channel straight for half a mile above and below station. Banks of earth; covered with trees and brush; subject to overflow at a stage of −10.0 feet. Control half a mile below gage; probably permanent except for drift lodging on it.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, −12.5 feet at 3.45 p. m. on May 30 (discharge not determined); minimum stage, −26.60 feet at 8.25 a. m. September 11 (discharge, 2.0 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined below 600 second-feet, poorly defined from 600 to 2,400 second-feet, and extended above. Gage read to hundredths once daily. Daily discharge determined by applying mean daily gage height to rating table except as noted in footnote to table of daily discharge. Records fair.

Discharge measurements of Neches River near Reese, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 10	−21.96	487	June 5	−17.04	1,400	July 26	−25.95	11
May 1	−21.46	569	June 24	−23.96	91	Sept. 13	−26.40	2.0
June 4	−15.51	2,350						

Daily discharge, in second-feet, of Neches River near Reese, Tex., for the year ending September 30, 1924

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	568	3,775	78	7.0	4.0	16	363	568	171	17	5.0	124
2	------	568	3,580	47	7.0	3.0	17	363	490	143	15	5.0	227
3	------	568	3,360	42	6.5	2.5	18	284	438	150	15	5.0	363
4	------	568	2,430	42	6.0	2.5	19	284	386	116	15	5.0	284
5	------	568	1,430	42	6.0	2.5	20	221	375	81	15	5.0	227
6	------	549	1,430	40	5.0	2.5	21	158	363	74	15	5.0	227
7	------	549	1,075	37	5.0	2.5	22	150	363	81	15	5.0	227
8	------	549	949	32	5.0	2.5	23	549	282	88	13	4.6	200
9	------	530	822	31	4.0	2.5	24	227	200	85	11	4.3	177
10	490	568	470	28	4.0	2.5	25	177	335	81	11	4.0	153
11	428	661	449	25	4.0	2.0	26	945	470	74	8.2	4.0	128
12	428	754	386	25	4.0	2.5	27	785	754	74	7.6	4.0	118
13	407	700	307	17	4.0	3.0	28	625	955	67	7.0	4.0	86
14	386	682	227	17	5.0	12	29	568	963	72	7.0	4.0	54
15	386	663	199	17	5.0	20	30	568	5,030		7.0	4.0	47
							31	------	3,970		7.0	4.0	------

NOTE.—Braced figures show estimated mean discharge for periods indicated. No record Apr. 20, 27, May 3, 11, 14, 18, 20, 23, 25, June 1, 8, 13, 15, 16, 19, 22, July 4, 6, 13, 20, 27, Aug. 1, 3, 10, 17, 23, 24, 26, 31, Sept. 7, 12, 14, 16, 21, 25, and 28; discharge interpolated.

Monthly discharge of Neches River near Reese, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 10-30	945	150	419	17,400
May	5,030	200	806	49,600
June	3,775	67	744	44,300
July	78	7.0	22.8	1,400
August	7.0	4.0	4.82	296
September	363	2.0	90.3	5,370
The period				118,000

NECHES RIVER NEAR DIBOLL, TEX.

LOCATION.—At Houston East & West Texas Railway bridge, 2½ miles below mouth of Alabama Creek, 5 miles above mouth of Stovall Creek, and 7 miles south of Diboll, Angelina County.

DRAINAGE AREA.—2,670 square miles (measured on base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—November 5, 1923, to September 30, 1924.

GAGE.—Chain gage; read by Pearl Cole and Mrs. Bettie Cole.

DISCHARGE MEASUREMENTS.—Made from upstream side of railroad bridge or by wading.

CHANNEL AND CONTROL.—Channel straight above and below station. Bed composed of sand and débris and fairly permanent. Left bank high; right bank low, subject to overflow at a stage of 10 feet. Control for low and medium stages is a rapids below gage; for high stages, indefinite. Probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 15.40 feet, December 23 (discharge, 14,800 second-feet); minimum stage, 1.80 feet, September 17-21 (discharge, 26 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined from 40 to 7,000 second-feet; extended above. Gage read to hundredths twice daily. Mean daily discharge determined by applying mean gage height to rating table. Records good.

Discharge measurements of Neches River near Diboll, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 5	7.74	815	Feb. 4	12.52	3,480	Apr. 23	10.04	1,570
Dec. 12	13.43	4,580	Feb. 19	13.83	5,690	July 13	3.96	290
Dec. 27	13.34	4,440	Mar. 12	14.05	6,420	Aug. 12	2.39	48

Daily discharge, in second-feet, of Neches River near Diboll, Tex., for the year ending September 30, 1924

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	275	3,740	2,760	6,200	4,320	7,120	5,360	540	91	31
2	-------	1,290	3,740	2,510	5,640	4,000	5,080	7,120	495	91	30
3	-------	2,510	3,610	2,950	5,080	3,740	4,000	9,600	450	84	32
4	-------	3,610	3,610	3,350	4,480	3,740	5,080	9,600	406	77	31
5	818	3,250	3,740	3,150	4,320	3,610	3,050	8,500	364	71	31
6	720	3,050	3,480	3,050	4,160	3,350	2,760	7,120	336	64	32
7	525	2,760	3,250	3,050	4,000	3,250	2,510	6,660	322	63	32
8	406	2,760	3,250	2,850	3,740	3,250	2,310	6,660	308	54	32
9	350	3,380	3,250	2,590	6,660	3,150	2,130	7,120	294	49	33
10	308	4,000	3,050	2,590	6,200	3,740	2,080	7,580	280	46	33
11	280	4,800	3,050	2,670	5,920	5,080	1,860	7,120	275	43	32
12	275	4,640	3,150	3,050	6,200	5,080	1,690	6,200	260	50	32
13	260	4,320	3,250	3,250	6,660	4,320	1,480	5,640	280	53	32
14	245	3,770	3,050	2,850	7,580	3,150	1,380	5,080	275	51	30
15	245	3,220	3,480	2,670	8,500	2,850	1,290	4,480	260	50	30
16	245	2,670	5080	2,510	8,500	2,590	1,210	4,000	245	46	28
17	230	2,250	6,200	2,850	7,580	2,440	1,130	3,610	245	43	26
18	230	1,960	10,200	3,740	7,120	2,310	1,070	3,250	230	42	26
19	230	1,860	4,160	5,080	6,660	2,250	1,070	3,050	205	42	26
20	230	1,910	4,320	5,080	7,120	2,190	1,170	2,850	190	40	26
21	230	3,250	3,740	4,640	7,120	1,960	1,250	2,760	175	38	26
22	230	8,500	3,740	4,640	6,660	1,860	1,210	2,310	168	35	32
23	230	13,200	4,000	4,480	6,660	1,580	1,170	2,250	154	34	35
24	230	10,200	5,640	4,640	5,920	1,580	1,040	2,250	147	33	41
25	245	7,580	6,200	6,200	5,640	1,330	950	2,370	147	34	91
26	245	5,640	7,120	8,040	5,080	1,480	1,130	1,290	133	35	205
27	245	4,480	5,640	8,500	5,080	4,800	1,210	630	126	34	275
28	260	3,150	5,360	8,500	4,800	8,040	1,210	630	119	32	294
29	245	3,610	4,000	8,040	4,800	9,000	1,210	615	112	31	308
30	260	3,740	3,610	-------	4,800	9,000	2,590	600	105	30	294
31	-------	3,480	3,050	-------	4,640	-------	4,000	-------	98	30	-------

NOTE.—Record doubtful Dec. 23, 24, Feb. 13–19, Mar. 4, 5, and 13; discharge partly estimated. No record Dec. 9, 14, and 15; discharge interpolated.

Monthly discharge of Neches River near Diboll, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
November 5–30	818	230	308	15,900
December	13,200	275	4,040	248,000
January	10,200	3,050	4,280	263,000
February	8,500	2,510	4,150	239,000
March	8,500	3,740	5,920	364,000
April	9,000	1,330	3,630	216,000
May	7,120	950	2,140	132,000
June	9,600	600	4,540	270,000
July	540	98	250	15,400
August	91	30	48.9	3,010
September	308	26	73.5	4,380
The period				1,770,000

NECHES RIVER NEAR ROCKLAND, TEX.

LOCATION.—At ferry on highway between Rockland and Zavalla, half a mile above Texas & New Orleans Railroad bridge, 1 mile north of Rockland, Tyler County, 2 miles below mouth of Billams Creek, and 18 miles above mouth of Angelina River.

DRAINAGE AREA.—3,540 square miles (measured on base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—October 1, 1923, to September 30, 1924.

GAGE.—United States Weather Bureau staff gage on left bank.

DISCHARGE MEASUREMENTS.—Made from railroad bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of rock; permanent. Channel straight 150 feet above gage and 300 feet below. Banks of earth; subject to overflow. Control is rock shoals, 2,000 feet below gage; permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 22.1 feet June 2 and 3 (discharge, 14,200 second-feet); minimum stage, —0.6 foot, August 25 and September 6–27 (discharge, 50 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined from 60 to 10,000 second-feet; fairly well defined from 10,000 to 12,000 second-feet; extended above. Gage read to nearest tenths once daily. Mean daily discharge determined by applying daily gage height to rating table. Records fair.

COOPERATION.—Records of stage furnished by United States Weather Bureau.

Discharge measurements of Neches River near Rockland, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 4	2.06	699	Dec. 14	16.10	9,020	Feb. 5	10.68	4,980
Nov. 6	5.68	2,210	Dec. 29	19.99	11,400	May 19	3.66	1,200
Nov. 19	.68	225	Feb. 2	14.22	7,530	Aug. 15	—.42	61

Daily discharge, in second-feet, of Neches River near Rockland, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	375	160	2,960	8,380	8,380	11,900	6,160	6,980	13,400	820	96	61
2	256	256	3,380	7,120	7,680	11,500	5,760	8,240	14,200	890	96	55
3	256	3,260	4,530	6,020	6,980	11,100	5,500	9,080	14,200	750	85	55
4	555	3,500	7,960	5,050	6,160	10,300	5,240	9,220	14,100	680	85	55
5	375	2,900	9,290	4,460	5,180	10,300	4,980	8,870	13,700	615	85	55
6	495	2,460	9,990	4,220	4,100	9,850	4,720	8,170	13,100	555	76	50
7	256	2,240	10,600	4,100	3,740	9,360	4,460	7,610	12,600	435	76	50
8	375	2,020	10,300	4,040	3,620	8,660	4,220	6,630	12,100	405	76	50
9	256	1,260	9,780	3,920	3,620	8,940	3,980	5,760	10,700	345	76	50
10	204	890	9,360	4,220	3,500	9,080	5,240	4,160	9,500	315	68	50
11	204	615	9,290	4,220	3,380	9,430	6,160	3,020	9,010	315	68	50
12	181	495	9,220	3,980	3,740	9,640	6,160	2,460	8,660	285	68	50
13	181	495	9,150	3,860	3,860	9,640	6,160	2,130	8,520	285	61	50
14	160	256	9,010	3,800	3,860	9,710	6,160	1,920	7,890	256	61	50
15	160	256	8,660	4,100	3,860	9,920	6,020	1,820	7,610	256	61	50
16	1,260	256	8,100	6,980	3,860	10,200	6,020	3,080	6,770	229	61	50
17	960	315	7,540	7,400	4,100	10,300	5,640	1,440	6,630	229	61	50
18	890	256	6,700	8,030	4,860	10,400	5,120	1,350	5,960	229	55	50
19	890	229	6,560	8,520	6,020	10,400	4,460	1,220	5,380	181	55	50
20	820	229	7,190	8,590	6,560	10,600	3,980	1,180	4,790	181	55	50
21	615	229	7,960	8,310	7,400	10,400	3,560	1,220	4,040	181	55	50
22	495	229	9,920	8,100	7,820	10,100	2,680	1,440	3,860	160	55	50
23	345	204	11,400	7,750	7,960	9,990	2,350	1,720	3,560	160	55	50
24	345	204	12,600	8,590	9,080	9,710	2,080	1,620	3,140	141	55	50
25	256	181	13,800	8,800	9,360	9,430	1,720	1,480	2,740	124	50	50
26	256	181	14,100	9,220	10,300	8,940	3,440	1,350	2,240	124	55	50
27	256	229	13,800	9,570	11,400	8,660	4,040	4,280	1,530	124	55	50
28	204	285	13,000	9,570	11,900	8,100	5,050	5,380	1,030	124	55	109
29	204	1,720	12,000	9,500	12,100	7,540	5,440	4,460	855	109	55	124
30	160	2,240	11,000	9,360	-------	6,700	6,160	4,160	680	96	61	160
31	160	-------	9,780	8,800	-------	6,020	-------	12,700	-------	96	61	-------

Monthly discharge of Neches River near Rockland, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,260	160	400	24,600
November	3,500	160	935	55,600
December	14,100	2,960	9,320	573,000
January	9,570	3,800	6,730	414,000
February	12,100	3,380	6,360	366,000
March	11,900	6,020	9,570	589,000
April	6,160	1,720	4,760	283,000
May	12,700	1,180	4,330	266,000
June	14,200	680	7,420	441,000
July	890	96	313	19,200
August	96	50	65.7	4,040
September	160	50	59.1	3,520
The year	14,200	50	4,190	3,040,000

NECHES RIVER AT EVADALE, TEX.

LOCATION.—At Gulf, Colorado & Santa Fe Railway bridge, 500 feet west of Evadale railroad station, Jasper County, 600 feet below mouth of Mill Creek, and 12 miles above mouth of Village Creek.

DRAINAGE AREA.—7,910 square miles (measured on base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—July 1, 1904, to December 31, 1906; October 1, 1923, to September 30, 1924.

GAGE.—Vertical staff gage on left bank; read by F. B. Kirkpatrick.

DISCHARGE MEASUREMENTS.—Made from upstream side of railroad bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of mud and sand; shifts. Channel straight for 500 feet above and below gage. Left bank high; right bank low and at a stage of 16 feet is overflowed for a considerable distance. Control is a sandbar, 1½ miles below gage; shifting. Zero of the gage is 7.2 feet above mean sea level.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 19.0 feet from 7 a. m. June 1 to 7 a. m. June 7 (discharge, 40,700 second-feet); minimum stage, 1.30 feet from 6 a. m. September 21 to 6 a. m. September 22 (discharge, 387 second-feet).

1904–1906; 1923–24: Maximum discharge, that of June 1–7, 1924; minimum stage, 5.2 feet October 31 to November 22, 1904 (discharge, 202 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined from 180 to 37,000 second-feet. Gage read twice daily to half-tenths prior to August 16 and to hundredths thereafter. Daily discharge determined by applying mean daily gage height to rating table. Records good.

COOPERATION.—Records of stage from October 1 to July 31 furnished by United States Engineer Corps, Galveston, Tex.

69809—28——3

Discharge measurements of Neches River at Evadale, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Mar. 29	16.55	22,100	June 11	18.44	36,500
May 18	13.22	8,540	Aug. 18	1.95	479

Daily discharge, in second-feet, of Neches River at Evadale, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,420	1,240	4,070	33,000	23,200	24,000	18,800	11,400	40,600	3,260		484
2	1,710	1,340	6,200	33,000	23,200	26,200	18,000	11,700	40,600	3,190		504
3	1,540	1,760	7,800	32,200	23,200	27,000	17,200	12,600	40,600	3,050		527
4	1,380	4,150	9,020	30,000	22,500	27,000	15,800	13,200	40,600	2,840		527
5	1,380	6,950	10,400	28,500	21,800	27,000	14,600	13,600	40,600	2,660		504
6	1,440	8,680	11,400	26,200	21,000	27,800	14,000	14,000	40,600	1,380		484
7	1,500	9,750	12,600	24,000	19,500	27,000	13,200	19,500	40,600	1,270		444
8	1,460	9,950	14,000	21,000	18,800	27,000	12,200	19,500	37,500	1,200		444
9	1,340	9,380	15,100	17,200	17,200	27,000	11,400	18,800	37,500	1,130	622	424
10	1,270	7,800	20,200	14,600	22,500	27,000	11,100	18,800	37,500	1,060		424
11	1,240	6,700	20,200	15,100	13,600	27,000	10,800	18,800	37,500	969		424
12	1,200	5,220	23,200	14,000	12,600	25,500	10,400	17,200	36,800	939		404
13	1,100	4,230	25,500	14,000	11,700	26,200	11,400	16,500	36,000	1,420		404
14	999	3,400	27,800	13,600	13,600	26,200	10,800	15,800	33,800	1,380		404
15	1,030	2,980	28,500	12,900	10,200	25,500	11,400	14,600	30,000	1,340		424
16	1,160	2,660	28,500	12,900	10,200	25,500	10,400	13,600	28,500	1,310		444
17	1,760	2,400	27,800	12,900	9,950	24,000	12,600	12,200	27,000	1,270	527	444
18	4,150	2,100	26,200	13,200	9,950	24,000	13,200	11,400	24,800	1,240	504	424
19	5,580	1,900	27,000	13,600	9,950	24,000	11,400	9,200	23,200	1,200	504	404
20	5,580	1,710	28,500	14,600	10,200	24,000	11,100	8,850	21,800	1,160	527	387
21	4,500	1,620	30,800	15,800	10,400	24,000	10,600	7,800	21,000	1,130	504	387
22	3,680	1,580	35,200	16,500	10,800	23,200	9,550	7,650	20,200	1,100	504	387
23	2,840	1,500	30,800	16,500	11,700	23,200	8,500	7,350	21,000	1,060	504	387
24	2,500	1,420	30,800	21,000	12,600	23,200	7,500	7,080	18,800	1,030	504	404
25	2,150	1,380	29,200	22,500	15,100	23,200	6,950	5,950	14,600	999	527	444
26	1,950	1,340	27,000	22,500	18,800	22,500	5,950	5,820	10,800	969	527	444
27	1,670	1,340	27,000	21,800	21,000	22,500	11,100	5,580	7,500	939	504	424
28	1,500	1,500	30,800	21,800	21,800	22,500	11,400	5,220	6,200	909	484	404
29	1,420	1,760	31,500	21,800	22,500	21,000	11,400	6,320	4,070	881	464	387
30	1,380	2,720	32,200	22,500	-------	21,000	11,400	7,800	3,400	825	464	404
31	1,310	-------	32,600	22,500	-------	18,800	-------	11,400	-------	717	504	-------

NOTE.—Braced figures show estimated mean discharge for period indicated. Discharge estimated Oct. 6.

Monthly discharge of Neches River at Evadale, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	5,580	999	2,040	125,000
November	9,950	1,240	3,680	219,000
December	35,200	4,070	23,000	1,410,000
January	33,000	12,900	20,100	1,230,000
February	23,200	9,950	16,200	931,000
March	27,800	18,800	24,600	1,520,000
April	18,800	5,950	11,800	702,000
May	19,500	5,220	11,900	732,000
June	40,600	3,400	27,500	1,630,000
July	3,260	717	1,410	86,900
August			565	34,700
September	527	387	433	25,800
The year	40,600	387	11,900	8,650,000

MUD CREEK AT PONTA, TEX.

LOCATION.—At Texas & New Orleans Railroad bridge, three-quarters of a mile west of Ponta, Cherokee County, 1 mile south of mouth of Sandy Creek, and 12 miles above confluence with Angelina River.

DRAINAGE AREA.—481 square miles (measured on base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—April 15 to September 30, 1924.

GAGE.—Staff gage on downstream side of Texas & New Orleans Railroad bridge; read by J. M. Langley. The staff is inverted, reading the distance from the base of the rail to the water surface.

DISCHARGE MEASUREMENTS.—Made from upstream side of railroad bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of mud and sand; fairly permanent. One channel at all stages; straight for a short distance above and below gage. Banks are of earth, covered with brush and trees; high and not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, −12.72 feet at 5.32 a. m. May 30 (discharge, 4,000 second-feet, determined from extension of rating curve); minimum stage, −24.25 feet August 30 to September 12 (discharge, 3.3 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 1,800 second-feet; extended above. Gage read to hundredths or half-tenths five or six times a week. Daily discharge ascertained by applying daily gage height to rating table, except as noted in footnote to table of daily discharge. Records poor.

Discharge measurements of Mud Creek at Ponta, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 18	−19.22	439	June 4	−15.22	1,770	July 25	−23.46	8.9
May 2	−17.07	958	June 23	−21.59	121	Sept. 13	−24.00	4.2

Daily discharge, in second-feet, of Mud Creek at Ponta, Tex., for the period April 15 to September 30, 1924

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	980	{3,100	46	6.1	3.3	16	492	540	208	18	3.7	4.1
2	------	930		43	6.1	3.3	17	476	589	164	18	3.6	4.1
3	------	789	2,370	40	5.6	3.3	18	444	664	141	17	3.6	4.1
4	------	649	1,780	37	5.2	3.3	19	384	740	125	16	3.6	12
5	------	508	1,410	34	4.8	3.3	20	354	740	109	16	3.6	12
6	------	384	1,240	31	4.5	3.3	21	324	645	{120	16	3.4	12
7	------	369	1,090	29	4.2	3.3	22	296	476		14	3.4	11
8	------	354	943	26	4.0	3.3	23	354	384	119	13	3.4	67
9	------	414	794	27	3.9	3.3	24	476	354	119	12	3.4	94
10	------	444	645	28	3.9	3.3	25	476	415	119	9.3	3.4	76
11	------	414	508	27	3.8	3.3	26	589	476	97	8.6	3.4	46
12	------	384	431	26	3.8	3.3	27	665	800	80	8.2	3.4	28
13	------	354	354	24	3.7	4.0	28	740	980		7.9	3.4	20
14	------	384	296	22	3.7	4.0	29	840	1,010	{70	7.2	3.4	13
15	508	462	252	20	3.7	4.0	30	880	2,140		6.9	3.3	12
							31	------	3,820	------	6.6	3.3	------

NOTE.—No record Apr. 20, May 3, 4, 11, 12, 15, 18, 25, June 7, 8, 9, 12, 15, 16, 19, 26, July 3, 4, 6, 7, 9, 11, 13, 17, 20, 27, 30, Aug. 3–5, 7, 9, 10, 14, 15, 17, 18, 24, 25, 28, 29, 31, Sept. 1, 2, 6–10, 14, 17, 21, and 28; discharge interpolated. Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Mud Creek at Ponta, Tex., for the period April 15 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 15-30	880	296	518	16,500
May	3,820	354	729	44,800
June			668	39,800
July	46	6.6	21.1	1,300
August	6.1	3.3	3.95	243
September	94	3.3	15.6	926
The period				104,000

ANGELINA RIVER NEAR LUFKIN, TEX.

LOCATION.—At Houston East & West Texas Railway bridge, 800 feet above mouth of Lamana Bayou, 8 miles north of Lufkin, Angelina County, and 30 miles above mouth of Attoyac Bayou.

DRAINAGE AREA.—1,580 square miles (measured on base map of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—October 29, 1923, to September 30, 1924.

GAGE.—Chain gage attached to upstream side of bridge; read by J. R. Lilly, Coy Jordan, and H. F. Denby.

DISCHARGE MEASUREMENTS.—Made by wading or from upstream side of railroad bridge.

CHANNEL AND CONTROL.—Channel straight for some distance above gage and for 200 feet below. Bed of stream composed of sand and mud; shifts. Banks covered with trees and brush; left bank subject to overflow at stage of 9 feet. Control is remains of old dam, 300 feet below gage; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 13.90 feet at 6.30 a. m. June 5 (discharge, 19,500 second-feet, determined from extension of rating curve); minimum discharge, 39 second-feet September 2 and 3.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 5,000 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table; shifting-control method used October 29 to December 10. Records for low and medium stages, good; for high stages, poor.

Discharge measurements of Angelina River near Lufkin, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 30	5.72	144	Mar. 14	11.43	4,870	Aug. 11	3.44	47
Dec. 13	10.17	2,070	Apr. 22	8.73	1,060	Sept. 29	4.73	88
Dec. 26	10.96	3,100	July 8	5.86	241			

Daily discharge, in second-feet, of Angelina River near Lufkin, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		111	858		3,890	4,590	2,910	2,430	9,290	450	53	40
2		234	901		4,220	3,890	2,430	2,005	10,540	385	52	39
3		593	817		4,220	4,220	2,310	1,830	12,440	364	51	39
4		709	709		3,890	4,590	2,100	1,830	18,200	322	51	40
5		568	1,600		3,600	5,440	2,100	1,830	18,840	282	50	40
6		496	1,675		3,110	5,000	1,915	1,915	16,920	262	49	41
7		428	1,600		2,730	4,590	1,830	2,430	13,720	206	49	42
8		428	1,530	3,500	2,430	3,890	1,675	2,430	11,170	224	48	42
9		473	2,005		2,200	4,590	1,600	2,005	9,290	206	48	42
10		450	1,830		1,915	4,590	1,675	1,750	7,500	198	47	41
11		406	2,100		1,750	3,890	1,675	1,530	5,910	189	47	40
12		364	2,005		1,830	3,600	1,675	1,330	4,590	173	45	40
13		302	2,005		1,750	3,600	1,600	1,270	3,890	166	45	40
14		302	1,915		1,675	4,590	1,460	1,270	3,110	151	44	40
15		262	1,750	2,100	1,530	4,590	1,395	1,395	2,570	121	44	40
16		262	1,675	3,110	1,395	4,590	1,332	1,460	2,200	98	43	40
17		243	1,600	3,890	1,460	4,220	1,270	1,395	1,750	94	43	40
18		234	1,600	5,000	2,100	4,590	1,210	1,270	1,332	102	43	41
19		234	1,460	4,220	3,340	5,440	1,152	1,152	993	90	43	42
20		234	2,570	3,600	3,110	6,410	1,096	1,096	817	81	42	43
21		224	4,220	2,570	2,910	6,940	1,096	1,210	743	78	42	46
22		234	9,910	3,110	2,730	6,940	1,043	1,530	743	74	42	42
23		234	7,500	3,340	2,310	5,910	993	1,460	709	69	42	71
24		234	5,440	6,410	2,570	5,000	901	1,460	677	63	43	74
25		243	3,890	7,500	2,730	4,220	817	1,460	619	60	45	74
26		243	3,340	6,940	3,600	3,890	1,152	1,460	593	60	45	71
27		262	3,110	5,910	5,910	3,600	2,430	1,530	568	57	44	74
28		322	3,890	4,590	6,410	3,340	7,500	1,675	544	55	43	74
29	166	647	7,500	3,890	5,440	3,340	3,890	1,600	496	55	42	84
30	144	817	8,680	3,890	-------	3,340	3,110	1,830	473	54	42	94
31	121	-------	8,080	3,890	-------	3,110	-------	6,410	--------	53	42	-------

NOTE.—Braced figures show estim ated mean discharge for periods indicated. Records incomplete and discharge partly estimated Sept. 11.

Monthly discharge of Angelina River near Lufkin, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 29-31	166	121	144	855
November	817	111	360	21,400
December	8,680	709	3,150	194,000
January	----------	----------	3,970	244,000
February	6,410	1,395	2,990	172,000
March	6,940	3,340	4,530	279,000
April	7,500	817	1,910	114,000
May	6,410	1,096	1,780	110,000
June	18,840	473	5,370	320,000
July	450	53	156	9,600
August	53	42	45.5	2,790
September	94	39	50.5	3,000
The period	----------	----------	----------	1,470,000

ATTOYAC BAYOU NEAR CHIRENO, TEX.

LOCATION.—At highway bridge between Nacogdoches and San Augustine, 1 mile below mouth of Woodson Creek, 3 miles northeast of Chireno, Nacogdoches County, and 20 miles above confluence with Angelina River.

DRAINAGE AREA.—502 square miles (measured on base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—January 24 to September 30, 1924.

GAGE.—Chain gage attached to upstream side of bridge; read by Uriah Rogers.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Channel straight above and below gage. Bed composed of sand and mud; subject to shift. Banks are overflowed at a stage of about 15 feet. Control of rock, 1 mile below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 18.88 feet at 7 a. m. June 3 (discharge, 8,260 second-feet); minimum stage, 3.54 feet at 6 a. m. August 15 (discharge, 46 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined from 50 to 5,000 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table, except for the period April 15–23, when the discharge was partly estimated. Records good.

Discharge measurements of Attoyac Bayou near Chireno, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 17	14.60	1,240	Apr. 24	6.77	244	Sept. 5	3.77	51
Dec. 24	17.83	4,870	July 9	4.90	97			
Jan. 26	15.31	1,510	July 25	4.14	62			

Daily discharge, in second-feet, of Attoyac Bayou near Chireno, Tex., for the year ending September 30, 1924

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		1,190	2,270	630	2,060	6,760	120	61	58
2		950	1,970	600	1,720	7,860	114	58	58
3		828	1,650	674	1,480	6,430	108	52	58
4		620	1,430	729	1,040	3,290	102	52	55
5		630	1,300	729	880	2,610	102	55	52
6		729	1,100	718	652	2,060	97	55	52
7		729	850	718	1,130	1,720	97	52	49
8		729	740	718	1,220	1,480	97	55	49
9		718	865	707	1,130	1,220	97	55	49
10		718	950	590	970	865	97	55	49
11		718	930	641	865	600	92	55	47
12		729	910	630	740	440	92	58	47
13		570	1,100	620	540	349	92	58	58
14		590	1,430	610	394	304	87	49	77
15		580	1,530	530	403	277	82	49	65
16		550	1,530	490	385	252	82	49	55
17		550	1,530	450	394	236	77	52	52
18		910	1,800	412	376	220	73	52	49
19		1,160	1,720	376	295	204	73	55	52
20		1,380	1,590	340	286	196	69	58	55
21		1,480	1,650	304	470	196	65	58	58
22		1,720	1,480	277	520	220	61	61	61
23		1,720	1,340	252	590	228	61	73	65
24	1,720	1,880	1,220	228	610	220	61	82	102
25	1,720	1,880	1,190	212	580	212	61	73	108
26	1,590	1,970	1,130	470	620	196	65	65	82
27	2,490	1,800	1,070	1,220	850	172	87	58	65
28	2,160	2,490	970	1,650	784	140	126	52	58
29	1,800	3,000	910	3,440	795	126	92	49	55
30	1,590		674	2,610	1,220	126	73	49	55
31	1,340		685		1,970		65	52	

Monthly discharge of Attoyac Bayou near Chireno, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
January 24-31	2,490	1,340	1,800	28,600
February	3,000	550	1,160	66,500
March	2,270	674	1,270	78,400
April	3,440	212	752	44,800
May	2,060	286	838	51,500
June	7,860	126	1,310	77,800
July	126	61	86.0	5,290
August	82	49	56.7	3,480
September	108	47	59.8	3,560
The period				360,000

AYISH BAYOU AT SAN AUGUSTINE, TEX.

LOCATION.—At San Augustine-Nacogdoches highway bridge, a quarter of a mile west of courthouse in San Augustine, San Augustine County, and 5 miles north of mouth of Bernard Creek.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—July 24 to September 30, 1924.

GAGE.—Vertical staff gage attached to downstream side of left abutment of highway bridge; read by J. B. Whitton or J. A. Clark.

DISCHARGE MEASUREMENTS.—Made from upstream side of highway bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of gravel; practically permanent. One channel at all stages; straight for several hundred feet above and below gage. Banks are of earth, fairly permanent; not subject to overflow. Channel downstream forms control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 1.94 feet at 4 p. m. July 26 (discharge, 45 second-feet); minimum discharge, 3.2 second-feet on September 5.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 30 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records good.

Discharge measurements of Ayish Bayou at San Augustine, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
July 9		6.4	Sept. 5	1.16	3.2
Sept. 24	1.21	4.6	Sept. 23	1.39.	9.9

Daily discharge, in second-feet, of Ayish Bayou at San Augustine, Tex., for the year ending September 30, 1924

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1	------	5.2	6.5	11	------	4.0	4.0	21	------	4.4	} 8.0
2	------	4.4	6.0	12	------	4.0	4.0	22	------	6.0	
3	------	4.7	5.4	13	------	4.0	8.3	23	------	4.7	9.6
4	------	4.4	4.7	14	------	4.0	6.5	24	4.7	4.7	4.4
5	------	4.2	4.0	15	------	4.0	5.7	25	4.4	4.4	4.9
6	------	4.0	4.0	16	------	4.0	4.9	26	26	4.0	4.9
7	------	4.4	4.0	17	------	4.0	4.0	27	12	4.0	4.4
8	------	4.7	4.0	18	------	4.4	4.0	28	8.3	4.0	4.4
9	------	4.4	4.0	19	------	4.4	} 8.0	29	6.0	4.0	4.4
10	------	4.0	4.0	20	------	4.2		30	5.4	4.0	4.9
								31	5.4	5.2	------

NOTE.—Braced figures show estimated mean discharge for period indicated.

Monthly discharge of Ayish Bayou at San Augustine, Tex, for the year ending September, 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
July 24-31	26	4.4	9.02	143
August	6.0	4.0	4.34	267
September	----------	----------	5.40	321
The period	----------	----------	----------	731

VILLAGE CREEK NEAR KOUNTZE, TEX.

LOCATION.—At Gulf, Colorado & Santa Fe Railway bridge, 4 miles east of Kountze, Hardin County, and 8 miles below mouth of Beech Creek.

DRAINAGE AREA.—838 square miles (measured on base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—May 14 to September 30, 1924.

GAGE.—Chain gage attached to upstream side of railroad bridge; read by Ocie Adams. Scale inverted, so that gage heights give distance from base of rail to water surface.

DISCHARGE MEASUREMENTS.—Made from upstream side of railroad bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of sand; shifts. Channel straight for 500 feet above gage and 200 feet below. Banks of earth; low and flat; subject to overflow. Control is an accumulation of trees and logs partly buried in sand, 200 feet below gage; subject to shift.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, —11.19 feet June 2 (discharge, not determined); minimum stage, —28.35 feet September 27 (discharge, 96 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined from 40 to 1,000 second-feet; poorly defined to 8,500 second-feet. Gage read to hundredths once daily except Sundays. Daily discharge determined by applying mean daily gage height to rating table except as noted in footnote to daily-discharge table. Records fair.

Discharge measurements of Village Creek near Kountze, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
May 16	−23.69	805	June 11	−23.33	920
June 4	−14.23	8,450	Aug. 16	−27.59	149

Daily discharge, in second-feet, of Village Creek near Kountze, Tex., for the year ending September 30, 1924

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	------	------	325	178	140	16	816	578	232	199	132
2	------	------	310	168	148	17	772	536	232	234	140
3	------	------	310	168	221	18	696	496	232	269	132
4	------	------	310	168	158	19	620	477	221	244	116
5	------	6,200	355	158	168	20	557	496	210	232	108
6	------	2,800	326	158	168	21	641	496	199	148	108
7	------	2,240	296	158	146	22	706	459	188	148	108
8	------	1,910	282	158	124	23	578	422	188	148	108
9	------	1,580	269	158	116	24	838	422	178	153	100
10	------	1,000	256	153	108	25	761	405	188	158	100
11	------	883	256	148	116	26	684	388	188	158	96
12	------	750	244	148	124	27	578	371	188	148	96
13	------	684	244	232	124	28	684	371	188	148	98
14	907	641	244	232	120	29	860	356	178	148	100
15	860	610	244	269	116	30	955	340	178	140	100
						31	1,260	------	178	140	------

NOTE.—No record May 18, 25, June 8, 15, 22, 29, July 6, 13, 20, 27, Aug. 3, 10, 17, 24, 31, Sept. 7, 14, 21, and 28, discharge interpolated. Daily gage heights in feet, for days when discharge was beyond limits of rating curve, are as follows: June 2, −11.19; June 3, −12.09; June 4, −13.91.

Monthly discharge of Village Creek near Kountze, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
May 14-31	1,260	557	765	27,300
June 5-30	6,200	340	997	51,400
July	355	178	240	14,800
August	269	140	176	10,800
September	221	96	125	7,240

TRINITY RIVER BASIN

WEST FORK OF TRINITY RIVER AT BRIDGEPORT, TEX.

LOCATION.—At Rock Island pumping plant, a quarter of a mile below Balsora-Bridgeport highway bridge, half a mile southwest of railroad station at Bridgeport, Wise County, and 1¼ miles below mouth of Gentry Creek. Prior to July 10, 1924, gage was located at highway bridge a quarter of a mile upstream.

DRAINAGE AREA.—1,010 square miles (measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—October 1, 1914, to September 30, 1924.

GAGE.—Vertical staff gage on left bank, three-eighths of a mile above Rock Island Dam; read by F. G. Howard. Prior to July 10, 1924, a weight and tape gage of the Mott type, fastened to downstream side of highway bridge, was used; read by Minnie Lee Hembree.

DISCHARGE MEASUREMENTS.—Made from downstream side of bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of clay, gravel, and sand. Banks are slightly wooded, high, and overflowed at a stage of 25 feet. Channel straight above and below station for 100 feet. Control is a 4-foot concrete dam, three-eighths of a mile below station; clean and permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 23.3 feet at 1 p. m. November 14 (discharge, 10,000 second-feet); no flow July 18 to August 6 and September 7–11.

1908–1924: Maximum stage recorded, 28.9 feet June 8, 1915 (discharge not determined); no flow during several periods.

ICE.—None.

DIVERSIONS.—Practically the only diversion above station is by the city of Bridgeport which diverts a small amount for municipal uses.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent for each of the curves used. Rating curves well defined. Gage read to hundredths twice daily October 1 to July 10; to hundredths once daily thereafter; oftener during floods. Daily discharge determined by applying mean daily gage height to rating tables. Records good.

Discharge measurements of West Fork of Trinity River at Bridgeport, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 1	16.10	2,940	Nov. 15	19.45	5,400	Nov. 17	12.23	2,180
Do	15.61	3,130	Do	18.78	4,700	Nov. 18	9.48	1,260
Do	15.13	2,960	Do	17.64	4,100	Do	8.73	933
Nov. 2	10.40	1,660	Do	17.10	3,930	Feb. 7	3.54	12
Do	9.75	1,370	Nov. 16	16.15	3,560	Apr. 24	5.83	15
Do	9.35	1,200	Do	16.17	3,610	Do	5.83	.44
Nov. 3	7.33	309	Nov. 17	14.20	2,740	July 9	5.79	a.25
Nov. 14	22.84	7,390	Do	13.41	2,430	Sept. 18	6.15	9.1

a Estimated.

Daily discharge, in second-feet, of West Fork of Trinity River at Bridgeport, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	3,270	78	63	16	7.0	53	52	9.5	1.2	0.0	6.1
2	72	1,450	89	44	15	7.0	50	41	9.5	1.2	.0	4.6
3	86	319	194	39	15	7.0	47	35	123	1.0	.0	3.2
4	99	110	212	34	14	6.2	43	27	48	.5	.0	1.7
5	110	89	194	30	14	5.6	41	20	27	3.0	.0	.8
6	566	78	138	28	13	5.6	43	18	16	2.0	.0	.2
7	248	68	110	26	13	5.6	47	15	9.5	1.2	.2	.0
8	212	68	99	24	13	5.6	47	15	9.5	.5	15	.0
9	54	58	89	23	13	227	47	15	9.5	.4	13	.0
10	49	42	89	23	13	54	47	15	54	.4	6.7	.0
11	39	39	212	23	6.0	22	47	14	73	.4	4.9	.0
12	20	37	3,040	23	13	20	45	14	48	4.3	3.4	3.4
13	10	68	6,050	23	9.7	46	43	14	34	4.6	76	9.0
14	58	9,460	2,800	22	9.1	326	41	14	27	2.8	174	3.8
15	1,180	4,500	1,690	22	8.2	266	37	31	24	1.8	27	2.6
16	698	3,470	1,230	22	7.9	227	35	35	20	.5	56	1.6
17	1,570	2,480	698	22	7.3	812	32	41	16	.2	102	8.0
18	2,220	1,090	248	20	7.0	286	31	41	12	.0	31	10
19	2,070	354	194	20	7.0	1,080	29	39	9.5	.0	16	7.5
20	1,140	138	138	20	7.0	3,300	27	35	7.0	.0	10	6.4
21	354	110	110	20	7.0	1,580	26	33	5.5	.0	6.7	6.7
22	194	110	110	20	7.0	886	22	31	4.0	.0	5.8	94
23	68	99	99	20	7.0	372	20	31	4.0	.0	4.3	18
24	42	89	89	18	7.0	.225	17	31	3.2	.0	4.3	208
25	29	89	89	18	7.0	144	188	31	2.4	.0	4.9	152
26	20	78	89	18	7.0	123	1,060	100	2.0	.0	4.9	54
27	18	78	78	17	7.0	78	439	598	1.2	.0	2.6	19
28	522	78	78	16	7.0	54	331	225	.8	.0	1.6	16
29	2,050	78	78	16	7.0	73	176	48	.5	.0	7.5	9.5
30	1,490	78	68	16	-------	67	78	27	.4	.0	10	7.0
31	3,270	-------	68	16	-------	54	-------	16	-------	.0	7.5	-------

Monthly discharge of West Fork of Trinity River at Bridgeport, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	3,270	10	600	36,900
November	9,460	37	936	55,700
December	6,050	68	598	36,800
January	63	16	24.1	1,480
February	16	7.0	9.8	564
March	3,300	5.6	335	20,600
April	1,060	17	106	6,330
May	598	14	54.9	3,380
June	123	.4	20.3	1,210
July	4.6	0	0.84	51.6
August	174	0	19.2	1,180
September	208	0	21.8	1,300
The year	9,460	0	228	165,000

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

LOCATION.—Just above Lake Worth Dam, 4 miles above confluence of Clear Fork and West Fork of Trinity River, 4½ miles northwest of courthouse in Fort Worth, Tarrant County.

DRAINAGE AREA.—1,870 square miles (measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—October 1, 1923, to September 30, 1924.

GAGE.—Gurley 8-day water-stage recorder installed June 10 in concrete valve tower just above dam and 300 feet to right of spillway. Gage prior to this date was staff gage on right bank, half a mile upstream. Both gages set at same datum.

DISCHARGE MEASUREMENTS.—Made by wading or from bridge 2 miles below gage.

CHANNEL AND CONTROL.—Control formed by concrete dam.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.25 feet November 18 (discharge, 8,390 second-feet); no flow October 1–15 and June 28 to September 30.

ICE.—None.

DIVERSIONS.—Diversions for municipal use only. Amount not known.

REGULATION.—Storage above dam causes considerable regulation.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 3,000 second-feet; extended above by means of formulae, Q equals $CLh^{3/2}$, using a value of 3.55 for C which was derived from measurements made at the station. Gage read to the nearest half inch once daily, by employees of the city of Fort Worth, prior to February 19; since that date till June 9, gage read to hundredths twice daily. Operation of water-stage recorder from June 10 to September 30, satisfactory except for the periods June 13–16 and 21–27, when the staff was read. Daily discharge ascertained by applying to rating table mean daily gage height determined by inspection of recorder graph or by gage readings. Records prior to February 19 poor; good thereafter.

COOPERATION.—Records of stage prior to February 19 furnished by city of Fort Worth.

Discharge measurements of West Fork of Trinity River at Lake Worth Dam, above Fort Worth, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Feb. 27	0.04	51	Mar. 20	1.06	2,810	May 26	0.46	788
Mar. 17	.86	1,900	May 7	.10	110	June 12	.00	37
Mar. 18	.74	1,560	May 17	.04	58	June 21	−.10	*4

* Estimated.

Daily discharge, in second-feet, of West Fork of Trinity River at Lake Worth Dam, above Fort Worth, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		1,300	62	62	62	70	179	759	256
2		1,900	94	62	62	46	156	380	156
3		2,130	94	94	62	46	156	287	349
4		2,680	133	133	54	62	156	202	225
5		2,680	190	133	46	54	156	156	179
6		1,300	190	133	38	46	156	110	179
7		617	190	133	30	38	156	156	94
8		437	190	94	30	30	144	94	78
9		190	190	94	30	30	133	62	62
10		190	190	94	30	30	133	78	62
11		133	190	94	30	225	110	62	62
12		133	437	94	30	418	94	46	38
13		190	3,080	94	30	494	94	62	30
14		240	3,280	62	30	349	110	62	38
15		240	3,280	62	30	318	110	78	94
16	437	437	7,030	62	30	570	110	94	86
17	806	5,030	8,110	62	30	1,940	94	78	54
18	1,550	8,110	6,510	62	30	1,660	54	62	46
19	1,550	6,510	5,760	62	62	1,980	30	46	14
20	1,550	4,560	2,480	62	38	2,680	30	46	4.0
21	1,550	3,490	806	62	38	2,090	30	46	9.2
22	1,690	1,550	806	62	30	2,170	30	78	4.0
23	1,030	617	806	62	30	2,400	179	46	4.0
24	532	302	617	62	30	3,080	179	30	4.0
25	437	302	617	62	38	3,080	240	46	2.4
26	437	240	302	62	38	1,590	2,480	570	2.4
27	302	133	240	62	78	806	1,720	916	.8
28	302	133	240	62	62	532	1,590	617	
29	302	94	240	62	70	380	1,940	1,030	
30	302	62	190	62		349	1,200	570	
31	617		133	62		287		349	

NOTE.—No flow over dam on days for which no discharge is given.

Monthly discharge of West Fork of Trinity River at Lake Worth Dam, above Fort Worth, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,690	0	432	26,600
November	8,110	62	1,530	91,100
December	8,110	62	1,510	92,600
January	133	62	78.4	4,820
February	78	30	41.3	2,380
March	3,080	30	898	55,200
April	2,480	30	398	23,700
May	1,030	30	233	14,300
June	349	0	71.1	4,230
The year	8,110	0	434	315,000

NOTE.—No flow during July, August, and September.

WEST FORK OF TRINITY RIVER AT FORT WORTH, TEX.

LOCATION.—At old intake pump house of Fort Worth Power & Light Co.'s plant, in Fort Worth, Tarrant County, one-fourth mile below mouth of Clear Fork of Trinity River and 150 feet above Paddock viaduct.

DRAINAGE AREA.—2,430 square miles (revised, measured on topographic maps and base map of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—October 11, 1920, to September 30, 1924.

GAGE.—Gurley graph water-stage recorder, in old pump house of Fort Worth Power & Light Co.; inspected by employee of city of Fort Worth.

DISCHARGE MEASUREMENTS.—Made by wading or from highway bridge, 1,000 feet above, or from North Twelfth Street Bridge, 2 miles below gage.

CHANNEL AND CONTROL.—Channel straight for 500 feet above station and 1,000 feet below. Right bank high, brushy, and not subject to overflow. Left bank low; has a protection levee but is subject to overflow at high stages. Bed composed of rock, gravel, and clay. Control is a concrete dam just below gage; permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 7.45 feet at 8 p. m. November 18 (discharge, 6,900 second-feet); dry August 2–5 and September 8–11.

1910–1924: Maximum stage recorded, 23.95 feet at 12.20 p. m. April 25, 1922 (discharge, 85,000 second-feet); no flow during several periods.

ICE.—None.

DIVERSIONS.—The city of Fort Worth diverts, for municipal use, about 15 second-feet from storage reservoir known as Lake Worth.

REGULATION.—Flow is partly regulated by storage at Lake Worth, which has a capacity of about 30,000 acre-feet.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 14,000 second-feet; extended above. Operation of water-stage recorder satisfactory, except for short breaks in record. Daily discharge determined by applying to rating table mean daily gage height obtained from recorder graph by inspection or by use of planimeter, except as noted in footnote to daily-discharge table. Records good.

The following discharge measurements were made:

December 18, 1923: Gage height, 5.72 feet; discharge, 4,650 second-feet.

September 14, 1924: Gage height, 0.90 foot; discharge, 0.5 second-foot (estimated).

Daily discharge, in second-feet, of West Fork of Trinity River at Fort Worth, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.4	1,520	96	297	109	175	386	928	426	11	0.3	1.8
2	9.6	1,880	137	520	106	145	359	555	976	11	0	1.2
3	17	2,290	160	167	126	130	343	398	1,160	11	0	1.6
4	15	2,350	194	167	287	156	381	302	460	24	0	1
5	14	2,480	206	148	134	145	348	232	333	25	0	.9
6	15	1,660	254	134	69	145	343	202	259	25	2.8	.6
7	12	740	273	141	52	119	312	202	194	25	12	.2
8	11	414	259	145	52	126	287	171	148	22	6.0	0
9	11	254	228	137	55	278	292	163	119	22	20	0
10	11	167	215	287	55	141	263	148	116	31	9.6	0
11	9.6	116	317	119	134	232	228	141	217	25	4.4	0
12	9.6	90	1,860	145	240	514	215	112	116	12	1.8	26
13	11	86	3,220	123	163	829	219	106	90	17	73	18
14	99	112	2,290	109	130	901	206	109	99	18	297	7.2
15	280	631	2,290	134	112	604	206	106	116	12	52	6.0
16	862	1,190	4,560	167	123	856	206	109	109	11	25	6.0
17	1,070	3,100	5,970	156	148	3,570	206	96	83	9.6	9.6	17
18	1,420	6,480	4,850	126	106	2,160	206	83	58	5.2	8.4	14
19	1,220	6,220	3,600	156	119	3,550	137	74	38	4.4	7.2	8.4
20	1,370	4,700	1,980	156	119	4,240	126	396	31	4.4	5.2	8.4
21	1,520	3,520	1,090	90	102	2,600	123	606	29	5.2	2.8	11
22	1,670	1,740	892	77	86	2,350	123	152	29	2.8	2.0	11
23	1,320	829	646	96	90	2,600	333	96	27	2.8	1.8	8.4
24	692	508	514	156	102	3,150	426	102	18	2.8	3.6	8.4
25	343	354	437	152	145	3,450	1,710	86	20	6.0	4.4	8.4
26	223	292	386	116	198	2,100	4,000	3,500	15	5.2	3.6	7.2
27	145	194	364	102	263	1,880	1,940	1,760	17	4.4	3.6	6.0
28	123	163	333	102	198	820	1,670	856	15	5.2	3.6	6.0
29	148	171	297	116	175	910	1,820	2,140	14	1.8	3.6	9.6
30	249	109	348	116	-------	569	1,420	1,060	12	1.0	1.6	9.6
31	812	-------	348	116	-------	496	-------	555	-------	.7	1.4	-------

NOTE.—Record incomplete, Dec. 29, Jan. 5, Mar. 22, 29, Apr. 13, and 19; discharge partly estimated. Discharge obtained by comparison with U. S. Weather Bureau gage, Dec. 30 to Jan. 4, Mar. 23–28, and Apr. 14–18.

Monthly discharge of West Fork of Trinity River at Forth Worth, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,670	8.4	443	27,200
November	6,480	86	1,480	88,000
December	5,970	96	1,250	76,600
January	520	77	154	9,470
February	287	52	131	7,530
March	4,240	119	1,290	79,200
April	4,000	123	628	37,400
May	3,500	74	501	30,800
June	1,160	12	178	10,600
July	31	.7	11.7	721
August	297	0	18.3	1,120
September	26	0	6.8	404
The year	6,480	0	508	369,000

TRINITY RIVER AT DALLAS, TEX.

LOCATION.—At Commerce Street viaduct in city of Dallas, Dallas County, 800 feet below Texas & Pacific Railway bridge, and 5 miles below confluence of Elm and West Forks of Trinity River.

DRAINAGE AREA.—6,000 square miles (revised, measured on topographic maps and base map of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—October 1, 1898, to December 31, 1899 (discharge not determined); July 1, 1903, to December 31, 1906; and October 1, 1920, to September 30, 1924.

GAGE.—Chain gage attached to downstream handrail of Commerce Street viaduct; read by C. J. Anderson.

DISCHARGE MEASUREMENTS.—Made by wading on upstream side of Commerce Street viaduct, or from "Miller's Ferry" bridge, about 6 miles downstream from gage.

CHANNEL AND CONTROL.—Channel practically straight for 1,000 feet above and 600 feet below station. Banks fairly high; right bank subject to overflow. Bed composed of clay and gravel; fairly permanent. Control formed by gravel shoal; 300 feet below gage. A lock and dam, 13 miles below gage, will back water at station to a gage height of 11.65 feet when wickets are closed. This, however, rarely occurs.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 38.2 feet at 12.45 p. m. December 15 (discharge, 43,100 second-feet); minimum stage, 4.27 feet at 4 p. m. September 11 (discharge, 68 second-feet).

1898–1899; 1903–1906; 1921–1924: Maximum stage recorded, 42.35 feet at 5.15 a. m. April 27, 1922 (discharge, 75,100 second-feet); minimum discharge, that of September 11, 1924.

Maximum flood on record from United States Weather Bureau records, 52.6 feet at 6 p. m. May 26, 1908 (discharge not determined). During drought of 1917–1918 discharge was practically zero.

ICE.—None.

DIVERSIONS.—Only known diversions are for municipal uses. No irrigation of importance above.

REGULATION.—Low-water flow is partly regulated by municipal dams on West Fork, 40 miles above, and on Elm Fork, 6 miles above gage.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined for all stages. Gage read to hundredths twice daily from October 1 to July 11 and September 3–30. United States Weather Bureau records of one reading daily to tenths used for rest of year. Daily discharge determined by applying mean daily gage height to rating table. Records good.

COOPERATION.—United States Weather Bureau records of stage used July 12 to September 3.

The following discharge measurements were made:

April 3, 1924: Gage height, 11.16 feet; discharge, 994 second-feet.

August 9, 1924: Gage height, 5.48 feet; discharge, 67 second-feet.

September 2, 1924: Gage height, 4.65 feet; discharge, 20 second-feet.

Daily discharge, in second-feet, of Trinity River at Dallas, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	2,630	265	680	340	420	1,220	3,180	1,870	26	16	16
2	15	1,780	340	640	340	370	1,080	1,750	1,690	29	16	16
3	29	1,960	280	560	310	355	975	1,350	1,300	82	16	21
4	25	3,340	460	500	280	355	1,000	1,050	975	129	16	20
5	20	3,940	1,000	460	250	355	1,000	700	2,740	82	21	18
6	34	3,300	700	440	265	340	950	580	925	78	21	20
7	34	1,840	500	400	250	325	875	460	520	75	21	18
8	30	1,100	400	370	210	310	800	400	325	64	21	18
9	25	600	460	460	181	1,150	775	520	310	48	61	20
10	23	400	825	500	163	2,980	725	480	265	61	48	12
11	22	265	2,170	540	250	3,100	680	400	230	54	31	9.2
12	22	210	7,630	560	560	1,220	640	355	230	190	21	75
13	22	181	12,500	480	660	1,150	620	325	210	163	21	51
14	520	310	23,200	420	750	3,580	600	340	181	82	31	86
15	800	1,300	42,400	370	640	5,200	580	750	163	68	210	78
16	3,990	5,400	27,000	370	660	6,300	560	1,020	172	48	280	48
17	5,150	6,790	15,800	500	600	7,700	520	580	181	48	129	30
18	4,950	5,800	11,100	580	660	11,700	460	420	163	42	68	22
19	2,420	4,900	8,990	420	370	14,700	385	310	145	42	42	20
20	1,820	5,550	7,380	385	255	14,200	355	265	121	31	21	26
21	1,220	5,910	4,900	310	340	16,800	325	440	105	26	21	27
22	850	4,950	3,100	265	325	15,500	310	1,510	113	26	21	22
23	1,570	3,020	3,820	280	325	12,300	280	460	105	26	21	17
24	1,570	1,510	3,300	355	600	10,500	355	295	97	31	21	14
25	850	700	1,900	325	580	6,790	1,380	181	89	26	26	16
26	400	460	1,300	280	900	5,200	5,800	2,630	78	21	26	14
27	280	440	1,180	250	1,080	3,780	8,020	9,260	75	21	21	17
28	200	385	1,100	370	700	2,460	10,800	10,400	64	21	21	18
29	190	370	800	340	460	2,080	10,300	5,400	54	21	16	14
30	2,080	280	750	310	-------	1,870	7,820	3,140	22	21	16	11
31	4,120	-------	700	355	-------	1,570	--------	2,380	-------	21	16	-------

***Monthly discharge** of Trinity River at Dallas, Tex., for the year ending September 30, 1924*

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	5,150	15	1,070	66,000
November	6,790	181	2,320	138,000
December	42,400	265	6,010	369,000
January	680	250	422	25,900
February	1,080	163	462	26,600
March	16,800	310	4,990	307,000
April	10,800	280	2,010	119,000
May	10,400	181	1,660	102,000
June	2,740	22	451	26,800
July	190	21	54.9	3,380
August	280	16	43.1	2,650
September	86	9.2	26 5	1,580
The year	42,400	9.2	1,640	1,190,000

TRINITY RIVER NEAR ROSSER, TEX.

LOCATION.—At Lock No. 7, a quarter of a mile above Texas Midland Railroad bridge, a quarter of a mile below mouth of East Fork of Trinity River, and 2½ miles from Rosser, Kaufman County.

DRAINAGE AREA.—8,060 square miles (measured on topographic maps; United States Army progressive military maps; and base map of Texas, scale 1 : 500,000).

RECORDS AVAILABLE.—July 25 to September 30, 1924.

GAGE.—Vertical staff gage in four sections on right bank near locks; read by A. C. McSpadden.

DISCHARGE MEASUREMENTS.—Made from railroad bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of solid rock and gravel; fairly permanent. Channel straight for 200 feet above and below station. One channel at all stages. Banks are of earth and clay, wooded, high; subject to overflow. Dam at Lock No. 7 forms control up to a stage of 3 feet. For stages above this, the control is probably several rock and gravel riffles below dam.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 1.10 feet at 6 p. m. August 17 (discharge, 295 second-feet); minimum stage, 0.54 foot September 8–11 (discharge, 34 second-feet).

ICE.—None.

DIVERSIONS.—Negligible.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined from 35 to 65 second-feet; extended above. Gage read to hundredths twice daily. Discharge determined by applying mean daily gage height to rating table. Records fair.

The following discharge measurements were made:

July 25, 1924: Gage height, 0.60 foot; discharge, 50 second-feet.

September 25, 1924: Gage height, 0.58 foot; discharge, 49 second-feet.

Daily discharge, in second-feet, of Trinity River near Rosser, Tex., for the year ending September 30, 1924

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1	------	39	39	11	------	70	34	21	------	70	62
2	------	39	39	12	------	62	54	22	------	54	58
3	------	39	39	13	------	54	104	23	------	50	58
4	------	39	39	14	------	45	180	24	------	50	58
5	------	39	39	15	------	45	145	25	50	45	45
6	------	39	39	16	------	126	130	26	45	45	45
7	------	39	39	17	------	268	90	27	42	45	39
8	------	39	34	18	------	212	99	28	39	39	39
9	------	39	34	19	------	117	108	29	36	39	39
10	------	42	34	20	------	86	94	30	39	39	39
								31	39	39	------

Monthly discharge of Trinity River near Rosser, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
July 25–31	50	36	41.4	575
August	268	39	64.3	3,950
September	180	34	63.2	3,760

TRINITY RIVER NEAR OAKWOOD, TEX.

LOCATION.—At International-Great Northern Railroad bridge, 1 mile south of station at Long Lake, 4 miles northeast of Oakwood, Anderson County, and 5 miles below mouth of Keechi Creek.

DRAINAGE AREA.—12,800 square miles (measured on United States Army progressive military maps and base map of Texas, scale 1 : 500,000).

RECORDS AVAILABLE.—October 1, 1923, to September 30, 1924.

GAGE.—United States Weather Bureau chain gage, attached to upstream side of railroad bridge; read by George Ellis.

DISCHARGE MEASUREMENTS.—Made from bridge at gage or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of sand, mud, and gravel. Channel straight for 400 feet above gage and half a mile below. Right bank of earth, high; not subject to overflow. Left bank of earth, wooded, medium in height; subject to overflow at a stage of 32 feet. Control is three-fourths of a mile below gage, fairly permanent, and probably shifts for high stages. River channel above and below bridge is affected by log jams owing to sawmill operation.

EXTREMES OF DISCHARGE.—Maximum stage during year, 43.3 feet December 25 and 26 (discharge, 50,800 second-feet); minimum stage not determined.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined from 80 to 3,000 second-feet; poorly defined from 3,000 to 48,000 second-feet; extended above. Gage read to tenths once daily, but the work of the observer is very doubtful, especially for low stages. Daily discharge determined by applying daily gage height to rating table. Records of stage not deemed sufficiently reliable to justify the publication of daily or minimum discharge; therefore, only monthly and yearly figures published.

COOPERATION.—Gage-height record furnished by the Houston office of the United States Weather Bureau.

Discharge measurements of Trinity River near Oakwood, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 17	4.69	150	Dec. 8	8.94	872	Dec. 20	42.70	46,700
Oct. 23	15.63	2,880	Dec. 15	31.71	14,100	Feb. 10	10.39	1,220
Oct. 24	13.39	2,090	Dec. 16	34.07	15,000	Mar. 18	38.52	19,900
Oct. 25	12.05	1,550	Dec. 17	36.36	17,500	July 26	4.45	110
Oct. 25	11.90	1,620	Dec. 18	39.89	30,700			
Nov. 7	15.38	3,050	Dec. 19	42.67	46,300			

Monthly discharge of Trinity River near Oakwood, Tex., for the year ending September 30, 1925

Month	Discharge in second-feet		Run-off in acre-feet
	Maximum	Mean	
October	4,520	664	40,800
November	2,690	1,200	71,500
December	50,800	20,900	1,290,000
January	----------	6,260	385,000
February	14,200	4,830	278,000
March	26,300	16,000	985,000
April	28,600	6,570	391,000
May	15,800	5,310	326,000
June	19,200	6,300	375,000
July	211	90.0	5,530
August	128	77.8	4,780
September	11,500	1,610	95,800
The year	50,800	5,850	4,250,000

TRINITY RIVER AT RIVERSIDE, TEX.

LOCATION.—At International-Great Northern Railroad bridge at Riverside, Walker County, 2 miles below mouth of Harmon Creek and 13 miles above mouth of Tantabogue Creek.

DRAINAGE AREA.—15,500 square miles; revised (measured on topographic maps; United States Army progressive military maps; and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—January 1, 1903, to December 31, 1906; October 1, 1923, to September 30, 1924.

GAGE.—United States Weather Bureau chain gage attached to downstream side of railroad bridge near center of drawbridge.

DISCHARGE MEASUREMENTS.—Made by wading or from highway or railroad bridge.

CHANNEL AND CONTROL.—Channel straight for 400 feet above and 1,000 feet below gage. Bed composed of sand and clay; fairly permanent. Right bank high and not subject to overflow; left bank medium in height and subject to overflow at extremely high stages. Control for low stages is rock and gravel riffle, 500 feet below gage; for high stages it is probably the lock and dam 10 miles below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 36.7 feet at 7 a. m. April 28 (discharge, 58,200 second-feet, determined from extension of rating curve and subject to considerable error); minimum discharge, 180 second-feet August 18–20 and September 5–15.

1903–1906; 1923–24: Maximum stage recorded that of April 28; minimum stage, 7.0 feet October 23–31, 1904 (discharge, 160 second-feet).

ICE.—None.

DIVERSIONS.—Negligible.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined from 150 to 45,000 second-feet; extended above. Gage read to tenths once daily. Daily discharge determined by applying daily gage height to rating table, using shifting-control method June 14 to September 15 and September 21–30. Records fair.

COOPERATION.—Records of stage furnished by United States Weather Bureau.

Discharge measurements of Trinity River at Riverside, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 2	2.41	673	Dec. 27	30.90	38,400	Mar. 7	14.87	9,600
Oct. 24	7.60	4,580	Dec. 28	30.72	38,500	Mar. 8	10.68	6,310
Oct. 25	7.18	4,130	Dec. 29	30.88	38,200	Apr. 8	22.05	20,000
Oct. 26	6.12	3,140	Dec. 31	31.64	42,500	June 6	24.71	23,900
Nov. 6	7.55	4,520	Jan. 2	31.91	38,900	July 28	.91	263
Dec. 10	7.86	4,540	Feb. 15	7.98	4,050			

Daily discharge, in second-feet, of Trinity River at Riverside, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,130	1,360	4,220	41,800	12,000	29,200	20,800	18,400	19,000	875	240	220
2	695	1,240	5,760	42,100	8,670	24,100	21,100	13,300	30,100	785	220	220
3	540	5,080	7,560	40,600	5,760	21,100	21,900	12,800	32,500	615	220	200
4	695	2,240	10,200	39,400	4,140	19,300	22,800	13,200	29,900	540	200	200
5	740	2,310	9,450	35,400	3,560	18,400	23,200	13,400	27,700	540	200	180
6	540	4,140	7,650	23,500	3,160	16,700	23,500	13,300	24,200	470	200	180
7	540	4,140	7,120	12,700	2,840	11,700	23,400	12,700	22,200	470	200	180
8	440	3,560	4,990	6,440	2,680	7,200	20,200	12,300	21,000	410	200	180
9	380	3,080	10,200	4,310	2,460	17,300	14,100	11,400	19,900	410	200	180
10	615	3,480	4,650	4,480	2,310	16,000	18,100	8,380	18,900	410	200	180
11	575	4,060	6,780	4,900	2,160	16,900	14,100	5,240	17,800	410	200	180
12	440	4,140	7,740	5,330	3,080	17,000	11,400	3,400	15,100	365	200	180
13	338	3,640	10,500	5,080	4,740	17,500	9,350	2,460	9,250	410	200	180
14	312	2,840	12,200	4,220	5,160	24,400	7,470	2,240	4,650	470	220	180
15	288	2,020	13,500	4,140	4,740	25,000	6,860	2,160	2,540	470	220	180
16	300	1,360	14,300	13,100	3,970	26,100	5,920	2,160	1,950	410	200	5,160
17	275	1,020	14,400	12,200	5,240	25,000	5,080	2,240	1,670	410	200	8,670
18	350	830	14,300	13,100	8,200	23,400	3,880	1,950	1,420	365	180	13,200
19	350	740	16,000	9,950	16,900	23,000	3,160	1,740	1,300	338	180	10,400
20	410	615	23,500	6,260	18,200	25,200	2,840	1,600	1,180	410	180	6,350
21	325	540	33,500	4,990	15,800	25,600	2,610	1,600	1,080	540	220	3,000
22	575	2,680	47,800	4,740	10,800	25,600	2,460	1,670	1,950	540	240	2,240
23	3,240	4,740	49,800	4,140	7,920	25,400	2,310	1,950	1,300	540	240	2,090
24	4,310	5,760	49,200	15,700	11,400	24,100	2,160	2,020	1,180	410	220	1,810
25	3,970	6,180	45,000	20,000	10,800	22,800	2,020	3,160	1,180	365	220	1,300
26	3,160	6,350	41,500	24,100	19,800	21,900	2,460	5,080	975	338	288	785
27	2,310	6,260	38,800	18,500	29,600	21,000	45,000	6,780	785	312	338	540
28	1,880	6,180	38,200	15,000	37,300	20,200	58,200	7,830	785	275	288	410
29	1,810	14,100	38,500	14,000	35,600	20,000	52,300	8,010	695	262	262	410
30	1,810	6,260	40,000	14,000	-------	20,400	32,000	9,850	695	262	240	338
31	1,600	-------	40,600	13,600	-------	20,500	-------	19,200	-------	240	220	-------

Monthly discharge of Trinity River at Riverside, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	4,310	275	1,130	69,300
November	14,100	540	3,700	220,000
December	49,800	4,220	21,500	1,320,000
January	42,100	4,140	15,400	948,000
February	37,300	2,160	10,300	593,000
March	29,200	7,200	21,000	1,290,000
April	58,200	2,020	16,000	953,000
May	19,200	1,600	7,150	439,000
June	32,500	695	10,400	621,000
July	875	240	441	27,100
August	338	180	221	13,600
September	13,200	180	1,980	118,000
The year	58,200	180	9,120	6,610,000

TRINITY RIVER AT ROMAYOR, TEX.

LOCATION.—At Gulf, Colorado & Santa Fe Railway bridge, one-quarter of a mile west of railroad station at Romayor, Liberty County, 2½ miles below mouth of Big Creek and 12 miles above mouth of Lamb Creek.

DRAINAGE AREA.—17,200 square miles (measured on topographic maps; United States Army progressive military maps; and base maps of Texas, scale 1:500,000).

RECORDS AVAILABLE.—May 4 to September 30, 1924.

GAGE.—Chain gage on downstream side of railroad bridge; read by E. O. Elliot or M. C. Richardson. Scale inverted so as to read the distance from the base of rail to water surface.

DISCHARGE MEASUREMENTS.—Made from upstream side of railroad bridge.

CHANNEL AND CONTROL.—Bed of stream composed of sand; shifts. Channel straight for 500 feet above and 200 feet below gage. Left bank, high; right bank subject to overflow. Control is indefinite; probably shifts.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, −23.20 feet at 7 a. m. June 4 (discharge, 39,700 second-feet); minimum discharge, 315 second-feet September 11 and 12.

ICE.—None.

DIVERSIONS.—Negligible.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined from 100 to 47,000 second-feet. Gage read to hundredths once daily except Sundays. Daily discharge determined by applying daily gage height to rating table except as noted in footnote to daily-discharge table. Records fair.

Discharge measurements of Trinity River at Romayor Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
May 4	−32.74	17,000	June 9	−29.14	24,200
May 7	−36.10	13,600	July 29	−51.64	492

Daily discharge, in second-feet, of Trinity River at Romayor, Tex., for the year ending September 30, 1924

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1	-------	31,400	1,200	465	415	16	3,090	4,590	690	390	340
2	-------	35,800	1,250	465	390	17	2,810	3,300	690	378	365
3	-------	38,200	1,200	452	365	18	2,740	2,670	690	365	365
4	18,000	39,700	1,160	440	340	19	2,670	2,300	660	340	4,590
5	14,600	39,400	1,080	440	340	20	2,420	2,060	630	340	4,510
6	14,000	36,400	1,000	415	340	21	2,300	1,900	600	340	3,760
7	13,500	33,300	930	390	340	22	2,420	1,900	570	340	3,020
8	13,000	29,000	860	390	340	23	3,230	1,900	630	340	2,360
9	12,400	24,800	825	365	340	24	3,510	2,180	690	340	1,790
10	11,700	22,600	790	365	340	25	3,810	2,120	690	340	1,300
11	9,460	18,800	790	365	315	26	4,110	1,840	690	365	930
12	7,210	18,800	755	340	315	27	6,350	1,640	645	365	755
13	5,000	16,400	738	340	340	28	7,720	1,440	600	340	622
14	3,510	12,400	720	415	352	29	7,720	1,320	540	365	490
15	3,230	8,500	690	440	365	30	8,820	1,160	515	415	600
						31	27,000	-------	490	415	------

NOTE.—No record May 11, 18, 25, June 1, 8, 15, 22, 29, July 6, 13, 20, 27, Aug. 3, 10, 17, 24, 31, Sept. 17, 14, 21, and 28; discharge interpolated.

Monthly discharge of Trinity River at Romayor, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
May 4-31	27,000	2,300	7,730	429,000
June	39,700	1,160	14,600	868,000
July	1,250	490	774	47,600
August	465	340	383	23,500
September	4,590	315	1,030	61,600
The period				1,430,000

CLEAR FORK OF TRINITY RIVER AT FORT WORTH, TEX.

LOCATION.—40 feet above upper dam of Texas & Pacific Railway, 350 feet above highway bridge on Fort Worth-Granbury road, 3 miles above confluence of Clear and West Forks of Trinity River, and 3 miles southwest of Tarrant County courthouse, Fort Worth.

DRAINAGE AREA.—522 square miles (measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—March 8 to September 30, 1924

GAGE.—Vertical staff on right bank; read by J. W. Rost.

DISCHARGE MEASUREMENTS.—Made from highway or railroad bridge or by wading.

CHANNEL AND CONTROL.—Banks clean; subject to overflow at extremely high stages. Control for all but extremely high stages is concrete dam, 40 feet below gage; permanent. Railroad embankment below will probably be the control for high stages.

EXTREMES OF DISCHARGE.—Maximum stage during period of record, 4.98 feet during night of June 2 (discharge, 5,800 second-feet); no flow July 25 to August 7, August 12, 13, and August 24 to September 30.

ICE.—None.

DIVERSIONS.—Practically all of low flow is diverted 1,000 feet below gage by Texas & Pacific Railway.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined below 2,000 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records good.

Discharge measurements of Clear Fork of Trinity River at Fort Worth, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Mar. 17	2.79	1,940	Apr. 22	0.46	61.0	July 7	0.29	10.9
Mar. 18	1.35	487	May 7	.54	77.5	Aug. 23	.18	*.1

* Estimated.

Daily discharge, in second-feet, of Clear Fork of Trinity River at Fort Worth, Tex., for the year ending September 30, 1924

Day	Mar.	Apr.	May	June	July	Aug.	Day	Mar.	Apr.	May	June	July	Aug.
1	------	182	114	138	6.4	------	16	205	90	48	27	5.2	6.4
2	------	187	102	1,590	5.2	------	17	1,950	79	44	24	3.4	1.8
3	------	178	94	765	5.2	------	18	525	72	44	19	3.4	5.2
4	------	174	86	174	9.0	------	19	2,700	72	37	19	3.4	4.3
5	------	169	79	110	10	------	20	1,830	65	34	14	1.8	1.2
6	------	151	79	86	9.0	------	21	640	65	950	14	1.8	.7
7	------	142	82	72	7.5	------	22	490	58	82	14	.7	.1
8	68	142	79	65	7.5	24	23	490	178	54	10	.7	.1
9	126	134	79	51	7.5	12	24	390	79	44	10	.7	------
10	86	126	79	51	86	4.3	25	335	765	51	10	------	------
11	72	126	72	232	10	2.6	26	306	1,950	3,760	10	------	------
12	79	118	65	65	7.5	------	27	286	282	490	7.5	------	------
13	286	118	58	51	10	------	28	277	192	151	7.5	------	------
14	368	118	58	37	9.0	455	29	357	151	1,050	6.4	------	------
15	250	98	51	30	6.4	58	30	241	134	310	6.4	------	------
							31	196	------	130	------	------	------

NOTE.—Dry for days on which no discharge is given.

Monthly discharge of Clear Fork of Trinity River at Fort Worth, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March 8-31	2,700	68	523	24,900
April	1,950	58	213	12,700
May	3,760	34	273	16,800
June	1,590	6.4	124	7,370
July	86	0	7.0	431
August	455	0	18.6	1,140
The period				63,300

ELM FORK OF TRINITY RIVER NEAR DENTON, TEX.

LOCATION.—At Texas & Pacific Railway bridge, 1 mile east of Mingo, 1 mile below mouth of Clear Creek, and 6 miles northeast of Denton, Denton County.

DRAINAGE AREA.—1,100 square miles (measured on topographic maps and base maps of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—November 20, 1923, to September 30, 1924.

GAGE.—Chain gage attached to upstream side of bridge; read by Hughlon King.

DISCHARGE MEASUREMENTS.—Made from highway bridge a quarter of a mile below gage, or from railroad bridge at gage, or by wading.

CHANNEL AND CONTROL.—Channel straight for 50 feet above and 400 feet below gage. Bed of stream composed of earth; permanent. Banks subject to overflow at a stage of about 25 feet. Control gravel riffle 600 feet below gage; permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 29.05 feet at 9.05 a. m. March 20 (discharge, 8,330 second-feet); no flow September 8 and 11.

ICE.—None.

DIVERSIONS.—Negligible. The railroad diverts 100,000 gallons a day just above gage.

REGULATIONS.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 1,500 second-feet; poorly defined above 1,500 second-feet. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records good.

Discharge measurements of Elm Fork of Trinity River near Denton, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 21	4.00	170	Mar. 11	6.34	401	Apr. 18	3.17	98
Dec. 20	6.77	450	Do	5.51	300	May 8	5.22	256
Jan. 25	3.70	149	Mar. 20	28.75	8,020	June 25	1.46	17
Feb. 12	4.93	274	Mar. 21	24.99	4,620	July 23	1.12	8.0
Mar. 10	11.73	1,250	Do	23.65	4,470	Sept. 3	.61	a.1
Do	11.30	1,210						

a Estimated.

Daily discharge, in second-feet, of Elm Fork of Trinity River near Denton, Tex., for the year ending September 30, 1924

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	90	163	97	72	216	216	84	36	2.0	0.8
2	-------	90	155	90	69	207	180	78	132	1.7	.6
3	-------	380	163	90	66	207	155	75	46	1.7	.6
4	-------	440	163	84	66	236	139	69	28	1.7	.8
5	-------	309	147	78	66	226	132	61	25	1.4	.4
6	-------	189	132	72	64	207	125	54	22	1.3	.6
7	-------	147	125	75	61	189	118	56	22	44	1.0
8	-------	132	139	69	464	171	276	54	19	84	0
9	-------	1,080	147	69	3,250	171	132	48	19	30	.1
10	-------	216	147	69	1,420	163	118	44	34	12	.3
11	-------	1,360	132	75	404	147	104	38	18	5.0	0
12	-------	2,980	125	226	198	147	97	38	27	2.8	5.4
13	-------	3,310	118	226	320	139	368	36	25	2.5	4.9
14	-------	2,770	104	139	2,260	132	368	32	16	2.8	3.2
15	-------	982	111	111	3,670	132	490	30	11	2.3	2.4
16	-------	778	163	104	2,260	125	163	26	8.2	2.0	2.0
17	-------	587	147	97	6,290	111	118	25	7.1	1.5	2.3
18	-------	503	125	84	4,670	104	97	22	6.3	1.6	2.4
19	-------	464	118	84	2,830	97	90	20	5.5	1.5	2.2
20	180	464	111	84	7,290	97	78	19	4.9	1.7	2.0
21	147	452	90	78	4,670	90	75	18	4.6	1.5	1.9
22	139	863	84	72	1,500	171	72	17	3.8	1.3	1.7
23	125	1,220	97	75	846	1,760	69	18	7.5	1.2	8.8
24	111	530	118	78	632	452	64	19	4.9	1.1	24
25	104	344	139	78	503	795	97	17	3.6	1.2	7.8
26	97	309	118	84	428	6,360	1,520	16	3.0	1.0	3.7
27	84	287	104	84	380	5,440	2,590	14	2.8	1.0	2.8
28	78	266	97	78	356	829	477	13	2.3	1.0	2.0
29	81	236	111	75	332	320	180	11	2.1	1.0	1.5
30	104	226	118	-------	320	256	125	16	2.1	1.0	1.5
31	-------	198	104	-------	246	-------	97	-------	2.3	.9	-------

Monthly discharge of Elm Fork of Trinity River near Denton, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
November 20-30	180	78	114	2,480
December	3,310	90	716	44,000
January	163	84	126	7,770
February	226	69	94	5,400
March	7,290	61	1,480	91,200
April	6,360	90	657	39,100
May	2,590	64	288	17,700
June	84	11	35.6	2,120
July	132	2.1	17.8	1,090
August	84	.9	6.96	428
September	24	0	2.92	174
The period	----------	----------	----------	211,000

ELM FORK OF TRINITY RIVER NEAR CARROLLTON, TEX.

LOCATION.—At Carrollton Dam, 40 feet below highway bridge on Dallas–Denton road, 1 mile below confluence of Denton Creek and Elm Fork of Trinity River, and 1½ miles west of Carrollton, Dallas County.

DRAINAGE AREA.—2,540 square miles (measured on topographic maps and base map of Texas, scale 1 : 500,000).

RECORDS AVAILABLE.—November 1, 1923, to September 30, 1924.

GAGE.—Vertical staff in two sections, attached to left wing wall of dam and to second pile bent from left concrete pier of bridge; read by J. L. Coleman, observer for United States Weather Bureau.

DISCHARGE MEASUREMENTS.—Made from bridge; by wading; from boat; or from St. Louis Southwestern Railway bridge, 1 mile below.

CHANNEL AND CONTROL.—Channel straight for 150 feet above and below gage. Bed and banks of stream are of black loam. Left bank subject to overflow at a stage of 8 feet. Control is a concrete dam; permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 12.75 feet during morning of December 14 (discharge not determined); minimum discharge, about 2.0 second-feet August 2–8 and August 21 to September 25.

ICE.—None.

DIVERSIONS.—None.

ACCURACY.—Stage-discharge relation permanent. Curve well defined below 2,000 second-feet; poorly defined to 20,000 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table except as noted in footnote to daily-discharge table. Records good.

Discharge measurements of Elm Fork of Trinity River near Carrollton, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 15	9.35	[a] 18,800	Jan. 26	1.00	287	July 18	0.24	13
Dec. 16	7.03	9,590	Feb. 29	.84	206	Aug. 29	−2.00	[b] 2.0
Dec. 18	2.17	1,040	Apr. 22	.76	181			

[a] Partly estimated. [b] No flow over dam—leakage through valves.

Daily discharge, in second-feet, of Elm Fork of Trinity River near Carrollton, Tex., for the year ending September 30, 1924

Day	Nov.	Dec.	Jan.	Feb.	Mar	Apr.	May	June	July	Aug.	Sept.
1	515	167	386	224	179	455	455	609	17	2.8	
2	363	167	336	220	171	426	380	391	38	2.0	
3	515	167	304	206	150	426	330	455	154	2.0	
4	1,600	609	336	192	150	485	293	238	80	2.0	
5	1,500	609	314	188	150	485	263	167	50	2.0	
6	426	426	293	167	146	455	238	143	40	2.0	
7	171	309	263	158	143	397	229	124	35	2.0	
8	352	253	258	150	146	380	243	117	35	2.0	
9	90	224	293	150	775	363	363	106	35	90	
10	106	810	293	150	3,490	341	248	96	42	68	
11	62	2,500	278	283	1,500	320	224	93	248	25	
12	50	8,320	288	278	546	293	197	83	163	7.9	
13	45	15,400	288	325	386	288	179	80	53	17	2.0
14	93	-------	248	369	1,700	288	330	71	45	7.9	
15	4,680	32,000	238	273	5,060	293	609	59	38	40	
16	7,020	10,100	268	248	5,260	253	546	53	28	16	
17	4,500	1,600	341	238	8,880	238	320	48	21	6.0	
18	775	1,070	299	229	10,100	224	233	42	14	5.6	
19	485	954	258	210	8,320	197	188	38	12	4.4	
20	375	954	238	192	12,200	188	163	35	9.8	4.4	
21	304	954	233	192	11,500	184	150	35	7.9	2.0	
22	273	1,240	201	184	10,400	175	132	35	6.0	2.0	
23	253	2,250	192	171	3,190	1,410	120	35	5.6	2.0	
24	215	1,800	299	158	1,410	1,910	120	32	5.2	2.0	
25	192	810	320	158	1,070	917	120	28	5.2	2.0	
26	171	641	288	283	917	7,020	4,150	25	5.2		4.8
27	163	577	243	263	775	7,020	3,340	30	4.4		6.0
28	154	546	220	243	707	7,520	2,250	28	4.4	2.0	5.6
29	143	515	220	210	954	2,900	1,410	21	4.4		.6
30	146	455	229	-------	775	609	577	19	4.0		3.6
31	-------	426	238	-------	577	-------	293	-------	3.6		-------

NOTE.—On Dec. 14 gage height 12.72 feet was beyond limits of rating curve; discharge not determined. Braced figures indicate the mean discharge for the period Aug. 26 to Sept. 25.

Monthly discharge of Elm Fork of Trinity River near Carrollton, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
November	7,020	45	858	51,000
December	-------	167	-------	-------
January	386	192	274	16,900
February	369	150	210	12,500
March	12,200	143	2,960	182,000
April	7,520	175	1,220	72,300
May	4,150	120	603	37,100
June	609	19	111	6,620
July	248	3.6	39.2	2,410
August	90	2.0	10.7	657
September	6	2.0	2.45	146

ELM FORK OF TRINITY RIVER NEAR DALLAS, TEX.

LOCATION.—At city of Dallas pumping plant and dam (known as Record Crossing plant), 300 feet above Record Crossing highway bridge, 2,800 feet above Chicago, Rock Island & Gulf Railway bridge, 1.2 miles above confluence with West Fork, and 5 miles northwest of Dallas, Dallas County.

DRAINAGE AREA.—2,660 square miles (revised; measured on topographic maps and base maps of Texas, scale 1:500,000).

RECORDS AVAILABLE.—October 17, 1920, to September 30, 1924.

GAGE.—Vertical staff attached to pump house; read by W. J. Selby.

DISCHARGE MEASUREMENTS.—Made from Record Crossing highway bridge, 200 feet below gage; from Chicago, Rock Island & Gulf Railway bridge, half a mile below; or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel; shifting. Control is concrete dam; permanent. Left bank is wooded, high, and not subject to overflow except at extremely high stages; right bank wooded, medium in height, and subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 19.55 feet at 8 a. m. December 15 (discharge not determined; backwater from Trinity River affected gage height); no flow during several periods.

1920–1924: Maximum stage recorded, 20.20 feet at 10 a. m. April 27, 1922 (discharge not determined; backwater from Trinity River affected gage height); no flow during several periods.

ICE.—None.

DIVERSIONS.—No diversions except for municipal use, the largest being at the Record Crossing plant. The sum of all the diversions is believed to be but a small percentage of the total run-off during years of ordinary flow.

REGULATION.—During extremely low stages, flow regulated by city of Dallas reservoir at Carrollton.

ACCURACY.—Stage-discharge relation permanent, except as affected by backwater from Trinity River. Rating curve well defined below 1,100 second-feet; fairly well defined to 16,000 second-feet; extended above. Gage read to hundredths twice daily and oftener during floods. Discharge determined by applying mean daily gage height to rating table or by averaging discharge for fractional parts of a day, except as noted in footnote to table of daily discharge. Records fair.

Daily discharge, in second-feet, of Elm Fork of Trinity River near Dallas, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
1	------	1,570	128	450	180	160	510	540	970	------
2	------	395	140	351	160	160	450	395	570	------
3	------	395	120	300	160	140	395	330	368	76
4	------	1,570	300	290	160	140	510	290	315	102
5	------	1,570	670	268	140	140	450	268	200	42
6	------	705	395	268	140	136	450	245	152	29
7	------	180	330	245	120	132	422	209	120	21
8	------	113	245	245	120	128	368	180	120	15
9	------	76	222	245	120	152	340	340	106	10
10	------	55	705	290	120	2,720	315	254	85	6.1
11	------	45	1,170	290	180	2,130	295	200	73	85
12	------	34	5,780	268	368	855	268	180	70	152
13	------	29	------	268	330	570	268	160	70	64
14	------	50	------	268	368	1,650	268	192	58	29
15	37	2,130	------	245	281	3,140	263	570	39	21
16	2,290	------	------	245	245	4,840	245	635	29	10
17	3,400	------	------	290	222	6,050	245	315	25	2
18	2,630	------	------	315	200	------	222	200	17	------
19	635	570	------	290	200	------	180	160	10	------
20	192	------	------	268	160	------	160	160	8.3	------
21	92	------	1,050	245	160	------	160	140	6.2	------
22	61	340	1,170	222	160	------	140	120	6.1	------
23	29	222	2,050	200	140	------	120	102	17	------
24	21	200	2,050	222	140	6,500	2,800	102	14	------
25	12	180	1,170	254	140	1,810	742	102	10	------
26	.4	160	705	290	290	1,010	------	1,970	10	------
27	.4	140	635	245	290	892	------	------	6.1	------
28	------	140	570	222	254	780	------	------	4.4	------
29	16	18	540	200	200	1,010	------	1,970	1.7	------
30	2,290	254	510	200	------	855	------	855	.4	------
31	3,060	------	480	200	------	635	------	340	------	------

NOTE.—Daily gage heights, in feet, for days when discharge was not determined on account of backwater from West Fork of Trinity River, are as follows: Nov. 16, 8.40; Nov. 17, 10.45; Nov. 18, 8.45; Nov. 20, 4.95; Nov. 21, 5.55; Dec. 13, 15.10; Dec. 14, 16.70; Dec. 15, 19.32; Dec. 16, 17.28; Dec. 17, 15.42; Dec. 18, 11.30; Dec. 19, 9.25; Dec. 20, 7.30; Mar. 18, 15.05; Mar. 19, 15.28; Mar. 20, 15.28; Mar. 21, 15.85; Mar. 22, 15.50; Mar. 23, 14.98; Apr. 26, 9.55; Apr. 27, 13.75; Apr. 28, 14.00; Apr. 29, 13.72; Apr. 30, 7.10; May 27, 13.20; May 28, 12.32. Dry July 1, 2, and July 18 to Sept. 30.

Monthly discharge of Elm Fork of Trinity River near Dallas, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	3,400	0	476	29,300
November		18		
December		120		
January	450	200	264	16,300
February	368	120	198	11,400
March		128		
April 1–25	2,800	120	423	21,000
May		102		
June	970	.4	116	6,900
July	152	.0	21.4	1,320

DENTON CREEK NEAR ROANOKE, TEX.

LOCATION.—At highway bridge on Fort Worth-Denton highway, 3 miles north of Roanoke, Denton County, 13 miles south of Denton, and 15 miles above confluence of Denton Creek with Elm Fork of Trinity River.

DRAINAGE AREA.—704 square miles (measured on topographic maps and base maps of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—October 12, 1923, to September 30, 1924.

GAGE.—Chain gage attached to downstream truss of bridge; read by J. W. Kinley.

DISCHARGE MEASUREMENTS.—Made from bridge to which gage is attached or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of rock and gravel; fairly permanent. One channel for all stages; straight for 150 feet above and below gage. Right bank clean, high; subject to overflow at extremely high stages. Left bank subject to overflow. Low-water control is a rock and gravel bar, 75 feet below gage; probably permanent. High-stage control indefinite.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 14.60 feet at 7.30 a. m. December 13 (discharge not determined); no flow October 13, July 22–24, July 26 to August 6, August 9–11, August 20 to September 11, and September 14–30.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 100 second-feet; poorly defined from 100 to 560 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table except as noted in footnote to daily-discharge table. Records fair.

Discharge measurements of Denton Creek near Roanoke, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 12	0.50	[a] 0.20	Jan. 25	2.00	78	Apr. 18	1.72	51
Nov. 19	2.18	94	Feb. 12	2.09	87	June 25	.75	1.6
Dec. 19	3.22	214	Mar. 10	4.45	565	July 23	.56	[a] .1

[a] Estimated.

Daily discharge, in second-feet, of Denton Creek near Roanoke, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	------	152	50	72	33	37	113	119	48	0.3	------	------
2	------	28	61	67	35	28	108	86	203	.2	------	------
3	------	46	67	82	36	26	102	65	118	.2	------	------
4	------	55	124	72	35	24	124	60	92	.4	------	------
5	------	38	97	64	32	21	118	49	54	.3	------	------
6	------	11	76	57	29	20	108	40	33	.3	------	------
7	------	7.0	44	55	25	19	97	44	25	.4	0.1	------
8	------	5.6	32	67	30	17	92	47	20	.6	.1	------
9	------	4.5	27	72	39	203	92	49	17	1.0	------	------
10	------	5.0	24	76	48	538	82	46	15	1.3	------	------
11	------	5.6	253	60	76	188	92	42	12	82	------	------
12	0.2	5.3	------	51	76	130	92	38	8.3	12	.1	0.3
13	------	5.0	------	52	47	97	86	42	6.4	5.6	76	.7
14	.1	218	------	42	33	673	86	203	4.7	5.0	15	------
15	176	------	------	54	33	------	82	176	3.8	4.0	4.0	------
16	730	------	394	58	31	394	72	108	2.9	3.1	.7	------
17	176	340	273	53	32	------	58	61	2.9	2.2	.5	------
18	72	152	218	49	35	------	50	45	2.4	1.4	.3	------
19	72	97	218	47	35	------	46	32	1.8	1.0	.2	------
20	24	59	188	46	32	------	44	30	.8	.4	------	------
21	19	42	188	44	30	------	38	28	.6	.1	------	------
22	8.7	26	367	33	29	844	43	25	.3	------	------	------
23	4.2	37	253	42	28	460	------	24	.1	------	------	------
24	3.8	32	176	66	30	313	92	24	.1	------	------	------
25	1.8	29	152	76	32	253	203	21	.2	.1	------	------
26	4.0	20	141	42	43	203	------	------	1.4	------	------	------
27	3.3	22	130	38	82	188	------	460	.7	------	------	------
28	2.4	50	118	34	59	176	427	141	.5	------	------	------
29	102	42	113	39	55	203	367	164	.7	------	------	------
30	493	39	102	42	------	293	130	102	.5	------	------	------
31	460	------	92	39	------	124	------	53	------	------	------	------

NOTE.—Gage height, in feet, for days when stage was beyond the limits of rating curve are as follows: Nov. 15, 8.44; Nov. 16, 8.00; Dec. 12, 12.58; Dec. 13, 14.03; Dec. 14, 9.98; Dec. 15, 7.27; Mar. 15, 5.58; Mar. 17, 10.46; Mar. 18, 5.38; Mar. 19, 8.55; Mar. 20, 10.21; Mar. 21, 6.10; Apr. 23, 7.07; Apr. 26, 5.84; Apr. 27, 5.15; May 26, 6.67. Dry on Oct. 13, July 22–24, July 26 to Aug. 6, Aug. 9–11, Aug. 20 to Sept. 11, and Sept. 14–30.

Monthly discharge of Denton Creek near Roanoke, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 12-31	730	0	196	7,790
January	82	33	54.5	3,350
February	82	25	40	2,300
June	203	.1	22.5	1,340
July	82	0	3.93	242
August	76	0	3.13	192
September	.7	0	.03	2.0

EAST FORK OF TRINITY RIVER NEAR ROCKWALL, TEX.

LOCATION.—At bridge on State Highway No. 1 between Dallas and Rockwall, 3 miles southwest of Rockwall, Rockwall County, and 7 miles below mouth of Pilot Creek.

DRAINAGE AREA.—831 square miles (measured on topographic maps; base map of Texas, scale 1:500,000; and United States Army progressive military maps).

RECORDS AVAILABLE.—November 9, 1923, to September 30, 1924.

GAGE.—Chain gage attached to the downstream side of bridge; read by C. A. Coates or J. T. Callum.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—One channel at all stages; curves above and below bridge. Bed of stream of earth, clean; probably fairly permanent. Banks of earth; left bank subject to overflow. Control shifts occasionally.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 15.40 feet from 9.30 to 10.35 a. m. December 15 and at 6.15 a. m. May 31 (discharge, 7,390 second-feet); no flow from July 20 to September 30.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve fairly well defined below 8,000 second-feet. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table, using shifting-control method December 25 to March 8 and May 1–26. Records good.

Discharge measurements of East Fork of Trinity River near Rockwall, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 9	2.49	29	Feb. 4	4.14	163	May 16	3.95	118
Dec. 14	14.56	4,720	Feb. 23	4.16	152	July 19	.89	2.0
Dec. 15	15.34	7,390	Mar. 25	9.99	731			
Dec. 17	10.58	802	Apr. 17	4.21	148			

Daily discharge, in second-feet, of East Fork of Trinity River near Rockwall, Tex., for the year ending September 30, 1924

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
1		25	262	190	190	317	347	2,220	9.2
2		26	217	181	173	280	280	644	8.1
3		25	217	173	157	280	235	387	58
4		29	235	165	149	317	217	208	29
5		52	226	157	149	327	190	165	20
6		82	208	149	149	327	173	141	16
7		65	173	133	133	271	157	125	14
8		49	190	125	133	244	149	109	13
9	31	40	208	133	271	235	165	101	13
10	28	38	208	133	347	217	149	90	11
11	26	165	217	181	377	199	68	76	65
12	26	764	190	289	347	190	133	68	141
13	25	2,490	173	337	327	181	125	62	49
14	25	4,440	165	280	1,040	181	117	52	22
15	26	7,050	157	217	1,400	173	109	46	15
16	26	3,150	190	181	1,700	165	117	35	9.4
17	35	981	317	181	2,490	149	125	29	6.0
18	58	457	280	181	4,440	133	97	26	4.4
19	46	511	217	181	5,500	125	86	23	2.5
20	35	668	190	190	3,340	117	79	22	
21	31	906	190	181	3,540	117	86	20	
22	29	1,540	149	165	4,440	109	173	20	
23	29	1,620	157	149	1,990	105	101	20	
24	29	1,890	226	165	1,120	109	72	21	
25	28	1,040	337	181	740	101	62	22	
26	26	555	357	307	566	704	544	22	
27	25	417	271	307	500	3,340	1,460	19	
28	25	377	217	271	457	4,950	2,220	16	
29	25	347	208	217	511	1,700	3,150	13	
30	25	307	208		522	599	3,750	11	
31		289	208		437		6,090		

Monthly discharge of East Fork of Trinity River near Rockwall, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
November 9–30	58	25	30.0	1,310
December	7,050	25	980	60,300
January	357	149	218	13,400
February	337	125	197	11,300
March	5,500	133	1,210	74,600
April	4,950	101	542	32,300
May	6,090	62	672	41,300
June	2,220	11	160	9,550
July	141	0	16.3	1,000
August	0	0	0	0
September	0	0	0	0
The period				245,000

SAN JACINTO RIVER BASIN

SAN JACINTO RIVER NEAR CONROE, TEX.

LOCATION.—At International-Great Northern Railroad bridge, 150 feet below highway bridge, 3 miles below mouth of Lake Creek, 4 miles south of Conroe, Montgomery County, and 7 miles above mouth of Crystal Creek.

DRAINAGE AREA.—832 square miles (measured on base map of Texas, scale 1 : 500,000).

RECORDS AVAILABLE.—May 7 to September 30, 1924.

GAGE.—Staff gage attached to downstream side of railway bridge; read by C. A. Hopper. Staff is inverted, so as to read the distance from the base of the rail to the water surface.

DISCHARGE MEASUREMENTS.—Made from railway bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of sand. One channel for low and medium stages; three for high stages; straight for 150 feet above and 300 feet below gage. Banks low, covered with brush and trees; subject to overflow. Control is formed by riprap near the bridge; shifts.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, −5.20 feet at 5.30 p. m. May 30 (discharge not determined); minimum stage, −23.45 feet, August 23–25 (discharge, 18 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined below 22,000 second-feet. Gage read to hundredths once daily. Daily discharge determined by applying mean daily gage height to rating table, except as noted in footnote to daily-discharge table. Records fair.

The following discharge measurements were made:

May 8, 1924: Gage height, −21.42 feet; discharge, 166 second-feet.

June 3, 1924: Gage height, −9.61 feet; discharge, 8,260 second-feet.

July 28, 1924: Gage height, −23.02 feet; discharge, 36 second-feet.

Daily discharge, in second-feet, of San Jacinto River near Conroe, Tex., for the year ending September 30, 1924

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		18,200	97	35	32	16	167	131	41	26	26
2		13,000	97	35	30	17	149	113	41	26	28
3		10,500	105	35	30	18	140	113	41	25	29
4		5,700	105	35	28	19	131	113	41	24	30
5		4,000	65	32	26	20	131	113	41	22	30
6		3,100	64	32	25	21	113	113	41	20	30
7	167	1,770	62	32	25	22	158	200	41	19	30
8	167	526	65	32	26	23	167	314	41	18	30
9	149	292	65	32	28	24	176	424	41	18	30
10	158	248	65	31	30	25	411	314	41	18	30
11	167	226	58	30	32	26	349	226	44	19	30
12	167	206	48	29	32	27	361	149	44	22	30
13	149	167	48	29	30	28	494	140	44	25	30
14	149	149	48	28	29	29	349	131	38	27	29
15	167	140	44	27	28	30	27,100	122	35	30	28
						31	31,100		35	31	

NOTE.—No record June 22; discharge estimated. Discharge interpolated June 15, 29, July 6, 13, 20, 27, Aug. 3, 10, 17, 24, 31, Sept. 7, 14, 21, and 28.

Monthly discharge of San Jacinto River near Conroe, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
May 7–31	31,100	113	2,520	125,000
June	18,200	113	2,030	121,000
July	105	35	54.4	3,340
August	35	18	27.2	1,670
September	32	25	29.0	1,730
The period				253,000

BRAZOS RIVER BASIN

DOUBLE MOUNTAIN FORK OF BRAZOS RIVER NEAR ASPERMONT, TEX.

LOCATION.—At bridge on Aspermont-Hamlin highway in southeast corner of section 134, Texas & Pacific Railway Block U, 8 miles below mouth of Mountain Creek, and 11 miles south of Aspermont, Stonewall County.

DRAINAGE AREA.—7,980 square miles (measured on topographic maps and base map of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—December 3, 1923, to September 30, 1924.

GAGE.—Chain gage attached to downstream side of bridge; read by I. E. Smith.

DISCHARGE MEASUREMENTS.—Made from bridge to which gage is attached or by wading.

CHANNEL AND CONTROL.—Channel straight 500 feet above and half a mile below gage. Bed of stream composed of sand; shifts. Banks of clay, clean, shifting; not subject to overflow. Control indefinite; shifts.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 7.50 feet at 4.30 p. m. April 24 (discharge not determined); no flow January 15–18, March 27 to April 12, June 24 to July 3, July 8, 9, 16–18, July 21 to September 1, and September 9–11.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve fairly well defined below 200 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table, using shifting-control method December 29 to January 30, April 25 to June 10, and September 12–30. Records fair.

Discharge measurements of Double Mountain Fork of Brazos River near Aspermont, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 3	2.08	66	Apr. 14	2.59	182	July 24	1.16	0
Dec. 31	1.46	4.1	May 19	1.56	43	Aug. 7		0
Jan. 16	1.29	.0	May 26	1.81	96	Aug. 27		0
Jan. 27	1.18	1.2	June 7	1.51	14	Sept. 16	1.59	40
Feb. 7	1.02	a.5	June 25	1.00	0	Sept. 18	2.93	740
Feb. 18	.99	a.15	July 9	1.06	0			
Mar. 27	.98	a.05	July 12	1.56	11			

a Estimated.

Daily discharge, in second-feet, of Double Mountain Fork of Brazos River near Aspermont, Tex., for the period December 3, 1923, to September 30, 1924

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Sept.
1		2.3	0.4	0.1		3.0	12		
2		2.0	.4	.1		2.2	81		299
3	66	1.3	.3	.1		2.8	158		42
4	54	1.1	.2	.1		1.6	63	.4	26
5	44	.9	.2	.1		1.6	33	.4	13
6	38	.8	.2	.2		5.8	9.4	.2	2.5
7	27	.5	.2	.2		26	6.2	.2	1.0
8	23	.4	.2	.2		18	2.5		.6
9	23	.3	.2	.2		5.0	.8		
10	21	.3	.2	.1		1.3	.4	308	
11	27	.2	.3	.1		1.1	.2	51	
12	34	.1	.3	.1		1.0	.2	21	615
13	33	.1	.3	.3	692	242	.2	1.3	86
14	71	.1	.2	.2	229	654	.3	.7	199
15	72		.2	.2	92	285	.3	.4	106
16	54		.2	.2	50	267	.2		79
17	51		.2	.2	30	98	.2		542
18	39		.2	.2	16	60	.2		508
19	30	.1	.2	.8	11	48	.3	1.2	508
20	25	.1	.3	.3	6.6	31	.3	.5	233
21	25	.2	.3	.2	2.7	9.4	.2	167	167
22	25	.3	.2	.3	1.6	5.8	.2		106
23	23	.4	.2	.2	.6	2.2	.2		69
24	15	.6	.2	.2	2,000	1.2			51
25	12	.7	.2	.2	1,460	.8			38
26	14	.8	.2	.2	196	120			30
27	12	1.0	.2		83	179			19
28	10	1.0	.2		37	98			12
29	11	.8	.1		15	56			9.4
30	7.0	.7			5.4	28			7.0
31	5.4	.5				18			

NOTE.—Dry on days for which no discharge is given.

Monthly discharge of Double Mountain Fork of Brazos River near Aspermont, Tex., for the period December 3, 1923, to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
December 3-31	72	5.4	30.7	1,770
January	2.3	0	.57	34.9
February	.4	.1	.23	13.3
March	.8	0	.17	10.5
April		0	164	9,770
May	654	.8	73.3	4,510
June	158	0	12.3	732
July	308	0	12.4	764
August	0	0	0	0
September	615	0	126	7,470
The period				25,100

BRAZOS RIVER AT SEYMOUR, TEX.

LOCATION.—At bridge on Wichita Valley highway, three-fourths of a mile above Wichita Valley Railroad bridge, 1 mile southwest of courthouse in Seymour, Baylor County, and 1¼ miles above mouth of Seymour Creek.

DRAINAGE AREA.—14,500 square miles (measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—November 30, 1923, to September 30, 1924.

GAGE.—Chain gage attached to downstream side of bridge; read by A. J. Waters.

DISCHARGE MEASUREMENTS.—Made from bridge to which gage is attached or by wading.

CHANNEL AND CONTROL.—Channel straight for a quarter of a mile above and below gage. Bed of stream and control composed of sand, clean; shifts. Banks of sand and covered with brush; shift; not subject to overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 7 feet at 9 a. m. April 25 (discharge, 12,100 second-feet); no flow February 5–10, 22, March 6–12, 26–28, April 5–12, June 19–21, July 2, 3, 13, 14, July 19 to August 14, August 20 to September 3, and September 11.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 5,000 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by shifting-control method, except as noted in footnote to daily-discharge table. Records fair.

Discharge measurements of Brazos River at Seymour, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 30	2.44	169	Apr. 26	4.52	3,740	July 8	1.54	12.2
Jan. 15	1.99	13.3	Apr. 27	3.66	1,580	July 23	1.12	.0
Jan. 28	2.02	13.8	May 20	2.29	193	Sept. 6	1.89	70.7
Feb. 19	1.64	1.6	June 5	3.19	760	Sept. 19	3.94	1,970
Mar. 18	2.87	192	June 10	5.18	5,010			
Apr. 17	2.73	162	June 26	2.11	92			

Daily discharge, in second-feet, of Brazos River at Seymour, Tex., for the period November 30, 1923, to September 30, 1924

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept
1		198	17	6.4	20	5.6	130	144	3.2		
2		223	44	6.0	7.2	5.2	85	87			
3		193	61	5.6	3.4	4.0	107	1,850			
4		193	42	1.2	1.8	3.6	314	1,110	12		36
5		189	24		1.8		320	906	118		72
6		223	47				144	646	66		76
7		223	41				83	470	16		47
8		167	42				41	189	14		45
9		148	41				30	120	6.4		14
10		144	25				21	9,090	3.8		27
11		189	25	4.4			10	1,650	1.0		
12		268	24	5.6			29	438	.6		998
13		398	10	5.6	1.8	40	14				1,650
14		320	14	4.4	2.2		1,950				705
15		202	14	5.6	2.4	288	2,600	160	21	202	274
16		184	14	3.8	4.4	223	622		7.2	118	158
17		314	14	2.6	193	176	834		3.6	41	207
18		320	14	4.8	176	158	518		2.6	6.0	4,350
19		288	17	3.6	171	78	383			4.8	2,260
20		320	10	2.2	101	26	218				1,370
21		300	11	2.2	30		320				508
22		207	7.6		17	1,250	115	2,160			422
23		151	9.6	1.0	7.6		45	1,110			134
24		134	7.2	1.0	2.8		23	390			144
25		158	10	4.8	.2	11,400	5.2	158			130
26		115	10	6.0		4,060	19	123			87
27		115	7.6	11		1,560	576	52			50
28		101	12	6.8		936	300	20			32
29		89	8.8	12	94	369	398	10			9.6
30	167	81	8.8		10	176	239	6			6.8
31		61	7.6		5.6		180				

NOTE.—Dry on days for which no discharge is given. Owing to incomplete record, discharge was estimated by comparison with flow at other stations Apr. 13, 14, 21–24, June 13–18, and Sept. 4.

Monthly discharge of Brazos River at Seymour, Tex., for the period November 30, 1923, to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
November 30	167	167	167	331
December	398	61	201	12,300
January	61	7.2	20.7	1,270
February	12	0	3.68	211
March	193	0	27.5	1,690
April	11,400	0	818	48,700
May	2,600	5.2	344	21,200
June	9,090	0	723	43,000
July	118	0	8.88	546
August	202	0	12.0	737
September	4,350	0	460	27,400
The period				157,000

BRAZOS RIVER NEAR MINERAL WELLS, TEX.

LOCATION.—At bridge on Mineral Wells-Palo Pinto highway, 4 miles west of Mineral Wells, Palo Pinto County, 6 miles below mouth of Eagle Creek, and 8 miles below mouth of Keechi Creek.

DRAINAGE AREA.—23,100 square miles (measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—January 31 to September 30, 1924.

GAGE.—Chain gage attached to downstream handrail of bridge; read by Joe C. Savage.

DISCHARGE MEASUREMENTS.—Made from bridge to which gage is attached or by wading.

CHANNEL AND CONTROL.—Channel straight half a mile above and below gage. Banks fairly clean, high; not subject to overflow. Control is a sand and gravel riffle, 1,000 feet below gage; shifts.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 10.50 feet at 7.30 a. m. September 22 (discharge not determined); no flow July 23 to August 6, August 12–14, and August 17 to September 7.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 14,000 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by shifting-control method except for period September 8–14 when discharge was estimated by comparison with that at other stations. Records good.

Discharge measurements of Brazos River near Mineral Wells, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 31	3.76	88.5	Mar. 24	4.98	1,210	Apr. 27	8.34	9,980
Feb. 13	3.74	101	Apr. 21	3.84	189	May 13	4.10	239
Feb. 28	3.78	115	Apr. 26	4.58	891	June 13	5.64	2,030
Mar. 17	5.64	2,210	Apr. 27	8.95	13,500			

Daily discharge, in second-feet, of Brazos River near Mineral Wells, Tex., for the period January 31 to September 30, 1924

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		86	95	258	1,940	1,600	77		
2		77	86	192	1,410	1,220	51		
3		73	77	167	1,100	1,670	51		
4		65	70	179	760	1,720	44		
5		57	65	167	570	1,100	46		
6		57	60	162	450	1,220	36		
7		62	54	145	366	1,220	35	7.4	
8		57	60	123	288	1,280	27	26	
9		54	57	104	266	1,040	19	11	
10		49	51	86	303	1,160	19	4.0	
11		68	68	82	295	843	17	1.5	180
12		77	82	73	303	4,710	16		
13		91	151	65	236	2,080	14		
14		95	416	60	186	1,340	12		
15		95	342	54	139	915	17	5.0	1,800
16		95	288	54	104	658	19	2.0	1,800
17		86	2,080	230	1,040	432	12		1,340
18		77	1,280	581	2,910	273	9.0		1,800
19		70	3,100	424	2,720	167	5.8		9,890
20		65	5,560	266	1,940	117	3.0		8,060
21		77	4,710	186	1,220	86	2.0		4,710
22		113	2,550	128	831	57	1.0		19,200
23		104	1,800	91	614	54			12,600
24		91	1,280	128	458	46			4,200
25		99	1,040	266	318	26			1,800
26		108	855	1,100	382	24			1,410
27		113	703	12,000	738	19			1,160
28		113	592	4,710	3,960	12			726
29		99	494	4,200	3,960	38			416
30			407	2,910	7,260	113			342
31	86		326		3,300				

NOTE.—Dry on days for which no discharge is given.

Monthly discharge of Brazos River near Mineral Wells, Tex., for the period January 31 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
January 31	86	86	86	171
February	113	49	81.8	4,710
March	5,560	51	929	57,100
April	12,000	54	973	57,900
May	7,260	104	1,300	80,100
June	4,710	12	841	50,100
July	77	0	17.2	1,060
August	26	0	1.84	113
September	19,200	0	2,420	144,000
The period				395,000

BRAZOS RIVER NEAR GLEN ROSE, TEX.

LOCATION.—A quarter of a mile above highway bridge on Glen Rose-Cleburne road, 1¼ miles above mouth of Squaw and Paluxy Creeks, and 4 miles northeast of Glen Rose, Somervell County.

DRAINAGE AREA.—24,800 square miles (measured on topographic maps and base map of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—October 1, 1923, to September 30, 1924.

GAGE.—A combination vertical and inclined staff gage on right bank; read by Byron Welborn.

DISCHARGE MEASUREMENTS.—Made from bridge below gage or by wading.

CHANNEL AND CONTROL.—Channel straight for 1 mile above and below gage. Bed of stream composed of rock, sand, and gravel; fairly permanent. Right bank of sand and clay, high; left bank of sand, wooded, subject to overflow at a stage of 17 feet. Control for low water is a rock and gravel shoal, 600 feet below gage; permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 13 feet at 6 p. m. October 17 (discharge, 37,500 second-feet); no flow September 7–9.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 16,000 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table, except as noted in footnote to daily-discharge table. Records good for low and medium stages; poor for high stages.

Discharge measurements of Brazos River near Glen Rose, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 4	0.66	103	Apr. 28	5.36	10,000	July 31	0.06	5.10
Dec. 14	6.14	12,400	Apr. 30	3.35	4,020	Sept. 5	−.24	.05
Feb. 6	.67	158	May 14	.96	386	Sept. 23	7.31	16,100
Mar. 3	.79	214	May 27	4.76	7,390			
Apr. 7	.94	398	May 28	2.74	2,560			

Daily discharge, in second-feet, of Brazos River near Glen Rose, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	184	12,000	550	590	217	295	660	3,110	6,960	54	4.0	2.4
2	167	10,700	520	560	200	259	590	2,690	4,350	48	2.8	1.9
3	149	8,160	520	540	192	250	484	2,340	3,340	46	2.6	1.7
4	143	4,620	520	530	184	233	430	1,760	2,510	67	2.1	1.5
5	233	6,960	484	502	167	217	448	1,150	2,030	108	1.6	1.0
6	175	9,380	466	448	155	200	421	1,040	1,760	167	1.1	.3
7	143	7,560	502	457	143	184	376	930	1,500	100	23	0
8	570	5,460	530	466	132	233	367	670	1,040	59	11	0
9	1,040	3,110	560	448	132	242	358	560	1,095	29	7.0	0
10	720	1,760	580	430	286	175	340	502	1,040	14	12	.4
11	540	1,500	620	412	304	143	322	448	1,150	8	132	.9
12	349	1,320	1,380	394	322	217	286	394	1,040		56	24
13	268	1,150	16,100	367	250	322	268	376	1,320		29	40
14	331	1,150	13,300	340	268	376	250	376	3,840		17	
15	690	19,600	13,600	340	268	466	233	304	2,690		26	500
16	5,760	13,900	12,300	331	259	412	233	268	1,890		41	
17	34,500	10,000	11,000	322	250	1,380	217	217	1,380		65	
18	29,200	5,460	9,700	304	250	2,340	184	175	1,150		40	930
19	15,100	4,620	8,460	286	333	4,090	167	233	720		25	820
20	13,600	4,090	6,360	277	217	9,380	143	2,030	570		15	4,890
21	12,000	3,590	2,180	268	200	10,700	149	2,690	439	7	10	7,560
22	7,560	3,340	1,440	277	184	8,760	304	2,510	394		7.0	6,360
23	4,620	2,340	1,260	277	167	6,660	466	2,180	322		5.0	14,700
24	3,340	1,260	1,040	286	138	6,060	875	1,760	268		4.0	11,300
25	2,510	1,100	930	286	167	5,170	2,480	1,150	217		4.0	5,760
26	2,030	985	820	286	233	2,340	4,090	6,360	161		2.9	2,510
27	1,760	820	770	268	268	1,760	5,170	9,380	120		2.9	1,500
28	1,500	700	770	268	286	1,380	11,000	2,510	93		2.8	1,150
29	1,440	660	720	259	304	1,260	8,460	8,760	78		2.8	1,040
30	25,100	600	720	250	-------	1,040	3,590	8,760	67		3.5	820
31	19,200	-------	640	233	-------	930	-------	12,000	-------	6	2.8	---------

NOTE.—Braced figures show estimated mean discharge for periods indicated. Owing to incomplete record, discharge partly estimated Sept. 18–22. No record Apr. 25; discharge interpolated.

Monthly discharge of Brazos River near Glen Rose, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	34,500	143	5,970	367,000
November	19,600	600	4,930	293,000
December	16,100	466	3,530	217,000
January	590	233	365	22,400
February	333	182	223	12,800
March	10,700	143	2,180	134,000
April	11,000	143	1,450	86,000
May	12,000	175	2,500	154,000
June	6,960	67	1,450	86,300
July	167	6	27.1	1,660
August	132	1.1	18.1	1,110
September	14,700	0	2,050	122,000
The year	34,500	0	2,060	1,500,000

BRAZOS RIVER AT WACO, TEX.

LOCATION.—At suspension bridge in Waco, McLennan County, 2½ miles below mouth of Bosque River and 4½ miles above mouth of Cottonwood Creek.

DRAINAGE AREA.—28,500 square miles (revised, measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—September 14, 1898, to December 31, 1911; October 1, 1914, to September 30, 1924.

GAGE.—United States Weather Bureau chain gage on downstream side of suspension bridge used since May 5, 1922.

DISCHARGE MEASUREMENTS.—Made from upstream side of first one-span highway bridge above gage or by wading.

CHANNEL AND CONTROL.—Bed composed of sand and gravel; shifts. Banks are clay, have been improved by city; overflowed at extremely high stages. Channel straight above and below for several thousand feet. Location of control not known.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 20.2 feet at 7 a. m. December 13 (discharge, 41,900 second-feet); minimum discharge, 15 second-feet for several days in September.

1898–1924: Maximum stage recorded, 39.7 feet December 3, 1913 (discharge not determined); no flow August 20 and 21, 1918, and several days in August, 1923.

ICE.—None reported.

DIVERSIONS.—Records of the Board of Water Engineers for the State of Texas show that numerous small diversions are made above station for mining, irrigation, and municipal uses, but total probably does not appreciably affect the flow except during low stages.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve fairly well defined. Gage read to tenths once daily. Daily discharge determined by shifting-control method except for the period September 1–12 when discharge was estimated. Records fair.

COOPERATION.—Gage-height record furnished by United States Weather Bureau.

Discharge measurements of Brazos River at Waco, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 20	12.52	15,000	Feb. 2	7.10	707	June 20	7.56	1,080
Nov. 11	8.85	2,450	Mar. 22	11.97	9,340	July 19	5.70	80
Dec. 15	13.22	16,200	Mar. 23	12.60	12,300	Aug. 16	5.63	101
Dec. 29	8.17	1,970	Apr. 20	7.10	824	Sept. 7	5.18	16
Jan. 25	8.06	1,430	May 26	15.78	29,500	Sept. 18	5.82	202

Daily discharge, in second-feet, of Brazos River at Waco, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	161	11,900	950	1,770	600	2,160	2,900	5,520	4,900	186	46	
2	138	6,880	875	1,660	600	1,770	2,750	5,300	8,100	161	46	
3	394	7,600	800	1,560	600	1,660	2,600	4,300	9,200	138	46	
4	600	5,100	875	1,460	600	1,560	2,300	3,500	5,980	117	39	20
5	800	4,100	730	1,280	490	1,370	2,160	2,900	3,950	117	39	
6	352	4,300	730	1,280	394	1,370	2,020	2,450	3,050	138	39	
7	314	6,200	660	1,190	394	1,110	1,770	2,020	2,300	117	46	16
8	214	5,100	660	1,110	394	1,030	1,660	1,660	2,300	117	39	
9	214	4,100	730	1,110	394	11,900	1,660	1,460	2,160	161	490	
10	186	3,200	800	1,110	394	7,100	1,560	1,370	1,560	161	214	15
11	440	2,600	2,160	950	394	3,350	1,280	1,190	1,460	117	186	
12	730	2,160	11,000	875	800	2,600	1,280	1,030	1,460	117	98	
13	543	1,770	41,900	800	730	3,050	1,280	950	1,370	117	81	39
14	440	1,560	29,000	730	730	12,800	1,190	875	1,370	98	81	278
15	730	1,370	13,100	660	600	5,100	1,190	800	1,280	81	117	117
16	1,190	12,200	10,400	730	600	4,500	1,190	800	3,200	67	98	81
17	1,460	10,100	6,650	730	543	3,800	950	730	2,750	67	81	138
18	27,700	5,980	5,100	660	543	11,900	875	730	2,020	67	67	186
19	24,100	4,100	5,520	660	730	6,420	800	660	1,460	81	55	161
20	10,700	3,950	5,100	600	730	13,800	800	600	1,110	67	46	161
21	9,800	3,350	5,300	440	660	12,800	800	600	875	67	39	490
22	8,650	3,200	4,500	440	600	10,700	730	4,100	800	55	33	8,380
23	5,520	2,750	4,500	440	600	11,600	660	3,500	660	55	33	5,300
24	4,100	2,300	3,950	2,450	600	6,650	660	2,750	543	46	46	14,400
25	3,050	2,020	3,500	1,460	600	6,880	1,030	2,450	490	46	39	11,000
26	2,300	1,560	3,200	950	1,030	6,200	15,400	11,000	394	39	28	7,100
27	1,770	1,370	3,050	800	4,500	5,750	10,400	16,400	314	46	28	4,100
28	1,370	1,190	2,750	800	3,350	4,900	5,520	11,300	278	46	28	2,600
29	1,280	1,110	2,600	730	2,750	4,900	11,900	4,700	245	46	24	1,770
30	6,650	950	2,450	730	-------	5,300	7,100	7,100	214	46	33	1,370
31	18,500	-------	2,160	600	-------	3,650	-------	8,380	-------	46	28	-------

NOTE.—Braced figures show mean estimated discharge for periods indicated.

Monthly discharge of Brazos River at Waco, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	27,700	138	4,340	267,000
November	12,200	950	4,140	246,000
December	41,900	660	5,670	348,000
January	2,450	440	992	61,000
February	4,500	394	895	51,500
March	13,800	1,030	5,730	352,000
April	15,400	660	2,880	171,000
May	16,400	600	3,580	220,000
June	9,200	214	2,190	130,000
July	186	39	91.3	5,610
August	490	24	74.6	4,590
September	14,400	----------	1,930	115,000
The year	41,900	----------	2,720	1,970,000

BRAZOS RIVER NEAR COLLEGE STATION, TEX.

LOCATION.—At Jones Bridge, 4 miles below Munson Shoals, 6 miles southwest of College Station, Brazos County, and 19 miles above mouth of Yegua River.

DRAINAGE AREA.—38,500 square miles (measured on topographic maps; base map of Texas, scale 1:500,000; and United States Army progressive military maps).

RECORDS AVAILABLE.—February 23, 1918, to September 30, 1924.

GAGE.—Standard chain gage on upstream handrail of bridge, installed April 18, 1922; read by Lamar McRae.

DISCHARGE MEASUREMENT.—Made from bridge.

CHANNEL AND CONTROL.—Bed compsed of sand and mud; shifting. Location of control not known. Banks high and free from vegetation. Right bank subject to overflow at extremely high stages (about 40 feet).

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 37.6 feet at 6 p. m. December 14 (discharge, 70,700 second-feet); minimum discharge was about 400 second-feet during the last part of August and first part of September.

1918–1924: Maximum stage recorded, 53.0 feet, 1 to 3 a. m. September 12, 1921 (discharge not determined); minimum discharge, 92 second-feet September 4, 1918.

ICE.—None.

DIVERSIONS.—No important diversions above or below station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 40,000 second-feet; poorly defined from 40,000 second-feet to 114,000 second-feet. Gage read to tenths twice daily. Daily discharge determined by shifting-control method, except from July 1 to September 14, when discharge was estimated by comparison with records at other stations. Records fair.

Discharge measurements of Brazos River near College Station, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 19	21.00	27,300	Mar. 2	13.70	11,400	July 15	5.95	881
Nov. 30	8.38	2,730	Mar. 25	15.03	12,000	Aug. 14	5.25	499
Jan. 4	8.74	3,740	Apr. 23	7.99	2,380	Sept. 16	8.69	3,250
Jan. 27	11.13	8,170	June 30	6.71	1,340	Sept. 28	9.70	4,200

Daily discharge, in second-feet, of Brazos River near College Station, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	715	19,800	2,460	4,310	4,200	19,400	7,020	10,100	27,100			
2	715	16,700	2,300	4,000	4,000	11,500	5,610	8,660	25,800			
3	715	13,300	2,700	3,800	3,900	8,840	4,870	8,480	21,900			
4	688	11,900	4,640	3,800	3,600	7,340	4,420	7,340	16,500			
5	632	10,500	5,350	3,600	3,500	6,700	4,530	6,280	10,800			
6	528	8,140	4,640	7,820	3,230	6,000	4,425	4,870	7,180			
7	1,010	7,820	4,000	7,340	3,140	5,870	4,000	4,310	7,660			
8	945	7,500	3,800	6,700	3,050	5,350	3,600	4,310	6,000			450
9	1,010	7,180	2,220	6,140	2,960	8,300	3,410	4,000	4,990	1,100		
10	715	4,100	1,780	5,610	2,870	16,400	5,110	3,600	4,420			
11	440	4,000	7,660	5,480	3,050	13,700	4,640	3,500	4,200			
12	440	3,900	18,100	4,640	3,050	11,500	9,920	4,420	4,100			
13	460	3,600	43,100	6,700	3,600	7,980	5,610	4,200	4,100			
14	1,010	3,500	69,900	6,860	4,420	12,300	4,420	3,050	3,410			
15	1,560	8,840	68,800	4,420	4,000	17,500	4,000	2,870	3,230			1,700
16	1,560	8,300	38,000	4,310	3,600	11,200	3,500	2,780	4,000		450	3,230
17	1,490	7,660	28,600	4,200	3,320	8,660	3,320	3,140	3,900			2,870
18	1,490	8,140	24,400	4,000	9,560	8,840	3,230	3,410	3,800			2,540
19	23,800	7,180	19,800	3,600	7,340	11,200	2,700	2,700	3,800			1,350
20	21,500	6,000	17,300	3,050	10,800	11,200	2,620	2,540	3,410			945
21	12,300	5,740	20,200	2,870	10,800	16,500	2,540	2,780	2,960			945
22	10,800	5,610	21,500	2,700	5,870	16,500	2,380	2,620	2,540			885
23	9,380	4,870	20,600	2,700	5,110	15,300	2,380	3,050	2,380			825
24	6,420	4,420	15,500	13,300	4,870	13,700	2,220	4,000	1,780	650		5,610
25	4,200	3,500	10,800	14,900	4,640	12,300	2,080	4,420	1,700			10,800
26	3,320	3,410	10,400	13,500	6,860	11,200	5,480	9,740	1,560			9,740
27	2,870	3,050	8,480	8,300	11,500	9,380	19,000	15,700	1,490			8,300
28	2,540	2,870	6,140	6,700	33,900	8,840	22,300	19,400	1,350			4,310
29	2,460	2,700	13,000	5,350	42,900	9,380	14,300	16,900	1,350			3,500
30	2,300	2,700	19,000	4,870	-------	8,840	12,600	13,700	1,350			2,620
31	7,980	-------	12,400	4,640	-------	8,660	-------	21,300	-------			-------

Monthly discharge of Brazos River near College Station, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	23,800	440	4,060	250,000
November	19,800	2,700	6,900	410,000
December	69,900	1,780	17,000	1,050,000
January	14,900	2,700	5,810	357,000
February	42,900	2,870	7,370	424,000
March	19,400	5,350	11,000	675,000
April	22,300	2,080	5,870	350,000
May	21,300	2,540	6,720	413,000
June	27,100	1,350	6,290	374,000
July	----------	----------	868	53,400
August	----------	----------	450	27,700
September	10,800	----------	2,220	132,000
The year	69,900	----------	6,220	4,520,000

BRAZOS RIVER AT ROSENBERG, TEX.

LOCATION.—At Rosenberg-Richmond highway bridge, at Rosenberg, Fort Bend County, and 3 miles above mouth of Jones Creek.

DRAINAGE AREA.—44,000 square miles (measured on topographic maps; base map of Texas, scale 1 : 500,000; and United States Army progressive military maps).

RECORDS AVAILABLE.—October 1, 1922, to September 30, 1924.

GAGE.—Regulation United States Weather Bureau long box chain gage attached to the downstream handrail of bridge; read by G. W. Nelson.

DISCHARGE MEASUREMENTS.—Made from upstream side of bridge to which gage is attached.

CHANNEL AND CONTROL.—Bed of stream consists of sand; shifts. Channel straight 400 feet above and 700 feet below station. Banks high; subject to overflow at extremely high stages. Control is bed of stream; shifts.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 33.0 feet December 16 (discharge, 73,000 second-feet; revised; determined from extension of curve); minimum stage, 1.3 feet September 7–10 (discharge, 605 second feet).

1922–1924: Maximum discharge, that of December 16, 1923; minimum stage, 1.03 feet August 27–29, 1923 (discharge, 530 second-feet).

By levels to floodmarks, the flood of December 9, 1913, reached a stage of 55.46 feet by present datum.

ICE.—None.

DIVERSIONS.—No important diversions.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 44,000 second-feet; extended above. Gage read to tenths once daily. Daily discharge determined by applying daily gage height to rating table. Records fair.

COOPERATION.—Gage-height record furnished by United States Weather Bureau.

Discharge measurements of Brazos River at Rosenberg, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 23	12.51	13,700	Feb. 12	5.86	3,870	May 3	14.05	17,500
Oct. 24	11.38	12,400	Mar. 21	16.16	22,200	May 29	15.00	21,800
Oct. 25	10.68	10,200	Mar. 22	16.69	24,300	June 4	24.56	42,600
Oct. 26	9.52	9,060	Mar. 24	17.63	26,000	Do	23.97	38,400
Oct. 27	8.18	6,760	Do	17.42	25,700	June 5	20.95	32,600
Do	7.88	6,320	Mar. 25	16.07	22,600	June 6	19.16	28,400
Oct. 28	7.12	5,390	Mar. 26	15.58	20,900	July 1	4.57	2,500
Oct. 30	7.75	7,500	Do	15.54	20,600	Aug. 12	1.75	764
Jan. 10	7.24	5,650	Apr. 16	13.33	15,900	Sept. 13	1.53	714

Daily discharge, in second-feet, of Brazos River at Rosenberg, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,020	4,240	7,090	14,600	11,600	53,000	13,800	19,100	52,500	2,300	885	685
2	2,090	11,200	7,840	13,200	10,500	46,900	13,800	17,400	48,400	2,160	885	685
3	1,820	24,600	13,800	12,100	9,310	43,800	12,500	17,000	46,600	2,300	885	685
4	1,440	29,700	22,800	10,500	8,160	29,500	11,400	15,300	43,000	2,470	845	685
5	1,380	25,300	24,400	9,480	8,000	23,700	8,800	14,800	35,700	2,090	805	645
6	1,330	21,500	24,600	8,800	7,240	20,200	7,840	11,800	29,700	1,950	805	645
7	1,330	18,900	20,600	8,000	6,800	17,800	7,240	12,700	24,600	1,820	805	605
8	1,560	14,600	15,900	7,390	6,120	16,300	6,660	9,990	19,100	1,820	765	605
9	1,880	12,300	11,900	6,520	5,860	15,100	6,120	8,800	17,000	1,620	765	605
10	1,440	10,700	10,200	5,730	5,470	13,600	6,800	7,840	15,100	1,620	725	605
11	1,330	10,900	9,990	5,340	4,840	18,400	12,900	6,520	13,600	1,500	725	645
12	1,280	8,800	13,200	5,990	4,240	22,600	20,600	5,990	12,300	1,500	725	645
13	1,280	6,800	20,200	7,090	3,780	20,000	19,300	5,470	11,200	1,440	725	645
14	1,280	6,250	34,300	6,800	3,890	17,200	18,600	6,800	10,500	1,440	725	685
15	1,380	5,340	53,600	6,250	4,240	18,400	23,900	6,940	9,140	1,380	725	685
16	1,330	9,140	62,600	8,160	4,720	23,000	18,900	6,660	8,000	1,380	685	645
17	1,330	9,480	64,800	8,480	5,210	25,600	13,800	5,600	7,240	1,330	765	645
18	1,330	5,730	62,400	11,000	5,470	20,600	12,700	5,340	6,120	1,280	765	645
19	1,330	11,800	43,200	10,200	17,800	17,400	10,900	6,520	5,080	1,220	765	845
20	1,620	13,400	39,500	8,320	28,500	16,700	8,970	5,470	4,240	1,160	725	2,300
21	21,700	10,700	39,500	7,540	25,600	21,900	7,540	4,960	3,670	1,160	725	2,380
22	22,800	8,320	52,200	7,240	24,400	21,900	5,990	4,240	5,990	1,120	725	1,950
23	15,300	6,660	56,100	6,940	23,000	25,100	5,210	3,780	5,470	1,060	725	1,120
24	12,700	5,340	50,300	11,800	20,200	25,600	4,600	4,240	4,840	1,060	725	1,120
25	11,000	4,240	42,700	29,700	23,900	23,000	4,000	4,600	4,000	975	725	1,060
26	9,140	4,360	36,000	29,700	29,000	21,100	3,780	5,080	3,450	975	685	1,120
27	6,940	4,480	28,800	28,100	43,200	18,900	5,990	6,250	3,240	930	685	7,240
28	5,470	5,210	23,000	24,200	47,900	16,500	17,400	7,390	3,130	975	685	9,990
29	5,210	4,480	20,200	20,600	51,700	15,300	40,700	17,800	2,930	930	685	7,840
30	4,960	4,000	17,800	14,400	-------	14,200	34,800	23,500	2,640	930	685	5,860
31	4,120	-------	14,200	12,300	-------	14,000	-------	40,700	-------	885	685	-------

Monthly discharge of Brazos River at Rosenberg, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	22,800	1,280	4,810	296,000
November	29,700	4,000	10,600	632,000
December	64,800	7,090	30,400	1,870,000
January	29,700	5,340	11,800	727,000
February	51,700	3,780	15,500	894,000
March	53,000	13,600	22,500	1,380,000
April	40,700	3,780	12,900	765,000
May	40,700	3,780	10,300	632,000
June	52,500	2,640	15,300	909,000
July	2,470	885	1,440	88,800
August	885	685	750	46,100
September	9,990	605	1,820	108,000
The year	64,800	605	11,500	8,350,000

SALT FORK OF BRAZOS RIVER NEAR ASPERMONT, TEX.

LOCATION.—At Aspermont-Guthrie highway bridge, 10 miles north of Aspermont, Stonewall County.

DRAINAGE AREA.—4,990 square miles (measured on base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—December 5, 1923, to September 30, 1924.

GAGE.—Standard chain gage attached to downstream side of the bridge; read by L. F. McCoy or E. V. Smith.

DISCHARGE MEASUREMENTS.—Made from bridge to which gage is attached or by wading.

CHANNEL AND CONTROL.—Channel straight for 1,000 feet above and below gage. Banks of sand, shift; not subject to overflow. Control shifts.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 7.80 feet at 10 a. m. June 21 (discharge, 11,600 second-feet); dry at numerous times.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 2,500 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by shifting-control method, except as noted in footnote to daily-discharge table. Records for low and intermediate stages, fair; for high stages, poor.

Discharge measurements of Salt Fork of Brazos River near Aspermont, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 5	2.08	65	Apr. 15	2.22	53	July 11	2.21	0
Jan. 2	1.59	5.8	May 19	1.96	26	Do	2.92	174
Jan. 27	1.49	1.4	May 27	2.62	137	July 24	2.16	*.5
Feb. 7	1.45	*1.2	June 6	2.56	140	Aug. 7		0
Feb. 18	1.38	*1.0	June 25	2.56	20	Aug. 27		0
Mar. 26	1.75	2.2	July 9	2.23	*.07	Sept. 17	3.41	569

* Estimated.

Daily discharge, in second-feet, of Salt Fork of Brazos River near Aspermont, Tex., for the period December 5, 1923, to September 30, 1924

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	------	8.0	1.4	1.5	0.6	0.1	5.9	1.9	------	5.9
2	------	6.3	1.2	1.5	.3	------	550	2.4	------	.2
3	------	5.9	1.3	1.3	.1	277	1,360	1.4	------	.2
4	------	5.0	1.5	1.3	.1	91	250	1.2	------	.7
5	62	3.3	1.3	1.3	.1	50	91	.9	------	.1
6	54	3.3	.8	1.3	.2	26	64	.7	------	------
7	42	3.3	.7	1.3	.4	15	69	.4	------	------
8	34	3.3	.7	1.3	.5	6.3	46	.1	------	------
9	29	4.2	.6	1.3	.4	3.7	36	.1	------	------
10	25	3.7	.8	1.3	.2	1.9	15	------	------	------
11	37	2.9	3.3	1.3	.2	1.4	------	182	------	------
12	68	2.0	3.3	1.3	.2	1.0	------	116	------	24
13	100	1.8	1.8	1.5	2.4	2,640	------	73	------	22
14	89	1.8	1.5	1.5	19	2,300	------	50	------	12
15	84	1.9	1.3	1.4	36	250	------	42	------	12
16	68	1.8	1.2	124	19	109	------	32	------	19
17	71	1.9	1.2	49	11	55	------	17	------	875
18	71	1.9	1.3	8.9	5.0	37	------	50	------	2,410
19	62	1.6	1.3	32	1.6	23	------	62	------	625
20	52	1.6	1.4	36	.6	15	------	39	------	185
21	49	1.8	1.8	19	.1	11	8,700	13	------	82
22	48	1.6	3.3	16	------	5.4	1,550	3.7	------	40
23	44	1.6	3.7	12	------	2.0	124	1.8	------	14
24	42	1.3	3.7	8.0	26	1.3	14	.2	------	1.3
25	39	1.3	3.7	5.0	700	.7	11	.7	------	.3
26	33	1.0	2.0	2.9	229	2,190	5.0	.5	------	.1
27	29	1.0	1.8	2.0	104	500	3.3	.2	------	------
28	25	1.3	1.8	4.2	46	54	2.0	------	------	------
29	20	1.3	1.5	2.9	24	33	1.8	------	------	------
30	16	1.4	------	1.6	6.3	18	1.8	.4	------	------
31	12	1.4	------	1.2	------	12	------	------	79	------

NOTE.—Dry for days on which no discharge is given. Discharge estimated Apr. 14; interpolated June 30 and July 27.

Monthly discharge of Salt Fork of Brazos River near Aspermont, Tex., for the period December 5, 1923, to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
December 5-31	100	12	48.3	2,590
January	8.0	1.0	2.60	160
February	3.7	.6	1.77	102
March	124	1.2	11.1	684
April	700	0	41.1	2,450
May	2,640	0	282	17,300
June	8,700	0	430	25,600
July	182	0	22.3	1,370
August	79	0	2.55	157
September	2,410	0	144	8,590
The period	------	------	------	59,000

CLEAR FORK OF BRAZOS RIVER AT NUGENT, TEX.

LOCATION.—At highway bridge at Nugent, Jones County, and 2 miles below mouth of Elm Creek.

DRAINAGE AREA.—2,220 square miles (measured on topographic maps and base maps of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—February 10 to September 30, 1924.

GAGE.—Vertical staff in four sections on left bank, 350 feet below highway bridge; read by M. F. Howard, or C. F. Howard.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Channel straight for 1,000 feet above and 400 feet below gage. Bed of stream composed of rock; clean and permanent. Banks covered with light brush, high; subject to overflow at extremely high stages. Control formed by rock shoal, 1,000 feet below gage; permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 11.65 feet at 7.20 p. m. May 26 (discharge, 5,800 second-feet); minimum stage, 1.06 feet from 6.30 p. m. August 4 to 8 a. m. August 6 (discharge, 0.6 second-foot).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 2,000 second-feet; fairly well defined to 10,000 second-feet. Gage read to hundredths twice daily, or oftener during floods. Daily discharge determined by applying mean daily gage height to rating table except for the period February 28 to March 2 when the discharge was estimated and on April 10 and September 8 when the discharge was interpolated. Records good.

Discharge measurements of Clear Fork of Brazos River at Nugent, Tex., during the ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Feb. 10	1.62	13.3	May 27	6.26	2,110	Aug. 12	1.36	3.5
Apr. 28	2.75	230	June 29	1.30	2.0	Aug. 28	1.88	44.3
May 17	3.09	323	July 18	1.28	2.8	Sept. 29	1.73	27.5

Daily discharge, in second-feet, of Clear Fork of Brazos River at Nugent, Tex., for the year ending September 30, 1924

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		24	14	24	116	3.0	1.1	46
2		24	14	19	205	2.8	.9	257
3		17	14	15	135	3.0	.8	29
4		18	15	14	158	3.9	.7	29
5		23	15	13	68	4.2	.6	13
6		24	15	21	38	4.5	.8	7.2
7		22	15	77	34	4.5	1.0	5.1
8		17	16	41	27	4.5	1.2	4.6
9		18	17	33	22	3.9	1.0	4.0
10	15	19	16	133	16	4.2	.8	3.4
11	59	23	15	140	14	5.1	1.0	3.2
12	90	38	15	59	12	161	3.6	357
13	59	41	19	970	14	28	2.2	1,030
14	45	34	25	915	9.9	12	1.6	312
15	67	35	22	2,330	9.9	6.9	1.4	374
16	52	25	17	670	9.9	4.5	1.2	49
17	65	22	16	312	8.1	3.3	17	390
18	72	22	15	163	6.6	2.9	4.5	1,470
19	92	25	18	92	5.4	2.6	4.2	810
20	65	23	15	38	4.8	2.6	2.7	205
21	77	20	12	25	5.1	2.4	2.0	52
22	65	23	12	23	5.7	2.3	1.7	970
23	72	28	12	31	5.7	2.0	1.3	103
24	65	24	11	16	4.8	2.0	1.0	70
25	77	22	408	14	4.2	2.0	1.0	70
26	49	23	2,070	2,740	4.4	1.9	2.3	33
27	31	25	408	3,650	3.8	1.8	5.1	28
28	24	22	231	500	3.4	1.8	49	28
29	24	22	55	192	3.0	1.5	8.7	25
30		21	35	180	2.8	1.3	5.7	25
31		17		390		1.4	43	

Monthly discharge of Clear Fork of Brazos River at Nugent, Tex,. for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
February 10–29	92	15	58.2	2,310
March	41	.17	23.9	1,470
April	2,070	.11	119	7,100
May	3,650	13	446	27,500
June	205	2.8	31.9	1,900
July	161	1.3	9.28	571
August	49	.6	5.45	335
September	1,470	3.2	227	13,500
The period				54,700

CLEAR FORK OF BRAZOS RIVER AT FORT GRIFFIN, TEX.

LOCATION.—At highway bridge on Fort Griffin-Throckmorton road, 600 feet below mouth of Collins Creek and half a mile east of Fort Griffin, Shackleford County.

DRAINAGE AREA.—3,970 square miles (measured on topographic maps and base map of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—December 9, 1923, to September 30, 1924.

GAGE.—Chain gage attached to downstream side of bridge; read by Lee Tuton or H. C. Herron.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Channel straight for 200 feet above and 400 feet below gage. Bed of stream composed of gravel; permanent. Banks of clay, underlain by a stratum of rock; sparsely wooded; fairly permanent. Left bank is overflowed at a stage of 15 feet and right bank at a stage of 33 feet. Low-water control is gravel shoal, 300 feet below gage, fairly permanent; high-water control, channel below station.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period of record, 15.50 feet at 8 a. m. May 28 (discharge, 5,100 second-feet); minimum stage, 2.09 feet August 9 (discharge, 2.1 second-feet).

ICE.—None.

DIVERSIONS.—Small amount diverted for municipal use; amount not known.

REGULATION.—Possibly slight regulatory effect at low stages by power plant at Stamford.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined below 5,000 second-feet. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records fair.

Discharge measurements of Clear Fork of Brazos River at Fort Griffin, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 6	3.25	136	Apr. 27	10.42	2,980	June 29	2.34	10
Jan. 4	2.98	85	Do	9.80	2,720	July 21	2.24	6.8
Jan. 14	3.10	97	May 17	5.44	1,910	Aug. 12	2.25	7.7
Jan. 30	2.76	50	May 28	14.36	4,390	Sept. 28	2.76	51
Apr. 19	2.68	33	Do	11.35	3,100			

Daily discharge, in second-feet, of Clear Fork of Brazos River at Fort Griffin, Tex., for the year ending September 30, 1924

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		127	39	38	64	153	275	11	5.8	12
2		96	46	36	39	94	275	12	6.6	8.6
3		82	34	38	29	65	170	12	6.6	10
4		78	30	36	41	40	508	18	5.8	31
5		71	28	36	46	39	238	21	3.8	21
6		78	28	36	40	40	205	20	3.2	14
7		78	27	36	38	153	172	17	2.5	11
8		78	27	33	34	121	94	12	2.5	9.5
9	106	71	27	27	48	82	70	10	2.1	7.6
10	80	71	22	23	46	85	56	10	20	6.2
11	222	71	23	22	37	65	41	8.6	12	5.8
12	800	117	25	22	46	117	34	14	8.3	37
13	850	104	25	22	1,000	199	23	14	23	28
14	1,100	104	123	23	1,200	1,400	20	13	21	758
15	674	104	123	27	548	1,620	16	12	14	850
16	448	96	76	25	172	2,630	14	11	11	256
17	162	68	56	34	66	1,580	8.3	11	10	3,320
18	294	68	89	54	43	548	6.9	10	8.3	3,140
19	256	53	78	98	32	350	8.6	9.0	26	2,020
20	256	46	78	114	32	238	10	8.6	20	1,980
21	294	58	75	125	24	164	10	8.0	12	331
22	275	58	75	275	20	94	11	8.3	11	222
23	275	56	75	199	20	68	14	9.5	8.3	139
24	275	54	75	134	19	45	14	11	7.2	448
25	275	54	75	102	26	43	9.0	9.5	6.2	143
26	275	49	73	89	1,050	31	9.0	8.0	7.2	96
27	238	49	56	82	2,520	1,860	6.9	5.8	8.3	70
28	221	46	43	73	1,000	3,860	5.5	5.8	8.3	54
29	193	46	43	64	548	1,000	11	8.3	3.8	52
30	196	46		64	294	428	11	8.0	19	30
31	170	44		78		294		7.2	14	

Monthly discharge of Clear Fork of Brazos River at Fort Griffin, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
December 9–31	1,100	80	345	15,700
January	127	44	71.6	4,410
February	123	22	55.0	3,160
March	275	22	66.6	4,100
April	2,520	19	304	18,100
May	3,860	31	565	34,700
June	508	5.5	78.2	4,650
July	21	5.8	11.1	682
August	26	2.1	10.3	630
September	3,320	5.8	470	28,000
The period				114,000

CLEAR FORK OF BRAZOS RIVER AT CRYSTAL FALLS, TEX.

LOCATION.—At Walker-Caldwell Water Co.'s pumping plant, a quarter of a mile north of Crystal Falls, Stephens County, and 1 mile above mouth of Hubbard Creek.

DRAINAGE AREA.—4,320 square miles (measured on topographic maps and base maps of Texas, scale 1 : 500,000).

RECORDS AVAILABLE.—November 12, 1921, to September 30, 1924.

GAGE.—Vertical staff on right bank in four sections, opposite pumping plant; read by pumpman. Gage lowered 1 foot August 14.

DISCHARGE MEASUREMENTS.—Made by wading or from highway bridge 500 feet below gage.

CHANNEL AND CONTROL.—Channel straight 800 feet above gage and 400 feet below. Bed of stream composed of rock. Right bank of clay, fairly clean, and high. Left bank of clay, wooded, and is overflowed during extremely high stages. Control is formed by concrete dam, about 800 feet below gage; permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.55 feet at 6 p. m. October 18 (discharge, 12,200 second-feet); no flow during several periods.

1922–1924: Maximum stage, 18.25 feet at 10.30 p. m. April 30, 1922 (discharge not determined); no flow during several periods.

ICE.—None.

DIVERSIONS.—Large part of ordinary flow diverted for municipal use and for use in mining.

REGULATION.—Low-water flow partly regulated by dam above gage.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 3,200 second-feet; extended above. Gage read to hundredths once daily. Daily discharge determined by applying mean daily gage height to rating table except as noted in footnote to daily-discharge table. Records for low and medium stages, good; for high stages, fair.

Discharge measurements of Clear Fork of Brazos River at Crystal Falls, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Feb. 20	1.23	68.1	Apr. 28	2.77	1,770	July 22	0.96	[a] 0.4
Mar. 25	1.32	116	May 15	2.73	1,800	Aug. 14		0
Apr. 18	1.20	59.9	May 29	3.42	3,210	Sept. 24	2.23	1,080
Apr. 28	3.02	2,230	June 28	1.01	[a] 3.0			

[a] Estimated.

NOTE.—Gage lowered 1.00 foot Aug. 14. Gage heights for all measurements prior to Aug. 14 have been increased 1.00 foot.

Daily discharge, in second-feet, of Clear Fork of Brazos River at Crystal Falls, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		1,600	104	155		44	62	184	169		0	1.2
2		1,600	116	142		44	71	116	336			.4
3		4,890	142	116		36	62	62	246			
4		5,690	184	104		36	52	62	184	3.6		29
5		2,930	184	93		29	36	52	336	8.0		16
6		742	246	93		29	29	52	214	5.2		12
7		436	206	82		29	22	52	184	5.2		3.6
8		246	184	93	30	36	16	246	142	3.6		1.2
9		246	169	93		36	16	116	52	2.0		1.2
10		230	246	93		29	12	93	44	2.0		.4
11		184	290	82		22	16	71	36	2.0		
12		169	1,600	76		16	16	71	29	2.0		246
13	3.6	246	1,040	71		22	22	299	22	2.0		169
14	246	3,160	1,310	169		16	1,180	184	16	2.0		52
15	7,080	1,760	1,040	169	[b] 82	16	670	1,760	16	2.0		1,240
16	10,300	1,180	915	169	104	22	318	2,600	12	2.0		622
17	8,810	1,450	790	169	104	22	155	2,500	8.0	2.0		2,020
18	12,200	1,310	550	142	93	16	52	1,180	5.2	2.0		7,650
19	7,940	915	436	116	104	52	44	385	3.6	2.0	16	3,160
20	2,110	550	336	104	71	116	36	230	2.0	2.0	52	1,520
21	790	246	246	82	62	104	29	129	2.0	2.0	16	1,000
22	104	104	169	52	52	169	22	93	2.0	.4	16	622
23	116	62	184	44	44	142	22	52	2.0		246	104
24	104	52	199	44	62	142	16	22	2.0		1.2	742
25	104	62	169	44	82	116	52	12	2.0			246
26	670	93	169	52	71	116	82	318	2.0			93
27	4,630	129	199	52	62	116	2,500	52	3.6	2.0	12	62
28	4,890	116	199	52	62	104	1,600	2,710	2.8	2.0	2.0	52
29	6,240	104	184	71	52	82	646	2,820	2.0	2.0		52
30	6,520	104	184	71		62	356	436	2.0		.4	44
31	6,240		169	70		62		246			1.2	

NOTE.—Braced figures show estimated mean discharge for periods indicated. Dry on days for which no discharge is given. Discharge estimated Sept. 21, owing to backwater from Hubbard Creek.

Monthly discharge of Clear Fork of Brazos River at Crystal Falls, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	12,200	0	2,550	157,000
November	5,690	52	1,020	60,700
December	1,600	104	392	24,100
January	169	44	95.6	5,880
February	104	----------	52.7	3,030
March	169	16	60.7	3,730
April	2,500	12	274	16,300
May	2,820	12	555	34,100
June	336	2.0	69.3	4,120
July	8.0	0	1.87	115
August	246	0	11.7	720
September	7,650	0	659	39,200
The year	12,200	0	481	349,000

CLEAR FORK OF BRAZOS RIVER NEAR ELIASVILLE, TEX.

LOCATION.—At suspension highway bridge near southern line of Young County, 2½ miles northeast of Eliasville, and 6 miles above mouth of stream, below all tributaries.

DRAINAGE AREA.—5,740 square miles (revised, measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—November 12, 1915, to April 30, 1920, and December 8, 1923, to September 30, 1924.

GAGE.—Chain gage attached to downstream handrail of bridge.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of sand and gravel; free from vegetation. One channel at all stages; straight above and below station. Banks are high and wooded, composed of clay and sand; subject to overflow at a stage of 38 feet. Below 2-foot stage control is gravel shoal, 800 feet below gage; from 2 to 8 feet it is a shoal 600 feet below gage. Both low-water controls subject to shift. There is a possibility of backwater from Brazos River during high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 24.30 feet at 5 p. m. September 21 (discharge, 13,600 second-feet); discharge probably less than 1 second-foot on numerous days from June to September.

1916–1920; 1923–1924: Maximum discharge, that of September 21, 1924; no flow for extended periods.

ICE.—None.

DIVERSIONS.—Records of the Board of Water Engineers for the State of Texas show numerous small diversions above the station which probably reduce the flow considerably at low stages. Two diversions are made between the station and confluence with the Brazos.

REGULATION.—None of consequence, except at extremely low stages.

ACCURACY.—Stage-discharge relation not permanent. Rating curve fairly well defined for all stages. Gage read to half-tenths twice daily, but work of observer not reliable. On account of inaccuracies in gage readings, especially at low stages, only the run-off in acre-feet for the period is published. This is 223,000 acre-feet and may be as much as 10 per cent too low.

Discharge measurements of Clear Fork of Brazos River near Eliasville, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 9	4.52	122	Mar. 19	5.67	650	June 27	3.64	2.31
Jan. 3	4.23	94.9	Apr. 18	4.36	86.4	July 22	3.65	1.60
Jan. 15	4.15	101	May 16	8.07	1,630	Aug. 13	3.56	.20
Jan. 28	4.13	51.4	May 29	17.79	7,960	Sept. 22	22.18	11,700
Feb. 20	4.04	72.7	May 30	6.37	1,020	Sept. 23	6.37	818

PALUXY CREEK AT GLEN ROSE, TEX.

LOCATION.—At highway bridge in Glen Rose, Somervell County, 3 miles above confluence with Brazos River.

DRAINAGE AREA.—424 square miles (measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—October 27, 1923, to September 30, 1924.

GAGE.—Chain gage attached to downstream handrail of bridge; read by W. N. Carter.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of solid rock. One channel at all stages; straight for half a mile above and 300 feet below gage Banks of earth and gravel, sodded, clean; not subject to overflow. No definite control except bed of stream; permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 7.10 feet at 5 p. m. April 25 (discharge not determined); minimum stage, 0.28 foot at 4 p. m. September 5 (discharge, 0.7 second-foot).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 100 second-feet. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records good for period for which discharge is published.

Discharge measurements of Paluxy Creek at Glen Rose, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 27	0.51	6.4	Mar. 4	0.85	43	July 31	0.39	2.3
Dec. 15	1.05	94	Apr. 7	.97	73	Sept. 5	.28	a 1.0
Feb. 6	.66	18	May 14	.85	45	Sept. 23	.69	19

a Estimated.

Daily discharge, in second-feet, of Paluxy Creek at Glen Rose, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	------	------	15	39	20	49	94	110	32	7.9	3.0	1.8
2	------	132	18	37	20	45	94	94	71	7.9	3.0	1.8
3	------	6.2	26	34	20	45	94	71	68	7.9	2.6	1.8
4	------	60	28	33	20	45	85	60	39	9.7	2.6	1.8
5	------	47	26	33	19	45	79	53	30	11	2.3	1.4
6	------	34	26	32	18	49	77	51	28	9.1	1.9	2.3
7	------	26	26	30	17	45	74	47	26	8.5	143	2.3
8	------	23	23	29	17	45	88	47	23	8.5	45	2.1
9	------	20	23	28	17	45	79	47	20	7.9	14	2.1
10	------	79	23	28	17	41	71	45	19	7.9	5.8	2.1
11	------	23	107	28	32	41	68	45	18	6.8	4.4	2.1
12	------	23	------	26	58	45	68	45	16	6.8	3.7	45
13	------	26	------	26	53	------	71	45	15	6.2	3.7	51
14	------	107	------	28	51	------	71	45	15	5.8	3.7	16
15	------	79	124	28	47	113	66	43	15	5.5	3.0	9.1
16	------	41	101	25	47	55	63	43	14	5.1	2.6	14
17	------	20	63	25	45	------	58	39	13	5.1	2.4	9.1
18	------	22	66	25	45	------	53	37	13	4.8	2.3	9.1
19	------	20	88	25	51	------	49	34	11	4.8	2.1	11
20	------	18	77	23	51	------	43	32	11	4.8	1.9	12
21	------	18	66	23	45	------	39	32	10	4.4	1.8	11
22	------	18	58	22	41	------	34	29	9.1	4.4	1.8	10
23	------	17	55	23	39	------	34	26	9.1	4.0	1.8	12
24	------	17	53	25	32	------	34	25	8.5	3.7	1.8	9.1
25	------	16	51	23	29	------	------	25	8.5	3.7	1.8	8.5
26	------	16	47	23	85	143	------	------	7.9	3.3	2.1	7.4
27	6.2	16	45	22	58	132	------	120	7.9	3.3	1.9	6.8
28	7.4	16	45	22	51	117	------	43	7.9	3.3	1.8	5.5
29	------	16	43	22	49	107	------	39	7.9	3.3	2.1	5.1
30	132	15	41	22	------	101	132	34	7.9	3.0	2.1	4.8
31	55	------	41	20	------	94	------	34	------	3.0	1.9	------

NOTE.—Gage height, in feet, for days when stage was beyond limits of rating curve and discharge not determined, are as follows: Oct. 29, 1.80; Nov. 1, 1.38; Dec. 12, 2.60; Dec. 13, 1.73; Dec. 14, 1.23; Mar. 13, 1.75; Mar. 14, 1.61; Mar. 17, 3.73; Mar. 18, 1.69; Mar. 19, 2.56; Mar. 20, 2.09; Mar. 21, 1.86; Mar. 22, 2.06; Mar. 23, 1.99; Mar. 24, 1.62; Mar. 25, 1.24; Apr. 25, 3.95; Apr. 26, 2.05; Apr. 27, 1.85; Apr. 28, 1.53; Apr. 29, 1.26; May 26, 2.42.

Monthly discharge of Paluxy Creek at Glen Rose, Tex., for the year ending September 30, 1924

[Drainage area, 424 square miles]

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
January	39	20	26.7	1,640
February	85	17	37.7	2,170
June	71	7.9	19.4	1,150
July	11	3.0	5.85	360
August	143	1.8	8.84	543
September	51	1.4	9.27	552

NOLANDS RIVER AT BLUM, TEX.

LOCATION.—At upper Santa Fe Railway bridge, a quarter of a mile northeast of Blum, Hill County, and 8 miles above the confluence with Brazos River.

DRAINAGE AREA.—275 square miles (measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—July 29 to September 30, 1924.

GAGE.—Combined inclined and vertical staff in three sections at bridge on left bank; read by Miss Myrtis Haaf.

DISCHARGE MEASUREMENTS.—Made by wading or from railroad bridge.

CHANNEL AND CONTROL.—Bed of stream composed of solid rock with scattered boulders; clean and permanent. Channel straight for 500 feet above gage and 400 feet below. Banks of earth, clean, permanent, high; left bank subject to overflow at extreme stages. Low-water control gravel bar 300 feet below gage; permanent. Moderate and high-stage control ruins of old masonry dam 350 feet below gage; clean and permanent.

EXTREMES OF DISCHARGE.—Maximum stage not known, but it is believed that the maximum discharge was not greater than 4 second-feet on September 15; no flow July 30 to September 13.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. No rating curve defined. Gage read to hundredths twice daily, but work of the observer very doubtful and gage readings not used except in a very general way. Discharge estimated on basis of measurements made and visits of engineers to the station. Records fair.

The following discharge measurements were made:

July 30, 1924: Gage height, 2.59 feet; discharge, 0.00 second-foot.

September 24, 1924: Gage height, 2.74 feet; discharge, 0.80 second-foot (estimated).

Daily discharge, in second-feet, of Nolands River at Blum, Tex., for the period July 30 to September 30, 1924

Date	Discharge	Date	Discharge
July 30 to Sept. 13	Dry.	Sept. 24	0.8
Sept. 14-23	[a] 1.9	Sept. 25-30	[a] .7

[a] Estimated mean discharge for the period indicated.

NOTE.—Total run-off, July 30 to Sept. 30, 47.6 acre-feet.

NORTH BOSQUE RIVER NEAR CLIFTON, TEX.

LOCATION.—A quarter of a mile above Santa Fe Railway bridge, one-third of a mile above Santa Fe Dam, 1⅝ miles northwest of Clifton, Bosque County, and 2 miles below Meridian Creek.

DRAINAGE AREA.—974 square miles (measured on topographic maps and base map of Texas, scale 1 to 500,000).

RECORDS AVAILABLE.—November 4, 1923, to September 30, 1924.

GAGE.—Staff gage in four sections attached to trees on right bank; read by Miss Belinda Swenson.

DISCHARGE MEASUREMENTS.—Made from Santa Fe Railway bridge or by wading.

CHANNEL AND CONTROL.—Channel straight for 1 mile below and one-fifth of a mile above station. Bed and banks composed of sand and earth; permanent. Banks slightly wooded and subject to overflow at a stage of 17 feet. Two channels above gage height 17 feet and three above 20 feet. Concrete dam 10 feet high, one third of a mile below gage, serves as control to stage of 15 feet. Above this stage control is probably river channel. Controls permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period of record, 9.65 feet at 7 a. m. April 26 (discharge, not determined); minimum stage, 0.74 foot, September 10 and 11 (discharge, 1.2 second-feet).

ICE.—None.

DIVERSIONS.—Railroad pumps about 100,000 gallons a day above dam and below gage.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 2,000 second-feet; extended to 2,800 second-feet. Discharges above 2,000 second-feet subject to error. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage heights to rating table. Records good.

Discharge measurements of North Bosque River near Clifton, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 16	1.74	264	May 15	1.39	88	July 30	1.00	4.0
Mar. 4	1.60	189	May 26	3.23	2,050	Sept. 6	.79	a 1.5
Apr. 8	1.67	224	May 27	2.18	557			

a Estimated.

Daily discharge, in second-feet, of North Bosque River near Clifton, Tex., for the year ending September 30, 1924

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	52	102	79	244	266	158	86	12	4.0	1.8
2	-------	47	93	71	211	266	137	102	12	3.9	1.7
3	-------	47	102	68	189	266	128	82	12	3.7	1.6
4	28	82	115	57	184	266	124	64	13	3.7	1.5
5	10	82	102	52	168	244	119	57	16	3.7	1.5
6	3.7	64	93	52	153	238	119	47	16	3.7	1.5
7	2.9	52	93	49	137	228	111	44	16	3.6	1.4
8	2.4	47	93	54	300	222	102	39	16	3.4	1.4
9	2.1	44	102	57	910	222	102	36	14	3.4	1.4
10	1.6	44	102	57	324	200	97	34	14	3.4	1.2
11	1.4	158	93	75	278	189	97	31	13	3.4	1.2
12	1.8	1,790	86	179	255	189	89	28	12	3.4	1.7
13	5.0	-------	82	153	-------	184	86	28	11	3.4	14
14	22	425	79	106	850	189	86	24	10	3.4	10
15	272	289	86	86	527	179	86	24	9.0	3.3	9.0
16	115	255	106	79	425	158	82	22	8.0	3.2	8.0
17	75	222	111	75	2,450	137	71	21	8.0	3.2	8.0
18	57	222	93	86	970	124	64	21	8.0	3.0	10
19	47	266	79	106	850	119	57	17	7.0	2.9	9
20	44	233	79	133	2,710	115	57	17	6.0	2.6	
21	44	233	75	102	660	111	57	17	6.0	2.3	
22	39	233	71	93	705	111	54	17	6.0	2.2	6.
23	39	211	750	93	850	106	57	17	5.0	2.0	4.
24	41	189	244	97	511	163	49	17	5.0	1.8	4.0
25	41	168	168	106	453	360	47	17	5.0	1.7	4.0
26	36	163	115	179	425	-------	1,410	16	5.0	1.6	4.0
27	36	163	93	366	399	439	460	14	5.0	1.8	4.0
28	39	158	93	286	373	255	179	14	5.0	2.2	3.7
29	34	137	93	289	800	211	111	13	4.0	2.3	3.4
30	57	133	89	-------	342	179	233	13	4.0	2.2	3.2
31	-------	119	82	-------	289	-------	115	-------	4.0	2.0	-------

NOTE.—Mean daily gage height, in feet, on days when discharge was beyond rating curve: Dec. 13, 4.10; Mar. 13, 4.34; Apr. 26, 5.75.

Monthly discharge of North Bosque River near Clifton, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
November 4–30	272	1.4	40.6	2,180
December		44		
January	750	71	121	7,470
February	386	49	117	6,710
March		137		
April		106		
May	1,410	47	153	9,410
June	102	13	32.6	1,940
July	16	4.0	9.26	569
August	4.0	1.6	2.92	179
September	14	1.2	4.57	272
The period				

SOUTH BOSQUE RIVER NEAR SPEEGLEVILLE, TEX.

LOCATION.—At highway bridge half a mile below mouth of Hog Creek, 2 miles south of Speegleville, McLennan County.

DRAINAGE AREA.—388 square miles (measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—March 24, 1924, to September 30, 1924.

GAGE.—Chain gage attached to upstream side of highway bridge; read by E. L. McLennan.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Channel straight 300 feet above and 750 feet below gage. Bed of sand and gravel; shifts. Right bank subject to overflow. Left bank lightly timbered, and not subject to overflow. Control is gravel riffle 500 feet below gage; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 17.7 feet at 8 a. m. May 26 (discharge, not determined); no flow for several days in August.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 3,100 second-feet and extended above. Gage read to hundredths twice daily. Daily discharge determined by shifting-control method. Records fair.

Discharge measurements of South Bosque River near Speegleville, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Mar. 24	5.91	448	June 20	4.39	31.8	Sept. 7	3.95	0.4
Apr. 18	5.05	108	July 20	4.00	3.2	Sept. 18	4.00	1.9
May 26	14.02	[a] 6,030	Aug. 18	3.96	.0			

[a] Velocity observed at 3 feet below the surface over most of the section and coefficient used to reduce to the mean velocity. This measurement of doubtful accuracy because of this and rapidly falling stage.

Daily discharge, in second-feet, of South Bosque River near Speegleville, Tex., for the year ending September 30, 1924

Day	Mar.	Apr.	May	June	July	Aug.	Sept.
1		225	83	204	14	1.3	0.3
2		218	79	171	14	1.1	.3
3		211	78	211	12	.9	.3
4		208	69	124	12	.7	.4
5		187	68	103	14	.7	.4
6		171	68	87	14	.5	.4
7		165	68	81	13	.5	.3
8		165	64	78	12	.3	.3
9		162	66	72	11	.3	.3
10		154	68	69	9.9	.2	.5
11		152	64	64	8.5	.2	.7
12		146	61	58	7.9	.1	1.9
13		138	60	55	7.0	.1	5.5
14		136	74	49	6.4	0	5.5
15		128	63	44	5.8	.1	2.8
16		124	56	41	4.6	0	1.9
17		116	50	39	3.7	0	1.9
18		107	46	34	3.4	0	2.1
19		101	46	31	3.1	0	1.9
20		94	43	29	3.1	0	1.9
21		88	44	33	3.1	0	1.3
22		88	43	43	2.5	0	1.3
23		88	42	36	2.3	.1	1.3
24	454	88	40	31	2.1	.1	1.3
25	416	92	39	28	1.9	.1	1.1
26	421	322	4,130	26	1.9	.1	1.5
27	379	110	294	22	1.7	.5	1.5
28	343	101	149	18	1.7	.3	1.5
29	358	96	1,350	17	1.5	.3	1.3
30	271	88	2,100	16	1.5	.2	1.3
31	225	-------	384	-------	1.3	.2	-------

Monthly discharge of South Bosque River near Speegleville, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March 24–31	454	225	358	5,690
April	322	88	142	8,470
May	4,130	39	319	19,600
June	211	16	63.8	3,800
July	14	1.3	6.48	398
August	1.3	0	.29	17.7
September	5.5	.3	1.43	85.3
The period				38,100

LEON RIVER NEAR BELTON, TEX.

LOCATION.—At intake of waterworks, 100 feet below bridge of Southwestern Traction Co., half a mile above city of Temple dam, 2 miles east of Belton, Bell County, 2 miles above mouth of Nolan Creek, and 7 miles below mouth of Cowhouse Creek.

DRAINAGE AREA.—3,550 square miles (measured on topographic maps and base map of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—October 1, 1923, to September 30, 1924.

GAGE.—Vertical staff on left bank, attached to pump intake masonry; read by W. I. Massey.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of silt and mud overlying decomposed rock. Banks composed of earth medium in height; subject to overflow at extremely high stages. Low-water control concrete and masonry dam, a quarter of a mile below gage; permanent. High-water control section of the channel near railroad bridge below dam.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.80 feet from noon to 1 p. m. May 26 (discharge not determined); minimum stage, 2.38 feet September 11 and 12 (discharge, 4.2 second-feet).

ICE.—None.

DIVERSIONS.—Several small pumping plants above; amount of water diverted not known.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 500 second-feet; poorly defined to 3,500 second-feet; extended above. Gage read to hundredths twice daily or oftener during floods. Daily discharge determined by applying mean daily gage height to rating table. Records fair.

Discharge measurements of Leon River near Belton, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 5	2.80	89.5	Apr. 11	3.42	517	Aug. 19	2.41	10.0
Dec. 11	3.41	616	May 27	4.85	1,780	Sept. 15	2.88	121
Dec. 13	5.80	3,570	June 26	2.74	116	Sept. 18	2.66	61.6

Daily discharge, in second-feet, of Leon River near Belton, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	44	1,270	82	163	228	782	972	2,720	3,790	53	12	5.0
2	44	736	82	163	228	736	924	1,640	2,100	53	12	5.0
3	59	1,120	29	134	228	736	829	924	1,760	47	12	5.0
4	29	1,420	68	117	228	736	782	690	1,320	47	10	5.0
5	97	1,760	59	97	228	736	736	553	782	47	10	5.0
6	134	1,320	59	82	215	644	736	491	644	47	10	5.0
7	167	1,120	59	82	196	598	690	571	598	47	10	5.0
8	294	1,020	59	82	196	535	635	626	544	47	10	5.0
9	97	830	59	82	196	1,320	690	447	482	41	10	5.0
10	56	464	397	82	196	924	626	397	456	41	8.6	5.0
11	47	286	571	82	196	736	571	380	397	41	8.6	4.2
12	44	215	2,980	82	380	924	553	309	333	35	8.6	4.2
13	44	196	4,070	82	243	1,220	535	301	309	29	8.6	129
14	44	163	1,530	82	228	1,270	517	388	272	29	8.6	1,020
15	44	152	1,120	82	228	1,170	482	482	228	29	6.8	157
16	317	134	1,530	134	228	1,320	482	414	202	29	6.8	157
17	301	106	1,420	228	228	1,530	464	309	152	29	6.8	82
18	228	286	1,760	228	317	1,120	447	690	140	26	6.8	47
19	106	598	2,220	228	571	1,020	414	690	112	23	6.8	38
20	500	626	2,470	196	535	1,320	380	571	97	23	6.8	22
21	482	1,020	1,870	163	422	1,420	372	364	87	23	6.8	18
22	535	782	1,120	163	372	1,640	372	301	87	20	6.8	14
23	380	422	829	163	348	2,600	372	243	87	20	6.8	14
24	228	196	736	598	340	2,220	364	228	87	17	5.0	12
25	163	176	571	447	340	2,340	364	228	87	17	5.0	12
26	163	152	553	286	508	2,720	1,870	4,070	78	17	5.0	12
27	97	117	508	228	1,760	2,600	1,220	1,980	78	17	5.0	12
28	97	82	397	228	1,270	1,870	1,420	736	68	14	5.0	10
29	82	82	340	228	1,020	1,530	2,600	414	59	14	5.0	10
30	196	82	243	228	-------	1,220	3,240	2,600	53	14	5.0	10
31	163	-------	228	228	-------	1,070	-------	2,720	-------	12	5.0	-------

Monthly discharge of Leon River near Belton, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	535	29	170	10,500
November	1,760	82	564	33,600
December	4,070	29	904	55,600
January	598	82	176	10,800
February	1,760	196	403	23,200
March	2,720	535	1,310	80,500
April	3,240	364	822	48,900
May	4,070	228	886	54,500
June	3,790	53	516	30,700
July	53	12	30.6	1,880
August	12	5.0	7.75	476
September	1,020	4.2	61.1	3,640
The year	4,070	4.2	488	354,000

LITTLE RIVER NEAR LITTLE RIVER, TEX.

LOCATION.—At Missouri, Kansas & Texas Railway bridge, 150 feet west of Bartlett-Temple highway, 2 miles south of Little River, Bell County, and 4½ miles below confluence of Leon and Lampasas Rivers.

DRAINAGE AREA.—5,250 square miles (measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—October 6, 1923, to September 30, 1924.

GAGE.—Chain gage attached to downstream guardrail of middle span of railroad bridge; read by W. A. Warnock.

DISCHARGE MEASUREMENTS.—Made from downstream side of railroad bridge, from highway bridge, or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of mud and silt, overlying decomposed rock; shifting. Right bank high and not overflowed except at extremely high stages; left bank subject to overflow. Channel straight for 250 feet above gage and 150 feet below. Control is a small island 150 feet below gage, which divides the stream at low stages into two channels; shifts.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 37.0 feet at 8 a. m. December 13 (discharge, 14,700 second-feet); minimum stage, 3.96 feet from 6.30 a. m. September 8 to 9 a. m. September 9 (discharge, 53 second-feet).

DIVERSIONS.—Several small diversion above station; amount diverted not known.

REGULATION.—Dam of Temple waterworks on Leon River may regulate flow at extremely low stages.

ACCURACY.—Stage-discharge relation not permanent. Rating curve fairly well defined. Gage read to hundredths twice daily or oftener during floods. Daily discharge determined by shifting-control method, or as noted in footnote to daily-discharge table. Records fair.

Discharge measurements of Little River near Little River, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 6	5.11	211	Dec. 14	21.25	*4,320	Sept. 15	12.89	1,810
Oct. 30	11.19	1,870	Jan. 5	7.10	622	Do	11.64	1,630
Do	16.01	5,120	Mar. 28	13.74	2,760	Sept. 21	4.59	122
Oct. 31	7.90	859	Apr. 11	8.76	1,060	Sept. 26	4.19	82
Dec. 11	10.29	1,480	June 27	5.32	267			
Dec. 13	35.69	12,800	Aug. 19	4.10	69			

* Discharge corrected for changing stage, 6,280 second-feet.

Daily discharge, in second-feet, of Little River near Little River, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	920	169	724			1,480	2,080	4,420	255	102	57
2	-------	1,140	187	696			1,340	1,870	5,170	266	96	57
3	-------	1,260	187	696			1,280	1,420	3,880	245	85	57
4	-------	1,630	276	646			1,260	1,090	3,310	225	79	56
5	-------	1,750	297	596		2,120	1,170	1,080	3,040	235	78	55
6	215	1,540	266	571			1,120	1,090	1,750	178	76	55
7	362	1,280	255	571			1,060	1,140	1,090	169	74	54
8	160	1,140	276	546			1,030	1,260	1,000	160	71	53
9	160	1,000	276	521	533	1,840	1,090	1,200	948	144	70	54
10	136	920	546	521		1,840	1,120	1,140	892	136	68	55
11	121	621	1,310	521		1,810	1,000	1,140	808	128	68	56
12	215	362	3,910	498		1,630	724	1,120	780	121	68	196
13	128	276	11,800	498		1,450	452	1,170	752	114	68	406
14		276	4,330	475		1,400	429	1,280	696	108	68	521
15		255	1,930	498		1,310	406	1,370	696	108	68	2,230
16		225	1,400	498		1,230	406	1,370	621	102	63	
17		215	1,400	475		1,480	362	1,310	475	102	68	
18		235	1,990	362		2,530	318	1,260	452	102	67	
19		318	2,800	245		2,710	297	1,230	384	102	65	
20		808	3,040	245		2,590	276	1,840	384	96	59	
21	238	1,000	3,340	235		2,200	255	2,170	297	96	57	
22		1,090	3,190	235		2,170	245	2,320	266	96	57	
23		724	2,650	318		2,110	225	2,290	266	90	57	290
24		406	2,050	1,090	1,850	2,050	255	2,230	318	88	57	
25		276	1,170	1,200		2,080	318	2,170	340	82	57	
26		266	1,120			1,960	1,660	3,430	318	121	58	
27		245	1,060			1,810	2,590	4,720	276	152	58	
28		225	1,000	945		2,560	2,620	4,180	245	144	57	
29	152	196	920			2,560	2,530	3,130	225	128	57	
30	2,410	178	864		-------	2,260	2,290	2,110	206	114	57	
31	1,140	-------	808		-------	1,930	-------	3,700	-------	108	57	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated. Owing to incomplete record, discharge partly estimated on Dec. 22, 29, Jan. 3, 12, 19, Mar. 15, Apr. 5, 19, May 10, 31, June 21, and 28. Discharge interpolated Jan. 4.

Monthly discharge of Little River near Little River, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 6–31	-------	-------	337	17,400
November	1,750	178	693	41,200
December	11,800	169	1,770	109,000
January	-------	235	618	38,000
February	-------	-------	1,080	62,000
March	-------	-------	2,020	124,000
April	2,620	225	987	58,700
May	4,720	1,030	1,900	117,000
June	5,170	206	1,140	68,000
July	266	82	139	8,560
August	102	57	67.4	4,150
September	-------	53	277	16,500
The period	-------	-------	915	665,000

LITTLE RIVER AT CAMERON, TEX.

LOCATION.—At McCowan Bridge at Cameron-Rockdale highway crossing, 1 mile above Gulf, Colorado & Santa Fe Railway bridge, 2 miles southeast of Cameron, and 6½ miles below mouth of San Gabriel River.

DRAINAGE AREA.—7,030 square miles (measured on topographic maps; base map of Texas, scale 1: 500,000; and United States Army progressive military map).

RECORDS AVAILABLE.—November 1, 1916, to September 30, 1924.

GAGE.—Chain gage attached to upstream handrail of bridge; read by Tracy Hobson.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of rock, boulders, sand, gravel, and clay; free from vegetation; fairly permanent. Banks of rock and gravel; subject to overflow at extremely high stages. Rock and gravel shoal 20 feet below gage serves as control for low and medium stages. During extremely high stages on Brazos River, backwater may reach gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 34.55 feet at 9.05 a. m. December 14 (discharge, 28,100 second-feet, determined from extension of rating curve and estimated flow in overflow channel); minimum stage, 3.70 feet September 9–12 (discharge, 120 second-feet).

1917–1924: Maximum stage recorded, 49.5 feet at 2.30 p. m. September 10, 1921 (discharge, 647,000 second-feet, determined by slope method, using value of 0.035 for "n" in Kutter's formula); minimum discharge, 2.6 second-feet at 7 a. m. September 3, 5, and 7, 1918.

ICE.—None.

DIVERSIONS.—Numerous small diversions are made for irrigation and municipal uses, but such diversions have little effect on flow at station, except during extremely low stages. Records of the Board of Water Engineers for State of Texas show that about 2,500 acres have been declared irrigated above station. No diversions of consequence below station. During time of low flow, water pumped by Cameron Power & Light Co. will affect flow at this station.

REGULATION.—Slight effect by pumping for city of Cameron.

ACCURACY.—Stage-discharge relation not permanent. Two rating curves used during year; both well defined below 11,500 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table, except as noted in footnote to daily-discharge table. Records for low and medium stages good; for high stages fair.

Discharge measurements of Little River at Cameron, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 29	6.98	1,100	Apr. 11	23.21	8,970	Aug. 15	4.05	181
Jan. 5	7.39	1,390	Apr. 12	13.86	4,220	Sept. 16	12.45	3,440
Mar. 28	14.16	4,040	Apr. 28	21.12	8,000	Sept. 17	6.88	1,170
Apr. 11	25.83	11,200	June 28	5.58	652			

Daily discharge, in second-feet, of Little River at Cameron, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	226	2,920	498	1,580	1,180	4,770	2,400	3,960	12,500	549	227	129
2	198	1,560	628	1,420	1,110	3,830	1,980	4,200	8,500	515	221	129
3	184	3,820	758	1,380	1,070	3,280	2,110	3,280	7,820	515	215	129
4	255	4,500	2,580	1,380	1,030	3,010	2,030	2,570	4,970	482	209	129
5	212	2,580	3,860	1,340	953	2,920	1,980	1,860	3,500	450	209	138
6	158	2,020	2,100	1,260	878	2,750	1,900	1,620	2,620	450	202	129
7	171	1,940	825	1,180	878	2,490	1,820	1,540	2,150	450	202	129
8	184	1,560	692	1,140	841	2,320	1,740	1,460	1,940	450	190	129
9	255	1,310	1,130	1,180	841	2,890	2,150	1,500	1,740	450	179	120
10	314	1,170	1,560	2,400	841	3,460	8,090	2,070	1,580	450	179	120
11	314	964	4,600	1,740	841	3,010	9,820	1,940	1,460	419	179	120
12	226	758	7,980	1,220	1,070	2,530	4,250	1,820	1,380	419	179	120
13	171	626	25,700	1,070	1,300	3,010	2,700	1,460	1,260	396	179	158
14	398	529	26,300	1,030	1,260	5,170	1,980	1,460	1,220	374	168	1,110
15	626	498	16,600	1,180	1,110	4,200	1,860	4,630	1,120	360	190	2,490
16	561	529	7,820	1,500	1,030	3,630	1,740	3,550	1,030	346	277	3,190
17	314	498	3,730	1,180	1,300	3,060	1,620	2,400	953	332	228	1,340
18	405	436	3,550	1,070	2,400	3,280	1,580	1,870	878	332	179	656
19	405	405	4,770	991	6,070	3,320	1,070	1,340	841	318	168	450
20	374	390	5,820	934	5,970	4,100	1,180	1,540	804	304	158	360
21	314	627	6,380	878	3,460	4,100	1,300	1,500	767	290	158	325
22	255	864	7,870	878	2,270	3,370	1,260	1,620	767	290	158	290
23	436	1,100	5,870	1,860	2,030	3,640	1,220	1,340	767	277	148	389
24	436	995	3,420	5,870	2,030	3,920	1,180	1,110	991	277	143	360
25	436	778	2,660	4,870	2,660	4,200	1,420	1,590	841	264	138	251
26	359	561	2,320	2,230	7,320	3,920	5,320	2,070	804	264	138	226
27	284	498	2,150	1,580	14,200	4,060	10,600	5,170	1,110	258	138	202
28	255	561	2,110	1,340	15,500	4,290	7,920	6,990	693	251	129	190
29	226	1,060	1,940	1,340	8,750	4,340	3,190	4,390	638	245	138	179
30	1,100	626	1,940	1,340	-------	3,590	3,190	2,840	584	239	129	158
31	4,850	-------	1,700	1,260	-------	2,840	--------	11,800	-------	233	129	-------

NOTE.—No record, Oct. 7, 14, 21, 28, Nov. 11, 21, 22, 25, Dec. 2, 9, Jan. 6, 20, Feb. 3, 10, Mar. 9, 16, 23, 30, Apl. 6, 20, May 4, 11, 18, June 8, 15, 22, 29, July 6, 13, 20, 27, July 29 to Aug. 3, Aug. 10, 17, 24, 31, Sept. 7, 21, and 28; discharge interpolated. Discharge estimated May 25. Discharge partly estimated Dec. 23, 30, Jan. 13, 27, Feb. 17, 24, Mar. 2, Apr. 13, June 1, and Sept. 14.

Monthly discharge of Little River at Cameron, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	4,850	158	481	29,600
November	4,500	390	1,220	72,800
December	26,300	498	5,160	317,000
January	5,870	878	1,600	98,400
February	15,500	841	3,110	179,000
March	5,170	2,320	3,530	217,000
April	10,600	1,070	3,020	180,000
May	11,800	1,110	2,790	172,000
June	12,500	584	2,210	131,000
July	549	233	363	22,300
August	277	129	177	10,900
September	3,190	120	461	27,500
The year	26,300	120	2,010	1,460,000

LAMPASAS RIVER AT YOUNGSPORT, TEX.

LOCATION.—Half a mile northeast of Youngsport, Bell County, and 22 miles above mouth of Lampasas River.

DRAINAGE AREA.—1,240 square miles (measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—February 5 to September 30, 1924.

GAGE.—Combined vertical and inclined staff in four section on left bank, 500 feet above steel highway bridge; read by J. R. McClintock.

DISCHARGE MEASUREMENTS.—Made from highway bridge below gage or by wading.

CHANNEL AND CONTROL.—Channel straight for half a mile above and below station. Bed of stream composed of rock; clean and permanent. Banks of rock and clay; subject to overflow at extreme stages. Control for low and medium stages rock shoal, 50 feet below gage; clean and permanent. Control for high stages indefinite.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 9.24 feet at 10 a. m. September 14 (discharge not determined); minimum stage, 2.67 feet at 7.30 p. m. August 25 and 6.15 p. m. September 10 (discharge, 4.6 second-feet).

ICE.—None.

DIVERSIONS.—Small amount diverted for municipal uses.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 2,000 second-feet; extended above. Gage read to hundredths twice daily or oftener during floods. Daily discharge determined by applying mean daily gage height to rating table. Records good.

Discharge measurements of Lampasas River at Youngsport, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Feb. 7	3.11	78.5	June 26	3.01	57.0	Sept. 14	5.04	1,310
Apr. 12	3.42	210	Aug. 19	2.70	5.6	Do	4.64	823
May 26	5.60	1,620	Sept. 14	5.44	1,770	Do	4.44	765
May 27	4.09	580						

Daily discharge, in second-feet, of Lampasas River at Youngsport, Tex., for the year ending September 30, 1924

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	------	495	254	137	782	35	7.1	6.4
2	------	470	249	137	445	33	6.7	6.7
3	------	445	239	129	346	30	6.4	6.4
4	------	420	239	125	297	28	6.4	6.0
5	85	395	235	121	263	28	6.4	5.6
6	81	370	220	129	239	28	6.4	5.6
7	78	346	211	113	220	26	6.0	5.3
8	85	370	206	106	206	28	6.0	5.3
9	85	470	322	146	187	24	5.6	5.0
10	85	370	268	215	173	24	5.6	5.0
11	99	346	230	187	151	19	5.6	5.0
12	146	346	211	146	129	19	5.3	38
13	125	420	192	129	113	17	5.3	102
14	109	395	183	1,600	106	16	11	2,730
15	99	370	173	820	92	16	15	287
16	106	346	183	287	85	15	9.6	92
17	102	370	164	192	78	16	8.9	60
18	268	370	146	164	68	13	8.2	47
19	346	395	129	137	62	11	6.4	42
20	278	395	129	121	62	9.6	7.1	30
21	259	370	121	113	62	8.9	6.4	40
22	249	370	121	106	60	9.6	6.4	38
23	259	395	113	99	73	8.2	5.6	33
24	249	346	287	99	78	8.2	5.0	26
25	268	346	183	99	73	8.9	5.0	19
26	395	322	820	3,130	57	8.2	5.0	16
27	580	297	420	900	57	8.2	12	13
28	610	297	230	370	55	28	11	11
29	550	297	173	239	47	26	8.9	11
30	------	287	160	1,220	42	19	7.1	9.6
31	------	273	------	1,220	------	12	6.7	------

Monthly discharge of Lampasas River at Youngsport, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
February 5–29	610	78	224	11,100
March	495	273	371	22,800
April	820	113	227	13,500
May	3,130	99	411	25,300
June	782	42	157	9,340
July	35	8.2	18.7	1,150
August	15	5.0	7.23	444
September	2,730	5.0	124	7,350
The period				91,000

SAN GABRIEL RIVER AT GEORGETOWN, TEX.

LOCATION.—One-fourth of a mile below confluence of North and South Forks of San Gabriel River, three-fourths of a mile below Georgetown-Belton Highway bridge, 1 mile northeast of Georgetown, Williamson County, and 1 mile above Missouri, Kansas & Texas Railway bridge.

DRAINAGE AREA.—414 square miles (measured on topographic maps and base maps of Texas, scale 1 : 500,000).

RECORDS AVAILABLE.—February 21 to September 30, 1924.

GAGE.—Inclined staff in three sections on right bank; read by Oscar Krieg.

DISCHARGE MEASUREMENTS.—Made from highway bridges, three-quarters of a mile above gage, or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of rock partly overlain with gravel and subject to slight change owing to aquatic growth. One channel at all stages; straight for a quarter of a mile above and 300 feet below gage. Banks of earth and rock; subject to overflow at medium and high stages. Control for low stages rock and gravel riffle, 10 feet downstream from gage; for medium stages remains of concrete road crossing a quarter of a mile downstream.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 12.1 feet about noon May 20 (discharge not determined); minimum stage, 2.05 feet at 6.20 p. m. September 20 (discharge, 17 second-feet).

ICE.—None.

DIVERSIONS.—Several small diversions above; amount not known.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 1,700 second-feet; extended above through one slope measurement made at a stage of 10.5 feet. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table using shifting-control method September 9–30. Records fair.

Discharge measurements of San Gabriel River at Georgetown, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Feb. 21	2.90	230	Apr. 10	3.42	464	Aug. 20	2.09	25
Feb. 27	3.68	545	May 28	2.80	164	Sept. 16	2.15	29
Apr. 8	2.80	166	June 2	3.77	636	Sept. 22	2.10	18
Apr. 9	10.50	[a] 7,580	June 26	2.59	119			

[a] Determined by slope method, using Kutter's formula.

Daily discharge, in second-feet, of San Gabriel River at Georgetown, Tex., for the year ending September 30, 1924

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		454	182	137	1,460	87	35	26
2		385	182	135	770	83	35	49
3		362	190	143	525	78	32	30
4		340	182	156	340	76	35	25
5		318	179	135	296	78	35	25
6		287	175	162	274	78	32	26
7		270	172	156	249	78	30	26
8		296	172	121	228	74	29	26
9		362	1,540	597	220	70	27	26
10		270	670	340	208	66	27	26
11		262	241	175	197	63	27	26
12		245	201	169	186	63	27	36
13		454	182	159	175	63	26	385
14		318	175	940	172	59	118	123
15		283	175	190	169	59	49	42
16		257	175	169	153	59	31	27
17		270	175	162	143	57	27	21
18		287	165	149	132	59	25	20
19		279	156	137	126	57	24	18
20		362	153	132	123	57	23	17
21	212	257	149	720	143	56	23	20
22		249	143	179	274	56	25	20
23		245	137	137	190	52	26	18
24		228	132	129	137	50	27	20
25		220	162	126	121	49	29	23
26		228	1,320	770	110	49	27	26
27	770	228	194	190	105	46	27	31
28	880	253	175	149	98	49	27	33
29	573	279	169	143	91	49	27	37
30		197	149	3,630	87	42	27	40
31		186		525		37	27	

NOTE.—No record Feb. 22-26.

Monthly discharge of San Gabriel River at Georgetown, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March	454	186	285	17,500
April	1,540	132	272	16,200
May	3,630	121	360	22,100
June	1,460	87	250	14,900
July	87	37	61.3	3,770
August	118	23	31.8	1,960
September	385	17	42.3	2,520
The period				79,000

SAN GABRIEL RIVER AT CIRCLEVILLE, TEX.

LOCATION.—At highway bridge on Meridian Highway between Taylor and Granger, half a mile southeast of Circleville, Williamson County, half a mile above Missouri, Kansas & Texas Railway bridge, and 15 miles below junction of North and South Forks of San Gabriel River.

DRAINAGE AREA.—602 square miles (measured on topographic maps and base maps of Texas, scale 1:500,000).

RECORDS AVAILABLE.—February 1 to September 30, 1924.

GAGE.—Chain gage attached to upstream rail of highway bridge; read by Willie Southall or W. A. Becker.

DISCHARGE MEASUREMENTS.—Made from highway bridge, railroad bridge, or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of mud and gravel; clean; shifting. One channel at all stages; winding above and below gage. Banks medium in height and gently sloping; covered with brush and light timber; and subject to overflow at extremely high stages. Control formed by gravel riffle, 100 feet below gage; shifts.

EXTREMES OF DISCHARGE.—Maximum stage recorded for period, 20.7 feet at 4.30 p. m. May 30 (discharge not determined); no flow September 5, 6, 8, and 11.

ICE.—None.

DIVERSIONS.—Several small diversions for municipal use above; amount not known.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 1,100 second-feet; extended above by means of velocity-area curves. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table, using shifting-control method March 18 to April 26. Records for low and medium stages good; for high stages poor.

Discharge measurements of San Gabriel River at Circleville, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Feb. 1	3.60	183	May 26	4.42	396	Aug. 20	2.74	42
Mar. 18	4.63	468	May 28	3.88	298	Sept. 16	2.94	65
Apr. 10	6.04	828	May 31	6.22	954	Sept. 22	2.88	60
Apr. 11	4.95	502	June 25	3.57	196	Sept. 26	2.74	37

Daily-discharge, in second-feet, of San Gabriel River at Circleville, Tex., for the year ending September 30, 1924

Day	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	189	369	224	212	1,280	102	47	0.4
2	178	514	212	200	1,240	99	49	.2
3	178	426	212	189	930	114	52	.2
4	167	397	224	178	455	127	48	.1
5	156	369	224	156	369	125	47	0
6	156	636	200	261	274	127	49	0
7	167	574	189	248	236	136	47	.2
8	}	397	189	236	274	127	49	0
9		426	636	341	236	127	49	.1
10		455	1,070	864	274	123	43	.2
11	} 167	426	455	798	224	113	39	0
12		514	369	765	224	95	37	13
13		605	328	574	224	102	35	49
14		397	287	2,120	212	99	102	300
15	}	369	274	964	167	94	123	146
16	167	397	261	397	178	86	63	106
17	167	484	248	355	167	80	49	63
18	1,380	831	212	236	178	77	44	39
19	930	1,420	200	236	189	74	37	26
20	514	1,380	200	224	178	80	37	23
21	397	897	189	605	167	74	20	22
22	397	700	189	341	156	71	13	39
23	397	328	189	224	146	63	8.8	37
24	605	300	189	212	167	60	7.0	33
25	574	287	236	212	156	55	6.4	22
26	544	274	2,120	831	156	50	4.0	33
27	514	248	605	484	146	63	3.4	24
28	455	261	328	236	146	62	1.6	21
29	397	369	287	397	156	57	1.3	17
30	------	274	248	9,300	146	52	.8	16
31	------	261	------	1,415	------	49	.4	------

NOTE.—Braced figures shows estimated mean discharge for period indicated.

Monthly discharge of San Gabriel River at Circleville, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
February	1,380	156	344	19,800
March	1,420	261	503	30,900
April	2,120	189	360	21,400
May	9,300	156	768	47,200
June	1,280	146	302	18,000
July	136	49	89.1	5,480
August	123	.4	35.9	2,210
September	300	0	34.3	2,040
The period				147,000

BRUSHY CREEK AT COUPLAND, TEX.

LOCATION.—At Missouri, Kansas & Texas Railway bridge, half a mile north of Coupland, Williamson County, and 32 miles above confluence with San Gabriel River.

DRAINAGE AREA.—198 square miles (measured on topographic maps and base map of Texas, scale 1 : 500,000).

RECORDS AVAILABLE.—May 27 to September 30, 1924.

GAGE.—Chain gage attached to downstream guardrail of railroad bridge; read by S. J. Clay.

DISCHARGE MEASUREMENTS.—Made from railroad bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of clay and silt and covered with a scattered growth of brush and willows; shifting. Channel winding above and below station. Banks covered with light timber and brush; subject to overflow at high stages. Control indefinite; will be affected by growth of brush and timber.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 12.12 feet at 8.10 a. m. June 3 (discharge, 548 second-feet), minimum stage, 2.94 feet at 8.07 a. m. September 6 (discharge, 1.6 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 100 second-feet; poorly defined to 1,000 second-feet. Gage read to hundredths once daily. Daily discharge determined by shifting-control method except as noted in footnote to daily-discharge table. Records poor.

Discharge measurements of Brushy Creek at Coupland, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
May 27	6.67	96	Sept. 22	6.35	88
June 25	5.56	64	Sept. 23	4.79	29
July 21	3.34	* 2.5			

* Estimated.

Daily discharge, in second-feet, of Brushy Creek at Coupland, Tex., for the year ending September 30, 1924

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		208	30	10	2.1	16		62	17	8.6	20
2		177	37	15	2.1	17		58	16	7.1	13
3		548	36	12	24	18		55	14	5.6	9.0
4		148	32	8.3	2.2	19		52	13	4.1	6.8
5		114	27	11	2.1	20		52	12	2.6	6.1
6		104	30	8.3	1.6	21		90	12	5.5	75
7		95	34	9.6	1.8	22		90	11	4.0	159
8		90	32	6.8	2.1	23		128	11	3.4	26
9		85	32	12	2.1	24		78	11	2.8	12
10		83	27	7.2	2.5	25		62	9.8	2.2	10
11		81	30	2.4	2.1	26		55	9.8	2.4	8.0
12		65	23	2.4	263	27	96	52	15	2.3	6.1
13		62	24	2.5	524	28	56	49	20	2.2	5.0
14		72	24	18	280	29	55	43	21	2.2	3.8
15		67	18	6.3	36	30	171	37	8.2	2.2	3.7
						31	239		12	2.2	

NOTE.—No record on June 1, 6, 8, 10, 15, 29, July 4, 6, 13, 20, 27, Aug. 3, 10, 17, 18, 19, 23, 24, 27, 29, 31, Sept. 7, 12, 14, 19, 21, 25, 26, 28; discharge interpolated. No record June 21 and 22; discharge estimated.

Monthly discharge of Brushy Creek at Coupland, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
May 27–31	239	55	123	1,220
June	548	37	98.7	5,880
July	37	8.2	20.9	1,290
August	18	2.2	6.17	379
September	524	1.6	50.4	3,000
The period				11,800

YEGUA CREEK NEAR SOMERVILLE, TEX.

LOCATION.—At Gulf, Colorado & Santa Fe Railway bridge, a quarter of a mile above Somerville-Brenham highway bridge, 2 miles south of Somerville, Burleson County, and 5 miles above mouth of Davidson Creek.

DRAINAGE AREA.—990 square miles (measured on topographic maps and base map of Texas, scale 1 : 500,000).

RECORDS AVAILABLE.—May 24 to September 30, 1924.

GAGE.—Chain gage attached to upstream side of railway bridge; read by L. Moser. Scale inverted so as to read the distance from the base of rail to water surface.

DISCHARGE MEASUREMENTS.—Made from upstream side of railway bridge.

CHANNEL AND CONTROL.—Bed of stream composed of sand and silt; shifts. Banks composed of sand and silt, covered with light timber and brush, with considerable swamp land above and below gage. One channel above bridge and several below. Control formed by channel below gage; subject to change owing to growth of brush in channel.

EXTREMES OF DISCHARGE.—Maximum stage recorded, −22.6 feet at 11 a. m. May 30 (discharge, 11,600 second-feet); dry, August 17–19, August 23 to September 20, and September 24–30.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined below 1,000 second-feet; well defined from 1,000 to 18,000 second-feet. Gage read to hundredths once daily. Daily discharge determined by applying daily gage height to rating table, except as noted in footnote to daily-discharge table. Records fair.

The following discharge measurements were made:

June 30, 1924: Gage height, −31.84 feet; discharge, 5.6 second-feet.

August 13, 1924: Gage height, −32.97 feet; discharge, 0 second-foot.

September 13, 1924: Gage height, −33.10 feet; discharge, 0 second-foot.

Daily discharge, in second-feet, of Yegua Creek near Somerville, Tex., for the period May 24 to September 30, 1924

Day	May	June	July	Aug.	Sept.	Day	May	June	July	Aug.	Sept.
1		3,210	4.4	0.4		16		11	1.4	0.1	
2		1,810	12	.4		17		10	1.4		
3		2,650	20	.4		18		9.5	1.4		
4		1,100	7.5	.3		19		8.0	1.0		
5		475	5.1	.3		20		7.5	1.0	.1	
6		315	4.4	.3		21		7.0	1.0	.1	0.1
7		202	3.8	.2		22		8.0	1.0	.1	.1
8		120	3.2	.2		23		8.8	.8		.1
9		38	2.6	.2		24	28	9.5	.7		
10		30	2.3	.2		25	95	8.8	.7		
11		25	2.3	.2		26	165	11	.5		
12		20	2.3	.2		27	565	9.0	.5		
13		17	2.0	.2		28	395	7.0	.5		
14		14	1.8	.2		29	290	6.0	.5		
15		12	1.6	.2		30	10,900	5.1	.5		
						31	8,200		.5		

NOTE.—Dry on days for which no discharge is given. No record, May 25, June 8, 11, 15, 17, 20, 23, 27, 29, July 2, 6, 8, 13, 20, Aug. 3, 10, 16, 21, Sept. 21, and 23; discharge interpolated.

Monthly discharge of Yegua Creek near Somerville, Tex., for the period May 24 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
May 24-31	10,900	28	2,580	40,900
June	3,210	5.1	339	20,200
July	20	.5	2.86	176
August	.4	0	.14	8.5
September	.1	0	.01	.6
The period				61,300

NAVASOTA RIVER NEAR EASTERLY, TEX.

LOCATION.—At International-Great Northern Railroad bridge, 3 miles below mouth of Steel Creek, and 6 miles northeast of Easterly, Robertson County.

DRAINAGE AREA.—949 square miles (measured on topographic maps; United States Army progressive military maps, and base maps of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—March 27 to September 30, 1924.

GAGE.—Vertical staff gage on right bank; read by Mack McCullough. Staff inverted so as to read the distance from the base of rail to water surface.

DISCHARGE MEASUREMENTS.—Made from downstream side of bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of sand and silt; shifting. Channel winding above and below gage. Banks of sand and earth; low; heavily wooded; and subject to overflow at stage of about −9 feet. Control formed by channel below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, −10.2 feet at 2 p. m., June 2 (discharge, 6,730 second-feet); dry, July 24 to September 12.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 7,000 second-feet. Gage read to hundredths once daily at irregular intervals; the work of the observer doubtful. Daily discharge determined by applying daily gage height to rating table, except as noted in footnote to daily-discharge table; shifting-control method used September 20–30. Records poor.

Discharge measurements of Navasota River near Easterly, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Mar. 20	−17.40	613	Apr. 17	−22.68	66	Aug. 15	−25.00	0
Mar. 27	−19.95	237	June 29	−24.31	10	Sept. 16	−20.80	179

Daily discharge, in second-feet, of Navasota River near Easterly, Tex., for the period March 27 to September 30, 1924

Day	Mar.	Apr.	May	June	July	Sept.	Day	Mar.	Apr.	May	June	July	Sept.
1		138	351	5,190	23		16		102	26	40	3	178
2		138	171	6,730	20		17		67	26	32	3	152
3		126	67	4,970	20		18		97	26	26	2	126
4		114	108	3,550	17		19		120	26	23	2	117
5		102	97	1,160	15		20		102	23	18	2	108
6		102	87	339	13		21		77	23	17	1	84
7		102	77	256	11		22		67	23	17	1	60
8		102	62	206	9		23		52	23	15	1	36
9		102	52	164	9		24		40	23	15		30
10		102	36	144	9		25		32	36	13		2
11		102	32	126	7		26		164	52	13		20
12		102	29	114	7		27	206	1,190	238	13		19
13		102	29	108	5	} 190	28	164	855	484	13		18
14		102	26	82	5		29	150	595	537	11		17
15		102	26	62	5	214	30	144	467	1,370	11		17
							31	138		3,550			

NOTE.—Braced figure shows estimated mean discharge for period indicated. Dry on days for which no discharge is given. Incomplete record, Mar. 30, Apr. 3, 4, 6, 7, 9, 11, 13, 15, 18, 24, 28, 30, May 2, 5, 6, 8, 12, 13, 16, 18, 20, 22, 23, 25, June 1, 3, 5, 8, 10, 12, 14, 15, 17, 19, 22, 23, 25, 27, July 2, 3, 5, 6, 8, 10, 13, 15, 17, 18, 20, 22, Sept. 17, 19, 21, 22, 24, 25, 27-29; discharge partly estimated.

Monthly discharge of Navasota River near Easterly, Tex., for the period March 27 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March 27-31	206	138	160	1,590
April	1,190	32	189	11,200
May	3,550	23	250	15,300
June	6,730	11	783	46,600
July	23	0	6.13	377
August	0	0	0	0
September	214	0	53.4	3,180
The period				78,200

COLORADO RIVER BASIN

COLORADO RIVER AT COLORADO, TEX.

LOCATION.—At lower steel highway bridge in town of Colorado, Mitchell County, 1¼ miles below Texas & Pacific Railway bridge.

DRAINAGE AREA.—4,280 square miles (measured on base map of Texas, scale 1 : 500,000).

RECORDS AVAILABLE.—November 28, 1923, to September 30, 1924.

GAGE.—Chain gage attached to upstream side of highway bridge; read by Ben S. Cooper or Paul Snively.

DISCHARGE MEASUREMENTS.—Made from bridge at gage or by wading.

CHANNEL AND CONTROL.—Channel straight for half a mile above and below gage. Bed of stream of sand and silt; clean; shifts. Banks of sandy clay; medium in height; covered with brush and light timber; subject to overflow at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 9.12 feet at 7.40 a. m. May 14 (discharge not determined); dry, during numerous periods.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 850 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table, using shifting-control method December 15 to February 5 and August 29 to September 11. Records prior to February 5 subject to error owing to poor gage-height record; records thereafter good for low and medium stages and fair for high stages.

Discharge measurements of Colorado River at Colorado, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 28	3.67	27	May 5	6.02	[b]748	June 24		0
Jan. 2	3.16	2.6	Do	5.94	[b]789	Sept. 4	3.24	1.7
Jan. 22	3.16	[a]2.6	May 6	4.51	163			

[a] Estimated.

[b] Corrected for changing stage.

Daily discharge, in second-feet, of Colorado River at Colorado, Tex., for the period November 28, 1923, to September 30, 1924

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		32	5.4	2.3	0.2		1.8	526			4.4
2		20	4.1	2.3	.2		.9	776			2.0
3		18	5.0	.1	.2		5.0	252			1.3
4		17	4.7	.1	.2		3.5	72			.6
5		9.0	4.7	.1	.1		126	31			1.1
6		7.7	4.7		.1		162	18			.2
7		7.2	4.7		.1		38	15			.1
8		7.2	4.7		.2		12	7.2			.1
9		6.4	4.7		.6		74	3.8			.1
10		6.4	4.7	.1	1.6		11	2.3			.1
11		6.4	4.1		.2		5.9	1.5		5.0	
12		6.4	4.1		.1		14	.2		.2	157
13		18	4.1	.1	.2		380	.1			86
14		70	3.5	.1	.2		2,700	.1			252
15		46	3.5	.1	.1	71	341				220
16		18	2.9	.2	.1	31	165			1.6	160
17		16	2.9	.1	.1	7.2	114			1.8	220
18		14	2.9	.1	.2	1.1	62				49
19		12	2.9	.1	.9	8.6	44		41		23
20		9.5	2.9	.1	.7	1.5	31		190		1.1
21		9.0	2.9	.1	.2		23		114		2.0
22		9.0	2.3	.1	.1	.1	18		62		1.5
23		9.0	2.3	.2	.2	.1	13		38		.9
24		8.8	2.3	.2	3.2	.1	14		2.0		.6
25		6.8	2.3	.2	.2	1,090	12		.2		.2
26		6.4	2.3	.2	.2	360	86		.2	1.5	.2
27		5.4	2.3	.2	.1	65	77		.1	.2	.2
28	30	5.4	2.3	.2	.1	29	62		.1	1,310	.2
29	24	5.4	2.3	.2	.1	12	49			77	.2
30	28	5.4	2.3			8.6	38			20	.2
31		5.4	2.3				20			11	

NOTE.—Dry on days for which no discharge is given. Braced figures show estimated mean discharge for periods indicated. Discharge partly estimated May 4, July 27, and Sept. 3.

Monthly discharge of Colorado River at Colorado, Tex., for the period November 28, 1923, to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
November 28-30	30	24	27.3	162
December	70	5.4	13.7	839
January	5.4	2.3	3.45	212
February	2.3		.28	16.1
March	3.2	0	.35	21.2
April	1,090	0	56.2	3,340
May	2,700	.9	152	9,330
June	776	0	56.8	3,380
July	190	0	14.4	888
August	1,310	0	46.1	2,830
September	252	0	39.5	2,350
The period				23,400

COLORADO RIVER NEAR ROBERT LEE, TEX.

LOCATION.—6 miles southwest of Bronte, 6 miles southeast of Robert Lee, Coke County, and 7 miles above former station near Bronte.

DRAINAGE AREA.—15,900 square miles (measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—October 23, 1923, to September 30, 1924. A station was maintained near Bronte, 7 miles below, from September 19, 1915, to September 30, 1920.

GAGE.—Vertical and inclined staff gage on right bank; read by Mrs. J. R. Smith.

DISCHARGE MEASUREMENTS.—Made by wading or from cable 20 feet below gage.

CHANNEL AND CONTROL.—Channel straight for a quarter of a mile above and below gage. Bed composed of ledge rock overlain in places with gravel and silt; fairly permanent. Banks medium in height; subject to overflow. Control consists of rock and gravel shoal, a quarter of a mile below gage; clean and permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 11.51 feet at 6.30 a. m. April 25 (discharge not determined); dry, July 1–4, 7, and August 27.

ICE.—None.

DIVERSIONS.—Records of the Board of Water Engineers for the State of Texas show that about 1,700 acres have been declared irrigated in the area above the station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Curve well defined below 5,000 second-feet. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records good.

Discharge measurements of Colorado River near Robert Lee, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 23	1.66	60	Jan. 1	1.19	12	May 8	2.34	242
Nov. 30	1.40	28	Apr. 9	.83	a.5	Sept. 1	2.45	266

a Estimated.

Daily discharge, in second-feet, of Colorado River near Robert Lee, Tex., for the period October 23, 1923, to September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		128	33	12	5.2	5.6	0.5	59	62			277
2		2,180	71	12	4.4	6.0	.4	43	1,100			128
3		834	62	12	4.4	5.2	.4	31	918			65
4		512	60	11	4.8	3.6	.4	26	446			45
5		284	38	11	2.8	2.8	.4	24	225	0.1		31
6		150	48	10	2.4	2.4	.5	45	82	.2		18
7		110	48	9.0	2.8	2.4	.5	464	31			167
8		85	33	8.4	2.4	2.0	.5	211	75			3.6
9		65	30	8.4	2.8	2.0	.4	139	53			2.4
10		59	33	7.8	2.8	2.0	.4	116	40			1.8
11		53	32	8.4	3.2	1.4	.4	250	31			1.2
12		56	48	7.2	4.0	1.6	.3	82	24			54
13		198	38	6.0	4.0	4.4	3.2	1,900	11			2,240
14		60	29	6.0	3.6	4.4	1.7	2,980	11			455
15		2,680	24	6.0	4.0	4.4	2.0	3,030	10			198
16		1,090	24	6.0	4.0	2.8	1.4	618	5.2			182
17		464	65	6.6	4.4	3.6	.5	247	3.2			2,220
18		254	62	6.0	3.6	3.2	.4	202	2.0			788
19		147	52	2.4	3.6	7.2	.3	116	2.0			300
20		110	43	2.0	4.4	6.6	.2	76	1.7			179
21		91	36	4.8	3.6	4.4	.2	65	1.4			71
22		65	37	5.2	3.6	4.4	.2	50	1.4			48
23	62	59	29	6.0	3.6	3.2	.1	41	1.1			40
24	53	53	24	6.0	3.6	2.8	.4	36	.8			43
25	50	56	24	6.0	3.6	2.0	2,680	29	.3			46
26	48	39	23	5.2	6.0	2.0	1,800	737	.4			34
27	40	31	18	5.2	6.0	1.8	676	1,120	.3			28
28	99	46	17	5.2	6.0	3.6	284	300	.2		59	19
29	62	33	17	5.6	6.0	3.6	142	97	.1		1,170	15
30	110	36	13	5.6		1.8	82	126	.1		269	9.6
31	71		14	5.2		1.2		78			349	

NOTE.—Dry on days for which no discharge is given. Discharge interpolated June 23.

Monthly discharge of Colorado River near Robert Lee, Tex., for the period October 23, 1923, to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 23–31	110	40	66.1	1,180
November	2,680	31	334	19,900
December	71	13	36.3	2,230
January	12	2.0	7.04	433
February	6.0	2.4	3.99	229
March	7.2	1.2	3.37	207
April	2,680	.1	189	11,300
May	3,030	24	430	26,500
June	1,100	.1	105	6,230
July	.2	0	.01	.6
August	1,170	0	59.6	3,660
September	2,240	1.2	257	15,300
The period				87,200

COLORADO RIVER AT BALLINGER, TEX.

LOCATION.—Half a mile below Hutchins Avenue highway bridge, two-thirds of a mile below Gulf, Colorado & Santa Fe Railway bridge at Ballinger, Runnels County, and half a mile above mouth of Elm Creek. Prior to December 18, 1922, station was located at Hutchins Avenue highway bridge, half a mile upstream.

DRAINAGE AREA.—16,800 square miles (revised; measured on topographic map and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—December 11, 1915, to September 30, 1924. Records of stage have been obtained at Hutchins Avenue gage by United States Weather Bureau since July 1, 1903; current-meter measurements were begun May 29, 1915.

GAGE.—Staff gage on right bank, installed December 19, 1922; read by Lennis Brown.

DISCHARGE MEASUREMENTS.—Made from downstream side of bridge or by wading.

CHANNEL AND CONTROL.—Banks consist of clay and gravel; wooded; medium in height; subject to overflow at extremely high stages. Bed composed of hard clay, sand, gravel, and rock; shifting. Control is rock shoal, one-third of a mile below gage; permanent.

ICE.—None reported.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 19.93 feet at 9 p. m. April 25 (discharge, 15,600 second-feet); minimum stage, 1.00 foot August 20–24 (discharge, 0.50 second-foot).

1916–1924: Maximum discharge, 28,000 second-feet during night of April 26, 1922; no flow during several periods.

DIVERSIONS.—During low stages a large part of the flow is diverted a few miles above the station for irrigation. Records of the Board of Water Engineers for the State of Texas show that about 6,900 acres have been declared irrigated above the station.

REGULATION.—Negligible.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined below 1,000 second-feet; poorly defined to 14,000 second-feet; extended above. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records for low and medium stages good; for high stages fair.

Discharge measurements of Colorado River at Ballinger, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 18	3.51	960	Feb. 16	1.43	22	Apr. 25	18.04	13,800
Nov. 22	1.95	132	Mar. 5	1.42	18	Apr. 26	3.28	834
Dec. 20	1.82	90	Apr. 10	1.34	8.9	June 19	1.34	12

Daily discharge, in second-feet, of Colorado River at Ballinger, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	1,030	66	38	24	26	13	135	128	1.8	0.7	327
2	3.2	2,000	64	35	24	24	13	89	643	1.2	.7	279
3	2.6	1,420	98	35	21	22	12	64	1,490	1.0	.6	143
4	45	865	83	36	21	21	12	52	765	1.4	.7	73
5	39	560	76	34	18	20	12	52	427	1.9	.7	45
6	24	376	61	31	17	19	12	7,430	279	1.8	2.0	28
7	15	251	61	31	17	17	13	1,030	199	1.8	1.4	21
8	9.8	199	64	31	18	17	12	480	120	1.3	.9	21
9	5.6	128	57	31	18	17	12	964	83	1.6	.8	13
10	3.2	101	61	32	19	15	12	352	64	1.2	.7	8.9
11	2.0	98	69	31	21	14	12	166	50	1.0	.8	6.8
12	1.6	73	81	29	26	15	12	182	39	1.0	.8	21
13	298	98	73	29	29	17	21	643	31	.9		2,460
14	1,490	1,030	92	28	26	16	13	7,810	31	.8		1,030
15	6,140	1,490	76	28	22	17	15	4,750	24	.9	.7	427
16	5,260	1,630	61	28	21	24	15	1,490	19	.9		251
17	1,560	964	57	29	20	22	14	964	19	.9	.7	132
18	1,030	480	76	28	19	21	12	402	15	.8	.6	1,780
19	587	327	104	28	17	34	11	256	12	.9	.7	376
20	376	224	89	28	19	29	11	170	9.8	.9	.5	289
21	376	166	81	24	19	26	11	120	9.8	.8	.5	132
22	190	128	73	24	18	24	8.0	95	8.0	.8	.5	73
23	132	101	61	26	19	24	8.9	73	8.0	.8	.5	52
24	78	92	57	28	18	22	8.0	59	6.8	.7	.5	38
25	83	71	54	27	21	21	7,620	56	4.4	.7	.6	22
26	107	61	50	26	28	19	3,820	1,350	2.0	.6	.8	49
27	73	49	49	26	31	17	1,030	2,000	3.2	.6	.8	32
28	78	56	47	25	31	17	587	798	2.6	.6	964	36
29	427	54	44	24	28	15	327	427	2.0	.6	95	25
30	150	54	44	26	-------	13	212	765	2.0	.6	765	17
31	220	-------	41	24	-------	13	---------	216	--------	.6	352	-------

Monthly discharge of Colorado River at Ballinger, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	6,140	1.6	607	37,300
November	2,000	49	473	28,100
December	104	41	66.8	4,110
January	38	24	29.0	1,790
February	31	17	21.7	1,250
March	34	13	19.9	1,230
April	7,620	8.0	463	27,600
May	7,810	52	1,080	66,300
June	1,490	2.0	150	8,920
July	1.9	.6	1.01	62.3
August	964	.5	70.8	4,360
September	2,460	6.8	274	16,300
The year	7,810	.5	272	197,000

COLORADO RIVER NEAR MILBURN, TEX.

LOCATION.—At steel highway bridge on Brady-Brownwood highway, 1½ miles northwest of Milburn, McCulloch County.

DRAINAGE AREA.—24,600 square miles (measured on topographic maps and base maps of Texas, scale 1:500,000).

RECORDS AVAILABLE.—November 20, 1923, to September 30, 1924.

GAGE.—Chain gage attached to upstream side of bridge; read by J. W. McBride.

DISCHARGE MEASUREMENTS.—Made from highway bridge. Measuring conditions at low stages poor.

CHANNEL AND CONTROL.—Channel straight for half a mile above and a quarter of a mile below station. Bed composed of gravel and silt; free from vegetation; shifts. Banks of clay, sparsely covered with trees; high; subject to overflow at extremely high stages. Control rock shoal, a quarter of a mile below gage; clean and permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 25.03 feet at 6.10 a. m. April 27 (discharge, 35,000 second-feet); minimum stage, 3.08 feet at 7.30 a. m. August 10 (discharge, 5.9 second-feet).

ICE.—None.

DIVERSIONS.—About 18,000 acres have been declared irrigated above station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve fairly well defined from 40 to 50,000 second-feet. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table using shifting-control method June 5 to August 30. Records fair for discharges above 40 second-feet; poor for others.

Discharge measurements of Colorado River near Milburn, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 20	5.88	520	Apr. 11	4.69	116	May 17	7.82	2,280
Dec. 18	5.60	450	Apr. 28	7.82	1,920	June 20	4.59	81
Jan. 11	4.90	183	Apr. 29	6.60	1,250	Sept. 29	4.70	126
Mar. 8	4.84	153	May 16	10.51	4,860			

Daily discharge, in second-feet, of Colorado River near Milburn, Tex., for the year ending September 30, 1924

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		269	235	143	235	162	464	2,040	25	7.3	486
2		269	235	140	235	151	382	1,220	24	6.9	625
3		305	219	145	235	135	324	2,040	22	6.8	464
4		324	203	148	219	135	443	2,040	20	6.6	382
5		287	185	135	194	135	235	1,140	19	6.5	287
6		269	173	131	188	133	269	760	19	6.3	219
7		269	176	117	176	121	6,810	552	19	6.3	162
8		252	173	108	156	119	1,020	422	20	6.3	100
9		235	167	113	151	123	2,640	348	19	6.1	80
10		219	167	104	143	121	2,140	287	18	16	
11		676	179	108	135	117	1,060	252	17	36	60
12		1,390	176	113	131	113	507	235	16	23	74
13		3,400	176	121	324	167	422	235	16	20	133
14		1,140	173	133	235	252	5,040		15	26	1,140
15		576	167	131	191	162	14,000	186	14	22	1,300
16		486	167	135	182	140	5,970		12	18	676
17		464	162	135	219	138	1,850	138	12	16	486
18		422	159	145	203	121	825	68	12	15	1,310
19		402	156	156	362	102	576	68	11	14	2,140
20	530	382	156	143	732	86	1,220	78	11	13	703

Daily discharge, in second-feet, of Colorado River near Milburn, Tex., for the year ending September 30, 1924—Continued

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
21	464	362	153	135	464	79	1,300	74	11	12	443
22	382	343	153	135	443	73	507	68	9.7	11	343
23	305	269	156	138	382	68	305	67	9.5	9.8	269
24	269	140	153	131	305	64	235	58	9.1	9.4	173
25	252	117	151	138	269	2,040	219	46	8.8	8.9	159
26	235	67	156	179	252	15,400	5,690	39	8.8	8.6	269
27	219	91	176	203	235	16,000	8,910	37	8.7	8.6	167
28	197	96	170	235	235	1,940	4,190	35	8.3	8.6	156
29	235	252	162	235	219	975	1,480	30	8.1	9.4	131
30	269	252	145	-------	197	650	4,190	28	8.1	8.8	117
31	-------	235	145	-------	176	-------	4,550	-------	8.0	203	-------

NOTE.—Discharge interpolated June 27 and estimated June 14–16, Sept. 9, 10, and 18.

Monthly discharge of Colorado River near Milburn, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
November 20–30	530	197	305	6,660
December	3,400	67	460	28,300
January	235	145	172	10,600
February	235	104	143	8,200
March	732	131	252	15,500
April	16,000	64	1,330	79,400
May	14,000	219	2,510	154,000
June	2,040	28	432	25,700
July	25	8.0	14.2	871
August	203	6.1	18.6	1,140
September	2,140	60	438	26,100
The period	----------	----------	----------	356,000

COLORADO RIVER NEAR TOW, TEX.

LOCATION.—At highway bridge 1¼ miles northeast of Tow, Llano County, 2 miles below mouth of Fall Creek and 6 miles northwest of Bluffton.

DRAINAGE AREA.—31,100 square miles (measured on topographic maps and and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—October 26, 1923, to September 30, 1924.

GAGE.—Chain gage attached to the upstream handrail of the bridge; read by W. A. Farris.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Channel straight for 2 miles above and half a mile below gage. Bed of stream of rock partly overlain with gravel and silt; fairly permanent. Banks rock; high; subject to overflow only at extremely high stages. Control is rock ledge and boulder shoal, one-eighth of a mile below gage; clean and permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 14.26 feet at 1.40 p. m. April 28 (discharge, 17,400 second-feet); minimum stage, 5.26 feet from 7.15 p. m. August 11 to 8.30 a. m. August 12 (discharge, 44 second-feet).

ICE.—None.

DIVERSIONS.—Numerous small diversions in drainage above; amount not known.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined from 100 to 20,000 second-feet; extended below. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records good.

Discharge measurements of Colorado River near Tow, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 26	6.55	603	Apr. 27	11.27	8,440	Apr. 30	8.02	2,130
Dec. 15	10.16	5,740	Apr. 28	14.07	16,700	July 18	5.69	115
Mar. 12	6.48	519	Apr. 29	9.35	4,040	Sept. 26	6.58	617

Daily discharge, in second-feet, of Colorado River near Tow, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		2,640	618	738	510	738	738	1,480	8,180	175	72	545
2		8,180	618	696	510	738	696	1,160	4,580	151	71	618
3		13,600	696	657	476	738	657	912	3,880	145	63	304
4		7,660	912	657	444	696	618	779	6,220	115	57	545
5		4,400	958	618	444	657	582	657	3,230	142	57	866
6		2,640	1,010	510	476	657	545	779	2,640	145	60	618
7		2,100	866	582	444	582	510	696	1,600	139	71	444
8		1,600	822	582	476	696	510	3,230	1,320	151	64	350
9		1,320	779	582	444	582	545	2,500	1,100	139	58	261
10		1,050	779	582	476	545	510	2,360	912	132	56	261
11		912	866	545	411	545	476	3,550	822	129	48	239
12		779	779	510	411	545	374	2,230	696	136	46	220
13		779	5,360	545	444	545	444	1,430	545	132	66	476
14		822	9,800	582	444	510	444	2,100	545	139	86	5,360
15		4,050	5,780	582	411	958	657	8,710	510	113	101	1,370
16		3,710	2,500	545	444	958	657	16,100	476	126	81	2,230
17		2,360	1,840	545	476	738	582	10,400	374	120	85	1,480
18		3,390	1,600	545	476	618	393	3,550	333	118	88	1,130
19		2,230	1,430	582	476	1,840	444	1,970	344	110	67	822
20		1,720	1,320	510	510	1,430	411	1,490	310	96	79	779
21		1,320	1,210	510	510	4,960	399	1,370	327	96	74	1,970
22		1,100	1,100	510	510	3,880	387	4,770	310	88	67	1,010
23		958	1,100	545	510	1,970	399	1,600	299	92	66	866
24		912	1,100	545	444	1,720	362	1,100	282	88	72	476
25		696	958	510	510	1,320	368	738	266	71	69	738
26	582	657	912	822	510	1,160	3,080	912	229	75	60	510
27	660	657	912	510	582	1,010	8,180	10,100	234	72	69	405
28	738	618	866	510	738	912	16,400	11,200	229	72	94	405
29	582	582	822	510	738	822	4,770	10,900	229	74	108	411
30	6,220	582	738	510		779	2,100	4,050	201	69	86	510
31	11,200		779	476		779		7,920		69	545	

Monthly discharge of Colorado River near Tow, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 26–31	11,200	582	3,330	39,600
November	13,600	582	2,470	147,000
December	9,800	618	1,610	98,800
January	822	476	569	35,000
February	738	411	492	28,300
March	4,960	510	1,120	68,700
April	16,400	362	1,570	93,700
May	16,100	657	3,890	239,000
June	8,180	201	1,370	81,800
July	175	69	114	6,980
August	545	46	86.6	5,330
September	5,360	220	875	52,100
The period				896,000

COLORADO RIVER AT MARBLE FALLS, TEX.

LOCATION.—At steel highway bridge a quarter of a mile south of Marble Falls, Burnet County, and 10 miles below mouth of Sandy Creek.

DRAINAGE AREA.—36,100 square miles (revised, measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—October 1, 1916, to September 30, 1924. Miscellaneous discharge measurements were made in 1902. Records of stage have been obtained by the United States Weather Bureau since January 1, 1908.

GAGE.—Chain gage on upstream side of bridge; read by M. M. Galloway.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading. Measuring conditions poor.

CHANNEL AND CONTROL.—Bed composed of solid rock. Banks composed of rock, gravel, and clay; wooded; high; and not subject to overflow. Rapids just below gage serve as fairly permanent control, except at times when sand and gravel collect.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 15.25 feet at 5.30 p. m. October 30 (discharge not determined); minimum stage, 0.94 foot at 6.55 a. m. August 12 (discharge, 107 second-feet).

1900–1924: Maximum stage,[1] 23.9 feet April 7, 1900 (discharge not determined); no flow August 7, 8, 11–25, 1918, caused by storing water above gage.

ICE.—None.

DIVERSIONS.—Several large projects have been proposed in the drainage basin above station, but none has been developed. Numerous small diversions for irrigation and municipal uses are made above station, total amount diverted not known. Records of the Board of Water Engineers for the State of Texas show that approximately 36,000 acres have been declared irrigated by diversions above station. Little water is diverted between Marble Falls and Austin.

REGULATION.—None of importance except possibly during extremely low stages.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 6,000 second-feet and poorly defined above owing to the inability to read the gage accurately on account of surge and inaccuracies in measurements on account of high velocities and submerged drift. Gage read to hundredths twice daily, although the influence of wind on long gage chain and surge of water at high stages probably introduce some error. Daily discharge above 6,000 second-feet not of sufficient accuracy for publication. Daily discharge for period published determined by applying mean daily gage heights to rating table. Records for low stages fair.

Discharge above 6,000 second-feet, as published in previous reports, is subject to large error and should be used with caution.

The following discharge measurements were made:

November 15, 1923: Gage height, 4.11 feet; discharge, 2,910 second-feet.
December 11, 1923: Gage height, 3.98 feet; discharge, 2,980 second-feet.
March 10, 1924: Gage height, 3.08 feet; discharge, 1,190 second-feet.

[1] United States Weather Bureau, Daily river stages.

Daily discharge, in second-feet, of Colorado River at Marble Falls, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	585	-------	1,570	1,800	1,180	2,050	1,430	2,800	-------	413	158	195
2	522	-------	1,800	1,800	1,180	1,880	1,430	2,230	-------	344	158	195
3	522	-------	2,050	1,720	1,000	1,720	1,360	1,880	-------	344	158	208
4	465	-------	3,930	1,640	946	1,720	1,300	1,960	-------	324	158	286
5	465	-------	3,010	1,640	946	1,640	1,240	1,500	-------	344	148	688
6	465	-------	2,600	1,570	946	1,570	1,180	1,640	5,020	324	148	1,060
7	762	5,320	2,410	1,570	946	1,500	1,180	1,570	3,680	324	148	805
8	522	4,460	2,140	1,500	946	1,430	1,120	1,300	2,800	304	137	618
9	465	3,450	1,960	1,500	946	1,800	1,880	-------	2,320	304	137	552
10	762	3,010	1,640	1,430	946	1,430	2,600	5,620	1,960	324	137	438
11	653	2,600	3,010	1,430	1,000	1,300	1,640	5,320	1,720	304	137	388
12	725	2,410	4,190	1,430	1,060	1,430	1,430	4,190	1,570	286	128	388
13	653	2,320	-------	1,360	1,060	1,360	1,360	2,230	1,360	286	137	725
14	762	2,410	-------	1,360	1,060	1,430	1,360	2,410	1,240	252	158	5,020
15	897	3,220	-------	1,360	1,000	1,360	1,360	5,620	1,120	222	137	4,190
16	3,680	-------	-------	1,360	946	2,140	1,360	-------	1,000	236	128	1,800
17	-------	4,460	4,460	1,360	946	1,720	1,500	-------	946	236	170	2,600
18	-------	4,190	3,930	1,360	1,570	1,800	1,240	-------	848	236	148	1,960
19	-------	4,740	3,680	1,300	1,800	1,640	1,060	3,680	762	222	148	1,500
20	4,190	3,450	3,220	1,300	1,800	3,010	1,000	2,600	725	222	158	1,180
21	2,800	2,800	3,010	1,240	1,570	3,450	946	3,010	725	195	158	1,800
22	2,320	2,600	3,010	1,240	1,300	-------	946	4,740	762	195	137	2,140
23	1,800	2,140	2,800	1,360	1,240	4,190	946	3,680	897	195	128	1,430
24	1,430	1,960	2,600	1,570	1,240	3,220	946	2,230	762	182	128	1,180
25	1,300	1,880	2,410	1,570	2,140	2,600	946	1,570	653	182	137	1,120
26	1,240	2,140	2,410	1,360	1,960	2,230	2,320	1,880	585	195	128	1,060
27	1,240	1,570	2,320	1,300	2,600	2,050	-------	-------	522	195	137	897
28	1,240	1,640	2,230	1,300	2,410	1,880	-------	-------	465	182	137	688
29	1,430	1,720	2,140	1,240	2,230	1,640	-------	-------	438	170	158	585
30	-------	1,640	2,050	1,240	-------	1,570	4,190	-------	1,300	158	170	618
31	-------	-------	1,960	1,240	-------	1,500	-------	-------	-------	158	208	-------

NOTE.—Discharge above 6,000 second-feet not published. The following are the approximate mean daily stages, in feet, for the days for which discharge was not applied: Oct. 17, 5.54; Oct. 18, 7.04; Oct. 19, 6.34; Oct. 30, 10.52; Oct. 31, 10.98; Nov. 1, 8.46; Nov. 2, 12.18; Nov. 3, 11.38; Nov. 4, 8.92; Nov. 5, 6.94; Nov. 6, 5.61; Nov. 16, 6.00; Dec. 13, 7.75; Dec. 14, 6.78; Dec. 15, 7.22; Dec. 16, 5.18; Mar. 22, 5.72; Apr. 27, 7.57; Apr. 28, 7.93; Apr. 29, 7.42; May 9, 6.17; May 16, 8.07; May 17, 8.46; May 18, 5.74; May 27, 5.48; May 28; 7.06; May 29, 8.31; May 30, 6.39; May 31, 6.21; June 1, 7.44; June 2, 6.88; June 3, 6.69; June 4, 6.34; June 5, 5.34.

Monthly discharge of Colorado River at Marble Falls, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
January	1,800	1,240	1,430	88,200
February	2,600	946	1,340	77,200
June 5-30	5,020	438	1,370	67,800
July	413	158	253	15,600
August	208	128	147	9,050
September	5,020	195	1,210	72,000

COLORADO RIVER AT AUSTIN, TEX.

LOCATION.—At Congress Avenue concrete viaduct in Austin, Travis County, half a mile below Shoal Creek and above mouth of Waller Creek, 1 mile below mouth of Barton Creek, and 3½ miles below Austin Dam.

DRAINAGE AREA.—38,200 square miles (revised, measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—February 15, 1898, to September 30, 1924.

GAGE.—A continuous water-stage recorder, installed March 1, 1923, on downstream side of pier of viaduct.

DISCHARGE MEASUREMENTS.—Made by wading or from upstream side of Montopolis highway bridge, 4 miles below gage.

CHANNEL AND CONTROL.—Channel straight for 1,000 feet above and 500 feet below gage. Right bank composed of clay and gravel, is fairly clean, of medium height, and subject to overflow; left bank resembles right bank except that it is high, clean, and nearly vertical in places. Bed composed of rock, gravel, and sand; clean; shifts. Control is gravel shoal, 500 feet below gage; shifts.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 13.6 feet at 11.30 a. m. November 3 (discharge, 53,000 second-feet); minimum stage 0.18 foot at 9 p. m. August 30 (discharge, 185 second-feet).

1898–1924: Maximum stage recorded, 33.5 feet a few minutes after the failure of the dam, which occurred at 11.30 a. m. April 7, 1900 (discharge, 236,000 second-feet, determined from extension of rating curve and subject to considerable error). At the time of failure the depth of water over the crest of the dam was 11.07 feet, with a computed discharge of 151,000 second-feet. According to information obtained from people living near Congress Avenue Bridge, the water rose 6.1 feet as a result of the failure of the dam. Therefore, the gage height corresponding to a discharge of 151,000 second-feet was 27.4 feet. According to a statement by Mr. W. P. Johnson, who was in charge of the power plant at the dam, the flood appeared to be practically at its crest when the dam failed. Minimum discharge 2.2 second-feet at 6 p. m. August 18, 1918.

ICE.—None.

DIVERSIONS.—Records of the Board of Water Engineers for the State of Texas show that approximately 36,000 acres of land have been declared irrigated by diversions above the station. Most of the area irrigated is in the upper basin of the main stream and adjacent to large tributaries. Little water is diverted between Austin and Columbus.

REGULATION.—Flow entirely regulated at times by operation at the Austin Dam, about 3½ miles upstream. Sluice gates, crest gates, and power plant at the dam were not in operation during the years ending September 30, 1919–1924. Capacity of reservoir about 24,000 acre-feet.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined. Operation of water-stage recorder satisfactory. Daily discharge determined by applying to rating table mean daily gage height obtained from recorder graph by inspection, or by use of planimeter, or by averaging discharge for fractional parts of a day; shifting-control method used October 1–9 and February 29 to September 11. Records good.

From recent information it is believed that the discharge as published in Water-Supply Papers 408 and 548 for December 13–26, 1914, and February 9–17, 1915, is too low. Discharge on those days probably exceeded 20 second-feet.

Discharge measurements of Colorado River, at Austin, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 9	1.05	834	Jan. 16	1.62	2,000	May 19	3.70	8,300
Oct. 24	1.76	2,210	Feb. 4	1.48	1,540	May 31	5.50	15,400
Nov. 7	3.59	8,610	Mar. 7	2.04	2,480	June 26	1.48	1,310
Dec. 5	2.42	4,010	Apr. 4	1.72	2,130	July 14	.80	491
Dec. 27	2.28	3,650	Apr. 22	1.50	1,280	Aug. 5	.46	289

Daily discharge, in second-feet, of Colorado River at Austin, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	990	23,800	1,820	2,830	1,710	4,270	2,270	5,530	10,600	667	286	230
2	885	26,000	1,820	2,720	1,670	3,750	2,170	3,300	16,800	636	270	276
3	807	48,000	1,820	2,570	1,690	3,330	2,170	2,670	16,800	607	256	281
4	744	32,000	2,290	2,490	1,580	3,100	2,120	2,340	11,700	588	286	276
5	711	18,000	3,690	2,340	1,460	2,910	2,070	2,100	9,650	578	281	281
6	645	11,700	4,470	2,290	1,420	2,720	2,030	2,000	8,320	542	261	314
7	616	8,130	3,630	2,270	1,400	2,440	1,940	1,870	5,900	524	256	412
8	667	6,260	3,160	2,170	1,380	2,340	1,890	1,730	4,820	533	238	744
9	846	4,990	2,910	2,150	1,360	2,390	2,030	1,750	3,750	524	234	820
10	733	4,230	2,800	2,190	1,360	2,460	4,990	8,890	3,100	524	238	689
11	607	3,660	2,850	2,100	1,400	2,150	7,000	6,450	2,640	499	234	598
12	768	3,240	5,350	2,100	1,420	2,150	3,910	4,470	2,360	490	234	578
13	6,500	2,960	13,300	1,980	1,460	2,150	2,750	4,640	2,150	474	222	900
14	3,910	2,850	16,800	1,910	1,460	2,150	2,390	4,040	1,940	490	211	4,640
15	2,190	2,800	13,700	1,910	1,400	2,150	2,120	3,630	1,670	465	204	2,700
16	1,400	3,210	13,300	1,840	1,400	2,150	2,070	4,300	1,520	412	211	4,640
17	1,820	6,820	8,890	1,840	1,500	2,150	1,890	12,100	1,420	412	225	2,960
18	6,450	5,710	6,640	1,820	1,940	2,150	1,840	15,200	1,240	384	222	2,240
19	12,500	4,640	5,900	1,820	2,670	2,150	1,710	8,890	1,140	370	200	2,240
20	9,650	4,820	5,530	1,710	3,420	2,640	1,560	4,820	1,100	377	200	1,870
21	4,990	4,100	5,170	1,640	3,040	2,150	1,380	3,360	1,000	377	225	1,780
22	3,380	3,420	4,640	1,620	2,670	3,600	1,280	3,130	1,690	370	225	2,700
23	2,670	2,940	4,470	1,730	2,520	4,560	1,240	3,420	1,560	351	218	3,100
24	2,150	2,590	4,230	1,940	2,360	5,530	1,190	4,640	1,620	351	214	2,070
25	1,840	2,360	3,970	2,050	2,720	4,640	1,320	3,070	1,910	358	214	1,580
26	1,620	2,190	3,750	2,170	3,180	3,660	1,480	2,460	1,340	325	211	1,240
27	1,440	2,050	3,630	2,050	4,040	3,360	2,290	2,150	990	303	200	1,120
28	1,360	2,320	3,440	1,870	5,170	2,800	7,940	3,690	872	308	204	1,020
29	1,380	2,070	3,360	1,820	4,820	3,070	14,400	11,000	794	308	200	900
30	2,570	1,820	3,210	1,750	-------	2,800	12,100	15,600	733	303	197	768
31	38,100	-------	3,020	1,730	-------	2,540	-------	14,400	-------	303	204	-------

NOTE.—Record of stage from the United States Weather Bureau gage used Nov. 29, Dec. 4, and Mar. 11–29. Record incomplete and discharge partly estimated Dec. 5 and Mar. 31. Discharge interpolated Nov. 29, Dec. 2, Mar. 23 and 30.

Monthly discharge of Colorado River at Austin, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	38,100	607	3,710	228,000
November	48,000	1,820	8,320	495,000
December	16,800	1,820	5,280	324,000
January	2,830	1,620	2,050	126,000
February	5,170	1,360	2,190	126,000
March	5,530	2,150	2,920	179,000
April	14,400	1,190	3,180	190,000
May	15,600	1,730	5,410	333,000
June	16,800	733	4,040	240,000
July	667	303	444	27,300
August	286	197	228	14,000
September	4,640	230	1,470	87,200
The year	48,000	197	3,260	2,370,000

EVAPORATION NEAR AUSTIN, TEX.

LOCATION.—At reservoir on Hill ranch, 1,000 feet from ranch house, 5 miles southeast of Austin, Travis County. Elevation, 475 feet above sea level.

RECORDS AVAILABLE.—April 1, 1916, to September 30, 1924.

EQUIPMENT.—Two evaporation pans; one floating on surface of reservoir about 30 feet wide by 250 feet long, which is supplied by spring; and the other on land about 30 feet from reservoir. Auxiliary equipment consists of hook

gage, rain gage, anemometer, maximum and minimum thermometers and psychrometer.

ACCURACY.—Moss and weed growth in reservoir may at times affect results. Records from land pan more accurate than that from floating pan. Observations made daily at 8 a. m. Observer's work good.

COOPERATION.—Computations made by United States Weather Bureau.

Evaporation near Austin, Tex., for the year ending September 30, 1924

Month	Temperature (°F)					Mean relative humidity (per cent)	Wind		Rainfall (inches)	Evaporation (inches)	
	Air		Water				Average velocity (miles per hour)	Prevailing direction		Floating pan	Land pan
	Mean maximum	Mean minimum	Mean	Floating pan (mean)	Land pan						
October	76.5	56.3	66.4	66.6	61.9	86.0	1.7	NE.	7.16	e 3.411	e 4.178
November	65.5	46.3	55.9	56.6	51.2	86.2	1.8	SW.	4.33	e 1.961	e 2.176
December	58.7	45.4	52.0	53.5	51.3	92.0	2.4	SW.	6.00	e 1.070	e 1.977
January	54.4	31.1	42.8	45.0c	42.8b	95.2i	3.0	NE.	2.56	e 1.809	e 1.948
February	60.4	39.7	50.0	50.4a	45.1	87.9	4.2	SW.	3.53	e 2.326	e 2.873
March	65.4	43.2	54.3	55.1	49.9	83.6	3.4	E.	2.28	2.859	4.219
April	77.6	55.4	66.5	63.8	60.6	85.8	2.5	S.	4.21	e 3.708	e 5.254
May	80.6	60.4	70.5	67.1	66.5	85.0	1.8	SW.	4.71	e 3.346	6.464
June	92.1	71.5	81.8	74.4	76.6	77.4	1.3	S.	3.84	e 3.430	e 7.501
July	94.1	71.2	82.6	75.4	73.9	80.7	1.3	S.	2.69	e 4.854	8.605
August	98.2	73.3	85.8	78.1	77.9	79.4	1.1	S.	0.40	5.074	9.022
September	88.5	63.9	76.2	72.5	70.0	75.8	1.2	SE.	3.34	e 4.016	6.082
The year	76.0	54.8	65.4	63.2	60.6	84.6	2.1	S.+SW.	45.05	37.864	60.299

e Estimated.

NOTE.—Letters following figures indicate number of days missing—a, 1 day; b, 2 days; etc.

COLORADO RIVER AT COLUMBUS, TEX.

LOCATION.—At county highway bridge, half a block from county jail and 400 feet below Galveston, Harrisburg & San Antonio Railway bridge, in eastern edge of Columbus, Colorado County.

DRAINAGE AREA.—40,800 square miles (revised, measured on topographic maps; base map of Texas, scale 1 : 500,000; and United States Army progressive military maps).

RECORDS AVAILABLE.—January 1, 1903, to December 31, 1911; May 22, 1916, to September 30, 1924.

GAGE.—Gurley graph water-stage recorder inspected by E. J. Frnka.

DISCHARGE MEASUREMENTS.—Made from upstream side of bridge or by wading.

CHANNEL AND CONTROL.—Channel straight for 400 feet above and below station. Right bank composed of firm earth, high, and not subject to overflow. Left bank of medium height and is overflowed above a gage height of 34 feet. Bed of stream clean and sandy; shifts. A sand and gravel section, 350 feet below gage, may serve as low-water control. Stage-discharge relation, during medium and high stages, may be controlled by a bend in river below bridge.

EXTREMES OF DISCHARGE.—Maximum stage during year from recorder graph, 27.05 feet at 11 p. m. November 4 (discharge, 42,000 second-feet); minimum discharge, 302 second-feet August 23–25.

1903–1911; 1916–1924: Maximum stage from water-stage recorder, 38.3 feet May 5, 1922 (discharge, 79,500 second-feet, determined from extension of rating curve and subject to error); minimum stage, 4.2 feet September 9 and 10, 1910 (discharge, 10 second-feet).

ICE.—None.

DIVERSIONS.—Considerable water is diverted for irrigation in the drainage basin above Austin, but between Austin and Columbus little water is diverted. The station is above the irrigated rice belt which comprises several thousand acres. Records for the Board of Water Engineers for the State of Texas show that about 36,000 acres have been declared irrigated above Austin.

REGULATION.—Flow at Columbus during low stages partly controlled by storage at Lake Austin.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined. Operation of water-stage recorder not satisfactory owing to improper attendance. Mean daily gage heights determined from recorder graph by inspection or by use of planimeter, or from graph drawn from United States Weather Bureau gage heights as noted in footnote to daily-discharge table. Daily discharge determined by shifting-control method. Records fair.

COOPERATION.—Record of gage heights for numerous short periods furnished by United States Weather Bureau as noted in footnote to daily-discharge table.

Discharge measurements of Colorado River at Columbus, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 28	9.20	2,160	Apr. 15	13.05	6,930	July 2	8.44	1,670
Dec. 1	10.32	3,850	May 2	14.83	10,500	Aug. 11	6.55	321
Jan. 10	9.91	2,820	May 29	11.22	4,040	Sept. 12	6.76	600
Feb. 12	8.90	2,000	May 31	19.60	22,300			
Mar. 20	11.68	5,020	June 1	17.64	17,200			

Daily discharge, in second-feet, of Colorado River at Columbus, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
										d		
1	1,930	4,800	4,030	4,030	2,800	6,700	3,550	12,900	17,300	1,710	400	320
2	1,710	31,600	13,300	3,670	2,600	6,400	2,900	10,200	15,000	1,670	427	316
3	1,520	28,600	8,630	3,220	2,500	5,950	2,700	7,360	17,300	1,710	414	313
4	1,900	38,800	9,480	3,550	2,360	5,360	2,500	6,100	19,400	1,560	404	313
5	1,370	37,300	11,800	3,220	2,230	5,080	2,460	4,540	14,600	1,300	400	313
6	1,160	24,900	8,750	3,110	2,180	4,670	2,360	4,150	12,700	1,200	400	344
7	1,060	15,800	5,500	3,000	2,100	4,410	2,320	3,670	11,400	1,120	380	372
8	992	12,000	5,360	2,900	2,010	4,150	2,230	3,670	10,200	1,060	364	388
9	928	9,290	5,220	2,800	1,970	3,910	2,230	3,910	8,210	1,020	344	388
10	862	7,530	5,350	2,800	2,010	3,670	6,420	6,100	7,190	992	328	396
11	830	6,400	7,940	2,800	1,970	3,670	6,250	4,150	6,250	960	320	414
12	830	5,650	11,400	3,220	1,970	3,550	5,080	6,700	5,360	895	320	595
13	960	4,940	27,200	2,900	2,010	3,790	11,600	7,190	4,670	895	320	895
14	928	4,670	30,000	2,600	2,140	5,220	17,100	7,530	4,150	862	324	928
15	895	7,700	17,500	2,700	2,100	5,650	7,190	10,600	3,910	740	324	928
16	5,950	6,400	14,600	3,550	2,010	4,540	4,670	8,570	3,440	740	320	1,090
17	4,030	4,670	13,900	2,700	2,010	3,670	3,550	5,650	3,110	740	324	3,220
18	3,910	3,910	13,300	2,500	15,100	3,670	3,000	4,800	2,900	740	320	3,110
19	2,800	3,910	14,800	2,360	19,500	3,670	2,800	10,900	2,600	698	310	4,150
20	3,320	6,550	18,000	2,230	9,860	4,940	2,550	11,300	2,410	650	310	3,220
21	8,210	5,360	18,200	2,140	6,100	4,670	2,460	8,040	2,360	617	310	2,550
22	7,190	5,080	16,000	2,100	4,940	4,410	2,360	6,100	2,500	585	310	2,460
23	5,080	4,940	10,200	4,760	5,250	4,030	2,230	5,080	2,500	575	302	2,280
24	4,150	4,280	7,360	13,100	8,040	4,670	2,100	4,150	2,650	555	302	2,900
25	3,440	3,790	6,250	6,700	9,890	5,950	1,970	3,910	4,030	540	302	3,110
26	3,000	3,440	5,800	5,080	28,300	6,700	5,720	4,540	2,700	525	306	3,110
27	2,550	3,220	5,500	4,150	26,600	5,220	16,900	5,220	2,500	515	313	2,500
28	2,180	3,000	5,220	3,440	14,800	4,540	9,110	7,360	2,600	495	316	2,050
29	2,010	4,280	4,940	3,220	6,860	4,030	5,080	4,690	2,140	465	320	1,780
30	1,820	5,080	4,670	3,000	-------	5,080	7,100	12,800	1,860	440	313	1,560
31	1,740	-------	4,280	2,800	-------	5,650	-------	27,000	-------	418	313	-------

NOTE.—Daily gage heights obtained from graph drawn from United States Weather Bureau gage readings of one reading to tenths daily on the following days: Oct. 16, Nov. 1–3, Dec. 6–9, 17–21, Jan. 26 to Feb. 1, Feb. 28, 29, Mar. 1, Apr. 12–15, May 5–10, June 15–17, 27, 28, July 2–4, 19, Aug. 19–22, 26–29, and Sept. 19.

Monthly discharge of Colorado River at Columbus, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	8,210	830	2,560	157,000
November	38,800	3,000	10,300	611,000
December	30,000	4,030	10,800	663,000
January	13,100	2,100	3,560	219,000
February	28,300	1,970	6,630	381,000
March	6,700	3,550	4,760	293,000
April	17,100	1,970	4,950	295,000
May	27,000	3,670	7,380	454,000
June	19,400	1,860	6,600	393,000
July	1,710	418	871	53,500
August	427	302	337	20,700
September	4,150	313	1,540	91,900
The year	38,800	302	5,000	3,630,000

COLORADO RIVER AT WHARTON, TEX.

LOCATION.—At highway bridge in western edge of Wharton, Wharton County, 200 feet below Galveston, Harrisburg & San Antonio Railway bridge.

DRAINAGE AREA.—41,200 square miles (measured on topographic maps; base map of Texas, scale 1:500,000; and United States Army progressive military map).

RECORDS AVAILABLE.—July 12 to August 31, 1916; July 3 to August 18, 1917; July 11 to August 4, 1918; and March 19, 1919, to September 30, 1924.

GAGE.—Gurley graph water-stage recorder attached to pier of highway bridge near left bank, installed March 19, 1919.

DISCHARGE MEASUREMENTS.—Made from highway or railway bridge.

CHANNEL AND CONTROL.—Channel straight above and below station for a few hundred feet. Bed composed of sand and clay; shifting. Banks medium in height, composed of clay, and subject to overflow during extremely high stages. At a gage height of 34 feet, water enters a channel above station known as Caney Creek and flows thence to Gulf of Mexico. The Colorado River raft, several miles below station, probably serves as control for all stages.

EXTREMES OF DISCHARGE.—Maximum stage from water-stage recorder, 27.45 feet, 10 p. m. November 5 (discharge, 32,800 second-feet); minimum stage, 8.30 feet at 4 p. m. September 2 (discharge, 203 second-feet).

1916–1924: Maximum stage recorded during period of record, 40.7 feet from 9 a. m. to 6 p. m. May 6, 1922 (discharge not determined); minimum stage, 4.35 feet at 12.46 p. m. August 27, 1921 (discharge, 45 second-feet ascertained from extension of rating curve and subject to error).

ICE.—None.

DIVERSIONS.—Station is in area of rice irrigation, roughly estimated to cover about 75,000 acres, about one-third of which is irrigated by diversions from Colorado River between Columbus and Wharton, and the remaining two-thirds by diversions below Wharton. During periods of maximum demands, practically the entire flow is diverted, unless the river is above ordinary stage.

REGULATION.—Flow at low and medium stages is regulated to some extent by storage in Lake Austin at Austin, Tex.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined from 300 to 17,500 second-feet; fairly well defined to 26,000 second-feet; extended above. Operation of water-stage recorder not satisfactory, owing to improper attendance. Mean daily gage height determined from recorder graph by inspection or by use of planimeter. Daily discharge determined by shifting-control method except as noted in footnote to daily-discharge table Stage-discharge relation affected by backwater from the "raft." Records for low and medium stages fair; for high stages poor.

Discharge measurements of Colorado River at Wharton, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 25	11.90	3,820	Apr. 15	17.62	10,800	June 2	19.89	16,200
Nov. 27	11.85	3,440	Apr. 16	15.26	6,810	June 3	19.30	14,100
Jan. 9	12.11	2,970	May 2	18.64	13,300	July 1	11.04	1,810
Feb. 11	10.97	2,120	May 3	16.98	9,000	Aug. 12	8.71	305
Mar. 23	13.42	4,500	May 28	14.28	5,310	Sept. 13	9.00	576

Daily discharge, in second-feet, of Colorado River at Wharton, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,840	1,900	4,660	4,400	2,940	8,480	5,310	9,500	20,500	1,870	544	274
2	2,540	13,000	5,600	4,200	2,840	7,660	3,820	13,500	16,300	1,630	555	244
3	2,360	25,000	9,000	3,900	2,800	7,180	3,260	8,820	14,700	1,550	555	324
4	2,180	27,700	12,000	3,500	2,600	6,420	2,940	6,420	17,600	1,630	550	398
5	2,040	31,800	10,000	3,370	2,500	5,710	2,840	4,920	17,400	1,590	588	363
6	1,910	30,800	10,000	3,200	2,400	5,310	2,740	4,060	13,100	1,470	622	383
7	1,830	21,000	8,400	3,200	2,300	4,920	2,640	3,700	11,800	1,320	634	478
8	1,750	17,600	5,180	3,000	2,200	4,660	2,640	3,370	10,700	1,240	676	533
9	1,670	11,600	5,200	2,940	2,180	4,420	2,540	3,480	9,330	1,200	664	555
10	1,590	9,330	5,200	2,840	2,140	4,180	3,150	3,700	7,500	1,130	429	506
11	1,510	7,660	5,200	2,840	2,090	4,060	8,650	5,990	6,570	1,100	358	516
12	1,430	6,420	7,000	2,740	2,040	3,940	6,570	4,300	5,570	1,100	315	560
13	1,240	5,570	18,000	2,940	2,040	4,060	4,920	6,870	4,790	1,060	287	577
14	1,240	4,790	27,000	2,840	2,090	4,660	11,800	7,180	4,180	1,020	270	706
15	1,360	5,710	23,400	2,640	2,140	5,440	12,600	9,330	3,820	990	248	920
16	1,830	7,340	17,600	2,740	2,180	5,710	6,570	11,800	3,480	955	240	990
17	2,710	5,850	14,200	3,260	2,090	4,920	4,540	8,310	3,150	920	274	1,060
18	3,590	4,420	13,800	2,740	2,270	4,180	3,590	5,570	2,840	888	393	1,830
19	3,480	3,940	13,400	2,450	19,600	4,060	3,150	5,440	2,640	888	456	2,640
20	3,480	4,920	16,400	2,360	15,500	4,420	3,040	12,400	2,540	855	467	3,260
21	4,300	5,990	19,000	2,270	8,990	5,310	2,840	10,900	2,940	766	462	3,040
22	9,160	5,050	22,600	2,270	5,850	4,790	2,640	7,980	3,150	700	445	2,540
23	7,500	4,790	17,000	2,640	4,920	4,420	2,540	6,270	2,940	694	450	2,360
24	5,050	4,660	11,000	12,800	7,660	4,180	2,640	5,050	2,740	664	440	2,270
25	3,940	4,000	8,480	11,800	8,480	4,540	2,450	4,420	2,740	634	363	2,540
26	3,370	3,590	6,870	7,500	19,800	5,710	2,270	4,180	3,590	652	296	2,940
27	2,940	3,480	6,270	5,310	28,600	6,420	10,900	4,660	2,840	670	252	2,940
28	2,500	3,200	5,710	3,940	22,300	5,310	16,300	5,440	2,360	652	236	2,450
29	2,300	3,000	5,310	3,370	12,900	4,540	8,480	6,870	2,450	572	236	2,140
30	2,100	4,000	5,000	3,260	-------	4,180	5,310	4,060	2,180	566	236	1,910
31	2,000	-------	4,700	3,040	-------	4,790	-------	20,000	-------	533	305	-------

NOTE.—Owing to incomplete record, discharge estimated Oct. 28 to Nov. 2, Nov. 25, 28–30, Dec. 2–7, 9–14, 17–21, 23–24, 30–31, Jan. 1–4, 6–8, and Feb. 3–8. Discharge partly estimated Oct. 1–6, 14–16, 18–21, Nov. 10–17, 24, Jan. 9, Feb. 2 and 9. Discharge interpolated, Oct. 17.

Monthly discharge of Colorado River at Wharton, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	9,160	1,240	2,830	174,000
November	31,800	1,900	9,600	571,000
December	27,000	4,660	11,100	681,000
January	12,800	2,270	3,880	239,000
February	28,600	2,040	6,770	390,000
March	8,480	3,940	5,120	315,000
April	16,300	2,270	5,120	305,000
May	20,000	3,370	7,050	433,000
June	20,500	2,180	6,880	409,000
July	1,870	533	1,020	62,500
August	676	236	414	25,500
September	3,260	244	1,410	83,800
The year	31,800	236	5,080	3,690,000

DEEP CREEK NEAR SNYDER, TEX.

LOCATION.—1¼ miles southeast of Snyder, Scurry County, and 16 miles above confluence with Colorado River.

DRAINAGE AREA.—120 square miles (measured on base map of Texas, scale 1 : 500,000).

RECORDS AVAILABLE.—November 23, 1923, to September 30, 1924.

GAGE.—Vertical staff on left bank; read by M. F. Davis.

DISCHARGE MEASUREMENTS.—Made from upstream side of highway bridge 0.2 mile upstream or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of sand and gravel; shifts. Channel above gage congested with brush and débris, fairly clear below. Banks covered with light timber and brush; medium in height; subject to overflow. One channel at all stages; winding above gage, straight for 1,000 feet below. Low and medium stage control formed by rock shoal 700 feet below gage. High-stage control indefinite.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 13.9 feet at 5 p. m. April 24 (discharge, 2,760 second-feet, determined from rating curve extended through two slope measurements); dry, for numerous periods.

ICE.—None.

DIVERSIONS.—Negligible.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 2 second-feet, extended above by two slope measurements. Discharge above 2 second-feet subject to considerable error. Gage read to hundredths once daily. Daily discharge determined by applying daily gage height to rating table. Records poor.

Discharge measurements of Deep Creek near Snyder, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 24	1.54	[a] 0.6	Apr. 24	13.90	[b] 2,760	June 24	1.14	0
Jan. 3	1.45	[a] .05	May 6	1.68	2.0	Sept. 4		0

[a] Estimated. [b] Determined by slope method using Kutter's formula.

Daily discharge, in second-feet, of Deep Creek near Snyder, Tex., for the period November 23, 1923, to September 30, 1924

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
1		1.3	0.2	0.1	0.1	0.4	0.8	15	
2		.2	.2	.1	.1	.5	1.0	.8	
3		.2	.1	.1	.1	.2	.8	.2	
4		.2	.1	.2	.1	.1	.2		
5		.1	.1		.1	.1	44	.1	
6		.1	.1		.1	.1	2.8	.1	
7		.1	.1	.1	.1	.1	.4	.1	
8		.2	.1	.2	.1	.1	.2	.1	
9		.2	.2	.2	.1	.1	1.5	.1	
10		1.0	.2	.2	.1	.1	.1	.1	7.5
11		.3	.2	.2		.1	.2		.5
12		.7	.2	.2	.2	.1	.1		
13		.5	.2	.2	.2	82	9.2		
14		.2	.4	.1	.1	12	316		
15		.2	.7	.1	.1	2.0	7.5		
16		.4	.4	.1	.2	.8	2.3		
17		.2	.5	.2	.1	.2	.7		
18		.5	.5	.1	.1	.1	.2		
19		.5	.5	.1	.2	.1	.2		
20		.5	.5	.1	.1	.1	.1		
21		.7	.5	.1	.1	.1	.2		
22		.5	.6	.1	.1	.1	.2		
23	0.4	.7	.5	.1	.1	.1	.1		
24	.5	.4	.7	.2	.1	256	.1		
25	.7	.5	.7	.2	.1	72	.2		
26	.5	.7	.7	.2	.1	4.8	44		
27	1.4	.7	.7	.1	.1	.8	2.3		
28	1.6	.7	.8	.1	.1	.8	.9		
29	1.3	.5	.2	.1	.2	.6	.2		
30	1.0	.5	.2		.7	.6	.2		
31		.2	.2		.4		.2		

NOTE.—Dry on days for which no discharge is given.

Monthly discharge of Deep Creek near Snyder, Tex., for the period November 23, 1923, to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
November 23-30	1.6	0.4	0.92	14.7
December	1.3	.1	.44	27.2
January	.8	.1	.36	22.4
February	.2	0	.13	7.5
March	.7	0	.14	8.7
April	256	.1	14.5	863
May	316	.1	14.1	867
June	15	0	.55	32.9
July	7.5	0	.26	15.9
The period				1,860

NORTH CONCHO RIVER NEAR CARLSBAD, TEX.

LOCATION.—Just above State Sanitarium dam, 1½ miles below mouth of Live Oak Creek, and 2 miles above Carlsbad, Tom Green County.

DRAINAGE AREA.—1,530 square miles (measured on base map of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—March 27 to September 30, 1924.

GAGE.—Vertical staff on left bank near State pump station, just above dam; read by T. E. Heskew.

DISCHARGE MEASUREMENTS.—Made from cable 200 feet above gage or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of rock, overlain in places with gravel and silt. Channel straight for 600 feet above and 400 feet below gage. Banks of medium height; covered with brush and trees; subject to overflow at extremely high stages. At about gage height of 12.5 feet water runs over crest of banks on both sides of the stream into draws which do not drain back into the river but form lakes. Control is composed of concrete dam just below gage; permanent. There is a notch in the crest of the dam as a part of a fish ladder and during very dry periods this notch is closed. Point of zero flow, with notch open, 1.67 feet, and with notch closed, 2.21 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 10.6 feet at 10 a. m. April 25 (discharge, 15,600 second-feet, determined from extension of rating curve); no flow June 20 to August 28.

ICE.—None.

DIVERSIONS.—Several pumps in the drainage above which are reported to have a combined capacity of 40 second-feet; amount of water actually diverted not known, but flow materially affected at low stages.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined below 3,000 second-feet; extended above, through one discharge measurement made by the slope method using Kutter's formula at a stage of 14.45 feet and discharge of 35,800 second-feet. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table except as noted in footnote to daily-discharge table. Records poor.

The following discharge measurements were made:

March 27, 1924: Gage height, 2.24 feet; discharge, 5.0 second-feet.

August 29, 1924: Gage height, 6.26 feet; discharge, 2,970 second-feet (made by timing drift and coefficient used to reduce surface to mean velocity).

Daily discharge, in second-feet, of North Concho River near Carlsbad, Tex., for the period March 27 to September 30, 1924

Day	Mar.	Apr.	May	June	Aug.	Sept.	Day	Mar.	Apr.	May	June	Aug.	Sept.
1		5.9	5.0	9.3		9.3	16		1.8	17	0.4		
2		5.9	4.2	7.6			17		1.8	11	.3		
3		5.0	4.2	5.9			18		1.4	11	.2		
4		4.2	4.2	4.2			19		.7	11	.1		
5		2.5	4.2	2.5			20		.7	9.3			
6		2.1	4.2	2.1			21		.7	7.6			
7		1.8	4.2	2.1			22		1.1	4.2			
8		1.4	4.2	1.8			23		1.4	4.2			
9		1.8	23	1.8		3.4	24		108	4.2			3.4
10		1.8	15	1.8			25		3,460	4.2			
11		1.4	2.5	1.4			26		36	8.4			
12		1.4	2.5	1.4			27	5.9	18	9.3			
13		2.5	2.5	1.1			28	5.9	17	9.3			
14		2.5	2.5	.7			29	5.9	12	9.3		310	
15		2.1	128	.6			30	5.9	8.4	9.3		430	
							31	5.9		9.3		109	

NOTE.—Dry on days for which no discharge is given. Owing to incomplete record discharge partly estimated Aug. 29 to Sept. 1; estimated, Sept. 2–30.

Monthly discharge of North Concho River near Carlsbad, Tex., for the period March 27 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
March 27–31	5.9	5.9	5.9	58.5
April	3,460	.7	124	7,360
May	128	2.5	11.3	692
June	9.3	0	1.51	89.8
July	0	0	0	0
August	430	0	27.4	1,680
September	9.3	3.4	3.60	214
The period				10,100

NORTH CONCHO RIVER AT SAN ANGELO, TEX.

LOCATION.—At county concrete viaduct in San Angelo, Tom Green County, 1 mile above confluence of North Concho and South Concho Rivers.

DRAINAGE AREA.—1,800 square miles (revised; measured on topographic maps and base maps of Texas, scale 1:500,000).

RECORDS AVAILABLE.—October 27, 1915, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder attached to pier of viaduct; installed September 1, 1920.

DISCHARGE MEASUREMENTS.—Made from second highway bridge upstream from gage or by wading.

CHANNEL AND CONTROL.—Bed composed of solid rock which is, to some extent, covered in high-water channel with grass and moss; permanent. Channel straight for 800 feet above and 400 feet below gage. Banks are sloping, clean, composed of rock and clay; not subject to overflow except during high floods. About 20 feet below gage and at downstream side of viaduct is a concrete dam, about 4½ feet high, which, before the viaduct was constructed, served as part of low-water crossing. This dam forms an artificial control and insures a permanent stage-discharge relation. Backwater probably occurs at this station when the Concho reaches a stage of 25 feet.

EXTREMES OF DISCHARGE.—Maximum stage from water-stage recorder, 11.35 feet at 1 p. m. April 25 (discharge, not determined); no flow July 5 to August 28.

1916–1924: Maximum stage from water-stage recorder, 19.3 feet at 7.30 p. m. April 26, 1922 (discharge not determined; backwater from Concho River probably existed); no flow for several periods during record.

DIVERSIONS.—Records of the Board of Water Engineers for the State of Texas show that about 600 acres have been declared irrigated by diversions from North Concho River, all above station.

REGULATION.—Negligible.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 1,100 second-feet; poorly defined above to 14,000 second-feet. Operation of water-stage recorder satisfactory. Daily discharge determined by applying to rating table mean daily gage height determined from recorder graph by inspection, by use of planimeter, or by averaging discharge for fractional parts of a day, except for December 6–8 and May 26 when discharge was interpolated. Records fair for low and medium stages; poor for high stages.

Discharge measurements of North Concho River at San Angelo, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 20	0.48	1.5	Apr. 26	1.20	164	Sept. 13	2.13	1,090
Dec. 1	.41	[a] 1.0	Aug. 30	1.45	336	Sept. 30	.26	0
Apr. 25	10.12	15,800						

[a] Estimated.

Daily discharge, in second-feet, of North Concho River at San Angelo, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	36	0.9	2.3	3.7	8.4	5.2	6.8	5.9	0.1	-------	663
2	0	7.7	1.3	2.0	2.7	7.3	4.5	5.9	3.2	.1	-------	44
3	73	3.2	1.7	2.0	2.5	7.7	4.5	4.9	2.0	.1	-------	12
4	56	2.2	1.2	2.2	2.5	7.7	4.5	4.2	1.7	.1	-------	4.5
5	5.2	1.4	.9	2.2	2.3	6.8	4.9	4.5	1.6	-------	-------	1.8
6	1.2	1.0	1.3	1.8	2.3	6.8	4.9	3.9	1.3	-------	-------	.9
7	.7	1.0	1.7	1.7	2.5	7.3	4.9	5.9	1.1	-------	-------	.6
8	.6	1.0	2.1	2.0	2.5	6.4	5.5	5.2	1.0	-------	-------	.4
9	.5	1.0	2.5	2.2	2.7	5.5	5.2	4.9	.9	-------	-------	.3
10	.4	1.0	1.3	2.0	2.7	4.5	4.5	3.7	.7	-------	-------	.3
11	.3	1.0	1.8	2.0	3.9	4.5	3.4	2.9	.7	-------	-------	.2
12	.1	.9	2.2	2.2	4.9	4.2	2.2	2.7	.6	-------	-------	.3
13	.1	7.0	3.7	2.7	4.9	5.9	2.3	3.2	.6	-------	-------	304
14	75	2.9	4.5	2.5	4.5	6.8	2.3	11	.5	-------	-------	96
15	689	1.1	3.7	2.9	4.5	6.8	2.0	61	.4	-------	-------	25
16	76	1.0	3.2	3.2	3.9	7.3	1.8	19	.4	-------	-------	12
17	13	.8	2.9	3.4	3.9	8.4	1.4	9.7	.4	-------	-------	5.5
18	5.5	.8	2.9	3.4	4.9	8.4	1.3	5.9	.4	-------	-------	4.5
19	2.2	1.4	2.9	3.9	4.9	11	1.3	4.2	.4	-------	-------	1.8
20	1.6	1.8	2.3	3.9	4.5	12	1.2	2.7	.3	-------	-------	1.1
21	1.0	1.3	2.3	3.4	4.2	9.0	1.0	2.2	.3	-------	-------	.8
22	.7	.9	3.2	3.9	4.5	7.7	1.0	2.0	.3	-------	-------	.7
23	.7	.6	3.2	3.9	4.9	7.3	1.0	1.6	.3	-------	-------	.5
24	.7	.7	2.9	4.9	4.9	7.3	1.0	1.3	.2	-------	-------	.4
25	.7	.8	3.4	3.9	8.4	7.7	4,410	1.7	.2	-------	-------	.4
26	.7	.8	3.9	3.7	11	7.7	141	20	.2	-------	-------	.4
27	.7	.7	2.9	3.7	9.7	7.7	41	1.8	.2	-------	-------	.2
28	.7	1.0	2.5	4.2	9.0	9.0	18	1.1	.2	-------	-------	.2
29	.7	1.0	2.9	4.2	9.0	6.4	13	251	.2	-------	209	.2
30	.7	.9	3.4	4.2	-------	6.4	9.7	106	.1	-------	355	.1
31	8.0	-------	2.7	4.5	-------	5.5	-------	16	-------	-------	98	-------

NOTE.—Dry on days for which no discharge is given.

Monthly discharge of North Concho River at San Angelo, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	689	0	32.8	2,020
November	36	.6	2.76	164
December	4.5	.9	2.53	155
January	4.9	1.7	3.06	188
February	11	2.3	4.72	271
March	12	4.2	7.27	447
April	4,410	1.0	157	9,330
May	251	1.1	18.6	1,140
June	5.9	.1	.88	52.2
July	.1	.0	.01	.79
August	355	.0	21.4	1,310
September	663	.1	39.4	2,340
The year	4,410	.0	24.0	17,400

CONCHO RIVER NEAR SAN ANGELO, TEX.

LOCATION.—Half a mile below confluence of North Concho and South Concho Rivers, 1¾ miles southeast of San Angelo, Tom Green County.

DRAINAGE AREA.—4,490 square miles (revised; measured on topographic maps and base map of Texas, scale 1 : 500,000).

RECORDS AVAILABLE.—September 17, 1915, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder on right bank, 1,500 feet below an old ford; inspected by B. W. Wynn.

DISCHARGE MEASUREMENTS.—Made by wading or from cable near gage.

CHANNEL AND CONTROL.—Bed composed of solid rock and gravel. Channel straight for 1,000 feet above and below station. Right bank wooded, rocky; not subject to overflow. Left bank composed of clay and gravel, covered with scattered trees, medium in height; subject to overflow at high stages. Rapids just below gage serve as control for medium and low stages but affected by moss; location of control for high stages not known.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 28.1 feet at 12.30 p. m. April 25 (discharge, 51,900 second-feet, determined from extension of rating curve); minimum stage, 0.30 foot at 7 p. m. July 23 (discharge, 0.90 second-foot).

1915–1924: Maximum stage, 36.8 feet April 26, 1922 (discharge, 139,000 second-feet, from extension of rating curve; no flow November 29, 1921.

ICE.—None.

DIVERSIONS.—Flow at low stage materially affected by diversions above station. About a mile above mouth of South Concho River, a storage dam has been constructed by the San Angelo Light & Power Co. Records of the Board of Water Engineers for the State of Texas show that about 11,000 acres have been declared irrigated by water diverted above the station and about 3,500 acres by diversions below station.

REGULATION.—Storage at the dam of the San Angelo Light & Power Co. has slight effect on flow at station. No regulation of consequence on North Concho River.

ACCURACY.—Stage-discharge relation not permanent. Rating curve fairly well defined below 22,000 second-feet; poorly defined from 22,000 to 46,000 second-feet by slope measurements; extended above. Operation of water-stage recorder satisfactory. Daily discharge determined by applying to rating table mean daily gage height obtained from recorder graph by inspection, by use of planimeter, or by averaging discharge for fractional parts of a day; shifting-control method used November 17 to April 24, Records good.

Discharge measurements of Concho River near San Angelo, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 20	1.58	66	Apr. 8	1.58	62	Aug. 30	2.34	277
Dec. 1	1.78	97	May 26	27.2	*45,000			
Dec. 31	1.76	85	May 30	7.64	3,270			

* Measurements by floats.

Daily discharge, in second-feet, of Concho River near San Angelo, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	795	97	84	70	99	68	57	286	8.3	1.4	672
2	16	675	110	86	62	92	56	54	702	4.0	1.5	119
3	78	206	112	88	64	92	60	53	286	3.4	1.6	62
4	266	127	105	86	57	92	62	45	188	4.9	1.4	41
5	453	103	99	86	54	92	60	40	157	12.2	1.3	30
6	120	97	94	86	56	92	59	39	146	18	1.4	25
7	65	92	94	86	57	94	59	37	130	14	2.3	22
8	44	90	94	88	60	90	60	39	120	4.2	1.4	20
9	34	88	94	90	64	88	59	40	114	2.0	1.7	18
10	29	88	94	86	62	86	62	40	112	3.3	1.2	16
11	26	94	103	86	70	88	62	42	108	4.0	1.3	16
12	25	92	105	84	76	92	68	46	101	4.2	1.3	12
13	513	110	105	84	70	101	76		84	3.5	1.6	247
14	835	225	103	84	67	99	64		70	3.4	1.6	163
15	2,830	376	97	86	65	99	54	50	65	2.6	2.2	84
16	515	178	97	84	70	105	49		62	3.1	2.0	62
17	182	127	97	82	72	103	46		57	2.8	1.6	54
18	112	117	97	84	82	86	37		46	2.6	1.3	175
19	82	112	94	80	84	101	36	45	36	1.8	1.3	65
20	72	105	94	82	82	92	38		36	1.7	1.2	48
21	67	105	94	84	80	92	40	34	37	1.6	1.2	45
22	62	108	99	80	82	92	39	23	40	1.1	1.3	46
23	57	110	94	78	80	86	40	25	39	1.0	1.4	370
24	56	105	92	78	86	86	40	19	31	1.3	1.3	134
25	56	105	92	77	114	88	11,800	28	25	1.3	1.2	80
26	110	101	92	77	110	88	1,920	8,430	22	1.4	1.3	62
27	72	101	92	77	103	82	340	582	19	1.4	1.4	56
28	65	117	92	77	105	80	163	243	16	1.4	1.6	51
29	64	110	90	77	103	62	105	1,190	14	1.3	123	48
30	65	103	86	76	-------	68	76	1,820	10	1.4	444	46
31	123	-------	84	76	-------	70	-------	733	-------	1.4	113	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated. No record, Jan. 25–29; discharge interpolated.

Monthly discharge of Concho River near San Angelo, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,830	16	229	14,100
November	795	88	165	9,840
December	112	84	96.5	5,930
January	90	76	82.5	5,080
February	114	54	76.1	4,380
March	105	62	89.6	5,510
April	11,800	36	523	31,100
May	8,430	19	453	27,800
June	702	10	105	6,270
July	18	1.0	3.82	235
August	444	1.2	23.3	1,430
September	672	12	96.3	5,730
The year	11,800	1.0	162	117,000

CONCHO RIVER NEAR PAINT ROCK, TEX.

LOCATION.—At Santa Fe (Concho, San Saba & Llano Valley) Railway bridge, a quarter of a mile below mouth of Kickapoo Creek and 2 miles northwest of Paint Rock, Concho County.

DRAINAGE AREA.—5,530 square miles (revised, measured on topographic maps and base maps of Texas, scale 1:500,000).

RECORDS AVAILABLE.—September 20, 1915, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder attached to downstream end of middle railroad bridge pier, installed September 16, 1920.

DISCHARGE MEASUREMENTS.—Made by wading, from railroad bridge at gage, or from highway bridge below.

CHANNEL AND CONTROL.—Bed composed of solid rock. Channel straight for 500 feet above and below gage. Right bank not subject to overflow; left bank sloping, wooded, medium in height, and subject to overflow during high water. Permanent control during low and medium stages is a shoal in solid rock, 400 feet below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 14.64 feet at 1 a. m. April 26 (discharge, 24,000 second-feet, determined from extension of rating curve); no flow July 16 to August 5 and August 17–27.

1915–1924: Maximum stage recorded, 27.5 feet at 11 a. m. April 27, 1922 (discharge not determined); no flow during several periods of every year except 1920 and 1921.

DIVERSIONS.—Records of the Board of Water Engineers for the State of Texas show that about 11,000 acres have been declared irrigated by diversions from Concho River, practically all of which are above the station. Flow during low stages is materially affected by diversions.

REGULATION.—Ten storage dams of small capacity are located between this station and San Angelo. An abandoned dam, 12 feet in height, known as "Fourmile Dam," is 4 miles below San Angelo, and a small dam, 8 feet in height, has been constructed for storage on Sims ranch just above station. None of the dams appreciably affect the flow by storing water, except during extremely low stages.

ACCURACY.—Stage-discharge relation permanent. Curve well defined below 6,000 second-feet; poorly defined to 20,000 second-feet; extended above. Operation of the water-stage recorder satisfactory. Daily discharge determined by applying to rating table mean daily gage height obtained from recorder graph by inspection, by use of planimeter, or by averaging discharge for fractional parts of a day. Records good.

Discharge measurements of Concho River near Paint Rock, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 19	1.83	110	Apr. 10	1.59	60	July 15	0.74	[a] 0.03
Dec. 20	1.80	104	Apr. 26	4.86	2,090			
Mar. 5	1.75	90	June 19	1.50	44			

[a] Estimated.

Daily discharge, in second-feet, of Concho River near Paint Rock, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	245	97	94	85	112	65	99	470	6.0	-------	250
2	24	1,000	94	90	82	107	69	82	285	4.7	-------	328
3	26	444	104	90	72	102	61	70	886	3.8	-------	128
4	82	194	107	94	67	97	53	63	281	3.1	-------	92
5	344	128	94	92	67	92	56	66	185	3.1	-------	80
6	274	99	90	92	63	90	59	90	157	3.1	40	82
7	118	92	90	92	63	87	59	61	143	1.8	58	80
8	74	87	90	92	65	90	59	50	128	1.0	20	80
9	56	85	92	92	69	82	59	50	115	.7	11	80
10	47	82	92	94	70	82	59	50	112	.5	7.4	80
11	41	85		87	72	80	58	48	104	.2	4.7	80
12	37	87		87	76	82	61	47	97	.2	3.1	82
13	37	92	98	90	74	87	69	47	94	.1	2.0	82
14	726	109		92	78	97	76	53	80	.1	.7	287
15	840	255		92	74	99	67	58	72	.1	.2	233

Daily discharge, in second-feet, of Concho River near Paint Rock, Tex., for the year ending September 30, 1924—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
16	1,100	298		94	70	97	59	72	61	-------	0.1	176
17	800	166	98	90	70	97	53	76	58	-------	-------	178
18	800	123	98	90	74	99	48	63	55	-------	-------	494
19	115	107		94	80	97	44	53	45	-------	-------	248
20	87	99	104	90	82	97	41	48	38	-------	-------	154
21	72	92	104	90	80	94	39	41	29	-------	-------	118
22	65	90	107	94	80	90	38	38	29	-------	-------	97
23	59	90	107	94	82	85	39	34	30	-------	-------	113
24	56	87	107	94	85	80	37	31	28	-------	-------	74
25	53	85	104	94	104	80	4,710	29	25	-------	-------	41
26	53	82	104	90	118	80	6,570	7,510	21	-------	-------	41
27	76	80	104	85	115	80	589	2,340	15	-------	-------	43
28	76	90	104	87	107	78	272	411	12	-------	7.5	43
29	65	94	104	90	112	74	179	623	9.7	-------	7.4	43
30	61	102	102	87	-------	67	131	1,940	8.3	-------	7.9	44
31	69	-------	97	87	-------	61	-------	1,670	-------	-------	226	-------

NOTE.—Dry on days for which no discharge is given. Records incomplete and discharge partly estimated Oct. 15, 16, 19, and Dec. 10. Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Concho River near Paint Rock, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,100	24	205	12,600
November	1,000	80	159	9,460
December	-------	-------	99.4	6,110
January	94	85	91.0	5,590
February	118	63	80.6	4,630
March	112	61	88.5	5,440
April	6,570	37	459	27,300
May	7,510	29	513	31,600
June	886	8.3	122	7,290
July	6.0	.0	.92	56.5
August	226	.0	12.8	785
September	494	41	132	7,840
The year	7,510	.0	164	119,000

PECAN BAYOU AT BROWNWOOD, TEX.

LOCATION.—At pumping plant of city of Brownwood, 800 feet above lower dam, three-eighths of a mile above Brownwood-Comanche highway bridge, 1 mile north of Brownwood, Brown County, 2 miles above mouth of Adams Branch, and 30 miles above confluence with Colorado River.

DRAINAGE AREA.—1,610 square miles (revised; measured on topographic maps and base map of Texas, scale 1 : 500,000).

RECORDS AVAILABLE.—May 24, 1917, to June 30, 1918, and October 17, 1923, to September 30, 1924.

GAGE.—A combined inclined and vertical staff gage at upstream end of the city pumping plant; read by C. N. Davis, employee of the city of Brownwood.

DISCHARGE MEASUREMENTS.—Made from highway bridge, three-eighths of a mile below gage, or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of mud and clay, free from vegetation; channel straight above and below station. Banks are wooded; subject to overflow during extremely high stages. When stream is nearly bank full, there is flow through a slough which leaves the river a short distance above the gage and connects with Adams Branch. One channel for all but extremely high stages. City dam, 800 feet below gage, serves as control for stages when flow is confined within the banks; dam has opening of 140 feet. When banks are submerged, water spreads over wide area.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.90 feet at 1 p. m. May 14 (discharge, 12,100 second-feet, determined from extension of rating curve); no flow June 21 to September 17.

1917–1918; 1923–24: Maximum stage recorded that of May 14, 1924; no flow for several periods.

ICE.—None.

DIVERSIONS.—Records of the Board of Water Engineers for the State of Texas show 590 acres declared irrigated above the station. City of Brownwood pumps water just below station. Two small pumps below the control dam, but amount of water diverted not known.

REGULATION.—Flow at station regulated during normal flow by storage reservoir and pumping plants above. Two miles above station city of Brownwood has a dam to impound water for municipal use. Water is released from this reservoir when the supply is short in the pond at the gage from which the city supply is pumped. Backwater from the lower dam extends to the upper dam. No regulation of consequence from irrigation above station.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 4,000 second-feet; poorly defined to 12,000 second-feet. Gage read to hundredths twice daily or oftener during floods. Mean daily discharge determined by applying mean daily gage height to rating table. Records good.

Discharge measurements of Pecan Bayou at Brownwood, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 17	1.46	185	Apr. 27	1.83	417	May 16	1.89	463
Dec. 18	1.50	205	Apr. 28	1.38	142	June 20	.90	1.2
Jan. 11	1.08	26.7	May 14	8.64	9,710	Sept. 29	1.02	9.0
Mar. 6	1.10	39.4	May 15	4.38	3,920			
Apr. 11	1.15	41.9	Do	3.24	1,950			

Daily discharge, in second-feet, of Pecan Bayou at Brownwood, Tex., for the period October 17, 1923, to September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Sept.
1		3,090	94	49	25	90	126	43	905	
2		1,010	65	43	25	103	82	31	1,350	
3		470	90	37	25	78	65	25	395	
4		229	82	31	19	56	60	25	164	
5		145	73	31	13	56	56	19	116	
6		82	60	31	8	43	52	11	65	
7		46	56	31	8	31	52	8	43	
8		37	52	31	8	28	52	19	37	
9		31	43	28	8	25	49	22	28	
10		25	31	28	8	19	49	31	19	
11		19	905	28	8	15	43	56	15	
12		19	2,910	28	40	15	37	52	8.0	
13		15	5,180	28	37	65	34	760	8.0	
14		2,550	715	25	31	73	37	6,920	6.2	
15		340	381	25	49	37	31	3,270	4.6	
16		171	276	25	46	22	31	410	3.2	
17	185	78	229	22	43	1,230	25	206	2.1	
18	90	56	206	19	43	510	19	126	1.6	107
19	34	43	180	19	43	1,480	15	73	1.2	90
20	25	37	159	19	19	4,110	13	56	1.0	65
21	11	31	154	19	11	698	9	43		37
22	11	25	140	17	11	425	8	31		395
23	7.0	25	126	19	11	354	8	28		276
24	5.4	25	112	31	8	252	8	25		116
25	4.6	25	107	25	8	196	805	25		56
26	3.2	17	99	25	15	164	715	3,450		49
27	112	15	86	25	37	154	381	3,270		19
28	1,900	11	73	25	43	149	164	388		17
29	4,400	65	65	25	73	181	94	175		11
30	630	49	65	25		206	56	905		9
31	116		56	22		170		486		

NOTE.—Dry on days for which no discharge is given.

Monthly discharge of Pecan Bayou at Brownwood, Tex., for the period October 17, 1923, to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 17-31	4,400	3.2	502	14,900
November	3,090	11	293	17,400
December	5,180	31	415	25,500
January	49	17	27.0	1,660
February	73	8	24.9	1,430
March	4,110	15	356	21,900
April	805	8	106	6,300
May	6,920	8	677	41,600
June	1,350	0	106	6,290
July	0	0	0	0
August	0	0	0	0
September	395	0	41.6	2,470
The period				139,000

SAN SABA RIVER AT MENARD, TEX.

LOCATION.—1,000 feet above steel highway bridge in Menard, Menard County.

DRAINAGE AREA.—1,150 square miles (revised, measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—September 14, 1915, to September 30, 1924.

GAGE.—Combined inclined and vertical staff gage on right bank; read by Mrs. O. D. Parker. Prior to March 13, 1924, chain gage attached to the floor on downstream side of highway bridge; read by Horace Wilson.

DISCHARGE MEASUREMENTS.—Made by wading or from highway bridge.

CHANNEL AND CONTROL.—Channel straight 450 feet above and 250 feet below station. Bed of stream composed of rock and gravel; fairly clean and permanent. Banks composed of rock and clay, wooded, sloping; left bank subject to overflow at high stages. A rock and gravel shoal 100 feet below the gage serves as control; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 12.09 feet, November 1 (discharge, 6,640 second-feet, determined by slope method); minimum discharge, 20 second-feet July 25 and August 19–21.

1915–1924: Maximum stage recorded, 13.6 feet at 2.30 a. m. September 16, 1915 (discharge, 8,610 second-feet, determined from extension of rating curve), no flow July 12–14, 19–31, August 1–4, and 26–31, 1918.

DIVERSIONS.—Considerable land is irrigated with water diverted above station. Noyes Canal on right bank of river, which serves a considerable area, diverts a short distance above station. Record of the Board of Water Engineers for the State of Texas show that about 4,300 acres have been declared irrigated above the station and about 7,700 acres below station.

REGULATION.—Flow controlled at low stages during irrigation season by diversion to Noyes Canal.

ACCURACY.—Stage-discharge relation not permanent. Rating curve at old station used prior to March 14, well defined below 270 second-feet. Rating curve at the new station well defined below 85 second-feet. Both curves extended by use of one slope measurement made at a stage of 12.08 feet at the old gage, and 11.18 feet at the new gage. Gage read to hundredths twice daily. Daily discharge determined by shifting-control method. Records good.

Discharge measurements of San Saba River at Menard, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 1	12.09	[a] 6,640	Feb. 1	2.81	73	June 10	1.77	66
Nov. 8	2.85	77	Mar. 14	[b] 1.90	72	Sept. 23	1.58	49
Jan. 7	2.84	80	Apr. 14	1.68	51			

[a] Discharge determined by slope method using Kutter's formula and values of 0.050 and 0.030 for "n."
[b] Gage at new datum and located 1,000 feet upstream.

Daily discharge, in second-feet, of San Saba River at Menard, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	4,760	74	81	73	76	65	42	118	24	23	27
2	29	1,200	86	79	72	73	70	42	644	26	23	30
3	29	438	94	78	72	60	65	42	133	24	27	29
4	29	120	81	78	72	63	70	42	86	21	24	29
5	29	96	74	78	72	74	70	42	75	30	24	29
6	29	82	74	74	54	74	60	44	70	30	23	27
7	29	76	74	76	31	74	52	44	70	27	40	50
8	29	78	72	74	31	74	51	44	65	26	34	53
9	29	74	72	74	31	72	51	44	65	27	25	53
10	29	74	72	74	31	70	51	44	65	24	21	53
11	29	74	143	74	34	68	51	44	65	32	21	56
12	29	74	143	74	36	68	51	44	64	27	21	70
13	29	82	184	74	31	68	51	44	63	27	21	80
14	70	103	98	74	31	75	51	44	63	26	24	65
15	72	84	74	74	31	75	51	44	62	25	24	62
16	52	74	96	74	31	75	51	44	40	24	21	50
17	39	74	88	74	25	75	49	44	40	24	21	45
18	31	74	88	74	36	75	50	44	39	23	21	37
19	31	74	88	74	52	86	50	44	39	25	20	53
20	31	74	88	74	74	75	50	44	37	27	20	50
21	29	74	88	74	74	75	49	53	37	27	20	50
22	29	74	88	72	74	75	48	53	37	26	21	45
23	29	74	88	72	74	75	48	53	30	21	21	47
24	32	74	88	72	74	70	48	53	29	21	22	48
25	35	74	88	72	74	70	64	158	27	20	22	48
26	46	72	88	72	78	70	44	1,070	26	21	215	48
27	46	68	84	72	78	70	44	133	26	26	21	50
28	46	86	84	72	78	70	44	80	26	27	35	50
29	49	78	82	72	78	70	44	80	26	45	31	49
30	58	74	81	72	-------	70	44	125	21	50	28	47
31	76	-------	81	72	-------	65	-------	133	-------	49	27	-------

Monthly discharge of San Saba River at Menard, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	76	29	38.1	2,340
November	4,760	68	284	16,900
December	184	72	90.4	5,560
January	81	72	74.2	4,560
February	78	25	55.2	3,180
March	86	60	71.9	4,420
April	70	44	52.9	3,150
May	1,070	42	92.3	5,670
June	644	21	72.9	4,340
July	50	20	27.5	1,690
August	215	20	30.4	1,870
September	80	27	47.7	2,840
The year	4,760	20	77.9	56,500

SAN SABA RIVER NEAR SAN SABA, TEX.

LOCATION.—200 feet above Beveridge highway bridge, 1 mile below mouth of China Creek, 2 miles northwest of San Saba, San Saba County, and 4 miles above mouth of Simpson Creek.

DRAINAGE AREA.—3,040 square miles (revised; measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—December 30, 1904, to December 31, 1906; September 11, 1915, to September 30, 1924. Miscellaneous discharge measurements previous to 1904.

GAGE.—Vertical and inclined staff, on right bank; read by G. M. Pool.

DISCHARGE MEASUREMENTS.—Made by wading or from downstream side of bridge.

CHANNEL AND CONTROL.—Channel straight above and below station for 100 feet. Bed composed of rock and gravel; shifts. Left bank composed of gravel and clay, wooded and not subject to overflow. Right bank consists of clay and gravel, wooded, sloping, medium in height, and subject to overflow during high water. A shoal at a ford about 75 feet below gage serves as control during medium and low stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 19.2 feet at 5.10 p. m. November 2 (discharge, 6,500 second-feet); minimum stage, 1.42 feet at 7 p. m. August 6 (discharge, 42 second-feet).

1904–1906; 1915–1924: Maximum stage recorded, about 37 feet April 26 or 27, 1922, determined from floodmarks on gage (discharge not determined); no flow, August 9 and 10, 1918.

DIVERSIONS.—Considerable water is diverted from stream and tributaries above station. There are also diversions below the station, but none in the vicinity of the station. Flood water from Brady Creek at Brady is stored for municipal uses; capacity of reservoir not known, but probably small. Records of the Board of Water Engineers for the State of Texas show that about 9,300 acres have been declared irrigated by diversions above station and about 2,700 acres below station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined for all stages. Gage read to hundredths twice daily. Daily discharge determined by shifting-control method. Records good.

Discharge measurements of San Saba River near San Saba, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 13	2.08	148	Mar. 10	2.58	227	June 21	1.94	114
Dec. 17	3.37	403	Apr. 12	2.44	199	Sept. 29	2.68	250

Daily discharge, in second-feet, of San Saba River near San Saba, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	138	2,310	256	256	211	279	211	178	777	80	46	79
2	138	6,100	279	244	200	268	211	168	590	78	48	73
3	138	4,020	384	244	200	256	211	178	3,740	76	55	68
4	148	1,540	412	244	189	256	211	178	1,170	82	53	68
5	138	905	412	244	189	244	211	222	560	85	55	68
6	129	651	330	256	189	233	211	200	470	88	43	68
7	129	530	304	244	189	222	211	148	330	90	66	68
8	129	384	292	244	189	222	211	178	292	90	53	68
9	129	412	279	244	189	211	211	441	268	86	49	65
10	120	412	268	244	189	233	211	745	244	85	61	65
11	120	356	292	233	200	211	211	330	178	85	50	65
12	120	356	384	233	211	211	200	222	200	82	55	78
13	129	330	1,200	233	200	222	222	200	189	90	61	2,030
14	356	412	745	222	189	233	211	304	189	84	58	745
15	809	530	560	233	189	233	244	304	189	78	75	256
16	713	441	441	222	189	222	222	244	158	66	61	189
17	470	384	384	222	189	233	200	178	158	63	68	158
18	304	330	384	222	200	279	189	168	158	66	68	138
19	233	330	384	222	233	268	178	148	651	68	66	138
20	200	304	356	222	222	441	168	1,200	2,590	76	68	138
21	178	292	356	211	211	412	168	256	120	65	60	120
22	168	279	356	211	200	330	168	211	129	55	57	111
23	158	268	356	222	200	356	168	189	129	59	54	108
24	158	268	304	244	200	330	168	168	120	59	60	108
25	222	268	304	233	211	304	682	168	111	60	68	104
26	304	268	304	222	256	279	1,780	1,860	106	65	68	104
27	256	244	304	211	330	268	476	3,460	102	68	68	104
28	233	256	292	222	304	256	268	1,040	99	66	68	104
29	268	279	292	222	304	244	233	530	101	68	68	233
30	530	268	279	222	-------	233	189	1,680	101	59	71	148
31	590	-------	268	222	-------	222	-------	1,610	-------	54	82	-------

Monthly discharge of San Saba River near San Saba, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	809	120	253	15,600
November	6,100	244	791	47,100
December	1,200	256	379	23,300
January	256	211	231	14,200
February	330	189	213	12,200
March	441	211	265	16,300
April	1,780	168	282	16,800
May	3,460	148	552	33,900
June	3,740	99	474	28,200
July	90	54	73.4	4,510
August	82	43	60.7	3,730
September	2,030	65	196	11,600
The year	6,100	43	313	227,000

NOYES CANAL AT MENARD, TEX.

LOCATION.—In Menard, Menard County, 4 miles below head gates and dam and 1,000 feet above steel highway bridge.

RECORDS AVAILABLE.—March 13 to September 30, 1924.

GAGE.—Vertical staff on right bank; read by Mrs. O. D. Parker.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Bed and banks of canal consist of earth. Channel straight above and below station. Control is bed and banks of canal.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 1.78 feet July 4–6 (discharge, 38.5 second-feet); no flow, March 13 to April 5, May 22 to June 15, July 30, and September 7–30.

DIVERSIONS.—Above all diversions.

REGULATION.—Flow regulated by head gates.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined for all stages. Gage read to hundredths twice daily. Daily discharge determined by shifting-control method. Records good.

The following discharge measurement was made:

April 14, 1924: Gage height, 1.20 feet; discharge, 25.1 second-feet.

Daily discharge, in second-feet, of Noyes Canal at Menard, Tex., for the period March 13 to September 30, 1924

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	20	------	36	28	30	16	24	20	22	34	34	------
2	------	20	------	37	28	32	17	23	20	22	34	28	------
3	------	21	------	38	28	33	18	23	19	22	32	30	------
4	------	20	------	38	27	33	19	23	19	22	33	31	------
5	------	20	------	38	28	32	20	20	19	22	33	30	------
6	27	20	------	38	28	32	21	20	3.9	22	32	30	------
7	25	20	------	38	32	------	22	20	------	24	30	31	------
8	25	19	------	37	34	------	23	20	------	27	29	31	------
9	25	17	------	37	34	------	24	21	------	30	29	29	------
10	25	19	------	37	34	------	25	22	------	32	28	28	------
11	25	20	------	36	32	------	26	21	------	32	26	33	------
12	25	19	------	35	31	------	27	20	------	33	25	28	------
13	25	19	------	36	31	------	28	21	------	34	25	31	------
14	24	19	------	36	34	------	29	21	------	35	24	31	------
15	24	19	------	36	34	------	30	20	------	29	------	30	------
							31	------	------	------	28	30	------

NOTE.—Dry on days for which no discharge is given.

Monthly discharge of Noyes Canal at Menard, Tex., for the period March 13 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April (25 days)	27	20	22.8	1,130
May (21 days)	21	3.9	18.7	779
June (15 days)	35	22	27.2	809
July (30 days)	38	24	33.2	1,970
August	34	27	30.6	1,880
September (6 days)	33	30	32.0	381
The period				6,950

NORTH LLANO RIVER NEAR JUNCTION, TEX.

LOCATION.—500 feet above remains of old Wilson Dam, 1 mile below mouth of Bear Creek, 3 miles northwest of Junction, Kimble County, and 4 miles above confluence of North Llano and South Llano Rivers.

DRAINAGE AREA.—914 square miles (revised; measured on topographic maps and base maps of Texas, scale 1:500,000).

RECORDS AVAILABLE.—September 14, 1915, to September 30, 1924.

GAGE.—Overhanging chain gage on left bank; read by W. M. Keen.

DISCHARGE MEASUREMENTS.—Made by wading or from highway bridge, 2½ miles below station.

CHANNEL AND CONTROL.—Bed composed of solid rock. Channel straight above and below for 400 feet, with a series of pools and rapids. Left bank not subject to overflow; right bank wooded and subject to overflow during high stages. A solid rock ledge having about 2-foot vertical fall at site of old dam is a permanent control for medium and low stages, except for slight effect from growth of moss during low stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 12.89 feet during the night of October 29 (discharge, 17,600 second-feet, determined by slope method); minimum stage, 1.26 feet August 24–27 (discharge, 11 second-feet).

1915–1924: Maximum stage recorded, 23 feet about midnight April 24, 1923 (discharge, 43,100 second-feet, determined from extension of rating curve); no flow during several periods.

DIVERSIONS.—Records of the Board of Water Engineers for the State of Texas show that about 1,200 acres have been declared irrigated by diversions above the station. During low stages such diversions materially reduce flow at the station.

REGULATION.—No indication that flow at station is regulated.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined below 360 second-feet; extended above by means of two slope measurements made at gage heights of 12.9 and 19.03 feet. Gage read to hundredths twice daily or oftener during floods. Daily discharge determined by applying mean daily gage height to rating table. Records good for low and medium stages; fair for high stages.

Discharge measurements of North Llano River near Junction, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 29	12.89	[a] 17,600	Jan. 9	1.82	142	June 9	1.76	103
Nov. 5	2.44	351	Mar. 17	4.02	1,450	Sept. 24	1.40	23
Nov. 9	2.10	221	Apr. 16	1.66	75			

[a] Slope measurement, using Kutter's formula.

Daily discharge, in second-feet, of North Llano River near Junction, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	3,770	138	158	99	87	87	58	208	36	22	20
2	20	5,910	155	155	99	87	81	58	507	36	22	18
3	18	1,040	184	151	93	87	81	58	259	36	20	18
4	18	481	208	148	93	81	81	53	184	36	20	18
5	18	347	181	145	93	81	81	53	161	36	20	18
6	18	294	171	142	93	75	81	53	145	36	18	16
7	18	259	171	138	93	75	81	53	138	33	18	16
8	18	242	171	138	87	75	78	53	132	33	18	16
9	18	225	171	138	87	75	109	53	119	33	18	16
10	18	208	171	138	87	72	99	53	115	30	18	14
11	18	208	294	132	87	69	93	49	112	30	18	15
12	18	191	294	132	81	69	84	49	106	30	18	27
13	66	191	312	132	81	69	81	49	106	30	18	36
14	66	259	259	128	81	69	81	49	99	27	16	32
15	294	225	242	125	81	69	81	49	99	27	16	27
16	151	208	225	125	75	69	81	49	93	27	16	24
17	84	208	225	125	75	431	75	49	87	27	16	24
18	75	191	225	119	93	178	75	46	75	24	16	24
19	69	188	225	119	93	151	75	44	69	24	16	24
20	58	178	208	112	84	128	69	44	61	24	14	24
21	53	171	208	112	90	115	69	44	53	24	13	24
22	49	165	208	112	84	112	69	44	53	24	13	24
23	49	158	208	106	78	106	69	44	49	24	13	24
24	44	158	191	106	75	106	69	41	44	24	11	24
25	44	151	191	106	87	99	69	39	44	24	11	24
26	78	151	188	106	90	99	69	78	41	24	11	24
27	53	145	184	99	93	96	69	56	39	24	11	27
28	44	145	178	99	93	93	69	49	39	24	20	22
29	4,330	142	174	99	87	93	63	44	36	24	20	22
30	3,490	138	171	99	-------	87	63	2,370	36	24	20	22
31	1,300	-------	165	99	-------	87	-------	507	-------	22	20	-------

Monthly discharge of North Llano River near Junction, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	4,330	18	342	21,100
November	5,910	138	545	32,400
December	312	138	203	12,500
January	158	99	124	7,620
Feburary	99	75	87.3	5,020
March	431	69	103	6,330
April	109	63	77.7	4,630
May	2,370	41	140	8,600
June	507	36	110	6,560
July	36	22	28.3	1,740
August	22	11	16.8	1,030
September	36	14	22.1	1,320
The year	5,910	11	150	109,000

LLANO RIVER NEAR JUNCTION, TEX.

LOCATION.—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 (revised; measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—September 13, 1915, to September 30, 1924.

GAGE.—Combination vertical and inclined staff on right bank; read by Bonnie Oliver.

DISCHARGE MEASUREMENTS.—Made by wading at Mason road crossing, a quarter of a mile above gage, or from cable 400 feet above gage.

CHANNEL AND CONTROL.—Bed composed of solid rock; permanent. Channel straight for 700 feet above and 350 feet below gage. Left bank slightly wooded, and subject to overflow during high water. Right bank not subject to overflow. One channel at all stages, except above a stage of 11.3 feet when a small part of the flow may follow a slough that leaves the river a short distance above gage and enters main stream below gage. Control for low and medium stages is a rock ledge 75 feet below gage, having a fall of approximately 3 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 24.83 feet at 11.30 a. m. October 29 (discharge, 85,500 second-feet); minimum stage, 1.56 feet August 23–26 (discharge, 63 second-feet).

1915–1924: Maximum stage recorded, 26.3 feet at 3 a. m. September 16, 1915 (discharge, 98,800 second-feet, determined from extension of rating curve); minimum stage, 1.32 feet during August 23–28, 1918 (discharge, 13 second-feet).

ICE.—None.

DIVERSIONS.—Records of the Board of Water Engineers for the State of Texas show that about 2,500 acres have been declared irrigated by diversions above the station and about 1,300 acres below the station. Diversions materially reduce flow at station during low stages.

REGULATION.—Slight regulation by water-power plant on South Llano River at Junction.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 1,700 second-feet and extended above by means of one slope measurement. Gage read to hundredths once daily. One reading daily for medium and high stages may not be true index to discharge owing to rapid fluctuations. Daily discharge ascertained by applying daily gage height to rating table October 1 to November 6 and by shifting-control method for remainder of year. Records good for discharges below 1,700 second-feet; poor for higher stages.

Discharge measurements of Llano River near Junction, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 29	24.83	[a]85,500	Jan. 10	2.16	267	June 5	2.10	298
Nov. 4	3.43	1,630	Mar. 15	1.98	191	Sept. 25	1.66	98
Nov. 6	2.86	918	Mar. 17	2.43	415			
Nov. 9	2.56	597	Apr. 15	1.98	205			

[a] Measurement by slope method using Kutter's formula with a value of 0.0375 for "n."

Daily discharge, in second-feet, of Llano River near Junction, Tex., for the year ending September 30, 1924

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept
1	134	13,300	324	301	260	250	194	174	795	116	80	84
2	134	12,400	324	289	260	239	194	174	575	116	80	84
3	125	6,880	336	289	260	218	194	165	540	109	80	84
4	125	2,170	354	283	260	208	194	165	472	109	80	84
5	116	1,080	342	283	260	198	198	165	360	109	80	84
6	116	905	330	283	260	198	198	165	378	109	80	84
7	102	745	318	272	260	198	198	165	244	109	80	84
8	102	655	318	272	260	198	198	156	234	109	80	84
9	102	575	312	255	260	198	229	156	224	102	80	84
10	102	540	312	260	260	189	234	156	213	102	80	84
11	102	472	312	255	260	189	213	156	203	102	80	84
12	160	472	409	255	277	189	213	156	194	102	80	255
13	160	472	409	255	277	189	213	156	184	102	80	129
14	208	472	409	255	277	198	203	156	184	102	80	120
15	1,080	472	378	255	277	189	203	156	174	102	80	120
16	965	440	378	244	277	189	203	156	165	102	80	120
17	965	440	366	244	277	905	194	147	156	102	80	112
18	745	440	366	244	277	540	194	147	147	102	80	112
19	700	409	366	234	277	409	194	147	138	102	74	112
20	655	378	360	234	277	306	194	138	129	102	74	105
21	575	378	360	250	277	208	194	138	129	94	69	105
22	540	360	360	250	277	198	194	129	125	94	69	105
23	440	360	348	250	277	198	194	129	125	94	63	102
24	295	354	348	250	266	194	184	120	125	94	63	102
25	272	342	330	250	255	194	184	120	125	87	63	98
26	250	330	330	250	244	194	184	120	125	87	63	98
27	218	330	318	250	244	194	184	120	125	87	87	120
28	1,080	330	318	250	244	198	184	4,310	125	87	84	112
29	47,400	324	318	260	244	198	184	2,170	125	80	84	105
30	17,600	324	301	260	------	189	174	1,020	125	80	84	102
31	8,390	------	301	260	------	189	------	1,020	------	80	84	------

Monthly discharge of Llano River near Junction, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	47,400	102	2,710	167,000
November	13,300	324	1,570	93,500
December	409	301	344	21,100
January	301	234	259	16,000
February	277	244	265	15,200
March	905	189	244	15,000
April	234	174	197	11,700
May	4,310	120	405	24,900
June	795	125	232	13,800
July	116	80	99.2	6,100
August	87	63	77.5	4,760
September	255	84	105	6,260
The year	47,400	63	544	395,000

LLANO RIVER NEAR CASTELL, TEX.

LOCATION.—4 miles above mouth of Hickory Creek, 6 miles east of Castell, Llano County, and 14 miles west of Llano.

DRAINAGE AREA.—3,510 square miles (measured on topographic maps and base map of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—November 17, 1923, to September 30, 1924.

GAGE.—Vertical and inclined staff gage on right bank; read by V. A. Grenwelge.

DISCHARGE MEASUREMENTS.—Made from cable 200 feet above gage or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of sand; shifts. One channel at all stages, straight for several hundred feet above and below gage. Banks of earth, sand, and gravel; gently sloping; sparsely timbered; permanent; not subject to overflow. Rock ledge, 200 feet below gage forms control; clean and permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 6.94 feet at 2 p. m. December 12 (discharge, 7,230 second-feet); minimum stage, 1.42 feet August 25 (discharge, 70 second-feet).

ICE.—None.

DIVERSIONS.—Several small diversions above; amount not known.

REGULATION.—Slight regulation at extremely low stages by pumps above.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined for all stages. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records good.

The following discharge measurements were made:

March 11, 1924: Gage height, 2.44 feet; discharge, 319 second-feet.

July 19, 1924: Gage height, 1.66 feet; discharge, 103 second-feet.

September 25, 1924: Gage height, 1.70 feet; discharge, 108 second-feet.

Daily discharge, in second-feet, of Llano River near Castell, Tex., for the year ending September 30, 1924

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		565	530	375	460	305	270	1,540	138	88	88
2		760	530	375	400	328	270	3,640	132	84	102
3		720	530	375	400	305	270	1,730	134	83	112
4		940	530	350	400	328	305	850	134	80	100
5		720	530	328	375	328	375	640	138	80	86
6		680	495	305	350	328	305	495	142	80	84
7		640	495	328	350	328	270	430	146	80	82
8		600	495	350	350	328	252	375	142	79	82
9		600	495	328	350	350	530	350	138	78	80
10		760	495	350	350	430	375	328	138	78	80
11		850	460	375	328	460	288	305	134	78	78
12		4,440	460	375	328	375	270	305	130	78	92
13		1,800	430	375	350	350	252	288	122	78	170
14		1,200	430	350	375	328	305	270	120	78	305
15		990	460	328	350	328	270	252	114	76	220
16		895	460	328	328	305	252	235	112	75	202
17	940	850	460	328	350	288	235	229	110	75	150
18	805	850	430	460	600	270	220	217	107	74	144
19	760	850	430	565	1,260	270	211	205	104	73	130
20	720	760	430	430	720	270	214	199	101	73	134
21	680	805	400	328	530	270	252	193	98	72	128
22	680	850	400	350	495	270	235	193	95	73	124
23	640	760	460	375	530	270	223	187	94	72	122
24	640	720	495	350	460	270	205	187	102	72	116
25	600	680	460	400	430	530	199	181	102	70	112
26	600	680	460	640	400	1,140	720	172	101	73	110
27	565	640	400	640	400	430	680	165	101	73	108
28	640	640	400	530	375	350	400	155	98	78	107
29	600	600	400	495	375	350	288	150	94	92	104
30	565	600	400	-------	328	288	990	144	92	101	110
31	-------	565	375	-------	328	-------	2,600	-------	89	92	-------

Monthly discharge of Llano River near Castell, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
November 17–30	940	565	674	18,700
December	4,440	565	904	55,600
January	530	375	459	28,200
February	640	305	396	22,800
March	1,260	328	433	26,600
April	1,140	270	359	21,400
May	2,600	199	404	24,900
June	3,640	144	487	29,000
July	146	89	116	7,140
August	101	70	78.6	4,830
September	305	78	122	7,260
The period				246,000

PEDERNALES RIVER AT STONEWALL, TEX.

LOCATION.—100 feet below Stonewall bathhouse at Stonewall, Gillespie County, 2 miles below mouth of South Grape Creek, and 7 miles below mouth of Palo Alto Creek.

DRAINAGE AREA.—647 square miles (measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—July 22 to September 30, 1924.

GAGE.—Vertical staff gage on right bank; read by William Klier, jr.

DISCHARGE MEASUREMENTS.—Made from cable 300 feet above gage or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of sand and silt. Channel straight for 300 feet above and 700 feet below gage. Banks sparsely wooded; not subject to overflow. Control rock ledge at road crossing, 600 feet below gage; clean and permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 1.03 feet at 7.10 p. m. September 13 (discharge, 105 second-feet); minimum stage, 0.43 foot September 6–10 (discharge, 4.8 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined for all stages. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records good.

The following discharge measurements were made:

July 22, 1924: Gage height, 0.52 foot; discharge, 11 second-feet.

August 8, 1924: Gage height, 0.46 foot; discharge, 6.7 second-feet.

August 28, 1924: Gage height, 0.48 foot; discharge, 7.3 second-feet.

Daily discharge, in second-feet, of Pedernales River at Stonewall, Tex., for the year ending September 30, 1924

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1	------	7.6	5.3	11	------	5.8	5.3	21	------	5.3	7.6
2	------	7.1	5.3	12	------	6.2	6.2	22	9.4	5.3	7.1
3	------	6.6	5.3	13	------	7.1	71	23	8.7	5.3	7.1
4	------	6.6	5.3	14	------	6.2	34	24	8.0	5.3	7.1
5	------	6.6	5.3	15	------	5.8	14	25	8.0	5.3	7.1
6	------	6.6	4.8	16	------	5.8	9.4	26	7.6	5.3	6.6
7	------	6.2	4.8	17	------	5.3	8.7	27	7.6	5.3	6.6
8	------	6.2	4.8	18	------	5.3	8.0	28	40	6.6	6.6
9	------	6.2	4.8	19	------	5.3	8.0	29	11	5.3	6.2
10	------	6.2	4.8	20	------	5.3	7.6	30	8.0	5.3	6.2
								31	7.6	5.3	------

Monthly discharge of Pedernales River at Stonewall, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
July 22-31	40	7.6	11.6	230
August	7.6	5.3	5.92	364
September	71	4.8	9.70	577
The period				1,170

PEDERNALES RIVER NEAR SPICEWOOD, TEX.

LOCATION.—1½ miles above Austin-Marble Falls road crossing, 2½ miles below mouth of Fall Creek, 6½ miles above mouth of river, and 8 miles southeast of Spicewood, Burnet County.

DRAINAGE AREA.—1,290 square miles (measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—November 7, 1923, to September 30, 1924.

GAGE.—Vertical staff on right bank; read by J. W. Bowles.

DISCHARGE MEASUREMENTS.—Made from cable 250 feet above gage or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of cobblestones, coarse gravel, overlain in places with silt, clean and fairly permanent. One channel at all stages; straight for one-quarter of a mile above and 400 feet below gage. Banks fairly high; wooded; permanent; not subject to overflow. Control composed of boulders and coarse gravel 400 feet below gage; clean and permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 10.45 feet at 7 a. m. June 2 (discharge, 8,480 second-feet, determined from extension of rating curve); minimum stage, 1.46 feet at 6.30 a. m. August 27 (discharge, 5.2 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 1,500 second-feet; extended above by means of Kutter's formula. Gage read to hundredths twice daily or oftener during floods. Daily discharge determined by applying mean daily gage height to rating table. Records fair.

The following discharge measurements were made:

March 12, 1924: Gage height, 3.33 feet; discharge, 417 second-feet.

May 6, 1924: Gage height, 2.96 feet; discharge, 248 second-feet.

August 30, 1924: Gage height, 1.51 feet; discharge, 7.3 second-feet.

Daily discharge, in second-feet, of Pedernales River near Spicewood, Tex., for the year ending September 30, 1924

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	112	306	169	784	306	185	670	80	25	7.2
2	-------	119	285	163	670	285	172	6,770	71	22	7.8
3	-------	204	285	153	642	285	169	1,950	65	18	18
4	-------	670	285	134	642	285	264	784	62	16	17
5	-------	727	306	126	584	285	243	556	59	14	13
6	-------	426	243	124	584	264	264	452	56	14	10
7	196	306	243	124	504	264	207	400	56	13	9.4
8	142	264	222	124	504	243	179	353	53	12	8.7
9	126	243	218	124	613	353	3,450	330	51	11	8.1
10	108	222	243	124	504	3,030	1,470	285	47	10	7.8
11	93	426	222	131	452	670	530	264	45	9.4	7.5
12	85	3,340	218	142	452	556	353	243	41	9.4	22
13	83	4,020	196	140	613	426	285	218	39	9.4	2,300
14	87	1,710	189	134	670	530	478	196	35	9.4	353
15	105	907	185	126	556	400	478	179	32	9.0	222
16	204	784	189	121	478	330	306	159	30	8.4	89
17	169	670	189	117	452	306	243	140	28	8.4	65
18	121	670	182	330	504	264	204	131	25	8.1	45
19	101	727	175	907	784	243	182	114	24	8.1	33
20	89	613	163	641	641	243	169	103	30	8.1	27
21	83	613	148	452	613	222	613	103	20	8.1	24
22	80	584	145	426	504	218	285	179	19	7.8	45
23	74	530	169	400	478	207	196	1,240	20	7.5	24
24	73	478	285	400	478	200	166	727	18	7.5	20
25	68	452	306	426	426	264	156	306	18	6.6	18
26	65	426	243	670	426	907	243	185	18	6.3	18
27	66	426	192	1,320	426	670	400	137	17	6.3	17
28	78	400	175	1,039	478	306	330	114	17	6.0	16
29	124	376	182	907	400	243	218	101	16	6.3	16
30	140	353	182	-------	376	211	907	87	20	6.3	14
31	-------	330	179	-------	330	-------	1,470	-------	19	6.6	-------

Monthly discharge of Pedernales River near Spicewood, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
November 7-30	204	65	107	5,080
December	4,020	112	714	43,900
January	306	145	218	13,400
February	1,320	117	352	20,200
March	784	330	534	32,900
April	3,030	200	434	25,800
May	3,450	156	478	29,400
June	6,770	87	583	34,700
July	80	16	36.5	2,240
August	25	6.0	10.3	631
September	2,300	7.2	116	6,910
The period	----------	----------	----------	215,000

BARTON SPRINGS AT AUSTIN, TEX.

LOCATION.—Barton Springs issue from channel of Barton Creek, 1,600 feet above Austin-Bee Cave highway bridge, half a mile above confluence of Barton Creek with Colorado River, and half a mile southwest of Austin, Travis County.

RECORDS AVAILABLE.—October 1, 1918, to September 30, 1924. Daily record of flow of Barton Creek, which approximates flow of Barton Springs as the ordinary flow of the creek is from the springs, have been published from April 25, 1917, to September 30, 1918. Miscellaneous discharge measurements of Barton Creek made from 1894 to 1906 and during 1916 and 1917.

DISCHARGE MEASUREMENTS.—Made by wading Barton Creek above and below the springs in order to determine the flow of springs as indicated in the following table:

Discharge measurements of Barton Creek and determination of discharge of Barton Springs at Austin, Tex., during the year ending September 30, 1924

Date	Discharge (second-feet)			Date	Discharge (second-feet)		
	Barton Creek below springs	Barton Creek above springs	Barton Springs		Barton Creek below springs	Barton Creek above springs	Barton Springs
Oct. 9	21.0	0	21.0	Mar. 10	256	167	89.0
Oct. 26	38.1	0	38.1	Apr. 4	161	64.4	96.6
Nov. 16	75.2	21.9	53.3	Apr. 23	100	10.5	89.5
Dec. 8	178	102	76.0	June 6	196	90.0	106
Dec. 26	236	160	76.0	July 3	99.2	8.2	91.0
Jan. 15	129	40.6	88.4	July 18	88.8	[a] 2.0	86.2
Feb. 4	102	31.0	71.0	Aug. 4	80.7	[a] .25	80.5
Feb. 23	265	169	96.0	Aug. 18	82.0	0	82.0

[a] Estimated.

LITTLE WALNUT CREEK NEAR AUSTIN, TEX.

LOCATION.—At Austin-Manor highway bridge, 1½ miles above confluence of Little Walnut and Walnut Creeks and 4½ miles northeast of Austin, Travis County.

DRAINAGE AREA.—12 square miles (measured on topographic maps).

RECORDS AVAILABLE.—April 25 to September 30, 1924.

GAGE.—Gurley eight-day water-stage recorder over a galvanized iron pipe well, attached to downstream side of concrete bridge pier.

DISCHARGE MEASUREMENTS.—Made from bridge to which gage is attached or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of solid rock. Channel winding above gage; straight for 150 feet below. Banks of rock, gravel, and clay; high; permanent. Rock control 150 feet below gage; clean and permanent.

EXTREMES OF DISCHARGE.—Maximum stage during period, from water-stage recorder, 4.90 feet during night of September 21 (discharge not determined); Minimum stage, 0.06 foot September 29 and 30 (discharge, 0.40 second-foot).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 15 second-feet; poorly defined to 53 second-feet. Operation of water-stage recorder satisfactory, except as noted in footnote to daily-discharge table. Daily discharge determined by applying mean daily gage height to rating table or by averaging discharge for fractional parts of a day. Records fair.

Discharge measurements of Little Walnut Creek near Austin, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 25	-------	22	May 9	0.90	53	Aug. 11	0.10	[a] 0.3
May 9	0.39	14	May 29	.30	5.4	Aug. 18	.10	[a] .3

[a] Estimated.

Daily discharge, in second-feet, of Little Walnut Creek near Austin, Tex., for the year ending September 30, 1924

Day	Apr.	May	June	July	Aug.	Sept.	Day	Apr.	May	June	July	Aug.	Sept.
1	------	11	20	3.0	1.4	0.8	16	------	8.8	4.7	2.0	0.9	0.5
2	------	7.6	18		1.2	1.7	17	------	8.2	4.3	2.0	.8	.5
3	------	21	11	2.6	1.2	1.7	18	------	7.0	4.3	1.9	.6	.5
4	------	9.4	8.8	2.6	1.4	1.1	19	------	7.0	4.3	1.9	.8	.5
5	------	9.4	8.2	2.6	1.4	.8	20	------	7.6	4.7	1.9	.6	.5
6	------	27	7.6	2.2	1.1	.8	21	------	10	5.1	1.9	.8	16
7	------	8.8	7.6	2.2	.9	.6	22	------	6.0	8.2	1.6	.6	6.4
8	------	7.0	7.6	1.9	.9	.6	23	------	6.0	7.0	1.6	.6	1.1
9	------	17	7.0	1.9	.8	.6	24	------	6.0	5.6	1.6	.6	.6
10	------	11	6.4	1.7		.6	25	------	6.0	4.3	1.2	.8	.6
11	------	9.4	6.4	1.7	.6	.6	26	23	29	3.5	.9	.8	.6
12	------	8.2	5.1	1.9	.8	1.4	27	12	7.6	3.0	1.2	.8	1.1
13	------	7.6	4.7	2.0	.8	7.6	28	12	5.6	3.5	1.4	.9	.6
14	------	34	4.7	2.2	.9	1.2	29	12	5.6	3.0	1.4	.9	.4
15	------	11	4.7	2.0	.9	.6	30	11	37		1.4	.8	
							31	------	11	------	1.4	.8	------

NOTE.—Owing to incomplete record, discharge partly estimated Apr. 26, July 3, 17, Aug. 11, 16, 18, 24, 25, 31, Sept. 2 and 28. Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Little Walnut Creek near Austin, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 26-30	23	11	14	139
May	37	5.6	11.9	730
June	20	3.0	6.54	389
July	----------	.9	1.90	117
August	1.4	.6	.88	54.0
September	16	----------	1.84	109
The period	----------	----------	----------	1,540

ONION CREEK NEAR DEL VALLE, TEX.

LOCATION.—At Del Valle-Creedmoor highway crossing, a quarter of a mile above Doyle's Crossing, 1 mile above mouth of Cottonwood Creek, 2 miles below mouth of Williamson Creek, and 2½ miles southwest of Del Valle, Travis County.

DRAINAGE AREA.—337 square miles (measured on topographic maps and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—May 15 to September 30, 1924.

GAGE.—Vertical staff attached to rock, 250 feet above low-water concrete bridge; read by C. T. Sundberg.

DISCHARGE MEASUREMENTS.—Made from low-water concrete bridge for medium stages and by wading for low stages. No measuring section for high stages.

CHANNEL AND CONTROL.—Bed of stream composed of solid rock, with some gravel. One channel at all stages; straight for 500 feet above and 200 feet below gage. Banks of rock and clay; permanent; right bank subject to overflow at extremely high stages. Control formed by rock and gravel rapids and low-water concrete bridge, 250 feet below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 10.05 feet at 8 a. m. June 22 (discharge, 8,240 second-feet); minimum stage, 3.40 feet September 11 (discharge, 1.4 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Two rating curves fairly well defined below 1,000 second-feet; poorly defined above. Gage read to hundredths twice daily. Daily discharge not sufficiently accurate for publication. Monthly records fair.

The following discharge measurements were made:

May 16, 1924: Gage height, 5.52 feet; discharge, 173 second-feet.

July 15, 1924: Gage height, 4.70 feet; discharge, 18 second-feet.

Monthly discharge of Onion Creek near Del Valle, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
May 15–31	2,320	98	332	11,200
June	3,730	49	255	15,200
July	103	3.5	22.7	1,400
August	7.5	1.7	2.90	178
September	82	1.4	4.81	286
The period				28,300

GUADALUPE RIVER BASIN

GUADALUPE RIVER NEAR COMFORT, TEX.

LOCATION.—At low-water bridge and dam on State Highway No. 27, 2 miles below mouth of Cherry Creek and 2.6 miles west of Comfort, Kendall County.

DRAINAGE AREA.—916 square miles (revised, measured on topographic maps; United States Army progressive military maps; and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—December 17, 1917, to September 30, 1924. Records prior to August 10, 1924, at a point 1 mile upstream.

GAGE.—Vertical staff on left bank; read by Gus Haufler. Gage prior to August 10 was vertical staff on left bank, 1 mile upstream. Relation between gages not known, but flow practically the same at both places.

DISCHARGE MEASUREMENTS.—Made by wading or from cable, 400 feet above gage.

CHANNEL AND CONTROL.—Channel straight for 1,000 feet above and 400 feet below gage. Bed of stream composed of gravel and silt; fairly permanent. Water in two channels at extremely high stages. Right bank of earth, covered with trees, high, and not subject to overflow at cable. Left bank of earth, covered with trees, medium in height, and subject to overflow at high stages. At extremely high stages water flows in second channel to right of cable. Control, up to a stage of 3 feet, is concrete low-water bridge and dam with opening in the center; permanent, if opening is kept clear, For high stages, control is gravel bar and earth banks; subject to shift, Station can not be reached at extremely high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 11.13 feet at 10.50 a. m. June 22 (discharge not determined); minimum stage, 2.30 feet at 7.02 a. m. August 23 (discharge, 32 second-feet).

1917–1924: Maximum stage about 41 feet on August 21, 1919, determined from floodmarks near gage (discharge not determined); minimum stage, 0.80 foot August 2, 1918 (discharge, 0.4 second-foot).

ICE.—None.

DIVERSIONS.—Few pumping plants along stream about 8 miles above station. Records of the Board of Water Engineers for the State of Texas show that

a total of about 400 acres have been declared irrigated by diversions above station.

REGULATION.—At Kerrville and Center Point dams are constructed and water used for mill purposes, but the effect of the regulation is slight except during low stages.

ACCURACY.—Stage-discharge relation not permanent. Rating curve prior to August 10 well defined below 400 second-feet; poorly defined to 3,120 second-feet; extended above. Rating curve subsequent to August 10 well defined below 100 second-feet; extended above. Gage read once daily to hundredths prior to August 10 and accuracy of readings doubtful; from August 11 to September 30, gage read twice daily to hundredths or oftener during floods. Daily discharge determined by applying mean daily gage height to rating table except as noted in footnote to daily-discharge table; shifting-control method used April 9 to August 10. Records prior to August 10 poor; thereafter fair.

Discharge measurements of Guadalupe River near Comfort, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 2	8.51	[a] 3,120	May 22	2.32	131	Aug. 29	2.68	98.1
Nov. 11	2.66	257	June 25	2.44	191	Sept. 6	2.47	52.2
Jan. 17	2.55	202	July 20	2.00	75.9	Do	2.48	57.6
Mar. 1	2.62	233	Aug. 11	[b] 2.55	66.0			
Apr. 22	2.54	213	Aug. 12	[c] 2.44	50.2			

[a] Slope measurement.
[b] Gage moved 1 mile downstream on this date. Old gage read 1.95.
[c] Old gage read 1.80.

Daily discharge, in second-feet, of Guadalupe River near Comfort Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	1,140	280	317	182	200	298	194	372	134	60	56
2	61	2,100	280	298	182	182	280	194	535	130	60	64
3	61	955	280	298	174	165	280	194	280	125	58	94
4	58	725	280	280	165	165	261	196	244	118	56	70
5	58	495	261	261	160	165	261	197	210	118	56	60
6	58	336	261	252	160	194	261	200	180	117	58	55
7	58	261	261	244	160	207	261	191	152	116	58	52
8	58	244	261	224	165	207	261	213	147	116	58	60
9	58	244	261	244	165	216	495	197	142	112	58	54
10	56	226	261	226	168	226	415	182	137	110	56	50
11	56	244	375	226	171	261	354	181	132	106	55	56
12	53	244	455	226	165	298	336	180	128	102	55	56
13	50	226	865	226	160	298	317	174	123	101	50	140
14	252	455	415	226	165	298	298	174	118	100	52	160
15	455	336	375	220	160	298	279	168	114	100	52	112
16	73	298	356	213	160	317	261	162	110	94	64	88
17	61	298	336	210	166	336	261	157	106	94	44	74
18	45	280	336	207	171	2,100	244	154	102	94	47	76
19	40	261	336	200	177	865	226	152	102	93	58	74
20	38	244	336	200	194	615	226	152	102	76	52	72
21	38	226	336	200	200	535	226	152	102	89	62	70
22	38	220	356	207	194	495	226	142	4,140	86	44	68
23	38	455	366	207	200	475	226	147	475	86	50	60
24	34	336	375	213	204	455	226	147	244	82	48	55
25	34	317	366	213	207	375	226	401	185	79	55	58
26	50	298	356	220	207	375	226	655	174	76	52	62
27	48	280	356	232	200	356	226	280	168	75	52	61
28	56	261	336	244	194	356	226	244	162	74	52	55
29	64	261	336	220	194	336	213	210	157	66	86	61
30	455	261	336	207	-------	326	200	210	152	63	61	54
31	495	-------	336	188	-------	317	-------	210	-------	60	56	-------

NOTE.—Shifting-control method used Apr. 18 to Aug. 10. No record and discharge interpolated on Oct. 7, 14, 28, Nov. 4, 18, 25, 29 Dec. 2, 9, 16, 23, 25, 30, Jan. 1, 6, 13, 20, 27, Feb. 3, 10, 17, 24, Mar. 2, 9, 16, 23, 30, Apr. 6, 13, 20, 27, May 4, 11, 18, 25, 30, June 1, 8, 15, 29, July 6, 13, 27, Aug. 3 and 10.

Monthly discharge of Guadalupe River near Comfort, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	495	34	98.8	6,080
November	2,100	220	418	24,800
December	865	261	346	21,300
January	317	188	231	14,200
February	207	160	178	10,300
March	2,100	165	388	23,800
April	495	200	270	16,100
May	655	142	207	12,700
June	4,140	102	316	18,800
July	134	60	96.5	5,930
August	86	44	55.6	3,420
September	160	50	70.9	4,220
The year	4,140	34	223	162,000

GUADALUPE RIVER NEAR SPRING BRANCH, TEX.

LOCATION.—At New Braunfels-Blanco City highway bridge, known as Esser bridge, 4 miles below Spring Branch, Comal County, and 6 miles below mouth of Curry Creek.

DRAINAGE AREA.—1,430 square miles (measured on topographic maps; United States Army progressive military maps; and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—June 28, 1922, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder attached to downstream side of pier on right bank; attended by E. L. Jonas.

DISCHARGE MEASUREMENTS.—Made by wading or from bridge.

CHANNEL AND CONTROL.—Channel straight for 200 feet above and 700 feet below gage. Bed composed of solid rock and gravel; permanent. Right bank of clay, wooded, and not subject to overflow. Left bank of clay and gravel, covered with grass and brush, and subject to overflow at a stage of about 46 feet. Low-water control is a rock and gravel riffle, 350 feet below gage; probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 9.50 feet at 9.20 a. m. May 26 (discharge, 6,070 second-feet, subject to error due to improper operation of recorder at time); minimum stage, 2.23 feet from 5 p. m. October 11 to midnight October 12 (discharge, 59 second-feet).

1922–1924: Maximum stage from water-stage recorder, 19.75 feet at 6.40 p. m. September 19, 1923 (discharge, 18,200 second-feet); minimum stage, 1.74 feet August 18, 1923 (discharge, 4.7 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 1,000 second-feet; fairly well defined above. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying to rating table mean daily gage height determined from recorder graph by inspection, or by use of planimeter, or by averaging discharge for fractional parts of a day. Records fair.

Discharge measurements of Guadalupe River near Spring Branch, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 16	3.21	430	June 23	6.40	2,440	Aug. 30	2.26	71
Mar. 5	3.53	566	June 25	3.38	498	Sept. 5	2.45	110
May 22	3.23	442	Aug. 1	2.46	109			

Daily discharge, in second-feet, of Guadalupe River near Spring Branch, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	102	358	260	540	379	629	540	623	598	274	100	91
2	93	3,940	284	529	374	605	529	605	667	260	93	82
3	87	3,130	374	523	358	605	518	592	872	243	93	82
4	80	1,420	692	506	364	592	518	686	642	230	89	89
5	74	738	611	467	348	586	501	758	551	217	87	109
6	68	557	512	462	338	562	490	1,360	490	209	89	95
7	64	450	462	462	333	534	484	1,400	450	213	93	82
8	61	384	434	462	328	523	484	772	428	209	89	74
9	61	338	417	456	323	534	648	2,540	411	209	87	76
10	61	308	406	467	323	523	916	931	400	205	87	76
11	61	289	534	473	323	495	712	648	395	194	85	80
12	59	274	1,200	439	333	484	617	580	379	194	82	85
13	62	270	3,000	422	333	523	568	540	369	190	82	596
14	93	358	2,360	406	328	605	540	611	348	166	82	217
15	104	529	1,480	400	313	551	518	605	343	166	78	213
16	163	462	1,240	406	303	523	490	506	284	163	76	154
17	213	390	1,090	395	303	529	484	467	265	160	72	134
18	172	353	1,050	379	328	1,360	456	434	251	157	72	116
19	154	338	977	374	390	940	434	417	238	145	72	109
20	129	328	894	374	557	916	395	400	222	129	72	102
21	116	298	828	364	725	779	422	590	217	129	72	95
22	107	274	786	358	909	738	417	445	284	126	68	100
23	100	260	758	338	725	725	390	369	2,450	124	74	95
24	93	243	705	348	523	686	364	353	740	121	68	91
25	89	234	679	369	523	654	374	333	501	114	62	87
26	87		660	411	648	635	1,360	3,100	417	109	64	82
27	102		642	358	712	623	772	1,560	374	104	64	82
28	129	234	623	353	673	605	686	686	338	126	68	82
29			598	358	642	611	673	580	313	114	70	80
30	130		586	369	-------	586	654	611	298	102	68	78
31			568	369	-------	568	-------	642	-------	102	95	-------

NOTE.—Record incomplete Nov. 1, 25, Dec. 2, 3, 4, 12, 13; discharge estimated. No record, Oct. 29-31 and Nov. 26-30; discharge estimated.

Monthly discharge of Guadalupe River near Spring Branch, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	213	59	102	6,300
November	3,940	----------	590	35,100
December	3,000	260	829	51,000
January	540	338	417	25,700
February	909	303	450	25,900
March	1,360	484	640	39,300
April	1,360	364	565	33,600
May	3,100	333	798	49,100
June	2,450	217	484	28,800
July	274	102	168	10,300
August	100	62	79.1	4,870
September	596	74	118	7,010
The year	3,940	59	437	317,000

GUADALUPE RIVER AT NEW BRAUNFELS, TEX.

LOCATION.—At highway bridge on San Antonio-Austin post road, 700 feet below International-Great Northern Railroad bridge, 1 mile below mouth of Comal River, and 1 mile northeast of center of New Braunfels, Comal County.

DRAINAGE AREA.—1,770 square miles (revised, measured on topographic maps; United States Army progressive military maps; and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—March 13, 1898, to December 30, 1899; January 27, 1915, to September 30, 1924.

GAGE.—Stevens water-stage recorder attached to downstream side of middle pier of highway bridge.

DISCHARGE MEASUREMENTS.—Made from upstream side of bridge.

CHANNEL AND CONTROL.—Bed composed of solid rock with pockets of coarse gravel. Banks composed of gravel, clay, and rock; slightly wooded; not subject to overflow. Rock and gravel shoal below gage serves as control; shifts.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 8.10 feet at 1 a. m. May 27 (discharge, 7,280 second-feet); minimum discharge, 516 second-feet, October 10–13.

1898–1899; 1915–1924: Maximum stage recorded, 28.6 feet at 3 a. m. September 10, 1921 (discharge, 56,600 second-feet, determined from extension of rating curve and subject to error); no flow for several hours on each of numerous days in August, September, and October, 1922, owing to regulation at dam under construction 300 feet above gage.

DIVERSIONS.—Some water diverted for irrigation above station in Kerr and Comal Counties and for waterworks and other municipal uses; amount not known.

REGULATION.—Flow at this point entirely regulated at times by operation of power plants on Comal River and by plant 300 feet above.

ACCURACY.—Stage-discharge relation not permanent owing to dredging operations on control. Rating curve well defined for all stages. Operation of water-stage recorder satisfactory except for breaks in record as indicated in footnote to daily-discharge table. Mean daily gage heights determined from recorder graph by inspection or by use of planimeter. Daily discharge determined by shifting-control method. Records fair.

Discharge measurements of Guadalupe River at New Braunfels, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 18	2.30	677	Apr. 24	2.01	976	June 24	3.34	1,760
Nov. 5	3.28	1,480	May 21	2.34	1,180	Aug. 2	1.60	796
Nov. 20	2.40	831	June 16	2.17	965	Sept. 1	1.10	613
Jan. 15	2.30	1,090	June 24	3.88	2,250	Sept. 5	1.08	522
Mar. 6	2.52	1,300						

Daily discharge, in second-feet, of Guadalupe River at New Braunfels, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	618	736	803	1,120	950	1,270	1,180	1,030	1,540	899	826	618
2	600	994	803	1,060	924	1,240	1,150	1,030	1,900	899	780	618
3	583	3,250	850	1,090	924	1,240	1,180	1,000	1,680	899	780	600
4	566	2,060	1,380	1,090	950	1,240	1,180	1,120	1,580	874		566
5	549	1,540	1,370	1,030	899	1,240	1,180	1,150	1,380	899		549
6	549	1,240	1,210	1,030	850	1,270	1,150	3,500	1,270	899		549
7	549	1,120	1,090	1,060	874	1,240		1,720	1,210	924		566
8	549	1,060	1,000	1,060	874	1,240		1,310	1,150	924		549
9	532	1,000	976	1,060	874	1,240		3,590	1,120	899		549
10	516	950	976	1,090	874	1,270	1,120	2,520	1,060	874		532
11	516	924	950	1,090	899	1,210		1,720	1,030	850		532
12	516	874	2,050	1,090	874	1,210		1,540	1,030	850		532
13	516	874	3,950	1,020	874	1,240		1,470	1,000	874		1,010
14	549	976	3,780	1,060	874	1,310	1,090	1,820	976	850		867
15	566	1,120	2,400	1,060	850	1,310	1,060	3,590	976	874		674
16	600	1,150	1,980	1,060	826	1,210	1,030	1,440	950	850		674
17	674	1,000	1,790	1,000	826	1,240	1,000	1,340	950	850	725	618
18	694	950	1,720	976	1,120	1,270	976	1,270	924	826		600
19	655	899	1,720	976	1,510	1,900	1,000	1,240	924	826		583
20	618	826	1,640	976	1,440	1,470	976	1,210	924	826		566
21	600	803	1,580	976	1,240	1,400	1,000	1,180	924	826		566
22	600	780	1,470	950	1,180	1,270	1,000	1,340	950	826		566
23	566	758	1,370	976	1,150	1,240	1,000	1,150	1,840	826		566
24	566	758	1,340	1,030	1,120	1,210	976	1,120	2,110	826		549
25	549	736	1,240	1,060		1,180	1,170	1,090	1,240	826		549
26	549	736	1,270	1,030	1,130	1,150	2,630	3,970	1,090	826		549
27	549	736	1,270	1,000		1,150	1,540	4,140	1,000	826		532
28	549	736	1,210	1,000	1,440	1,150	1,180	1,980	976	826		532
29	583	758	1,210	1,000	1,340	1,150	1,120	1,640	950	826		532
30	636	850	1,150	1,000	-------	1,150	1,090	1,510	924	826		532
31	736	-------	1,150	976	-------	1,210	-------	1,580	-------	826		-------

NOTE.—Braced figures show estimated mean discharge for periods indicated. Records incomplete, Feb. 28, Apr. 14, and Sept. 1; discharge estimated.

Monthly discharge of Guadalupe River at New Braunfels, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	736	516	581	35,700
November	3,250	736	1,040	61,900
December	3,950	803	1,510	92,600
January	1,120	950	1,030	63,500
February	1,510	826	1,030	59,400
March	1,900	1,150	1,260	77,600
April	2,630	976	1,160	68,800
May	4,140	1,000	1,780	110,000
June	2,110	924	1,190	70,600
July	924	826	857	52,700
August			732	45,000
September	1,010	532	594	35,400
The year	4,140	516	1,060	773,000

GUADALUPE RIVER BELOW CUERO, TEX.

LOCATION.—Three-fourths of a mile upstream from Heards Bridge on Arneckville road and 2½ miles southeast of Cuero, Dewitt County.

DRAINAGE AREA.—5,070 square miles (revised, measured on topographic maps; base map of Texas, scale 1 : 500,000; and United States Army progressive military maps).

RECORDS AVAILABLE.—August 6, 1916, to September 30, 1924 (fragmentary from May 29, 1919, to August 10, 1920). From December 26, 1902, to December 31, 1906, and August 19, 1915, to August 6, 1916, a station was maintained at Schleicher Bridge, 4 miles above this point. Discharge at two sites practically the same.

GAGE.—Stevens water-stage recorder on left bank; inspected by E. B. Dietze.

DISCHARGE MEASUREMENTS.—Made from cable, 40 feet upstream from gage; from Schleicher Highway Bridge; from San Antonio & Aransas Pass Railway bridge, 6 miles upstream; or by wading.

CHANNEL AND CONTROL.—Channel straight above and below station for 1,000 feet. Bed of stream composed of gravel and small rock; shifts slightly. Left bank composed of sand and dirt, covered with brush and open timber, and is overflowed at stages above a gage height of 20 feet, the water submerging an area for 1 mile back from the river. Right bank composed of sand and dirt, covered with brush and trees on sloping side and cultivated land on top, high, and not subject to overflow. Rock and gravel rapid, 250 feet below gage, serves as a control during low and medium stages; shifts slightly.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 18.12 feet at 5 a. m. June 3 (discharge, 14,000 second-feet); minimum stage, 1.23 feet at 10 a. m. October 9 (discharge, 422 second-feet).

1916–1924: Maximum stage occurred about October 20, 1919, when recorder was not in operation and reached a height of about 32.2 feet as determined from floodmarks on gage house (discharge not determined); minimum stage from water-stage recorder, approximately 0.58 foot from 9 to 10 a. m. November 1, 1917 (discharge, 80 second-feet).

DIVERSIONS.—There are numerous small diversions above station for irrigation and municipal uses, but flow is probably not materially affected thereby, except possibly during extremely low stages.

REGULATION.—Flow partly regulated during low and medium stages by operation of water-power plants upstream, chiefly, by a plant about 8 miles above.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined for all stages. Operation of water-stage recorder satisfactory. Daily discharge determined by applying to rating table mean daily gage height determined from recorder graph by inspection, by use of planimeter, and by shifting-control method for the periods October 18 to May 27 and September 12 to 30, or by averaging discharge for fractional parts of a day. Records good.

Discharge measurements of Guadalupe River below Cuero, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 29	2.00	911	Mar. 15	4.46	2,930	Aug. 9	2.12	888
Nov. 25	2.36	1,200	Apr. 18	3.58	2,240	Sept. 11	2.07	937
Jan. 8	3.30	1,970	May 27	3.61	2,240			
Jan. 21	2.90	1,670	July 2	3.45	2,000			

Daily discharge, in second-feet, of Guadalupe River below Cuero, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	890	799	3,340	2,350	1,750	4,460	2,650	2,200	9,520	1,520	955	922
2	890	922	6,000	2,280	1,710	3,100	2,200	2,050	12,400	1,750	890	806
3	806	955	9,380	2,200	1,710	2,950	2,120	1,980	13,200	2,500	922	747
4	858	1,340	12,500	2,120	1,680	2,800	2,050	1,900	8,070	1,450	955	792
5	922	2,650	10,500	2,120	1,680	2,720	2,050	1,860	7,900	1,340	955	780
6	890	3,580	7,820	2,050	1,640	2,650	2,050	1,900	4,060	1,300	922	792
7	858	2,350	6,220	2,050	1,600	2,580	2,050	1,980	2,500	1,300	922	623
8	825	1,710	2,950	1,980	1,600	2,500	1,980	2,280	2,200	1,270	890	812
9	702	1,450	2,280	1,980	1,560	2,420	1,980	2,880	2,120	1,240	858	812
10	653	1,270	2,120	1,980	1,560	2,350	2,800	2,800	2,050	1,240	825	792
11	683	1,160	2,420	1,980	1,600	2,420	5,500	5,340	1,900	1,200	922	780
12	647	1,160	3,580	2,050	1,600	2,350	6,380	6,300	1,820	1,200	858	955
13	754	1,130	5,700	2,050	1,600	2,280	4,540	3,820	1,750	1,160	890	825
14	557	1,130	8,840	1,900	1,600	2,350	3,260	3,180	1,710	1,160	858	721
15	1,060	1,790	11,600	1,860	1,560	2,950	5,020	5,100	1,680	1,160	858	990
16	4,860	2,580	12,800	1,820	1,560	3,100	5,420	6,060	1,640	1,130	825	1,410
17	5,020	4,220	12,000	1,820	1,520	2,580	3,660	8,070	1,600	1,100	780	1,380
18	3,100	2,280	6,090	1,820	1,750	2,420	3,020	6,140	1,520	1,100	890	1,130
19	2,420	1,680	6,430	1,790	4,170	2,350	2,050	2,880	1,490	1,060	858	1,020
20	1,790	1,490	9,860	1,750	8,500	2,350	1,900	2,420	1,450	1,020	825	922
21	1,160	1,380	12,300	1,710	10,400	2,650	1,900	2,280	1,560	1,020	780	858
22	990	1,300	12,700	1,710	9,130	2,880	1,820	2,200	2,120	1,060	858	1,020
23	922	1,270	10,400	1,710	3,260	2,650	1,820	2,050	1,680	1,020	773	1,490
24	922	1,240	7,580	2,500	3,020	2,580	1,820	2,200	4,620	990	740	1,490
25	825	1,200	4,140	3,100	4,220	2,500	1,790	2,200	5,020	990	890	1,060
26	858	1,200	3,020	3,340	5,740	2,420	1,750	2,050	3,180	990	858	922
27	786	1,200	2,800	2,350	8,070	2,350	2,280	2,200	2,280	955	858	890
28	659	1,160	2,650	1,900	10,000	2,280	4,780	3,170	1,790	990	799	665
29	858	1,240	2,580	1,820	9,720	2,280	5,500	6,220	1,600	990	747	858
30	671	3,020	2,500	1,750	-------	2,200	2,880	4,780	1,520	955	760	812
31	818	-------	2,420	1,750	-------	2,650	-------	6,380	-------	990	702	-------

Monthly discharge of Guadalupe River below Cuero, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	5,020	557	1,250	76,700
November	4,220	799	1,660	98,900
December	12,800	2,120	6,630	408,000
January	3,340	1,710	2,050	126,000
February	10,400	1,520	3,640	209,000
March	4,460	2,200	2,620	161,000
April	6,380	1,750	2,970	177,000
May	8,070	1,860	3,450	212,000
June	13,200	1,450	3,530	210,000
July	2,500	955	1,200	73,700
August	955	702	852	52,400
September	1,490	623	936	55,700
The year	13,200	557	2,560	1,860,000

BLANCO RIVER AT WIMBERLEY, TEX.

LOCATION.—At Harrison's resort, 800 feet below mouth of Cypress Creek, 1,200 feet above low-water concrete bridge on San Marcos-Wimberley road, and a quarter of a mile south of Wimberley, Hays County.

DRAINAGE AREA.—378 square miles (measured on topographic maps; United States Army progressive military maps; and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—August 6 to September 30, 1924.

GAGE.—Inclined and vertical staff on left bank; read by L. Harrison.

DISCHARGE MEASUREMENTS.—Made from cable 100 feet above gage or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of rock and gravel; will probably shift. Channel straight for 500 feet above and below gage. Banks sparsely wooded; permanent; not subject to overflow. Solid rock ledge, 200 feet below gage, forms control; permanent and clean.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 3.15 feet at 2 p. m. September 13 (discharge, 1,600 second-feet); minimum stage, 0.44 foot September 9, 10, and 30 (discharge, 28 second-feet).

ICE.—None.

DIVERSIONS.—Negligible.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records good.

The following discharge measurements were made:

August 7, 1924: Gage height, 0.53 foot; discharge, 43 second-feet.

September 4, 1924: Gage height, 45 feet; discharge, 31 second-feet.

Daily discharge, in second-feet, of Blanco River at Wimberley, Tex., for the period August 6 to September 30, 1924

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1		31	11	37	34	21	34	34
2		31	12	35	34	22	34	53
3		32	13	41	776	23	31	43
4		31	14	37	148	24	31	34
5		31	15	37	60	25	31	31
6	41	29	16	37	39	26	31	31
7	41	29	17	37	35	27	31	31
8	37	29	18	37	35	28	31	31
9	37	28	19	34	34	29	31	31
10	37	28	20	34	34	30	31	28
						31	31	

Monthly discharge of Blanco River at Wimberley, Tex., for the period August 6 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
August 6–31	41	31	34.8	1,800
September	776	28	62.5	3,720
The period				5,520

BLANCO RIVER SEEPAGE INVESTIGATION

During the three investigations the river was at a constant stage, and the measurements represent the natural conditions. There was no surface inflow or diversions.

Seepage measurements made on Blanco River between San Marcos-Wimberley crossing at Wimberley and the International-Great Northern Railroad bridge in June and July, 1924

Location	Distance in miles below San Marcos-Wimberley crossing	June 12		July 15–16			July 22	
		Discharge of river	Gain or loss between points of measurement	Discharge of river		Gain or loss between points of measurement	Discharge of river	Gain or loss between points of measurement
				July 15	July 16			
		Sec.-ft.	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*
San Marcos-Wimberley crossing	0	202			64.7			
Dan Nance ranch below Wimberley	3.7				63.2	−1.5		
Falls above Kyle	11.4	231	+29	67.7		+4.5	58.4	
¾ mile below Halifax Creek, near Kyle	13.4						53.8	−4.6
¾ mile below old mill, near Kyle	15.6						45.3	−8.5
International-Great Northern Railroad bridge	19.4	216	−15	51.9		−15.8		

SAN MARCOS RIVER AT OTTINE, TEX.

LOCATION.—At highway bridge one-fourth mile southwest of Ottine, Gonzales County, and 4 miles below mouth of Plum Creek.

DRAINAGE AREA.—Indeterminate.

RECORDS AVAILABLE.—June 22, 1915, to September 30, 1924.

GAGE.—Chain gage attached to upstream handrail of bridge; read by W. C. Meek.

DISCHARGE MEASUREMENTS.—Made from downstream side of highway bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of sand, clay, and gravel; shifts. Banks wooded. Right bank subject to overflow at stage of 28.7 feet and left bank at 34 feet. Channel straight above and below gage for 150 feet. Low-stage control formed by shoal 150 feet below gage. High-stage control is stretch of river channel.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 30 feet at 5.30 p. m. February 18 (discharge, 12,900 second-feet); minimum stage, 2.10 feet at 6 p. m. February 16 (discharge, 53 second-feet).

1915–1924: Maximum stage recorded, 37.5 feet at 7.30 a. m. May 16, 1920 (discharge, 45,600 second-feet, determined from curve extended through one slope measurement at stage 40.6 feet with a discharge of 125,000 second-feet made in 1926; subject to error); no flow at 6.30 p. m. July 29, 1923.

DIVERSIONS.—Small amounts of water are diverted above station for irrigation and municipal uses, but only a small part of total run-off is used. Little water, if any, is diverted below station.

REGULATION.—Flow regulated by operation of small cotton gin a short distance above. The operation of several small water-power plants in the upper drainage basin near San Marcos and Martindale does not materially affect flow at station.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined. Gage read to hundredths twice daily but mean of two readings daily may not be true index to discharge, owing to power regulation. Daily discharge determined by shifting-control method. Records fair.

Daily discharge records for certain periods during the years 1916 to 1923, have been revised and republished in this report.

Discharge measurements of San Marcos River at Ottine, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 31	2.98	224	Mar. 16	6.15	770	July 3	4.09	407
Dec. 2	21.49	[a] 5,340	Apr. 17	5.20	594	Aug. 10	3.12	217
Jan. 22	4.76	427	June 7	5.42	621	Sept. 11	2.82	192

[a] Discharge corrected for changing stage, 5,440 second-feet.

Daily discharge, in second-feet, of San Marcos River at Ottine, Tex., for certain periods during the years 1916–1923

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1916		1919		1919		1920	
Apr. 2	1,860	June 10	1,760	Oct. 31	1,200	Feb. 14	821
Apr. 3	1,980	June 11	2,260	Nov. 1	1,240	Feb. 18	821
Apr. 17	1,070	June 15	1,440	Nov. 2	983	May 8	2,550
May 21	911	June 16	4,620	Nov. 3	1,140	May 9	1,360
May 22	3,810	June 17	9,440	Nov. 4	1,090	May 14	2,360
May 23	2,130	June 18	12,800	Nov. 5	1,070	May 15	7,560
		June 19	2,410	Nov. 6	1,110	May 16	34,400
1917		June 20	1,000	Nov. 8	1,000	May 17	11,200
Apr. 20	2,210	June 21	2,390	Nov. 9	1,000	May 18	3,010
May 6	1,070	June 22	1,720	Nov. 10	2,150	May 19	1,950
May 7	5,560	June 25	2,910	Nov. 11	1,240	May 20	1,140
May 8	1,500	June 26	5,840	Nov. 13	1,060	May 21	815
May 13	2,040	June 27	10,700	Nov. 14	875	May 22	775
May 20	1,920	June 28	6,040	Nov. 15	821	May 28	1,140
		June 29	1,700	Nov. 16	839	June 7	1,780
1918		June 30	1,000	Nov. 30	821	June 13	775
Mar. 28	1,200	July 1	1,640	Dec. 1	839	June 23	1,020
Mar. 29	6,960	July 2	893	Dec. 2	821	June 24	1,140
Mar. 30	1,180	July 8	1,000	Dec. 3	893	Aug. 8	1,360
Apr. 2	1,640	July 9	1,540	Dec. 4	875	Aug. 9	1,540
Apr. 3	1,700	July 10	821	Dec. 19	893	Aug. 10	795
Apr. 6	5,840	July 22	9,440	Dec. 20	821	Aug. 12	1,300
Apr. 7	4,000	July 23	15,900	Dec. 21	875	Aug. 13	3,010
Apr. 29	2,000	July 24	6,800			Aug. 14	3,500
Apr. 30	4,870	July 25	3,730	1920		Aug. 15	1,140
May 6	7,830	July 26	1,700	Jan. 6	2,060	Aug. 22	2,620
May 7	1,400	July 28	1,130	Jan. 7	1,420	Aug. 23	955
Oct. 26	857	July 29	1,240	Jan. 8	1,060		
Oct. 27	3,880	July 30	1,000	Jan. 9	875	1921	
Dec. 13	2,530	July 31	911	Jan. 12	7,260	Mar. 2	1,970
Dec. 14	1,520	Aug. 1	893	Jan. 13	7,030	Mar. 3	935
Dec. 19	2,000	Aug. 2	821	Jan. 14	2,840	Mar. 12	6,780
Dec. 20	1,160	Aug. 22	1,840	Jan. 15	1,130	Mar. 13	4,240
Dec. 21	821	Aug. 23	2,300	Jan. 16	983	Mar. 14	12,900
Dec. 24	1,880	Aug. 24	839	Jan. 17	929	Mar. 15	3,180
Dec. 25	929	Sept. 15	2,440	Jan. 18	857	Apr. 5	1,380
		Sept. 16	6,440	Jan. 19	875	Apr. 6	775
1919		Sept. 17	1,220	Jan. 20	857	Apr. 7	4,560
Jan. 22	5,660	Sept. 18	2,910	Jan. 21	929	Apr. 8	21,100
Jan. 23	4,520	Sept. 19	821	Jan. 22	947	Apr. 9	6,700
Jan. 24	983	Sept. 21	857	Jan. 23	1,240	Apr. 10	1,460
Apr. 3	4,820	Sept. 22	911	Jan. 24	8,360	Apr. 11	1,280
Apr. 4	1,000	Sept. 23	2,810	Jan. 25	5,020	Apr. 12	1,140
Apr. 29	2,690	Sept. 24	5,660	Jan. 26	1,640	Apr. 13	955
Apr. 30	1,760	Sept. 25	2,130	Jan. 27	1,180	Apr. 14	815
May 1	965	Sept. 26	1,140	Jan. 28	1,140	Apr. 15	915
May 7	1,200	Sept. 27	875	Jan. 29	1,130	Apr. 27	915
May 8	3,700	Sept. 28	857	Jan. 30	1,090	June 4	1,340
May 9	1,310	Sept. 29	1,020	Feb. 1	875	June 12	815
May 10	857	Sept. 30	875	Feb. 2	821	June 13	2,720
May 11	1,330	Oct. 1	821	Feb. 3	839	June 14	2,460
May 12	4,820	Oct. 5	1,110	Feb. 4	911	June 15	855
May 13	3,250	Oct. 6–8	[a] 1,700	Feb. 5	875	June 22	1,020
May 18	1,060	Oct. 9	1,560	Feb. 6	911	June 26	995
May 19	1,240	Oct. 10	1,160	Feb. 7	839	July 11	1,140
May 20	1,000	Oct. 11–23	[a] 3,000	Feb. 8	839	July 12	2,080
May 24	3,070	Oct. 24	1,720	Feb. 10	875	Sept. 10	4,110
May 25	3,380	Oct. 25–28	[a] 1,500	Feb. 11	821	Sept. 11	14,600
May 26	1,840	Oct. 29	1,370	Feb. 12	839	Sept. 12	2,960
June 2	1,560	Oct. 30	1,350	Feb. 13	893	Sept. 13	1,180

[a] Estimated mean for period.

Daily discharge, in second-feet, of San Marcos River at Ottine, Tex., for certain periods during the years 1916–1923—Continued

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1921		1922		1922		1923	
Sept. 14	815	May 1	1,220	May 17	1,060	Feb. 22	16,600
Oct. 12	795	May 2	3,210	May 18	1,080	Feb. 23	2,670
		May 3	12,200	May 19	915	Feb. 26	1,180
1922		May 4	12,100	May 20	815	Feb. 27	2,360
Mar. 26	1,580	May 5	4,070	May 23	1,180	Mar. 27	875
Mar. 29	4,800	May 6	2,170	May 24	1,200	Mar. 28	9,520
Mar. 30	13,600	May 7	1,380	May 25	795	Mar. 29	1,930
Mar. 31	1,340	May 8	1,160	May 29	1,500	Apr. 11	1,100
Apr. 4	14,300	May 9	1,100	May 30	855	Apr. 12	3,040
Apr. 5	14,200	May 10	875	June 4	775	Apr. 13	8,250
Apr. 6	1,950	May 11	975	June 6	915	Apr. 14	1,560
Apr. 7	955	May 12	875	June 7	935	May 25	1,060
Apr. 27	2,820	May 13	1,660	June 8	815	Sept. 7	955
Apr. 28	11,300	May 14	2,190	June 11	835	Sept. 8	875
Apr. 29	1,820	May 15	1,080	June 12	815		
Apr. 30	855	May 16	1,780	June 13	775		

NOTE.—Discharges given above supersede records for same periods published in previous reports.

Daily discharge, in second-feet, of San Marcos River at Ottine, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	150	211	1,300	595	399	1,020	635	595	855	1,420	234	190
2	155	272	4,420	555	399	975	615	555	975	536	211	196
3	146	328	2,100	555	390	915	595	517	1,400	408	204	211
4	171	995	3,010	555	381	895	595	536	1,300	381	211	196
5	175	444	3,600	536	363	895	596	555	735	372	241	190
6	103	312	1,220	517	354	855	575	755	655	354	211	186
7	98	264	635	498	354	815	555	1,100	615	363	264	211
8	98	234	615	517	354	775	555	715	595	354	226	211
9	115	211	595	517	346	835	735	655	575	346	211	185
10	145	218	715	575	337	835	2,720	1,820	555	346	211	178
11	115	204	975	715	346	735	1,820	1,520	536	346	211	186
12	116	204	1,420	517	354	715	855	875	517	320	211	211
13	241	204	7,810	462	381	1,020	1,080	735	498	328	204	204
14	2,500	346	9,010	462	346	1,680	1,910	1,100	480	320	204	444
15	4,200	1,560	2,040	462	337	1,020	715	2,850	435	320	204	444
16	1,600	595	1,300	480	172	775	615	1,280	462	312	218	288
17	1,480	408	1,180	498	536	735	595	695	444	288	218	264
18	835	328	1,660	462	5,000	715	536	655	426	288	189	168
19	304	288	2,550	444	8,440	735	517	635	426	280	181	234
20	241	288	1,700	444	2,480	855	517	595	417	272	226	241
21	218	272	1,840	426	1,020	835	517	595	417	272	234	211
22	218	264	1,720	417	755	735	536	575	1,760	272	211	226
23	185	248	1,320	480	775	735	498	655	3,750	264	196	256
24	192	234	895	935	775	695	498	555	1,580	256	204	218
25	185	226	815	895	1,320	655	480	536	536	256	196	241
26	176	241	775	517	5,120	655	1,280	675	480	248	204	226
27	185	218	735	426	3,400	655	2,800	2,650	453	248	218	234
28	175	975	735	417	1,500	655	855	2,020	444	248	226	186
29	179	1,380	695	417	1,120	695	655	795	426	288	234	226
30	176	444	695	435	-------	1,320	635	1,910	417	218	226	196
31	211	-------	675	435	-------	655	-------	1,860	-------	196	193	-------

Monthly discharge of San Marcos River at Ottine, Tex., for the years ending September 30, 1916–1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
1915–16				
October	232	164	194	11,900
November	217	168	184	10,900
December	339	164	190	11,700
January	664	160	227	14,000
February	221	156	174	10,000
March	170	130	156	9,590
April	1,980	133	390	23,200
May	3,810	149	471	29,000
June	240	126	175	10,400
July	313	55	155	9,530
August	493	86	174	10,700
September	175	86	121	7,200
The year	3,810	55	218	158,000
1916–17				
October	183	90	117	7,190
November	141	106	117	6,960
December	133	106	121	7,440
January	141	90	114	7,010
February	137	109	122	6,780
March	137	106	119	7,320
April	2,210	106	254	15,100
May	5,660	106	551	33,900
June	133	87	107	6,370
July	585	61	114	7,010
August	208	43	84.6	5,200
September	175	40	93.2	5,550
The year	5,660	40	160	116,000
1917–18				
October	88	70	77.3	4,750
November	97	76	84.5	5,030
December	107	83	94.2	5,790
January	130	91	101	6,210
February	130	86	100	5,550
March	6,960	78	388	23,800
April	5,840	104	793	47,200
May	7,830	96	466	28,700
June	411	74	122	7,260
July	87	61	73.8	4,540
August	156	59	76.3	4,690
September	199	62	81.5	4,850
The year	7,830	59	205	148,000
1918–19				
October	3,880	65	242	14,900
November	465	80	120	7,140
December	2,530	74	489	30,000
January	5,660	62	591	36,400
February	386	209	281	15,600
March	648	169	248	15,200
April	4,820	145	561	33,400
May	4,820	140	1,150	70,800
June	12,800	231	2,500	149,000
July	15,900	341	1,820	112,000
August	2,300	386	656	40,300
September	6,440	282	1,210	71,700
The year	15,900	62	823	596,000
1919–20				
October	----------	604	2,010	124,000
November	2,150	566	895	53,300
December	893	510	663	40,800
January	8,360	474	1,800	111,000
February	911	680	800	44,400
March	704	402	516	31,700
April	642	314	395	23,500
May	34,400	297	2,510	155,000
June	1,780	420	705	42,000
July	510	246	334	20,500
August	3,500	246	814	50,100
September	384	212	289	17,200
The year	34,400	212	981	714,000

Monthly discharge of San Marcos River at Ottine, Tex., for the years ending September 30, 1916-1924—Continued

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
1920–21				
October	283	195	238	14,600
November	368	211	249	14,800
December	283	206	224	13,800
January	310	195	217	13,300
February	216	190	201	11,200
March	12,900	216	1,220	74,800
April	21,100	258	1,720	102,000
May	496	283	360	22,100
June	2,720	270	641	38,200
July	2,080	128	331	20,300
August	190	114	156	9,590
September	14,600	118	1,030	61,200
The year	21,100	114	547	396,000
1921–22				
October	795	258	323	19,900
November	258	211	227	13,500
December	479	190	212	13,100
January	310	150	187	11,500
February	246	132	178	9,880
March	13,600	132	831	51,100
April	14,300	293	1,910	114,000
May	12,200	533	1,970	121,000
June	935	308	512	30,500
July	308	164	256	15,700
August	234	164	199	12,200
September	192	136	159	9,480
The year	14,300	132	582	422,000
1922–23				
October	398	108	140	8,620
November	293	94	154	9,140
December	192	122	141	8,640
January	220	136	152	9,320
February	16,600	108	978	54,300
March	9,520	164	585	36,000
April	8,250	192	747	44,400
May	1,060	206	273	16,800
June	338	136	191	11,400
July	413	55	183	11,200
August	220	42	133	8,190
September	955	87	253	15,100
The year	16,600	42	322	233,000
1923–24				
October	4,200	98	487	29,900
November	1,560	204	414	24,600
December	9,010	595	1,900	117,000
January	935	417	521	32,100
February	8,440	172	1,310	75,100
March	1,680	655	842	51,700
April	2,800	480	870	51,700
May	2,850	517	1,020	62,600
June	3,750	417	772	45,900
July	1,420	196	346	21,300
August	264	181	214	13,200
September	444	168	229	13,600
The year	8,440	98	742	539,000

NOTE.—Records of monthly discharge for the years ending Sept. 30, 1916–1923, supersede records published in previous reports.

SAN ANTONIO RIVER AT SAN ANTONIO, TEX.

LOCATION.—At South Alamo Street Bridge in San Antonio, Bexar County, 4 miles below San Antonio Springs, source of normal flow of river, and 1¼ miles above mouth of San Pedro Creek.

DRAINAGE AREA.—Indeterminate.

RECORDS AVAILABLE.—January 26, 1915, to September 30, 1924. Miscellaneous discharge measurements were made from 1895 to 1906.

GAGE.—Gurley graph water-stage recorder on right bank at downstream side of bridge.

DISCHARGE MEASUREMENTS.—Made from upstream side of bridge or by wading.

CHANNEL AND CONTROL.—Channel is straight for 100 feet below gage and curved above. Bed composed of sand, gravel, and silt. Control formed by gravel bar; shifts.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 4.48 feet at 8.45 a. m. May 26 (discharge, 648 second-feet); minimum stage, owing to power regulation, 1.05 feet at 10 a. m. October 7 (discharge not determined).

1914–1924: Maximum stage recorded, 20.14 feet about 3 a. m. September 10, 1921, determined from floodmarks on gage (discharge, 15,300 second-feet, determined by slope method, using value of 0.035 and 0.050 for "n" in Kutter's formula), minimum stage, 0.58 foot on several days during November and December, 1918 (discharge, 7.0 second-feet).

ICE.—None.

DIVERSIONS.—Quantity of water diverted above gage not known, but it is believed to be immaterial. Considerable land is irrigated from diversions below the gage.

REGULATION.—The operation of water wheels at the Guenther flour mill, just above gage, causes sharp fluctuations in stage.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined from 19 to 300 second-feet; extended above. Operation of water-stage recorder satisfactory. Mean daily gage heights obtained from recorder graph by inspection or by use of planimeter. Daily discharge determined by shifting-control method. Records good.

The normal flow of San Antonio River comes from springs within the city limits, but two tributaries from the north furnish considerable run-off at time of heavy precipitation. Changes in mean daily stage during low flow are believed to be due to pumping from deep wells for the city water supply and the use of artesian water for irrigation in areas adjacent to the river for it is thought that the wells draw from the underground reservoir that feeds the river by springs.

Discharge measurements of San Antonio River at San Antonio, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 19	1.70	53.6	Feb. 20	2.17	129	Aug. 2	2.20	140
Nov. 22	1.94	87.4	Apr. 21	2.30	156	Sept. 8	2.12	117
Dec. 13	2.48	194	Mar. 24	2.40	175			
Jan. 17	2.22	126	June 20	2.37	176			

Daily discharge, in second-feet, of San Antonio River at San Antonio, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	53	61	100	142	128	147	168	170	213	185	149	117
2	52	58	100	144	128	147	168	170	250	183	147	119
3	52	54	104	142	128	155	170	176	235	183	140	117
4	53	52	122	140	129	155	170	170	207	179	145	119
5	50	57	108	138	129	155	176	172	205	181	144	116
6	54	56	112	136	129	155	168	181	203	178	142	114
7	56	56	114	140	129	153	168	174	203	179	142	111
8	52	58	117	140	129	168	164	172	203	178	142	111
9	48	56	116	140	133	153	179	183	205	176	142	111
10	50	56	122	138	128	157	176	176	205	174	136	111
11	50	57	122	138	133	155	170	174	207	174	138	116
12	50	58	216	136	128	157	172	176	207	172	138	149
13	52	76	190	133	128	166	172	176	207	164	136	144
14	52	138	138	133	126	153	174	195	201	168	135	124
15	55	69	140	131	126	153	174	191	197	166	133	128

Daily discharge, in second-feet, of San Antonio River at San Antonio, Tex., for the year ending September 30, 1924—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
16	56	76	142	129	126	151	172	181	195	164	131	126
17	59	76	149	128	153	158	170	181	189	160	129	128
18	58	84	155	129	162	155	168	181	183	158	131	129
19	56	83	153	129	131	162	162	179	181	158	131	129
20	53	84	151	122	131	160	158	181	178	157	131	129
21	50	86	155	128	129	162	155	178	185	160	129	131
22	54	88	151	126	131	168	153	176	274	157	126	129
23	53	90	149	144	133	162	149	174	187	157	124	126
24	53	89	149	129	131	170	149	174	185	157	124	126
25	53	88	147	126	168	170	157	170	187	157	126	126
26	52	90	151	126	140	170	306	328	189	155	119	126
27	52	90	147	128	140	172	170	199	189	157	117	122
28	49	103	147	135	142	172	172	191	191	158	116	119
29	54	86	147	128	149	172	172	191	185	155	114	122
30	54	90	144	128	-------	168	170	203	187	153	116	122
31	59	-------	142	126	-------	170	-------	191	-------	151	116	-------

NOTE.—Discharge estimated Nov. 2 and partly estimated Nov. 3.

Monthly discharge of San Antonio River at San Antonio, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	59	48	53.0	3,260
November	138	52	75.5	4,490
December	216	100	139	8,530
January	144	122	133	8,200
February	168	126	134	7,730
March	172	147	160	9,860
April	306	149	172	10,200
May	328	170	185	11,400
June	274	178	201	12,000
July	185	151	166	10,200
August	149	114	132	8,110
September	149	111	123	7,330
The year	328	48	140	101,000

SAN ANTONIO RIVER AT CALAVERAS, TEX.

LOCATION.—One-fourth of a mile south of San Antonio & Aransas Pass Railway station in Calaveras, Wilson County, and 1 mile below mouth of Calaveras Creek.

DRAINAGE AREA.—1,780 square miles (revised, measured on topographic maps; United States Army progressive military maps; and base map of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—March 12, 1918, to September 30, 1924.

GAGE.—Vertical staff in five sections on left bank near old brick plant; read by I. M. Smith.

DISCHARGE MEASUREMENTS.—Made from highway bridge, half a mile upstream from gage, or by wading below gage.

CHANNEL AND CONTROL.—Bed composed of sand and clay; shifts. Channel straight above and below station for 150 feet. Banks wooded, right bank subject to overflow only at extremely high stages. Old bricks piled into channel form a semipermanent low-water control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 24.6 feet about 2 p. m. June 23 (discharge, 6,080 second-feet); minimum stage, 1.44 feet October 13 (discharge, 67 second-feet).

1918–1924: Maximum stage recorded, 42.0 feet at 4 a. m. September 11, 1921 (discharge not determined); minimum discharge, 15 second-feet at 8.30 a. m. September 14, 1918.

ICE.—None.

DIVERSIONS.—Medina Dam, which creates a reservoir whose storage capacity is 254,000 acre-feet, is situated on Medina River about 50 miles above its confluence with the San Antonio. The diversion works, having a capacity of 850 second-feet, are 4 miles below Medina Dam. About 5,000 acres in this project were irrigated in 1922.

REGULATION.—The ordinary flow may be slightly affected by storage and diversions on Medina River.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined from 30 to 1,500 second-feet; extended above by means of the $A\sqrt{d}$ method based on measurement with discharge of 11,000 second-feet. Gage read to hundredths twice daily, but mean of two readings daily may not be true index to discharge, owing to rapid fluctuations. Daily discharge ascertained by shifting-control method except for the period June 5–8 when the discharge was interpolated. Records fair for low and medium stages; poor for high stages.

Discharge measurements of San Antonio River at Calaveras, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 20	1.89	119	Mar. 8	3.70	275	June 20	4.08	304
Nov. 23	2.76	189	Apr. 21	3.64	271	Aug. 8	3.07	196
Jan. 18	3.30	247	May 24	3.98	304	Sept. 9	2.68	176

Daily discharge, in second-feet, of San Antonio River at Calaveras, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	77	122	361	286	240	286	286	374	726	414	218	179
2	77	108	633	286	240	361	286	361	3,100	414	208	179
3	77	162	498	286	229	361	286	348	2,110	414	208	179
4	77	146	528	286	240	298	274	322	648	374	208	179
5	77	138	513	262	229	298	274	274	591	361	208	179
6	77	138	513	262	229	274	262	387	533	361	208	170
7	77	138	361	262	218	274	262	374	476	348	208	170
8	77	138	229	274	229	274	251	361	418	335	208	179
9	72	138	240	262	218	274	262	348	361	310	208	179
10	72	130	251	262	218	274	348	400	361	310	208	170
11	72	130	262	262	229	262	528	361	361	298	198	170
12	72	138	742	262	322	262	361	348	335	298	198	251
13	67	138	2,110	262	218	298	361	348	310	298	198	1,860
14	188	633	1,090	262	218	387	298	335	310	298	188	513
15	498	1,160	387	310	218	286	286	790	298	310	188	188
16	470	678	310	262	218	286	298	678	286	310	188	170
17	138	603	286	262	361	298	286	322	298	298	198	170
18	130	262	310	251	2,290	286	274	322	298	298	188	170
19	115	208	335	240	934	298	274	322	298	262	188	162
20	122	198	335	240	387	543	274	322	298	251	179	162
21	122	198	335	229	286	310	262	310	374	229	179	162
22	122	108	335	240	274	310	262	322	3,160	240	179	162
23	122	198	335	374	262	310	262	310	5,020	240	179	154
24	122	198	298	588	208	298	262	310	2,030	262	179	154
25	122	188	298	286	428	298	274	298	710	251	179	154
26	122	198	286	240	528	298	543	663	543	240	179	154
27	115	198	298	240	470	286	1,390	2,130	484	240	179	154
28	122	251	286	251	335	286	1,310	822	442	229	179	154
29	115	188	286	387	298	286	758	456	428	229	179	146
30	122	198	286	374	-------	286	414	822	414	218	179	146
31	122	-------	286	374	-------	286	-------	934	-------	218	179	-------

Monthly discharge of San Antonio River at Calaveras, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	498	67	128	7,850
November	1,160	108	248	14,700
December	2,110	229	439	27,000
January	588	229	288	17,700
February	2,290	218	372	21,400
March	543	262	304	18,700
April	1,390	251	392	23,300
May	2,130	274	486	29,900
June	5,020	286	867	51,600
July	414	218	295	18,200
August	218	179	193	11,800
September	1,860	146	237	14,100
The year	5,020	67	353	256,009

SAN ANTONIO RIVER AT GOLIAD, TEX.

LOCATION.—At Galveston, Harrisburg & San Antonio Railroad bridge in Goliad, Goliad County, 6½ miles above mouth of Manahentta Creek.

DRAINAGE AREA.—3,910 square miles (measured on topographic maps; United States Army progressive military maps; and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—June 19 to September 30, 1924.

GAGE.—Chain gage attached to upstream guardrail bridge; read by D. L. Donaho or J. T. Lacy.

DISCHARGE MEASUREMENTS.—Made from railroad bridge or by wading near gage.

CHANNEL AND CONTROL.—Bed of stream composed of sand; subject to shift. Channel straight for 150 feet above and half a mile below gage. Right bank slopes gently; covered with heavy growth of brush and light timber; subject to overflow at medium stages. Left bank covered with heavy growth of brush and light timber; not subject to overflow. Control is indefinite and formed by the bed and banks of the stream.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 21.90 feet at 5.05 p. m. June 25 (discharge, 5,100 second-feet); minimum stage, 4.58 feet at 5 p. m. September 11 (discharge, 200 second-feet).

ICE.—None.

DIVERSIONS.—Medina Dam, which creates a reservoir, whose storage capacity is 254,000 acre-feet, is on Medina River about 50 miles above its confluence with San Antonio River. The diversion works having a capacity of 850 second-feet are 4 miles below the Medina Dam.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined from 95 to 2,000 second-feet; fairly well defined to 12,000 second-feet. Gage read to hundredths twice daily. Daily discharge determined by shifting-control method. Records fair.

Discharge measurements of San Antonio River at Goliad, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
June 19	5.81	404	Sept. 15	7.79	776	Sept. 15	9.94	1,280
Aug. 8	5.11	249	Do	8.66	1,030	Sept. 16	9.20	1,100
Sept. 10	4.58	199	Do	9.54	1,180			

Daily discharge, in second-feet, of San Antonio River at Goliad, Tex., for the year ending September 30, 1924

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1		594	259	216	16		340	216	954
2		714	259	216	17		323	216	445
3		499	244	203	18		340	216	306
4		463	244	203	19	391	340	230	274
5		427	244	203	20	409	323	230	259
6		409	244	203	21	481	323	230	244
7		409	244	203	22	575	306	230	230
8		391	244	203	23	2,850	290	230	340
9		391	244	203	24	4,640	274	230	274
10		391	244	203	25	5,010	274	230	244
11		357	230	203	26	3,360	274	216	230
12		357	244	216	27	1,430	290	216	230
13		357	244	230	28	714	290	216	216
14		340	244	230	29	575	274	216	216
15		340	230	886	30	556	259	216	216
					31		259	216	

Monthly discharge of San Antonio River at Goliad, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
June 19–30	5,010	391	1,750	41,600
July	714	259	362	22,300
August	259	216	233	14,300
September	954	203	283	16,900
The period				95,100

SAN PEDRO CREEK AT SAN ANTONIO, TEX.

LOCATION.—At south end of Missouri, Kansas & Texas Railway culvert, 50 feet west of tracks, 700 feet south of its terminal, 200 feet south of Arsenal Street crossing, 1 mile above mouth of Salsamora and Martinez Creeks, 2 miles below San Pedro Springs, its source, and 2½ miles above confluence with San Antonio River.

DRAINAGE AREA.—Indeterminate.

RECORDS AVAILABLE.—July 20, 1916, to September 30, 1924.

GAGE.—Gurley 7-day water-stage recorder installed March 14, 1921; attended by engineers of city of San Antonio.

DISCHARGE MEASUREMENTS.—Made by wading near gage or from bridge near by.

CHANNEL AND CONTROL.—Bed and banks composed of smooth concrete; permanent. Low-stage control is a 4 by 4 inch timber bolted across bed of flume.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 6.38 feet at 11.50 p. m. April 25 (discharge, 1,070 second-feet, determined from extension of rating curve); minimum stage, 0.40 foot at 6 p. m. October 11 to 1.30 a. m. October 12 (discharge, 3.4 second-feet).

1916–1924: Maximum stage recorded, 8.6 feet at 11.30 p. m. September 9, 1921, when backwater from Alizan Creek existed (discharge not determined); minimum stage recorded, 1.30 feet December 10 and 11, 1918 (discharge, 0.7 second-foot).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—Flow partly regulated by small dam at swimming pool in San Pedro Park, a few miles above.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 200 second-feet and extended above by means of Kutter's formula with a value of 0.014 for "n" at a gage height of 6 feet. Operation of water-stage recorder satisfactory, except for short breaks in the record. Daily discharge determined by applying to rating table mean daily gage heights obtained from recorder graph by inspection or by use of the planimeter, or by averaging discharge for fractional parts of a day, except for the periods January 28 to April 25 and June 23 to July 14, when shifting-control method was used, and as noted in footnote to daily-discharge table. Records good.

Entire flow of San Pedro Creek, except during times of heavy precipitation, is furnished by San Pedro Springs and the flow at this station is believed to be that which reaches San Antonio River. Martinez and Salsamora Creeks carry no water except during heavy local rains, and have been known to be dry for several years at a time.

Discharge measurements of San Pedro Creek at San Antonio, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft*		*Feet*	*Sec.-ft.*
Oct. 19	0.36	1.7	Apr. 22	0.60	11	June 22	1.15	45
Jan. 17	.63	15	May 24	.66	17	Aug. 4	.58	11
Feb. 20	.40	2.9	June 22	1.28	61	Sept. 8	.54	9.7

Daily discharge, in second-feet, of San Pedro Creek at San Antonio, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.5	12	6.0	7.0	9.0	8.5	12	24	22	13	9.0	9.0
2	7.0	6.5	7.2	6.5	7.5	13	13	25	22	15	9.0	10
3	8.5	6.0	8.5	6.0	10	9.6	14	29	16	15	9.6	11
4	7.0	7.5	9.0	6.5	10	10	13	25	15	14	13	8.0
5	5.6	7.5	6.0	5.2	10	10	14	25	17	14	12	8.5
6	6.5	7.5	6.0	7.0	9.6	9.6	17	27	16	14	13	8.5
7	6.5	6.5	5.6	8.0	9.6	9.6	17	25	19	14	11	11
8	6.5	6.5	4.8	8.5	10	12	19	23	22	14	11	7.0
9	6.0	5.6	7.5	9.6	6.5	13	24	28	25	16	11	8.5
10	10	6.5	12	11	9.0	13	19	21	17	16	12	11
11	4.0	7.5	11	11	9.0	13	13	22	17	14	12	9.0
12	5.2	9.6	29	12	5.6	15	11	22	17	14	10	20
13	8.5	16	17	12	9.6	20	13	22	17	14	12	22
14	9.0	28	9.6	13	9.0	11	13	28	17	14	10	25
15	8.5	10	6.5	13	9.0	11	13	23	17	8.0	11	19
16	9.0	9.0	8.5	14	5.6	11	13	20	19	9.6	11	15
17	10	7.5	10	8.0	25	13	13	19	20	9.6	13	16
18	8.0	13	11	7.0	21	12	10	19	19	8.5	11	9.6
19	6.5	9.6	9.0	9.6	12	13	10	19	17	8.0	11	9.6
20	4.4	8.5	8.0	14	9.6	11	10	17	14	8.0	14	9.6
21	8.5	8.5	7.5	12	10	12	10	19	17	8.0	9.6	13
22	8.0	6.5	6.5	13	9.6	14	10	17	84	8.5	10	9.6
23	6.0	8.5	8.0	18	8.5	11	13	16	17	9.0		9.0
24	6.0	6.0	5.6	11	13	14	8.5	18	16	9.0		12
25	6.0	8.5	6.0	9.6	25	13	16	19	16	8.0		8.5
26	6.0	9.0	7.0	8.5	12	11	98	84	14	8.5	10	9.6
27	5.2	7.5	7.0	12	12	9.6	29	14	13	8.5		9.6
28	8.0	11	7.0	14	11	12	27	15	14	9.0		9.6
29	7.5	5.2	6.0	9.6	16	11	26	13	14	9.6		10
30	7.0	4.8	7.0	9.6	-------	11	25	17	14	10	10	8.0
31	10	-------	6.0	8.5	-------	12	-------	16	-------	11	13	-------

NOTE.—Discharge interpolated Dec. 1, 2, June 12 and 13. Discharge estimated Aug. 23–29. Discharge partly estimated Dec. 3, June 14, and Aug. 2–4.

Monthly discharge of San Pedro Creek at San Antonio, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	10	4.0	7.14	439
November	28	4.8	8.88	528
December	29	4.8	8.57	527
January	18	5.2	10.2	624
February	25	5.6	11.2	642
March	20	8.5	11.9	732
April	98	8.5	18.1	1,080
May	84	13	22.9	1,410
June	84	13	19.5	1,160
July	16	8.0	11.3	698
August	14	9.0	10.9	671
September	25	7.0	11.5	687
The year	98	4.0	12.7	9,200

MEDINA RIVER NEAR PIPE CREEK, TEX.

LOCATION.—2 miles below mouth of Privilege Creek, 3 miles above backwater from Medina Dam, 3½ miles above mouth of Pipe Creek, and 4 miles southwest of Pipe Creek post office, Bandera County.

DRAINAGE AREA.—412 square miles (measured on United States Army progressive military maps).

RECORDS AVAILABLE.—December 6, 1922, to September 30, 1924.

GAGE.—Stevens 8-day water-stage recorder on left bank; inspected by R. E. Buck.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Bed of stream consists of rock and gravel. Channel is straight for 1,000 feet above and below gage. Right bank rocky and not subject to overflow; left bank of sand has gentle incline, is sparsely covered with small trees, and begins to be overflowed at gage height of 9 feet. Low-water control is a concrete weir, 100 feet below gage. Weir is about 1.5 feet high for a distance of 95 feet with abutments 4 feet higher than the crest. A rock riffle 600 feet below gage serves as control for medium stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during the year, 8.10 feet at 8.55 a. m. May 26 (discharge, 4,080 second-feet, determined by floats); minimum discharge, 13 second-feet October 6.

1922–1924: Maximum stage recorded from water-stage recorder, 15.36 feet at 1 p. m. April 25, 1923 (discharge not determined); minimum stage, 0.62 foot August 27–29 and September 4, 1923 (discharge, 5.4 second-feet).

DIVERSIONS.—None above. Medina Dam, which creates a reservoir whose storage capacity is 254,000 acre-feet, is 19 miles below. Diversion works have a capacity of 850 second-feet, but only a small percentage of this capacity was used in 1923 and 1924.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 300 second-feet and extended above by means of the formula $Q = Clh^{3/2}$, using a coefficient for C derived from meter measurements at the station, and by one measurement made by floats at a stage of 8.10 feet. Operation of the water-stage recorder satisfactory except for short breaks in the record. Daily discharge ascertained by applying to rating table mean daily gage height determined from recorder graph by inspection, by use of the planimeter, or by averaging discharge for fractional parts of a day; shifting-control method used May 27 to September 30. Records for low stages good; for high stages poor.

Discharge measurements of Medina River near Pipe Creek, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 21	1.73	252	May 26	8.10	[a] 4,080	Aug. 4	0.75	52
Feb. 29	1.72	258	June 24	1.32	168	Sept. 6	.68	21
Apr. 20	1.45	170						

[a] Velocity determined by timing drift.

Daily discharge, in second-feet, of Medina River near Pipe Creek, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	278	177	259	142	247	272	120	174	89	56	25
2	23	1,350	177	256	134	247	266	117	321	87	56	25
3	20	628	182	247	132	247	262	120	180	83	54	22
4	17	349	313	235	122	247	253	152	150	83	52	26
5	14	284	275	217	117	244	247	129	137	81	48	30
6	13	235	256	211	115	250	238	894	129	81	48	23
7	23	197	247	205	112	232	229	220	120	79	48	30
8	23	177	226	205	112	232	223	155	117	79	46	35
9	22	166	214	202	110	223	366	134	112	76	46	30
10	19	155	284	202	108	208	360	134	110	72	46	26
11	19	144	374	188	108	205	294	127	105	72	42	25
12	19	147	650	185	108	205	259	115	101	70	41	33
13	83	142	973	174	108	278	247	110	94	76	39	81
14		853	694	168	103	247	235	108	87	74	37	66
15		565	586	168	101	235	223	105	83	72	35	54
16	142	430	516	171	101	226	220	98	81	72	35	44
17		360	481	157	98	543	202	98		70	33	39
18		323	474	150	425	481	191	94		68	33	35
19		307	452	147	262	408	185	89		66	32	33
20	81	278	426	139	226	384	177	87	75	66	32	30
21	76	250	377	134	205	357	171	96		66	32	49
22	70	229	398	134	200	360	163	83		66	30	200
23	66	217	363	150	200	353	157	81	270	64	28	37
24	60	205	349	155	208	330	150	79	168	62	26	32
25	56	202	340	139	238	323	152	74	134	60	30	28
26	66	188	326	129	275	326	191	1,520	108	62	30	26
27	92	174	323	122	256	310	144	505	103	62	28	26
28	81	281	310	134	253	304	137	281	98	60	26	26
29	72	214	297	144	253	300	139	238	92	58	26	26
30	68	191	291	139	-------	297	129	188	87	58	23	25
31	76	-------	278	180	-------	288	-------	168	-------	58	23	-------

NOTE.—Shifting-control method used May 27 to Sept. 30. Braced figures show estimated mean discharge for periods included. Record incomplete and discharge partly estimated Oct. 20, 26, 27, Nov. 1–11, and June 1.

Monthly discharge of Medina River near Pipe Creek, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	----------	13	65.8	4,040
November	1,350	142	317	18,900
December	973	177	375	23,100
January	259	122	176	10,800
February	425	98	170	9,780
March	543	205	295	18,100
April	366	129	216	12,900
May	1,520	74	210	12,900
June	321	----------	120	7,160
July	89	58	70.7	4,350
August	56	23	37.5	2,300
September	200	22	39.6	2,350
The year	1,520	13	174	127,000

MEDINA RIVER NEAR RIOMEDINA, TEX.

LOCATION.—Just above Medina Valley Irrigation Co.'s diversion dam, 1 mile above Haby's crossing, 4 miles below the company's main dam, and 6 miles northwest of Riomedina, Medina County.

DRAINAGE AREA.—606 square miles (measured on United States Army progressive military maps).

RECORDS AVAILABLE.—January 21, 1922, to September 30, 1924.

GAGE.—Gurley graph water-stage recorder, attached to right upstream side of diversion dam; attended by J. B. Milam.

DISCHARGE MEASUREMENTS.—Made from cable, 2,000 feet below gage, or by wading near Haby's crossing, 1 mile below gage.

CHANNEL AND CONTROL.—Channel composed of rock and gravel; permanent Banks composed of rock and earth, high; not subject to overflow. Control consists of concrete spillway dam; permanent. Point of zero flow over dam is 0.60 foot.

EXTREMES OF DISCHARGE.—Maximum stage during the year from water-stage recorder 1.70 feet at 2 a. m. April 26 (discharge not determined); no flow for several periods.

1922–1924: Maximum stage that of April 26, 1924; no flow over the dam for several periods.

DIVERSIONS.—Water is diverted to Medina Canal just above gage. About 5,000 acres irrigated in 1922. Maximum capacity of canal, 850 second-feet. See "Medina Canal near Riomedina."

REGULATION.—Flow regulated by main storage dam, 4 miles upstream, except when main reservoir is full and water flows over spillway.

ACCURACY.—Stage-discharge relation permanent. Curve for flow over the dam well defined below 45 second-feet and extended above by means of weir formula with low-water coefficients determined from meter measurements. A seepage curve, giving the relation of the height of the water behind the dam and seepage past the dam, measured 1 mile below, is well defined for all lake levels. Operation of water-stage recorder satisfactory. Daily discharge determined by applying to rating table mean daily gage heights determined from recorder graph by inspection, or by use of the planimeter, or by averaging discharge for fractional parts of a day. Mean monthly seepage past the dam determined by applying to the seepage rating table mean monthly lake levels obtained by averaging Medina Valley Co.'s daily gage readings. Records fair.

COOPERATION.—Medina Valley Irrigation Co. furnishes daily gage readings of lake level which are used to determine monthly seepage.

Discharge measurements of Medina River near Riomedina, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 22	−0.27	[a] 27	June 26	0.76	[b] 61	Sept. 7	−1.80	[c] 27
Mar. 7	.16	[a] 27	Aug. 5	−1.32	[a] 28			
May 23	.70	[b] 41	Sept. 7	−1.80	[c] 17			

[a] No flow over dam, discharge represents seepage inflow between dam and measuring section.
[b] Discharge includes the flow over the dam and the seepage inflow between the dam and the measuring section.
[c] Measured at 400 feet below dam and not total seepage.

Daily discharge, in second-feet, of Medina River near Riomedina, Tex., for the year ending September 30, 1924

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Sept.
1		4.2		6.9	23	50	30	26	
2		6.9		1.9	20	45	35	20	
3		5.5			12	35	30	20	
4					6.9	26	26	20	
5					4.2	26	26	12	
6					1.9	40	23		
7						26	26		
8						26	23		
9						26	20		
10						26	12		
11					6.9	26	3.0	4.2	
12		3.0		6.9	26	26			
13		4.2		6.9	26	26			
14		4.2		8.5	30	23			
15	17			14	26	14			
16	23			14	26	14			
17	23			26	12	14			
18	23			26	14	14			
19	20			35	14	14			
20	20			30	14	14			
21	17			30	14	14			3.0
22	14			35	8.5	14	4.8		5.5
23	8.5	12		17	5.5	14	113		6.9
24	10	10		14	.9	14	45		8.5
25	10	8.5		17	14	8.5	30		12
26	10	10		20	261	30	35		12
27	10	20	6.9	26	50	23	35		6.9
28	8.5	26	14	30	45	23	35		
29	10	26	14	26	45	23	35		
30	17	20		35	40	23	30		
31	5.5	1.9		26		26			

NOTE.—No flow on days for which no discharge is given.

Monthly discharge of Medina River near Riomedina, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
December	23	0	7.95	489
January	26	0	5.24	322
February	14	0	1.20	69.2
March	35	0	14.6	897
April	261	0	24.9	1,490
May	50	8.5	23.3	1,440
June	113	0	20.6	1,220
July	26	0	3.30	203
September	12	0	1.83	109
The year	261	0	8.58	6,230

NOTE.—Dry October, November, and August. The mean seepage past the gaging station near Riomedina was 27 second-feet for each month, measured at Haby's crossing 1 mile below the dam.

MEDINA CANAL NEAR RIOMEDINA, TEX.

LOCATION.—Just above upper end of flume No. 1 on Medina Valley Irrigation Co.'s main canal, one-third of a mile below head of canal, and 6 miles north of Riomedina, Medina County.

RECORDS AVAILABLE.—March 30, 1922, to September 30, 1924. Station maintained during irrigation seasons of 1920 and 1921 by United States Department of Agriculture in cooperation with Texas Board of Water Engineers for seepage studies.

GAGE.—Gurley graph water-stage recorder.

DISCHARGE MEASUREMENTS.—Made by wading or from footplank just above gage.

CHANNEL AND CONTROL.—Metal flume and concrete-lined canal; permanent.

EXTREMES OF DISCHARGE.—Maximum stage from water-stage recorder, 1.79 feet from 6 a. m. to 4 p. m. June 21 (discharge, 99 second-feet); no flow during numerous periods.

1922–1924: Maximum stage from water-stage recorder, 2.07 feet from 8 a. m. to noon June 26, 1923 (discharge, 128 second-feet); no flow for several periods.

DIVERSIONS.—Above all diversions from canal.

REGULATION.—Flow controlled by head gates. Canal ordinarily carries a small flow during nonirrigation season for domestic use and water for stock.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined for all stages. Operation of water-stage recorder satisfactory. Daily discharge determined by applying to rating table mean daily gage height ascertained from recorder graph by inspection, by use of planimeter, or by averaging discharge for fractional parts of a day. Records good.

Canal diverts from right bank of Medina River. Water used for irrigation near Lacoste and Natalia.

Discharge measurements of Medina Canal near Riomedina, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 22	0.18	3.9	May 23	0.61	15	Aug. 5	1.42	55
Mar. 7	.14	3.7	June 26	.46	10	Sept. 7	1.13	40

Daily discharge, in second-feet, of Medina Canal near Riomedina, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	16	-------	3.1	18	12	-------	7	-------	15	59	44
2	-------	3.6	-------	4.3	19	21	14	15	-------	15	59	48
3	-------	-------	-------	13	20	21	21	15	-------	15	64	51
4	-------	-------	-------	12	10	21	21	15	-------	15	59	51
5	-------	-------	-------	12	5.0	21	21	15	0.9	22	59	51
6	-------	-------	-------	15	4.1	31	25	15	4.5	32	59	41
7	-------	-------	-------	19	4.0	15	30	11	4.3	38	55	41
8	-------	-------	-------	12	11	2.9	41		8.9	48	59	44
9	-------	-------	-------	5.6	17	1.0	35		15	48	55	44
10	-------	1.9	-------	4.1	18	2.9	6.3		23	48	59	48
11	-------	7.0	16	44	19	4.7	5.8		29	48	59	41
12	-------	16	17	3.6	21	2.0	5.0		29	55	55	27
13	38	16	2.6	3.1	6.7	-------	3.8		30	68	55	9.2
14	38	2.6	-------	11	-------	-------	3.1		35	78	59	4.5
15	23	6.3	-------	15	-------	-------	2.8	15	38	78	55	4.3
16	19	7.9	-------	15	-------	-------	3.3		41	64	64	4.3
17	16	7.9	-------	5.6	-------	4.3	13		51	64	64	13
18	15	7.5	-------	3.0	-------	-------	13		73	64	59	28
19	14	4.7	-------	-------	-------	-------	13		78	73	59	10
20	12	4.5	-------	-------	-------	-------	13		83	64	59	9.2
21	12	4.1	-------	-------	-------	-------	17		94	64	59	12
22	12	4.0	-------	-------	-------	-------	20		9.6	64	55	13
23	13	4.1	-------	-------	-------	10	23	15	4.0	59	55	13
24	15	3.6	-------	-------	9.2	20	27	15	11	55	55	13
25	14	1.3	-------	-------	7.6	13	11	8.7	15	55	48	13
26	12	.7	-------	-------	-------	13	-------	3.1	8.9	55	48	15
27	12	-------	-------	-------	-------	13	-------	2.9	8.9	48	48	19
28	12	-------	-------	-------	-------	8.2	7.5	2.5	9.7	51	44	19
29	12	-------	-------	-------	-------	7.5	5.8	5.7	11	64	41	19
30	16	-------	2.9	3.0	-------	6.3	1.8	-------	17	64	41	19
31	17	-------	3.8	17	-------	-------	-------	-------	-------	64	41	-------

NOTE.—Dry on days for which no discharge is given. No record May 8–22; discharge estimated from Medina Valley Irrigation Co.'s gage-height record. Record incomplete and discharge partly estimated Jan. 6, May 7, Aug. 9, and Sept. 7.

Monthly discharge of Medina Canal near Riomedina, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October (19 days)	38	12	16.9	639
November (19 days)	16	.7	6.30	237
December (5 days)	17	2.6	8.46	83.9
January (20 days)	44	3.0	11.0	437
February (15 days)	21	4.0	12.6	376
March (21 days)	31	1.0	11.9	497
April (27 days)	41	1.8	14.9	800
May (29 days)	15	2.5	12.8	736
June (26 days)	94	.9	28.2	1,450
July	78	15	51.5	3,160
August	64	41	55.2	3,390
September	51	4.3	25.6	1,520
The year				13,300

CIBOLO CREEK AT SUTHERLAND SPRINGS, TEX.

LOCATION.—At highway bridge in Sutherland Springs, Wilson County, and 25 miles above confluence with San Antonio River.

DRAINAGE AREA.—665 square miles (measured on topographic maps; United States Army progressive military maps; and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—June 22 to September 30, 1924.

GAGE.—Vertical staff in two sections on right bank at upstream side of highway bridge; read by J. S. Lane.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Channel straight for 500 feet above and below gage. Bed of stream composed of sandy clay; clean; shifts. Banks are steep, covered with heavy growth of brush and small timber; fairly permanent. Left bank not subject to overflow; right bank subject to overflow at a stage of about 39 feet at which time gage can not be reached from right bank. Control is rock shoal, a quarter of a mile below gage; permanent except for drift and vegetation.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 8.48 feet at 10.20 a. m. June 23 (discharge, 1,700 second-feet); minimum discharge, 7.4 second-feet on September 20.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve fairly well defined below 1,600 second-feet. Gage read to hundredths twice daily. Daily discharge determined by shifting-control method. Records good.

Discharge measurements of Cibolo Creek at Sutherland Springs, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
June 23	8.19	1,550	Sept. 8	2.42	18
June 25	2.80	76	Sept. 14	3.73	165
Aug. 6	2.30	20			

Daily discharge, in second-feet, of Cibolo Creek at Sutherland Springs, Tex., for the year ending September 30, 1924

Day	June	July	Aug.	Sept.	Day	June	July	Aug.	Sept.
1		42	22	20	16		23	18	12
2		34	22	20	17		22	22	11
3		29	20	20	18		22	22	12
4		28	20	19	19		22	21	7.7
5		26	20	18	20		23	20	7.4
6		26	20	18	21		24	21	10
7		26	20	18	22	127	24	20	13
8		24	18	18	23	990	25	21	8.8
9		24	18	18	24	142	26	22	8.4
10		24	17	18	25	76	26	22	7.7
11		24	17	20	26	48	23	19	7.7
12		23	16	24	27	37	21	19	8.1
13		23	17	20	28	32	20	20	8.1
14		23	18	150	29	31	22	20	8.1
15		23	17	28	30	29	22	20	8.1
					31		22	21	

Monthly discharge of Cibolo Creek at Sutherland Springs, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
June 22–30	990	29	168	3,000
July	42	20	24.7	1,520
August	22	16	19.7	1,210
September	150	7.4	18.9	1,120
The period				6,850

NUECES RIVER BASIN

NUECES RIVER AT LAGUNA, TEX.

LOCATION.—200 feet east of Old Spanish Trail, half a mile above Nueces River crossing, half a mile below Laguna, Uvalde County.

DRAINAGE AREA.—764 square miles (measured on topographic maps; base map of Texas, scale 1 : 500,000; and United States Army progressive military maps).

RECORDS AVAILABLE.—October 25, 1923, to September 30, 1924.

GAGE.—Combined vertical and inclined staff on right bank; read by Lilly Secrest.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Channel straight for a quarter of a mile above and half a mile below gage. Bed of stream composed of rock overlain with gravel; shifts. Right bank of rock, fairly clean, permanent, and does not overflow; left bank of gravel and sand, covered with trees and brush, subject to overflow at high stages. Control is rock and gravel shoal just below gage; shifts. At extremely low stages large part of flow may go through gravel bar on left bank.

EXTREMES OF DISCHARGE.—Maximum stage during period of record, 4.02 feet at 9 a. m. October 30 (discharge, 2,220 second-feet); minimum discharge, 8.9 second-feet September 9–11.

By levels to distinct drift line, the flood of September 21, 1923, reached a stage of 23.23 feet. This and the flood of 1913, which reached about the same stage, are the highest known.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined from 5 to 400 second-feet; extended above through one measurement made at a stage of 23.23 feet with discharge of 74,500 second-feet, determined by slope method using Kutter's formula with a value of 0.050 for "n." Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table using shifting-control method October 25 to November 1 and May 26 to September 30. Records good.

Discharge measurements of Nueces River at Laguna, Tex., during the years ending September 30, 1923 and 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
1923	*Feet*	*Sec.-ft.*	1924	*Feet*	*Sec.-ft.*	1924	*Feet*	*Sec.-ft.*
Sept. 21	23.23	[a] 74,500	Jan. 30	1.08	122	July 9	0.61	46
Oct. 25	1.52	155	Mar. 23	1.13	149	Aug. 13	.50	17
Nov. 20	1.87	385	Apr. 15	1.12	141	Sept. 6	.45	9.9
Nov. 30	1.60	271	May 29	.92	100			

[a] Discharge by slope method, using Kutter's formula.

Daily discharge, in second-feet, of Nueces River at Laguna, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	1,110	266	181	136	122	159	99	86	}	24	13
2	-------	2,090	282	178	126	122	152	99	94		21	14
3	-------	1,250	266	173	126	119	152	94	99		21	13
4	-------	936	282	165	126	112	146	103	92		21	12
5	-------	781	266	162	129	117	149	99	86	} 50	21	10
6	-------	614	249	162	122	122	152	101	82		20	10
7	-------	584	249	157	117	114	149	103	82		20	10
8	-------	529	249	154	117	112	139	97	80		17	10
9	-------	480	234	162	117	117	218	94	80	46	17	8.9
10	-------	458	234	157	117	117	189	90	76	46	17	8.9
11	-------	458	234	157	122	112	204	90	76	44	17	8.9
12	-------	435	249	152	114	110	189	86	74	44	17	14
13	-------	435	266	146	103	108	178	86	72	41	17	24
14	-------	480	249	146	112	101	173	84	72	39	17	20
15	-------	480	249	141	112	112	152	84	66	39	15	15
16	-------	435	234	144	114	112	141	86	66	39	15	15
17	-------	435	249	144	101	119	131	82	66	37	15	14
18	-------	414	234	139	117	126	126	82	62	34	15	14
19	-------	393	234	136	117	131	124	78	59	41	14	14
20	-------	374	249	136	119	136	122	76	}	37	14	13
21	-------	354	234	134	117	134	117	74		34	14	13
22	-------	354	234	134	122	136	112	74		32	14	13
23	-------	336	218	141	117	141	114	74		32	14	13
24	-------	317	218	136	119	146	114	70		29	14	12
25	157	317	204	136	122	141	117	70	70	28	13	12
26	159	317	204	131	122	141	110	94		28	13	12
27	157	300	204	136	122	146	112	126		28	12	12
28	154	300	189	136	122	141	108	117		28	12	13
29	189	282	189	136	122	146	105	103		24	12	13
30	1,510	282	189	131	-------	146	103	94	}	24	12	13
31	978	-------	184	131	-------	157	-------	86	-------	24	12	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Nueces River at Laguna, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 25-31	1,510	154	472	6,550
November	2,090	282	544	32,400
December	282	184	235	14,500
January	181	131	148	9,070
Feburary	136	101	119	6,840
March	157	101	126	7,770
April	218	103	142	8,440
May	126	70	90.2	5,540
June	99	59	74.7	4,440
July	50	24	38.6	2,380
August	24	12	16.0	986
September	24	8.9	12.9	769
The period				99,700

NUECES RIVER NEAR CINONIA, TEX.

LOCATION.—Just below suspension bridge near Oswald ranch, 2 miles east of Cinonia, Zavalla County, and 8 miles northeast of Crystal City.

DRAINAGE AREA.—2,150 square miles (revised, measured on topographic maps; United States Army progressive military maps; and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—July 5, 1915, to September 30, 1924.

GAGE.—Vertical staff installed May 6, 1918, on right bank, 200 feet below highway bridge; read by C. C. Oswald.

DISCHARGE MEASUREMENTS.—Made from downstream side of bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of clay and gravel. Banks wooded; not subject to overflow except at extremely high stages. Channel straight above and below station. A concrete control was completed at the site of the gage on September 23, 1917; point of zero flow, 0.85 foot.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 20.7 feet at 7 a. m. October 31 (discharge, 2,690 second-feet, determined from extension of rating curve); minimum stage, 1.32 feet August 29 to September 12 (discharge, 7.4 second-feet).

1915–1924: Maximum stage recorded, 49.1 feet September 23, 1919, determined by leveling from floodmarks (discharge not determined); no flow for several periods.

According to local residents, the greatest flood on record occurred in 1913, when the river reached a stage of about 53.2 feet by present gage datum.

ICE.—None.

DIVERSIONS.—Considerable water diverted above station for irrigation; amount not known.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Curve well defined below 700 second-feet; extended above by means of area-velocity curves. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table, using shifting-control method January 16 to March 27. Records good for low and medium stages; fair for high stages.

Backwater from a dam 40 feet high, about 20 miles below station, extends within 2 miles of station when reservoir is full. A large part of the flow of the river is known to seep into the bed just below Uvalde and return to the surface just above the station. The condition of the underground water may have an effect on this return water and thus help to equalize the flow.

Discharge measurements of Nueces River near Cinonia, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 28	1.84	32.0	Mar. 27	2.10	32.2	Apr. 1	1.86	32.3
Mar. 7	2.16	33.9	Mar. 28	1.89	32.1	Apr. 17	2.08	47.7

Daily discharge, in second-feet, of Nueces River near Cinonia, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	106	1,520	201	112	58	38	30	36	46	24	14	7.4
2	100	977	194	112	56	36	30	36	76	24	13	7.4
3	94	2,000	194	112	50	36	30	33	48	24	13	7.4
4	82	2,180	194	112	50	36	30	40	38	23	13	7.4
5	67	921	187	112	50	36	33	38	30	23	13	7.4
6	56	718	187	112	48	33	33	53	33	23	13	7.4
7	50	659	180	112	48	33	33	61	30	23	13	7.4
8	46	560	180	112	48	33	33	48	28	23	13	7.4
9	43	498	173	112	48	33	33	43	28	22	12	7.4
10	40	448	159	112	46	33	33	38	28	21	12	7.4
11	40	411	159	112	46	33	38	36	28	21	12	7.4
12	36	384	173	112	43	33	56	33	28	20	11	7.4
13	36	366	173	112	43	36	48	33	27	19	11	8.9
14	82	357	166	106	40	36	43	30	27	19	11	13
15	67	357	159	112	40	33	43	33	26	18	11	11
16	46	357	159	106	40	33	43	30	25	18	11	10
17	40	357	159	94	40	33	43	30	24	17	10	9.7
18	36	348	166	88	43	33	40	30	24	17	9.7	9.7
19	30	330	166	82	43	33	38	30	24	16	9.7	8.9
20	21	312	159	82	43	33	38	28	24	16	9.7	10
21	33	304	159	82	40	33	38	30	23	16	8.9	8.9
22	33	296	159	76	40	33	36	30	24	16	8.9	9.7
23	33	288	118	76	40	33	36	28	288	15	8.9	12
24	30	280	118	70	38	33	33	28	82	15	8.9	9.7
25	30	264	118	67	40	33	36	28	36	15	8.1	9.7
26	30	248	112	67	40	33	50	28	30	14	8.1	9.7
27	30	232	112	67	40	33	159	28	28	14	8.1	9.7
28	30	216	112	67	40	33	70	28	27	14	8.1	9.7
29	30	208	112	64	38	33	48	33	25	14	7.4	8.9
30	187	201	112	61	-------	33	38	50	25	14	7.4	8.9
31	2,300	-------	112	61	-------	30	-------	48	-------	14	7.4	-------

Monthly discharge of Nueces River near Cinonia, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,300	21	125	7,700
November	2,180	201	553	32,900
December	201	112	156	9,580
January	112	61	93.0	5,720
February	58	38	44.1	2,540
March	38	30	33.6	2,070
April	159	30	43.1	2,560
May	61	28	35.4	2,180
June	288	23	41.0	2,440
July	24	14	18.5	1,130
August	14	7.4	10.5	645
September	13	7.4	8.90	529
The year	2,300	7.4	96.5	70,000

NUECES RIVER AT COTULLA, TEX.

LOCATION.—100 feet upstream from Farmer Dam, half a mile below International-Great Northern Railroad bridge, 1 mile below San Antonio-Laredo highway crossing, and 1.9 miles, by road, from post office at Cotulla, La Salle County.

DRAINAGE AREA.—5,260 square miles (measured on topographic maps; United States Army progressive military maps; and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—October 31, 1923, to September 30, 1924. From July 1, 1915, to June 13, 1918, a station known as "Nueces River near Cotulla, Tex.," was maintained at a point 5 miles upstream; discharge at the two stations differs.

GAGE.—Vertical staff on left bank, 100 feet above dam; read by Kathleen Lind. Gage used from October 31, 1923, to August 3, 1924, was vertical staff on left bank, 40 feet upstream from highway bridge.

DISCHARGE MEASUREMENTS.—Made from upstream side of highway or railroad bridge. Measurement conditions poor. During floods measurements made at a rising stage may show too small a discharge because water enters an old channel or slough on right bank above gage and water from this channel does not reach measuring section until later; measurements made at a falling stage may show too great a discharge because water in this channel drains out more slowly than that from main channel.

CHANNEL AND CONTROL.—Bed of stream composed of sand and silt. Channel straight for 1 mile above and below gage. Right bank of earth, covered with rushes and cat-tails, low, and at a stage of 3.5 feet is subject to overflow. Left bank of earth, wooded, steep, and subject to overflow at extremely high stages. Low-water control is a concrete and rock dam, 100 feet below gage. This control probably submerged at a stage of about 2 feet. At about 4-foot gage height another dam farther downstream probably serves as control, and this dam is probably submerged at a stage of 6 feet.

EXTREMES OF DISCHARGE.—Maximum stage recorded during the period, 3.10 feet at 6.45 a. m. September 26 (discharge, 4,610 second-feet); no flow March 30 to April 9, April 15–27, June 12 to September 23.

ICE.—None.

DIVERSIONS.—Most of low-water flow is diverted by pumping from storage reservoirs above; amount not known.

REGULATION.—Low-water flow regulated by storage reservoirs above.

ACCURACY.—Stage-discharge relation permanent. Two rating curves used during the period; one from October 31 to August 3 and one from August 4 to September 30, both of which are are fairly well defined below 50,000 second-feet. Gage read to hundredths twice daily and oftener during floods. Daily discharge determined by applying mean daily gage height to rating table. Records fair.

Discharge measurements of Nueces River at Cotulla, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 31	1.82	[a] 1.0	July 11	[b] −2.15	[a] 0.4
Dec. 14	2.78	303	Aug. 4	[c] −3.45	0
May 25	2.85	310			

[a] Estimated.
[b] Below crest of dam and shows leak through dam only.
[c] Gage moved downstream 1 mile on August 4. Datum of new gage 1.14 feet higher than that of old gage.

Daily discharge, in second-feet, of Nueces River at Cotulla, Tex., for the period October 31, 1923, to September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Sept.
1		2.6	165	278	22	12		180	428	
2		26	165	244	22	12		210	1,280	
3		2,070	165	210	22	12		150	1,460	
4		2,400	158	195	22	11		60	1,980	
5		2,400	150	165	22	11		36	2,240	
6		2,400	142	128	22	10		172	1,980	
7		2,620	135	90	21	10		338	1,630	
8		2,070	135	70	21	10		530	938	
9		1,900	135	60	21	11		685	380	
10		1,280	135	51	20	12	67	826	38	
11		635	135	44	20	11	35	987	13	
12		530	135	38	19	11	22	1,120		
13		418	195	38	19	10	16	1,200		
14		486	278	35	18	10	1.7	1,110		
15		585	408	35	18	10		826		
16		782	530	32	18	9.0		698		
17		970	475	32	17	9.0		530		
18		905	456	32	17	9.0		428		
19		724	437	29	30	8.0		372		
20		585	418	29	83	8.0		278		
21		497	380	29	116	8.0		312		
22		418	346	29	41	7.4		372		
23		355	329	26	20	7.4		338		
24		304	321	26	17	7.4		295		32
25		278	312	26	17	7.4		346		2,710
26		261	295	26	18	6.5		475		3,760
27		244	295	23	18	5.3		437		1,700
28		218	295	23	17	3.2	10	346		670
29		195	278	23	16	1.7	48	252		180
30		180	278	23			122	142		96
31	2.6		278	23				70		

NOTE.—Dry on days for which no discharge is given. Prior to July 15 there was a leak through the dam of about 0.50 second-foot.

Monthly discharge of Nueces River at Cotulla, Tex., for the period October 31, 1923, to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 31	2.6	2.6	2.6	5.16
November	2,620	2.6	891	53,000
December	530	135	270	16,600
January	278	23	68.1	4,190
February	116	16	26.9	1,500
March	12	0	8.40	516
April	122	0	10.7	638
May	1,200	36	456	28,000
June	2,240	13	412	24,500
September	3,760	0	307	18,200
The period				147,000

NOTE.—Dry during July and August.

NUECES RIVER NEAR THREE RIVERS, TEX.

LOCATION.—At San Antonio, Uvalde & Gulf Railroad bridge, 1 mile west of Kittie, 2 miles southeast of Three Rivers, Live Oak County, and half a mile below mouth of Frio River.

DRAINAGE AREA.—15,600 square miles (measured on topographic maps; United States Army progressive military maps; and base maps of Texas, scale 1:500,000).

RECORDS AVAILABLE.—July 1, 1915, to September 30, 1924.

GAGE.—Inclined and vertical staff in four sections on left bank or attached to piers of railroad bridge; read by Roy E. Kibbey.

DISCHARGE MEASUREMENTS.—Made by wading near gage or from highway bridge, half a mile below gage.

CHANNEL AND CONTROL.—Bed composed of adobe shale and sand; does not change greatly. Channel straight above and below station. Banks wooded, high, and not subject to overflow except at extremely high stages. Position of high-water control not known. Shoal just below gage probably forms low-water control; shifts.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 29.40 feet at 8 a. m. December 3 (discharge, 10,200 second-feet); no flow August 14 to September 13.

1915–1924: Maximum stage recorded, 46.0 feet at 5 a. m. September 18, 1919 (discharge not determined, probably backwater due to Gulf storm); no flow during several periods of record.

DIVERSIONS.—Records of the Texas Board of Water Engineers show that about 10,000 acres have been irrigated by diversions from the stream above the station.

REGULATION.—Negligible.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 7,000 second-feet, extended above by means of area-velocity curves, and subject to error. Gage read to hundredths or tenths once daily. Daily discharge determined by shifting-control method. Records fair for low and medium stages; poor for high stages.

Discharge measurements of Nueces River near Three Rivers, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 22	2.30	125	Mar. 13	1.59	67	Aug. 8	0.62	[a]0.5
Nov. 24	5.56	725	Apr. 19	1.78	83	Sept. 9		0
Jan. 19	2.17	122	May 25	7.82	1,210			

[a] Estimated.

Daily discharge, in second-feet, of Nueces River near Three Rivers, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,100	34	375	355	85	239	45	257	2,900	1,060	1.6	-------
2	2,870	34	8,150	335	85	239	44	627	765	335	1.6	-------
3	3,150	34	10,200	517	75	239	44	627	1,570	149	.9	-------
4	3,550	32	2,040	435	75	239	43	355	539	96	.9	-------
5	2,800	32	1,570	335	75	90	41	673	455	60	5.8	-------
6	2,520	32	860	435	85	82	41	335	375	43	43	-------
7	435	32	627	239	85	78	39	395	335	35	4.1	-------
8	222	239	583	192	80	78	38	315	276	22	.5	-------
9	52	605	561	163	80	77	37	605	583	17	.4	-------
10	136	742	517	149	68	76	605	257	788	14	.4	-------
11	112	956	455	142	63	68	184	375	812	10	.1	-------
12	112	1,190	415	136	61	67	276	335	836	10	.1	-------
13	80	1,210	1,740	130	60	66	239	295	788	7.9	.1	-------
14	112	1,290	4,830	136	58	64	118	375	207	7.9	-------	14
15	2,700	1,920	2,450	130	57	63	184	1,270	80	5.8	-------	495
16	2,380	2,420	1,030	124	52	62	257	1,030	90	5.8	-------	39
17	1,080	1,770	956	124	52	58	222	627	80	5.8	-------	6.8
18	375	2,420	956	118	51	96	118	539	60	4.1	-------	3.4
19	335	1,770	1,060	118	2,190	192	85	495	35	2.7	-------	20
20	239	1,430	1,860	118	884	124	66	335	22	2.7	-------	149
21	177	1,060	1,800	118	375	112	54	149	13	2.7	-------	101
22	124	836	1,450	118	295	112	49	222	696	2.7	-------	101
23	85	627	1,370	112	276	106	41	1,030	2,340	2.7	-------	2,280
24	75	673	1,370	112	257	106	38	1,110	3,040	2.7	-------	1,240
25	68	696	1,240	112	257	88	34	1,190	6,080	1.6	-------	475
26	55	605	1,010	106	627	85	32	1,110	3,590	1.6	-------	627
27	41	561	583	101	475	56	32	980	1,400	1.6	-------	742
28	41	517	561	101	276	55	156	932	1,320	1.6	-------	836
29	38	395	517	96	257	52	96	836	1,620	1.6	-------	375
30	36	395	435	90	-------	51	90	836	2,190	1.6	-------	239
31	35	-------	415	85	-------	51	-------	3,040	-------	1.6	-------	-------

NOTE.—Dry on days for which no discharge is given.

Monthly discharge of Nueces River near Three Rivers, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	3,550	35	843	51,800
November	2,420	32	819	48,700
December	10,200	375	1,680	103,000
January	517	85	180	11,100
February	2,190	51	256	14,700
March	239	51	102	6,290
April	605	32	112	6,640
May	3,040	149	695	42,800
June	6,080	13	1,130	67,200
July	1,060	1.6	61.8	3,800
August	43	0	1.92	118
September	2,280	0	258	15,400
The year	10,200	0	512	372,000

NUECES RIVER AT CALALLEN, TEX.

LOCATION.—At old pump house for city of Corpus Christi, half a mile northwest of Callallen, Nueces County, and half a mile above edge of tidewater and breakwater dam.

DRAINAGE AREA.—16,900 square miles (revised, measured on topographic maps, United States Army progressive military maps, and base map of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—August 12, 1915, to September 30, 1924.

GAGE.—Vertical staff attached to pipe-line support of old pump house; read by John W. Cunningham.

DISCHARGE MEASUREMENTS.—Made by wading at backwater or from cable 125 feet below gage.

CHANNEL AND CONTROL.—Bed composed of clay and gravel. Channel straight above and below station. Left bank wooded, low, and bordered by levee constructed to prevent overflow; right bank wooded, medium in height, and not subject to overflow. The breakwater dam, which is loose rock fill, half a mile below, serves as control. It leaks badly and is subject to change during floods. Flood damage is repaired by dumping loose rock on the crest.

EXTREMES OF STAGE.—Maximum stage recorded during year, 8.75 feet at 4 p. m. December 6; minimum stage, 1.30 feet at 4 p. m. August 29.

1915–1924: During September, 1919, the river reached a stage of about 12 feet, as determined from floodmarks on gage. This was not only the highest stage reached during the period covered by records but probably exceeds any that occurred for many years prior to the establishment of this station. Discharge indeterminate because of lowlands on left bank overflowing for a width of several miles. No flow August 23–28, 1918.

DIVERSIONS.—Considerable water taken from river for irrigation immediately above station, and river water is also used for irrigation throughout the drainage above. The city of Corpus Christi pumps water just below gage for municipal supply. They reported a consumption of 922 acre-feet during 1918.

REGULATION.—Negligible.

ACCURACY.—Stage-discharge relation not permanent because of leakage through and repair to breakwater dam. Rating curve is poorly defined. Gage read to hundredths twice daily. Daily discharge not computed because of changing control and insufficient discharge measurements. Records poor.

No discharge measurements were made at this station during the years 1920 to 1924.

Daily gage height, in feet, of Nueces River at Callallen, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec	Jan.	Feb	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.70	1.58	2.45	2.25	1.75	2.05	1.62	1.50	3.35	3.62	1.70	1.50
2	5.52	1.55	4.65	2.20	1.75	2.00	1.50	1.58	3.98	3.08	1.70	1.52
3	4.45	1.55	6.30	2.15	1.75	1.90	1.52	2.42	4.12	2.88	1.70	1.55
4	4.58	1.52	7.45	2.08	1.75	1.88	1.52	2.50	2.70	2.28	1.70	1.55
5	5.10	1.55	8.25	2.02	1.75	1.80	1.50	2.42	2.98	1.95	1.70	1.55
6	5.55	1.50	8.72	2.00	1.75	1.78	1.50	2.32	3.20	1.85	1.70	1.58
7	5.55	1.50	8.28	2.00	1.75	1.70	1.50	2.35	2.58	1.70	1.70	1.60
8	3.22	1.48	6.25	2.00	1.75	1.65	1.50	2.35	2.42	1.58	1.70	1.48
9	2.28	1.45	3.08	1.95	1.75	1.65	1.50	2.32	2.52	1.55	1.75	1.50
10	2.05	1.48	2.30	1.90	1.75	1.65	1.50	2.45	2.82	1.55	1.75	1.45
11	2.02	2.40	2.30	1.90	1.75	1.60	1.50	2.35	2.65	1.50	1.75	1.40
12	1.92	2.62	2.25	1.90	1.75	1.55	2.42	2.18	2.72	1.48	1.80	1.45
13	1.90	2.88	2.30	1.90	1.75	1.50	2.28	2.20	2.65	1.48	1.80	1.48
14	2.32	3.08	2.45	1.82	1.75	1.50	2.05	2.40	2.65	1.40	1.80	1.45
15	3.95	3.28	4.58	1.80	1.75	1.45	1.98	2.30	2.60	1.42	1.75	1.45
16	4.88	3.38	5.65	1.75	1.75	1.50	1.88	2.65	2.18	1.78	1.70	1.50
17	5.48	3.82	5.95	1.70	1.75	1.55	1.75	3.18	2.05	1.82	1.65	2.08
18	4.75	4.15	3.80	1.70	1.75	1.60	1.92	2.60	1.80	1.85	1.60	2.70
19	2.88	3.88	2.95	1.70	2.05	1.60	2.00	2.42	1.82	1.90	1.60	2.38
20	2.38	3.20	2.80	1.70	2.70	1.68	1.90	2.42	1.82	1.90	1.60	2.25
21	2.32	3.22	3.05	1.75	3.10	1.78	1.75	2.38	2.32	1.90	1.50	2.18
22	2.22	3.30	4.08	1.80	2.80	1.90	1.70	2.50	1.95	1.90	1.50	2.08
23	2.08	3.02	4.00	1.80	2.22	1.88	1.68	2.62	1.80	1.90	1.50	2.50
24	1.92	2.85	3.45	1.80	2.00	1.78	1.65	2.28	1.92	1.85	1.60	2.65
25	1.88	2.78	3.15	1.80	2.00	1.68	1.60	2.68	3.92	1.90	1.62	4.28
26	1.78	2.78	2.85	1.80	1.95	1.60	1.60	3.02	4.58	1.90	1.52	3.92
27	1.70	2.80	2.65	1.80	2.00	1.65	1.60	3.10	5.35	1.90	1.55	3.22
28	1.68	2.58	2.55	1.80	2.20	1.65	1.60	3.02	5.85	1.90	1.60	3.40
29	1.65	2.40	2.55	1.75	2.32	1.65	1.50	3.00	5.45	1.90	1.45	3.52
30	1.62	2.38	2.40	1.75	-------	1.65	1.50	3.00	3.42	1.90	1.40	3.55
31	1.60	-------	2.35	1.75	-------	1.65	-------	2.88	-------	1.70	1.50	-------

NOTE.—Loose rock, placed on the dam about the middle of July, caused a raise in gage height.

NUECES RIVER SEEPAGE INVESTIGATION

There were no unusual conditions during this investigation, and the measurements represent the natural conditions.

Seepage measurements made on Nueces River from the mouth of Odley Creek to LaPryor Crossing during March and August, 1924

Location	Distance below mouth of Odley Creek	Mar. 10–11			Mar. 17–26								Aug. 11–18				
		Mar. 10	Mar. 11	Gain or loss between points of measurements	Mar. 17	Mar. 18	Mar. 22	Mar. 23	Mar. 24	Mar. 25	Mar. 26	Gain or loss between points of measurements	Aug. 11	Aug. 12	Aug. 13	Aug. 18	Gain or loss between points of measurements
	Miles	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*
Mouth of Odley Creek near Vance	0				1.0												
Above spring below Odley Creek	1.5				.9							−0.1					
Near Vance	8.3				55.1							[b]+54.2	0				
Barksdale	14.2					39.2	70.4					−15.9		0			
Campwood	18.1						126					+55.6		20			+20
300 feet above Montell Creek	29.4						78.7					−47.3		0			−20
Reservoir site above Laguna	37.2						142					[c]+63.3			24		+24
Laguna	40.2							149				+7			17.1		−6.9
Chalk Bluff	45.3								115			−34			0		−17.1
Riverview	49.3								123			+8					
Mouth of West Nueces River	51.8								64.7			−58.3			0		
Southern Pacific R. R. crossing	56.3									34.6		−30.1			0		
Old Spanish Trail or lower Uvalde-Del Rio crossing	59.1	[a]0.1								[a]1.2		−33.4			0		
Tom Nunn crossing	61.1		25.3	+25.2						22.8		+21.6				27	+27
Tom Nunn Hill dam site	62.7		26.9	+1.6						23.7		+.9					
Old Eagle Pass crossing	66.6									37.6		+13.9					
San Antonio, Uvalde & Gulf R. R. bridge	69.6										29.2	−8.4					
LaPryor crossing	74.4										32.2	+3				21	−6

[a] Estimated. [b] Includes inflow of 11.2 second-feet from springs 1½ mile below Odley Creek. [c] Includes inflow of 0.2 second-foot from Montell Creek.

FRIO RIVER AT CONCAN, TEX.

LOCATION.—Half a mile below Concan post office, Uvalde County, 15 miles above mouth of Dry Frio River, and 23 miles from Uvalde.

DRAINAGE AREA.—485 square miles (measured on progressive military maps of United States Army and base map of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—October 26, 1923, to September 30, 1924.

GAGE.—Inclined and vertical staff gage on right bank used for stages below 6.6 feet, for stages above 6.6 feet an overhanging chain gage on the left bank of the river is used. Gage used October 26 to July 28 was 206 feet upstream from the present gage and set to different datum. Gages read by H. G. Fletcher or C. T. McNair.

DISCHARGE MEASUREMENTS.—Made from cable 123 feet upstream from gage or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of solid rock overlain on right side with small amount of gravel; permanent. Channel straight for a quarter of a mile above and half a mile below station. Left bank of semiconglomerate, fairly permanent, clean, high, and not subject to overflow. Right bank of sand and gravel, heavily wooded, permanent, medium in height, and subject to overflow at a stage of 21 feet. Control is solid rock ledge, 50 feet below gage; clean and permanent. Control at gage used prior to July 28 was shifting gravel bar.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 9.80 feet during night of November 2 (discharge, 1,200 second-feet, determined from extension of rating curve); minimum discharge, 21 second-feet from August 18–30.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent. Rating curve prior to July 29 poorly defined from 24 to 250 second-feet; extended above through one discharge measurement made by the slope method with discharge of 111,000 second-feet. Since July 29 rating curve poorly defined below 20 second-feet, well defined from 20 to 45 second-feet, and poorly defined from 45 to 175 second-feet. Gage read to hundredths twice daily but mean of two readings daily may not be true index to mean daily discharge owing to rapid fluctuations during rises. Daily discharge from October 26 to July 28 determined by shifting-control method and from July 29 to September 30 by applying mean daily gage height to the rating table. Records poor.

Discharge measurements of Frio River at Concan, Tex., during the period September 18, 1923, to September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
1923	*Feet*	*Sec.-ft.*	1924	*Feet*	*Sec.-ft.*	1924	*Feet*	*Sec.-ft.*
Sept. 18	[a] 28.8	[b] 111,000	Jan. 26	8.21	101	July 10	7.95	53
Oct. 26	8.10	184	Mar. 10	8.18	98	July 29	[c] 1.60	34
Nov. 22	8.36	222	Apr. 15	8.25	144	Sept. 18	1.55	29
Dec. 1	8.32	182	June 7	8.08	106			

[a] Datum of new location of July 29.
[b] Slope measurement using Kutter's formula.
[c] July 29 gage moved 200 feet downstream and set to different datum.

Daily discharge, in second-feet, of Frio River at Concan, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	410	177	143	93	103	135	152	128	73	24	23
2	-------	987	172	143	93	100	135	152	168	73	24	23
3	-------	774	172	143	90	100	135	156	135	73	24	23
4	-------	492	172	139	90	103	131	168	135	70	23	23
5	-------	410	172	139	90	103	135	152	124	67	23	23
6	-------	356	164	131	90	103	131	177	124	57	23	23
7	-------	322	164	128	90	103	131	168	114	55	23	23
8	-------	295	160	128	90	103	131	160	117	55	23	23
9	-------	263	156	128	90	100	156	181	117	55	23	23
10	-------	290	164	128	90	96	160	181	117	55	23	23
11	-------	311	177	120	93	96	156	160	114	}	22	23
12	-------	311	195	120	96	103	147	164	103		22	23
13	-------	284	213	120	93	103	147	160	103		22	26
14	-------	339	218	120	93	106	143	160	103		22	28
15	-------	295	213	120	87	103	143	156	103		22	28
16	-------	263	204	114	82	103	139	152	103		22	27
17	-------	258	204	114	87	120	135	152	103		22	26
18	-------	258	195	110	106	147	160	152	100		21	27
19	-------	253	195	114	100	172	160	152	93		21	27
20	-------	243	186	114	100	164	143	152	93	40	21	26
21	-------	238	181	110	100	164	143	147	87		21	27
22	-------	223	181	110	100	160	147	143	87		21	27
23	-------	209	177	114	100	152	147	143	87		21	26
24	-------	200	172	110	100	152	147	147	84		21	25
25	-------	190	172	96	117	152	147	147	84		21	26
26	190	190	160	96	103	147	164	263	84		21	26
27	164	181	160	96	103	143	147	186	79		21	26
28	152	186	156	103	103	143	147	139	79		21	27
29	156	181	152	96	103	147	152	131	76	32	21	26
30	284	172	152	96	-------	143	143	139	76	24	21	26
31	295	-------	152	96	-------	139	-------	131	-------	24	23	-------

NOTE.—Braced figures show estimated mean for period indicated.

Monthly discharge of Frio River at Concan, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October 26–31	295	152	206	2,460
November	987	172	313	18,600
December	218	152	177	10,900
January	143	96	117	7,220
February	117	82	95.6	5,500
March	172	96	125	7,680
April	164	131	145	8,600
May	263	131	159	9,760
June	168	76	104	6,190
July	73	24	46.2	2,840
August	24	21	22.0	1,350
September	28	23	25.2	1,500
The period				82,600

FRIO RIVER NEAR FRIO TOWN, TEX.

LOCATION.—At Tiner's Frio Apiary, 300 feet below Frio ford on old Frio Town-Sabinal road, 1½ miles below mouth of Sabinal Creek, 7 miles northwest of Frio Town, Frio County.

DRAINAGE AREA.—1,460 square miles (measured on topographic maps; base map of Texas, scale 1:500,000; and progressive military map of United States Army).

RECORDS AVAILABLE.—April 9 to September 30, 1924.

GAGE.—Combined vertical staff and chain gage on left bank. Staff gages range 0 to 23.7 feet, and overhanging chain gage from 23.8 to 56.0. Chain gage 200 feet downstream from low-water gage. Gage read by J. L. Tiner.

DISCHARGE MEASUREMENTS.—Made from cable, 340 feet below staff gage, or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of gravel; clean; permanent. One channel at all stages; straight for half a mile above and below gage. Banks high; not subject to overflow. Low-water control is gravel riffle, 150 feet below staff gage; subject to shift. High-water control is narrow section in river, 500 feet downstream from low-water control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 3.45 feet at 1 p. m. April 26 (discharge, 360 second-feet, determined from extension of rating curve and subject to considerable error); no flow June 21 and July 16 to September 30.

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve poorly defined below 135 second-feet; extended to cover the range of stage; extension subject to considerable error. Gage read to hundredths once daily and oftener during floods. Daily discharge determined by applying mean daily gage height to rating table. Records poor.

Discharge measurements of Frio River near Frio Town, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 10	1.95	90.9	May 26	0.85	0.42
Do	2.12	144	Sept. 20		0
Apr. 12	1.50	36.3			

Daily discharge, in second-feet, of Frio River near Frio Town, Tex., for the period April 9 to September 30, 1924

Day	Apr.	May	June	July	Day	Apr.	May	June	July
1		9.0	30	0.1	16	26	5.8	0.2	
2		5.0	60	.1	17	20	5.0	.1	
3		3.3	52	.1	18	17	4.3	.1	
4		7.0	46	.1	19	14	3.0	.1	
5		3.3	37	.1	20	11	1.6	.1	
6		3.0	24	.1	21	10	1.3		
7		3.0	15	.1	22	9.0	1.0	14	
8		70	12	.1	23	8.6	.8	258	
9	12	36	8.2	.1	24	8.6	.5	64	
10	98	14	5.8	.1	25	17	.2	8.2	
11	50	12	5.0	.1	26	318	.9	4.3	
12	36	9.0	4.3	.1	27	41	334	.2	
13	29	8.2	.9	.1	28	24	77	.9	
14	26	7.4	.5	.1	29	17	58	1.6	
15	26	6.6	.2	.1	30	12	41	.2	
					31		34		

NOTE.—Dry on days for which no discharge is given.

Monthly discharge of Frio River near Frio Town, Tex., for the period April 9 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 9-30	318	8.6	37.7	1,650
May	334	.2	24.7	1,520
June	258	0	21.8	1,300
July	.1	0	.05	2.98
The period				4,470

NOTE.—Dry during August and September.

FRIO RIVER NEAR DERBY, TEX.

LOCATION.—At International-Great Northern Railroad bridge, 900 feet below mouth of Leona River, 400 feet below highway bridge, and 4 miles south of Derby, Frio County.

DRAINAGE AREA.—3,490 square miles (revised; measured on topographic maps; progressive military maps of United States Army; and base map of Texas, scale 1: 500,000).

RECORDS AVAILABLE.—August 1, 1915, to September 30, 1924.

GAGE.—Vertical staff, attached to railroad bridge pier; read by C. E. Harris.

DISCHARGE MEASUREMENTS.—Made from railroad bridge, from highway bridge, or by wading.

CHANNEL AND CONTROL.—Bed composed of rock, sand, and gravel. Channel curved above and below station, but straight at gage for 150 feet. Banks wooded, high, and subject to overflow at extremely high stages. A concrete dam 50 feet below gage serves as control during low and medium stages; location of high-water control not known. Point of zero flow, gage height 0.07 foot, except when affected by moss on control.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.4 feet at 2.30 a. m. June 25 (discharge, 6,400 second-feet); no flow for several periods.

1915–1924: Maximum stage recorded, 18.5 feet September 18, 1919 (discharge, 34,400 second-feet, determined from extension of rating curve); no flow during several periods of each year.

DIVERSIONS.—Small areas are irrigated by diversions in the headwaters, but available information does not show that water is taken from the stream immediately above station.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined below 18,000 second-feet. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records good.

Discharge measurements of Frio River near Derby, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Feb. 19	0.29	7.6	June 25	6.24	1,470
Do	.29	7.5	Aug. 5	.13	.8
June 25	8.75	4,120			

Daily discharge, in second-feet, of Frio River near Derby, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.8	2.1	5.8	39	15	14	17	42	76	11	1.6	-------
2	3.2	2.1	4.8	35	15	18	15	24	108	8.4	1.0	-------
3	2.7	2.1	4.2	31	15	19	15	16	64	6.8	1.0	-------
4	2.4	1.6	12	27	13	17	15	17	100	4.8	1.0	-------
5	2.1	29	13	27	13	15	13	14	104	2.9	1.0	-------
6	1.6	188	12	27	12	15	13	16	81	2.7	1.0	-------
7	1.6	138	10	27	10	13	12	13	38	2.7	1.0	-------
8	1.6	88	8.4	27	8.4	13	10	25	25	2.1	1.0	-------
9	1.6	56	7.4	27	7.4	12	10	28	20	2.1	1.0	-------
10	1.6	40	7.4	27	7.4	12	12	46	16	2.1	1.0	-------
11	1.6	29	6.3	31	7.4	12	70	31	14	2.7	.5	-------
12	1.6	20	6.8	29	7.4	12	111	19	13	2.7	.5	-------
13	1.6	14	44	27	7.4	12	51	17	12	2.7	.5	-------
14	47	34	115	27	7.4	12	46	16	12	2.7	.5	22
15	302	70	242	25	7.4	12	37	16	9.2	2.1	.5	17
16	162	850	162	25	7.4	12	27	15	7.4	2.1	.5	4.2
17	47	318	148	25	7.4	13	22	13	5.8	2.1	.5	2.7
18	22	162	133	25	10	13	18	12	4.8	2.1	.5	2.1
19	12	126	128	25	8.4	17	14	12	3.2	2.1	.5	2.1
20	6.8	90	122	23	8.4	17	13	13	3.2	2.1	.1	1.6
21	4.2	67	108	20	8.4	15	10	13	3.2	2.1	.1	1.0
22	3.2	52	100	16	8.4	15	8.4	90	3.2	1.6	.1	2.1
23	2.7	39	90	15	8.4	26	8.4	15	632	1.6	-------	1.6
24	2.1	31	82	15	8.4	20	7.4	48	3,390	1.6	-------	1.6
25	2.1	24	74	15	10	19	7.4	49	3,390	1.6	-------	1.0
26	2.1	20	62	17	8.4	19	7.4	23	388	1.6	-------	1.0
27	2.1	14	56	17	8.4	19	632	14	77	1.6	-------	1.0
28	2.1	11	51	17	8.4	21	937	49	44	1.6	-------	1.0
29	2.1	7.9	47	17	11	19	242	145	20	1.6	-------	.5
30	2.1	6.8	44	17	-------	19	102	74	15	1.6	-------	.1
31	2.1	-------	42	15	-------	17	-------	92	--------	1.6	-------	-------

NOTE.—Dry on days for which no discharge is given.

Monthly discharge of Frio River near Derby, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	302	1.6	21.1	1,300
November	850	1.6	84.4	5,020
December	242	4.2	62.8	3,860
January	39	15	23.8	1,460
February	15	7.4	9.47	545
March	26	12	15.8	970
April	937	7.4	83.4	4,960
May	145	12	32.8	2,020
June	3,390	3.2	289	17,200
July	11	1.6	2.81	173
August	1.6	0	.50	30.5
September	22	0	2.09	124
The year	3,390	0	51.9	37,700

LEONA RIVER NEAR DIVOT, TEX.

LOCATION.—At highway bridge on Divot-Pearsall road, 2½ miles northeast of Divot, Frio County, and 12 miles above mouth of river.

DRAINAGE AREA.—565 square miles (measured on topographic maps; base map of Texas, scale 1:500,000; and progressive military maps of United States Army).

RECORDS AVAILABLE.—April 6 to September 30, 1924.

GAGE.—Vertical staff gage attached to pecan tree on left bank 6 feet below bridge; read by E. N. Cory.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Bed of stream composed of earth and sand; fairly permanent. Channel straight for 600 feet above and 65 feet below gage. Banks of earth; steep, wooded, and fairly permanent. Right bank subject to overflow at a stage of 12 feet; left bank not subject to overflow. Four channels at high stages. The low-water control is 100 feet below gage; composed of gravel and a partly buried log; subject to shift. High-water control indefinite.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 14.17 feet at 5 a. m. June 24 (discharge not determined); no flow July 30 to September 30.

ICE.—None.

DIVERSIONS.—Several small diversions in the drainage basin above; amount not known.

REGULATION.—Low-water flow regulated by dams above.

ACCURACY.—Stage-discharge relation permanent. Rating curve fairly well defined below 250 second-feet; extended above by means of poorly defined velocity-area curves. Gage read to hundredths twice daily. Records of discharge below 250 second-feet, good; above, poor.

Discharge measurements of Leona River near Divot, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Apr. 11	0.97	2.8	June 25	5.53	217
May 25	1.58	22	June 26	2.32	49

Daily discharge, in second-feet, of Leona River near Divot, Tex., for the period April 6 to September 30, 1924

Day	Apr.	May	June	July	Day	Apr.	May	June	July
1		31	92	5.2	16	12	9.5	11	1.2
2		12	60	2.7	17	12	9.5	10	1.2
3		11	60	1.6	18	9.5	9.5	8.0	1.2
4		36	97	1.6	19	6.5	9.5	6.5	1.2
5		32	77	1.6	20	6.5	9.5	6.5	1.2
6	6.5	31	56	1.6	21	6.5	9.5	3.8	1.2
7	6.5	20	24	1.6	22	6.5	20	24	1.2
8	6.5	16	12	1.6	23	6.5	64	} 780	1.2
9	6.5	16	12	1.6	24	6.5	44		1.2
10	6.5	14	12	1.6	25	6.5	21	250	1.2
11	4.4	12	11	1.6	26	6.5	12	56	1.2
12	3.8	12	11	1.6	27	6.5	12	16	1.2
13	26	12	11	1.6	28	102	11	9.5	1.2
14	27	12	11	1.6	29	152	11	6.5	1.2
15	14	11	11	1.4	30	68	11	6.5	------
					31	------	11	------	------

NOTE.—Braced figures show estimated mean discharge for period indicated. Dry on days for which no discharge is given.

Monthly discharge of Leona River near Divot, Tex., for the period April 6 to September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
April 6–30	152	3.8	20.9	1,030
May	64	9.5	17.8	1,090
June	----------	3.8	110	6,570
July	5.2	0	1.46	89.9
The period	----------	----------	----------	8,780

NOTE.—Dry during August and September.

RIO GRANDE BASIN

RIO GRANDE BELOW ELEPHANT BUTTE DAM, N. MEX.

LOCATION.—In T. 13 S., R. 4 W., 1 mile below Elephant Butte Dam, Sierra County. Nearest tributary, Mescal Canyon; enters half a mile downstream.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 1, 1916, to September 30, 1924.

GAGE.—Stevens water-stage recorder on left bank.

DISCHARGE MEASUREMENTS.—Made from cable at gage.

CHANNEL AND CONTROL.—Bed composed of compact gravel; probably permanent. Control is gravel bar at mouth of Mescal Canyon; shifts.

ICE.—Stage-discharge relation not affected by ice.

REGULATION.—Flow controlled by Elephant Butte Dam which forms reservoir having capacity of 2,638,000 acre-feet

EXTREMES OF DISCHARGE.—No data.

COOPERATION.—Records furnished by United States Bureau of Reclamation.

Daily discharge, in second-feet, of Rio Grande below Elephant Butte Dam, N. Mex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,400	250	200	16	1,000	1,000	1,600	2,640	2,100	2,300	1,800	2,300
2	1,400	250	200	16	1,000	1,000	1,600	2,640	2,100	2,300	1,800	2,100
3	1,400	250	200	16	1,000	1,000	1,600	2,640	2,100	2,300	1,800	2,100
4	1,400	250	200	16	1,000	1,000	1,600	2,640	2,100	2,300	1,800	2,100
5	1,400	250	200	16	1,000	1,000	1,600	2,640	2,100	2,300	1,800	2,100
6	1,000	250	200	16	1,000	1,000	1,600	2,640	2,100	2,300	2,100	2,100
7	1,000	250	200	16	1,000	1,000	1,600	2,640	2,100	2,300	2,500	2,100
8	1,000	250	200	16	1,000	1,000	2,200	2,640	2,500	2,300	2,580	2,100
9	1,000	250	600	16	1,000	1,000	2,200	2,640	2,500	2,300	2,800	2,100
10	1,000	200	200	16	1,000	1,000	2,200	2,640	2,500	2,300	2,800	2,100
11	1,000	200	200	16	1,000	1,000	2,200	2,640	2,500	1,800	2,800	2,050
12	1,000	200	200	16	1,000	1,000	2,200	2,640	2,500	1,800	2,800	1,850
13	500	200	200	16	1,000	1,000	2,200	2,640	2,500	1,800	3,070	1,850
14	500	200	200	16	1,000	1,000	2,200	2,640	2,500	1,800	3,270	1,850
15	500	200	200	16	1,000	1,000	2,200	2,640	2,500	1,800	3,080	1,620
16	500	200	200	16	1,000	1,000	2,200	2,640	2,500	1,800	2,760	1,290
17	500	200	200	16	1,000	1,000	2,200	2,640	2,500	1,800	2,600	1,130
18	500	200	200	16	1,000	1,000	2,200	2,640	2,500	1,800	2,720	1,130
19	500	200	200	16	1,000	1,000	2,200	2,640	2,500	1,800	2,800	1,120
20	500	200	200	16	1,000	1,000	2,200	2,640	3,000	1,800	2,800	1,120
21	500	200	200	16	1,000	1,000	2,200	2,640	3,000	1,800	2,870	1,120
22	500	200	200	16	1,000	1,000	2,200	2,640	2,800	1,800	3,000	1,120
23	500	200	200	16	1,000	1,000	2,200	2,640	2,800	1,800	3,000	1,120
24	500	200	200	16	1,000	1,000	2,200	2,640	2,800	1,800	3,000	1,120
25	500	200	200	16	1,000	1,000	2,200	2,640	2,800	1,800	3,000	1,100
26	500	200	200	16	1,000	1,000	2,200	2,640	2,800	1,800	3,000	1,040
27	500	200	200	16	1,000	1,000	2,200	2,100	2,300	1,800	2,850	1,040
28	500	200	200	16	1,000	1,000	2,200	2,100	2,300	1,800	2,700	1,040
29	300	200	200	16	1,000	1,600	2,600	1,000	2,300	1,800	2,600	1,040
30	300	200	200	16	-------	1,600	2,600	2,100	2,300	1,800	2,400	1,040
31	300	-------	0	16	-------	1,600	-------	2,100	-------	1,800	2,400	-------

NOTE.—Quantities changed slightly to conform to computation rules used by the U. S. Geological Survey.

Monthly discharge of Rio Grande below Elephant Butte Dam, N. Mex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run off in acre-feet
	Maximum	Minimum	Mean	
October	1,400	300	732	45,000
November	250	200	215	12,800
December	600	0	206	12,700
January	16	16	16	984
February	1,000	1,000	1,000	57,500
March	1,600	1,000	1,060	65,200
April	2,600	1,600	2,090	124,000
May	2,640	1,000	2,520	155,000
June	3,000	2,100	2,460	146,000
July	2,300	1,800	1,960	121,000
August	3,270	1,800	2,630	162,000
September	2,300	1,040	1,570	93,400
The year	3,270	0	1,370	996,000

RIO GRANDE NEAR EL PASO, TEX.

LOCATION.—At Courchesne's limekiln, 1 mile upstream from pumping house of Smelter Co., 4 miles north of El Paso, El Paso County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 10, 1889, to June 30, 1893, for station at Old Fort Bliss, 1,500 feet above the Mexican dam; January 25, 1895 to May 1, 1897, for station at the pumping house of Smelter Co., 3 miles north of El Paso; and May 1, 1897, to September 30, 1924, at the present site.

GAGE.—Continuous water-stage recorder. A number of inclined gages have been used, located at slightly different points, but referred to same datum.

DISCHARGE MEASUREMENTS.—Made from cable.

CHANNEL AND CONTROL.—Bed of stream composed of sand; shifting. Banks high, steep, with brush along edges; not subject to overflow. Control is a stretch of the channel of stream; shifting.

EXTREMES OF DISCHARGE.—Maximum mean daily stage, 3.52 feet August 16 (discharge, 2,900 second-feet); minimum mean daily discharge, 145 second-feet February 1.

1889–1893; 1895–1924: Maximum mean daily discharge, 23,680 second-feet June 12, 1905; no flow for numerous periods.

DIVERSIONS.—Considerable water is diverted in Colorado and New Mexico; amount not known.

REGULATION.—Flow regulated by storage at Elephant Butte Dam, 120 miles above El Paso.

ACCURACY.—Stage-discharge relation not permanent. Daily discharge based largely on 153 current-meter measurements made at regular intervals.

COOPERATION.—Daily discharge furnished by the Mexican section of the International Boundary Commission. Monthly and yearly figures changed to agree with United States Geological Survey methods of computation.

Daily discharge, in second-feet, of Rio Grande near El Paso, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,162	419	275	875	145	990	1,350	1,800	1,820	1,500	1,230	2,275
2	1,100	412	260	770	150	920	1,190	1,760	2,060	1,680	1,775	1,900
3	1,112	427	255	525	150	930	1,100	2,000	2,170	1,825	1,580	1,740
4	1,135	615	275	415	155	915	1,080	2,175	1,290	2,700	1,375	1,560
5	1,135	675	335	375	815	900	1,130	2,450	1,325	2,350	1,270	1,675
6	1,143	473	360	340	845	925	1,290	2,125	1,295	2,040	1,070	1,500
7	1,111	411	380	310	930	910	1,140	2,110	1,350	2,025	1,015	1,710
8	1,198	404	370	260	875	900	1,150	2,020	1,500	1,825	890	1,730
9	986	408	250	260	850	900	2,230	1,920	1,500	1,775	1,160	1,480
10	852	412	370	260	845	1,125	1,825	1,860	1,230	2,150	1,610	1,510
11	844	378	372	260	990	890	1,610	1,820	1,540	2,850	1,920	1,450
12	903	383	715	260	990	880	1,620	1,820	1,450	2,730	1,500	1,425
13	1,024	377	1,345	200	915	870	1,640	1,725	1,450	2,150	1,560	1,450
14	1,133	425	815	215	870	870	1,740	1,780	1,425	1,720	1,500	1,375
15	1,158	443	580	255	900	840	1,500	1,850	1,525	1,475	1,880	1,510
16	1,116	419	515	230	980	930	1,400	2,010	1,675	1,390	2,900	1,380
17	846	410	350	220	980	980	1,525	1,960	1,620	1,300	2,410	1,525
18	779	431	400	215	980	900	1,525	2,085	1,520	1,975	1,930	1,450
19	740	454	420	210	960	990	1,625	2,200	1,520	1,850	1,460	1,050
20	700	424	460	215	1,030	1,050	1,675	2,200	1,440	1,650	1,560	750
21	650	354	440	215	1,030	1,025	1,725	2,100	1,530	1,690	1,300	815
22	600	315	460	205	1,020	980	1,575	2,010	1,860	1,500	1,200	920
23	500	305	520	250	990	925	1,410	1,970	2,505	1,290	1,090	815
24	517	307	495	235	950	925	1,650	2,060	1,930	1,350	2,120	860
25	517	303	530	190	1,075	845	1,730	2,215	1,780	1,300	2,230	860
26	500	301	500	180	1,025	835	1,725	2,320	1,850	1,425	2,250	815
27	517	248	470	185	1,070	800	1,740	2,200	1,890	1,475	2,600	790
28	517	251	480	190	1,025	820	1,775	2,040	1,820	1,950	2,690	875
29	540	274	730	175	950	885	1,575	1,720	1,870	2,100	2,550	870
30	525	268	1,495	175	-------	990	1,725	1,690	1,760	1,400	2,060	845
31	436	-------	1,045	160	-------	1,025	-------	1,650	-------	1,325	2,390	-------

Monthly discharge of Rio Grande near El Paso, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,200	436	839	51,600
November	675	248	391	23,300
December	1,500	250	525	32,300
January	875	160	285	17,500
February	1,080	145	844	48,500
March	1,120	800	924	56,800
April	2,230	1,080	1,530	91,000
May	2,450	1,650	1,990	122,000
June	2,500	1,230	1,650	98,200
July	2,850	1,290	1,800	111,000
August	2,900	890	1,740	107,000
September	2,280	750	1,300	77,400
The year	2,900	145	1,150	837,000

RIO GRANDE NEAR FINLAY, TEX.

LOCATION.—At lower end of the Valley of El Paso, in Hudspeth County, 1½ miles below Old Fort Quitman and 11½ miles south of Finlay, Hudspeth County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—January 1, 1923, to September 30, 1924.

GAGE.—Vertical staff on left bank.

DISCHARGE MEASUREMENTS.—Made from cable near gage.

CHANNEL AND CONTROL.—Bed of stream consists of sand; shifting. Banks sparsely vegetated, never overflowed. Channel straight for 500 feet above and below station. Control is a stretch of channel of the stream; shifting.

EXTREMES OF DISCHARGE.—Maximum mean daily stage during the year, 5.83 feet July 10 (discharge, 2,200 second-feet); minimum mean daily discharge, 75 second-feet August 12.

1922–1924: Maximum mean daily stage recorded, 6.7 feet August 26, 1923 (discharge, 2,600 second-feet); minimum mean daily discharge, 49 second-feet April 15, 1923.

ICE.—None.

DIVERSIONS.—Considerable water diverted in Colorado, New Mexico, Texas, and Mexico; amount not known.

REGULATION.—Flow regulated by storage at Elephant Butte Dam, 120 miles above El Paso.

ACCURACY.—Stage-discharge relation not permanent. Daily discharge based on 216 current-meter measurements made at regular intervals.

COOPERATION.—Station maintained and record furnished by the Mexican section of the International Boundary Commission.

Daily discharge, in second-feet, of Rio Grande near Finlay, Tex., for the year ending September 20, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	598	389	220	805	145	655	330	570	760	780	637	1,200
2	1,435	390	215	840	145	655	320	560	770	730	445	1,210
3	875	381	255	660	145	610	320	700	730	660	370	1,230
4	713	340	260	610	145	555	345	780	740	570	405	1,245
5	684	333	270	545	145	485	390	810	530	680	520	1,250
6	650	312	280	460	140	515	390	905	370	890	310	1,125
7	700	448	260	420	135	530	385	965	340	1,020	258	910
8	716	384	240	370	280	545	425	950	280	1,025	210	825
9	783	376	260	340	670	535	435	865	275	950	170	780
10	825	380	290	330	660	530	440	730	365	2,200	130	760
11	632	356	280	300	650	510	385	640	350	1,025	105	665
12	568	319	270	285	660	505	485	765	345	1,020	75	615
13	642	301	265	255	755	480	640	740	480	1,025	270	580
14	556	285	245	240	735	450	660	670	485	1,050	300	580
15	714	279	500	240	695	430	685	640	345	1,200	280	645
16	740	261	650	230	675	415	670	640	340	1,290	205	700
17	805	245	570	210	680	390	620	715	505	1,290	195	730
18	762	290	505	205	700	430	570	785	495	975	510	710
19	620	282	460	200	750	435	595	900	415	870	660	695
20	465	283	450	195	730	420	605	980	400	1,050	710	670
21	465	323	435	185	685	525	630	975	370	1,075	360	620
22	450	336	415	185	560	535	630	940	385	1,305	330	470
23	462	344	440	185	480	510	600	970	400	1,400	405	445
14	446	324	440	185	510	495	575	930	570	1,335	490	425
25	424	290	440	180	560	505	575	870	720	1,020	525	395
26	411	275	440	175	665	385	575	905	815	830	745	370
27	408	271	440	175	865	275	640	940	800	805	750	340
28	388	253	475	175	735	260	705	975	735	777	910	315
29	428	253	465	170	650	265	650	945	730	755	925	305
30	428	246	500	165	-------	260	665	915	775	755	1,275	310
31	428	-------	590	160	-------	295	-------	850	-------	775	1,230	-------

Monthly discharge of Rio Grande near Finlay, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	1,440	388	620	38,100
November	448	245	318	18,900
December	650	215	381	23,400
January	840	160	312	19,200
February	865	135	529	30,400
March	655	260	464	28,500
April	705	320	531	31,600
May	980	560	824	50,700
June	815	275	521	31,000
July	2,200	570	1,000	61,500
August	1,280	75	475	29,200
September	1,250	305	704	41,900
The year	2,200	75	552	404,000

NOTE.—Yearly and monthly figures changed to agree with the computation rules of the U. S. Geological Survey.

RIO GRANDE ABOVE PRESIDIO, TEX.

LOCATION.—1 mile above the Haciendita, 8 miles above mouth of Rio Conchos, and 10 miles northwest of Presidio, Presidio County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 22, 1900, to March 31, 1914; September 1, 1919, to March 31, 1920; and August 1, 1923, to September 30, 1924. Records from May 22, 1900, to September 25, 1905, and from July 7, 1909, to March 31, 1914, were obtained at the Haciendita; from September 26, 1905, to, July 6, 1909, at a site 8 miles farther upstream, but the flow at these points is practically the same as at present site.

GAGE.—Stevens eight-day recorder installed in summer of 1924. Prior to that date, inclined staff on left bank, 200 feet below cable.

DISCHARGE MEASUREMENTS.—Made from cable near gage.

CHANNEL AND CONTROL.—Bed of stream consists of sand; clean. Channel straight 1,000 feet above and below station. Banks medium in height; steep. Control is a stretch of channel of stream; shifts. Backwater reaches this station at extremely high stages from the Rio Conchos.

EXTREMES OF DISCHARGE.—Maximum mean daily discharge for the year, 2,160 second-feet October 6; minimum mean daily discharge, 185 second-feet February 9–11.

1900–1914; 1919–20; 1923–1924: Maximum mean daily discharge, 18,100 second-feet September 15 and 16, 1919; no flow for several periods.

DIVERSIONS.—Considerable water diverted in Colorado, New Mexico, Texas, and Mexico; amount not known.

REGULATION.—Flow largely regulated by storage at Elephant Butte Dam, 120 miles above El Paso.

ACCURACY.—Stage-discharge relation not permanent. Gage read to half-tenths twice daily. Daily discharge based largely on 114 current-meter measurements made at regular intervals.

COOPERATION.—Station maintained and records furnished by the Mexican section of the International Boundary Commission.

Daily discharge, in second-feet, of Rio Grande above Presidio, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,119	761	535	555	270	830	430	780	1,200	725	690	1,150
2	1,020	656	530	555	260	795	425	805	920	680	685	1,000
3	995	703	525	660	250	795	435	1,000	760	1,250	675	1,400
4	1,365	555	520	740	245	795	445	780	750	725	630	1,200
5	1,915	555	515	680	220	795	445	730	780	750	625	1,000
6	2,155	555	480	660	210	795	420	780	760	710	620	1,060
7	967	555	470	635	210	750	455	930	850	655	540	1,075
8	812	555	455	610	205	685	530	945	695	680	470	1,065
9	818	555	440	585	185	685	480	950	630	850	410	900
10	824	555	435	560	185	685	495	950	550	1,090	355	840
11	824	597	430	535	185	685	500	965	530	1,070	345	830
12	872	579	425	535	400	685	540	850	505	1,200	415	910
13	772	579	420	530	560	695	560	990	480	970	295	870
14	700	1,500	415	490	650	705	560	745	470	855	275	850
15	923	710	410	490	700	705	520	810	460	870	250	910
16	693	552	435	440	720	650	770	745	470	930	225	850
17	659	517	415	430	750	635	790	665	510	1,005	215	910
18	693	560	415	350	775	625	795	650	520	1,080	225	1,175
19	764	530	610	350	750	625	795	715	465	1,150	250	850
20	744	517	630	305	690	625	650	810	475	1,375	250	785
21	715	517	620	305	715	665	630	875	560	1,125	215	720
22	681	510	590	305	715	610	680	905	640	975	365	735
23	597	500	590	290	715	610	740	945	475	1,130	605	820
24	597	500	590	280	710	730	745	920	530	950	455	750
25	597	525	590	280	700	700	745	900	430	1,050	345	675
26	597	540	545	275	690	630	690	925	380	1,000	330	590
27	597	545	540	275	700	630	690	875	430	985	470	550
28	586	550	535	275	700	590	680	810	550	890	525	520
29	575	537	580	275	760	530	710	885	755	835	610	505
30	586	537	580	250	-------	500	800	935	800	840	750	465
31	661	-------	520	250	-------	480	-------	950	-------	830	755	-------

Monthly discharge of Rio Grande above Presidio, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,160	575	852	52,400
November	1,500	500	597	35,500
December	630	410	509	31,300
January	740	250	444	27,300
February	775	185	511	29,400
March	830	480	675	41,500
April	800	420	605	36,000
May	1,000	650	856	52,600
June	1,200	380	611	36,400
July	1,380	655	944	58,000
August	755	215	448	27,500
September	1,400	465	865	51,500
The year	2,160	185	660	479,000

NOTE.—Yearly and monthly figures changed to agree with the computation rules of the U. S. Geological Survey.

RIO GRANDE BELOW PRESIDIO, TEX.

LOCATION.—At west end of canyon section of Rio Grande, 6 miles below Presidio, Presidio County, and 7 miles below mouth of Rio Conchos.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 1, 1900, to July 31, 1915; September 1, 1919, to March 31, 1920; and August 1, 1923, to September 30, 1924.

GAGE.—Stevens continuous recorder installed June 18, 1924. Prior to that date, inclined staff on left bank, 300 feet below cable and vertical staff at gravel hills.

DISCHARGE MEASUREMENTS.—Made from cable near gage or in overflow area from boat.

CHANNEL AND CONTROL.—Bed of stream composed of sand; shifts. Right bank, steep; does not overflow. Left bank wooded; overflows at a gage height of 20 feet for about 750 feet. Control consists of sand; shifts; affected by intermittent stream, Alamito Creek, which reaches the river a quarter of a mile below the station. This creek is subject to torrential floods which bring large quantities of boulders and gravel into the Rio Grande, forming a temporary dam which causes changes in the stage-discharge relation.

EXTREMES OF DISCHARGE.—Maximum mean daily discharge during year, 6,600 second-feet, January 1 to 2; minimum mean daily discharge, 1,000 second-feet, August 18.

1900–1915; 1919–1920; 1923–1924: Maximum stage recorded, 26.35 feet September 11, 1904 (discharge, 149,200 second-feet); minimum mean daily discharge, 5 second-feet, May 4–14, 1904.

ICE.—None.

DIVERSIONS.—Considerable water diverted in Colorado, New Mexico, Texas, and Mexico; amount not known.

REGULATION.—Flow partly regulated by storage at Elephant Butte dam, 120 miles above El Paso.

ACCURACY.—Stage-discharge relation not permanent. Gage read to half-tenths twice daily. Daily discharge based largely on 115 current-meter measurements made at regular intervals.

COOPERATION.—Station maintained and records furnished by the Mexican section of the International Boundary Commission.

Daily discharge, in second-feet, of Rio Grande below Presidio, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,939	2,871	3,083	6,595	2,700	2,350	1,650	1,720	1,785	1,400	1,725	1,860
2	3,745	3,306	2,921	6,595	2,645	2,395	1,575	1,775	2,375	1,325	1,650	2,220
3	3,476	2,958	2,867	6,290	2,550	2,395	2,730	1,925	1,785	1,900	1,575	2,500
4	3,244	2,958	2,867	6,160	2,550	2,240	1,595	2,120	1,785	1,560	1,560	3,330
5	3,620	2,804	2,807	5,550	2,460	2,180	1,595	1,875	1,675	1,400	1,500	3,270
6	3,560	2,804	2,626	5,325	2,330	2,120	1,575	1,870	1,650	1,340	1,375	1,840
7	3,682	2,705	2,626	5,200	2,330	2,060	1,575	1,870	1,580	1,580	1,325	2,680
8	3,655	2,705	2,419	4,650	2,330	1,980	1,665	1,870	1,530	1,450	1,300	2,410
9	3,600	2,691	2,670	4,540	2,330	1,980	1,650	2,020	1,420	1,490	1,255	2,075
10	3,489	2,691	3,642	4,130	2,330	1,980	1,630	2,020	1,420	1,600	1,230	1,860
11	3,324	2,769	3,940	4,130	2,330	1,890	1,675	2,990	1,420	1,600	1,180	1,775
12	3,225	2,769	3,792	3,850	2,200	1,780	1,725	2,370	1,375	1,700	1,190	1,660
13	3,175	2,769	3,741	3,800	2,275	1,780	1,680	2,300	1,325	1,950	1,170	1,650
14	4,877	3,392	3,606	3,500	2,415	1,900	1,650	1,865	1,300	1,740	1,160	1,800
15	3,400	2,859	3,572	3,400	2,415	1,880	1,650	1,750	1,230	1,675	1,125	2,110
16	3,337	2,695	3,341	3,275	2,545	1,860	1,640	1,750	1,230	2,210	1,060	2,300
17	3,220	2,654	3,270	3,180	2,630	1,860	1,630	1,600	1,230	1,975	1,055	2,680
18	3,138	2,654	3,130	3,225	2,725	1,885	1,800	1,485	1,230	1,975	1,000	4,220
19	3,030	2,654	3,415	3,225	2,700	1,820	1,750	1,485	1,230	2,650	1,050	4,770
20	2,979	2,654	3,555	3,230	2,515	1,700	1,750	1,485	1,230	2,825	1,080	3,710
21	2,910	2,654	3,455	3,140	2,325	1,875	1,625	1,570	1,250	2,850	1,055	3,450
22	2,842	2,751	3,405	3,040	2,450	1,770	1,675	1,875	1,240	2,730	1,125	3,260
23	2,807	3,068	3,405	3,040	2,375	1,725	1,650	1,925	1,230	2,475	1,410	3,000
24	2,759	3,244	3,405	2,950	2,325	1,770	1,650	1,780	1,220	2,640	1,250	2,790
25	2,676	3,618	3,405	2,770	2,450	1,925	1,620	1,720	1,220	2,475	1,170	2,560
26	2,607	3,556	3,245	2,965	2,345	1,815	1,575	1,735	1,150	2,930	1,110	2,500
27	2,538	3,681	3,245	2,860	2,220	1,815	1,550	1,735	1,175	2,950	1,160	2,665
28	2,538	3,482	3,245	2,860	2,220	1,770	1,510	1,650	1,285	2,520	1,200	3,230
29	2,393	3,184	3,868	2,805	2,240	1,675	1,480	1,720	1,375	2,180	1,375	3,060
30	2,664	3,108	6,060	2,710	-------	1,625	1,525	1,800	1,550	2,010	2,475	2,910
31	2,798	-------	6,215	2,645	-------	1,625	-------	1,820	-------	2,180	1,780	-------

Monthly discharge of Rio Grande below Presidio, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	4,880	2,390	3,200	197,000
November	3,680	2,650	2,960	176,000
December	6,220	2,420	3,450	212,000
January	6,600	2,640	3,920	241,000
February	2,720	2,200	2,420	139,000
March	2,400	1,620	1,920	118,000
April	2,730	1,480	1,670	99,300
May	2,990	1,480	1,850	114,000
June	2,380	1,150	1,420	84,300
July	2,950	1,320	2,040	126,000
August	2,480	1,000	1,310	80,700
September	4,770	1,650	2,670	159,000
The year	6,600	1,000	2,410	1,750,000

NOTE.—Yearly and monthly figures changed to agree with the computation rules of the U. S. Geological Survey.

RIO GRANDE AT LANGTRY, TEX.

LOCATION.—At east end of canyon section, half a mile from Langtry, Val Verde County, one-fourth mile below Pump Canyon, and 13 miles above mouth of Pecos River.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 1, 1900, to October 15, 1914; December 1, 1919, to March 31, 1920; January 20 to September 30, 1924.

GAGE.—Vertical and inclined staff gage on right bank; read by H. T. Dodd. Exact datum of previous gages not known, but present gage set within 0.10 foot of the datum of the last gage. All gages at approximately the same location.

DISCHARGE MEASUREMENTS.—Made from cable 500 feet below gage, or by wading near control.

CHANNEL AND CONTROL.—Channel straight for 1 mile above and one-fourth mile below station. Bed of stream consists of sand and gravel; fairly permanent. Banks of rock; not subject to overflow. Control is sand, gravel, and boulder riffle, 1,000 feet below the gage; subject to shift.

EXTREMES OF DISCHARGE.—Maximum stage recorded during the period, 6 feet at 8.45 a. m. June 2 (discharge, 13,000 second-feet); minimum stage, 1 foot from 5 p. m. August 25 to 5 p. m. August 27 (discharge, 840 second-feet).

1900–1914; 1919–1920; 1924: Maximum stage recorded during periods of record, 34.25 feet September 13, 1904 (discharge, 132,000 second-feet); minimum discharge, 270 second-feet May 8–13, 1904.

A stage of 56.9 feet, present gage datum, was reached about June 18, 1922. Determined by leveling to floodmark made by W. H. Dodd. This flood was 10 feet higher than the flood in 1919.

ICE.—None.

DIVERSIONS.—Considerable water is diverted in Colorado, New Mexico, Texas, and Mexico. Amount not known. Records of the Board of Water Engineers for the State of Texas show that about 180,000 acres were irrigated in 1920 by diversions below this station, practically all of which was in Hidalgo and Cameron Counties.

REGULATION.—Flow partly regulated by storage at Elephant Butte Dam, 120 miles above El Paso, and on Mexican tributaries.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined for all stages. Gage read to nearest tenth or half-tenth twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records good.

Discharge measurements of Rio Grande at Langtry, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Jan. 22	2.32	2,320	June 2	5.23	10,200	Sept. 6	2.15	2,280
Feb. 26	2.03	1,900	July 2	1.15	928	Sept. 12	2.20	2,060
Mar. 14	1.80	1,600	Aug. 10	1.60	1,450	Sept. 19	2.20	2,230
May 5	1.50	1,280	Aug. 16	1.20	1,030	Sept. 27	2.70	3,100
May 25	1.50	1,240	Aug. 23	1.15	958			
May 31	1.60	1,450	Aug. 29	1.30	1,150			

Daily discharge, in second-feet, of Rio Grande at Langtry, Tex., for the year ending September 30, 1924

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		1,910	1,910	1,380	1,280	3,700	955	1,910	1,380
2		1,770	1,910	1,380	1,220	7,700	955	1,910	1,910
3		1,640	1,910	1,380	1,280	3,480	955	1,770	4,400
4		1,640	2,060	1,380	1,280	3,700	995	1,770	3,700
5		1,770	1,910	1,380	1,280	2,880	1,080	1,640	2,520
6		1,770	1,910	1,380	1,330	1,910	1,130	3,070	2,200
7		1,640	1,910	1,330	1,330	1,770	1,180	2,520	2,520
8		1,640	1,910	1,280	1,280	1,640	1,280	1,640	2,880
9		1,640	1,910	1,280	1,380	1,500	1,380	1,500	2,520
10		1,770	1,910	1,280	2,200	1,440	1,380	1,380	2,520
11		1,640	1,910	1,280	1,910	1,380	1,280	1,180	2,520
12		1,570	1,770	1,280	1,440	1,220	1,380	1,130	2,200
13		1,570	1,770	1,330	1,380	1,080	1,440	1,080	2,200
14		1,500	1,640	1,380	1,700	1,080	1,280	1,040	2,520
15		1,500	1,640	1,330	2,060	1,080	1,330	995	2,200
16		1,500	1,500	1,280	2,060	1,080	1,500	995	2,200
17		1,770	1,500	1,380	1,910	1,040	1,770	995	2,200
18		2,200	1,500	1,280	1,910	995	3,700	955	2,200
19		3,270	1,500	1,280	2,060	995	5,140	955	2,200
20	2,700	3,700	1,440	1,280	1,910	995	3,700	955	2,880
21	2,520	2,880	1,440	1,280	1,700	995	2,700	955	4,160
22	2,360	2,200	1,440	1,280	1,640	1,080	2,520	955	5,140
23	2,200	2,060	1,440	1,280	1,570	1,080	2,520	955	5,660
24	2,700	2,060	1,380	1,280	1,380	1,180	3,270	915	5,140
25	2,360	1,910	1,380	1,280	1,280	1,180	2,700	878	4,160
26	1,910	2,060	1,440	1,280	1,380	1,180	2,520	840	3,270
27	1,910	1,910	1,440	1,380	1,500	1,180	2,520	840	3,070
28	1,910	1,910	1,380	1,380	1,500	1,220	2,520	1,220	2,880
29	1,910	2,060	1,380	1,280	1,500	1,280	2,200	1,080	2,880
30	1,770		1,380	1,280	1,380	1,280	2,200	995	2,700
31	1,770		1,380		1,380		2,200	995	

Monthly discharge of Rio Grande at Langtry, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
January 20–31	2,700	1,770	2,170	51,600
February	3,700	1,500	1,950	112,000
March	2,060	1,380	1,640	101,000
April	1,380	1,280	1,320	78,400
May	2,200	1,280	1,560	96,000
June	7,700	995	1,740	104,000
July	5,140	955	1,990	122,000
August	3,070	840	1,290	79,400
September	5,660	1,380	2,960	176,000
The period				920,000

RIO GRANDE NEAR DEL RIO, TEX.

LOCATION.—At the International Highway bridge between Del Rio, Val Verde County, and Villa Acuna, Coahuila, Mexico, 3.2 miles by road from Courthouse in Del Rio, 12 miles below mouth of Devils River, and 12 miles above mouth of Sycamore Creek.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 17, 1923, to September 30, 1924. A station was maintained 1 mile below mouth of Devils River from May 1, 1900, to April 30, 1915. A station was maintained at McKee's Switch, 4½ miles below mouth of Devils River from December 1, 1919, to March 31, 1920.

GAGE.—Vertical and inclined staff gage on left bank; read by J. N. McFarland. For description of former gages, see Water-Supply Papers 358, 388, and 408.

DISCHARGE MEASUREMENTS.—Made from cable, 900 feet above low-water gage, or from bridge at gage.

CHANNEL AND CONTROL.—Channel straight for half a mile above and 1,400 feet below station. Bed of stream composed of solid rock overlain with about 2 inches sand and gravel; permanent. Right bank of sand and clay, high; left bank medium in height, composed of sand and clay, subject to overflow at stage of about 13 feet. Low-water control is rock ledge partly covered with sand and gravel 500 feet below gage; probably permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 5.60 feet at 8 a. m. September 22 (discharge, 14,400 second-feet, determined from extension of rating curve); minimum stage, 2.32 feet at 8 a. m. August 26 (discharge, 1,710 second-feet).

1910–1915; 1919–20; 1923–24: Highest stage recorded at gage 1 mile below mouth of Devils River, 36.5 feet April 6, 1900. Highest stage at gage 4½ miles below mouth of Devils River, 41 feet in September, 1919 (discharges not determined). Relation to present gage not known.

Highest stage on record occurred June 18 or 19, 1922, and reached a gage height by present datum of 32.8 feet, determined by leveling in 1924 to flood mark on Mexican bank pointed out by Mexican custom officer (discharge not determined).

ICE.—None.

DIVERSIONS.—Considerable water diverted in Colorado, New Mexico, Texas, and Mexico; amount not known.

REGULATION.—Flow partly regulated by storage at Elephant Butte Dam, 120 miles above El Paso, on Pecos River and on Mexican tributaries.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined from 1,500 to 11,000 second-feet. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Records good.

Discharge measurements of Rio Grande near Del Rio, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 11	3.26	3,700	May 23	2.68	2,260	Aug. 26	2.36	1,770
Dec. 17	3.56	4,980	Do	2.68	2,490	Sept. 2	2.44	1,960
Dec. 29	3.38	4,210	June 3	4.17	7,140	Sept. 10	3.00	3,070
Jan. 28	3.10	3,630	July 3	2.38	1,820	Sept. 15	3.68	5,530
Feb. 14	2.87	2,850	Aug. 6	2.60	2,400	Sept. 22	4.76	9,720
Mar. 10	2.98	3,140	Aug. 13	2.54	2,200			
Apr. 29	2.70	2,590	Aug. 20	2.38	1,870			

Daily discharge, in second-feet, of Rio Grande near Del Rio, Tex., for the year ending September 30, 1924

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		4,420	3,550	3,280	3,020	2,530	10,100	1,870	3,020	1,980
2		6,980	3,420	3,420	2,900	2,420	4,420	1,870	2,900	2,300
3		8,720	3,280	3,420	2,900	2,420	6,570	1,870	2,900	3,550
4		9,170	3,280	3,550	2,900	2,420	5,430	1,870	2,650	3,420
5		8,720	3,280	3,420	2,900	2,530	3,280	1,980	2,530	3,150
6		8,270	3,280	3,420	2,770	5,800	3,280	1,980	2,420	3,020
7		8,270	3,280	3,280	2,770	2,770	3,150	2,080	3,550	3,150
8		8,270	3,150	3,280	2,770	2,770	2,770	2,300	2,770	3,420
9		7,830	3,150	3,280	2,900	2,770	2,770	2,300	2,420	3,550
10		6,980	3,020	6,570	3,150	2,900	2,650	2,190	2,770	3,420
11		6,570	3,020	3,280	3,020	2,650	2,650	2,190	2,420	3,150
12		6,570	3,020	3,280	2,900	2,650	2,530	2,080	2,300	3,280
13		5,800	3,020	3,280	2,770	2,770	2,530	2,080	2,190	4,740
14		5,430	3,020	3,150	2,770	2,770	2,530	2,080	2,080	4,740
15		5,430	3,020	3,150	2,770	2,770	2,420	2,300	1,980	5,430

Daily discharge, in second-feet, of Rio Grande near Del Rio, Tex., for the year ending September 30, 1924—Continued

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
16	-------	5,080	3,020	3,150	2,770	3,280	2,420	2,420	1,870	4,120
17	5,080	5,080	3,020	3,020	2,650	3,020	2,300	2,650	1,870	3,280
18	5,080	4,740	3,280	3,020	2,650	2,900	2,300	2,900	1,870	3,420
19	4,740	4,420	3,280	3,020	2,530	2,770	2,300	3,020	1,870	4,420
20	4,740	4,420	3,420	3,280	2,530	2,770	2,190	4,120	1,870	3,550
21	4,740	4,420	4,740	3,150	2,530	2,650	2,190	3,550	1,870	5,080
22	4,740	4,120	4,740	3,150	2,530	2,530	2,080	3,280	1,770	12,000
23	4,740	4,120	4,420	3,020	2,650	2,530	2,080	3,280	1,770	7,830
24	4,740	4,120	4,120	3,020	2,650	2,420	2,080	3,280	1,770	6,180
25	4,420	3,830	3,830	3,020	2,770	2,420	1,980	3,420	1,770	5,080
26	4,420	3,830	3,690	2,900	2,650	2,420	1,980	3,280	1,770	4,740
27	4,420	3,550	3,550	2,900	2,530	2,530	1,980	3,020	1,770	4,420
28	4,420	3,550	3,420	2,900	2,530	2,530	1,870	2,900	1,980	4,420
29	4,420	3,550	3,280	2,900	2,530	2,530	1,870	2,770	2,080	3,830
30	4,420	3,550	-------	2,900	2,530	2,650	1,870	2,770	1,980	3,550
31	4,420	3,550	-------	2,900	-------	3,690	-------	3,020	1,980	-------

Monthly discharge of Rio Grande near Del Rio, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
December 17–31	5,080	4,420	4,640	138,000
January	9,170	3,550	5,590	344,000
February	4,740	3,020	3,430	198,000
March	6,570	2,900	3,270	201,000
April	3,150	2,530	2,740	163,000
May	5,800	2,420	2,790	172,000
June	10,100	1,870	2,950	176,000
July	4,120	1,870	2,600	160,000
August	3,550	1,770	2,220	136,000
September	12,000	1,980	4,270	254,000
The period				1,940,000

RIO GRANDE AT EAGLE PASS, TEX.

LOCATION.—At International Highway bridge at foot of Main Street, Eagle Pass, between Eagle Pass, Maverick County, Tex., and Piedras Negras, Coahuila, Mexico, and 1 mile above Southern Pacific Railroad bridge.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 1, 1900, to March 31, 1914; August 10, 1914, to April 30, 1916; November 26, 1923, to September 30, 1924.

GAGE.—Vertical staff on left bank. Gage from May 1, 1900, to March 31, 1914, and from August 10, 1914, to April 30, 1916, was maintained at a point half a mile above the old highway bridge between Eagle Pass and Ciudad Porfirio Dias, Mexico, and quarter of a mile below present location. Relation between old gage and present gage not known.

DISCHARGE MEASUREMENTS.—Made from highway or railroad bridge.

CHANNEL AND CONTROL.—Bed of stream composed of sand or limestone; clean; permanent. Channel straight for half a mile above and 1 mile below station. Banks medium in height; composed of sand and clay; subject to overflow at a stage of 14 feet. Drift collecting on temporary highway bridge may cause change in stage-discharge relation. Control probably a gravel bar around an old steel highway bridge span lying in the river just below railroad bridge.

EXTREMES OF DISCHARGE.—Maximum mean daily stage recorded during period, 8.0 feet September 14 (discharge, 20,800 second-feet); minimum mean daily stage, 2.1 feet August 13–30 (discharge, 1,880 second-feet).

1900–1916, 1923–24: Maximum stage, 34.6 feet at midnight June 29, 1905 (mean daily discharge, June 30, 1905, 238,000 second-feet); minimum mean daily discharge, 1,030 second-feet April 15, 1913.

ICE.—None.

DIVERSIONS.—Considerable water is diverted in Colorado, New Mexico, Texas and Mexico; amount not known.

REGULATION.—Flow partly regulated by storage at Elephant Butte Dam, 120 miles above El Paso; on Pecos River; and on Mexican tributaries.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined from 1,710 to 13,000 second-feet. Gage read once daily to tenths, but the work of the observer doubtful. Daily discharge determined by applying daily gage height to rating table. Records fair.

COOPERATION.—Gage-height records furnished by United States Weather Bureau.

Discharge measurements of Rio Grande at Eagle Pass, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Nov. 15	4.00	6,680	Mar. 17	2.90	3,140	Aug. 19	2.16	1,960
Nov. 27	3.26	4,800	Apr. 18	2.60	3,050	Aug. 27	2.10	1,920
Dec. 13	3.38	4,110	May 28	2.58	2,900	Sept. 3	2.28	2,140
Jan. 2	3.48	4,920	June 27	2.18	2,150	Sept. 8	2.85	3,490
Jan. 3	4.76	8,760	Aug. 5	2.50	2,740	Sept. 16	5.08	9,840
Feb. 5	3.00	3,410	Aug. 12	2.39	2,400	Sept. 24	4.80	8,840
Mar. 8	3.10	3,430						

Daily discharge, in second-feet, of Rio Grande at Eagle Pass, Tex., for the year ending September 30, 1924

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		4,700	1,550	5,230		2,800	3,010	3,700	3,230	3,230	2,220
2		4,700	3,010	5,230		2,800	2,800	6,350	3,230	3,230	2,220
3		4,440	8,880	5,230		2,800	2,800	4,960	2,800	3,230	2,220
4		4,440	8,880	5,230		3,700	2,800	6,060	2,800	3,230	3,010
5		4,440	8,880	4,190		3,230	2,800	5,500	2,040	2,800	4,700
6		4,700	8,880	3,460		3,010	8,210	4,190	2,040	3,230	4,190
7		4,700	8,880	3,460		2,800	5,230	4,190	2,040	3,230	3,940
8		4,700	8,210	3,460		2,800	3,700	4,190	2,040	3,940	3,700
9		4,190	8,210	3,230		2,800	3,700	3,700	2,040	3,230	3,940
10		4,440	8,210	3,230		2,800	3,230	3,700	2,040	2,800	4,190
11		4,440	7,560	3,230		2,800	2,800	3,700	2,040	2,600	4,190
12		4,440	6,940	3,010		2,800	2,800	2,600	2,040	2,410	4,190
13		4,440	6,640	3,010		2,800	3,230	2,600	2,800	1,880	4,190
14		4,700		2,800		2,800	3,230	2,600	2,410	1,880	20,800
15		4,700		2,800		2,800	3,230	2,600	2,410	1,880	16,900
16		4,700		3,010	3,380	2,800	2,800	2,600	2,040	1,880	10,200
17		4,700		3,460		2,800	2,800	3,700	2,040	1,880	7,250
18		4,700		3,700		2,800	2,800	2,600	2,800	1,880	6,350
19		4,960		3,700		2,800	3,010	2,040	3,230	1,880	3,940
20		4,960		3,700		2,800	3,230	2,040	4,700	1,880	6,350
21		4,960		3,940		2,800	5,230	2,040	4,700	1,880	6,940
22		4,700	5,160	3,700		2,800	3,700	2,040	3,700	1,880	8,880
23		4,700		3,230		2,800	3,700	2,040	3,700	1,880	14,200
24		4,700		3,010		3,230	3,700	2,040	3,460	1,880	8,880
25		4,700		3,460		3,230	3,230	2,040	2,040	1,880	7,560
26	3,460	4,700		3,940		2,800	3,010	2,040	3,940	1,880	6,640
27	3,940	4,960		3,700		2,800	2,800	2,040	3,460	1,880	6,640
28	4,190	5,230		3,230		2,800	2,800	2,040	3,230	1,880	6,350
29	4,960	5,230		3,230		2,800	4,440	2,040	2,800	1,880	5,780
30	4,700	4,960				2,800	8,540	2,040	2,410	1,880	5,500
31		4,960					3,230		2,410	2,040	

NOTE.—Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Rio Grande at Eagle Pass, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
November 26–30	4,960	3,460	4,250	42,100
December	5,230	4,190	4,710	290,000
January			6,050	372,000
February	5,230	2,800	3,650	210,000
March			3,380	208,000
April	3,700	2,800	2,880	171,000
May	8,540	2,800	3,630	223,000
June	6,350	2,040	3,130	186,000
July	4,700	2,040	2,800	172,000
August	3,940	1,880	2,360	145,000
September	20,800	2,220	6,540	389,000
The period				2,410,000

RIO GRANDE NEAR LAREDO, TEX.

LOCATION.—At Fort McIntosh, 1½ miles above Mexican National Railroad bridge; 1¼ miles west of Laredo post office, Webb County; and 2¼ miles above international highway bridge.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 1, 1900, to March 31, 1914 (records of stage and discharge measurements); November 1, 1922, to September 30, 1924.

GAGE.—Stevens continuous recorder installed in July, 1924. Prior to July, vertical and inclined staff located on the left bank was used. Zero of gage 351.35 feet above sea level and 350.44 feet above datum of International Boundary Commission.

DISCHARGE MEASUREMENTS.—Made from cable, 50 feet below gage.

CHANNEL AND CONTROL.—Channel straight for 1,000 feet above and below gage. Right bank medium in height, subject to overflow at a stage of about 10 feet, left bank high, subject to overflow at a stage of 30 feet. Bed composed of sand; shifts. Control is channel of stream; shifts.

EXTREMES OF DISCHARGE.—Maximum mean daily stage for year, 15.25 feet September 22 (discharge, 36,500 second-feet); minimum mean daily discharge, 1,600 second-feet August 29 and 30.

1900–1914; 1922–1924: Maximum stage recorded, 32.2 feet on night of June 30, 1905 (discharge not determined); minimum mean daily discharge, 955 second-feet August 17, 1910.

The highest stage known was about 46 feet, present gage datum, on June 20 and 21, 1922.

DIVERSIONS.—Considerable water diverted in Colorado, New Mexico, Texas, and Mexico; amount not known.

REGULATION.—Flow partly regulated by storage at Elephant Butte Dam, 120 miles above El Paso; on Pecos River; and on Mexican tributaries.

ACCURACY.—Stage-discharge relation not permanent. Daily discharge based largely on 125 current-meter discharge measurements made at regular intervals.

COOPERATION.—Daily discharge record furnished by the Mexican Section of the International Boundary Commission.

Daily discharge, in second-feet, of Rio Grande near Laredo, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9,716	4,013	4,125	3,765	3,700	2,840	2,460	2,575	4,750	2,000	2,550	1,825
2	10,132	3,898	4,290	3,700	3,620	2,800	2,460	2,460	7,050	1,875	2,575	1,825
3	8,694	3,838	4,231	3,700	3,600	2,885	2,465	2,460	8,600	1,680	2,460	1,880
4	8,672	3,800	5,025	7,120	3,575	2,885	2,465	2,460	9,650	1,650	2,575	1,880
5	8,270	7,074	4,209	7,600	3,300	2,885	2,465	2,475	9,200	1,775	2,383	1,925
6	7,638	6,897	3,880	7,150	3,120	3,125	2,400	2,560	7,015	1,775	2,225	2,675
7	7,176	6,107	3,680	7,400	2,950	3,125	2,420	3,700	5,175	1,800	2,225	3,725
8	6,789	4,904	3,576	7,040	2,875	3,125	2,420	5,700	4,550	1,800	2,140	3,025
9	6,510	4,491	3,548	6,870	2,825	3,120	2,350	3,850	4,750	1,875	2,130	3,100
10	7,156	4,468	3,576	6,675	2,800	3,000	2,400	3,050	3,300	1,875	2,650	3,175
11	6,870	4,567	3,821	6,795	2,720	3,000	2,545	2,975	3,200	1,900	2,425	3,320
12	6,230	4,316	3,506	6,775	2,720	2,880	3,200	2,900	3,100	1,975	2,290	3,350
13	6,230	4,316	4,200	6,375	2,650	2,895	3,300	2,900	3,055	1,850	2,325	3,275
14	6,691	5,301	3,500	6,275	2,580	2,895	2,530	2,700	3,055	1,800	2,210	3,325
15	6,127	5,630	3,400	5,720	2,520	2,895	2,380	2,650	2,900	1,800	2,075	14,000
16	6,076	6,354	4,000	5,600	2,450	2,895	2,380	2,950	2,850	1,800	2,060	18,250
17	5,779	5,265	4,325	5,600	2,390	2,880	2,310	2,950	2,635	1,875	2,030	11,200
18	5,753	5,041	4,275	5,400	2,800	2,880	2,310	3,050	2,500	1,925	2,000	7,550
19	7,024	4,837	4,515	5,200	2,470	2,850	2,275	3,280	2,450	1,975	1,975	6,050
20	6,389	4,817	4,445	5,175	2,350	2,910	2,275	2,920	2,375	1,975	1,820	5,600
21	6,105	5,193	4,600	5,100	2,350	2,910	2,275	3,750	2,375	2,400	1,820	4,975
22	5,868	4,699	4,550	5,050	2,350	2,910	2,275	4,725	2,375	2,750	1,880	36,500
23	5,721	4,081	4,600	4,875	2,300	2,850	2,240	3,625	2,375	3,075	1,875	13,200
24	5,879	3,593	4,362	4,670	2,250	2,670	2,240	3,525	2,185	2,800	1,870	12,700
25	5,800	3,428	3,790	4,600	3,000	2,670	2,175	3,200	2,185	2,575	1,860	8,825
26	5,158	3,428	4,133	4,575	2,810	2,670	4,000	2,925	2,160	2,800	1,850	7,800
27	4,978	3,312	4,133	4,430	2,800	2,500	3,100	2,840	2,150	2,850	1,780	7,350
28	4,601	3,294	3,821	4,350	2,800	2,440	2,800	2,840	2,040	2,850	1,720	6,525
29	4,490	3,476	3,739	4,160	2,805	2,440	2,450	4,780	2,040	2,600	1,600	6,175
30	3,826	4,018	3,739	4,160	-------	2,450	2,310	8,800	2,040	2,575	1,600	5,875
31	3,741	-------	3,739	4,160	-------	2,460	-------	6,425	-------	2,375	1,750	-------

Monthly discharge of Rio Grande near Laredo, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	10,100	3,740	6,450	397,000
November	7,070	3,290	4,620	275,000
December	5,020	3,400	4,040	248,000
January	7,600	3,700	5,490	338,000
February	3,700	2,250	2,810	162,000
March	3,120	2,440	2,830	174,000
April	4,000	2,180	2,520	150,000
May	8,800	2,460	3,480	214,000
June	9,650	2,040	3,800	226,000
July	3,080	1,650	2,150	132,000
August	2,650	1,600	2,090	129,000
September	36,500	1,820	7,010	417,000
The year	36,500	1,600	3,940	2,860,000

NOTE.—Yearly and monthly figures changed to agree with the computation rules of the U. S. Geological Survey.

RIO GRANDE AT ROMA, TEX.

LOCATION.—At Roma, Starr County, just above United States customhouse and ferry crossing between Roma, Tex., and San Pedro, Mexico, and 9½ miles above mouth of Rio San Juan.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 14, 1900, to March 31, 1914; and November 1, 1922, to September 30, 1924.

GAGE.—Stevens continuous recorder installed July, 1924. Prior to that date, vertical and inclined staff on left bank, 100 feet above customhouse; read to half-tenths twice daily and oftener during floods.

DISCHARGE MEASUREMENTS.—Made from cable.

CHANNEL AND CONTROL.—Bed of stream of sand; shifts. Banks not subject to overflow. Channel straight for 1,000 feet above and below station. Control is channel of stream; shifts.

EXTREMES OF DISCHARGE.—Maximum mean daily discharge, 55,700 second-feet September 23; minimum mean daily discharge, 1,460 second-feet August 29 and 30.

1900–1914; 1922–1924: Maximum stage recorded, 25.75 feet September 16, 1904 (discharge, 96,900 second-feet, determined from poorly defined rating curve and subject to considerable error); minimum mean daily discharge, 810 second-feet March 28 and 29, 1912.

On June 22, 1922, a stage of 32.4 feet, present gage datum, was reached (from levels by the International Boundary Commission, Mexican section) and the discharge, as measured by United States Geological Survey engineers by the slope method, was 240,000 second-feet.

DIVERSIONS.—Considerable water diverted in Colorado, New Mexico, Texas, and Mexico; amount not known.

REGULATION.—Flow partly regulated by storage at Elephant Butte Dam, 120 miles above El Paso. Slight storage on Pecos and Mexican tributaries.

ACCURACY.—Stage-discharge relation not permanent. Daily discharge based largely on 139 current-meter measurements made at regular intervals. Records good.

COOPERATION.—Station maintained and record furnished by the Mexican Section of the International Boundary Commission.

Daily discharge, in second-feet, of Rio Grande at Roma, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22,200	5,435	6,100	6,500	4,480	3,690	2,600	2,635	6,100	1,775	2,550	1,500
2	20,700	5,666	6,400	6,400	4,430	3,690	2,610	2,635	7,675	2,885	2,425	1,570
3	22,200	6,130	6,731	6,300	4,380	3,690	2,620	2,635	10,750	2,885	2,250	1,650
4	23,000	6,439	6,443	6,080	4,330	3,600	2,600	2,340	9,600	2,700	2,660	1,725
5	16,600	5,744	6,443	7,700	4,000	3,550	2,580	2,340	10,250	2,725	2,710	1,775
6	15,000	8,522	6,500	7,000	4,000	3,550	2,580	2,340	8,975	2,510	2,430	1,725
7	15,200	7,833	6,558	10,685	3,800	3,425	2,580	2,650	6,300	2,090	2,220	1,875
8	13,900	6,355	6,358	9,900	3,800	3,300	2,580	8,420	4,700	2,090	2,220	2,900
9	12,232	5,826	5,959	9,650	3,800	3,225	2,580	7,325	4,160	1,960	2,120	3,350
10	13,232	5,478	5,759	9,550	3,770	3,025	2,750	7,200	3,800	1,960	2,120	2,725
11	12,730	5,378	5,759	9,300	3,650	2,975	2,390	5,325	3,625	1,850	2,180	2,725
12	11,730	5,229	6,340	8,900	3,450	2,900	2,450	3,050	3,400	1,850	2,950	3,200
13	11,730	5,311	6,123	8,400	3,270	2,800	2,830	2,950	3,175	1,900	2,520	3,390
14	11,730	5,394	6,005	8,200	3,270	2,800	3,500	2,950	3,050	1,930	2,310	3,350
15	9,716	6,553	5,982	7,700	3,150	2,800	3,025	5,950	2,860	1,915	2,310	4,250
16	9,432	7,426	5,982	7,300	3,150	2,850	2,920	8,000	2,775	1,900	1,970	39,250
17	8,682	7,185	5,982	7,200	3,150	2,850	2,880	4,725	2,575	1,900	1,860	37,000
18	8,417	8,937	6,611	7,200	3,350	2,800	2,880	3,550	2,575	1,900	1,800	46,700
19	8,237	8,141	7,400	7,100	3,550	2,800	2,880	2,990	2,320	1,900	1,750	46,500
20	9,735	7,933	7,240	6,550	3,750	2,800	2,825	2,990	2,275	2,000	1,700	28,650
21	9,013	7,811	7,201	6,300	4,175	2,780	2,675	3,075	2,525	2,065	1,685	20,250
22	8,695	7,811	7,201	6,100	3,850	2,660	2,675	4,400	4,200	2,375	1,670	20,000
23	8,457	7,616	7,201	5,300	3,575	2,660	2,675	3,975	2,250	2,825	1,655	55,725
24	8,457	7,144	6,752	5,300	3,675	2,660	2,585	5,300	4,125	3,300	1,640	43,500
25	8,457	6,829	6,460	5,300	4,200	2,600	2,585	3,900	2,500	3,350	1,640	43,175
26	7,386	6,361	6,168	5,300	4,100	2,750	2,770	2,880	2,180	2,560	1,630	27,500
27	6,385	6,323	6,002	4,825	3,850	2,700	3,490	2,700	2,125	2,620	1,610	17,000
28	5,994	6,199	5,836	4,825	3,875	2,650	3,920	3,550	2,075	2,620	1,595	13,150
29	5,693	6,109	5,807	4,825	3,700	2,620	3,040	2,445	1,955	2,950	1,460	13,450
30	5,346	6,099	5,772	4,825	-------	2,610	2,825	4,875	1,955	2,870	1,460	12,475
31	5,196	-------	5,743	4,550	-------	2,610	-------	9,200	--------	2,720	1,530	-------

Monthly discharge of Rio Grande at Roma, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	23,000	5,200	11,500	707,000
November	8,940	5,230	6,640	395,000
December	7,400	5,740	6,350	390,000
January	10,700	4,550	6,940	427,000
February	4,480	3,150	3,780	217,000
March	3,690	2,600	2,980	183,000
April	3,920	2,390	2,800	167,000
May	9,200	2,340	4,140	255,000
June	10,750	1,960	4,300	256,000
July	3,350	1,780	2,350	144,000
August	2,950	1,460	2,020	124,000
September	55,700	1,500	16,700	994,000
The year	55,700	1,460	5,870	3,940,000

NOTE.—Yearly and monthly figures changed to agree with the computation rules of the U. S. Geological Survey.

RIO GRANDE NEAR BROWNSVILLE, TEX.

LOCATION.—Opposite Matamoros, Tamaulipas, Mexico, half a mile above international railroad bridge, and 1 mile above Brownsville, Cameron County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 29, 1900, to March 31, 1914; and October 1, 1922, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder installed July 1, 1924. Prior to July 1 vertical staff on right bank, 40 feet below cable. All gages set to same datum.

DISCHARGE MEASUREMENT.—Made from cable near gage.

CHANNEL AND CONTROL.—Bed of stream of sand; shifting. Channel straight for 500 feet above and 2,000 feet below station. Banks composed of sand and clay; subject to overflow at extremely high stages. Control is channel of stream; shifts.

EXTREMES OF DISCHARGE.—Maximum mean daily discharge, 23,800 second-feet September 28; minimum mean daily discharge, 300 second-feet August 29.

1923–24: Maximum mean daily discharge, 25,500 second-feet September 12 and 13, 1923; minimum mean daily discharge August 29, 1924.

DIVERSIONS.—Considerable water diverted in Colorado, New Mexico, Texas, and Mexico; amount not known.

Between Roma and Brownsville there are many lagoons (old river channels) which take river water during moderate floods, and a large area is overflowed deeply in large floods. Much of this water returns slowly to the river as the floods subside, thus making the flow more uniform at Brownsville than at Roma. Large quantities, during extremely high stages, also leave the river entirely, reaching the Gulf of Mexico by other channels.

REGULATION.—Flow partly regulated by storage at Elephant Butte dam, 120 miles above El Paso.

ACCURACY.—Stage-discharge relation not permanent. Daily discharge based largely on 128 current-meter measurements.

COOPERATION.—Records furnished by the Mexican Section of the International Boundary Commission.

Daily discharge, in second-feet, of Rio Grande near Brownsville, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20,200	7,354	7,750	7,750	6,375	4,425	2,000	1,870	4,300	2,325	1,980	700
2	19,300	8,574	7,830	7,670	6,225	4,425	1,825	2,025	9,400	2,030	1,730	700
3	18,500	11,734	7,910	7,670	6,000	4,335	1,700	1,740	9,850	1,750	1,650	510
4	19,500	12,208	8,067	7,150	5,805	4,175	1,630	1,820	16,800	1,750	1,760	535
5	20,700	10,313	8,107	7,075	5,675	3,875	1,525	1,915	18,590	4,325	1,550	700
6	21,300	10,033	8,157	8,250	5,625	3,675	1,675	1,505	16,850	5,275	1,480	615
7	19,500	10,208	7,967	8,805	5,525	3,625	1,730	1,255	13,750	4,850	1,390	500
8	19,000	10,771	7,828	9,800	5,450	3,625	1,560	1,725	9,000	4,100	1,420	800
9	18,500	10,181	7,828	10,500	5,150	3,890	1,525	1,820	7,650	3,925	1,420	1,000
10	16,000	8,997	7,738	10,600	4,700	3,890	1,620	2,230	6,500	2,870	1,480	1,000
11	14,300	8,406	7,665	10,200	4,525	3,590	1,580	3,450	5,475	2,360	1,790	500
12	14,900	7,714	7,565	10,150	4,350	3,625	1,550	4,625	4,565	2,175	1,460	1,475
13	14,400	7,234	7,466	9,350	4,250	3,560	1,890	4,625	4,300	2,130	1,130	1,775
14	15,500	6,798	7,267	9,250	4,175	3,560	2,380	3,650	3,950	2,050	890	2,475
15	18,800	6,593	7,267	9,000	3,900	2,725	2,270	3,975	3,650	1,750	1,060	2,680
16	18,500	6,524	7,247	8,650	3,725	3,725	2,150	3,520	3,325	1,290	1,630	2,775
17	17,400	7,381	7,247	8,300	3,850	3,725	2,275	4,175	2,800	1,200	1,720	4,050
18	14,900	10,701	7,247	7,950	4,125	3,300	2,050	6,500	2,250	1,175	1,830	16,500
19	13,100	12,327	7,616	7,900	4,025	3,275	1,840	6,500	1,800	1,150	1,720	20,100
20	12,000	11,692	8,124	7,650	3,650	3,110	1,810	5,250	1,700	1,100	1,170	21,000
21	11,814	10,294	8,992	7,450	3,620	2,890	1,995	4,375	1,825	1,100	765	21,500
22	12,188	9,655	9,388	7,250	3,620	2,890	1,775	3,925	2,200	975	690	22,000
23	11,345	9,655	9,645	7,200	3,620	3,000	1,600	3,700	2,350	850	650	22,900
24	10,327	9,655	9,161	7,050	4,275	3,275	1,530	4,125	2,630	810	690	23,000
25	9,926	9,655	8,724	6,975	4,465	2,780	1,190	4,470	3,300	810	765	23,250
26	9,685	9,164	8,416	6,675	4,465	2,275	840	4,585	3,950	950	800	23,400
27	9,685	8,736	8,232	6,275	4,625	2,310	1,070	4,650	3,950	1,270	535	23,600
28	9,510	8,308	8,112	6,225	4,685	2,310	1,690	4,370	3,600	1,620	385	23,750
29	8,811	8,074	8,001	6,150	4,525	2,375	1,440	3,805	3,125	1,700	300	22,250
30	7,905	7,898	7,966	6,150	-------	2,425	1,325	3,230	2,675	1,875	345	19,500
31	7,455	-------	7,922	6,330	-------	2,350	-------	4,095	-------	2,010	700	-------

Monthly discharge of Rio Grande near Brownsville, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	21,300	7,460	14,700	904,000
November	12,300	6,520	9,220	549,000
December	9,640	7,250	8,010	493,000
January	10,600	6,150	7,980	491,000
February	6,380	3,620	4,660	268,000
March	4,420	2,280	3,360	207,000
April	2,380	840	1,700	101,000
May	6,500	1,260	3,530	217,000
June	18,600	1,700	5,870	349,000
July	5,280	810	2,050	126,000
August	1,980	300	1,190	73,200
September	23,800	500	10,200	607,000
The year	23,800	300	6,030	4,390,000

NOTE.—Yearly and monthly figures changed to agree with computation rules of the U. S. Geological Survey.

PECOS RIVER NEAR DAYTON, N. MEX.

LOCATION.—In sec. 13, T. 18 S., R. 26 E., 3 miles east of Dayton, Eddy County, half a mile above mouth of Penasco River.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—March 24, 1905, to September 30, 1924.

GAGE.—Stevens water-stage recorder on right bank.

DISCHARGE MEASUREMENTS.—Made from cable.

CHANNEL AND CONTROL.—Bed composed of sand and gravel; shifts. Right bank consists of clay; left bank of sand. Banks subject to overflow at a stage of about 11.5 feet. No well defined control.

EXTREMES OF DISCHARGE.—Maximum mean daily stage during year, 14.80 feet on October 6 (discharge 7,000 second-feet, estimated from gain in storage in McMillan Reservoir and subject to error); minimum mean daily discharge, 35 second-feet, August 25.

1905–1924: Maximum stage recorded, 15.9 feet for five or six hours during morning of September 18, 1919 (discharge not determined, probably exceeded previous maximum of 50,300 second-feet on July 25, 1915, which was derived from discharge at Lake McMillan and included flow of Penasco River); minimum mean daily discharge, 20 second-feet, August 16 and 18, 1923.

ICE.—None.

DIVERSIONS.—Considerable water is diverted above station for irrigation; quantity not known, but not in conflict with rights of Carlsbad project of the United States Bureau of Reclamation, which serves about 20,000 acres in the vicinity of Carlsbad and stores part of the water used near Carlsbad in Lake McMillan, 10 miles below gage.

REGULATION.—None.

ACCURACY.—Stage-discharge relation not permanent, but periods of change are covered by discharge measurements. Operation of water-stage recorder satisfactory. Mean daily gage heights determined from recorder graph by inspection or by averaging gage heights for intervals of a day. Daily discharge determined by shifting-control method or by averaging discharge for intervals of a day on days of considerable fluctuation, except for the period October 4–8 and 10–12 when discharge was estimated from gain in storage in McMillan Reservoir. Records good.

COOPERATION.—Daily-discharge records and list of discharge measurements furnished by United States Bureau of Reclamation.

Discharge measurements of Pecos River near Dayton, N. Mex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 2	6.43	160	Feb. 8	6.85	298	June 21	5.90	82
Nov. 24	7.30	339	Mar. 15	6.40	205	Aug. 16	6.84	248
Jan. 3	7.88	514	May 15	7.40	453	Sept. 24	5.60	62

Daily discharge, in second-feet, of Pecos River near Dayton, N. Mex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	37	456	332	863	366	295	120	517	1,610	76	326	58
2	172	476	339	747	347	286	112	437	2,220	69	227	94
3	120	587	386	603	312	268	102	407	1,390	290	190	118
4	2,080	1,082	419	506	302	257	94	386	803	237	381	101
5	3,300	935	410	440	286	251	150	339	582	195	378	87
6	7,000	887	389	395	292	231	227	295	489	139	253	75
7	3,200	634	366	416	302	208	237	241	410	120	199	66
8	2,053	524	352	375	302	186	218	212	319	101	172	60
9	1,624	463	319	372	302	181	195	212	279	90	155	55
10	3,000	440	314	434	307	185	185	241	243	1,615	115	45
11	3,500	410	458	463	319	186	172	366	253	1,365	90	43
12	3,000	386	285	456	324	190	217	386	239	603	70	251
13	2,580	401	786	419	324	199	616	386	199	389	55	77
14	1,906	419	466	380	322	212	647	437	190	290	43	69
15	1,590	440	416	366	322	216	489	469	172	247	260	67
16	1,391	410	472	372	307	219	472	543	172	227	285	67
17	1,139	372	472	375	295	212	410	543	144	227	440	66
18	984	366	395	352	290	212	425	721	112	203	218	63
19	833	352	366	358	290	212	603	899	104	199	147	61
20	721	361	456	358	279	221	764	695	94	190	115	58
21	603	389	603	352	262	227	685	612	87	181	101	55
22	524	361	726	352	253	219	524	595	77	284	101	55
23	472	347	984	352	253	204	425	603	85	254	58	58
24	466	334	747	352	247	194	378	582	75	218	53	63
25	800	319	500	366	259	186	372	657	56	208	35	61
26	1,980	297	472	361	277	179	425	695	51	686	41	61
27	1,424	279	479	366	285	169	489	513	53	2,240	55	61
28	803	295	638	375	285	152	591	479	53	1,390	50	63
29	603	304	881	358	297	147	721	447	45	815	43	63
30	554	326	747	355	-------	158	671	434	76	562	43	63
31	472	-------	625	352	-------	133	-------	440	-------	425	46	-------

Monthly discharge of Pecos River near Dayton, N. Mex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	7,000	37	1,580	97,100
November	1,082	279	455	27,100
December	984	285	503	30,900
January	863	352	419	25,800
February	366	247	297	17,100
March	295	133	206	12,700
April	764	94	391	23,300
May	899	212	477	29,300
June	2,220	45	356	21,200
July	2,240	69	456	28,000
August	440	35	153	9,410
September	251	43	72.8	4,330
The year	7,000	35	449	326,000

PECOS RIVER AT CARLSBAD, N. MEX.

LOCATION.—In SE. ¼ sec. 6, T. 22 S., R. 27 E., at Green Street Bridge in Carlsbad, Eddy County, 300 feet downstream from Atchison, Topeka & Santa Fe Railway station, 1,500 feet above mouth of Dark Canyon, and 2,000 feet below Hagerman Dam.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 28, 1903, to March 31, 1908; May 13, 1914, to September 30, 1924.

GAGE.—Stevens eight-day water-stage recorder attached to downstream end of middle bridge pier, installed June 1, 1920; inspected by J. R. Yates.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Bed composed of gravel and rock; but considerable changes have taken place, due to sand deposits. Banks of medium height; not subject to overflow. Position of control not known.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 6.46 feet at 2.30 a. m. October 10 (discharge, 7,340 second-feet, determined from extension of rating curve and subject to considerable error); minimum stage, 0.40 foot at 3 a. m. September 11 (discharge, 44 second-feet, determined from extension of rating curve).

1903–1908; 1914–1924: Maximum stage recorded about 21 feet August 7, 1916 (discharge, 85,700 second-feet[2]); minimum discharge, 30 second-feet September 30, 1918.

ICE.—None.

DIVERSIONS.—Large quantities of water are stored a few miles above station at Lakes McMillan and Avalon by the United States Bureau of Reclamation for irrigating land near Carlsbad. Water is also diverted for irrigation in valleys adjacent to river above Lake McMillan. Capacity of storage reservoirs in connection with the Carlsbad project, 58,500 acre-feet. Considerable water seeps into the river between the storage reservoirs and the gaging station, the quantity depending on the amount being used for irrigation between the two points.

REGULATION.—Flow at this point completely controlled by storage reservoirs at the Carlsbad project, except during extreme floods.

[2] Discharge at Avalon Dam; reported by engineers of the United States Bureau of Reclamation.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined above 50 second-feet. Operation of water-stage recorder satisfactory. Mean daily gage heights determined from the recorder graph by inspection or by use of planimeter. Daily discharge determined by applying mean daily gage height to rating table, by shifting-control method, or by averaging discharge for fractional parts of a day. Records good.

COOPERATION.—Daily-discharge records furnished by the United States Bureau of Reclamation.

Discharge measurements of Pecos River at Carlsbad, N. Mex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 11	4.50	4,100	Feb. 9	1.40	500	June 21	0.68	102
Oct. 13	5.40	5,500	May 24	.68	101	Sept. 8	.77	131

Daily discharge, in second-feet, of Pecos River at Carlsbad, N. Mex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	89	623	462	1,320	322	264	219	139	106	95	100	106
2	106	485	462	1,090	322	166	208	135	112	97	97	103
3	112	404	470	663	310	162	166	130	106	100	100	109
4	109	462	455	312	310	208	157	118	106	97	103	109
5	109	724	432	952	355	447	148	127	200	100	106	109
6	115	735	432	453	425	448	135	124	348	97	109	112
7	164	812	462	538	378	432	130	121	404	97	100	121
8	647	769	492	585	599	390	144	121	342	103	106	115
9	1,340	663	500	647	545	383	162	127	186	100	103	76
10	3,800	575	500	639	392	390	153	121	106	95	103	84
11	3,900	560	671	522	296	383	152	127	97	100	100	73
12	4,700	552	695	455	303	390	166	135	97	97	106	78
13	5,460	508	760	462	392	390	157	130	95	103	106	78
14	4,140	492	418	463	493	390	152	130	95	106	103	78
15	1,170	567	418	470	375	390	153	127	95	103	100	78
16	269	440	404	463	284	390	152	121	97	112	106	84
17	522	432	411	588	346	390	130	127	103	103	103	86
18	537	545	418	580	540	390	130	106	103	106	106	87
19	530	508	425	376	348	390	153	115	100	106	106	86
20	793	362	485	349	398	390	152	109	100	106	106	84
21	369	418	699	496	450	390	157	118	106	109	106	84
22	411	432	507	585	506	355	139	112	100	112	106	86
23	515	425	466	508	443	323	162	112	103	112	109	95
24	515	455	1,000	500	287	323	148	103	100	109	95	97
25	508	447	1,140	447	251	316	139	100	95	106	106	100
26	508	455	1,220	342	170	310	144	103	97	100	103	81
27	1,290	404	1,420	310	170	236	139	103	95	95	100	76
28	1,690	369	690	310	320	157	143	103	97	100	103	87
29	354	376	260	584	316	166	144	112	103	100	106	84
30	81	425	112	711	-------	197	143	92	97	100	100	84
31	427	-------	555	468	-------	219	-------	103	-------	92	100	-------

Monthly discharge of Pecos River at Carlsbad, N. Mex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	5,460	81	1,140	70,000
November	812	362	514	30,600
December	1,420	112	576	35,400
January	1,320	310	554	34,100
February	599	170	367	21,100
March	448	157	328	20,200
April	219	130	153	9,080
May	139	92	118	7,240
June	404	95	133	7,920
July	112	92	102	6,260
August	109	95	103	6,350
September	121	73	91	5,410
The year	5,460	73	349	254,000

NOTE.—Yearly and monthly figures changed to agree with computation rules of the U. S. Geological Survey.

PECOS RIVER NEAR MALAGA, N. MEX.

LOCATION.—In sec. 18 or 19, T. 24 S., R. 29 E., 3½ miles southeast of Malaga, Eddy County, 4¼ miles below mouth of Black River.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 1, 1920, to September 30, 1924.

GAGE.—Stevens seven-day water-stage recorder, installed on right bank; inspected by W. F. Gerlach.

DISCHARGE MEASUREMENTS.—Made from cable or by wading near gage.

CHANNEL AND CONTROL.—Bed composed of solid rock covered with sand; shifts. Right bank solid rock and steep; left bank sand and high. Control is rock ledge overlain with sand, 500 feet below gage; shifts.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 11.45 feet at 10 a. m. October 10 (discharge, 14,000 second-feet, determined from extension of rating curve); minimum stage, at 5 p. m. August 2 (discharge, 53 second-feet, determined from extension of rating curve).

1920–1924: Maximum stage from water-stage recorder, 12.85 feet at 1 a. m., June 8, 1921 (discharge, 22,000 second-feet, determined from extension of rating curve); minimum discharge, 36 second-feet April 7, 1923 (determined from extension of rating curve)

In September, 1919, the river reached a stage of 26.4 feet (discharge not determined).

ICE.—None.

DIVERSIONS.—The Carlsbad project of the United States Bureau of Reclamation, with reservoirs of a capacity of 58,500 acre-feet, diverts a large part of the natural run-off above Carlsbad, N. Mex. During the season of irrigation, considerable water is returned to the stream by seepage from lands near Carlsbad. In addition to the water used by the Carlsbad project, some diversions are made for irrigation in the basin above the storage reservoirs of the Carlsbad project.

REGULATION.—The operation of the water-power plant of 300 horsepower capacity above station, just below Carlsbad, N. Mex., owned and operated by Carlsbad Electric Light & Power Co., does not materially regulate flow at gage. The flow is, however, regulated to a large extent by waters stored in the reservoirs of the Carlsbad project. In the season of irrigation, the effect of the regulation is decreased by return seepage water, but during the winter the flow depends on water released at the reservoirs.

ACCURACY.—Stage-discharge relation not permanent. Curve well defined above 100 second-feet. Operation of water-stage recorder satisfactory. Mean daily gage heights obtained from recorder chart by inspection or by averaging gage heights for fractional parts of a day. Daily discharge determined by shifting-control method. Records good.

COOPERATION.—Records furnished by United States Bureau of Reclamation.

Discharge measurements of Pecos River near Malaga, N. Mex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 11	8.35	3,760	Apr. 10	3.32	91	Sept. 9	3.78	171
Nov. 26	4.75	459	June 4	3.68	164			
Feb. 6	4.60	568	Aug. 30	4.00	258			

Daily discharge, in second-feet, of Pecos River near Malaga, N. Mex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	300	670	484	1,025	457	380	252	110	264	126	104	236
2	328	765	506	1,250	412	336	236	126	264	126	61	192
3	300	625	484	787	407	416	212	150	192	123	66	196
4	300	575	484	585	407	320	200	147	161	110	64	143
5	312	625	470	465	407	368	150	161	104	89	104	154
6	304	798	461	870	506	502	117	147	240	104	117	143
7	312	809	497	493	443	502	110	120	389	104	126	140
8	328	809	493	575	570	475	113	180	389	104	95	150
9	1,320	743	479	660	650	456	104	192	328	133	89	150
10	4,630	660	533	650	551	461	86	133	158	158	104	136
11	3,935	560	650	695	412	461	69	130	110	161	75	120
12	4,000	570	749	524	372	475	69	143	92	140	92	308
13	5,810	565	600	506	389	475	83	140	89	158	104	212
14	6,050	520	502	515	528	461	75	143	80	140	104	165
15	2,475	533	484	515	524	434	66	143	80	143	104	98
16	705	575	479	515	360	434	67	117	80	140	104	143
17	765	430	479	547	360	420	89	161	80	133	95	165
18	858	488	479	660	493	332	86	136	86	173	98	158
19	820	506	479	470	465	260	83	143	80	169	110	154
20	899	448	479	416	389	260	95	133	80	154	98	150
21	820	421	575	412	488	336	86	126	86	126	95	161
22	670	438	630	675	461	389	104	107	220	126	95	117
23	721	457	560	570	710	372	101	120	130	133	86	173
24	749	457	600	555	506	380	101	126	154	126	89	173
25	732	479	1,062	551	252	376	110	110	110	154	75	143
26	727	470	1,013	457	292	368	123	110	161	126	95	176
27	815	479	1,224	393	264	372	143	110	165	140	101	165
28	1,980	434	983	389	248	260	110	117	120	154	180	180
29	1,000	456	497	425	412	228	126	117	120	176	252	143
30	515	475	425	748	-------	208	133	147	161	173	248	196
31	470	-------	300	645	-------	256	-------	260	-------	173	260	-------

Monthly discharge of Pecos River near Malaga, N. Mex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	6,050	300	1,420	87,200
November	809	421	561	33,400
December	1,224	300	585	36,000
January	1,250	389	598	36,800
February	710	248	439	25,300
March	502	208	380	23,400
April	252	66	117	6,940
May	260	107	139	8,540
June	389	80	159	9,470
July	176	89	139	8,520
August	260	61	113	6,920
September	308	98	165	9,800
The year	6,050	61	402	292,000

NOTE.—Yearly and monthly figures changed to agree with computation rules of the U. S. Geological Survey.

PECOS RIVER NEAR ANGELES, TEX.

LOCATION.—In T. 26 S., R. 29 E., just below Pecos Valley Railroad bridge crossing Delaware Creek at its mouth, 2 miles north of New Mexico-Texas boundary, and 8½ miles northwest of Angeles, Reeves County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 27, 1914, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder, at first outcropping of rock on right bank 600 feet below railroad bridge and mouth of Delaware Creek.

DISCHARGE MEASUREMENTS.—Made by wading or from cable half a mile downstream.

CHANNEL AND CONTROL.—Bed and banks composed of sand, gravel, and rock; banks not subject to overflow. Control formed by a series of rapids 200 feet below gage; shifts.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 7.27 feet at 9 a. m. October 14 (discharge, 12,600 second-feet); minimum discharge, 99 second-feet April 22 and June 21.

1914–1924: Maximum stage recorded, 21.5 feet at 10 a. m. August 8, 1916, measured by leveling from floodmarks (discharge not determined); minimum discharge, 68 second-feet August 19 and 20, 1923.

ICE.—None.

DIVERSIONS.—The Carlsbad project of the United States Bureau of Reclamation, with reservoirs of a capacity of 58,500 acre-feet, diverts a large part of the natural run-off above Carlsbad, N. Mex. During the season of irrigation, considerable water is returned to the stream by seepage from lands near Carlsbad. In addition to the water used by the Carlsbad project, some diversions are made for irrigation in the basin above the storage reservoir of the Carlsbad project.

REGULATION.—The operation of a water-power plant of 300 horsepower capacity above station, just below Carlsbad, N. Mex., owned and operated by Carlsbad Electric Light & Power Co., does not materially regulate flow at gage. The flow is, however, regulated to a large extent by waters stored in the reservoirs of the Carlsbad project. In the season of irrigation the effect of the regulation is decreased by return seepage waters, but during the winter, the flow depends on water released at the reservoirs.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined. Operation of water-stage recorder satisfactory, except for short breaks in the record. Daily discharge determined by shifting-control method. Records fair.

Discharge measurements of Pecos River near Angeles, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 29	1.56	969	Mar. 21	0.38	168	Aug. 1	0.29	154
Nov. 22	.79	414	Apr. 22	.20	99.8	Aug. 25	.25	130
Dec. 20	.87	457	May 18	.26	160	Sept. 9	.30	161
Jan. 26	.88	470	June 12	.19	108			
Feb. 28	.50	238	July 1	.33	154			

Daily discharge, in second-feet, of Pecos River near Angeles, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	243	380	442	565	507	333		127	202	153	153	238
2	212	631	492	1,140	406	289			202	153	127	222
3	249	545	500	965	406	260			202	144	102	192
4	227	434	492	717	406	320			165	140	104	169
5	243	427	478	478	406	227	200		153	130	116	161
6	243	634	456	854	406	399			120	127	157	165
7	243	615	456	480	442	400			202	130	140	165
8	249	711	478	522	406	400			314	130	140	169
9	517	719	492	608	530	366	124		302	133	124	165
10	5,100	623	515	655	530	366		140	222	191	124	165
11	4,460	560	576	647	434	366			133	165	124	153
12	3,600	500	623	576	406	366			110	169	117	202
13	6,310	500	711	478	406	386			102	140	127	314
14	8,420	485	538	478	413	372			102	133	130	207
15	3,440	442	470	478	442	352			104	117	133	178
16	837	500	463	478	427	346	105		114	124	130	140
17	352	456	463	478	406	346			104	120	133	165
18	515	386	470	553	400	327		161	102	196	130	169
19	515	470	463	584	470	243		157	102	161	130	165
20	500	485	470	420	406	207		165	102	153	130	153
21	649	386	507	413	400	174		161	99	157	120	161
22	393	406	615	470	413		99	144	140	133	114	169
23	393	434	623	584	463			137	178	153	114	148
24	470	434	458	507	553			144	144	153	114	182
25	470	449	494	492	420		120	137	153	127	124	178
26	470	463	1,030	463	357	270		133	137	124	114	157
27	470	463	1,150	406	294			137	165	133	120	178
28	1,220	456	1,270	406	232		153	137	153	140	140	174
29	1,260	406	764	406	232		117	130	124	157	207	178
30	504	413	449	497	-------		120	133	133	169	227	157
31	320	-------	434	647	-------		-------	161	-------	161	212	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated.

Monthly discharge of Pecos River near Angeles, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	8,420	212	1,390	85,500
November	719	380	494	29,400
December	1,270	434	576	35,400
January	1,140	406	563	34,600
February	553	232	414	23,800
March	400	----------	306	18,800
April	----------	----------	136	8,080
May	----------	----------	142	8,740
June	314	99	153	9,090
July	196	117	146	8,960
August	227	102	135	8,280
September	314	140	178	10,600
The year	8,420	----------	387	281,000

PECOS RIVER NEAR PORTERVILLE, TEX.

LOCATION.—At highway bridge on Pecos-Porterville road, half a mile east of Arno station on Atchison, Topeka & Santa Fee Railway, 2 miles west of Porterville, Loving County, and 20 miles north of Pecos.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—February 1, 1922, to September 30, 1924.

GAGE.—Chain gage attached to downstream end of highway bridge; read by Tom Wright.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Composed of silt, sand, and gravel; shifts.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 12.0 feet at 10.10 a. m. October 11 (discharge, 5,250 second-feet, determined from extension of rating curve); minimum discharge, 77 second-feet June 25.

1922–1924: Maximum stage that of October 11, 1923; minimum discharge, 58 second-feet August 4 and 5, 1923.

ICE.—None.

DIVERSIONS.—The Carlsbad project of the United States Bureau of Reclamation with reservoirs of capacity of 58,500 acre-feet, diverts a large part of the natural run-off above Carlsbad, N. Mex. During the season of irrigation, considerable water is returned to the stream by seepage from lands near Carlsbad. In addition to the water used by the Carlsbad project, some diversions are made for irrigation in the basin above the storage reservoir of the Carlsbad project.

REGULATION.—The operation of a water-power plant of 300-horsepower capacity above station, just below Carlsbad, N. Mex., owned and operated by Carlsbad Electric Light & Power Co., does not materially regulate the flow at gage. The flow is, however, regulated to a large extent by waters stored in the reservoirs of the Carlsbad project. In the season of irrigation the effect of the regulation is decreased by return seepage waters, but during the winter the flow depends on water released at the reservoirs.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 1,000 second-feet; poorly defined to 4,500 second-feet. Gage read to hundredths once daily and may not be true index to mean daily discharge at high stages, owing to rapid fluctuations. Daily discharge determined by shifting-control method except as noted in footnote to daily-discharge table. Records good.

Discharge measurements of Pecos River near Porterville, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 3	1.74	173	Jan. 16	2.60	460	May 3	1.01	125
Oct. 11	10.05	4,080	Jan. 28	2.28	379	May 16	1.09	146
Oct. 28	3.03	516	Feb. 13	2.01	325	June 5	1.14	153
Nov. 7	3.58	760	Feb. 26	2.07	340	June 28	.94	123
Nov. 21	2.67	501	Mar. 17	1.90	311	July 25	.99	138
Dec. 7	2.46	446	Mar. 27	1.75	283	Aug. 14	.72	93
Dec. 21	2.49	432	Apr. 10	1.01	121	Sept. 16	1.23	185
Jan. 4	3.44	788	Apr. 23	.87	91.5			

Daily discharge, in second-feet, of Pecos River near Porterville, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	192	578	417	468	578	232	212	101	130	108	134	182
2	232	348	442	326	521	268	212	117	154	144	125	182
3	172	370	468	1,070	434	304	212	123	163	144	109	172
4	202	552	494	836	348	252	202	120	154	144	93	163
5	212	733	468	669	348	304	212	117	154	134	86	154
6	252	766	468	624	326	242	202	121	125	125	125	125
7	217	766	442	578	348	262	192	134	104	116	134	125
8	182	766	442	549	326	348	144	144	173	101	134	125
9	192	701	455	521	348	337	144	134	242	116	125	125
10	521	701	468	578	421	326	123	125	252	119	109	125
11	4,050	638	494	608	494	326	121	130	232	283	93	125
12	3,810	578	549	608	417	326	110	134	144	182	93	163
13	3,990	701	578	538	326	326	104	134	125	158	93	468
14	4,290	638	669	468	326	348	99	134	121	134	93	283
15	4,340	608	494	494	304	348	92	134	106	99	93	222

Daily discharge, in second-feet, of Pecos River near Porterville, Tex., for the year ending September 30, 1924—Continued

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
16	2,410	468	468	468	393	326	90	144	92	101	93	192
17	910	521	442	468	348	326	90	144	86	102	98	182
18	608	550	442	468	304	326	79	139	83	106	104	116
19	701	578	442	494	326	326	79	134	86	90	108	192
20	766	521	417	456	417	283	86	125	86	117	101	144
21	801	521	442	417	417	283	93	134	84	144	99	139
22	836	417	442	417	326	283	97	123	84	117	99	134
23	836	468	510	417	370	294	101	119	84	125	95	144
24	766	494	578	417	432	304	79	108	172	125	92	121
25	494	536	417	442	494	283	81	111	77	134	88	144
26	468	578	910	494	348	283	99	114	134	134	92	163
27	521	638	910	432	252	283	100	95	134	134	106	125
28	521	442	1,150	370	262	283	101	104	123	134	125	134
29	1,780	442	1,230	393	252	283	97	104	124	144	144	144
30	948	417	862	348	-------	252	102	106	125	154	163	125
31	608	-------	494	348	-------	222	-------	106	-------	134	172	-------

NOTE.—No record, Oct. 7, 21, Nov. 4, 18, 25, Dec. 2, 9, 16, 23, 30, Jan. 6, 13, 20, 27, Feb. 10, 17, 24, Mar. 2, 9, 23, 30, Apr. 6, 13, 20, 27, May 4, 11, 18, 25, June 1, 8, 15, 22, 29, July 6, 13, 20, 27, Aug. 3, 10, 17, 24, 31, Sept. 7, 21, 28; discharge interpolated.

Monthly discharge of Pecos River near Porterville, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	4,340	172	1,190	73,000
November	766	348	568	33,800
December	1,230	417	565	34,700
January	1,070	326	509	31,300
February	578	252	373	21,400
March	348	222	296	18,200
April	212	79	125	7,450
May	144	95	123	7,560
June	252	77	132	7,840
July	283	90	132	8,140
August	-------	86	110	6,780
September	468	116	165	9,790
The year	4,340	77	358	260,000

PECOS RIVER ABOVE BARSTOW, TEX.

LOCATION.—400 feet below dam and diversion of Barstow Canal (Ward County Irrigation District No. 1) and 10 miles northwest of Barstow, Ward County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—February 1, 1916, to May 11, 1921, and March 22, 1922, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder on left bank. From February 1, 1916, to May 11, 1921, gage was Stevens continuous water-stage recorder, 4 miles upstream.

DISCHARGE MEASUREMENTS.—Made by wading, from cable near gage, or from Texas & Pacific Railway bridge near Pecos.

CHANNEL AND CONTROL.—Channel straight for several hundred feet above and below station. Bed composed of rock; permanent. Banks high; subject to overflow at extremely high stages. Low-water control is rock ledge, 150 feet below gage; permanent. Point of zero flow is 1.3 feet.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 9.80 feet at 11 p. m. October 15 (discharge not determined); minimum stage, 1.41 feet August 27 (discharge, 0.30 second-foot).

1915–1924: Maximum stage from water-stage recorder, 12.1 feet at 6 a. m. August 10, 1916 (discharge not determined); minimum discharge, 0.2 second-foot April 27–29, June 25 to July 10, July 13–20, and July 24 to August 21, 1923.

ICE.—None.

DIVERSIONS.—In addition to water diverted in New Mexico by the Carlsbad project, the three principal diversions in Texas are the Farmers Independent, Cedarvale (formerly Biggs), and Barstow Canals. Small amount diverted by Boxley and Porterville irrigation systems. According to records of the Board of Water Engineers for the State of Texas, these projects have declared a total of 17,500 acres irrigated.

REGULATION.—Flow during low and medium stages regulated by storage reservoir on Carlsbad project in New Mexico and by diversion dams in Texas. Flood flow partly regulated by reservoirs on Carlsbad project.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 1,000 second-feet; fairly well defined from 1,000 to 3,000 second-feet; extended above. Operation of the water-stage recorder satisfactory. Daily discharge determined by applying to rating table mean daily gage height obtained from recorder graph by inspection, by use of planimeter, or by averaging discharge for fractional parts of a day; shifting-control method used October 1–10 and February 10 to June 22. Records good.

Discharge measurements of Pecos River above Barstow, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 5	2.62	100	Nov. 23	3.38	341	Apr. 21	1.54	[a] 0.75
Oct. 11	6.78	2,440	Jan. 4	4.44	970	May 12	1.65	1.3
Oct. 12	7.62	3,050	Jan. 18	3.47	382	June 23	1.46	[a] .50
Do	7.65	2,860	Feb. 15	3.02	205	July 23	1.53	.55
Oct. 17	4.71	1,020	Mar. 1	2.57	89	Aug. 16	1.43	[a] .30
Nov. 3	3.91	623	Mar. 22	1.79	[a] 6	Sept. 13	3.03	219
Nov. 5	3.70	489	Apr. 12	1.68	2			

[a] Estimated.

Daily discharge, in second-feet, of Pecos River above Barstow, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	461	322	360	443	108	2.8	1.1	0.6	0.5	0.4	0.4
2	62	370	331	246	470	112	1.5	.7	.6	.5	.4	.6
3	66	591	385	945	340	246	1.7	.7	.6	.4	.4	.5
4	63	670	416	904	250	201	2.3	.8	.7	.4	.4	.8
5	96	502	411	}	231	167	2.6	.7	.8	.5	.5	.8
6	86	459	400	}	227	169	2.8	1.3	1.3	.6	.5	.6
7	84	546	400	} 742	224	108	3.2	1.4	1.1	.5	.5	.6
8	70	687	385	}	242	162	3.0	1.4	1.0	.5	.5	.6
9	64	682	385	}	238	189	2.6	1.4	1.1	.5	.5	.6
10	78	659	400	}	263	198	2.3	1.3	1.9	.5	.5	.6
11	2,110	607	427	579	380	189	1.7	1.3	1.3	.7	.5	.6
12	2,970	574	491	585	340	195	1.7	1.4	1.0	1.0	.5	.6
13	3,170	453	540	568	242	204	1.5	1.3	.8	.8	.5	87
14	3,510	443	642	437	201	235	1.4	1.2	.8	.7	.5	13
15	4,200	443	540	411	205	192	1.1	1.2	.7	.6	.5	2.3
16	3,780	416	459	422	250	189	.9	1.2	.6	.6	.4	1.5
17	1,540	400	422	411	327	122	.8	1.2	.6	.5	.4	1.4
18	670	432	422	385	220	101	.8	1.3	.6	.6	.4	1.1
19	}	350	427	390	150	153	.8	1.3	.6	.5	.4	1.0
20	}	360	432	491	175	85	.8	1.3	.6	.7	.4	1.0
21	} 502	406	427	395	231	73	.8	1.3	.5	.8	.4	1.0
22	}	385	422	327	178	21	.8	1.3	.5	.7	.4	1.0
23	}	331	497	317	183	13	.8	1.3	.4	.7	.4	1.0
24	}	340	540	443	220	11	.8	1.2	.4	.7	.4	1.0
25	395	336	508	416	370	28	.8	1.1	.6	.6	.4	.9
26	422	336	630	395	336	8.5	.8	1.1	.5	.7	.4	.9
27	427	345	964	390	189	9.2	.9	1.1	.5	.6	.3	.9
28	437	345	1,050	345	150	146	1.0	1.0	.5	.6	.4	.8
29	985	355	1,270	274	120	253	1.7	.9	.5	.6	.4	.7
30	1,390	336	874	220	-------	127	1.5	.9	.5	.6	.4	.4
31	705	-------	385	211	-------	3.6	-------	.8	-------	.4	.4	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated. Records incomplete and discharge partly estimated Oct. 18 and Jan. 11.

Monthly discharge of Pecos River above Barstow, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	4,200	52	982	60,400
November	687	331	454	27.000
December	1,270	322	523	32,100
January	945	211	494	30,400
February	470	120	255	14,700
March	253	3.6	130	7,970
April	3.2	.8	1.54	91.6
May	1.4	.7	1.15	70.4
June	1.9	.4	.74	44.0
July	1.0	.4	.60	36.9
August	.5	.3	.43	26.6
September	87	.4	4.14	246
The year	4,200	.3	238	173,000

PECOS RIVER NEAR GRANDFALLS, TEX.

LOCATION.—At site of old highway bridge where Grandfalls-Fort Stockton road formerly crossed Pecos River, 1½ miles upstream from present Grandfalls-Fort Stockton road crossing at Iron Bridge, 2 miles below diversion dam for the lowline (silt-line) canal of the Imperial Irrigation Co., 3 miles south of Grandfalls, Ward County, and 4½ miles above diversion dam of Zimmerman project.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—November 6, 1915, to September 30, 1924. Records were taken at Iron Bridge, 1½ miles downstream from November 6, 1915, to August 3, 1917.

GAGE.—Stevens water-stage recorder, on downstream side of old bridge pier near left waters edge.

DISCHARGE MEASUREMENTS.—Made by wading; from cable 50 feet above gage; or, during extremely high stages, at Iron Bridge.

CHANNEL AND CONTROL.—Bed of stream clean, rough, solid rock, and permanent, except small deposits of sand and gravel. Channel straight for 100 feet above and below station. One channel below gage height of 8 feet; above this stage banks, which are of dirt and wooded, subject to overflow. Rock ledge extending diagonally across stream just below gage serves as low-water control; subject to shifts.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 6.10 feet at 6 a. m. October 18 (discharge, 3,040 second-feet); minimum stage, 0.31 foot June 19 and September 5–10 (discharge, 1.8 second-feet).

1915–1924: Maximum stage from water-stage recorder, 9.6 feet from 2 to 6 a. m. September 25, 1919 (discharge, 13,000 second-feet); minimum discharge less than 0.7 second-foot April 17, 1916.

ICE.—None.

DIVERSIONS.—Station is 2 miles below diversion of low-line (silt-line) canal of the Imperial Irrigation Co., 18½ miles below diversion for the Imperial Reservoir (17,000 acre-foot capacity), 25½ miles below diversion for Ward County Water Improvement District No. 2 (of which the old Grandfalls project is a part), and 4½ miles above diversion for Zimmerman project. Available data show that tracts aggregating approximately 143,000 acres are irrigable between station and lower boundary of Carlsbad project of the United States Bureau of Reclamation. Records of the Board of Water Engineers

for the State of Texas show about 58,000 acres declared irrigated in Texas above station. The effect of diversions is somewhat counterbalanced by water returned to stream by seepage. The only diversion of importance below the station is that for the Zimmerman project which has declared an irrigated area of 2,005 acres.

REGULATION.—Slight regulatory effect caused by operation of storage reservoirs on Carlsbad project.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined for all stages during the year. Operation of the water-stage recorder not satisfactory. Daily discharge determined by applying to rating table mean daily gage height determined from recorder graph by inspection, by use of planimeter, or by averaging discharge for fractional parts of a day, except as noted in footnote to daily-discharge table. Records good.

Discharge measurements of Pecos River near Grandfalls, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 18	6.05	3,180	Feb. 5	0.74	35.2	June 17	0.32	[a] 1.5
Oct. 24	1.92	379	Mar. 5	1.25	150	July 8	.43	[a] 3.0
Nov. 15	1.57	245	Mar. 18	.96	74.7	Aug. 5	.36	[a] 1.5
Nov. 27	1.26	154	Apr. 16	.36	[a] 3	Aug. 27	.32	[a] 1.3
Jan. 10	1.68	280	May 6	.34	[a] 2.5	Sept. 17	.66	29
Jan. 22	1.50	230	May 20	.32	[a] 2.0			

[a] Estimated.

Daily discharge, in second-feet, of Pecos River near Grandfalls, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	473	206	345	136	148	41	2.5	2.8	3.1	12	2.1
2	10	215	228	261	142	104	9.2	2.5	2.5	3.7	9.7	2.1
3	10	177	248	231	228	96	4.7	2.8	2.5	4.4	7.6	2.1
4	10	180	254	498	314	113	3.4	2.5	2.5	5.9	5.5	2.1
5	10	244	300	737	118	150	3.7	2.8	2.5	6.4	3.4	1.8
6	12	199	261	501	117	117	3.7	2.8	2.5	7.0		1.8
7	20	184	268	381	89	92	3.7	2.8	2.1	7.0		1.8
8	27	187	272	360	57	86	3.4	2.5	2.1	6.4	3.1	1.8
9	33	268	268	436	62	53	3.4	2.8	2.5	5.9		1.8
10	39	275	254	292	89		3.7	2.5	2.1	5.9		1.8
11	57	331	282	282	89		3.7	2.5	2.5	5.9	2.8	2.1
12	856	386	344	316	43		3.4	2.5	2.1	5.9	2.8	2.5
13	1,670	344	363	349	100	75	3.4	2.1	2.1	4.7	2.8	2.8
14	1,930	349	406	344	53		3.4	2.1	2.1	4.7	2.8	7.0
15	2,190	224	506	304	34		3.1	2.5	2.1	4.4	2.8	14
16	2,440	184	473	238	23		3.1	2.5	2.1	4.4	2.5	23
17	2,700	180	362	225	18		2.5	2.1	2.1	4.1	2.8	26
18	2,960	153	335	225	49	73	2.8	2.1	2.1	4.7	2.8	22
19	1,100	156	312	218	71	69	2.8	2.1	1.8		2.8	23
20	632	156	275	212	24	53	2.8	2.1	3.1		2.5	21
21	603	142	244	238	16	46	3.1	2.1	7.0		2.5	18
22	391	145	272	241	17	43	3.1	2.1	8.2		2.8	17
23	319	156	251	202	80	37	3.1	2.5	8.8		2.5	17
24	378	145	261	180	46	28	2.8	2.5	8.8	4.7	2.1	18
25	241	139	296	190	115	22	2.8	3.1	7.0		2.1	20
26	218	139	358	235	151	20	2.5	3.1	4.7		2.1	20
27	238	153	260	218	278	21	2.5	2.5	3.7		2.1	19
28	238	187	750	218	248	21	2.5	2.1	3.7		2.5	17
29	238	202	754	206	150	20	2.8	2.1	3.1		2.5	19
30	310	202	950	168	-------	31	2.1	3.1	3.4	16	2.5	20
31	920	-------	798	136	-------	55	-------	3.1	-------	14	2.1	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated. No record, Oct. 14–17 and Aug. 1–4; discharge interpolated. Record incomplete, Oct. 13, Jan .31, Feb. 1 and 2, Mar. 9 and 18, July 30, and Aug. 5; discharge partly estimated.

Monthly discharge of Pecos River near Grandfalls, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,960	10	671	41,300
November	473	139	216	12,800
December	950	206	368	22,600
January	737	136	290	17,800
February	314	16	102	5,870
March	150	20	67.7	4,160
April	41	2.1	4.61	274
May	3.1	2.1	2.50	154
June	8.8	1.8	3.49	207
July	16	3.1	5.68	349
August	----------	2.1	3.45	212
September	26	1.8	11.6	689
The year	2,960	1.8	147	106,000

PECOS RIVER NEAR BUENAVISTA, TEX.

LOCATION.—At highway bridge on Fort Stockton-Midland road, 4½ miles east of Buenavista, Pecos County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 5, 1921, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder, attached to left abutment of downstream side of bridge.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Composed of silt, sand, and gravel; shifts. Banks are overflowed during extremely high stages.

EXTREMES OF DISCHARGE.—Maximum stage from water-stage recorder, 7.77 feet at 2 a. m. October 19 (discharge, 2,640 second-feet, determined from extension of rating curve); minimum discharge, 18 second-feet September 21–25.

1921–1924: Maximum stage that of October 19, 1923; minimum discharge 15 second-feet, July 17 and 18, 1923.

ICE.—None.

DIVERSIONS.—Station is located below all diversions. During much of the time practically the only flow past the station is waste and seepage water from the irrigated area above gage.

REGULATION.—Flow regulated by storage and diversion dams in New Mexico and Texas.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined from 50 to 2,500 second-feet. Operation of water-stage recorder satisfactory. Daily discharge determined by shifting-control method, except as noted in footnote to daily-discharge table. Records good.

Discharge measurements of Pecos River near Buenavista, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 19	6.87	2,190	Jan. 8	2.16	386	May 7	0.63	50.7
Do	5.91	1,710	Jan. 23	1.48	229	May 21	.64	50.0
Do	5.20	1,400	Feb. 6	.86	93.6	June 18	.69	26.1
Oct. 20	3.35	644	Feb. 20	.76	74.5	July 8	.73	27.2
Oct. 23	1.60	213	Mar. 6	1.37	199	Aug. 5	.81	22.7
Nov. 15	1.71	256	Mar. 19	1.03	124	Aug. 27	.87	21.5
Nov. 28	.92	91.7	Apr. 17	.66	59.7	Sept. 17	.93	26.4

Daily discharge, in second-feet, of Pecos River near Buenavista, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	85	544	119		85	185	298	54	35	26	30	
2	87	249	122		82	176	317	54	32	27	27	
3	87	153	142		101	178	250	57	32	27	27	
4	90	130	137	435	185	170	197	55	32	26	27	
5	99	165	157		196	174	170	54	30	32	27	
6	69	231	264		97	197	99	54	28	35	30	
7	27	199	302		79	178	77	51	28	27	30	
8	24	170	284	387	85	166	80	51	27	27	26	
9	24	170	286	422	79	162	87	54	27	26	27	27
10	24	225	273	412	79	153	85	54	27	26	27	
11	26	250	277	340	101	153	82	54	27	24	26	
12	24	306	291	328	115	157	84	52	27	24	26	
13	845	306	317	375	108	153	87	54	27	24	27	
14	1,440	317	328	363	110	135	85	57	27	22	26	
15	1,720	277	352	340	101	144	70	60	27	22	26	
16	1,860	231	412	295	79	126	63	57	27	24	27	
17	2,100	211	400	250	70	144	62	54	26	24	26	27
18	2,450	195	340	244	75	121	65	54	26	24	26	24
19	2,000	191	317	231	80	119	65	52	24	24	24	21
20	624	189	295	229	77	113	63	51	27	32	21	20
21	491	170	239	223	74	108	63	49	27	33	22	18
22	359	140	213	242	84	112	62	39	28	27	22	18
23	227	135	229	227	99	110	59	33	26	26	22	18
24	225	133	223	201	99	108	63	32	26	27	22	18
25	198	122	239	180	104	96	82	36	26	26	22	18
26	128	104	284	193	153	70	63	44	26	26	20	20
27	106	103	323	211	229	59	59	33	26	26	22	20
28	119	96	347	207	286	59	55	30	24	26	28	20
29	117	101	534	199	244	70	54	32	24	24	27	20
30	112	104	654	140	-------	90	54	49	24	26	27	22
31	285	-------	800	108	-------	139	-------	41	-------	26	-------	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated. No record Oct. 21 and 22; discharge interpolated. Record incomplete Dec. 30, Jan. 8, and Sept. 17; discharge partly estimated.

Monthly discharge of Pecos River near Buenavista, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,450	24	518	31,900
November	544	96	197	11,700
December	----------	119	306	18,800
January	----------	108	303	18,600
February	286	70	116	6,660
March	197	59	133	8,180
April	317	54	100	5,950
May	60	30	48.4	2,980
June	35	24	27.3	1,630
July	35	22	26.3	1,620
August	----------	20	25.6	1,570
September	----------	18	23.9	1,420
The year	2,450	18	153	111,000

PECOS RIVER NEAR SHEFFIELD, TEX.

LOCATION.—At highway bridge on Fort Stockton-Ozona road, 3½ miles east of Sheffield, Pecos County, and 41 miles west of Ozona.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 10, 1921, to September 30, 1924.

GAGE.—Chain gage attached to upstream side of bridge; read by Kyle Smith or Mrs. T. A. Rowden. Auxiliary staff gage attached to pier near left bank.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Composed of silt, sand, and gravel; shifts. Right bank is not overflowed; left bank is overflowed during extremely high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.40 feet at 8 a. m. October 20 (discharge, 2,460 second-feet); minimum discharge, not determined.

1922–1924: Maximum stage recorded, that of October 20, 1923; minimum discharge, 15 second-feet at 6 p. m. August 15, 1923.

DIVERSIONS.—Station is below all diversions. During much of the time, practically the only flow past the station is waste and seepage water from the irrigated area above.

REGULATION.—Flow partly regulated by storage and diversion dam in New Mexico and Texas.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined from 20 to 2,500 second-feet. Gage read to hundredths twice daily, but accuracy of readings prior to March 1 doubtful. Daily discharge determined by applying mean daily gage height to rating table from October 1 to April 7, and by shifting-control method for remainder of year, except as noted in footnote to daily-discharge table. Records poor.

Discharge measurements of Pecos River near Sheffield, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 20	6.25	2,340	Nov. 28	2.49	165	May 22	2.61	73.2
Oct. 21	5.42	1,760	Jan. 9	3.33	505	June 18	2.70	42.8
Do	4.82	1,290	Feb. 7	2.74	262	July 9	3.20	42.4
Oct. 22	3.68	696	Mar. 6	2.57	204	Aug. 6	3.46	29.5
Do	3.48	619	Apr. 17	2.38	112	Aug. 28	3.72	42.1
Oct. 23	3.29	523	May 21	2.61	82.4	Sept. 27	3.00	45.3

Daily discharge, in second-feet, of Pecos River near Sheffield, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	107	492	133	713	187	377	66	59	125	79		
2	129	662	148	765	148	333	100	46	79	83		
3	468	588	179	563	83	269	269	46	69	66		
4	312	377	195	377	83	244	377	42	56	52		
5	122	215	179	355	83	228	333	42	46	36		
6	115	152	159	377	129	207	269	269	29	36		
7	104	167	199	563	265	187	232	97	23	33		
8	111	207	248	612	240	215	179	49	20	33		40
9	90	223		539	195	199	118	52	23	36		
10	69	195		445	152	187	104	66	26			
11	62	167		445	122	179	104	59	26			
12	62	175		445	107	179	115	56	20	30		
13	107	269		400	107	179	125	59	26			
14	377	377		400	93	183	111	69	29		30	
15	612	355		422	86	179	104	66	33			
16	1,580	355		422	86	156	111	69	36			
17	1,790	355		400	83	163	104	73	49			
18	1,930	312		377	86	163	93	76	42			
19	2,160	290	330	377	76	163	73	79	46			
20	2,300	219		355	73	156	69	69	52	40		
21	1,520	195		312	76	156	79	79	66			
22	713	179		277	111	137	79	76	66			
23	515	163		252		125	76	76	59			45
24	468	163		236		125	90	79	49			
25	333	163		228		125	90	90	52			
26	228	171		219	180	125	86	111	49			
27	133	175		215		125	86	137	46	35		
28	93	171		203		111	100	104	49			
29	104	148	400	203		86	97	97	46		40	
30	129	125	539	240	-------	62	86	422	52			
31	232	-------	637	228	-------	62	-------	333	-------			-------

NOTE.—Record of stage from Dec. 9–28 and on Feb. 4, doubtful; discharge estimated. No record Feb. 23–29; discharge estimated. From July 10 to Sept. 30 stage-discharge relation was so affected by the growth of grass that mean daily gage heights were not used directly. The discharge was estimated by comparison with other stations, using measurements and stage as a guide.

Monthly discharge of Pecos River near Sheffield, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,300	62	551	33,900
November	662	125	260	15,500
December			310	19,100
January	765	203	386	23,700
February		73	136	7,800
March	377	62	174	10,700
April	377	66	131	7,790
May	422	42	98.3	6,040
June	125	20	46.3	2,760
July	83		39.8	2,450
August			31.6	1,940
September			42.5	2,530
The year	2,300		185	134,000

PECOS RIVER NEAR COMSTOCK, TEX.

LOCATION.—At the Pecos High Bridge of Galveston, Harrisburg & San Antonio Railway Co., 12 miles west of Comstock, Val Verde County, and below all tributaries.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—May 1, 1900, to September 30, 1924. Also, gage heights for 1898.

GAGE.—Vertical staff, attached to downstream side of bridge pier on left bank; read by W. A. Clare or J. R. Hutchins.

DISCHARGE MEASUREMENTS.—Made from cable, 1,000 feet above bridge.

CHANNEL AND CONTROL.—Banks and stream bed composed of rock and gravel; water flows through a series of rapids and pools in a canyon approximately 300 feet deep; banks not subject to overflow. Stage-discharge relation at low stages changes slightly.

EXTREMES OF DISCHARGE.—Maximum stage recorded, 9.80 feet at 10.20 a. m. September 21 (discharge, 12,800 second-feet); minimum discharge, 129 second-feet August 22 and 23.

1900–1924: Maximum stage recorded, 35.75 feet April 6, 1900, (discharge not determined); minimum discharge recorded, 106 second-feet July 29 to August 1, 1918.

ICE.—None.

DIVERSIONS.—Considerable water is diverted and stored above the station for irrigation. Lakes McMillan and Avalon of the Carlsbad project of the United States Bureau of Reclamation, with a combined capacity of 58,500 acre-feet, are on Pecos River a few miles above Carlsbad, N. Mex. In addition to the water stored in New Mexico, water from Pecos River is used to irrigate large areas of land in the vicinity of Barstow and Grandfalls, Tex. There are no diversions below the station. Return waters tend to equalize effects of diversions in lower part of drainage basin.

REGULATION.—Flow partly controlled by storage and diversions for irrigation above station. No water-power plants of any consequence operated in the drainage basin, except a public-utility plant of about 300 horsepower near Carlsbad, N. Mex.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined for all stages. Gage read to hundredths twice daily. Daily discharge determined by shifting-control method. Records good.

Discharge measurements of Pecos River near Comstock, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 18	1.28	561	Mar. 13	0.90	373	Aug. 15	0.08	141
Jan. 24	.98	427	May 26	.36	202	Sept. 8	.37	195
Feb. 1	.91	411	June 3	.91	419	Sept. 18	.86	390
Do	.91	419	Aug. 11	.10	137			

Daily discharge, in second-feet, of Pecos River near Comstock, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	228	544	317	444	421	317	273	242	710	170	141	162
2	228	652	356	444	444	356	266	238	1,110	164	141	159
3	212	421	377	444	421	356	273	235	421	162	141	209
4	228	377	377	865	377	377	259	228	365	162	134	444
5	228	570	377	652	356	421	266	395	328	162	134	280
6	336	468	356	468	298	399	518	242	313	162	136	225
7	280	377	356	493	317	377	503	238	287	162	141	202
8	262	377	377	493	317	336	473	231	276	159	141	187
9	228	298	377	710	336	377	463	298	266	162	151	179
10	228	298	421	740	356	336	478	259	252	159	157	176
11	245	336	468	625	317	377	348	245	238	162	144	176
12	228	336	518	570	317	336	317	238	231	157	141	245
13	245	377	493	570	317	356	284	235	225	157	141	930
14	228	544	493	570	298	377	269	231	218	154	139	1,350
15	228	625	493	518	298	356	294	231	212	151	141	625
16	245	468	493	518	298	356	280	228	209	151	136	421
17	298	468	518	544	317	336	262	228	196	146	136	399
18	1,350	468	544	544	336	377	269	228	196	149	136	356
19	1,500	468	544	544	444	356	284	218	184	176	136	377
20	1,660	444	544	518	399	317	259	215	179	179	131	317
21	2,130	421	570	518	356	356	259	231	179	173	131	298
22	1,840	377	570	518	317	336	269	238	179	162	129	4,520
23	995	399	544	468	298	356	266	215	179	154	129	377
24	740	399	518	421	298	336	252	212	173	151	136	298
25	570	377	468	421	317	336	238	202	167	151	136	298
26	570	377	444	444	298	298	238	199	167	146	141	280
27	544	317	444	444	317	336	242	209	167	141	141	336
28	468	377	444	377	336	336	242	228	167	141	139	262
29	421	356	444	444	336	336	238	222	162	139	136	228
30	336	336	468	444	------	317	255	242	162	136	173	228
31	336	------	468	444	------	298	------	1,860	------	136	176	------

Monthly discharge of Pecos River near Comstock, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	2,130	212	569	35,000
November	652	298	422	25,100
December	570	317	457	28,100
January	865	377	523	32,200
February	444	298	340	19,600
March	421	298	350	21,500
April	518	238	305	18,100
May	1,860	199	289	17,800
June	1,110	162	271	16,100
July	179	136	156	9,590
August	176	129	141	8,660
September	4,520	159	485	28,800
The year	4,520	129	359	261,000

FARMERS INDEPENDENT CANAL NEAR PORTERVILLE, TEX.

LOCATION.—200 feet east of track of Atchison, Topeka & Santa Fe Railway, 300 feet below head gates of canal in Reeves County, and 5 miles southwest of Porterville, Loving County.

RECORDS AVAILABLE.—February 9, 1922, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder. Prior to September 16, 1924, Stevens 8-day water-stage recorder; attended by Otis Harrell.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Bed composed of sand and clay. Control not known but shifts.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 4.94 feet at 4 a. m. October 13 (discharge not determined); no flow for several periods.

1922–1924: Maximum daily discharges, 160 second-feet June 14, 1922; no flow for several periods.

ICE.—None.

DIVERSIONS.—Above all diversions.

REGULATION.—Regulated by head gates and height of river.

ACCURACY.—Stage-discharge relation not permanent. Rating curve fairly well defined from 10 to 80 second-feet and poorly defined below. Operation of the water-stage recorder not satisfactory owing principally to improper attendance. Mean daily gage heights determined from recorder graph by inspection or by use of planimeter. Daily discharge determined by shifting-control method except as noted in footnote to daily-discharge table. Records fair.

Discharge measurements of Farmers Independent Canal near Porterville, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 3	1.45	30.0	Mar. 27	1.77	33.9	June 5	1.64	37.3
Oct. 28	2.03	23.9	Apr. 10	2.07	50.2	June 13	1.90	41.2
Nov. 7	2.01	24.6	Apr. 23	2.33	66.0	June 28	2.32	53.4
Nov. 21	1.87	23.2	May 3	2.25	62.9	July 25	2.14	43.1
Jan. 4	.45	[a].5	May 16	2.12	55.4	Aug. 14	2.48	50.1
Mar. 17	1.93	35.4						

[a] Estimated.

Daily discharge, in second-feet, of Farmers Independent Canal near Porterville, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	22	23	0.5	------	33	54	4.4	43	55	45
2	32	22		.5	------	34	58	4.8	52	53	45
3	31	25	------	.5	------	33	62	25	58	47	------
4	31	24	------	.5	------	13	36	38	59	30	
5	31	24	------	.5	------	.1	------	37	49	21	
6	31	24	------	.5	------	.1	28	42	47		26
7	30	25	------	.5	------	49	50	42	46		
8	30	25	------	.5	------	50	56	38	43		
9	30	25	------	.5	------	47	53	66	45	34	51
10	43	25	------	.5	------	49	51	77	45		50
11	72	25	------	------	------	49	56	71	44		51
12	90	25	------	------	31	44	53	56	43	52	57
13	98	24	------	------	59	42		42	36	55	63
14	80	23	------	------	38	43	54	37	33	50	65
15	74	23	------	------	37	52		32	28	60	56

Daily discharge, in second-feet, of Farmers Independent Canal near Porterville, Tex., for the year ending September 30, 1924—Continued

Day	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May	June	July	Aug.	Sept.
16	52	23	------	------	36	55	55	32	29	72	52
17		23	------	------	36	50	54	33		72	47
18	34	23	------	------	36	47	53	38	30	75	41
19		22	------	------	37	46	52	32		77	42
20		23	------	------	36	59	51	31		68	42
21		23	------	------	34	66	51		31	71	42
22		23	------	------	33	64	52		43	69	
23		23	------	------	34	63	50		38	54	
24	26	23	------	------	36	54	47	42	36	66	
25		24	------	------	35	59	47		40	64	
26		24	------	------	34	59	49		35		36
27		24	------	------	34	59	43		33	77	
28	24	25	0.5	------	36	25		55	33		
29	30	25		------	37	23	41	60	36		
30	28			------	34	57		48	42	90	
31	23	------		------	34	------	14	------	61	45	------

NOTE.—Dry on days for which no flow is given. Braced figures show estimated mean discharge for periods indicated. Record incomplete Oct. 1, 28, Nov. 16, June 28, July 12, 21, Aug. 3, 22, 23, and Sept. 9 and 21; discharge partly estimated. Discharge from one staff gage reading only on October 20, August 30, and September 3. No record Nov. 5, 6, 15, July 11; discharge interpolated. No record Aug. 31, Sept. 1 and 2; discharge estimated.

Monthly discharge of Farmers Independent Canal near Porterville, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	98	----------	39.1	2,400
November	----------	----------	23.8	1,420
December (8 days)	----------	----------	6.12	97.2
January (10 days)	----------	----------	.50	9.9
March (20 days)	59	31	36.4	1,440
April	66	.1	44.1	2,630
May (30 days)	62	14	48.7	2,900
June	77	4.4	41.2	2,450
July	61	----------	40.3	2,480
August	90	----------	56.7	3,490
September (29 days)	65	----------	41.5	2,390
The year	----------	----------	----------	21,700

CEDARVALE CANAL NEAR BARSTOW, TEX.

LOCATION.—At highway bridge across canal near Barstow Canal head gates below Boxley Canal pumping plant, 8 miles northwest of Barstow, Ward County. From August 21 to December 5, 1923, station was at head gates of canal, 1½ miles above present site.

RECORDS AVAILABLE.—February 12, 1922, to September 30, 1924.

GAGE.—Stevens 8-day water-stage recorder. Datum of gage lowered 0.78 foot December 5, 1923.

DISCHARGE MEASUREMENTS.—Made by wading.

EXTREMES OF DISCHARGE.—Maximum stage not known; no flow for several periods.

ICE.—None.

DIVERSIONS.—Boxley Canal diverts water from this canal between river and lower station, at times when the water is not utilized by the Cedarvale Canal.

REGULATION.—Regulated by canal head gates.

ACCURACY.—Stage-discharge relation not permanent. Rating curve not defined. Recorder operation not satisfactory. Daily or monthly discharge not determined on account of poor gage record and backwater conditions. Total discharge for the year, 9,250 acre-feet, estimated from incomplete gage-height record, comparison with other stations, and discharge measurements. Records poor.

Canal diverts from left bank of Pecos River between Farmers Independent Canal and Barstow Canal.

Discharge measurements of Cedarvale Canal near Barstow, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Fee*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 4	0.35	[a] 44	Mar. 1	2.21	56	June 11	2.98	47
Do		2.3	Mar. 8	3.47	165	July 2	1.88	37
Oct. 9	−.1	20	Mar. 15	2.72	64	July 5	2.14	52
Nov. 2	−.2	[a] 23	Mar. 22	2.24	18	July 12	2.35	35
Nov. 17	−.2	[a] 24	Mar. 27	.76	3.4	July 30	2.60	42
Do		[b] .2	Apr. 7	.60	1.3	Aug. 4	3.15	46
Feb. 23	2.36	65	May 5	3.09	91	Aug. 29	1.88	32
Feb. 27	2.22	55	June 2	3.37	96			

[a] Water returning to the river. [b] Estimated.

BOXLEY CANAL NEAR BARSTOW, TEX.

LOCATION.—One-fourth of a mile above Barstow Dam (Ward County Irrigation District No. 1), 7 miles northwest of Barstow, Ward County, and 8 miles north of Pecos.

RECORDS AVAILABLE.—October 1, 1923, to September 30, 1924. Miscellaneous measurements during 1922 and 1923.

GAGE.—Vertical staff gage on right bank, 150 feet below pump discharge.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Channel straight for 800 feet below the pumps; composed of earth, sand, and small gravel; clean. Control not well defined but believed to be fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage for year not definitely known. No flow for several periods.

ICE.—None.

DIVERSIONS.—None above gage.

REGULATION.—Regulated by operation of pumps, 150 feet above gage.

ACCURACY.—Stage-discharge relation not permanent. No rating curve developed. Gage read to hundredths twice daily while pumps were running. Daily discharge determined from discharge measurements made during each period when pumps were in operation and from knowledge of rate of pumping at other times. Discharge not sufficiently accurate to justify publication of daily discharge. Records fair.

Discharge measurements of Boxley Canal near Barstow, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Mar. 8		16	June 2		10	July 30	4.66	16
Mar. 15		11	June 11		11	Aug. 4	4.70	15
Mar. 22		13	July 2		13	Aug. 9	4.48	11
Apr. 21		11	July 5		17	Aug. 22	4.54	11
May 5		10	July 12		18			

Monthly discharge of Boxley Canal near Barstow, Tex., for the year ending September 30, 1924

Month	Run-off in acre-feet	Month	Run-off in acre-feet	Month	Run-off in acre-feet
March (16 days)	445	June (4 days)	67.4	September (3 days)	55.5
April (11 days)	221	July (9 days)	207		
May (5 days)	81.3	August (19 days)	433	The year	1,510

NOTE.—Dry from Oct. 1, 1923, to Mar. 7, 1924.

BARSTOW CANAL NEAR BARSTOW, TEX.

LOCATION.—200 feet below head gates and dam of Ward County Irrigation District No. 1 and 8 miles northwest of Barstow, Ward County.

RECORDS AVAILABLE.—February 12, 1922, to September 30, 1924.

GAGE.—A water-stage recorder (fuzee type) attached to footbridge. Prior to March 30, 1923, Stevens 8-day water-stage recorder and from March 30, 1923, to September 11, 1924, Stevens continuous water-stage recorder.

DISCHARGE MEASUREMENTS.—Made by wading or from bridge about 2,500 feet downstream.

CHANNEL AND CONTROL.—Bed composed of rock and gravel; shifts. Low-water control is rock and gravel shoal, 150 feet below gage. Point of zero flow, about 0.70 foot.

EXTREMES OF DISCHARGE.—Maximum stage during the year from water-stage recorder, 4.84 feet at 3 p. m. September 13 (discharge, 258 second-feet); no flow from 1 to 5 a. m. July 2.

1922–1924: Maximum stage, 7.42 feet at 8 a. m. August 30, 1923 (discharge, 499 second-feet); no flow for several periods of record.

ICE.—None.

DIVERSIONS.—Above all diversions.

REGULATION.—Regulated by head gates.

ACCURACY.—Stage-discharge relation not permanent. Two rating curves used during the year; one well defined below 240 second-feet applicable from October 1 to November 9 and from May 5 to September 30; the other well defined below 180 second-feet applicable from November 10 to May 4. Operation of water-stage recorder satisfactory, except for short breaks in the record, as noted in footnote to table of daily discharge. Mean daily gage heights determined from the recorder graph by inspection or by means of planimeter. Daily discharge ascertained by shifting-control method except as noted in footnote to daily-discharge table. Records fair.

Barstow Canal diverts water on left bank from Pecos River for irrigation and domestic use.

Discharge measurements of Barstow Canal near Barstow, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 5	2.67	83.5	Feb. 15	3.28	118	May 26	2.78	91.5
Nov. 2	1.48	16.0	Feb. 27	2.72	67.0	June 2	1.01	1.55
Nov. 17	2.62	63.4	Mar. 8	1.20	3.37	June 11	3.45	152
Dec. 4	2.70	67.8	Mar. 22	3.90	165	June 23	1.93	32.0
Dec. 13	1.12	[a] 1.50	Mar. 29	1.37	6.16	July 2	.90	[a] 0.40
Jan. 3	2.07	34.4	Apr. 7	3.90	163	July 5	1.17	3.10
Jan. 11	1.95	28.7	Apr. 12	2.80	76.2	July 12	3.38	144
Jan. 25	2.79	78.5	Apr. 21	2.02	30.2	July 28	2.31	57.5
Feb. 1	3.12	104	May 12	3.04	110	Aug. 9	2.10	41
Feb. 9	3.52	143	May 19	3.08	113	Aug. 16	1.88	30

[a] Estimated.

Daily discharge, in second-feet, of Barstow Canal near Barstow, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	118	19		26	107	98	128	45	73	0.5	3.0	16
2	128	17	67	24	101	109	65	8.4	1.7	.1	2.0	37
3	112	17		33	83	3.0	84	6.5	21	.5	2.0	74
4	97	17	68	33	86	2.0	103	7.2	48	1.0	13	128
5	84	17	68	30	92	1.6	111	34	70	19	42	116
6	82	13	64	28	93	1.7	127	83	116	53	43	89
7	84	1.1	52	29	100	1.7	160	98	97	56	38	72
8	86	2.3	50	28	115	2.9	131	98	82	67	42	
9	80	6.0	52	26	143	3.4	111	104	100	67	41	74
10	70	57	52	26	139	3.5	99	93	168	72	30	
11	81	52	52	28	135	3.5	85	93	152	100	34	76
12	90	50	41	30	131	3.5	76	112	136	148	32	82
13	69	50	12	29	127	3.5	68	104	104	110	32	150
14	54	52		28	123	3.5	57	99	81	92	32	179
15	6.3	52		34	119	47	43	100	67	75	31	191
16	33	53	29	38	119	89	33	104	57	59	30	152
17	82	63		55	97	132	30	104	52	55	33	132
18	25	65		72	89	161	26	112	48	54	34	104
19	23	62		74	86	139	25	112	46	58	29	96
20	33	61		80	90	185	25	108	44	75	27	100
21	40	62	23	65	105	143	28	104	40	120	21	96
22	67	64	27	60	91	160	31	98	37	90	23	99
23	100	64	33	60	105	151	31	100	32	86	21	100
24	111	65	34	81	90	212	30	91	32	69	18	108
25	112	66	33	80	65	226	34	87	64	63	17	91
26	108		37	78	74	226	36	91	52	72	21	95
27	93		37	77	65	234	42	96	52	62	29	108
28	86	67	29	74	62	128	56	77	47	58	39	92
29	52		22	84	65	6.2	75	70	48	56	27	68
30	25		28	120	-------	94	67	68	37	37	.9	45
31	20	-------	26	123	-------	168	-------	56	-------	1.8	12	-------

NOTE.—Record incomplete, Nov. 9, Dec. 4, 21, Mar. 10–14, Apr. 11, 12, Sept. 7, and 11; discharge partly estimated. No record Jan. 17; discharge interpolated. Braced figures show the estimated mean discharge for the periods indicated.

Monthly discharge of Barstow Canal near Barstow, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	128	63	72.6	4,470
November	----------	1.1	46.1	2,740
December	----------	12	40.1	2,470
January	123	24	53.3	3,280
February	143	62	99.9	5,750
March	234	1.6	88.5	5,440
April	160	25	67.2	4,000
May	112	6.5	82.7	5,080
June	168	1.7	66.8	3,980
July	148	.1	60.5	3,720
August	43	.9	25.8	1,580
September	191	16	97.3	5,790
The year	234	.1	66.5	48,300

GRANDFALLS-BIG VALLEY CANAL NEAR BARSTOW, TEX.

LOCATION.—At head gates 10 miles southeast of Barstow, Ward County.

RECORDS AVAILABLE.—March 2, 1922, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Bed composed of clay. Control not known; shifts. Point of zero flow, −0.40 foot.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 3.52 feet at 11.30 a. m. December 27 (discharge, 253 second-feet, determined from extension of rating curve); no flow for several periods.

1922–1924: Maximum stage from water-stage recorder, 3.55 feet at 5 a. m. September 4, 1923 (discharge, 304 second-feet, determined from extension of rating curve); no flow for several periods.

ICE.—None.

DIVERSIONS.—Above all diversions.

REGULATION.—Regulated by head gates.

ACCURACY.—Stage-discharge relation not permanent. Two rating curves used; one well defined below 160 second-feet applicable from October 1 to 29; the other well defined below 200 second-feet applicable for remainder of year. Operation of the water-stage recorder not satisfactory. Mean daily discharge determined by applying to rating table mean daily gage height determined from recorder graph by inspection or by use of planimeter, using shifting-control method April 18 to September 30. Records fair.

Canal diverts from left bank of Pecos River for irrigation and domestic uses.

Discharge measurements of Grandfalls-Big Valley Canal near Barstow, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 26	0.80	25.9	Jan. 19	2.40	164	Apr. 26	1.02	51.0
Nov. 3	2.38	158	Feb. 3	2.55	161	May 10	.92	42.3
Nov. 12	2.28	146	Feb. 16	2.60	177	July 3	1.00	56.9
Nov. 24	2.11	134	Mar. 3	2.67	183	July 22	.31	18.5
Dec. 8	2.64	175	Mar. 14	2.50	164	Aug. 13	.35	19.4
Dec. 15	2.68	175	Mar. 29	2.69	181			
Jan. 5	2.44	166	Apr. 12	1.19	68.0			

Daily discharge, in second-feet, of Grandfalls-Big Valley Canal near Barstow, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	124	125	125	137	197	177	125	57	-------	18	23	19
2	139	133	129	149	242		95	54	-------	29	21	19
3	168	145	133	148	206	173	80	52	-------	54	19	26
4	113	161	133	205	103	165	72	48	-------	32	19	31
5	5.4	149	147	169	169	149	65	47	-------	28	19	22
6	15	137	185		169	149	67	46	-------	26	20	21
7	19	141	185		177	157	98	52	-------	23	19	21
8	15	145	177		181	153	83	50	-------	22	19	22
9	26	141	185		185	165	76	46	-------	22	18	21
10	20	145	193		177	161	80	43	-------	26	18	7.0
11	26	141	202		189	161	75	53	-------	26	19	-------
12	18	133	193	163	193	157	69		-------	24	18	-------
13	15	117	202		165	161	69		-------	22	19	-------
14	18	113	202		153	165	67		-------	22	19	-------
15	21	121	193		145	173	67	50	-------	22	18	-------
16	23	117	181		169	161	67		-------	20	18	-------
17	23	125	177		181	153	63		-------	19	17	-------
18	27	129	169			157	65		-------	18	17	-------
19	16	129	165	157		153	62	-------	-------	19	17	-------
20	32	129	173	165		169	58	-------	-------	20	17	-------
21	43	133	193	189		157	56	-------	-------	19	16	-------
22	38	133	185	157		165	53	-------	-------	19	16	-------
23	31	125	189	141	177	113	53	-------	8.9	21	15	-------
24	22	125	210	153		86	55	-------	20	22	16	-------
25	22	125	233	189		102	52	-------	20	22	15	-------
26	25	137	183	173		113	52	-------	19	23	15	-------
27	26	141	212	169		102	50	-------	19	23	16	-------
28	26	125	149	165		113	51	-------	18	23	18	-------
29	83	125	193	145		160	53	-------	17	23	20	-------
30	185	125	202	169	-------	202	55	-------	16	23	22	-------
31	155	-------	131	181	-------	185	-------	-------	-------	24	20	-------

NOTE.—Braced figures show estimated mean discharge for periods indicated. Record incomplete, Jan. 19, Feb. 17, Mar. 3 and May 11; discharge partly estimated. Dry on days for which no discharge is given.

Monthly discharge of Grandfalls-Big Valley Canal near Barstow, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	185	5.4	49.0	3,010
November	161	113	132	7,870
December	212	125	178	11,000
January	205	----------	164	10,100
February	242	103	177	10,200
March	202	86	153	9,390
April	125	50	67.8	4,030
May (18 days)	----------	----------	49.9	1,780
June (8 days)	20	8.9	17.2	274
July	54	18	23.7	1,460
August	23	15	18.2	1,120
September (10 days)	31	7.0	20.9	415
The year	242	----------	----------	60,600

IMPERIAL HIGHLINE CANAL NEAR GRANDFALLS, TEX.

LOCATION.—4 miles below head gates of canal in Reeves County, 15 miles west of Grandfalls, and 25 miles southeast of Pecos.

RECORDS AVAILABLE.—March 14, 1922, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder.

DISCHARGE MEASUREMENTS.—Measurements made by wading or from bridge, 300 feet above gage.

CHANNEL AND CONTROL.—Bed composed of coarse gravel. Banks of earth. Control not known; shifts. Points of zero flow, 0.10 foot gage datum.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 6.48 feet at 6 a. m. October 31 (discharge, 274 second-feet), determined from extension of rating curve); no flow September 1–28.

1922–1924: Maximum stage, 6.85 feet September 18, 1923 (discharge, not determined); no flow for several periods.

ICE.—None.

DIVERSIONS.—Above all diversions. Sand gates, 300 feet above, are opened occasionally for a short time to clean canal.

REGULATION.—Regulated by head gates.

ACCURACY.—Stage-discharge relation not permanent. Rating curve well defined below 225 second-feet; extended above. Operation of water-stage recorder satisfactory. Mean daily gage height determined from the recorded graph by inspection or by use of the planimeter. Daily discharge determined by applying to rating table mean daily gage height determined from recorder graph by inspection, by use of the planimeter, by averaging discharge for fractional parts of a day, or by shifting-control method. Records fair.

Discharge measurements of Imperial Highline Canal near Grandfalls, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 18	0.60	7.3	Dec. 16	0.71	10	Apr. 16	0.64	8.7
Oct. 24	5.28	208	Jan. 7	.64	8.0	May 20	1.88	47
Do	[a] 5.32	190	Feb. 5	.62	7.6	June 17	1.10	21
Nov. 14	5.19	196	Feb. 19	3.04	102	July 8	.30	1.2
Do	5.08	195	Feb. 20	2.77	89	Aug. 5	.25	[b] 50
Nov. 26	[a] 3.43	98	Mar. 5	.43	3.5	Aug. 27	.25	[b] 50
Do	2.42	65	Mar. 18	.40	2.8			

[a] Measurements considered in error owing to poor section and changing stage.
[b] Discharge estimated.

Daily discharge, in second-feet, of Imperial Highline Canal near Grandfalls, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.2	221	38	8.5	7.5	4.0	18	8.0	43	1.1	0.9	-------
2	9.5	193	12	8.5	7.5	3.5	11	8.5	40	1.4	.8	-------
3	9.8	179	12	8.0	7.8	3.5	10	8.2	35	2.3	.8	-------
4	10	179	12	8.5	8.0	3.3	9.2	8.0	32	2.2	.6	-------
5	99	169	12	9.0	8.0	3.5	9.5	8.0	34	1.8	.5	-------
6	122	179	12	8.8	8.2	3.5	9.5	8.0	34	1.8	.6	-------
7	82	184	12	8.5	8.2	3.5	9.5	7.3	34	1.4	.8	-------
8	134	199	11	8.8	8.0	3.0	10	7.0	40		.6	-------
9	73	209	11	8.5	8.0	2.8	9.8	7.3	35		.5	-------
10	1.1	209	11	8.5	8.8	2.8	10	7.5	28		.5	-------
11	41	215	11	8.8	45	2.6	9.8	7.3	28		.5	-------
12	213	209	11	8.5	99	2.8	9.2	7.0	24		.5	-------
13	209	209	10	8.5	104	2.8	9.8	7.3	22		.5	-------
14	227	199	10	8.5	102	2.8	8.8	7.5	23		.5	-------
15	251	179	10	8.8	96	2.6	8.5	7.5	23	1.0	.5	-------
16	155	179	10	8.5	92	2.6	8.2	7.5	22		.6	-------
17	8.8	190	10	8.5	96	2.6	8.0	7.0	21		.6	-------
18	5.6	194	10	8.5	106	2.8	8.2	7.0	20		.5	-------
19	1.7	189	10	8.8	99	18	8.2	7.0	19		.5	-------
20	.8	179	9.8	8.5	89	27	8.0	40	18		.5	-------
21	64	179	9.5	8.5	89	27	7.5	42	19		.4	-------
22	215	189	9.5	8.2	52	17	7.5	41	19		.4	-------
23	221	184	9.5	8.5	5.8	12	7.5	45	13	.5	.4	-------
24	215	179	9.2	8.2	4.9	10	7.8	45	2.5	.6	.4	-------
25	204	174	8.5	8.2	4.9	9.5	8.0	44	1.8	.8	.4	-------
26	204	127	8.5	8.0	4.9	10	7.8	48	1.7	.8	.4	-------
27	209	56	8.2	8.0	4.9	9.8	7.8	38	1.4	.6	.4	-------
28	209	58	9.5	8.2	4.4	10	8.0	35	1.2	.6	.3	-------
29	195	58	9.2	8.2	4.2	8.8	8.2	34	1.2	.6	.2	4.4
30	220	58	9.2	7.8	-------	24	7.5	35	1.1	.9	.1	28
31	263	-------	8.8	7.5	-------	42	-------	36	-------	1.4	.1	-------

NOTE.—Dry on days for which no discharge is given. Braced figures show the estimated mean discharge for the periods indicated. Record incomplete, Apr. 15 and 16; discharge partly estimated.

Monthly discharge of Imperial Highline Canal near Grandfalls, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October	263	0.8	125	7,700
November	221	56	171	10,200
December	38	8.2	11.1	683
January	9.0	7.5	8.41	517
February	106	4.2	40.8	2,350
March	42	2.6	9.04	556
April	18	7.5	9.03	537
May	48	7.0	20.2	1,240
June	43	1.1	21.2	1,260
July	2.3	----------	1.09	67.0
August	.9	.1	.49	30.3
September (2 days)	28	4.4	16.2	64.3
The year	----------	----------	----------	25,200

IMPERIAL LOWLINE CANAL NEAR GRANDFALLS, TEX.

LOCATION.—Opposite the gage on Pecos River near Grandfalls, 3 miles below head gates of canal, and 4 miles west of Grandfalls, Pecos County.

RECORDS AVAILABLE.—March 29, 1922, to September 30, 1924.

GAGE.—Stevens continuous water-stage recorder.

DISCHARGE MEASUREMENTS.—Made by wading or from footbridge near gage.

CHANNEL AND CONTROL.—Bed of canal consists of clay, gypsum, and silt. Banks of earth. Control not known; shifts.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 4.15 feet October 13 (discharge, 249 second-feet, determined from extension of rating curve); no flow October 1–9.

1922–1924: Maximum stage from silt marks in well, 4.25 feet September 18, 1923 (discharge, 254 second-feet, determined from extension of rating curve); no flow for several periods.

ICE.—None.

DIVERSIONS.—Above all diversions. Sand gates, 1½ miles above, opened occasionally for short periods.

REGULATION.—Flow regulated by head gates.

ACCURACY.—Stage-discharge relation not permanent. One rating curve well defined below 160 second-feet applicable October 1–22; another curve well defined below 110 second-feet used October 23 to September 30. Operation of water-stage recorder not satisfactory. Mean daily discharge determined by shifting-control method October 1 to November 3, March 11–31, and April 25 to September 30; for the remainder of the year, by applying to rating table mean daily gage height determined from recorder graph by inspection, or by use of planimeter, or by averaging discharge for fractional parts of a day. Records fair.

Discharge measurements of Imperial Lowline Canal near Grandfalls, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Oct. 18	2.90	154	Feb. 5	2.27	70	May 20	0.88	6.2
Oct. 24	3.16	116	Feb. 19	2.73	96	July 8	.83	4.0
Nov. 15	1.03	12	Feb. 20	1.88	50	Aug. 5	.80	4.2
Nov. 16	2.30	72	Mar. 5	.81	5.3	Aug. 27	.71	2.2
Dec. 17	1.00	10	Mar. 18	.80	4.4	Sept. 17	1.88	39
Jan. 7	2.73	98	Apr. 16	.97	10			
Jan. 22	2.63	93	May 6	.94	7.6			

Daily discharge, in second-feet, of Imperial Lowline Canal near Grandfalls, Tex., for the year ending September 30, 1924

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	-------	126	74	93	78	6.8	26	7.1	17		3.4	3.2
2	-------	111	75	90	84	6.5	28	7.4	17		2.9	2.9
3	-------	99	75	87	93	6.2	16	7.4	17		4.8	2.9
4	-------	96	76	99	99	5.6	12	7.4	15	8.8	4.6	2.8
5	-------	114	49	108	81	5.3	10	7.4	15		4.3	3.2
6	-------	111	12	99	84	5.6	9.8	7.7	15		4.3	4.1
7	-------	96	12	99	81	5.9	9.5	7.4	14		4.1	
8	-------	84	12	99	77	5.6	12	7.1	13	4.5	3.9	
9	-------	93	11	102	78	5.3	13	6.8	13	4.5	3.7	
10	14	93	10	96	81	4.8	12	6.8	15	4.5	3.4	
11	42	52	10	96	81	5.0	12	6.8	14	4.5	3.6	3.4
12	161	13	10	96	81	5.6	12	6.8	13	4.3	3.4	
13	249	13	10	99	102	4.6	12	6.8	13	4.1	3.4	
14	215	13	11	99	96	4.5	12	6.8	13	3.9	3.4	
15	158	17	11	96	87	4.5	11	6.8	13	3.7	3.2	
16	153	72	11	93	60	4.3	10	7.1	13	3.6	3.2	3.2
17	153	71	11	93	52	4.3	9.8	7.1	13	3.6	3.7	38
18	153	69	11	93	94	4.5	9.8	6.5		3.6	6.7	-------
19	121	71	26	90	99	4.3	9.5	6.2		3.7	3.6	-------
20	112	70	56	90	58	4.3	9.2	6.2		3.9	3.4	-------
21	90	66	55	93	47	4.5	9.2	8.0		3.7	3.2	-------
22	64	68	56	93	52	3.7	9.2	11		3.7	3.2	-------
23	114	69	55	90	102	3.6	9.2	12		3.6	3.1	-------
24	117	67	56	87	93	3.7	9.2	12	8.8	3.6	2.1	-------
25	108	65	56	90	108	3.4	9.5	13		3.4	2.1	-------
26	108	63	66	90	111	3.1	9.2	19		3.4	2.2	-------
27	108	70	99	90	73	2.8	8.3	17		3.2	2.4	-------
28	111	72	120	90	7.4	2.2	8.3	13		3.2	2.6	-------
29	111	73	120	90	7.1	2.2	8.0	12		3.1	2.6	-------
30	104	74	114	87	-------	2.4	7.7	20		3.6	2.8	-------
31	144	-------	108	78	-------	2.5	-------	23	-------	4.6	3.1	-------

NOTE.—No flow Oct. 1–9. No record Sept. 18–30. Braced figures show estimated mean discharge for periods indicated. Records incomplete, June 17, July 8, Sept. 6, and 16; discharge partly estimated.

Monthly discharge of Imperial Lowline Canal near Grandfalls, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
October (22 days)	249	14	123	5,380
November	126	13	72.4	4,310
December	120	10	47.7	2,930
January	108	78	93.4	5,740
February	111	7.1	77.5	4,460
March	6.8	2.2	4.44	273
April	28	7.7	11.4	681
May	23	6.2	9.66	594
June	17	----------	11.9	709
July	----------	3.1	4.94	304
August	4.8	2.1	3.34	205
September 1–17	38	----------	5.35	180
The period	----------	----------	----------	25,800

DEVILS RIVER NEAR DEL RIO, TEX.

LOCATION.—2,200 feet above Southern Pacific Railroad bridge, 1.8 miles below State highway No. 3 crossing, and 12 miles northwest of Del Rio, Valverde County.

DRAINAGE AREA.—4,000 square miles (measured on topographic maps; progressive military maps of United States Army; and base map of Texas, scale 1:500,000).

RECORDS AVAILABLE.—May 1, 1900, to March 31, 1914, and December 6, 1923, to September 30, 1924. Records from 1900 to 1914, 1 mile downstream at station known as Devils River at Devils River.

GAGE.—Staff gage in six sections on the left bank.

DISCHARGE MEASUREMENT.—Made by wading.

CHANNEL AND CONTROL.—Bed composed of solid rock; rough and clean for low water; permanent. High-water channel of rock, overlain with gravel, with some trees and brush. Banks of rock and clay; not subject to overflow. Channel straight 1,000 feet above and below station. Control is solid rock ledge, 80 feet below gage; permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 5 feet on May 31, determined from drift marks on gage (discharge, 5,620 second-feet); minimum stage, 1.77 feet on August 21 and September 10 (discharge, 378 second-feet).

ICE.—None.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Stage-discharge relation permanent. Rating curve well defined from 330 to 1,400 second-feet; poorly defined to 32,500 second-feet. Gage read to hundredths once daily. Daily discharge determined by applying daily gage height to rating table. Records good.

Discharge measurements of Devils River near Del Rio, Tex., during the year ending September 30, 1924

Date	Gage height	Discharge	Date	Gage height	Discharge	Date	Gage height	Discharge
	Feet	*Sec.-ft.*		*Feet*	*Sec.-ft.*		*Feet*	*Sec.-ft.*
Dec. 14	1.96	502	May 27	1.84	434	Sept. 4	1.78	381
Dec. 28	1.94	479	Aug. 7	1.78	390	Sept. 10	1.76	397
Jan. 29	1.91	465	Aug. 14	1.78	380	Sept. 14	2.16	678
Mar. 11	1.86	447	Aug. 21	1.76	376	Sept. 23	1.90	475

Daily discharge, in second-feet, of Devils River near Del Rio, Tex., for the year ending September 30, 1924

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	------	497	466	466	466	438	1,580	424	396	384
2	------	497	466	466	466	438	1,300	424	396	384
3	------	497	466	466	466	438	922	424	384	396
4	------	497	466	466	466	438	543	424	384	390
5	------	497	466	497	466	438	543	424	384	384
6	543	497	466	466	466	543	466	410	384	384
7	528	481	466	466	466	532	466	396	384	384
8	528	466	466	466	466	522	466	410	384	384
9	543	466	466	466	466	512	466	410	384	384
10	528	466	466	466	512	512	466	410	384	378
11	528	466	466	452	466	466	452	410	384	384
12	528	466	466	466	466	438	452	410	384	384
13	528	466	466	466	466	438	452	396	384	384
14	520	466	466	466	466	438	438	396	384	700
15	512	466	466	466	466	438	438	396	384	1,120
16	512	466	466	466	466	424	438	396	384	543
17	512	466	466	466	466	424	424	396	384	497
18	512	466	466	466	466	424	424	396	384	497
19	528	466	466	466	466	424	424	396	384	481
20	512	466	466	466	438	424	424	424	384	481
21	512	466	466	466	438	424	424	424	378	466
22	512	466	466	466	438	424	424	410	384	497
23	512	466	466	466	438	424	424	410	384	474
24	512	466	466	466	438	424	424	396	384	452
25	512	466	482	466	438	424	424	396	384	452
26	512	466	497	466	438	424	410	396	384	438
27	497	466	466	466	438	424	410	396	384	438
29	497	466	466	466	438	424	410	396	384	584
29	497	466	466	466	438	424	410	396	384	481
30	497	481	------	466	438	512	410	396	384	466
31	497	466	------	466	------	3,840	------	396	384	------

NOTE.—No record Feb. 25, 29, Mar. 31, Apr. 30, May 7, 8, 17, June 1 and 3; discharge estimated or interpolated.

Monthly discharge of Devils River near Del Rio, Tex., for the year ending September 30, 1924

Month	Discharge in second-feet			Run-off in acre-feet
	Maximum	Minimum	Mean	
December 6-31	543	497	516	26,600
January	497	466	473	29,100
February	497	466	468	26,900
March	497	452	467	28,700
April	512	438	457	27,200
May	3,840	424	559	34,300
June	------	410	525	31,200
July	424	396	406	25,000
August	396	378	385	23,600
September	1,120	378	469	27,900
The period	------	------	------	280,000

MISCELLANEOUS DISCHARGE MEASUREMENTS

Discharge measurements of streams in the western Gulf of Mexico basins at points other than regular gaging stations are listed in the following table:

Miscellaneous discharge measurements in western Gulf of Mexico drainage basins during the year ending September 30, 1924

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
Nov. 8	Neches River	Gulf of Mexico	International-Great Northern Railroad bridge near Neches.		62.7
Dec. 21	do	do	do		1,530
Nov.	do	do	Ferry at Townbluff, Tex		6,500
Apr. 8	Camp Springs	Clear Fork of Brazos River.	Camp Springs, Tex		[a] 2.0
Sept. 21	Gonzales Creek	do	Breckenridge, Tex		[b] 7,960
4	Bosque River	Brazos River	Bosqueville, Tex		7.8
July 19	do	do	do		24.6
Mar. 23	do	do	Near Waco, Tex		3,920
July 20	Middle Bosque River	Bosque River	1,300 feet below bridge on South Bosque-Speegleville road near South Bosque, Tex.		.3
20	South Bosque River	do	South Bosque, Tex		1.2
Jan. 21	Sulphur Creek Springs	Lampasas River	Lampasas, Tex		6.9
Oct. 9	Mill Spring	Barton Creek	Near Austin, Tex		0
26	do	do	do		.3
Nov. 16	do	do	do		5.1
Dec. 8	do	do	do		7.3
26	do	do	do		8.0
Jan. 15	do	do	do		7.7
Feb. 4	do	do	do		8.4
23	do	do	do		9.0
Mar. 10	do	do	do		8.1
Apr. 4	do	do	do		7.4
23	do	do	do		8.8
June 6	do	do	do		5.7
July 3	do	do	do		10.9
Aug. 4	do	do	do		8.5
18	do	do	do		5.7
28	Guadalupe River	Gulf of Mexico	Ingram, Tex., above Johnson Creek.		70.5
28	do	do	Kerrville, Tex		93.0
29	do	do	Center Point, Tex		89.9
29	do	do	Waring, Tex		104
29	do	do	Near Sisterdale, just below mouth of Sister Creek, Tex.		99.8
30	do	do	Just below Sabino Creek, at Amms crossing, Tex.		102
30	do	do	Dierks ford, near dam site, Tex.		98.8
30	do	do	Speek's crossing, near Spring Branch, Tex.		78.9
31	do	do	Crane's mill, Tex		78.4
31	do	do	Sattler, Tex		90.7
31	do	do	1 mile above Comal Springs, Tex.		168
Jan. 16	do	do	Dam site near Bergheim, Tex.		359
Oct. 31	do	do	Highway bridge near Gonzales.	[c] 2.05	934
Dec. 2	do	do	do	[c] 16.3	7,220
Jan. 22	do	do	do	[c] 3.15	1,640
Mar. 16	do	do	do	[c] 4.62	2,480
Aug. 10	do	do	do	[c] 1.80	984
Oct. 30	do	do	Highway bridge at Victoria, Tex.	[c] .77	878
Nov. 26	do	do	do	[c] 1.74	1,259
Jan. 21	do	do	do	[c] 3.46	1,720
Mar. 14	do	do	do	[c] 4.72	2,290
Aug. 28	Johnson Creek	Guadalupe River	At mouth, Tex		24.9
29	Cherry Creek	do	do		2.6
29	Cypress Creek	do	do		2.1
29	Holiday Creek	do	do		1.7

[a] Estimated.
[b] Slope measurement, using Kutter's formula with "n" of 0.075.
[c] United States Weather Bureau gage.

Miscellaneous discharge measurements in western Gulf of Mexico drainage basins during the year ending September 30, 1924—Continued

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
Aug. 29	Joshua Creek	Guadalupe River	At mouth, Tex.		3.0
29	Sister Creek	do	do		.6
30	Wasp Creek	do	do		1.8
30	Sabino Creek	do	do		.9
30	Curry Creek	do	do		2.5
30	Spring Branch Creek	do	Spring Branch, Tex.		3.5
31	Big Spring	do	Near Crane's mill, Tex.		7.4
31	Elm Creek	do	Near New Braunfels, Tex.		37.3
June 16	Comal Springs	do	Landas Park, New Braunfels, Tex.		[d] 406
Aug. 1	do	do	do		[d] 315
Sept. 5	do	do	do		[d] 398
Sept. 4	San Marcos River	do	San Marcos		184
Oct. 18	do	do	do		160
Nov. 20	do	do	do		155
Jan. 14	do	do	do		252
Mar. 5	do	do	do		254
Apr. 25	do	do	do		244
May 21	do	do	do		279
June 26	do	do	do		185
Aug. 1	do	do	do		245
5	Cypress Creek	Blanco River	Near Jacobs well, near Wimberley, Tex.		6.1
5	do	do	Mouth near Wimberley, Tex.		7.3
Mar. 20	West Nueces River	Nueces River	2 miles above second road crossing out of Brackettville, Tex.		20.4
20	do	do	300 feet below second road crossing.		0
20	do	do	6 miles below Silver Lake, Tex.		[e] .8
Sept. 9	Frio River	Nueces River	Three Rivers, Tex.		0
June 22	Chacan Creek	San Miguel Creek	Chacan Dam, near Natalia, Tex.		[f] 2,510
22	Atascosa River	Frio River	Benton, Tex.		[g] 25,900
Aug. 14	Pecos River	Rio Grande	Just above Farmers Independent Canal, 5 miles south of Porterville, Tex.		41.0
Sept. 9	Delaware Creek	Pecos River	Near Angeles		[e] .2
May 3	Porterville Canal	do	100 feet below pump, near Porterville, Tex.		5.4
3	do	do	1½ miles below pump, near Porterville.		4.5
June 5	do	do	100 feet below pump, near Porterville.		5.8
28	do	do	60 feet above pump, near Porterville.		7.0
July 25	do	do	300 feet below pump, near Porterville.		6.5
Sept. 13	Drain ditch	do	Below junction of all ditches, 4 miles south of Barstow, Tex.		9.0
June 3	San Solomon Springs	do	Outlet, main canal, near Balmorhea, Tex.		28.4
3	do	do	do		28.7
3	do	do	do		28.4
4	do	do	do		29.5
Sept. 6	do	do	Near Balmorhea, Tex., at head.		34.4
7	do	do	do		35.4
June 3	do	do	700 feet below outlet, near Balmorhea, Tex.		30.3
4	do	do	do		29.7
Sept. 6	do	do	Near Balmorhea, Tex., at concrete flume.		35.1
June 3	Giffin Springs	do	Near Balmorhea, Tex.		3.9
July 29	Irving Springs	do	5 miles southwest of Pecos, Tex.		1.0
Sept. 4	Coyanosa Draw	Pecos River	Fort Stockton-Fort Davis highway crossing near Fort Stockton, Tex.		[h] 4,070
May 7	Comanche Springs	do	Fort Stockton		49.2
22	do	do	do		48.9
June 19	do	do	do		47.2
19	do	do	do		47.6

[d] Total flow of springs.
[e] Estimated.
[f] By weir formula, using value of 2.64 for "C" over spillway and 0.79 for angle sides.
[g] Determined by slope method, using Kutter's formula with value of 0.045 and 0.080 for "n."
[h] Determined by slope method, using Kutter's formula with a value of 0.040 and 0.060 for "n."

Miscellaneous discharge measurements in western Gulf of Mexico drainage basins during the year ending September 30, 1924—Continued

Date	Stream	Tributary to—	Locality	Gage height	Discharge
				Feet	*Sec.-ft.*
July 9	Comanche Springs	Pecos River	Fort Stockton		45.7
Sept. 18	do	do	do		45.6
July 16	Drain ditch	do	3 miles south of Fort Stockton, Tex.		5.2
Sept. 18	do	do	do		5.0
July 16	Casa Blanca Springs	do	15 miles east of Fort Stockton, Tex.		.1
Aug. 6	Tunis Spring	do	20 miles south of Fort Stockton, Tex.		1.2
Mar. 7	Pecos Spring	do	1 mile east of Sheffield, Tex.		.7
Jan. 25	Goodenough Springs	Rio Grande	Near Comstock, Tex.		213
Mar. 15	do	do	do		216
Aug. 22	do	do	do		173
Sept. 26	do	do	do		235
Dec. 11	Arroyo de las Vacas	do	Villa Acuna, Coah, Mex.		12
14	San Felipe Springs	do	Del Rio, Tex.		84.2
Jan. 30	do	do	do		93.0
Mar. 18	do	do	do		90.7
Aug. 26	do	do	do		88.1
Sept. 25	do	do	do		84.4

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