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Surface Water Records of Texas

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

SURFACE WATER RECORDS OF TEXAS

1964

Prepared in cooperation with

Texas Water Commission
Pecos River Commission
Sabine River Compact Administration
City of Dallas
City of Houston
Corps of Engineers, U. S. Army
U. S. Soil Conservation Service
U. S. Public Health Service
U. S. Bureau of Reclamation

Copies of this report may be obtained from
District Chief, Water Resources Division
U. S. Geological Survey
Federal Building
300 East 8th Street
Austin, Texas 78701

CALENDAR FOR WATER YEAR 1964

OCTOBER 1963

S	M	T	W	T	F	S
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JANUARY 1964

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JUNE 1964

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AUGUST 1964

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SEPTEMBER 1964

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SURFACE WATER RECORDS OF TEXAS, 1964

INTRODUCTION

The surface-water records for the 1964 water year for gaging stations, partial-record stations, miscellaneous sites, and base-flow studies within the State of Texas are given in this report. For convenience there are also included records for a few pertinent gaging stations in bordering States. The records were collected and computed by the Water Resources Division of the U. S. Geological Survey, under the direction of Trigg Twichell, district chief, Water Resources Division.

Through September 30, 1960, the records of discharge and stage of streams and contents and stage of lakes or reservoirs were published in an annual series of U. S. Geological Survey water-supply papers, entitled "Surface Water Supply of the United States." Since 1951 there have been 20 volumes in the series; each volume covered an area whose boundaries coincided with those of certain natural drainage areas. The records in Texas were contained in Parts 7 and 8 of that series.

Beginning with the 1961 water year, streamflow records and related data have been released by the Geological Survey in annual reports on a State-boundary basis. Distribution of these basic-data reports is limited and primarily for local needs. Records will be published in Geological Survey water-supply papers at 5-year intervals.

COOPERATION

The first gaging station in Texas was established in the Rio Grande at El Paso, May 10, 1889, and a few miscellaneous measurements of Central Texas streams were made in 1894, 1895, and 1896. In 1897, Thomas U. Taylor, then Professor of Civil Engineering at the University of Texas, began a systematic study of a few of the principal streams of Texas for the Geological Survey. In 1915, the first cooperative agreement was entered into between the Texas Board of Water Engineers, now the Texas Water Commission, and the U. S. Geological Survey for stream-measurement work in Texas.

Organizations that assisted in collecting data under cooperative agreements with the Survey in 1964 are:

Texas Water Commission, Joe D. Carter, Chairman, H. A. Beckwith and O. F. Dent, members.

Pecos River Commission, J. C. Wilson, Commissioner for Texas, and David P. Hale, Commissioner for New Mexico.

Sabine River Compact Administration, S. J. Jackson, Federal Representative and Chairman, Calvin T. Watts and R. J. Palmer for Louisiana, and Henry L. Woodworth and J. R. Hopkins for Texas.

City of Dallas, H. H. Stirman, Director of Public Works.

City of Houston, E. B. Cape, Director, Department of Public Works.

Assistance in the form of funds or services were furnished by the following Federal Agencies:

Corps of Engineers, U. S. Army, in the operation of 117 gaging stations.

Public Health Service, Department of Health, Education, and Welfare, in the operation of 3 gaging stations.

Soil Conservation Service, Department of Agriculture, in the operation of 11 gaging stations.

Bureau of Reclamation, Department of the Interior, in the operation of 1 gaging station.

Acknowledgment is due the Weather Bureau, Department of Commerce, for assistance in collecting certain records published herein.

Assistance in the form of funds of services was rendered by the following organizations:

The cities of Abilene, Amarillo, Arlington, Brady, Breckenridge, Corpus Christi, Dallas, Fort Worth, Graham, Houston, Lampasas, Longview, San Angelo, Tyler, Tulia, and

Wichita Falls; Bexar, Medina, Atascosa Counties Water Control and Improvement District No. 1; Bistone Municipal Water Supply District; Brazos River Authority; Brown County Water Improvement District No. 1; Canadian River Municipal Water Authority; City Public Service Board of San Antonio; Colorado River Municipal Water District; Dallas County; Dallas Power and Light Company; Dow Chemical Company; Edwards Underground Water District; Guadalupe-Blanco River Authority; Harris County Flood Control District; Houston Lighting and Power Company; Lower Colorado River Authority; Lower Neches Valley Authority; Palo Pinto Water District; Red Bluff Water Power Control District; Reeves County Water Improvement District No. 1; Richmond Rice Association; Sabine River Authority of Texas; San Antonio River Authority; San Antonio City Water Board; San Jacinto River Authority; South Texas Water Company; Tarrant County Water Control and Improvement District No. 1; Texas Electric Service Company; Upper Neches River Municipal Water Authority; West Central Texas Municipal Water District; White River Municipal Water District and Wood County.

DEFINITION OF TERMS AND ABBREVIATIONS

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

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

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

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

Cubic feet per second per square mile (cfsm) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

Runoff in inches (in.) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

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

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

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

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

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

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

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

DOWNSTREAM ORDER AND STATION NUMBERS

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

As an added means of identification, each gaging station and partial-record station has been assigned a station number. The numbers have been assigned in the same downstream order used in the annual series of water-supply papers. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging stations, so that the station number for a partial-record station indicates downstream order position on a list made up of both types of

stations. Gaps are left in the numbers to allow for new stations that may be established; hence the numbers are not consecutive.

The complete number for each station, such as 8-1580.00, includes the part "8" and a six digit station number. In this report, the part number and only the essential digits of the station number are shown. For example, the complete number 8-1580.00 would appear as 8-1580, just to the left of the station name. In this report the records are listed in downstream order by parts. All records for a drainage basin encompassing more than one State could be arranged in downstream order by assembling pages from the various State reports by station number to include all records in the basin.

EXPLANATION OF DATA

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

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

At some gaging stations the stage-discharge relation is affected by backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in

a reach of the stream is a factor in determining discharge. Information required for determining the slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage. For such stations, the rate of change in stage is used as a factor for determining discharge.

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

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

The data in this report generally comprise a description of the station, a skeleton rating table, and a table showing the daily discharge and monthly and yearly discharge of the stream. Records are published for the water year which begins on October 1 and ends on September 30. A calendar for the 1964 water year is shown on page II to facilitate finding the day of the week for any date.

The description of the station gives the location, drainage area, records available, type and history of gages, average discharge, extremes of discharge, and general remarks. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Under "Records available" are given periods for which there are published records for the present station or for stations generally equivalent to the present one. Under "Gage" are given the type of gage currently in use and the datum of the gage above mean sea level, and a condensed history of the types, locations, and datums of previous gages used during the period of records available. The reference to "datum of 1929" and adjustments of other years are to the datum and adjustments of the U. S. Coast and Geodetic Survey. Under "Average discharge" is given the average discharge for the number of years indicated. It is not given for stations having fewer than five complete years of record of for stations where changes in water development during the period of record cause the figure to have little significance. Under "Extremes" are given the maximum discharge and gage height; the minimum discharge if there is little or no regulation; the minimum daily discharge if

there is extensive regulation (also the minimum discharge if useful); and the minimum gage height if it is significant. In the first paragraph, the data given are for the complete current water year unless otherwise specified. In the second paragraph, the data given are for the periods of record within the calendar year dates in the heading (not necessarily those for the complete years indicated by the heading dates). Reliable information concerning major floods that have occurred outside the period of record are given in the third or last paragraph under "Extremes". Unless otherwise qualified, the maximum discharge corresponds to the crest stage obtained by use of a water-stage recorder, a crest-stage indicator, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur at the same time as the maximum discharge, it is given separately. Information pertaining to the accuracy of the records and to conditions which affect the natural flow at the gaging station is given under "Remarks".

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

The daily table gives the discharge corresponding to the daily mean gage height unless there are large or rapid changes in discharge during a day. For days having large or rapid changes, discharge for the day is computed by averaging the mean discharges for several parts of a day. For stations equipped with nonrecording gages, the daily discharge corresponds to the once-daily readings of the gage or to the mean of twice-daily readings; but for periods of rapidly changing stage the discharge is determined from a gage-height graph based on gage readings.

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

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

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

Peak discharges and the times of their occurrence and corresponding gage heights for most stations are listed below the table of daily and monthly discharge. All independent peaks above the selected base are given. The base discharge, which is given in parentheses, is selected so that an average of about three peaks a year can be presented. Peak discharges are not published for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour time, for example 12:30 a.m. is 0030, 1:30 p.m. is 1330.

Footnotes to the table of daily discharge indicate periods for which discharge was computed or estimated by unusual or special methods because of no gage-height record, ice effect, or other conditions that reduce the degree of accuracy of the records. The footnotes are either reference footnotes, with corresponding symbols used in the table of daily discharge to indicate the days included, or general footnotes, introduced by the word "Note," in which the days included are stated.

For some gaging stations on lakes and reservoirs the data presented comprise a description of the station and a monthly summary table of stage and contents. For other reservoirs a table showing daily contents is given. A skeleton table of capacity at given stages is published each year for all reservoirs for which records are published on a daily basis, but it is not published for reservoirs for which only monthly data are given.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

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

The station description states the degree of accuracy of the records. "Excellent" indicates that, in general, the error in the daily records is believed to be less than 5 percent; "good," less than 10 percent; "fair," less than 15 percent; and "poor," probably more than 15 percent. The records of monthly and yearly mean discharge and runoff are, in general, more nearly accurate than the daily records.

Discharge at some stations, as indicated by the monthly mean, may vary widely from natural runoff, owing to diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial

causes, or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff in inches are not published.

SUPPLEMENTAL DATA

Data collected at partial-record stations and at miscellaneous sites are given at the end of this report. Data for partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements at miscellaneous sites are given in the third table.

At times special studies are made of the low-flow characteristics of a stream or a reach of a stream. A series of discharge measurements is made to determine gains or losses of base flow and in some cases quality samples are obtained at each measuring site to determine changes in the chemical constituents of the water. Whenever possible, changes in amounts of flow and in chemical content of the water are referred to geologic formations encountered in the reach investigated. Such investigations are given in special tables after the list of measurements at miscellaneous sites.

Information of a more detailed nature than that published for most of the gaging stations is on file in the district office, such as discharge measurements and recorder charts or nonrecording-gage readings. At many gaging stations water temperatures are obtained and at others water samples are collected for the purpose of making chemical analyses, computing dissolved solids, suspended sediment loads, and particle-size distribution. For most of these samples the results are published in an annual series of U. S. Geological Survey water-supply papers entitled "Quality of Surface Waters of the United States". Information on the availability of unpublished data or quality-of-water records may generally be obtained from the district office.

PUBLICATIONS

Water-supply papers and other publications of the Geological Survey containing data on the water resources of the United States may be purchased or consulted as follows:

1. Copies may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., who will, on application, furnish lists giving prices. A list of geological publications may also be obtained by applying to the Director, Geological Survey, Washington, D. C.

2. Sets of the reports may be consulted in the libraries of the principal cities (and many universities).

3. Sets are available for consultation in the District Office of the Geological Survey at Austin, Tex.

Early records of the flow of streams in the United States are published in reports listed below. In many of these reports records for years earlier than those indicated have been included for some streams.

Streamflow data for the years 1884-1900 for Texas streams, in reports of the Geological Survey

(A = Annual Report; B = Bulletin)

Report	Character of data	Year
10th A, pt. 2	Descriptive information only.	
11th A, pt. 2	Monthly discharge and descriptive information.	1884 to September 1890
12th A, pt. 2	.....do.....	1884 to June 30, 1891
13th A, pt. 2	.....do.....	1884-92
14th A, pt. 2	Monthly discharge.....	1888-93
B 131.....	Descriptions, measurements, gage heights, and ratings.	1893-94
B 140.....	Descriptions, measurements, gage heights, ratings, and monthly discharge.	1895
WSP 11.....	Gage heights.....	1896
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge.	1895-96
WSP 16.....	Descriptions, measurements, and gage heights of streams west of the Mississippi River, except Missouri River and tributaries above Kansas River.	1897
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge.	1897
WSP 28.....	Measurements, ratings, and gage heights of streams west of the Mississippi River, except Missouri River and tributaries.	1898
20th A, pt. 4	Monthly discharge.....	1898
21st A, pt. 4	.....do.....	1899
22d A, pt. 4	.....do.....	1900

Reports on surface-water supply containing records from 1899 to date for drainage basins in this report are listed below. The data for any particular gaging station will, in general, be found in the reports covering the years during which the station was maintained.

Numbers of water-supply papers containing results of stream measurements in Texas streams, 1899-1960

Year	WSP	Year	WSP	Year	WSP
1899	37	1921	527, 528	1941	927, 928
1900	50	1922	547, 548	1942	957, 958
1901	66, 75	1923	567, 568	1943	977, 978
1902	84	1924	587, 588	1944	1007, 1008
1903	99	1925	607, 608	1945	1037, 1038
1904	131, 132	1926	627, 628	1946	1057, 1058
1905	173, 174	1927	647, 648	1947	1087, 1088
1906	209, 210	1928	667, 668	1948	1117, 1118
1907-8	247, 248	1929	687, 688	1949	1147, 1148
1909	267, 268	1930	702, 703	1950	1177, 1178
1910	287, 288	1931	717, 718	1951	1211, 1212
1911	307, 308	1932	732, 733	1952	1241, 1242
1912	327, 328	1933	747, 748	1953	1281, 1282
1913	357, 358	1934	762, 763	1954	1341, 1342
1914	387, 388	1935	787, 788	1955	1391, 1392
1915	407, 408	1936	807, 808	1956	1441, 1442
1916	437, 438	1937	827, 828	1957	1511, 1512
1917	457, 458	1938	857, 858	1958	1561, 1562
1918	477, 478	1939	877, 878	1959	1631, 1632
1919-20	507, 508	1940	897, 898	1960	1711, 1712

The following is a list of reports on a State-boundary basis:

Surface Water Records of Texas, 1961
Surface Water Records of Texas, 1962
Surface Water Records of Texas, 1963

Monthly and yearly summaries of streamflow and reservoir data are published in a series of compilation reports. All records were examined for major computation errors and revised when warranted. These reports are:

WSP 1311 Compilation of records of surface waters of the United States, through 1950, Part 7, Lower Mississippi River basin.

WSP 1312 Compilation of records of surface waters of the United States, through 1950, Part 8, Western Gulf of Mexico Basins.

WSP 1731 Compilation of records of surface waters of the United States, October 1950 to September 1960, Part 7, Lower Mississippi River basin.

WSP 1732 Compilation of records of surface waters of the United States, October 1950 to September 1960, Part 8, Western Gulf of Mexico Basins.

The reports listed in the foregoing table contain the customary records of discharge collected during the systematic operation of gaging stations. Detailed information on the stage and discharge of many streams during major floods has been included in special reports on these floods published by the Geological Survey or other agencies. The more recent of these special reports also contain other pertinent hydrologic information and analysis and compilations of data relating to earlier notable floods. The following list gives the numbers and titles of these reports:

	Report	Issued by
WSP 147:	Destructive floods in the United States in 1904.	U. S. Geological Survey
WSP 162:	Destructive floods in the United States in 1905.	Do.
WSP 488:	The flood in central Texas in September 1921.	Do.
WSP 771:	Floods in the United States, frequency and magnitude.	Do.
WSP 796-G:	Major Texas floods of 1935.	Do.
WSP 816:	Major Texas floods of 1936.	Do.
WSP 842:	Floods in Canadian and Pecos River basins of New Mexico, May and June 1937.	Do.
WSP 847:	Maximum discharges at stream-measurement stations through September 1938.	Do.
WSP 914:	Texas floods of 1938 and 1939.	Do.
WSP 1046:	Texas floods of 1940.	Do.
WSP 1137-I:	Summary of floods in the United States during 1950.	Do.
WSP 1227-B:	Floods of May 1951 in western Oklahoma and northwestern Texas.	Do.
WSP 1227-D:	Summary of floods in the United States during 1951.	Do.
WSP 1260-A:	Floods of September 1952 in Colorado and Guadalupe River basins, central Texas.	Do.
WSP 1260-F:	Summary of floods in the United States during 1952.	Do.

Report		Issued by
WSP 1320-C:	Floods of April-June 1953 in Louisiana and adjacent States.	U. S. Geological Survey
WSP 1320-E:	Summary of floods in the United States during 1953.	Do.
WSP 1370-C:	Summary of floods in the United States during 1954.	Do.
WSP 1455-B:	Summary of floods in the United States during 1955.	Do.
WSP 1530:	Summary of floods in the United States during 1956.	Do.
WSP 1652-B:	Floods of April-June 1957 in Texas and adjacent States.	Do.
WSP 1652-C:	Summary of floods in the United States in 1957.	Do.
WSP 1660-A:	Floods of April-May 1958 in Louisiana and adjacent States.	Do.
WSP 1660-B:	Summary of floods in the United States in 1958.	Do.
WSP 1681:	Magnitude and frequency of floods in the United States, Part 7, Lower Mississippi River basin.	Do.
WSP 1750-B:	Summary of floods in the United States during 1959.	Do.
Cir. 32:	Flood of September 1946 at San Antonio, Tex.	Do.
Cir. 99:	Flood of August 1-6, 1950, at Wichita Falls, Tex.	Do.
Bull. 6311:	Floods in Texas, magnitude and frequency.	Texas Water Commission
Flood of September and October 1932, international portion of the Rio Grande.		International Boundary & Water Commission, United States and Mexico
Floods of 1948 along the international portion of the Rio Grande.		Do.

The following Texas Water Commission publications contain data on Texas surface water:

Bull. 5807-A: Compilation of surface water records in Texas through September 1957.
Bull. 5807-C: Streamflow measurements at points other than gaging stations.

Bull. 5807-D: Channel gain and loss investigations, Texas streams, 1918-58.
Bull. 5807-E: Texas stream-gaging program: evaluation and recommendations.
Cir. 62-04: Texas index of surface-water records, 1882-1961.

RECORDS OF DISCHARGE COLLECTED BY AGENCIES OTHER THAN THE GEOLOGICAL SURVEY

The International Boundary and Water Commission, United States and Mexico operates all streamflow stations on the Rio Grande and near the mouth of its principal tributaries at and below El Paso, Texas. Records collected at these stations are published in annual bulletins by the Commission and may be obtained by request to the office of the United States Section, P. O. Box 1859, El Paso, Texas.

HYDROLOGIC CONDITIONS

Annual runoff was generally below median, and was deficient in the Panhandle, west-central and eastern parts of the State.

Leona Springs near Uvalde was dry for the first time since 1959. A combination of drought and ground-water development caused Las Moras Springs at Brackettville to cease flowing for the first time in recorded history. Las Moras springflow has been measured since 1896. Comal Springs at New Braunfels discharges from the same aquifer that supplies the city of San Antonio. Annual mean discharge of Comal Springs was 188 cfs, compared with the long-term mean of 280 cfs.

Conservation storage in a selected group of 39 major reservoirs (with a combined storage of 11,900,000 acre-feet) increased from 63 to 69 percent of capacity during the year. In contrast, Red Bluff Reservoir on the Pecos River, which has a capacity of 310,000 acre-feet, decreased 12,390 acre-feet during the year to a low of 18,710 acre-feet at year's end.

In mid-June a tropical storm drenched small isolated areas. Unofficial amounts of up to 15 inches of rain were reported near McGregor in central Texas. The 20.9 square mile drainage area of Harris Creek near McGregor produced a peak discharge of 23,500 cfs on June 16.

In September, torrential rains of 10 inches or more in southwest Texas caused extensive flooding. The West Nueces River near Brackettville abruptly ended 36 consecutive months of no flow with a peak discharge of 246,000 cfs. The attenuating effect of valley storage is clearly illustrated by the Nueces River records. The combined flow of the West Nueces and the Nueces Rivers gave a peak of 188,000 cfs at the gaging station below Uvalde, and 80 miles downstream near Asherton the peak discharge was only 20,800 cfs. Tributaries to the Rio Grande were

also in flood; 500 people on the American side and 3,500 on the Mexican side of the Rio Grande near Del Rio were forced to evacuate their homes.

Torrential rains in the northern part of Dallas in September caused the highest discharge since at least 1886 on the headwaters of White Rock Creek. Record breaking floods also occurred during the month on Cibolo and Red Bluff Creeks in central Texas; two lives were lost.

Figure 1 on page 16 shows a comparison of monthly and yearly mean discharges with the median discharges for the four index gaging stations.

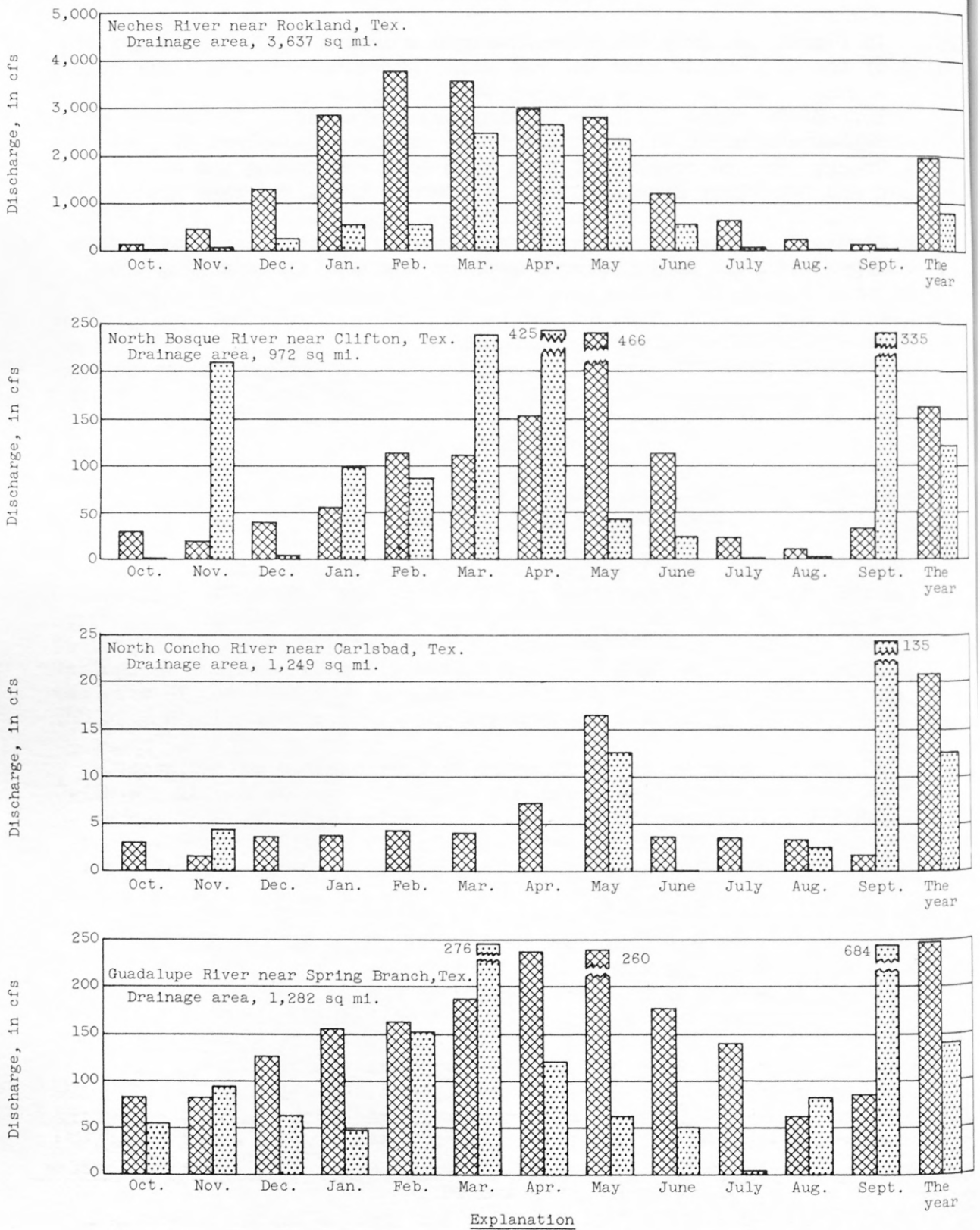

Figure 1.--Comparison of discharge at four long-term representative gaging stations during 1964 water year with median discharge for period 1931-60.

7-2275. Canadian River near Amarillo, Tex.

Location.--Lat 35°28'10", long 101°52'45", near left bank on downstream side of pier of bridge on U. S. Highways 87 and 287, 1,500 ft downstream from Pitcher Creek, 1.4 miles downstream from East Amarillo Creek, 1.7 miles downstream from Panhandle and Santa Fe Railway Co. bridge, and 19 miles north of Amarillo, Potter County.

Drainage area.--19,445 sq mi, of which 4,069 sq mi is probably noncontributing.

Records available.--January 1924 to December 1925, January 1938 to September 1964. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder and wire-weight gage read once daily. Datum of gage is 2,989.16 ft above mean sea level, datum of 1929. Jan. 16, 1924, to Dec. 31, 1925, chain gage and Apr. 3 to June 1, 1938, wire-weight gage, at site of old bridge 20 ft upstream at same datum. June 2 to Dec. 5, 1938, wire-weight gage at present site and datum.

Average discharge.--27 years, 425 cfs (307,700 acre-ft per year).

Extremes.--Maximum discharge during year, 26,000 cfs Sept. 16 (gage height, 9.04 ft); minimum, 1.0 cfs July 15.
1924-25, 1938-64: Maximum discharge, 135,000 cfs July 25, 1941 (gage height, 15.7 ft), from rating curve defined by current-meter measurements below 100,000 cfs; no flow at times January 1924 to December 1925, Aug. 7, 8, 1940.
Flood in May 1914 reached a stage of 24 ft; a higher stage probably occurred during flood in October 1904, from information by local resident.

Remarks.--Records poor. Daily discharge published only to show distribution of runoff. Extreme low flow is maintained by sewage effluent from Amarillo sewage disposal plant. City of Amarillo reported 7,190 acre-ft of effluent was contributed during year to East Amarillo Creek (tributary to Canadian River). Some regulation by Conchas and Ute Reservoirs in New Mexico. Conchas Canal and Bell Ranch Canal divert from Conchas Reservoir for irrigation. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Discharge measurements of East Amarillo Creek, in cubic feet per second, water year October 1963 to September 1964:

Oct. 11	10.5	Jan. 23	15.5	Apr. 10	10.9	July 9	15.9
Nov. 20	14.5	Mar. 4	14.3	May 8	15.6	Aug. 12	10.6
Dec. 18	6.01	26	13.6	June 3	14.3	Sept. 10	9.65

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	7.4	11	18	6.6	28	12	11	a60	7.2	12	12
2	13	16	8.8	15	3	18	14	9.6	a25	6.6	14	16
3	11	11	13	22	4	20	8.9	9.2	*14	7.2	12	15
4	11	9.4	13	20	5	*12	9.0	6.1	21	7.2	13	23
5	11	10	12	12	5	15	13	6.8	12	5.2	14	15
6	9.8	9.4	12	11	4	13	9.1	5.7	13	4.8	14	10
7	9.1	9.9	12	14	3	12	8.6	9.2	13	4.8	15	8.4
8	11	9.2	14	12	4	14	7.2	*7.9	8.8	5.7	16	7.8
9	9.5	8.4	14	12	10	13	8.5	11	6.1	*7.8	14	7.8
10	9.8	9.8	14	12	15	15	*8.1	10	8.2	12	12	*9.1
11	*9.2	9.1	12	10	50	13	7.3	6.2	9.8	6.1	12	9.1
12	12	11	12	8	76	13	8.4	11	9.5	8.4	*9.8	11
13	12	11	a10	6	168	12	6.8	11	12	4.8	4.4	9.1
14	8.4	7.8	a10	6	161	13	9.2	*9.8	21	3.5	36	9.8
15	10	9.1	a10	8	103	13	7.3	11	12	3.3	1,110	54
16	8.0	8.4	10	11	69	12	8.3	11	12	8.4	37	10,900
17	7.8	7.8	10	27	87	13	5.8	11	*14	8.4	8.4	952
18	9.0	9.0	*10	24	132	16	4.1	8.6	8.4	9.1	9.8	464
19	8.4	12	10	12	122	13	6.0	9.8	7.8	9.1	6.6	167
20	12	*12	10	9.8	94	16	5.9	9.8	7.8	9.1	6.7	69
21	12	15	8	12	68	15	8.0	*12	7.8	12	11	187
22	14	6.6	8	7.8	72	17	8.2	12	7.2	8.4	9.7	144
23	*11	10	10	*9.1	65	12	*8.0	13	8.4	9.8	9.8	48
24	9.6	10	14	6.2	51	16	7.6	13	8.4	12	6.6	*37
25	9.4	7.8	22	11	54	13	8.3	10	12	12	9.2	14
26	10	10	13	12	39	*12	7.8	15	9.8	12	*9.4	203
27	11	11	20	8.4	40	14	7.2	16	7.2	6.6	13	208
28	7.2	10	13	12	32	15	7.2	16	7.8	9.3	20	61
29	10	16	14	10	32	15	8.5	19	5.2	12	18	30
30	9.3	11	15	9.8	----------	12	9.2	207	7.2	12	13	20
31	7.4	----------	19	9.8	----------	13	----------	211	----------	12	11	----------
Total	333.9	305.1	383.8	377.9	1,574.6	448	247.5	729.7	376.4	256.8	1,507.4	13,721.1
Mean	10.8	10.2	12.4	12.2	54.3	14.5	8.25	23.5	12.5	8.28	48.6	457
Ac-ft	662	605	761	750	3,120	889	491	1,450	747	509	2,990	27,220

Calendar year 1963: Max 5,650 Min 3.5 Mean 125 Ac-ft 90,220
Water year 1963-64: Max 10,900 Min 3 Mean 55.4 Ac-ft 40,190

Peak discharge (base, 14,000 cfs)

Date	Time	Gage height	Discharge
9-16	0700	9.04	26,000

* Discharge measurement made on this day.
a No gage-height record.
Note.--Stage-discharge relation affected by ice Dec. 10-12, 16-24, Jan. 8-16, Feb. 2-10.

7-2280. Canadian River near Canadian, Tex.

Location.--Lat 35°55', long 100°22', near left bank on downstream side of pier of bridge on U. S. Highways 60 and 83, 500 ft downstream from Panhandle and Santa Fe Railway Co. bridge, 1.2 miles downstream from Red Deer Creek, and 1.6 miles northeast of Canadian, Hemphill County.

Drainage area.--22,866 sq mi, of which 4,688 sq mi is probably noncontributing.

Records available.--July 1924 to August 1925 (gage heights only), January 1938 to September 1964. Prior to April 1938 monthly discharge only, published in WSP 1311.

Gage.--Water-stage recorder, and two wire-weight gages read once daily during winter and twice daily during summer. Datum of gage is 2,301.50 ft above mean sea level, datum of 1929. July 1, 1924, to Aug. 31, 1925, chain gage, Apr. 21 to Dec. 15, 1938, wire-weight gage, and Dec. 16, 1938, to Sept. 30, 1953, water-stage recorder and wire-weight gages all at site 300 ft upstream at same datum.

Average discharge.--26 years (1938-64), 549 cfs (397,500 acre-ft per year).

Extremes.--Maximum discharge during year, 2,890 cfs June 14 (gage height, 6.10 ft); no flow at times.
1924-25, 1938-64: Maximum discharge, 122,000 cfs Sept. 23, 1941 (gage height, 9.8 ft, from graph based on gage readings), from rating curves for two channels extended above 8,000 and 38,000 cfs; no flow at times. Maximum stage 20.0 ft Oct. 2, 1904. Floods of May 2, 1914, and Oct. 5, 1923, second highest known, reached stages of 12 ft.

Remarks.--Records poor. Daily discharge published only to show distribution of runoff. Extreme low flow maintained by springs which enter river about 600 ft above gage. River flows in two channels for which separate records are computed; figures given herein represent combined discharge, and gage heights shown are those for recording gage on left channel. Some regulation by Conchas and Ute Reservoirs in New Mexico and Lake Meredith in Texas. No large diversions above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	0.9	1.2	70	28	90	1.9	1.2	176	0.6	0.1	0
2	*.6	.9	1.2	77	28	71	1.5	1.0	106	.6	0	0
3	.6	1.0	1.4	57	20	55	1.2	1.0	84	.4	0	*0
4	.6	.9	1.4	46	16	47	1.6	1.0	43	.2	0	.4
5	.6	1.0	1.0	37	120	36	1.6	1.0	24	.2	*0	.5
6	.6	1	.9	31	150	24	1.5	1.0	23	.2	0	.6
7	.5	1.0	.8	27	135	23	1.2	1.0	9.2	.1	0	.4
8	.5	1.0	1.0	26	145	26	1.2	1.0	1.5	.2	0	.2
9	.6	1	1.2	20	148	28	1.2	.9	.4	.2	0	.2
10	.6	1.2	1.2	20	146	30	1.2	9.3	*16	.2	0	.2
11	.6	1.2	1.2	18	438	26	1.2	6.5	862	.2	0	.8
12	.7	1.2	1.2	15	594	22	1.0	.8	700	.2	0	.4
13	.7	1.2	1.2	11	634	14	1.0	.9	357	.2	0	.3
14	.6	1.0	1.2	11	450	9	.9	.8	1,440	.1	0	.2
15	*.5	1	1.5	13	280	4.2	.9	*.8	861	.1	.1	.9
16	.6	1.2	1.5	17	219	3.0	*1.0	.7	411	.1	.1	2.3
17	.7	1.0	*1.6	24	152	2.4	1.2	.6	163	.2	.1	*1.6
18	.7	1	1.4	34	122	3.0	1.2	.6	24	.1	.1	3.6
19	.7	*1.4	1.2	34	104	4.8	1.2	.5	3.8	.1	.1	27
20	.7	1.4	1.2	36	90	2.5	1.0	.6	.7	.2	0	51
21	*.8	1.8	1	37	78	1.6	.9	.6	.5	.1	*0	6.6
22	.9	1.6	1	*45	66	1.6	1.0	.5	.7	.1	0	5.5
23	.9	1.0	1.0	38	81	1.6	1.0	.5	.7	0	0	6.2
24	.9	.9	1.5	31	82	1.8	.9	.5	*.6	0	.1	5.2
25	.8	1.0	2.5	24	72	*2.0	.9	.4	.5	0	.1	3.6
26	1.0	1.2	9.0	20	74	2	.9	.4	.5	0	.1	3.6
27	1.0	1.4	15	22	*68	2.2	.8	1.6	.5	0	.1	3.2
28	1	1.5	20	23	77	2.0	1.0	*1.6	.5	0	0	3.2
29	.9	1.5	31	23	91	2.2	*1.0	241	.5	.1	0	3.2
30	.9	1.6	62	24	----------	2.0	1.0	241	.7	.1	0	3.2
31	.9	----------	62	24	----------	2	----------	158	----------	.1	0	----------
Total	22.3	35.0	230.5	935	4,708	541.9	34.1	677.3	5,311.3	4.9	1.0	134.1
Mean	0.72	1.17	7.44	30.2	162	17.5	1.14	21.8	177	0.16	0.03	4.47
Ac-ft	44	69	457	1,850	9,340	1,070	68	1,340	10,530	9.7	2.0	266

Calendar year 1963: Max 1,860 Min 0 Mean 58.9 Ac-ft 42,640
Water year 1963-64: Max 1,440 Min 0 Mean 34.5 Ac-ft 25,050

Peak discharge (base, 8,900 cfs).--No peak above base.

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

Note.--No gage-height record made Oct. 28, 31, Nov. 1, 6, 9, 15, 18, 28-29, Dec. 10, 13, 16, 21-22, Jan. 5, 10, 13, 16, 23-24, 30, Feb. 14, 20-21, Mar. 5, July 12, 15, 30-31, Aug. 1, 17, 26-28, 30, Sept. 5, 7; stage-discharge relation affected by ice Jan. 9, 11-12, 14-15, Feb. 6, 8.

7-2335. Palo Duro Creek near Spearman, Tex.

Location.--Lat 36°12', long 101°19', near center of span on downstream side of bridge on State Highway 282, 6 miles west of Spearman, Hansford County, and 18 miles upstream from Horse Creek.

Drainage area.--960 sq mi, of which 520 sq mi is probably noncontributing.

Records available.--July 1945 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 2,961.63 ft above mean sea level, datum of 1929.

Average discharge.--19 years, 18.0 cfs (13,030 acre-ft per year).

Extremes.--Maximum discharge during year, 458 cfs June 11 (gage height, 9.57 ft); no flow for many days.
1945-64: Maximum discharge, 21,200 cfs Oct. 7, 1946 (gage height, 19.87 ft); no flow at times.
Maximum stage 22.5 ft Sept. 4, 1938, from floodmark (discharge, about 34,000 cfs). Flood of June 4, 1936, reached a stage of 21 ft, from floodmark (discharge, 26,100 cfs, from rating curve defined by current-meter measurements below 20,000 cfs).

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

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1	0.7	0.9	3	1	1	0.3	0.6	1.1	0		
2	.8	.7	.9	4	.8	1	.1	.8	1.8	0		
3	*.7	.8	.9	2.2	.4	.9	0	.2	1.4	0		(*)
4	.4	1.8	1	2	.1	.8	.2	.4	1.0	0		
5	.3	1.8	1	2	0	.7	.5	.1	.6	0	(*)	
6	.3	1.0	1	1.5	0	.6	.3	.2	.3	0		
7	.2	.8	1.1	1	6.6	.6	.3	.3	.1	0		
8	.3	.6	1	1	16	.7	.3	0	0	.3		
9	.3	1.1	1	1	10	.7	.6	0	0	3.2		
10	.2	1.1	.9	.5	7.0	.6	2.7	0	.2	5.8		
11	.2	.9	.5	.1	5.0	.5	3.2	.2	175	2.0		
12	.6	1.3	.5	0	4.7	.3	1.8	.5	34	.7		
13	.7	1.2	.5	0	3.8	.2	.9	.3	16	.1		
14	.3	1.2	.4	.1	3.5	.2	.5	.4	8.2	0		
15	*.2	1.0	.4	.1	3.4	.1	.7	*.2	5	0		
16	.1	.9	.6	.2	2.8	.1	*.6	0	3	0		
17	.2	.7	.5	.4	3.6	.2	.6	.1	1	0		
18	.3	.6	.4	.6	4.2	.2	.7	.1	.5	0		
19	.7	*.3	.4	.8	3.8	.2	.8	0	.2	0		
20	.7	.6	.5	.6	3	.4	.5	.1	.1	0		
21	*.9	2.0	.4	.8	2.5	.4	.1	.2	0	0		
22	.7	1.6	.2	1	2	.3	.1	.2	0	0		
23	11	1.3	.1	1.5	2	.2	.1	0	0	0		
24	15	.9	.2	1	2.5	.2	0	0	*0	0		
25	9.3	1.0	.5	1	3	*.2	0	0	0	0		
26	5.2	1	1	1	3	.3	.6	0	0	0		
27	3.0	1	1	1	2.5	.3	.7	0	0	0		
28	2.3	.9	1.5	1	2	.4	.2	*.1	0	0		
29	1.1	.9	1.5	1	1.5	.3	*.2	.9	0	0		
30	.9	.9	2	1	----------	.3	.4	1.6	0	0		
31	.7	----------	2	1	----------	.3	----------	1.4	----------	0		----------
Total	58.6	30.6	24.8	32.4	100.7	13.2	18.0	8.9	249.5	12.1	0	0
Mean	1.89	1.02	0.80	1.05	3.47	0.43	0.60	0.29	8.32	0.39	0	0
Ac-ft	116	61	49	64	200	26	36	18	495	24	0	0

Calendar year 1963: Max 1,260 Min 0 Mean 14.4 Ac-ft 10,440
Water year 1963-64: Max 175 Min 0 Mean 1.50 Ac-ft 1,090

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

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

Note.--No gage-height record Oct. 1-2, Dec. 14-16, 21-24, Feb. 20-26, June 15-23; stage discharge relation affected by ice Nov. 26-27, Nov. 29 to Dec. 6, Dec. 8-13, 17-20, Dec. 25 to Jan. 2, Jan. 4 to Feb. 1, Feb. 27 to Mar. 2, Mar. 4-5, 10.

7-2350. Wolf Creek at Lipscomb, Tex.

Location.--Lat 36°14'15", long 100°16'25", near center of stream on downstream side of bridge on State Highway 305, 0.3 mile north of Lipscomb, Lipscomb County, 0.7 mile downstream from Little Sand Creek, and 2 miles upstream from Plum Creek.
Drainage area.--697 sq mi, of which 222 sq mi is noncontributing.
Records available.--October 1937 to September 1942, October 1961 to September 1964. Prior to 1941, monthly discharge only, published in WSP 1311.
Gage.--Water-stage recorder and wire-weight gage. Datum of gage is 2,371.29 ft above mean sea level, datum of 1929. Prior to Feb. 25, 1938, chain gage, Feb. 25, 1938, to Sept. 30, 1942, water-stage recorder and wire-weight gage at present site at datum 5.77 ft higher.
Average discharge.--8 years (1937-42, 1961-64), 29.2 cfs (21,140 acre-ft per year).
Extremes.--Maximum discharge during year, 808 cfs June 15 (gage height, 6.84 ft); no flow for many days.
1937-42, 1961-64: Maximum discharge, 20,000 cfs Oct. 21, 1941 (gage height, 11.57 ft, present datum), from rating curve extended above 14,000 cfs on basis of velocity-area studies; no flow at times.
Maximum stage since 1890, 15.5 ft June 23, 1957, present site and datum, from floodmarks. Floods in October 1945 and May 1955 reached stages of 10.5 and 12.1 ft, respectively, present site and datum, from information by State Highway Department.
Revisions.--The figures of maximum discharge for the water year 1962 has been revised to 656 cfs Sept. 20, 1962 (gage height, 6.84 ft); minimum daily, 0.1 cfs May 19, 22, Aug. 30, 1962.
Remarks.--Records good except those for periods of no gage-height record or ice effect, which are fair. Small diversion for irrigation above station.
Revisions.--Revised figures of discharge, in cubic feet per second, for the periods June and September 1962, superseding previously published figures, are given herewith:

1962	
June 7	43
Sept. 20	177
21	136

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1962	731.0	138	2.4	24.4	1,450
September	418.5	177	.3	14.0	830
Water year 1961-62	2,725.1	206	.1	7.47	5,400
Calendar year 1962	2,654.8	206	.1	7.27	5,270

Revised peak discharge (base, 500 cfs).--1962: June 7 (2100 hrs.) 521 cfs (6.68 ft); Sept. 20 (1700 hrs.) 656 cfs (6.84 ft).

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.4	1.6	2.6	7.8	4.4	4.9	3.9	2.6	6.5	1.2		0
2	1.4	1.9	2.6	7.1	4.9	4.9	2.6	2.2	5.4	.7		0
3	*1.2	1.9	3.0	6.5	15	4.9	1.9	1.4	4.4	.4		*0
4	1.0	1.9	3.0	6.5	12	4.9	1.9	.9	7.1	.4		0
5	.7	1.9	3.0	6.5	12	4.4	2.2	.7	6.5	.2	(*)	9.5
6	.6	1.9	3.0	6.5	10	4.4	2.2	.4	4.4	.2		3.1
7	.6	1.9	3.0	6.5	8	4.4	1.9	.4	3.0	.1		0
8	.6	2.2	3.0	6.5	8	4.9	1.9	.3	1.6	.8		0
9	.6	2.2	3.4	6	9.2	5.4	1.9	.3	1.2	3.6		0
10	.6	2.6	3.9	6	9.2	5.9	1.9	.9	*1.5	.2		0
11	.6	2.6	3.5	6	10	5.4	1.9	3.9	5.4	.1		0
12	.6	2.2	3.5	5	10	4.9	1.9	3.9	4.4	.1		0
13	.6	2.2	3.5	5	10	4.9	1.9	3.4	3.0	.1		0
14	.5	2.6	3.5	5	10	4.4	2.2	2.6	7.8	0		0
15	*.5	3.0	3.5	5	10	4.4	2.2	*1.9	249	0		0
16	1.0	3.0	3.5	6	10	4.4	*2.2	1.0	39	.1		0
17	2.6	3.0	*3.5	7	9.2	4.4	2.6	.6	17	.1		0
18	2.2	3.0	3.5	8	7.8	4.9	2.6	.2	7.8	1.6		0
19	1.4	*3.0	3.5	9	7.1	4.9	3.0	.1	5.4	2.6		0
20	1.9	2.6	3.5	9.2	6.5	3.9	2.4	.5	3.4	.4		0
21	*1.9	2.6	3.5	8.5	6.5	4.4	2.6	1.0	3.4	.1		0
22	1.9	2.6	3.5	*6.5	7.1	4.9	2.2	.4	3.4	0		0
23	1.9	2.6	a4	5.9	7.1	4.4	2.2	.1	3.0	0		0
24	1.9	2.2	a5	5.9	6.5	4.4	2.6	0	*2.6	0		0
25	1.9	1.9	a6	5.9	6.5	* 4.4	2.2	0	2.2	0		0
26	1.9	2.2	7	5.4	7.8	4.4	1.4	0	2.2	0		0
27	1.6	2.2	7	5.9	* 7.1	4.4	1.6	3.1	1.6	0		0
28	1.4	2.2	7	5.9	5.9	4.4	1.6	*4.9	1.4	0		0
29	1.4	2.6	7	5.4	5.9	4.4	*1.8	5.0	1.0	0		0
30	1.4	2.6	7	5.4	----------	4.4	2.2	7.1	.9	0		0
31	1.4	----------	7.8	5.4	----------	4.4	----------	8.5	----------	0		----------
Total	39.2	70.9	130.3	197.2	243.7	144.4	65.6	58.3	405.5	13.0	0	12.6
Mean	1.26	2.36	4.20	6.36	8.40	4.66	2.19	1.88	13.5	0.42	0	0.42
Ac-ft	78	141	258	391	483	286	130	116	804	26	0	25

Calendar year 1963: Max 2,860 Min 0.1 Mean 24.0 Ac-ft 17,390
Water year 1963-64: Max 249 Min 0 Mean 3.77 Ac-ft 2,740

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
6-15	0830	6.84	808

* Discharge measurement or observation of no flow made on this day
a No gage-height record.
Note.--Stage-discharge relation affected by ice Dec. 11-22, 26-30, Jan. 9-19, Feb. 4-8.

7-2980. North Tule Draw at reservoir, near Tulia, Tex.

Note.--Records for 1964 water year have been withheld and will be published in a subsequent annual report.

7-2992. Prairie Dog Town Fork Red River near Lakeview, Tex.

Location.--Lat 34°34'23", long 100°44'43", on left bank at downstream side of bridge on Farm Road 657, 7.6 miles southwest of Lakeview, Hall County, 8.6 miles upstream from Little Red River, 13.3 miles downstream from former gage near Brice.
Drainage area.--9,792 sq mi, of which 7,769 sq mi is probably noncontributing.
Records available.--May 1963 to September 1964.
Gage.--Water-stage recorder and wire-weight gage. Datum of gage is 1,926.41 ft above mean sea level, datum of 1929.
Extremes.--Maximum discharge during year, 16,800 cfs June 14 (gage height, 8.60 ft); no flow at times.
1963-64: Maximum discharge, that of June 14, 1964, from rating curve defined by current-meter measurements below 2,300 cfs and slope-area measurement at 16,800 cfs; no flow at times.
Maximum stage since at least 1906 probably occurred in summer of 1933, from information by local residents.
Revisions.--The maximum discharge for the water year 1963, has been revised to 6,850 cfs Aug. 31, 1963 (gage height, 7.17 ft), superseding figures published in Surface Water Records of Texas, 1963.
Remarks.--Records poor. Several small diversions above station. Recording rain gage located at station.
Revisions.--Revised figures of discharge, in cubic feet per second, for the periods Aug. 13, 30-31, 1963, superseding previously published figures, are given herewith:

1963	
Aug. 13	1,540
30	238
31	2,460

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
August 1963	5,443.8	2,460	0.3	176	10,800

Peak discharge (base, 6,000 cfs)

Date	Time	Gage height	Discharge
8-13	1400	6.99	6,050
8-31	0030	7.17	6,850

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.5	1.9	1.2	1.9	1.2	1.2	0.9	0.7	0.7	*1.2	0.1	1.7
2	1.5	1.4	1.2	2.1	1.2	1.2	.9	.7	*.7	1.3	0	.5
3	1.4	1.3	1.3	1.9	2.8	1.1	1.4	.7	.4	127	0	.2
4	1.2	1.3	1.3	1.9	8.0	1.0	1.4	.6	.4	50	0	.2
5	1.2	1.3	1.4	1.6	4.7	1.0	1.3	.6	.3	6.0	0	.2
6	1.2	1.4	1.2	1.5	4.6	1.0	1.2	.6	.2	.7	0	.1
7	1.2	1.4	1.2	1.5	6.7	.8	1.2	*.6	.1	.7	0	0
8	1.2	1.4	1.2	1.6	4.8	1.2	1.2	.4	0	*.2	0	*.1
9	1.2	1.4	1.3	*1.9	3.6	1.1	*1.1	.8	0	.2	0	0
10	*1.2	1.3	1.3	2.2	2.5	.9	1.0	.8	0	.2	0	0
11	1.2	1.2	2.1	2.1	2.2	.8	1.0	.5	3.9	.2	*0	0
12	1.2	1.2	1.8	2.1	2.1	1.1	.8	.4	204	.3	0	.1
13	1.1	1.2	1.6	1	1.9	1.1	.9	.4	1,400	.3	.1	2.9
14	1.1	1.2	1	1	1.8	.8	1.0	.6	*3,850	.2	4.2	1.0
15	1.0	1.2	1.5	1.5	1.4	1.0	1.0	1.3	*538	.2	25	435
16	**.6	1.2	*1.8	2	1.6	.9	1.3	.8	152	.3	9.2	1,860
17	1.0	1.2	1.6	1.8	1.6	1.0	1.3	.6	74	.4	8.4	185
18	1.1	*1.2	1.3	1.6	1.4	1.6	1.1	.7	23	.3	116	9.4
19	1.4	2.1	**1.4	1.2	1.4	2.6	1.2	.7	*3.3	.2	24	3.2
20	1.9	2.1	1.5	*1.2	1.4	1.2	.8	*.6	76	.2	6.0	327
21	1.6	1.4	1	1.3	1.3	1.2	.7	.5	190	.2	6.0	*36
22	*1.8	1.2	1	1.3	1.3	1.2	*.8	.4	10	.2	6.0	3.2
23	1.6	1.2	1	1.3	1.2	1.2	.8	.4	4.2	.2	5.4	.7
24	1.5	1.2	1	1.2	1.2	1.2	.8	.4	3.2	.1	3.8	314
25	1.5	1.2	1.5	1.4	*1.2	1.1	.8	.3	2.1	.1	5.6	132
26	1.5	1.2	1.9	1.2	1.3	1.1	.8	.3	2.4	.2	61	23
27	1.5	1.4	1.8	1.2	1.2	*1.1	.7	.4	2.1	.2	514	39
28	1.4	1.5	1.8	1.2	1.2	1.1	.7	.5	1.8	.7	130	7.8
29	1.4	1.4	1.9	1.3	1.2	1.0	.7	2.2	1.8	.8	20	2.4
30	1.4	1.2	2.1	1.8	----------	1.1	.7	2.4	1.8	.1	6.5	2.4
31	1.6	----------	1.9	1.5	----------	1.0	----------	1.2	----------	.1	7.8	----------
Total	41.5	40.8	45.1	48.3	68.0	34.9	29.5	22.1	6,546.4	193.0	959.1	3,387.1
Mean	1.34	1.36	1.45	1.56	2.34	1.13	0.98	0.71	218	6.23	30.9	113
Ac-ft	82	81	89	96	135	69	59	44	12,980	383	1,900	6,720

	Max	Min	Mean	Ac-ft
Calendar year				
Water year 1963-64:	Max 3,850	Min 0	Mean 31.2	Ac-ft 22,640

Peak discharge (base, 6,000 cfs)

Date	Time	Gage height	Discharge
6-14	0700	8.60	16,800
9-16	0300	7.05	6,350

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Dec. 14-15, 20-25, Jan. 13-16.

7-2995.7. Red River near Quanah, Tex.

Location.--Lat 34°24'45", long 99°44'00", near right bank at downstream side of bridge on State Highway 283, 8 miles north of Quanah, Hardeman County, and 30 miles upstream from mouth of Salt Fork Red River.

Drainage area.--8,321 sq mi, of which 4,769 sq mi is probably noncontributing.

Records available.--November 1959 to September 1964.

Gage.--Water-stage recorder and wire-weight gage read once daily. Datum of gage is 1,412.97 ft above mean sea level, datum of 1929, supplementary adjustment of 1937.

Extremes.--Maximum discharge during year, about 12,000 cfs June 15 (gage height, about 9.5 ft); no flow at times.

1959-64: Maximum discharge, 64,000 cfs June 7, 1960 (gage height, 16.00 ft); no flow at times.

Maximum stage since at least 1891 occurred in 1896 and was about 2 ft higher than flood of June 1, 1957 (second highest), which reached a stage of 21.2 ft, from information by local resident.

Remarks.--Records poor. Several small diversions above gage for irrigation.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*1.5	1.2	4.3	6	29	2.9	4.0	1.4	87	0.3	0	0
2	1.4	1.0	3.4	8	22	2.4	3.4	1.4	16	.2	0	0
3	1.4	1.0	4.0	10	37	2.0	3.2	.8	3.2	.1	0	0
4	1.4	1.1	4.0	11	545	2.6	3.4	.6	*1.4	.1	0	0
5	1.2	.7	4.3	8.6	492	2.4	3.7	*.5	.4	.1	0	0
6	1.2	.4	3.7	6.6	241	2.0	2.6	.4	.2	.1	0	0
7	1.2	*1.1	3.7	7.1	133	1.6	1.6	.4	.1	.1	0	0
8	1.4	1.5	3.2	6.2	90	2.9	*2.0	.2	0	**.1	0	0
9	1.5	3.2	2.6	5.0	61	3.4	1.8	.2	*0	.1	0	0
10	1.5	2.0	3.2	*3.7	38	2.9	1.8	.2	1.0	.1	0	0
11	1.4	1.1	3.4	2.0	35	* 3.2	2.0	.3	79	.1	0	0
12	1.5	1.4	*5.4	1.5	*30	2.9	2.0	.1	160	.1	*0	0
13	1.2	1.6	5.0	1	23	3.2	1.5	* .1	311	.1	0	0
14	1.0	1.6	5.4	1	21	2.6	1.4	.1	319	.1	.3	0
15	1.0	2.0	5.4	1	21	1.8	1.4	37	6,610	.1	8.0	0
16	1.1	2.9	6.6	2	18	3.2	1.1	6.6	1,050	.1	2.0	*787
17	1.2	2.4	8.6	2.9	14	2.6	1.8	.3	287	1.1	4.0	3,120
18	1.5	2.2	6.2	5.4	12	8.4	1.5	.2	116	.4	1.0	288
19	2.5	43	7.1	5.4	7.6	46	1.6	.2	46	0	.3	54
20	6.6	45	7	*5.8	7.1	43	1.8	.2	14	0	.2	57
21	5.8	31	6.6	5.8	6.2	25	.9	.2	55	0	.1	13
22	2.4	34	6	5.0	6.2	17	1.0	0	357	0	.1	160
23	.8	30	4	4.6	6.6	7.6	1.2	.1	139	0	.1	94
24	.4	24	4	4.3	5.8	5.4	1.2	0	47	0	.1	40
25	.8	14	6	6.2	5.8	3.4	1.2	.2	15	0	.1	79
26	.9	7.6	12	6.6	4.0	2.9	1.0	.1	10	0	.6	84
27	.7	7.1	8.6	5.4	4.0	3.7	.7	.1	1.1	0	.1	804
28	.4	6.6	7.1	4.3	4.0	3.2	.7	.1	.2	2.2	.1	268
29	.3	5.0	8.1	4.6	3.2	3.7	.6	.1	.4	1.5	.1	69
30	.5	4.6	7	14	----------	4.0	.8	78	.3	.2	.1	31
31	.8	----------	6	28	----------	3.7	----------	211	----------	0	0	----------
Total	46.5	280.3	171.9	189.0	1,922.5	221.6	52.9	341.1	9,726.3	7.3	17.3	5,948.0
Mean	1.50	9.34	5.55	6.10	66.3	7.15	1.76	11.0	324	0.24	0.56	198
Ac-ft	92	556	341	375	3,810	440	105	677	19,290	14	34	11,800

Calendar year 1963: Max 5,910 Min 0.1 Mean 96.2 Ac-ft 69,630
Water year 1963-64: Max 6,610 Min 0 Mean 51.7 Ac-ft 37,530

Peak discharge (base, 5,000 cfs)

Date	Time	Gage height	Discharge
6-15	about 0200	about 9.5	about 12,000
9-16	2400	8.74	6,680

* Discharge measurement made on this day.
** Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Dec. 20, 22-25, Dec. 30 to Jan. 3, Jan. 12-16.

7-2996.7. Groesbeck Creek at State Highway 283, near Quanah, Tex.

Location.--Lat 34°21'20", long 99°44'25", near left bank at downstream side of bridge on State Highway 283, 2 miles downstream from confluence of North and South Groesbeck Creeks, 4 miles north of Quanah, Hardeman County, and 9 miles upstream from mouth.

Drainage area.--303 sq mi.

Records available.--November 1961 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,425.69 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 321 cfs Sept. 27 (gage height, 8.73 ft); no flow July 7 to Sept. 14, Sept. 18-23.
1961-64: Maximum discharge, 6,230 cfs June 9, 1962 (gage height, 20.34 ft); no flow July 7 to Sept. 14, Sept. 18-23, 1964.
Highest stage known to local residents occurred in June 1891. Highest stage since 1891 occurred in September 1929. Other large floods are reported to have occurred in 1912, 1936, 1946, 1951, 1955, and 1957, from information by local residents.

Remarks.--Records good. Diversions upstream from station for farm and ranch use, and for a gypsum wallboard plant.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*3.0	5.0	4.0	3.6	3.8	4.8	6.7	3.2	4.3	0.8		0
2	3.0	4.8	3.8	3.6	3.6	3.2	6.4	3.4	3.6	.7		0
3	3.0	4.3	3.8	3.2	4.0	2.9	4.8	2.6	3.8	.5		0
4	3.0	3.4	4.0	3.6	6.4	3.0	5.8	2.6	*3.8	.4		0
5	3.6	3.0	3.4	3.8	5.2	3.0	5.4	*3.0	3.0	.4		0
6	3.6	3.0	2.9	3.8	4.5	3.0	3.2	4.0	3.2	.3		0
7	3.8	*2.9	2.9	3.8	4.0	3.0	3.0	2.9	3.0	0		0
8	3.6	3.2	3.6	3.6	3.8	3.2	*3.4	2.4	2.6	*0		0
9	3.8	2.3	3.6	3.6	3.8	3.4	2.7	2.7	2.0	0		0
10	3.6	2.3	4.0	*3.4	3.8	3.4	2.7	4.2	2.0	0		0
11	3.4	2.4	4.0	3.4	3.8	*3.6	2.9	3.6	4.3	0		0
12	3.2	2.1	*3.4	3.2	*3.6	4.0	2.7	2.6	3.6	0	(*)	0
13	2.7	2.1	3.2	3.1	3.6	4.3	2.3	2.0	6.4	0		0
14	2.4	2.1	3.2	3.4	3.4	4.3	2.7	1.6	4.1	0		0
15	2.6	2.4	3.4	3.4	3.6	4.5	3.4	2.4	2.1	0		1.1
16	2.1	2.6	3.2	3.4	4.0	4.5	3.0	2.3	1.9	0		*31
17	2.6	2.4	3.6	3.4	4.0	4.5	2.6	1.9	1.5	0		.8
18	3.0	2.4	3.2	3.6	4.8	5.0	2.4	1.9	1.4	0		0
19	3.4	5.0	3.4	3.6	4.5	6.4	2.4	1.9	1.3	0		0
20	4.0	3.6	3.4	3.6	4.0	5.5	2.3	1.9	1.3	0		0
21	4.0	2.9	3.6	3.6	4.8	5.2	2.0	1.5	1.9	0		0
22	4.0	3.8	4.0	3.4	4.3	5.5	2.4	1.3	1.2	0		0
23	4.0	3.0	4.0	3.4	3.8	5.8	2.9	1.0	1.0	0		0
24	4.0	3.0	4.0	3.4	4.0	6.1	2.4	1.1	1.0	0		18
25	3.6	3.2	3.6	3.4	3.8	6.4	2.1	1.2	.9	0		2.1
26	3.8	3.2	3.4	3.4	3.8	6.4	2.6	1.2	.9	0		.7
27	4.0	3.8	3.4	3.0	3.8	6.4	2.4	1.0	.8	0		74
28	4.0	3.4	3.4	3.2	3.8	6.4	3.0	2.0	.8	0		4.3
29	4.3	3.6	3.6	3.2	4.0	6.7	2.9	6.4	.7	0		8.2
30	4.5	3.8	4.3	3.8	----------	6.7	3.0	6.4	.8	0		1.6
31	3.8	----------	3.8	4.0	----------	7.0	----------	13	----------	0		----------
Total	107.4	95.0	111.1	107.9	118.3	148.1	96.5	89.2	69.2	3.1	0	141.8
Mean	3.46	3.17	3.58	3.48	4.08	4.78	3.22	2.88	2.31	0.10	0	4.73
Ac-ft	213	188	220	214	235	294	191	177	137	6.1	0	281

Calendar year 1963: Max 386 Min 0.1 Mean 7.68 Ac-ft 5,560
Water year 1963-64: Max 74 Min 0 Mean 2.97 Ac-ft 2,160

Peak discharge (base, 1,000 cfs).--No peak above base.
* Discharge measurement or observation of no flow made on this day.

7-2998.5. Salt Fork Red River near Clarendon, Tex.

Location.--Lat 35°00'10", long 100°53'30", near right bank on downstream side of bridge on State Highway 70, a quarter of a mile downstream from Kelly Creek and 4 miles north of Clarendon, Donley County.

Drainage area.--457 sq mi, of which 191 sq mi is probably noncontributing.

Records available.--1950-60 (occasional low-flow measurements), May 1960 to September 1964 (discontinued).

Gage.--Water-stage recorder and wire-weight gage read once daily.

Extremes.--Maximum discharge during year, 3,180 cfs June 14 (gage height, 8.10 ft); minimum, 0.1 cfs Aug. 12.
1960-64: Maximum discharge, 28,000 cfs June 8, 1960 (gage height, 16.50 ft), from rating curve defined by current-meter measurements below 4,000 cfs and slope-area measurements at 3,950 and 22,400 cfs; minimum, 0.1 cfs May 17, July 20-24, 26, Aug. 1-9, 1963, Aug. 12, 1964.
Maximum stage since at least 1910, 32 ft June 9, 1954; flood of May 16, 1957, reached a stage of about 29 ft, from information by local residents.

Remarks.--Records poor. One small diversion for irrigation above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.4	15	11	18	15	13	10	7.0	7.4	*1.0	0.3	0.2
2	5.4	13	11	17	15	13	4.0	5.2	*4.4	2.4	.3	.2
3	5.8	11	11	15	12	13	3.1	2.1	11	20	.3	.2
4	5.1	11	11	17	56	11	7.7	2.2	21	4.6	.2	.3
5	4.8	10	11	18	51	11	8.5	2.2	8.3	1.5	.2	.4
6	4.4	10	11	19	22	11	3.2	1.3	3.6	.9	.2	.4
7	4.4	10	8.2	18	15	10	1.9	*1.9	1.7	.6	.2	.5
8	4.8	10	7.0	16	15	13	5.3	1.8	1.2	*.4	.2	.4
9	4.4	10	6.6	15	22	12	*5.6	2.2	.6	.6	.2	.4
10	*4.4	9.8	5.4	15	23	11	3.6	19	1.2	.5	.2	*.3
11	4.4	9.8	4	15	22	11	2.4	16	17	.4	.2	.4
12	4.4	9.2	2	10	21	11	3.1	4.1	20	.4	**.2	.5
13	4.4	9.8	4	4	18	11	2.7	3.3	50	.5	.2	.6
14	4.4	10	6	6	18	11	5.6	2.9	420	.6	.2	.6
15	4.8	11	8	8	15	11	5.5	3.1	25	.4	.4	145
16	4.8	9.8	*10	10	18	11	3.6	2.9	15	.4	.6	33
17	4.4	9.2	15	15	16	11	4.1	1.8	11	.5	.6	18
18	4.1	*9.8	15	20	15	13	7.1	1.5	7.1	.4	.5	15
19	9.7	14	15	21	15	17	10	1.5	5.4	.5	.4	28
20	13	10	18	*18	15	11	4.8	1.5	4.1	.4	.3	17
21	9.2	9.8	10	20	14	11	3.3	1.3	8.6	.5	.3	12
22	11	10	5	18	14	11	5.8	*.8	8.2	.6	.3	11
23	*11	11	5	18	14	9.2	*6.6	1.2	1.8	.4	.3	10
24	11	11	10	18	13	8.0	6.2	.6	2.4	.4	.4	7.4
25	12	11	23	16	*13	7.8	5.4	1.0	2.4	.4	.4	6.6
26	12	12	20	18	12	*8.5	3.6	.7	2.1	.4	*.3	5.8
27	11	13	19	17	12	8.2	3.6	22	1.6	.5	.4	4.1
28	11	9.8	19	17	12	8.2	3.6	21	1.2	.4	.3	3.3
29	11	8.8	21	16	13	8.8	3.8	17	1.2	.3	.4	4.1
30	12	11	22	21	----------	8.8	5.1	18	1.1	.3	.4	4.4
31	12	----------	18	17	----------	11	----------	14	----------	.3	.4	----------
Total	230.5	319.8	362.2	491	536	336.5	148.8	181.1	665.6	41.5	9.8	330.1
Mean	7.44	10.7	11.7	15.8	18.5	10.9	4.96	5.84	22.2	1.34	0.32	11.0
Ac-ft	457	634	718	974	1,060	667	295	359	1,320	82	19	655

Calendar year 1963: Max 1,430 Min 0.1 Mean 13.3 Ac-ft 9,640
Water year 1963-64: Max 420 Min 0.2 Mean 9.98 Ac-ft 7,240

Peak discharge (base, 1,500 cfs)

Date	Time	Gage height	Discharge
6-14	0130	8.10	3,180

* Discharge measurement made on this day.
** Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Dec. 11-19, 21-24, Jan. 9-10, 12-13, 17-18, Feb. 7-8.

7-3000. Salt Fork Red River near Wellington, Tex.

Location.--Lat 34°57'25", long 100°13'30", near center of stream on downstream side of bridge on U. S. Highway 83, 4 miles downstream from Fort Worth and Denver (Burlington) Railway Co. bridge, 4½ miles south of Lutie, and 6½ miles north of Wellington, Collingsworth County.

Drainage area.--1,222 sq mi, of which 209 sq mi is probably noncontributing.

Records available.--June 1952 to September 1964.

Gage.--Water-stage recorder and wire-weight gage read once daily or more often. Datum of gage is 1,941.41 ft above mean sea level, datum of 1929.

Average discharge.--12 years, 78.4 cfs (56,760 acre-ft per year).

Extremes.--Maximum discharge during year, 7,550 cfs Sept. 23 (gage height, 7.60 ft); minimum, 1.1 cfs Aug. 8.
1952-64: Maximum discharge, 146,000 cfs May 16, 1957 (gage height, 19.00 ft), from rating curve defined by current-meter measurements below 11,000 cfs and slope-area measurement at 63,400 cfs; minimum, 0.1 cfs June 19, 1952.

Remarks.--Records poor. Several small diversions above station for irrigation.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.5	15	13	50	58	35	11	7.6	14	*5.6	1.8	2.2
2	6.5	13	13	58	36	34	6.5	7.6	*10	5.1	1.8	2.0
3	6.0	11	14	44	56	34	11	7.1	8.2	5.1	1.8	1.8
4	7.1	12	14	27	107	29	14	7.1	9.4	4.7	1.8	2.0
5	6.5	12	15	24	80	23	10	11	8.2	4.5	1.8	2.0
6	6.5	12	16	24	50	19	8.2	80	6.5	4.3	1.8	2.0
7	6.5	12	15	24	40	17	8.8	*14	5.1	4.7	*1.6	2.0
8	7.6	14	14	25	40	23	9.4	7.6	3.0	3.5	1.6	2.0
9	*7.1	15	14	20	48	27	*9.4	13	2.2	3.3	2.2	2.0
10	6.5	14	16	20	63	29	8.8	121	2.0	3.0	2.0	2.0
11	6.5	14	16	19	67	32	7.6	48	31	3.0	2.0	2.2
12	7.1	13	17	18	77	27	7.1	13	55	3.3	2.0	2.8
13	6.5	14	19	12	77	21	7.6	10	130	3.6	2.0	2.8
14	5.6	14	20	12	67	19	7.6	9.4	*2,670	3.3	18	2.8
15	6.5	15	21	15	72	19	7.6	13	383	3.0	42	66
16	7.1	14	*21	15	65	20	6.5	13	88	3.3	13	130
17	7.6	13	20	15	54	21	7.1	8.2	36	3.6	6.5	42
18	8.2	14	20	22	58	30	7.6	6.0	22	3.6	4.3	*13
19	8.8	*53	18	52	54	73	8.2	6.0	11	3.3	3.6	5.1
20	14	46	18	40	48	84	7.1	6.0	7.6	2.8	2.8	3.6
21	15	38	16	*29	45	38	6.0	6.0	7	2.8	2.2	6.5
22	11	31	14	25	43	24	6.0	*5.1	6.0	3.0	2.2	6.5
23	*11	24	12	25	43	18	*6.0	4.7	7.1	2.5	2.2	*952
24	11	19	20	24	41	*17	6.0	4.0	6.5	2.2	2.0	28
25	11	14	40	22	36	14	6.0	4.0	6.5	2.5	2.0	16
26	11	14	69	21	*27	12	5.6	4.0	6.5	2.5	2.0	12
27	10	14	34	21	29	12	6.0	59	6.5	2.5	1.8	15
28	8.8	14	27	24	27	11	6.0	18	6	2.2	1.6	8.8
29	9.4	12	33	27	35	11	6.5	34	5.6	2.8	2.0	8.2
30	9.4	13	41	32	----------	11	7.1	43	5.6	2.5	1.8	9.4
31	9.4	----------	64	52	----------	11	----------	22	----------	2.0	2.2	----------
Total	261.7	533	704	838	1,543	795	232.3	612.4	3,565.5	104.1	136.4	1,352.7
Mean	8.44	17.8	22.7	27.0	55.1	25.6	7.74	19.8	119	3.36	4.40	45.1
Ac-ft	519	1,060	1,400	1,660	3,060	1,580	461	1,210	7,070	206	271	2,680

Calendar year 1963: Max 1,350 Min 2.2 Mean 35.6 Ac-ft 25,800
Water year 1963-64: Max 2,670 Min 1.6 Mean 29.2 Ac-ft 21,180

Peak discharge (base, 5,000 cfs)

Date	Time	Gage height	Discharge
6-14	0930	7.52	7,050
9-23	0700	7.60	7,550

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 19-25, Jan. 12-17, Feb. 5-8.

7-3005. Salt Fork Red River at Mangum, Okla.

Location.--Lat 34°52', long 99°31', in SW¼SE¼ sec. 34, T. 5 N., R. 22 W., near left bank on downstream side of pier of bridge on State Highway 34, half a mile south of Mangum and 13 miles downstream from Fish Creek.

Drainage area.--1,566 sq mi, of which 209 sq mi is probably noncontributing.

Records available.--April 1905 to June 1906, October 1937 to September 1964. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Datum of gage is 1,490.87 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation). Apr. 11, 1905, to June 30, 1906, chain gage at site a quarter of a mile upstream at different datum. Oct. 1, 1937, to Nov. 8, 1938, wire-weight gage at present site and datum.

Average discharge.--27 years (1937-64), 92.9 cfs (67,260 acre-ft per year).

Extremes.--Maximum discharge during year, 8,820 cfs June 14 (gage height, 10.11 ft); no flow for many days. 1905-6, 1937-64: Maximum discharge, 72,000 cfs May 16, 1957; maximum gage height, 14.7 ft June 16, 1938; no flow at times in each year.
Maximum stage known, that of June 16, 1938, from information by local residents.

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

Cooperation.--Records furnished by Geological Survey, District Office, Oklahoma City, Okla.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	24	62	22	28	1.3	0	112			0
2		0	24	66	26	27	1.0	0	52			0
3		0	26	37	51	26	.6	0	18			0
4		0	21	42	320	24	.5	0	8.2			0
5		0	16	66	1,120	22	.5	0	1.9			0
6		0	18	48	500	20	.1	0	.6			0
7		0	18	40	260	16	0	0	.1			0
8		1.9	15	32	120	14	0	0	0			0
9		6.0	19	21	55	14	0	.9	0	(*)		0
10	(*)	.2	19	18	66	12	0	87	0			*0
11		0	a 18	14	106	*11	0	50	*.4			0
12		0	a 15	6	*79	8.2	0	22	1.7		(*)	0
13		0	a 10	4	79	6.8	0	9.2	169			0
14		*0	a 8	*3	79	6.8	0	1.2	3,200			0
15		0	a 10	4	84	6.0	0	*.2	1,310	3		0
16		0	a 16	6	66	3.9	*0	12	49			27
17		0	19	8	62	3.2	0	5.9	14			*35
18		0	a 16	12	42	5.1	0	1.0	9.8			28
19		.8	* 13	16	30	14	0	0	4.5			12
20		27	20	21	24	20	0	0	2.5			35
21		45	12	30	27	75	0	0	8.7			*0
22		*58	a 10	27	28	58	0	0	2.8			0
23		75	a 15	23	24	27	0	0	2.3			250
24		79	a 20	20	20	*20	0	0	1.3			542
25		55	30	17	21	15	0	0	.7			16
26		48	* 50	18	*24	13	0	*0	*.1			9.8
27		37	84	16	28	7.7	0	0	0			9.2
28		26	40	15	30	4.2	0	0	0			9.2
29		24	33	*14	28	3.2	0	.4	0			5.6
30		23	35	16	----------	1.3	0	241	0			1.4
31		----------	45	24	----------	1.3	----------	180	----------			----------
Total	0	505.9	719	746	3,421	513.7	4.0	610.8	4,969.6	0	0	980.2
Mean	0	16.9	23.2	24.1	118	16.6	0.13	19.7	166	0	0	32.7
Ac-ft	0	1,000	1,430	1,480	6,790	1,020	7.9	1,210	9,860	0	0	1,940

Calendar year 1963: Max 3,210 Min 0 Mean 50.3 Ac-ft 36,240
Water year 1963-64: Max 3,200 Min 0 Mean 34.1 Ac-ft 24,740

Peak discharge (base, 6,000 cfs)

Date	Time	Gage height	Discharge
6-14	1930	10.11	8,820

* Discharge measurement or observation of no flow made on this day
a No gage-height record.
Note.--Stage-discharge relation affected by ice Dec. 26, Jan. 10-19, Feb. 6-8; discharge computed from once or more daily wire-weight gage readings Dec. 4-10, 17, 20-21, 25, Mar. 30 to Apr. 6, May 14-15, June 16-26, Sept. 18-20, 25-30.

7-3013. North Fork Red River near Shamrock, Tex.

Location.--Lat 35°15'50", long 100°14'30", on left bank at downstream side of bridge on U. S. Highway 83, 2½ miles north of Shamrock, Wheeler County, 16 miles upstream from Oklahoma-Texas State line, and 23 miles downstream from McClellan Creek.

Drainage area.--1,082 sq mi of which 379 sq mi is probably noncontributing.

Records available.--February to September 1964.

Gage.--Water-stage recorder and wire-weight gage. Datum of gage is 2,165.55 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during period February to September, 9,200 cfs June 14 (gage height, 5.60 ft); no flow for many days.
Maximum stage since at least 1915, 16.1 ft in May 1957, from information by State Highway Department and local residents.

Remarks.--Records poor. Small diversion from McClellan Creek upstream from gage.

Discharge, in cubic feet per second, during period February to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					-	16		0	42			0
2					-	10		0	22			0
3					-	6.8		0	13			0
4					-	4.4		0	44			*0
5					-	3.0		0	42			0
6					-	.8		0	13			0
7					-	0		0	3		(*)	0
8					-	1.6		0	0			0
9					-	2.2		0	0			0
10					-	2.2		.2	0			0
11					-	2.6		0	*0			0
12					-	1.9		0	0			0
13					-	.5		0	436			0
14					-	0		0	*2,650			0
15					-	0		0	*198			1.8
16					-	0		0	96			6.5
17					-	0		0	56			0
18					-	.3		0	19			0
19					*21	1.9		0	*1.1			0
20					22	3.0		0	0			0
21					22	3.0		0	0			0
22					20	1.5		0	0			0
23					24	.4		0	0			0
24					24	*.2		0	*0			0
25					21	0		0	0			0
26					*14	0		*0	0			0
27					11	0		*50	0			0
28					8.7	0		*1.0	0			0
29					14	0		*29	0			0
30					---	0	(*)	27	0			0
31		---			---	0	---	76	---			---
Total					-	62.3	0	183.2	3,635.1	0	0	8.3
Mean					-	2.01	0	5.91	121	0	0	0.28
Ac-ft					-	124	0	363	7,210	0	0	16

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

7-3014.1. Sweetwater Creek near Kelton, Tex.

Location.--Lat 35°28'30", long 100°07'15", near center of stream on downstream side of bridge on Farm Road 592, 5 miles north of Kelton, 8 miles upstream from Texas-Oklahoma state line, 8.5 miles northeast of Wheeler, Wheeler County.

Drainage area.--287 sq mi, of which 20 sq mi is probably noncontributing.

Records available.--November 1961 to September 1964.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 665 cfs June 14 (gage height, 13.44 ft); no flow at times.
1961-64: Maximum discharge, 910 cfs Aug. 19, 1963; no flow at times.
Maximum stage since at least 1882, about 20 ft May 16, 1957.

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

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.2	6.1	12	15	17	18	18	10	28	3.1		0
2	*4.0	7.0	12	15	15	18	18	12	18	2.6		0
3	3.8	7.3	12	12	17	18	16	9.8	15	2.4		0
4	3.4	7.5	12	11	37	17	17	8.5	16	2.0		*0
5	2.9	7.7	13	13	44	17	18	8.2	14	1.7		0
6	2.7	7.3	13	12	41	17	17	8.0	12	1.4		0
7	2.7	7.5	13	12	35	15	14	8.0	10	1.0	(*)	0
8	2.7	8.0	13	12	35	18	14	7.7	7.7	.9		0
9	2.7	8.5	13	13	29	19	15	7.0	6.1	.9		0
10	2.6	8.7	13	13	29	18	15	8.2	5.3	.8		0
11	2.6	8.7	14	14	32	17	15	12.0	* 7.7	.7		0
12	2.7	8.7	13	13	32	17	15	10.0	9.2	.7		0
13	2.7	9.0	13	16	27	17	14	8.2	15	.7		0
14	2.7	9.2	14	a14	24	15	15	* 7.3	*362	.7		0
15	*2.9	9.5	16	a15	30	15	15	7.0	103	.5		0
16	2.9	10	16	a16	23	16	17	6.8	46	.6		0
17	2.9	9.5	*17	a17	23	16	*18	6.1	31	.8		0
18	2.9	9.5	17	a18	20	17	14	5.7	22	.7		0
19	3.1	*11	16	a17	19	22	13	5.3	16	.7		0
20	5.6	13	15	a17	18	20	13	5.1	12	.5		0
21	*5.9	12	15	*16	18	17	11	4.8	11	.4		.1
22	4.4	14	14	16	18	18	10	4.6	10	.3		.3
23	4.2	11	15	15	18	18	10	4.4	9.2	.3		.2
24	4.4	11	16	14	18	17	10	3.6	* 8.2	.3		.1
25	4.8	11	17	14	18	*16	10	3.4	7.5	.3		.1
26	4.8	12	16	15	*17	16	9.2	*3.3	6.8	.3		.1
27	4.8	12	12	14	18	17	9.0	17	6.1	.2		.1
28	4.8	12	12	14	18	16	9.0	18	5.5	.1		.1
29	4.8	12	13	14	18	16	9.0	23	4.6	0		.2
30	5.5	12	14	15	----------	16	* 9.8	63	3.8	0		.2
31	5.5	----------	14	20	----------	17	----------	51	----------	0		----------
Total	116.6	292.7	435	452	708	531	408.0	357.0	828.7	25.6	0	1.5
Mean	3.76	9.76	14.0	14.6	24.4	17.1	13.6	11.5	27.6	0.83	0	0.05
Ac-ft	231	581	863	897	1,400	1,050	809	708	1,640	51	0	3.0

Calendar year 1963: Max 410 Min 0.1 Mean 15.9 Ac-ft 11,520
Water year 1963-64: Max 362 Min 0 Mean 11.4 Ac-ft 8,240

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
6-14	1800	13.44	665

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.
Note.--Stage-discharge relation affected by ice Dec. 8-19, 21-25, Jan. 9-12, 25, Feb. 7-8.

7-3082. Pease River near Vernon, Tex.

Location.--Lat 34°10'35", long 99°16'50", near left bank on downstream side of bridge on U. S. Highway 283, 1.9 miles north of Vernon, Wilbarger County, and 10 miles upstream from mouth.
Drainage area.--3,488 sq mi, of which 559 sq mi is probably noncontributing.
Records available.--December 1959 to September 1964.
Gage.--Water-stage recorder and wire-weight gage read once daily. Datum of gage is 1,166.03 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942.
Extremes.--Maximum discharge during year, 1,360 cfs May 30 (gage height, 8.45 ft); no flow for many days.
1959-64: Maximum discharge, 25,600 cfs June 9, 1962 (gage height, 15.42 ft); no flow for many days.
Maximum stage since at least 1890, 24 ft in 1891, present site and datum, from information by local resident. Flood in September 1936 reached a stage of 23.5 ft and flood of June 2, 1957, reached a stage of 22.0 ft, present site and datum, from information by local residents.
Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Four small diversions for irrigation above station. At end of year, flow from 6.97 sq mi above this station was partly controlled by six floodwater-retarding structures with a total combined capacity of 1,840 acre-ft below the flood spillway crests, of which 1,360 acre-ft is floodwater-retarding capacity and 480 acre-ft is sediment-pool capacity. All of these structures were built during the current year. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.
Revisions.--Revised figures of discharge, in cubic feet per second, for the period Sept. 4-30, 1963, superseding previously published figures, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1963		1963-Con		1963-Con.		1963-Con.	
Sept. 4	66	Sept. 11	0.2	Sept. 18	722	Sept. 25	3.0
5	25	12	.4	19	328	26	2.0
6	8.9	13	1.8	20	132	27	1.3
7	4.0	14	3.7	21	55	28	.9
8	3.2	15	6.6	22	26	29	.2
9	1.3	16	2,020	23	13	30	.1
10	.5	17	1,700	24	6.2		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
September 1963	5,515.3	2,020	0.1	184	10,940
Water year 1962-63	31,435.1	6,740	0	86.1	62,350

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.4	0.6	0.5	1.0	0.2	0	44		0	0.6
2		0	.3	.7	.4	.9	.1	0	28		0	0
3	(*)	0	.2	.8	4.4	.6	.1	0	10		0	0
4		0	.2	.8	147	.5	.1	0	* 5.4		0	0
5		0	.1	.8	386	.3	.1	*0	1.0		0	0
6		0	.1	.8	276	.3	.1	0	.6		0	0
7		*0	.1	.6	108	.3	.1	0	.4		0	0
8		0	0	.4	77	.3	** .1	0	.2	(*)	0	0
9		0	0	* .3	51	.5	0	0	0		0	0
10		0	0	.3	39	.6	0	0	0		0	0
11		0	.1	.2	31	* .5	0	0	15		*0	0
12		0	* .3	.1	*24	.4	0	0	10		0	0
13		0	.3	a 0	17	.3	0	0	14		0	0
14		0	.3	a 0	16	.2	0	0	169		0	0
15		0	.3	a 0	14	.1	0	0	359		35	28
16		0	.3	.1	9.0	.1	0	0	112		4.8	* 19
17		0	.3	.2	7.0	.1	0	0	42		1.0	4.6
18		0	.2	.2	6.2	.7	0	0	1.1		0	.2
19		88	.2	.2	5.0	2.2	0	0	0		0	0
20		251	.2	.2	4.2	1.2	0	0	0		0	0
21		39	.2	.2	3.7	1.5	0	0	0		0	0
22		44	.2	.2	3.2	1.5	0	0	0		0	22
23		45	.2	.2	3.0	1.2	0	0	0		0	3.8
24		16	.1	.2	2.8	1.2	0	0	0		0	.7
25		5.4	.1	.1	2.4	.7	.1	0	0		0	.2
26		2.8	.1	.1	2.0	.6	.2	0	0		0	1.5
27		2.4	.1	.1	1.8	.5	.2	0	0		0	88
28		1.4	.1	.1	1.5	.4	.2	0	0		0	221
29		.8	.2	.1	1.3	.2	.1	150	0		89	151
30		.5	.4	.2	----------	.2	.1	625	0		370	34
31		----------	.8	.5	----------	.2	----------	168	----------		3.9	----------
Total	0	496.3	6.4	9.3	1,244.4	19.3	1.8	943	811.7	0	503.7	574.6
Mean	0	16.5	0.21	0.30	42.9	0.62	0.06	30.4	27.0	0	16.2	19.2
Ac-ft	0	984	13	18	2,470	38	3.6	1,870	1,610	0	999	1,140

Calendar year 1963: Max 6,740 Min 0 Mean 75.1 Ac-ft 54,400
Water year 1963-64: Max 625 Min 0 Mean 12.6 Ac-ft 9,150

Peak discharge (base, 2,500 cfs).--No peak above base.
* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
a No gage-height record.
Note.--Stage-discharge relation affected by ice Dec. 20-21, 23-25, Jan. 16.

7-3085. Red River near Burkburnett, Tex.

Location.--Lat 34°06'30", long 98°32'00", on downstream side of bridge on U. S. Highways 277 and 281, 2 miles northeast of Burkburnett, Wichita County.

Drainage area.--20,570 sq mi, of which 5,936 sq mi is probably noncontributing.

Records available.--July 1924 to August 1925 (monthly discharge only), December 1959 to September 1964.

Gage.--Water-stage recorder and wire-weight gage read once daily. Altitude of gage is 956 ft (from topographic map). July 11, 1924, to Aug. 31, 1925, chain gage at site 1,000 ft downstream at same datum.

Extremes.--Maximum discharge during year, 10,100 cfs June 16 (gage height, 8.58 ft); no flow at times.
1924-25, 1960-64: Maximum discharge, 53,500 cfs Oct. 19, 1960 (gage height, 11.88 ft); no flow at times. Maximum stage occurred in 1891 (stage not known). Flood in June 1941 (stage not known) was second highest. Flood of May 19, 1935 (stage not known) destroyed part of highway bridge. Flood of June 3, 1957, reached a stage of 13.54 ft (from floodmarks). Flood in September 1923 reached a stage of 13 ft. Above information from local residents. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Pease River near Vernon (station 7-3082).

Remarks.--Records poor. Several small diversions for irrigation above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*31	53	73	86	71	129	62	31	1,200	91	0	73
2	25	38	67	86	67	112	58	22	1,410	78	0	32
3	*20	37	62	78	69	97	53	20	*1,260	65	0	10
4	16	28	60	78	156	80	53	*16	580	53	*0	26
5	13	*22	53	86	1,250	78	73	14	307	41	0	.5
6	10	18	48	97	2,520	71	62	14	202	25	0	0
7	*9.6	16	50	*86	1,580	65	*53	81	152	*18	0	0
8	8.1	15	43	69	1,390	71	50	1,090	94	15	0	0
9	5.4	13	36	62	865	108	43	524	48	12	0	0
10	4.6	13	*34	64	664	*108	43	112	27	8.1	0	0
11	3.4	11	44	60	*550	86	41	51	38	5.8	*0	0
12	3.2	8.6	45	30	490	73	33	60	300	5.8	0	0
13	2.4	7.6	48	25	416	69	28	*405	315	2.9	0	0
14	.8	5.8	44	*20	390	58	27	740	196	2.6	0	0
15	.5	4.3	48	25	344	53	25	1,010	112	1.4	.2	0
16	.5	6.2	55	30	322	51	25	611	5,420	.8	0	25
17	*.6	5.0	50	40	322	51	21	269	*3,590	.5	8.3	217
18	.5	2.9	50	44	329	58	17	152	2,130	.1	22	*1,000
19	.5	57	51	41	307	88	17	108	1,450	0	*8.6	750
20	.5	252	50	38	288	102	19	91	1,260	0	1.0	344
21	2.6	*196	50	38	288	118	*22	69	786	0	0	212
22	4.3	281	40	*37	275	136	22	58	382	*0	0	477
23	4.3	222	35	33	250	129	24	48	263	0	0	972
24	1.1	177	35	31	*222	108	32	38	373	0	*0	606
25	.5	173	38	36	196	*105	86	32	530	0	0	366
26	.8	136	*46	44	177	112	149	26	425	0	0	222
27	430	126	53	46	164	102	88	22	244	0	0	329
28	399	112	55	44	152	88	58	19	177	0	0	540
29	177	94	56	48	143	73	41	70	136	0	0	727
30	105	80	60	67	----------	69	34	759	105	0	0	1,070
31	71	----------	88	73	----------	65	----------	1,390	----------	0	0	----------
Total	1,351.2	2,210.4	1,567	1,642	14,257	2,713	1,359	7,952	23,512	426.0	40.1	7,975.1
Mean	43.6	73.7	50.5	53.0	492	87.5	45.3	257	784	13.7	1.29	266
Ac-ft	2,680	4,380	3,110	3,260	28,280	5,380	2,700	15,770	46,640	845	80	15,820

Calendar year 1963: Max 20,200 Min 0.5 Mean 431 Ac-ft 311,800
Water year 1963-64: Max 5,420 Min 0 Mean 178 Ac-ft 128,900

Peak discharge (base, 9,000 cfs)

Date	Time	Gage height	Discharge
6-16	1100	8.58	10,100

* Discharge measurement or observation of no flow made on this day.
Note.--Stage-discharge relation affected by ice Dec. 12, 21-24, Jan. 12-17.

7-3116. North Fork Wichita River near Paducah, Tex.

Location.--Lat 33°57'00", long 100°03'50", near center of stream on downstream side of county bridge, 4 miles downstream from Cottonwood Creek, 7 miles downstream from Salt Creek, 12 miles upstream from Middle Fork, and 14 miles southeast of Paducah, Cottle County.

Drainage area.--540 sq mi.

Records available.--1951-54 (occasional low-flow measurements), July 1961 to September 1964.

Gage.--Water-stage recorder.

Extremes.--Maximum discharge during year, 373 cfs May 30 (gage height, 5.77 ft); minimum, 0.3 cfs Sept. 1-4. 1961-64: Maximum discharge, 1,880 cfs Sept. 17, 1962 (gage height, 8.05 ft); minimum, that of Sept. 1-4, 1964.

Maximum stage since at least 1908, 29.5 ft in October 1955; flood in May or June 1956 reached a stage of 27 ft, from information by local resident.

Remarks.--Records good except those for period of ice effect, which are fair. One small diversion for irrigation above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.2	4.3	4.3	5.6	5.6	6.4	6.4	5.6	8.8	4.3	5.0	0.7
2	3.2	4.3	4.3	5.6	5.0	6.4	6.4	5.6	6.4	4.3	2.6	.5
3	*3.2	3.7	4.3	5.0	6.1	6.4	5.6	5.0	5.6	4.3	2.2	.5
4	3.2	3.7	5.0	5.0	26	6.4	6.4	5.0	5.0	4.3	1.8	.7
5	3.2	3.7	5.0	5.0	15	6.4	6.4	5.0	*6.4	3.7	1.8	.7
6	3.2	3.7	5.6	5.6	11	6.4	5.6	*5.6	5.0	3.7	1.8	.9
7	3.2	*3.7	6.4	5.6	9.7	6.4	5.0	5.6	4.3	3.2	1.8	1.2
8	3.2	5.0	5.6	5.6	8.8	7.2	*5.6	5.0	3.7	*3.2	1.4	1.2
9	3.2	5.0	6.4	*5.0	8.0	8.0	5.6	5.0	4.3	3.2	1.8	1.2
10	3.2	4.3	8.0	5.0	8.0	7.2	5.6	5.6	4.3	3.2	1.4	.9
11	3.2	3.7	8.0	5.0	8.0	*7.2	5.6	5.0	38	3.2	1.4	.9
12	3.2	3.7	6.4	5.0	8.0	6.4	5.0	5.0	42	3.2	*1.4	1.2
13	3.2	3.7	*6.4	5.0	*8.0	7.2	5.0	5.0	56	3.2	1.8	1.2
14	3.2	3.7	6.4	5.0	8.0	6.4	5.0	4.3	35	3.2	1.8	1.4
15	3.2	3.7	6.4	5.0	8.0	6.4	5.0	4.3	9.7	3.2	7.2	1.8
16	3.2	3.7	6.4	5.0	7.2	6.4	5.0	4.3	6.4	3.2	3.7	*3.2
17	2.6	3.7	6.4	5.0	8.0	6.4	5.0	3.7	5.6	3.2	2.2	3.2
18	2.6	7.1	6.4	5.0	8.0	6.4	5.0	4.3	5.0	3.2	1.4	2.2
19	3.2	148	6.4	5.0	7.2	6.4	5.0	5.0	4.3	3.2	1.4	1.8
20	3.2	30	6.4	5.6	7.2	6.4	5.0	5.0	3.7	3.2	1.4	1.8
21	3.2	8.0	6.4	6.4	8.0	6.4	5.0	5.6	5.0	3.2	1.4	2.2
22	2.6	6.4	6.4	6.4	8.0	6.4	5.0	5.6	4.3	3.2	1.4	3.2
23	2.6	4.3	5.6	6.4	8.0	6.4	5.0	5.0	4.3	3.2	1.8	4.3
24	2.2	4.3	5.6	6.4	8.0	6.4	5.0	5.6	5.0	3.2	1.4	2.6
25	2.6	4.3	5.6	6.4	8.0	6.4	5.0	5.6	4.3	3.2	1.4	2.6
26	2.6	3.7	5.0	6.4	8.0	5.6	5.0	5.6	4.3	2.6	1.8	3.2
27	2.6	4.3	5.0	6.4	8.0	5.6	4.3	7.2	4.3	2.6	1.8	6.4
28	3.2	3.7	5.0	6.4	8.0	5.6	5.0	6.4	4.3	2.6	1.4	3.7
29	3.2	2.6	5.6	7.2	7.2	6.4	5.0	7.2	4.3	3.2	1.2	3.2
30	3.7	3.2	7.2	14	----------	6.4	5.6	140	4.3	3.2	1.2	3.2
31	4.3	----------	5.6	8.8	----------	6.4	----------	35	----------	4.3	1.2	----------
Total	95.6	297.2	183.5	184.8	252.0	200.8	159.1	327.7	303.9	103.9	61.3	61.8
Mean	3.08	9.91	5.92	5.96	8.69	6.48	5.30	10.6	10.1	3.35	1.98	2.06
Ac-ft	190	589	364	367	500	398	316	650	603	206	122	123

Calendar year 1963: Max 148 Min 1.4 Mean 7.63 Ac-ft 5,530
Water year 1963-64: Max 148 Min 0.5 Mean 6.10 Ac-ft 4,430

Peak discharge (base, 400 cfs).--No peak above base.

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 22-23, Jan. 12-14.

7-3117. North Fork Wichita River near Truscott, Tex.

Location.--Lat 33°49'10", long 99°47'10", near right bank on downstream side of bridge on State Highway 183, 4½ miles north of Truscott, Knox County, and about 33 miles upstream from confluence with South Fork.

Drainage area.--937 sq mi.

Records available.--1952-57 (occasional low-flow measurements), December 1959 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,351.78 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 2,670 cfs June 12 (gage height, 11.24 ft); minimum daily, 0.1 cfs July 19, Aug. 12-13.
1959-64: Maximum discharge, 6,990 cfs Oct. 18, 1960 (gage height, 16.62 ft); minimum daily, that of July 19, Aug. 12-13, 1964.
Maximum stage since at least 1900 occurred in September 1919 and the next highest flood occurred in May 1954 from information by local resident.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. One small diversion for irrigation above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.1	5.4	10	14	17	8.3	11	6.8	58	2	8	.7
2	4.1	7.5	10	12	13	8.3	11	7.5	29	2	5	.7
3	*3.5	7.5	10	10	14	7.5	10	6.8	22	1	3	.7
4	2.9	7.5	10	10	335	7.5	10	6.1	21	1	2	.7
5	2.9	6.8	10	10	89	7.5	11	5.4	*34	.9	1.5	.7
6	2.9	6.8	11	10	38	7.5	11	*4.7	13	.8	1.0	.7
7	2.4	6.8	11	10	21	7.5	10	3.5	11	.7	.8	.7
8	2.4	*22	10	10	16	8.3	8.3	4.7	9.1	.6	.6	.7
9	2.4	12	11	*10	16	9.1	*6.8	4.7	8.3	*.5	.4	.7
10	2.4	10	12	9.1	15	10	6.8	5.4	7.5	.3	.2	.7
11	2.4	9.1	17	10	14	9.1	6.8	5.4	240	.2	.2	.7
12	2.4	7.5	16	10	13	*7.5	6.8	5.4	833	.2	*.1	.7
13	2.4	6.8	*14	9	*13	6.8	6.8	4.7	810	.2	.1	.5
14	1.9	6.1	11	8	11	6.8	6.8	4.1	115	.2	.2	.5
15	2.4	6.8	12	8	11	6.1	6.8	3.5	47	.2	.2	.7
16	2.4	7.5	11	8	10	6.1	6.8	2.9	24	.2	.2	472
17	2.4	6.8	11	10	10	6.1	6.8	2.9	16	.2	1.5	112
18	2.4	7.5	10	12	10	9.1	6.8	2.9	12	.2	1.9	22
19	2.9	340	10	11	9.1	21	6.8	2.9	10	.1	1.5	*83
20	4.7	187	10	10	9.1	20	6.8	2.9	8	.2	.7	54
21	7.5	82	11	9.1	10	14	6.1	2.9	8	.2	.7	61
22	9.1	66	10	9.1	10	10	6.1	2.9	7	.2	.5	83
23	8.3	25	9	9.1	10	10	6.1	2.9	6	.2	.5	29
24	6.8	17	8	9.1	9.1	10	6.1	2.9	5	.2	.7	44
25	4.7	14	20	9.1	9.1	11	6.1	2.9	4	.2	.7	20
26	4.7	13	15	9.1	9.1	11	6.8	2.4	4	.2	.7	10
27	4.7	13	12	10	9.1	11	6.8	2.4	3	.2	.7	30
28	4.7	11	10	10	9.1	11	6.8	2.4	3	.3	.7	20
29	4.7	10	12	10	8.3	10	6.8	103	3	1.9	.7	15
30	4.7	10	16	16	----------	10	6.8	1,270	2	1.9	.7	86
31	4.7	----------	17	20	----------	11	----------	391	----------	5	.7	----------
Total	120.9	938.4	367	321.7	768.0	299.1	228.4	1,878.9	2,372.9	22.2	36.4	8982
Mean	3.90	31.3	11.8	10.4	26.5	9.65	7.61	60.6	79.1	0.72	1.17	29.9
Ac-ft	240	1,860	728	638	1,520	593	453	3,730	4,710	44	72	1,780

Calendar year 1963: Max 1,820 Min 0.5 Mean 30.8 Ac-ft 22,320
Water year 1963-64: Max 1,270 Min 0.1 Mean 22.5 Ac-ft 16,370

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
5-30	2100	10.12	2,010
6-12	2200	11.24	2,670

* Discharge measurement made on this day.
Note.--No gage-height record June 18 to July 8, July 31 to Aug. 11, Sept. 25-26, 28-29; stage-discharge relation affected by ice Dec. 22-24, Jan. 12-17.

7-3118. South Fork Wichita River near Benjamin, Tex.

Location.--Lat 33°38'35", long 99°47'55", on downstream side of bridge on State Highway 283, 2 miles downstream from Panhandle and Santa Fe Railway Co. bridge, 4 miles north of Benjamin, Knox County, and 34 miles upstream from confluence with North Fork Wichita River.

Drainage area.--584 sq mi.

Records available.--1952-57 (occasional low-flow measurements), December 1959 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,334.23 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 2,600 cfs Sept. 22 (gage height, 12.49 ft); no flow at times.
1959-64: Maximum discharge, 13,000 cfs Oct. 18, 1960 (gage height, 15.40 ft); no flow at times.
Maximum stage since at least 1903 occurred in September 1919, the second highest flood occurred in 1935, and the third highest that of Oct. 18, 1960, from information by local residents.

Remarks.--Records fair. No regulation or diversion above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.2	0.5	3.8	7.0	8.9	5.4	4.2	2.8	21	0	0.5	0
2	.8	.4	3.8	7.0	7.9	5.0	4.2	2.8	8.9	0	.1	0
3	*.6	.6	3.8	6.6	8.8	4.6	3.8	2.5	5.4	0	0	0
4	.5	.8	3.8	5.8	178	4.6	3.8	2.2	104	0	0	0
5	.4	1.0	3.8	5.4	44	4.6	3.8	1.9	*93	0	0	0
6	.4	1.2	3.8	5.0	30	4.6	3.8	*4.4	16	0	0	0
7	.3	1.0	3.8	5.0	21	4.6	3.4	22	5.8	0	0	0
8	.2	*2.2	3.8	4.6	16	5.0	*3.4	8.2	2.5	0	0	0
9	.1	2.8	3.8	*4.2	12	5.8	*3.4	5.8	1.9	*0	0	0
10	.1	2.8	3.8	4.2	9.4	5.4	3.1	4.2	1.6	0	0	0
11	0	3.4	5.8	4.2	7.4	5.4	3.1	2.8	372	0	0	0
12	0	3.8	7.4	4	6.6	*5.0	3.1	2.2	536	0	*0	0
13	0	3.4	*7.9	4	*6.6	4.6	2.8	1.4	344	0	0	0
14	0	3.1	7.4	4	6.2	4.2	2.8	1.0	100	0	2.4	0
15	0	2.8	6.6	4	6.2	3.8	2.8	.8	30	0	29	5.4
16	0	2.8	6.2	4	5.8	3.8	2.8	.6	15	0	1	237
17	0	2.8	6.2	4	5.8	3.8	2.8	.6	10	0	.5	*140
18	0	3.1	5.8	4	5.8	5.8	2.8	.5	6	0	.1	70
19	0	249	5.4	4	5.4	8.4	2.8	.4	4	0	0	30
20	0	33	5.4	4.2	5.8	7.9	3.1	.3	3	0	0	10
21	11	19	5.4	4.2	6.2	7.4	2.8	.3	2	0	0	5
22	12	23	4.6	3.8	6.6	6.2	2.8	.2	2	0	0	1,300
23	5.8	12	4.6	3.8	6.6	5.0	2.8	.2	2	0	0	681
24	3.8	7.9	6.2	4.2	6.2	4.2	2.8	.1	1	0	0	223
25	2.2	6.6	7.0	4.2	6.2	3.8	2.5	.1	1	0	0	100
26	1.2	5.4	7.4	4.2	5.8	3.8	5.0	.1	1	0	0	60
27	.8	4.6	7.0	4.2	5.8	4.2	3.1	0	0	0	0	265
28	.5	4.6	6.2	4.6	6.2	3.8	2.5	0	0	0	0	80
29	.3	4.2	6.2	5.0	5.8	3.8	2.2	3.0	0	15	0	50
30	.2	3.8	6.6	7.0		3.8	2.5	111	0	4.2	0	30
31	.1		6.6	9.9		4.2		65		1	0	
Total	42.5	411.6	169.9	150.3	453.0	152.5	94.8	247.4	1,689.1	20.2	33.6	3,286.4
Mean	1.37	13.7	5.48	4.85	15.6	4.92	3.16	7.98	56.3	0.65	1.08	110
Ac-ft	84	816	337	298	898	302	188	491	3,350	40	67	6,520

Calendar year 1963: Max 566 Min 0 Mean 14.3 Ac-ft 10,370
Water year 1963-64: Max 1,300 Min 0 Mean 18.4 Ac-ft 13,390

Peak discharge (base, 800 cfs)

Date	Time	Gage height	Discharge
6-11	1000	8.90	1,130
6-12	1900	10.43	1,660
9-22	0800	12.49	2,600

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record June 14 to July 2, July 31 to Aug. 11, Aug. 13, Aug. 16 to Sept. 14, Sept. 17-21, 25-26, 28-30.

7-3119. Wichita River near Seymour, Tex.

Location.--Lat 33°42'00", long 99°23'10", near left bank on downstream side of pier of bridge on Ranch Road 1919, 6 miles upstream from head of Lake Kemp, 10 miles downstream from confluence of North and South Forks, and 10½ miles northwest of Seymour, Baylor County.

Drainage area.--1,874 sq mi.

Records available.--November 1959 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,152.7 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942 (State Highway Department bridge plans).

Extremes.--Maximum discharge during year, 11,100 cfs Sept. 22 (gage height, 14.50 ft); no flow at times.
1959-64: Maximum discharge, 17,800 cfs Oct. 18, 1960 (gage height, 17.05 ft); no flow at times in 1964.
Maximum stage since at least 1900 occurred in June 1915 (stage and discharge not known), from information by local residents.

Remarks.--Records good.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.5	3.9	18	16	19	15	10	4.4	456	6.5	0	0
2	2.7	3.5	17	17	21	15	9.6	4.4	179	5.4	0	0
3	2.3	3.5	15	16	61	14	9.6	3.5	88	4.8	0	0
4	*2.0	3.5	15	13	1,200	13	9.6	3.1	52	3.9	0	0
5	2.0	3.1	14	13	800	12	9.6	2.7	*262	3.1	0	0
6	2.0	2.7	14	12	258	12	9.0	*2.7	174	2.7	0	0
7	1.7	2.3	12	12	111	12	8.3	13	52	2.0	0	0
8	1.7	*2.9	12	12	66	13	7.7	320	30	1.4	0	0
9	1.4	62	12	11	49	17	*8.3	59	24	*1.1	0	0
10	1.1	30	12	*12	42	16	8.3	21	18	.9	0	0
11	1.1	12	21	11	35	14	8.3	13	1,710	.7	0	0
12	1.1	7.1	22	9.6	31	*13	8.3	9.6	1,830	.5	0	0
13	1.1	7.1	*22	8.3	28	12	7.1	7.1	2,580	.5	*0	0
14	.9	6.5	19	7.7	*26	11	6.5	5.4	1,390	.4	0	0
15	.9	6.5	20	9.6	25	9.6	6.5	4.4	370	.2	75	32
16	.9	6.5	16	10	22	9.6	6.0	3.9	202	.1	46	652
17	.9	6.5	15	10	22	9.0	5.4	3.1	126	.1	14	*660
18	.9	6.0	14	9.6	21	11	5.4	3.1	83	0	5.4	230
19	.9	1,520	13	11	19	32	5.4	2.7	59	0	2.3	84
20	1.7	986	14	12	19	20	6.0	2.7	43	0	.7	28
21	8.2	259	12	12	18	18	6.5	2.3	36	0	.1	44
22	7.7	300	13	11	18	18	6.0	2.3	28	0	0	6,410
23	6.5	123	14	10	18	16	5.4	2.3	24	0	0	3,850
24	6.0	64	15	9.6	17	15	5.4	2.0	22	0	0	1,150
25	5.4	39	17	9.0	18	12	5.4	2.0	17	0	0	429
26	5.4	32	12	9.0	16	10	5.4	1.7	14	0	0	275
27	4.8	27	18	8.3	16	11	14	1.7	12	0	0	2,250
28	3.9	24	17	8.3	15	11	7.7	1.7	10	0	0	633
29	3.9	22	14	8.3	15	10	5.4	2.3	9.0	0	0	262
30	3.5	^0	15	17		10	4.8	1,500	8.3	0	0	185
31	3.5		15	21		10		1,740		0	0	
Total	89.6	3,591.6	479	356.3	3,026	421.2	220.9	3,747.1	9,908.3	34.3	143.5	17,174
Mean	2.89	120	15.5	11.5	104	13.6	7.36	121	330	1.11	4.63	572
Ac-ft	178	7,120	950	707	6,000	835	438	7,430	19,650	68	285	34,060

Calendar year 1963: Max 8,870 Min 0.5 Mean 98.8 Ac-ft 71,520
Water year 1963-64: Max 6,410 Min 0 Mean 107 Ac-ft 77,720

Peak discharge (base, 2,500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-13	1500	10.65	3,920	9-27	0400	10.58	3,920
9-22	1400	14.50	11,100				

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

7-3120. Lake Kemp near Mabelle, Tex.

Location.--Lat 33°45', long 99°09', on outlet-gate control house at dam on Wichita River, 6.2 miles north of Mabelle, Baylor County, and 10.2 miles northeast of Seymour.

Drainage area.--2,086 sq mi.

Records available.--October 1922 to September 1964.

Gage.--Float-tape gage read once daily. Datum of gage is 2.40 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942.

Extremes.--Maximum contents observed during year, 236,000 acre-ft Oct. 1 (gage height, 1,136.90 ft); minimum observed, 121,800 acre-ft Sept. 15 (gage height, 1,125.12 ft).
1922-64: Maximum contents observed, 420,900 acre-ft June 30, 1941 (gage height, 1,149.6 ft); minimum observed since first appreciable storage, 26,160 acre-ft June 30, 1953 (gage height, 1,105.6 ft).

Remarks.--Reservoir is formed by hydraulic earth-fill dam 7,500 ft long, having an uncontrolled semicircular concrete service spillway 564 ft long with crest at gage height 1,150.6 ft. No flow has been permitted to pass over spillway. Two uncontrolled emergency spillways are located between the left end of dam and the service spillway, one 70 ft long with crest at gage height 1,159.1 ft and the other 335 ft long with crest varying from gage heights 1,159.6 to 1,162.9 ft. Storage began Oct. 1, 1922; dam completed Aug. 25, 1923. Outlet works consist of 6 conduits, 7 ft in diameter controlled by lift-type gates. Water is used for irrigation in the Wichita River Valley, oilfield operation and industrial use. Forty-two thousand acres of land is available for irrigation. Data regarding the dam is shown in the following table:

	Gage height (feet)	Capacity (acre-feet)
Crest of service spillway	1,150.6	461,800
Invert of outlet conduits	1,067.0	0

Cooperation.--Records of daily gage height furnished by city of Wichita Falls and Wichita County Water Improvement District No. 2. Capacity table furnished by Soil Conservation Service and was based on their survey made in 1958, and used beginning Oct. 1, 1958.

Month-end gage heights and contents, water year October 1963 to September 1964

Date	Gage height (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,136.92	236,200	-
Oct. 31	(a)	216,500	-19,700
Nov. 30	1,135.18	217,000	+500
Dec. 31	1,135.06	215,700	-1,300
Calendar year 1963	-	-	-92,500
Jan. 31	1,134.47	209,700	-6,000
Feb. 29	1,135.24	217,600	+7,900
Mar. 31	1,134.84	213,400	-4,200
Apr. 30	1,133.62	201,200	-12,200
May 31	1,133.27	197,700	-3,500
June 30	1,134.01	205,100	+7,400
July 31	1,129.85	163,500	-41,600
Aug. 31	1,126.74	133,200	-30,300
Sept. 30	1,130.87	173,700	+40,500
Water year 1963-64	-	-	-62,500

† Gage height at 0800 hours.
a No gage-height record.

7-3121. Wichita River near Mabelle, Tex.

Location.--Lat 33°45'35", long 99°08'35", near left bank on downstream side of bridge on U. S. Highways 183 and 283, 0.3 mile downstream from Lake Kemp Dam, 6 miles north of Mabelle, and 13 miles northeast of Seymour, Baylor County.

Drainage area.--2,086 sq mi, all of which is above Lake Kemp Dam.

Records available.--1952-58 (occasional discharge measurements), October 1959 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,062.72 ft above mean sea level, datum of 1929.

Average discharge.--5 years, 154 cfs (111,500 acre-ft per year).

Extremes.--Maximum daily discharge during year, 929 cfs May 30; maximum gage height, 5.70 ft May 30; minimum daily discharge, 2.4 cfs Dec. 23-24, 26-28, Jan. 8.
1959-64: Maximum discharge, 1,300 cfs Mar. 16, 1961 (gage height, 6.25 ft); minimum daily, 2 cfs Jan. 13-14, 20, 24-25, 1963 (result of freeze).

Remarks.--Records good. Flow completely regulated by Lake Kemp (see preceding page). Water is released from Lake Kemp to supply Lake Diversion from whence it is released for irrigation in vicinity of Wichita Falls (42,000 acres under permit).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 4-16, Jan. 11-21, Mar. 24 to Apr. 19, May 26-31, June 25 to July 13, Aug. 28 to Sept. 27)

2.7	2.0	3.5	64
2.8	4.0	3.8	124
2.9	7.0	4.2	236
3.0	11	5.0	559
3.1	17	6.0	1,060
3.3	35		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.1	7.0	5.5	2.6	3.4	3.0	144	5.2	5.2	600	577	410
2	6.1	7.0	5.5	2.8	3.4	3.0	144	5.2	4.6	600	572	410
3	6.1	7.0	5.5	2.6	3.8	3.2	184	4.9	4.6	487	568	379
4	*101	106	5.5	2.6	3.8	3.4	244	5.2	4.6	414	568	338
5	246	247	5.5	2.8	3.8	3.2	244	5.2	* 5.2	414	568	338
6	417	247	5.2	2.8	3.4	3.0	244	*5.2	5.5	414	568	338
7	5.9	247	5.2	2.6	3.4	3.0	244	6.3	5.8	422	568	338
8	4.9	*247	5.2	2.4	3.4	3.0	244	5.5	5.8	541	568	338
9	341	247	5.2	2.6	3.4	3.4	*239	5.5	6.4	541	497	241
10	536	247	5.2	* 2.8	3.4	3.4	88	5.5	235	*541	438	181
11	536	247	4.9	112	3.4	3.4	88	5.2	346	541	434	181
12	536	247	4.6	233	3.6	*3.4	88	5.2	284	541	434	181
13	541	247	* 4.0	233	3.6	3.4	88	5.2	7.3	552	*434	181
14	541	247	3.8	233	*3.6	3.4	88	5.2	6.4	654	428	181
15	541	247	3.6	233	3.6	3.6	88	5.2	6.4	654	128	146
16	541	143	3.4	233	3.6	3.8	90	5.2	6.7	654	5.2	57
17	541	62	3.6	233	3.6	4.0	92	5.5	7.0	641	3.2	*6.7
18	440	62	3.2	229	3.6	4.0	92	5.5	8.5	536	3.0	6.1
19	287	31	3.0	229	3.8	4.3	112	105	151	536	3.0	5.8
20	240	6.1	2.8	229	3.8	4.3	209	284	151	532	3.0	5.8
21	240	5.8	3.0	91	3.8	4.3	209	155	151	532	3.2	6.4
22	240	6.1	3.0	4.3	3.4	4.0	209	5.5	224	528	3.2	17
23	240	5.5	2.4	3.6	3.4	4.0	205	5.2	330	528	3.2	5.2
24	240	5.5	2.4	3.6	3.2	90	192	5.2	330	523	3.2	4.9
25	143	5.5	2.6	3.6	3.0	144	5.8	5.2	445	523	3.2	4.6
26	7.8	5.5	2.4	3.6	3.0	144	5.5	210	604	567	3.4	4.6
27	7.0	5.5	2.4	3.6	3.0	144	5.5	592	604	600	3.4	13
28	6.7	5.5	2.4	3.6	2.8	144	5.5	294	604	590	137	3.4
29	6.7	5.5	2.6	3.6	3.0	144	5.2	417	604	586	392	3.4
30	6.7	5.5	2.6	3.8	----------	144	5.2	929	600	586	514	3.4
31	6.7	----------	2.6	3.6	----------	144	----------	378	----------	582	410	----------
Total	7,558.7	3,204.0	118.8	2,351.5	100.0	1,179.5	3,901.7	3,481.0	5,753.0	16,960	8,843.2	4,328.3
Mean	244	107	3.83	75.9	3.45	38.0	130	112	192	547	285	144
Ac-ft	14,990	6,360	236	4,660	198	2,340	7,740	6,900	11,410	33,640	17,540	8,590

Calendar year 1963: Max 577 Min 2 Mean 148 Ac-ft 107,200
Water year 1963-64: Max 929 Min 2.4 Mean 158 Ac-ft 114,600

* Discharge measurement made on this day.

7-3122. Beaver Creek near Electra, Tex.

Location.--Lat 33°54'20", long 98°54'15", near right bank on downstream side of bridge on Farm Road 2326, 6.5 miles northwest of Kamay, 8 miles upstream from Wichita River, and 9 miles south of Electra, Wichita County.

Drainage area.--652 sq mi.

Records available.--February 1960 to September 1964.

Gage.--Water-stage recorder and wire-weight gage. Datum of gage is 991.3 ft above mean sea level (State Highway Department reference point).

Extremes.--Maximum discharge during year, 2,860 cfs Sept. 22 (gage height, 24.24 ft); no flow at times.
1960-64: Maximum discharge, 11,700 cfs Mar. 17, 1961 (gage height, 33.57 ft); no flow at times.
Maximum stage since at least 1925, 36.0 ft in 1941 (partly caused by deliberate demolition of Santa Rosa Dam to avoid its failure), from information by local residents.

Remarks.--Records good except those for periods of ice effect, which are fair. Some regulation by Santa Rosa Lake (capacity, 11,570 acre-ft) about 30 miles upstream. Several small diversions above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*0.2	0	0.2	0.5	0.4	1.0	2.6	1.0	51	3.9	13	6.4
2	.1	0	.1	.5	.5	.9	2.6	.5	12	2.5	2.5	2.2
3	.1	0	.1	.5	1.7	.9	3.1	.1	4.8	1.5	2.6	1.0
4	0	0	.1	.5	224	.8	2.6	*.1	2.0	1.1	2.7	.4
5	0	*0	.1	.5	164	.6	2.4	0	.5	.9	3.0	.1
6	.1	0	.1	.4	133	.5	1.7	0	.1	.8	2.9	.1
7	.9	0	.1	.2	28	.5	*.9	57	0	.6	1.8	0
8	.7	0	.1	.5	10	.7	.5	*890	0	*13	1.5	0
9	.6	0	.1	8.6	3.9	1.6	.3	71	*0	11	1.0	0
10	.5	0	*11	*8.6	1.0	*.7	.1	12	0	6.5	.4	0
11	.4	0	10	7.2	*.8	.4	0	3.8	1.8	3.4	*.2	.5
12	.2	0	8	5	.7	.2	0	1.4	52	3.0	.1	.5
13	.1	0	5	3	.6	.1	0	.3	54	2.1	.1	.1
14	.1	0	4	3	.5	.1	0	.1	50	1.1	0	.2
15	.1	0	3	3	.8	.1	0	0	14	.2	194	.6
16	.1	0	2.7	4	7.0	.1	0	0	4.6	.1	407	*511
17	0	0	1.6	4	7.0	.1	0	0	1.8	0	41	263
18	0	0	1.0	4.1	6.7	.2	0	0	.8	0	3.8	20
19	0	402	.8	2.7	4.9	3.0	0	0	.4	0	.6	5.7
20	0	137	.5	2.1	3.0	1.0	.2	*0	.1	0	1.6	483
21	0	25	.2	1.7	1.9	2.4	1.9	0	.1	0	1.2	78
22	0	33	.1	1.5	1.6	2.0	.1	0	.1	0	1.0	1,670
23	0	26	0	1.5	1.4	1.5	.1	0	.8	0	1.1	*1,600
24	0	11	0	.9	1.5	1.3	96	0	1.0	0	.8	*189
25	0	4.5	.5	.6	1.5	1.2	*464	0	.5	.1	.2	27
26	0	2.4	.6	1.5	1.4	1.1	76	0	.2	0	.1	12
27	0	1.6	.7	1.0	1.5	1.4	26	0	2.0	0	27	1,160
28	0	1.1	.7	.5	1.3	1.8	*7.7	.8	8.8	0	19	788
29	0	.7	.7	.7	1.1	1.9	3.5	1.1	6.7	.9	11	76
30	0	.7	.6	1.0		2.2	1.9	1,230	4.6	1.4	90	20
31	0		.5	.3		2.6		276		2.8	23	
Total	4.2	645.0	53.2	70.1	611.7	32.9	694.2	2,545.2	274.7	56.9	854.2	6,914.8
Mean	0.14	21.5	1.72	2.26	21.1	1.06	23.1	82.1	9.16	1.84	27.6	230
Ac-ft	8.3	1,280	106	139	1,210	65	1,380	5,050	545	113	1,690	13,720

Calendar year 1963: Max 2,480 Min 0 Mean 41.4 Ac-ft 29,940
Water year 1963-64: Max 1,670 Min 0 Mean 34.9 Ac-ft 25,310

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-25	0400	16.14	1,050	9-22	2030	24.24	2,860
5- 8	0600	18.56	1,490	9-27	1600	19.42	1,850
5-30	1000	19.84	1,730				

* Discharge measurement or observation of no flow made on this day.
Note.--Stage-discharge relation affected by ice Dec. 11-15, 23-25, 30-31, Jan. 12-17.

7-3125. Wichita River at Wichita Falls, Tex.

Location.--Lat 33°54'30", long 98°32'05", near center of stream on downstream side of bridge on Beverly Drive in Wichita Falls, Wichita County, 4 miles upstream from Fort Worth and Denver Railway Co. bridge and 8.4 miles upstream from Holliday Creek.

Drainage area.--3,140 sq mi, of which 2,086 sq mi is above Lake Kemp Dam.

Records available.--February 1900 to January 1902 (monthly discharge only, in WSP 1311), October 1910 to December 1911 (gage heights only), March 1938 to September 1964.

Gage.--Water-stage recorder and wire-weight gage read once daily. Datum of gage is 924.26 ft above mean sea level, datum of 1929. February 1900 to February 1902, staff gage (property of U. S. Department of Agriculture) at highway bridge about 4 miles downstream at different datum. Oct. 1, 1910, to Dec. 31, 1911, chain gage at site 4 miles downstream at different datum. Mar. 30, 1938, to Dec. 2, 1959, wire-weight gage at same site and datum.

Average discharge.--27 years (1900-1, 1938-64), 310 cfs (224,400 acre-ft per year).

Extremes.--Maximum discharge during year, 3,840 cfs Apr. 25 (gage height, 12.36 ft); minimum, 14 cfs Jan. 12 (result of freeze).
1938-64: Maximum discharge observed, 17,800 cfs Oct. 3, 1941 (gage height, 24.0 ft); no flow Oct. 11, 1960 (construction cofferdam upstream).
Maximum discharge known, 50,000 cfs June 8, 1915, computed by Vernon L. Sullivan, engineer for Big Wichita River Irrigation Co.

Remarks.--Records good except those for periods of ice effect, which are fair. Flow from 2,086 sq mi is regulated by Lake Kemp (capacity, 461,800 acre-ft) 71 miles upstream. Since completion of dam in 1923, no flow has been permitted to pass over spillway. Water is diverted from Diversion Reservoir (capacity, 40,000 acre-ft) 51 miles upstream for irrigation (42,000 acres under permit) in the vicinity of Wichita Falls. Information by the city of Wichita Falls indicates that during the water year 17,219 acre-ft was diverted from Lake Kickapoo on North Fork Little Wichita River for municipal use, of which 7,524 acre-ft was released to the Wichita River below station as sewage effluent and filter plant wash water. Diversion and return flow records furnished by the city of Wichita Falls.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*49	58	44	38	40	43	53	90	589	110	163	74
2	48	59	43	38	33	49	50	86	193	110	148	56
3	49	59	42	37	33	40	44	74	*105	106	148	51
4	48	58	42	37	127	36	43	*55	77	100	135	45
5	49	*56	42	34	306	33	118	56	63	98	135	43
6	48	58	40	34	264	37	110	84	54	100	125	49
7	49	59	40	34	202	34	*71	102	46	100	118	48
8	49	64	39	*34	95	42	60	512	38	*102	122	50
9	53	66	38	30	62	90	58	1,400	33	98	135	44
10	60	67	40	29	48	*77	59	317	32	106	139	43
11	64	64	*50	31	*45	46	56	190	33	111	*134	43
12	73	66	53	25	45	34	64	206	72	105	130	45
13	71	70	54	20	42	33	73	184	211	118	148	54
14	70	64	51	*15	38	31	58	100	388	132	153	56
15	74	70	48	*20	38	31	50	66	170	106	222	74
16	70	67	46	*40	32	49	45	55	102	95	1,110	353
17	62	64	44	37	33	40	56	46	73	100	446	792
18	60	60	43	36	51	34	63	42	63	111	204	*313
19	76	186	42	34	48	40	66	44	56	125	132	80
20	74	634	42	33	44	40	73	42	53	125	88	48
21	86	237	42	31	43	34	82	40	50	128	73	307
22	116	157	30	33	39	33	77	42	49	122	60	912
23	103	122	25	32	32	43	74	39	54	108	58	2,540
24	95	100	46	30	32	55	193	56	86	102	54	*2,500
25	84	74	43	32	36	45	*2,910	86	92	115	46	1,140
26	88	60	42	38	36	34	2,280	84	78	120	34	536
27	73	55	42	39	32	30	*399	73	80	140	37	984
28	58	48	40	38	33	32	195	82	84	153	45	1,860
29	58	44	38	38	33	43	126	255	97	152	69	1,280
30	56	44	38	49	----------	48	92	2,660	100	142	80	611
31	55	----------	38	46	----------	55	----------	2,560	----------	157	106	----------
Total	2,068	2,890	1,307	1,042	1,942	1,311	7,698	9,728	3,221	3,597	4,797	15,031
Mean	66.7	96.3	42.2	33.6	67.0	42.3	257	314	107	116	155	501
Ac-ft	4,100	5,730	2,590	2,070	3,850	2,600	15,270	19,300	6,390	7,130	9,510	29,810

Calendar year 1963: Max 2,670 Min 20 Mean 120 Ac-ft 86,540
Water year 1963-64: Max 2,910 Min 15 Mean 149 Ac-ft 108,400

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 22-23, Jan. 12-15.

7-3140. Lake Kickapoo near Archer City, Tex.

Location.--Lat 33°39'45", long 98°46'45", at intake tower near left end of dam on North Fork Little Wichita River, 8.2 miles south of Mankins and 9.2 miles northwest of Archer City, Archer County.

Drainage area.--275 sq mi.

Records available.--February 1946 to September 1964.

Gage.--Staff gage read twice daily. Datum of gage is mean sea level, datum of 1929. Prior to Oct. 8, 1947, water-stage recorder at same site and datum.

Extremes.--Maximum contents observed during year, 84,280 acre-ft Oct. 1 (elevation, 1,041.4 ft); minimum observed, 62,450 acre-ft Sept. 13-15 (elevation, 1,037.1 ft).
1946-64: Maximum contents, 134,300 acre-ft Aug. 2, 1950 (elevation, 1,049.2 ft); minimum observed since first appreciable storage in September 1946, 24,420 acre-ft Oct. 2, 1946 (elevation, 1,025.4 ft).

Remarks.--Reservoir is formed by an earth-fill dam 6,800 ft long, containing a reinforced concrete ogee-type uncontrolled service spillway at right end of dam, 482.7 ft long. Dam completed Dec. 15, 1945, and storage began Feb. 1, 1946. Capacity, 106,000 acre-ft between elevations 1,000.92 ft (bottom of two 48- by 60-inch outlet conduits) and 1,045.0 ft (top of spillway). Figures given herein represent total contents. There is no dead storage. Reservoir contents used as municipal supply for city of Wichita Falls.

Cooperation.--Capacity curve, record of lake elevations, and diversions for municipal use furnished by city of Wichita Falls. Capacity table is based on a curve obtained from the city of Wichita Falls entitled "Lake Kickapoo Area and Capacity Curve, November 1946." Curve was based on Geological Survey topographic map having 5-foot contour interval surveyed in 1929.

Month-end elevation, contents, and diversions, water year October 1963 to September 1964

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)	Diversions for municipal use (acre-feet)
Sept. 30	1,041.4	84,280	-	-
Oct. 31	1,040.6	79,800	-4,480	1,592
Nov. 30	1,040.5	79,250	-550	1,111
Dec. 31	d1,040.0	77,600	-1,650	1,031
Calendar year 1963	-	-	-27,100	18,765
Jan. 31	d1,039.0	76,500	-1,100	1,117
Feb. 29	d1,039.0	75,460	-1,040	1,027
Mar. 31	1,039.7	74,940	-520	1,069
Apr. 30	1,039.0	71,300	-3,640	1,288
May 31	1,039.3	72,860	+1,560	1,437
June 30	d1,039.9	74,940	+2,080	1,723
July 31	1,038.1	66,980	-7,960	2,702
Aug. 31	1,037.4	63,800	-3,180	1,824
Sept. 30	1,039.9	75,980	+12,180	1,298
Water year 1963-64	-	-	-8,300	17,219

† Elevation at 0800 hours.
d Doubtfull elevation record.

7-3150. Little Wichita River near Henrietta, Tex.

Location.--Lat 33°50'00", long 98°12'30", on left bank at downstream side of bridge on State Highway 148, 1.5 miles northwest of Henrietta, Clay County, 4 miles upstream from Turkey Creek, and 5 miles upstream from Dry Fork Little Wichita River.

Drainage area.--1,037 sq mi.

Records available.--January 1953 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 831.57 ft above mean sea level, datum of 1929. Prior to June 26, 1953, wire-weight gage at present site and datum.

Average discharge --11 years, 124 cfs (89,770 acre-ft per year).

Extremes.--Maximum discharge during year, 1,520 cfs Sept. 25 (gage height, 13.50 ft); no flow for many days.
1953-64: Maximum discharge, 6,390 cfs May 2, 1957 (gage height, 18.36 ft); no flow at times.
Flood in 1908 reached a stage of about 21 ft, from information by State Highway Department.

Remarks.--Records good except those for periods of city pumping, which are fair. Some regulation by Lake Kickapoo (see preceding page) on North Fork. The city of Wichita Falls diverted 17,219 acre-ft of water from Lake Kickapoo for municipal use and returned 7,524 acre-ft of sewage effluent and filter plant wash-water to Wichita River. The city of Henrietta diverted 667 acre-ft of water from gage pool for municipal use. Diversion records were furnished by the cities of Wichita Falls and Henrietta, respectively. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table, except for periods when stage-discharge relation affected by city pumping (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 26-30)

6.1	0	7.0	128
6.2	1.0	8.0	325
6.3	10	12.0	1,200
6.5	40	16.0	2,100

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	2.7	0.1	0	241	0	0	5.4	601		0	0
2	.1	1.0	.4	0	156	0	0	3.6	580		0	0
3	0	.7	.7	0	59	0	0	.1	114		0	0
4	0	1.0	.3	0	85	0	0	0	20		0	0
5	0	.7	.1	0	426	0	0	0	7.6		0	0
6	0	.7	.1	0	821	0	0	.3	3.6		0	0
7	0	.3	.1	0	737	0	.1	.3	1.5		0	0
8	0	.3	0	0	197	0	15	37	.3		0	0
9	0	.1	0	0	74	0	8.9	271	.1		0	0
10	0	.1	4.3	0	40	.3	5.4	557	0		0	0
11	0	0	6.4	0	23	25	3.6	*321	0		0	0
12	0	0	g.7	0	14	32	1.0	52	1.4		*0	0
13	0	0	g21	0	8.9	22	.7	38	76		0	0
14	0	0	g40	0	3.6	13	.3	30	628		0	0
15	0	0	g13	0	2.0	3.6	.1	52	654		0	0
16	0	0	g6.4	*0	1.5	1.5	0	27	216		53	33
17	0	0	g6.4	0	1.5	1.0	0	8.9	47		346	202
18	0	0	g1.0	0	1.0	2.3	0	1.0	16		235	440
19	0	126	g.3	0	1.5	6.4	0	.1	6.4		112	150
20	90	158	g.3	0	1.0	3.6	0	0	2.0		48	32
21	88	409	g.3	0	.7	1.5	0	0	.7		14	6.4
22	196	207	g.2	0	.3	.7	0	0	.1		1.5	163
23	346	57	g.2	0	.3	.3	0	0	0		1	621
24	231	134	g.3	0	.1	.1	0	0	0		.5	1,260
25	48	87	g.3	0	*0	.1	*.7	*0	*0		.1	1,490
26	48	*27	g.3	0	0	** .1	124	0	0		0	1,320
27	43	8.9	g.1	0	0	.1	579	0	0		0	542
28	17	4.4	g.1	0	0	0	*415	0	0		0	*743
29	7.6	.7	g0	*0	0	0	128	0	0	(*)	0	728
30	*2.7	.3	*0	114	----------	0	*17	42	0		0	323
31	2.0	----------	0	179	----------	0	----------	272	----------		0	----------
Total	1,119.8	1,226.9	103.4	293	2,895.4	113.6	1,298.8	1,718.7	2,975.7	0	811.1	8,053.4
Mean	36.1	40.9	3.34	9.45	99.8	3.66	43.3	55.4	99.2	0	26.2	268
Ac-ft	2,220	2,430	205	581	5,740	225	2,580	3,410	5,900	0	1,610	15,970

Calendar year 1963: Max 626 Min 0 Mean 20.3 Ac-ft 14,670
Water year 1963-64: Max 1,490 Min 0 Mean 56.3 Ac-ft 40,870

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
g Computed from once-daily staff-gage readings.
Note.--Stage-discharge relation affected by city pumping Oct. 27-29, May 1-4, 13-14, 16-20, Aug. 23-25.

7-3152. East Fork Little Wichita River near Henrietta, Tex.

Location.--Lat 33°48'46", long 98°05'05", on downstream side of bridge on U. S. Highway 82, 5.8 miles upstream from Little Wichita River, 6.4 miles east of Henrietta, Clay County, and 8.9 miles west of Ringgold.

Drainage area.--178 sq mi.

Records available.--November 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 825.32 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during period November to September, 367 cfs May 8 (gage height, 13.51 ft); no flow for many days.
Maximum stage since at least 1920, 28.8 ft in October 1941, from information by local resident.

Remarks.--Records fair. No diversion above station.

Discharge, in cubic feet per second, November 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		-	0	0.1	3.9	0	0	1.2	5.3		0	0
2		-	0	.1	1.4	0	0	.9	3.6		0	0
3		-	0	0	.7	0	0	.6	1.6		0	0
4		-	0	0	3.6	0	0	.4	.9		0	0
5		-	0	0	9.8	0	0	.3	.6		0	0
6		-	0	0	4.9	0	0	.2	.4		0	0
7		-	0	0	2.8	0	0	.2	.3		0	0
8		-	0	*0	1.7	0	0	*156	.1		0	0
9		-	0	0	1.0	.1	0	*253	.1		0	0
10		-	0	0	.5	*.2	0	53	0		0	0
11		-	0	0	.4	.2	0	*9.4	0		0	0
12		-	0	0	.3	.2	0	4.7	0		0	0
13		-	0	0	.2	.2	0	3.2	0		0	0
14		-	0	0	.2	.2	0	2.6	0		0	0
15		-	0	0	.2	.1	0	2.6	0		0	0
16		-	0	0	.1	.1	0	16	0		0	11
17		-	0	0	.1	.1	0	3.5	0		54	47
18		-	0	0	.1	.1	0	2.0	0		23	33
19		-	0	0	.1	0	0	1.4	0		60	4.9
20		-	0	0	.1	0	0	1.1	0		31	1.7
21		-	0	0	.1	0	0	.8	0		5.0	1.1
22		-	0	0	.1	0	0	.6	0		1.8	2.2
23		-	0	0	.1	0	0	.3	0		.9	3.4
24		-	0	0	.1	0	0	.1	0		.7	27
25		-	0	0	*0	0	**138	*0	*0		.6	6.1
26		*0	0	0	0	0	321	0	0		.6	2.2
27		0	0	0	0	0	*57	0	0		*.4	26
28		0	0	0	0	0	*11	0	0		.2	*41
29		0	.1	0	0	0	3.9	.1	0	(*)	.1	20
30		0	**.1	1.6	----------	0	*1.9	23	0		.2	4.5
31		----------	.1	3.8	----------	0	----------	8.8	----------		0	----------
Total		-	0.3	5.6	32.5	1.5	532.8	546.0	12.9	0	178.5	231.1
Mean		-	0.01	0.18	1.12	0.05	17.8	17.6	0.43	0	5.76	7.70
Ac-ft		-	0.6	11	64	3.0	1,060	1,080	26	0	354	458

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

7-3154. Little Wichita River near Ringgold, Tex.

Location.--Lat 33°53'55", long 98°04'05", on right bank at upstream side of bridge on abandoned county road, 2 miles downstream from East Fork Little Wichita River, 8 miles northwest of Ringgold, Montague County, 11.5 miles upstream from mouth, and 13 miles downstream from gaging station near Henrietta.

Drainage area.--1,350 sq mi, approximately.

Records available.--February 1959 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 791.30 ft above mean sea level, datum of 1929.

Average discharge.--5 years, 110 cfs (79,640 acre-ft per year).

Extremes.--Maximum discharge during year, 1,420 cfs Sept. 27 (gage height, 20.47 ft); no flow for many days. 1959-64: Maximum discharge, 4,120 cfs June 24, 1959 (gage height, 27.53 ft); no flow for many days. Maximum stage since 1908, about 31 ft in 1915, from information by local resident.

Remarks.--Records good except those for periods of no gage-height record, which are poor. For upstream regulation and diversions, see Little Wichita River near Henrietta (station 7-3150).

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2	0.6	0.5	0	263	0.1	0	14	752		0	0.1
2	1	.2	0	0	272	0	0	5.4	609		0	0
3	.5	0	0	0	106	0	0	3.6	359		0	0
4	.1	0	0	0	93	0	0	1.0	64		0	0
5	0	0	.2	0	302	0	0	.6	26		0	0
6	0	0	0	0	589	0	0	.5	13		0	0
7	0	0	0	0	766	0	.4	1.0	6		0	0
8	0	0	0	0	399	0	1.0	42	*3.4		0	0
9	0	0	0	0	99	.1	9.6	381	1.9		0	0
10	0	0	.4	0	42	3	6.5	585	1.0		0	0
11	0	0	11	0	21	6	4.1	*506	1.5		0	0
12	0	0	11	0	*12	*24	3.4	136	5.0		*0	0
13	0	0	5.7	0	7.2	21	2.2	37	74		0	0
14	0	0	47	0	4.7	13	1.4	36	567	(*)	0	*0
15	0	*0	38	0	3.3	6.8	.8	19	887		0	0
16	0	0	15	*0	2.6	3.8	.4	83	477		0	159
17	*0	0	*7.6	0	1.7	2.4	.2	48	151		192	160
18	0	0	4.5	0	1.3	2.2	.2	17	52		329	402
19	0	45	2.5	0	1.5	5.2	.1	6	22		202	277
20	6.9	223	1.7	0	1.7	6.8	.1	3	9.5		162	72
21	78	358	1.0	0	1.7	5.0	0	1	4.6		56	22
22	148	415	.5	0	1.4	2.8	0	.4	2.2		17	171
23	312	104	.2	0	1.1	1.9	0	.2	1.0		4.1	495
24	347	101	.1	0	.8	1.4	0	.2	.5		1.3	871
25	116	156	.1	0	.6	.9	10	.1	.2		.6	1,210
26	24	46	0	0	.4	.7	300	.1	.1		.4	1,320
27	58	14	0	0	.2	.4	400	0	0		.3	1,370
28	18	6.9	0	0	.2	.2	*563	0	0		.2	1,230
29	5.4	4	0	0	.1	.2	217	0	0		.2	900
30	2.3	1.8	0	81	----------	.1	*46	346	0		.3	524
31	.2	----------	0	329	----------	.1	----------	795	----------		.3	----------
Total	1,119.4	1,475.5	147.0	410	2,994.5	108.1	1,566.4	3,068.1	4,089.9	0	965.7	9,183.1
Mean	36.1	49.2	4.74	13.2	103	3.49	52.2	99.0	136	0	31.2	306
Ac-ft	2,220	2,930	292	813	5,940	214	3,110	6,090	8,110	0	1,920	18,210

Calendar year 1963: Max 724 Min 0 Mean 24.1 Ac-ft 17,450
Water year 1963-64: Max 1,370 Min 0 Mean 68.7 Ac-ft 49,850

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
9-27	1400	20.47	1,420

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record Oct. 1-16, Nov. 29, Mar. 9-11, Apr. 18-27, May 19-29.

7-3155. Red River near Terral, Okla.

Location.--Lat 33°52'50", long 97°56'15", near left bank on downstream side of pier of bridge on U. S. Highway 81, a quarter of a mile downstream from Chicago, Rock Island and Pacific Railroad Co. bridge, 1.2 miles south of Terral, Jefferson County, and 3.2 miles downstream from Little Wichita River.

Drainage area.--28,723 sq mi, of which 5,936 sq mi is probably noncontributing.

Records available.--January 1938 to September 1964. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder and wire-weight gage read once or twice daily. Datum of gage is 770.31 ft above mean sea level, datum of 1929. Prior to Jan. 12, 1939, wire-weight gage at same site and datum.

Average discharge.--26 years, 2,434 cfs (1,762,000 acre-ft per year).

Extremes.--Maximum discharge during year, 11,400 cfs Sept. 24 (gage height, 14.31 ft); minimum, 83 cfs Sept. 14.
1938-64: Maximum discharge, 197,000 cfs June 8, 1941 (gage height, 28.12 ft); minimum, 43 cfs Mar. 15, 1939.
Maximum stage known, that of June 8, 1941. Flood of May 19, 1935, reached a stage of 27.2 ft; floods in 1891 and May 1, 1908, are reported to have reached about the same stage.

Remarks.--Records good except those for periods of ice effect, which are fair. Some regulation by Lake Kemp on Wichita River (capacity, 461,800 acre-ft), Lake Kickapoo on North Fork Little Wichita River (capacity, 106,000 acre-ft), Lake Altus on North Fork Red River (capacity, 142,900 acre-ft), Lake Lawtonka on Medicine Creek (capacity, 63,000 acre-ft), Lake Thomas on Little Medicine Creek (capacity, 8,300 acre-ft), and Lake Ellsworth on East Cache Creek (capacity, 94,500 acre-ft). Principal diversions are from Wichita River for irrigation of about 20,000 acres in the vicinity of Wichita Falls, Tex., and from North Fork Red River for irrigation of about 48,000 acres in vicinity of Altus, Okla. Many small diversions for irrigation above station; amount of these diversions for acreage irrigated not known. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see station 7-3082.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	188	221	256	164	470	224	158	401	3,760	273	158	186
2	174	183	237	166	455	218	156	312	5,200	263	148	169
3	166	166	218	180	342	209	158	256	2,570	246	156	137
4	154	156	203	177	319	206	172	218	1,620	234	158	115
5	141	*146	194	172	559	209	230	197	1,180	218	151	108
6	139	139	188	169	2,490	206	256	194	782	203	148	104
7	130	130	180	169	4,980	191	273	174	545	188	139	100
8	121	119	166	174	3,730	194	280	291	*406	183	141	97
9	113	111	158	174	2,300	259	256	3,930	338	172	141	93
10	108	110	169	169	1,470	308	224	3,610	290	158	144	92
11	102	113	200	169	980	388	183	2,700	256	144	139	106
12	98	113	194	140	*807	*445	164	*2,530	266	137	*146	108
13	98	110	206	100	704	370	154	2,300	362	137	148	98
14	102	108	212	90	614	290	144	1,220	952	*137	146	*90
15	104	106	212	100	545	234	137	1,060	2,120	137	161	98
16	102	102	197	*130	490	203	132	1,020	1,440	134	186	372
17	*95	97	*188	140	440	186	130	1,100	3,140	144	230	542
18	98	92	177	166	401	186	121	835	3,380	132	1,170	1,070
19	102	119	164	148	366	212	115	496	1,720	123	1,180	1,220
20	106	337	164	141	350	215	113	460	1,220	117	1,270	1,020
21	130	559	156	137	334	200	169	375	933	119	622	680
22	263	1,140	110	132	315	218	256	334	856	130	406	793
23	322	877	100	130	297	212	186	280	638	141	283	2,680
24	401	746	140	128	276	221	161	230	470	130	209	9,650
25	338	680	180	126	*259	212	158	*174	*384	123	161	7,280
26	218	*535	183	121	243	*203	543	154	379	115	132	4,730
27	203	460	172	117	230	203	*2,960	172	401	115	*110	6,010
28	200	370	161	115	227	203	2,610	180	401	126	187	*5,530
29	197	312	156	*132	224	197	1,090	183	330	*130	198	4,790
30	*338	283	*158	212	----------	180	590	1,450	297	141	132	3,690
31	273	----------	164	440	----------	166	----------	4,870	----------	154	172	----------
Total	5,324	8,740	5,553	4,828	25,217	7,168	12,279	31,706	41,636	4,904	8,872	51,758
Mean	172	291	179	156	870	231	409	1,023	1,388	158	286	1,725
Ac-ft	10,560	17,340	11,030	9,580	50,020	14,220	24,360	62,890	82,580	9,730	17,600	102,700

Calendar year 1963: Max 25,800 Min 92 Mean 778 Ac-ft 563,200
Water year 1963-64: Max 9,650 Min 90 Mean 568 Ac-ft 412,600

Peak discharge (base, 21,000 cfs).--No peak above base.

* Discharge measurement made on this day.
Note.--Stage-discharge relation affected by ice Dec. 22-24, Jan. 12-17.

7-3160. Red River near Gainesville, Tex.

Location.--Lat 33°43'40", long 97°09'35", in SW¼ sec. 36, T. 9 S., R. 1 E., near center of span on downstream side of bridge on U. S. Highway 77, a quarter of a mile downstream from Gulf, Colorado and Santa Fe Railway Co. bridge, 5 miles downstream from Fish Creek, and 7 miles north of Gainesville.

Drainage area.--30,782 sq mi, of which 5,936 sq mi is probably noncontributing.

Records available.--May 1936 to September 1964. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Datum of gage is 627.91 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Jan. 17, 1939, wire-weight gage at same site and datum.

Average discharge.--28 years, 3,011 cfs (2,180,000 acre-ft per year).

Extremes.--Maximum discharge during year, 12,300 cfs Sept. 26 (gage height, 14.12 ft); minimum daily, 86 cfs July 24.
1936-64: Maximum discharge, 168,000 cfs June 9, 1941; maximum gage height, 26.53 ft May 21, 1951; minimum discharge observed, 48 cfs Jan. 27, 1940 (result of discharge measurement during period of ice effect).

Remarks.--Records good except those computed from wire-weight gage readings or ice effect, which are fair. Discharge measurements generally made twice a month; more frequently during rises. Flow slightly regulated by Lake Kemp (station 7-3120), since 1943 by Lake Altus, in Oklahoma, and since 1946 by Lake Kickapoo (station 7-3140).

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey, District Office, Oklahoma City, Okla.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 28 to May 1, May 11-13, June 1 to Aug. 19, Aug. 27 to Sept. 30)

6.9	80	11.0	3,970
7.2	145	12.0	6,020
7.9	420	13.0	9,200
8.9	1,090	13.5	11,700
9.9	2,150		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	286	157	350	169	226	254	192	1,190	1,830	395	94	825
2	254	250	298	163	246	278	196	720	4,560	358	94	395
3	214	230	262	163	450	250	298	518	6,480	322	96	375
4	182	210	242	163	548	286	278	420	4,510	298	104	290
5	169	175	218	169	554	278	250	400	2,510	282	104	250
6	160	169	210	169	455	238	234	380	1,650	258	106	206
7	148	154	189	169	506	222	196	346	1,230	242	106	175
8	140	140	163	172	3,890	222	254	358	946	222	108	142
9	120	130	163	160	4,420	326	450	390	713	210	120	132
10	116	116	200	160	3,160	290	370	638	584	192	120	125
11	110	112	218	160	2,150	266	322	3,410	500	182	110	118
12	106	100	226	160	1,550	302	282	3,880	440	169	98	114
13	102	98	230	b115	1,190	430	242	2,910	380	154	96	110
14	96	102	238	b110	986	494	200	2,510	338	132	92	110
15	90	100	234	b110	818	455	186	2,080	310	128	104	110
16	90	100	214	151	699	366	172	1,230	626	116	112	904
17	94	110	218	151	602	298	166	1,010	1,770	114	135	1,040
18	96	112	218	148	548	258	163	930	1,450	112	210	1,600
19	98	182	210	148	488	334	157	938	2,360	112	258	1,710
20	98	242	b200	154	440	290	157	839	3,160	112	734	1,890
21	94	258	b180	157	410	238	166	632	1,710	112	1,190	3,100
22	94	206	b150	157	375	218	154	500	1,240	108	1,200	3,200
23	94	362	b130	151	366	218	169	410	986	92	839	2,670
24	110	832	b160	145	354	214	410	350	888	86	512	2,590
25	196	881	175	140	342	206	1,060	310	769	88	400	5,340
26	314	720	178	138	326	206	620	266	620	94	326	11,500
27	370	657	175	130	310	206	1,320	234	512	94	1,100	9,490
28	306	560	175	125	286	206	1,010	234	465	94	2,080	6,230
29	210	460	175	138	270	203	2,150	250	440	94	1,770	8,220
30	178	400	172	172	----------	200	2,220	338	445	94	2,150	7,140
31	166	----------	169	214	----------	200	----------	664	----------	92	2,010	----------
Total	4,901	8,325	6,340	4,731	26,965	8,452	14,044	29,285	44,422	5,158	16,578	70,101
Mean	158	278	205	153	930	273	468	945	1,481	166	535	2,337
Ac-ft	9,720	16,510	12,580	9,380	53,480	16,760	27,860	58,090	88,110	10,230	32,880	139,000

Calendar year 1963: Max 23,100 Min 90 Mean 814 Ac-ft 589,300
Water year 1963-64: Max 11,500 Min 86 Mean 654 Ac-ft 474,600

Peak discharge (base, 24,000 cfs).--No peak above base.
b Stage-discharge relation affected by ice.
Note.--Discharge computed from once-daily wire-weight gage readings Oct. 6 to Nov. 19, Dec. 4-10, 21-25, Jan. 3 to Feb. 1, Apr. 5-8, 15-23, May 4-9, 21-31, June 8-16, June 23 to Aug. 20, Aug. 23 to Sept. 17, Sept. 21.

7-3315. Lake Texoma near Denison, Tex.

Location.--Lat 33°49'05", long 96°34'20", in NE¼ sec. 33, T. 8 S., R. 7 E., Indian meridian, in control tower of Denison Dam on Red River, 1 mile upstream from Shawnee Creek, 1⅞ miles upstream from Sand Creek, and 4 miles northwest of Denison.

Drainage area.--39,719 sq mi, of which 5,936 sq mi is probably noncontributing.

Records available.--July 1942 to September 1964. Month-end contents only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Mar. 30, 1944, staff or wire-weight gage at same site and datum. Prior to Oct. 1, 1948, auxiliary staff gage in Cumberland pool at same datum.

Extremes.--Maximum contents during year, 2,033,900 acre-ft Oct. 1 (elevation, 608.13 ft); minimum, 1,565,100 acre-ft Sept. 16 (elevation, 600.42 ft).
1942-64: Maximum contents, 5,991,300 acre-ft June 5, 1957 (elevation, 643.18 ft), from capacity table then in use; minimum since power-pool first reached, that of Sept. 16, 1964; minimum elevation, 599.96 ft Mar. 1-2, 1957.

Remarks.--Lake is formed by a rolled-fill earth dam. Flow was diverted through conduits July 27, 1942; regulated storage began Oct. 31, 1943; maximum power-pool stage was first reached Mar. 15, 1945. Capacity, 5,392,900 acre-ft (elevation, 640.0 ft, crest of spillway) based on 1962 survey, and 2,733,300 acre-ft (elevation, 617.0 ft, maximum power pool). Dead and sediment storage, 1,049,200 acre-ft (elevation, 590.0 ft, Denison pool). When contents are below 2,167,900 acre-ft, the lake is divided into two pools by protective levees around the Cumberland oilfield on the Washita River arm with bottom of outlet channel for the upper pool (known as Cumberland pool) at elevation 610 ft. At higher elevations the two pools are considered as being at a common level, contents being computed from gage in the Denison pool. Lake is used principally for flood control and power development. Figures given herein represent total contents of both pools. Revised capacity table, based on survey in 1962, used since Oct. 1, 1963.

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey,

Capacity table (elevation, in feet, and contents, in thousands of acre-feet)

600	1,542.8	605	1,828.2
601	1,596.3	607	1,956.7
603	1,707.6	609	2,095.3

Contents, in thousands of acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2,031.8	1,946.7	1,898.3	1,841.3	1,780.8	1,763.2	1,754.8	1,760.8	1,838.8	1,870.3	1,699.5	1,604.4
2	2,029.7	1,943.4	1,896.4	1,840.7	1,779.0	1,764.4	1,753.6	1,762.6	1,843.8	1,864.6	1,697.2	1,601.2
3	2,026.9	1,941.4	1,895.1	1,840.7	1,777.8	1,765.0	1,755.4	1,765.0	1,847.0	1,857.7	1,689.2	1,597.9
4	2,022.7	1,942.1	1,893.9	1,839.4	1,779.0	1,765.6	1,763.2	1,763.8	1,855.8	1,855.8	1,681.8	1,593.1
5	2,019.3	1,942.1	1,891.9	1,838.8	1,779.0	1,763.8	1,763.2	1,763.2	1,861.5	1,848.9	1,671.5	1,590.9
6	2,017.9	1,939.4	1,889.4	1,837.6	1,779.0	1,763.8	1,763.8	1,762.6	1,863.4	1,841.3	1,664.2	1,588.7
7	2,014.4	1,933.5	1,888.7	1,835.0	1,779.0	1,764.4	1,763.8	1,760.8	1,865.3	1,836.3	1,655.8	1,585.5
8	2,009.6	1,930.2	1,888.7	1,831.9	1,779.0	1,771.1	1,758.4	1,760.8	1,862.8	1,828.2	1,648.0	1,582.3
9	2,004.1	1,930.2	1,888.1	1,828.8	1,784.5	1,776.6	1,754.2	1,760.8	1,861.5	1,818.3	1,645.8	1,576.3
10	1,998.6	1,930.2	1,887.5	1,828.2	1,791.2	1,776.6	1,754.2	1,765.6	1,857.1	1,810.8	1,638.2	1,573.1
11	1,995.2	1,928.2	1,885.5	1,828.2	1,791.2	1,776.6	1,752.4	1,777.8	1,851.4	1,804.6	1,632.1	1,573.1
12	1,991.8	1,925.6	1,884.9	1,828.2	1,793.6	1,774.1	1,757.2	1,795.5	1,847.0	1,802.8	1,624.4	1,571.5
13	1,989.0	1,921.6	1,882.3	1,822.0	1,794.2	1,772.9	1,753.0	1,808.4	1,842.0	1,800.4	1,615.7	1,568.8
14	1,985.6	1,916.4	1,878.5	1,818.9	1,794.2	1,772.9	1,751.2	1,814.6	1,840.7	1,794.2	1,611.4	1,567.7
15	1,979.5	1,912.6	1,877.9	1,815.2	1,795.5	1,772.9	1,744.0	1,819.5	1,840.1	1,788.2	1,607.1	1,565.6
16	1,974.1	1,912.6	1,874.1	1,809.0	1,796.1	1,774.1	1,739.3	1,825.7	1,870.9	1,780.2	1,606.6	1,595.2
17	1,972.8	1,915.2	1,870.3	1,802.2	1,797.9	1,774.7	1,734.0	1,823.2	1,882.3	1,773.5	1,602.8	1,602.2
18	1,970.8	1,913.2	1,866.5	1,797.3	1,800.4	1,777.2	1,732.2	1,820.1	1,882.3	1,769.8	1,606.0	1,606.6
19	1,970.1	1,911.9	1,863.4	1,797.3	1,796.1	1,790.0	1,732.2	1,820.1	1,882.3	1,768.6	1,596.8	1,607.1
20	1,966.8	1,911.9	1,862.8	1,797.3	1,794.2	1,791.8	1,732.2	1,822.0	1,882.3	1,763.8	1,593.6	1,612.0
21	1,966.1	1,908.0	1,859.6	1,797.3	1,788.8	1,794.9	1,729.8	1,824.5	1,886.2	1,757.8	1,592.5	1,632.1
22	1,964.7	1,906.7	1,858.3	1,797.3	1,782.0	1,793.6	1,728.0	1,827.0	1,884.9	1,752.4	1,598.5	1,646.4
23	1,960.0	1,904.8	1,850.2	1,795.5	1,779.0	1,791.2	1,728.6	1,828.2	1,884.3	1,751.2	1,599.0	1,651.9
24	1,960.0	1,902.2	1,849.5	1,793.6	1,775.3	1,790.0	1,734.0	1,828.2	1,883.6	1,745.2	1,601.7	1,662.0
25	1,960.0	1,900.9	1,847.0	1,791.2	1,772.3	1,786.3	1,743.4	1,823.9	1,883.0	1,745.2	1,599.0	1,664.8
26	1,958.7	1,899.6	1,847.0	1,790.6	1,768.6	1,777.2	1,751.8	1,820.1	1,881.1	1,741.0	1,596.3	1,678.3
27	1,958.7	1,899.6	1,845.7	1,790.0	1,766.2	1,777.2	1,752.4	1,819.5	1,881.1	1,735.1	1,594.7	1,722.2
28	1,956.0	1,899.6	1,845.7	1,786.3	1,763.2	1,773.5	1,754.8	1,816.4	1,881.1	1,725.7	1,593.6	1,743.4
29	1,951.3	1,899.0	1,845.1	1,785.1	1,763.2	1,772.9	1,755.4	1,822.0	1,878.5	1,715.7	1,594.7	1,760.8
30	1,948.0	1,898.3	1,842.6	1,783.9	----------	1,768.6	1,759.0	1,833.8	1,874.1	1,709.9	1,597.9	1,777.2
31	1,947.4	----------	1,841.3	1,782.0	----------	1,761.4	----------	1,837.6	----------	1,701.8	1,603.3	----------
(†)	606.86	606.11	605.21	604.25	603.94	603.91	603.87	605.15	605.73	602.90	601.13	604.17
(‡)	-86.5	-49.1	-57.0	-59.3	-18.8	-1.8	-2.4	+78.6	+36.5	-172.3	-98.5	+173.9

Calendar year 1963..... ‡ -746.2
Water year 1963-64..... ‡ -256.7

† Elevation, in feet, at end of month.
‡ Change in contents, in thousands of acre-feet.
Note.--New capacity table put into use Oct. 1, 1963. Contents Sept. 30, 1963, by new capacity table, 2,033,900 acre-ft.

7-3316. Red River at Denison Dam, near Denison, Tex.

Location.--Lat 33°49'08", long 96°33'47", on right bank 1,800 ft downstream from Denison Dam powerhouse, 0.4 mile upstream from Shawnee Creek (spillway flow return), and 4½ miles north of Denison, Grayson County.
Drainage area.--39,720 sq mi, of which 5,936 sq mi is probably noncontributing.
Records available.--October 1923 to September 1964. Monthly discharge only for some periods, published in WSP 1311. Prior to October 1934, published as "near Denison, Tex.," and October 1934 to September 1961, published as "near Colbert, Okla." Gage-height records collected at various sites in this vicinity 1892-93, 1906-28, 1931-49, are contained in reports of U. S. Weather Bureau.
Gage.--Water-stage recorder. Datum of gage is 500.00 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Oct. 9, 1923, to Sept. 24, 1934, chain gage, and July 29, 1942, to Sept. 30, 1961, water-stage recorder at site 2.5 miles downstream at datum 6.85 ft higher prior to Oct. 1, 1931, at datum 7.07 ft higher Oct. 1, 1931, to Sept. 24, 1934, and at datum 2.64 ft lower July 29, 1942, to Sept. 30, 1961. Sept. 25, 1934, to July 28, 1942, water-stage recorder at site 1.9 miles downstream at datum 7.36 ft higher.
Average discharge.--41 years, 5,058 cfs (3,662,000 acre-ft per year).
Extremes.--Maximum discharge during year, 10,700 cfs July 8 (gage height, 8.82 ft); minimum daily, 60 cfs Sept. 15-17.
1923-64: Maximum discharge, 201,000 cfs May 21, 1935; maximum gage height, 24.14 ft Apr. 25, 1942 (site and datum then in use); minimum daily discharge, 12 cfs Jan. 10, 1944.
Maximum stage known, 45.5 ft May 26, 1908, site and datum used July 29, 1942, to Sept. 30, 1961, from records of U. S. Weather Bureau.
Remarks.--Records good. Flow regulated since Oct. 31, 1943, by Lake Texoma (see preceding page). No flow over spillway during year.
Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey, District Office, Oklahoma City, Okla.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 2 to Nov. 5, Jan. 12, Feb. 16-18, Apr. 1, Sept. 11-15, 18-19, 29-30; backwater from Shawnee Creek Sept. 16-17, 27-28)

1.9	57	3.5	900
2.3	133	4.0	1,460
2.6	218	6.0	4,350
2.9	390	6.3	4,890

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,780	338	91	140	138	125	*1,720	671	1,670	2,830	229	2,020
2	747	99	846	574	1,270	463	3,140	78	1,620	*2,920	706	2,730
3	1,730	67	531	668	1,530	345	3,340	71	3,150	2,600	3,900	2,220
4	*2,010	*386	1,020	430	3,030	855	546	*738	2,460	1,630	3,900	3,010
5	1,300	456	1,140	120	1,520	850	133	1,290	1,400	2,140	4,300	1,320
6	300	1,180	*1,510	599	868	983	2,920	2,170	2,060	3,460	4,300	842
7	2,000	2,070	130	1,340	1,390	1,190	3,150	3,320	180	3,690	4,800	1,520
8	2,000	*2,010	84	1,340	147	123	2,480	3,230	2,850	4,090	4,120	2,510
9	2,120	238	1,140	1,360	586	1,850	*2,240	200	3,360	3,910	544	2,750
10	2,140	95	1,980	1,260	470	973	804	84	3,380	3,440	3,200	1,960
11	1,580	762	2,450	167	2,300	860	304	3,120	*3,310	2,480	3,400	176
12	1,910	884	2,280	126	2,370	962	368	3,160	3,780	188	2,760	67
13	427	841	1,630	892	*1,040	3,050	1,950	2,420	2,750	1,200	2,450	*63
14	1,050	1,060	846	1,060	1,450	277	1,590	*2,380	245	2,540	3,400	70
15	2,900	990	115	3,740	562	99	*3,360	2,410	1,840	2,860	2,460	60
16	1,930	129	1,790	3,640	152	*80	2,030	1,290	1,790	3,500	234	60
17	362	91	1,140	3,510	*540	80	2,830	115	1,960	3,220	2,520	60
18	94	924	3,010	2,020	402	80	1,560	1,900	2,830	1,800	2,350	68
19	346	1,520	*1,590	267	1,950	286	107	2,490	*3,270	142	*3,220	2,320
20	353	1,220	1,390	376	2,040	180	2,990	2,540	1,860	1,370	2,920	1,010
21	*101	*2,420	1,070	418	2,220	113	780	2,660	1,430	1,950	3,380	2,380
22	1,080	349	1,530	321	3,380	87	2,150	2,200	2,340	1,220	372	2,720
23	1,510	514	2,580	484	2,450	1,640	*2,800	1,380	2,330	*1,090	95	2,560
24	326	3,180	692	*3,210	1,800	3,740	2,550	2,060	748	2,500	914	555
25	84	432	158	654	*1,930	*3,200	152	2,760	1,560	106	2,790	1,790
26	780	528	882	112	2,430	2,750	75	2,030	1,650	379	2,940	142
27	440	508	588	956	1,700	2,460	1,340	2,070	160	3,670	2,930	80
28	681	112	312	1,190	1,030	688	105	152	219	*4,410	3,100	70
29	482	575	134	2,270	413	87	361	1,950	1,020	4,310	2,670	80
30	548	108	*1,060	2,650	----------	2,330	77	190	2,600	4,370	232	103
31	339	----------	607	*2,130	----------	2,740	----------	99	----------	3,760	809	----------
Total	33,450	24,086	34,326	38,024	41,108	33,546	47,952	51,228	59,822	77,775	75,945	35,316
Mean	1,079	803	1,107	1,227	1,418	1,082	1,598	1,653	1,994	2,509	2,450	1,177
Ac-ft	66,350	47,770	68,080	75,420	81,540	66,540	95,110	101,600	118,700	154,300	150,600	70,050

Calendar year 1963: Max 7,670 Min 65 Mean 2,060 Ac-ft 1,491,000
Water year 1963-64: Max 4,800 Min 60 Mean 1,510 Ac-ft 1,096,000

* Discharge measurement made on this day.

7-3326. Bois d'Arc Creek near Randolph, Tex.

Location.--Lat 33°28'30", long 96°12'55", on right bank at downstream side of bridge on Farm Road 1281, 2.3 miles upstream from Henson Creek, and 2.4 miles east of Randolph, Fannin County.

Drainage area.--72 sq mi.

Records available.--November 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 564.38 ft above mean sea level, datum of 1929 (State Highway Department bench mark).

Extremes.--Maximum discharge during year, 6,310 cfs Sept. 27 (gage height, 13.75 ft); no flow most of time.
1962-64: Maximum discharge, that of Sept. 27, 1964; no flow at times.
Maximum stage since at least 1922, 24.6 ft about 1935, from information by State Highway Department and local resident.

Remarks.--Records good except those for period of no gage-height record, which are fair. No diversion or regulation above station. Recording rain gage located at station.

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

Oct. 1 to Apr. 22				Apr. 23 to Sept. 30			
2.2	0	3.0	15	2.1	0	3.0	24
2.3	.2	3.2	28	2.2	.2	3.2	40
2.4	.7	3.5	59	2.3	.7	3.5	73
2.5	1.4	4.0	134	2.4	1.7	4.0	150
2.6	2.6	4.5	234	2.5	3.4	5.0	390
2.8	6.6			2.6	5.8	6.0	765
				2.7	8.9	7.0	1,280
				2.8	13	10.0	3,460

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	0.1	199	19	0.4	0	0
2						.1	.1	262	*12	.4	0	0
3						.1	.1	20	8.9	.3	*0	0
4						.1	.1	10	7.2	.2	0	0
5						.1	6.5	8.2	6.0	.1	0	0
6						.1	.3	*18	5.4	0	0	0
7	(*)					.1	a.2	30	4.4	*0	0	0
8						1.3	a.2	265	3.2	0	0	0
9						19.5	a.2	89	2.2	0	0	0
10						.7	a.2	27	1.6	0	0	*0
11						.2	a.1	18	1.3	0	0	0
12		(*)				.1	a.1	13	1.0	0	0	0
13						0	a2.0	9.6	.7	0	0	0
14						0	a.5	7.8	.4	0	0	0
15			(*)			0	a.4	6.6	.5	0	0	0
16						0	a.3	5.8	1,240	0	1.1	259
17						0	a.2	4.7	202	0	.2	255
18						0	a.1	4.0	22	0	.1	4.4
19						160	a.1	3.4	10	0	0	1.0
20				(*)		19	a.1	3.0	6.4	0	0	.7
21						2.3	a3.0	2.5	4.4	0	0	1,420
22						1.0	a10	2.2	3.4	0	0	148
23						.7	972	1.7	2.5	0	0	230
24					(*)	.5	152	1.6	2.0	0	0	24
25						.4	123	1.4	1.5	0	0	13
26						.2	57	1.0	1.3	0	0	10
27						.1	22	.7	1.2	0	0	2,850
28						.1	9.6	.5	.9	0	0	204
29						.1	7.0	1.6	.7	0	0	53
30					----------	0	3.6	347	.5	0	0	35
31		----------			----------	*.1	----------	50	----------	0	0	----------
Total	0	0	0	0	0	206.9	1,371.1	1,414.3	1,572.6	1.4	1.4	5,507.1
Mean	0	0	0	0	0	6.67	45.7	45.6	52.4	0.05	0.05	184
Ac-ft	0	0	0	0	0	410	2,720	2,810	3,120	2.8	2.8	10,920

Calendar year 1963: Max 1,040 Min 0 Mean 9.88 Ac-ft 7,160
Water year 1963-64: Max 2,850 Min 0 Mean 27.5 Ac-ft 19,990

Peak discharge (base, 1,500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-23	2030	13.41	6,010	9-21	0700	12.30	5,180
6-16	1800	13.73	6,240	9-27	1230	13.75	6,310

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.

7-3355. Red River at Arthur City, Tex.

Location.--Lat 33°52'30", long 95°30'10", in NW¼ sec. 11, T. 8 S., R. 17 E., near right bank on downstream side of pier of bridge on U. S. Highway 271 at Arthur City, 10.6 miles downstream from Muddy Boggy River and 26.0 miles upstream from Kiamichi River.

Drainage area.--44,531 sq mi, of which 5,936 sq mi is probably noncontributing.

Records available.--January to September 1905 (gage heights and discharge measurements only), October 1905 to December 1911, July 1936 to September 1964. Monthly discharge only for some periods, published in WSP 1311. Gage-height records collected at same site since 1891 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 380.07 ft above mean sea level, datum of 1929. During 1905-11, staff gage at St. Louis-San Francisco Railway Co. bridge 200 ft upstream at same datum. July 1, 1936, to Mar. 24, 1940, wire-weight gage at present site and datum.

Average discharge.--34 years (1905-11, 1936-64), 8,385 cfs (6,070,000 acre-ft per year).

Extremes.--Maximum discharge during year, 28,200 cfs Sept. 29 (gage height, 16.15 ft); minimum, 220 cfs Nov. 7 (gage height, 5.21 ft).
1905-11, 1936-64: Maximum discharge, about 400,000 cfs May 28, 1908 (gage height, 43.2 ft), from rating curve extended above 41,000 cfs on basis of records for later years; minimum, 130 cfs Dec. 11, 12, 1956 (gage height, 4.49 ft).
Maximum stage known, that of May 28, 1908.

Remarks.--Records good. Discharge measurements generally made three or more times a month. Some regulation since Oct. 31, 1943, by Lake Texoma (station 7-3315), 92.8 miles above station.

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey, District Office, Oklahoma City, Okla.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	415	595	550	500	2,260	1,860	1,010	1,270	6,150	678	4,060	2,880
2	305	550	425	702	2,320	1,520	2,440	1,420	3,080	1,090	3,720	1,220
3	255	545	505	850	1,860	1,140	2,680	2,380	1,640	2,380	2,680	1,040
4	808	470	330	636	906	899	2,940	2,750	1,910	2,620	952	1,860
5	843	430	390	515	1,370	794	10,100	1,270	2,140	2,680	1,030	2,380
6	1,320	295	618	738	2,260	732	12,400	815	2,940	2,260	3,240	2,200
7	1,580	240	768	714	2,680	857	11,100	984	2,260	1,740	3,630	2,500
8	1,320	375	1,060	580	1,960	1,060	10,100	1,580	1,740	2,320	3,880	1,420
9	850	690	1,270	495	1,470	2,810	7,940	3,160	1,860	3,080	4,060	1,090
10	1,580	1,470	836	992	1,690	5,610	4,650	5,390	1,060	3,380	4,310	1,520
11	1,800	1,640	585	1,370	960	7,810	3,540	5,960	2,440	3,630	2,750	2,200
12	1,910	780	815	1,420	744	6,150	2,940	6,760	3,010	3,160	1,370	2,260
13	1,910	410	2,020	565	984	3,310	1,860	8,460	3,080	2,820	2,750	1,800
14	1,580	345	2,440	714	2,200	2,200	1,270	10,100	3,080	2,020	2,820	829
15	1,690	654	2,020	460	2,260	2,320	1,320	8,340	2,880	836	2,440	485
16	892	774	1,740	405	1,470	2,620	2,140	4,310	3,080	1,070	2,620	2,200
17	1,090	913	1,180	1,860	1,520	1,220	2,560	3,240	9,370	2,200	3,080	6,760
18	2,080	944	708	3,630	1,050	794	3,080	2,820	21,200	2,680	2,140	9,840
19	1,740	654	1,140	3,540	684	1,040	2,750	1,910	18,700	2,940	1,220	7,230
20	864	490	1,800	2,820	580	5,020	2,880	1,220	11,600	2,680	2,260	2,880
21	530	575	2,020	2,020	708	11,100	1,800	2,140	10,100	1,740	2,750	2,020
22	390	1,180	1,470	976	1,640	6,910	1,460	2,620	10,100	1,800	4,310	6,060
23	425	1,370	1,220	642	2,140	2,940	7,600	2,680	8,460	2,320	5,010	16,100
24	415	1,860	1,180	630	2,560	1,690	7,600	2,620	3,890	1,640	4,650	16,200
25	570	968	1,960	580	2,940	1,180	12,300	2,140	2,750	1,270	1,690	11,900
26	1,090	864	1,800	913	2,380	2,140	12,200	1,740	2,380	1,370	850	6,550
27	762	1,960	984	2,020	2,020	3,240	8,020	2,260	1,420	1,910	2,320	5,460
28	490	1,040	690	984	2,140	3,310	5,770	2,620	1,740	801	3,880	18,700
29	465	660	678	660	2,260	3,080	2,680	2,200	1,690	794	5,390	26,800
30	570	624	762	642	----------	2,440	2,140	2,880	944	3,160	4,650	17,700
31	565	----------	595	1,320	----------	1,420	----------	4,310	----------	3,970	3,970	----------
Total	31,104	24,365	34,559	34,893	50,016	89,216	151,270	102,349	146,694	67,039	94,482	182,084
Mean	1,003	812	1,115	1,126	1,725	2,878	5,042	3,302	4,890	2,163	3,048	6,070
Ac-ft	61,690	48,330	68,550	69,210	99,210	177,000	300,000	203,000	291,000	133,000	187,400	361,200

Calendar year 1963: Max 20,500 Min 240 Mean 2,785 Ac-ft 2,016,000
Water year 1963-64: Max 26,800 Min 240 Mean 2,754 Ac-ft 2,000,000

7-3368. Pecan Bayou near Clarksville, Tex.

Location.--Lat 33°41'07", long 94°59'41", on right bank at downstream side of bridge on Farm Road 1159, 0.2 mile downstream from Tanyard Bayou, 4.3 miles upstream from Little White Oak Creek, and 6.0 miles northeast of Clarksville, Red River County.

Drainage area.--100 sq mi.

Records available.--January 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 365.00 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 5,420 cfs Apr. 23 (gage height, 7.99 ft); no flow most of time.
1962-64: Maximum discharge, that of Apr. 23, 1964; no flow at times.
Maximum stage since at least 1910, about 12 ft in 1957, from information by local residents.

Remarks.--Records fair. No diversion above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3					0	21	22	1.8	0.3		0
2	.2					.3	*15	10	4.3	.2		0
3	.2					1.3	12	6.9	4.3	.2		0
4	.1					2.4	10	5.5	3.7	.1	(*)	0
5	.1					3.4	79	4.7	*3.2	0		0
6	.1					3.7	107	4.7	2.8	0		0
7	0					3.7	152	5.5	2.2	0		0
8	*0					3.7	125	8.4	1.8	*0		0
9	0					156	43	*23	1.5	0		0
10	0					200	18	75	1.3	0		0
11	0					324	12	89	1.0	0		0
12	0					195	9.6	32	.7	0		*0
13	0	(*)				77	9.0	9.6	.5	0		0
14	0					32	7.9	5.9	.4	0		0
15	0					21	7.9	5.1	.4	0		0
16	0					17	6.9	5.1	1.8	0		.1
17	0					14	6.4	5.1	2.8	0		8.4
18	0					13	6.9	4.7	2.4	0		0
19	0					14	6.9	4.7	2.0	0		.2
20	0		(*)			15	7.9	4.0	1.8	0		0
21	0			(*)		40	25	3.7	2.6	0		0
22	0					65	911	3.2	2.8	0		0
23	0					37	*3,760	2.8	2.6	0		0
24	0					24	*1,400	2.4	2.2	0		0
25	0					32	*790	1.8	1.7	0		0
26	0				(*)	25	742	1.3	1.3	0		0
27	0					18	730	1.0	1.1	0		20
28	0					21	631	.7	.7	0		106
29	0					24	290	.6	.6	0		34
30	0				----------	21	93	1.7	.4	0		39
31	0	---------			----------	23	----------	1.7	----------	0		----------
Total	1.0	0	0	0	0	1,426.5	10,035.4	351.8	56.7	0.8	0	207.7
Mean	0.03	0	0	0	0	46.0	336	11.3	1.89	0.03	0	6.92
Cfsm	0.0003	0	0	0	0	0.460	3.36	0.113	0.019	0.0003	0	0.069
In.	0.0004	0	0	0	0	0.53	3.73	0.13	0.02	0.0003	0	0.08
Ac-ft	2.0	0	0	0	0	2,830	19,910	698	112	1.6	0	412

Calendar year 1963: Max 630 Min 0 Mean 18.5 Cfsm 0.185 In. 2.52 Ac-ft 13,430
Water year 1963-64: Max 3,760 Min 0 Mean 33.0 Cfsm 0.330 In. 4.49 Ac-ft 23,960

Peak discharge (base, 800 cfs)

Date	Time	Gage height	Discharge
4-23	0400	7.99	5,420

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

7-3370. Red River at Index, Ark.

Location.--Lat 33°33'05", long 94°02'25", in SW¼ sec. 7, T. 14 S., R. 28 W., near right bank on downstream side of pier of bridge on U. S. Highway 71 at Index, 2¼ miles south of Ogden and 20.6 miles upstream from Little River.

Drainage area.--48,030 sq mi, of which 5,936 sq mi is probably noncontributing.

Records available.--July 1936 to September 1964. Gage-height records collected at same site since 1917 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 246.87 ft above mean sea level, datum of 1929. Prior to Dec. 12, 1939, wire-weight gage at same site and datum.

Average discharge.--28 years, 12,180 cfs (8,818,000 acre-ft per year).

Extremes.--Maximum discharge during year, 37,400 cfs Apr. 27 (gage height, 15.18 ft); minimum, 730 cfs Nov. 12-13.
1936-64: Maximum discharge, 297,000 cfs Feb. 23, 1938 (gage height, 34.25 ft); minimum, 378 cfs Nov. 28, 1956.

Remarks.--Records good. Discharge measurements generally made twice a month, more frequently during rises. Some regulation since Oct. 31, 1943, by Lake Texoma, Tex. (capacity, 5,530,300 acre-ft), 241 miles upstream.

Cooperation.--Records furnished by Geological Survey, District Office, Little Rock, Ark.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,540	1,030	1,620	1,340	1,620	2,520	4,340	12,100	3,780	2,240	1,420	13,100
2	1,580	910	1,580	1,160	1,340	2,340	3,940	9,060	4,520	2,290	1,420	9,320
3	1,500	910	1,270	1,160	1,200	2,400	3,210	7,140	5,660	2,020	2,700	7,140
4	1,200	910	1,100	1,100	1,460	2,760	2,700	6,060	6,700	1,720	3,560	5,260
5	1,000	910	1,030	1,000	2,340	3,280	2,940	5,660	5,260	1,460	3,780	3,560
6	910	910	940	970	2,760	3,000	6,660	5,860	3,560	1,760	3,490	2,580
7	855	910	880	1,060	2,820	2,700	22,500	5,460	2,820	2,580	2,640	2,400
8	910	880	830	1,060	2,640	2,290	28,200	4,100	2,760	2,880	1,760	2,760
9	1,130	855	780	970	3,000	2,290	24,600	3,350	3,140	2,820	1,760	2,880
10	1,300	830	830	940	3,420	3,350	17,900	3,070	3,280	2,460	2,820	2,880
11	1,540	780	1,060	970	3,210	12,600	14,100	3,280	2,760	2,240	3,490	2,640
12	1,540	755	1,270	970	2,580	20,200	11,200	4,880	2,580	2,700	3,780	2,070
13	1,340	780	1,540	880	2,340	20,700	8,800	8,560	2,290	3,560	4,020	2,020
14	1,500	1,160	1,540	880	2,240	16,300	7,140	11,800	2,240	3,780	3,860	2,400
15	1,810	1,500	1,300	1,000	1,910	11,800	6,060	12,100	3,000	3,780	2,760	2,460
16	1,960	1,380	1,200	1,240	1,670	9,060	4,880	11,200	3,560	3,420	2,240	2,760
17	1,960	1,100	1,700	1,300	1,760	7,140	4,020	10,700	3,860	2,940	2,760	3,140
18	1,860	970	2,240	1,380	2,400	5,860	3,560	9,320	4,020	2,180	2,820	3,070
19	1,760	940	2,240	1,240	2,400	5,460	3,420	6,700	5,140	1,620	2,760	5,060
20	1,460	1,060	2,070	1,030	2,070	4,260	3,490	5,260	14,600	1,760	3,350	6,920
21	1,380	1,200	1,760	1,500	1,860	3,490	3,940	4,520	18,100	2,400	3,420	9,060
22	1,810	1,300	1,460	2,820	1,670	5,830	5,260	3,700	13,800	2,820	2,700	8,080
23	1,860	1,300	1,420	3,140	1,380	12,500	11,600	3,070	10,900	3,070	2,240	5,260
24	1,460	1,200	1,860	2,820	1,240	11,800	25,200	2,880	10,100	2,700	2,760	3,630
25	1,160	1,030	2,240	2,180	1,200	9,060	32,600	3,350	9,580	1,960	3,860	12,300
26	1,030	1,160	2,070	1,620	1,620	6,700	33,900	3,490	8,320	1,540	5,060	17,500
27	1,000	1,460	1,810	1,270	2,180	5,060	36,600	3,490	5,660	1,620	5,460	15,200
28	940	1,720	1,670	1,130	2,580	4,180	32,000	3,420	3,860	1,720	4,430	13,800
29	940	1,540	2,070	1,060	2,760	3,940	23,400	2,880	3,350	1,620	3,350	18,300
30	1,160	1,340	2,120	1,200	----------	4,340	16,700	3,000	2,640	1,670	7,060	34,600
31	1,200	----------	1,620	1,760	----------	4,520	----------	3,420	----------	1,860	13,800	----------
Total	42,595	32,730	47,120	42,150	61,670	211,730	404,860	182,880	171,840	73,190	111,330	222,150
Mean	1,374	1,091	1,520	1,360	2,127	6,830	13,500	5,899	5,728	2,361	3,591	7,405
Ac-ft	84,490	64,920	93,460	83,600	122,300	420,000	803,000	362,700	340,800	145,200	220,800	440,600

Calendar year 1963: Max 37,400 Min 755 Mean 4,173 Ac-ft 3,021,000
Water year 1963-64: Max 36,600 Min 755 Mean 4,383 Ac-ft 3,182,000

7-3425. South Sulphur River near Cooper, Tex.

Location.--Lat 33°21', long 95°36', on left bank of cut channel at downstream side of bridge on State Highway 154, 0.6 mile downstream from Big Creek, 1.0 mile upstream from Brushy Creek, 3.5 miles downstream from Doctors Creek, and 5.7 miles southeast of Cooper, Delta County.

Drainage area.--527 sq mi.

Records available.--May 1942 to September 1964. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Datum of gage is 374.91 ft above mean sea level, datum of 1929. May 9, 1942, to Nov. 8, 1949, staff gage and Nov. 9, 1949, to May 13, 1955, water-stage recorder, at site 700 ft to right of present gage at same datum.

Average discharge.--22 years, 358 cfs (259,200 acre-ft per year).

Extremes.--Maximum discharge during year, 7,520 cfs May 31 (gage height, 17.71 ft); no flow for many days.
1942-64: Maximum discharge, 23,800 cfs Apr. 29, 1953 (gage height, 23.00 ft); no flow at times.

Remarks.--Records good except during period at channel construction downstream June 1-15, which are fair. Small diversions upstream from station. Records of chemical analyses and water temperature for the water year 1964 are available in the Austin District Office.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0	0.2	0.1	0.2	*1.0	24	5.070	0.6		0
2			0	.2	.1	.4	.9	15	2.220	.4		0
3			0	.2	.1	.7	.8	62	304	.3		0
4			0	.2	.2	1.3	.8	18	*97	.2	(*)	0
5			0	.2	9.9	.9	167	12	39	.1		0
6			0	.2	12	1.0	226	9.0	25	.1		0
7			0	.2	9.8	.8	70	*7.5	16	.1		0
8	(*)		0	.2	4.2	1.0	19	5.8	11	*0		0
9			0	.1	2.2	832	11	166	7.5	0		0
10			0	.1	1.5	1,490	7.0	643	6.1	0		*0
11			0	.1	1.0	1,580	4.3	143	2.9	0		0
12			0	.1	.8	206	3.4	32	1.3	0		0
13		(*)	0	.1	.8	38	2.4	16	.5	0		0
14			0	.1	.6	10	2.0	10	.2	0		0
15			0	.1	.6	12	1.6	6.8	.1	0		0
16			0	.1	.6	8.4	1.1	4.7	120	0		0
17			0	.1	.6	5.8	1.0	3.4	774	0		183
18			0	.1	.8	4.0	1.3	2.3	1,440	0		208
19			0	.1	1.0	4.5	3.4	1.7	1,830	0		74
20			*0	.1	.9	62	2.4	1.1	253	0		9.9
21			0	**.1	.8	355	134	.8	15	0		110
22			0	.1	.6	61	1,370	.7	7.0	0		806
23			0	.9	.6	20	1,370	.6	4.0	0		1,260
24			.1	.7	.5	12	966	.4	2.4	0		1,030
25			.2	.5	*.4	9.0	1,070	.4	1.8	0		65
26			.2	.4	.3	7.0	1,350	.4	1.5	0		8.1
27			.2	.3	.3	5.1	1,800	.3	1.3	0		259
28			.3	.2	.3	3.6	2,370	.3	1.1	0		1,650
29			.3	.2	.2	2.4	576	2.7	.9	0		3,190
30			.3	.2	----------	1.7	71	1,940	.6	0		2,370
31		----------	.2	.2	----------	1.3	----------	5,950	----------	0		----------
Total	0	0	1.8	6.6	51.8	4,737.1	11,603.4	9,079.9	12,253.2	1.8	0	11,223.0
Mean	0	0	0.06	0.21	1.79	153	387	293	408	0.06	0	374
Cfsm	0	0	0.0001	0.0004	0.003	0.290	0.735	0.556	0.774	0.0001	0	0.710
In.	0	0	0.0001	0.0005	0.004	0.33	0.82	0.64	0.86	0.0001	0	0.79
Ac-ft	0	0	3.6	13	103	9,400	23,020	18,010	24,300	3.6	0	22,260

Calendar year 1963: Max 4,250 Min 0 Mean 79.3 Cfsm 0.151 In. 2.04 Ac-ft 57,420
Water year 1963-64: Max 5,950 Min 0 Mean 134 Cfsm 0.254 In. 3.44 Ac-ft 97,110

Peak discharge (base, 8,000 cfs).--No peak above base.

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

7-3430. North Sulphur River near Cooper, Tex.

Location.--Lat 33°28', long 95°35', near center of span at downstream side of bridge on State Highway 24, 4.9 miles upstream from Auds Creek, 7.3 miles upstream from Click Creek, and 8.6 miles northeast of Cooper, Delta County.

Drainage area.--276 sq mi.

Records available.--October 1949 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 377.42 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Nov. 8, 1949, wire-weight gage and Nov. 8, 1949, to May 21, 1960, water-stage recorder and wire-weight gage, at site 50 ft upstream at datum 4.00 ft higher.

Average discharge.--15 years, 221 cfs (160,000 acre-ft per year).

Extremes.--Maximum discharge during year, 19,300 cfs June 16 (gage height, 17.32 ft); no flow at times.
1949-64: Maximum discharge, 42,800 cfs Apr. 29, 1953 (gage height, 29.86 ft, present site and datum); no flow at times.
Maximum stage since at least 1915, 30.6 ft May 2, 1944, present site and datum; flood in 1932 reached about same stage, from information by Corps of Engineers and local residents.

Remarks.--Records good except those for periods of no gage-height record, which are poor. In 1928-29 the channel was rectified for a distance of 28 miles upstream and 18 miles downstream from station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 23 to May 4, May 8 to June 18, June 20 to July 7, Aug. 18-19, 27-28, Sept. 16-19, 21-29)

1.3	0	3.0	280
1.4	.9	3.5	460
1.5	4.8	4.0	680
1.7	20	6.0	1,890
2.0	50	8.0	3,700
2.3	97	10.0	6,100
2.6	165		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0	0.1	1.8	0	*0.2	125	35	4.8	0	0
2		0	0	.1	1.2	.7	.2	1,870	12	3.3	0	0
3		0	0	0	.7	.2	.2	65	8	1.8	0	0
4		0	0	0	2.9	.4	.2	33	*7.3	.9	*0	0
5		0	0	0	51	.9	142	22	6.0	.5	0	0
6		0	0	0	12	.5	28	18	4.8	.4	0	0
7		0	0	0	4.3	.5	7.3	17	3.8	.2	0	0
8	(*)	0	0	0	1.8	.5	2.1	*1,720	2.1	*0	0	0
9		0	0	0	1.3	4,730	1.4	589	1.4	0	0	0
10		0	0	0	.9	162	.9	63	1.2	0	0	*0
11		0	6.6	0	.9	38	.7	37	.7	0	0	0
12		0	2.9	0	.9	22	.7	26	.5	0	0	0
13		*0	.9	0	.7	15	1.2	18	.4	0	0	0
14		0	.5	0	.7	14	1.2	14	.3	0	0	0
15		0	.2	0	.7	10	.7	13	.5	0	0	0
16		0	.1	0	.7	7.3	.2	12	5,010	0	0	5.4
17		0	.1	.1	.7	6.0	.2	12	2,550	0	0	496
18		0	.1	.1	.5	6.0	.2	11	150	0	.3	39
19		0	0	.1	.4	196	.2	10	38	0	.2	15
20		0	**.1	.7	.4	151	.1	8.7	22	0	0	11
21		0	.1	*.7	.2	16	304	8.0	18	0	0	3,350
22		0	.1	.5	.1	6.6	1,050	8.7	16	0	0	272
23		.1	.1	.4	0	5.4	3,040	8.0	14	0	0	73
24		.2	.1	.4	0	6.0	*2,350	7.3	13	0	0	55
25		.2	.1	.1	*0	6.0	*524	6.6	12	0	0	34
26		.2	.1	.1	0	2.9	2,150	6.0	11	0	0	29
27		.1	.1	.1	0	1.4	270	4.8	9.4	0	.2	4,500
28		.1	.1	.1	0	1.2	49	4.3	9.4	0	6.9	464
29		.1	.1	.1	0	.9	33	6.0	8.7	0	3	47
30		0	.1	.4	----------	.5	28	2,250	5.4	0	0	18
31		----------	.1	.9	----------	.2	----------	233	----------	0	0	----------
Total	0	1.0	12.6	5.0	84.8	5,408.1	9,985.9	7,226.4	7,971.1	11.9	10.6	9,408.4
Mean	0	0.03	0.41	0.16	2.92	174	333	233	266	0.38	0.34	314
Cfsm	0	0.0001	0.0015	0.0006	0.011	0.630	1.21	0.844	0.964	0.0014	0.0012	1.14
In.	0	0.0001	0.002	0.0007	0.011	0.728	1.35	0.973	1.07	0.0016	0.0014	1.27
Ac-ft	0	2.0	25	9.9	168	10,730	19,810	14,330	15,810	23.6	21.0	18,660

Calendar year 1963: Max 1,750 Min 0 Mean 33.6 Cfsm 0.122 In. 1.65 Ac-ft 24,320
Water year 1963-64: Max 5,010 Min 0 Mean 110 Cfsm 0.399 In. 5.41 Ac-ft 79,600

Peak discharge base, 20,000 cfs).--No peak above base.
* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record Feb. 6-16, Mar. 21-22, May 5-7, June 2-3, 19, Aug. 29, Sept. 20, 30.

7-3432. Sulphur River near Talco, Tex.

Location.--Lat 33°23'20", long 95°07'50", on right bank at downstream side of pier of bridge on U. S. Highway 271, about 150 ft downstream from abandoned Paris & Mt. Pleasant Railroad bridge, 2.4 miles northwest of Talco, Titus County, and 3.0 miles downstream from Mustang Creek.

Drainage area.--1,365 sq mi.

Records available.--October 1956 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 290.82 ft above mean sea level, datum of 1929.

Average discharge.--8 years, 1,243 cfs (899,900 acre-ft per year).

Extremes.--Maximum discharge during year, 10,700 cfs Apr. 27 (gage height, 22.23 ft); no flow Oct. 29-30.
1956-64: Maximum discharge, 50,600 cfs May 3, 1958 (gage height, 25.69 ft); no flow Oct. 1 to Nov. 2, 1956, Oct. 29-30, 1963.
Maximum stage since at least 1908, 27½ ft in 1908 and 1914, from information by local resident. Flood in 1945 reached a stage of 26½ ft, from information by local resident.

Remarks.--Records good except those for periods of no gage-height record, which are fair. At end of year, flow from 12.8 sq mi above this station was partly controlled by 9 floodwater-retarding structures with a total combined capacity of 4,960 acre-ft below the flood spillway crests, of which 4,220 acre-ft is floodwater-retarding capacity and 740 acre-ft is sediment-pool capacity. Two structures were built during the current year and have a total combined capacity below flood spillway crests of 1,560 acre-ft of which 170 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Small diversions above station. Records of Texas Power and Light Co. show that 1,480 acre-ft of water was diverted during March, April, May, and June 1964 at generating plant located 2 miles upstream.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 6 to May 15, May 30 to June 5, June 17-20, Sept. 17-18, 21-23, 27-30)

1.0	0	2.0	41	12.0	1,210	21.0	5,810
1.1	1.1	3.0	93	16.0	2,020	21.5	7,400
1.2	5.1	5.0	240	18.0	2,750	22.0	11,400
1.5	19	8.0	565	20.0	4,310		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.1	1.1	0.6	1.1	1.1	15	358	5,090	10	0.2	21
2	.1	.1	1.1	.6	.8	4.6	*12	1,180	4,310	7	.2	13
3	.1	.1	1.1	.6	1.1	11	8.8	1,020	5,200	5	.2	6.4
4	.1	.1	2.5	.6	4.6	37	6	215	1,400	4	.2	3.2
5	.1	.1	2.5	.4	39	40	167	118	216	3	* .2	1.4
6	.1	.1	2.1	.4	337	22	1,690	68	102	3	.2	.8
7	.1	.1	1.4	.4	132	16	694	42	*66	2	.2	.8
8	* .1	.1	.8	.4	52	12	215	28	45	2	.2	.6
9	.1	.1	.6	.4	27	1,280	99	1,690	30	2	.3	.3
10	.1	.1	.8	.3	20	8,350	55	*1,060	24	2	.3	.2
11	.1	.1	1.8	.3	18	4,920	30	775	21	*1.4	.2	* .4
12	.2	.1	1.4	.2	14	2,220	18	270	17	1.1	.2	.3
13	.1	* .1	2.1	.2	13	556	15	108	15	.8	.2	.3
14	.1	.2	3.6	.1	12	141	13	63	15	.6	.2	.3
15	.1	.3	2.9	.1	9.8	93	11	42	9.8	.6	.2	.2
16	.2	.3	2.1	.2	8.3	68	9.3	32	28	.6	.2	257
17	.2	.4	1.8	.3	6.9	50	12	28	4,640	.6	.2	1,340
18	.2	1.1	1.1	.3	6.4	38	9.8	25	6,570	.4	.2	1,760
19	.2	1.1	*.8	.3	5.1	36	6.4	22	2,450	.4	.2	576
20	.2	1.1	1.1	.3	4.1	301	5.6	20	1,800	.4	.2	270
21	.2	.6	.8	.3	3.6	269	91	18	629	.3	.2	295
22	.1	1.4	.8	*.6	2.9	428	4,590	16	143	.3	4	2,890
23	.2	1.1	.8	.4	2.5	167	8,780	15	76	.3	5.1	1,540
24	.8	1.1	.6	.4	2.1	82	*8,770	14	49	.4	4.1	1,300
25	.6	2.1	.6	.3	1.8	62	6,360	13	37	1.1	2.1	1,130
26	.2	1.8	.6	.2	*1.4	96	5,150	12	28	1.1	.8	282
27	.1	1.4	.6	.2	1.4	60	3,960	11	23	.6	.6	510
28	.1	1.4	.6	.2	1.1	43	5,960	11	20	.4	.6	5,260
29	0	1.1	.6	.8	1.1	28	3,280	10	19	.3	4.6	5,200
30	0	1.1	.6	1.4	----------	25	1,610	436	18	.2	43	2,660
31	.1	----------	.6	2.1	----------	20	----------	4,640	----------	.2	33	----------
Total	5.0	18.9	39.9	13.9	730.1	19,476.7	56,642.9	12,360	33,090.8	52.1	102.3	25,319.2
Mean	0.16	0.63	1.29	0.45	25.2	628	1,888	399	1,103	1.68	3.30	844
Cfsm	0.00012	0.00046	0.00095	0.00033	0.018	0.460	1.38	0.292	0.808	0.0012	0.0024	0.618
In.	0.0001	0.0005	0.001	0.0004	0.02	0.53	1.54	0.34	0.90	0.001	0.003	0.69
Ac-ft	9.9	37	79	28	1,450	38,630	112,300	24,520	65,630	103	203	50,220

Calendar year 1963: Max 9,950 Min 0 Mean 210 Cfsm 0.154 In. 2.08 Ac-ft 151,800
Water year 1963-64: Max 8,960 Min 0 Mean 404 Cfsm 0.296 In. 4.03 Ac-ft 293,200

Peak discharge (base, 15,000 cfs).--No peak above base.

* Discharge measurement made on this day.
Note.--No gage-height record Mar. 30 to Apr. 1, May 17-29, June 28 to July 10, Aug. 13-22.

7-3433. Cuthand Creek near Bogata, Tex.

Location.--Lat 33°32'52", long 95°10'24", near center of channel at downstream side of bridge on State Highway 37, 6.0 miles northeast of Bogata, Red River County, and 8 miles upstream from Scatter Creek.

Drainage area.--69 sq mi.

Records available.--October 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 352.44 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 2,560 cfs Mar. 9 (gage height, 16.45 ft); no flow at times. Maximum stage since at least 1950, that of Mar. 9, 1964.

Remarks.--Records good. No known diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 24-27)

1.75	0	3.0	45	9.0	372
1.8	.1	3.5	68	11.0	590
1.9	.7	4.0	88	13.0	854
2.0	1.8	5.0	128	14.0	1,060
2.2	6.1	6.0	175	15.0	1,430
2.4	14	7.0	230	16.0	2,180
2.6	23				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0	0	3.0	8.4	25		0	1.4
2					0	22	*1.9	6.1	5.8		0	.7
3					0	46	1.6	5.1	3.0		0	.2
4					0	9.4	1.4	4.4	1.9		*0	0
5					118	3.8	227	3.4	*1.5		0	0
6					50	2.4	149	2.6	1.0		0	0
7					14	1.1	40	1.9	.8		0	0
8					4.1	.7	20	*2.0	.7		0	0
9					1.2	1,510	11	137	.5	(*)	0	0
10					.4	579	7.6	*45	.4		0	0
11					.1	46	5.6	15	.4		0	*0
12					0	18	4.6	7.6	.3		0	0
13					.1	9.4	4.1	4.8	.2		0	0
14					0	5.6	3.2	3.2	0		0	0
15			(*)		0	3.8	2.8	2.6	0		0	0
16					0	2.8	2.6	1.9	51		0	55
17					0	2.0	3.0	1.5	236		0	353
18					0	1.5	2.8	1.1	50		0	46
19					0	3.2	2.2	.9	16		0	8.4
20					0	68	1.8	.7	5.8		0	3.4
21					0	26	*127	.6	3.4		0	2.4
22				(*)	0	9.0	1,030	.5	2.0		0	1.5
23					0	4.8	*675	.4	1.5		0	.9
24					0	4.6	*371	.3	1.0		0	.7
25					*0	10	*459	.2	.7		0	.4
26					0	7.3	*572	.1	.4		.1	.2
27					0	4.8	476	0	.1		0	213
28					0	3.6	72	0	0		0	556
29					0	4.4	26	0	0		0	50
30					----------	5.4	13	113	0		4.6	14
31		---------			----------	5.1	----------	172	----------		2.6	---------
Total	0	0	0	0	187.9	2,419.7	4,316.2	542.3	409.4	0	7.3	1,307.2
Mean	0	0	0	0	6.48	78.1	144	17.5	13.6	0	0.24	43.6
Cfsm	0	0	0	0	0.094	1.13	2.09	0.254	0.197	0	0.0035	0.632
In.	0	0	0	0	0.10	1.30	2.33	0.29	0.22	0	0.004	0.70
Ac-ft	0	0	0	0	373	4,800	8,560	1,080	812	0	14	2,590

Calendar year	Max	Min	Mean	Cfsm	In.	Ac-ft
Water year 1963-64:	Max 1,510	Min 0	Mean 25.1	Cfsm 0.364	In. 4.94	Ac-ft 18,230

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
3- 9	1800	16.45	2,560
4-22	0900	14.78	1,330

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

7-3435. Whiteoak Creek near Talco, Tex.

Location.--Lat 33°19', long 95°05', near center of main channel on downstream side of bridge on U. S. Highway 271, 2 miles upstream from Ripley Creek, 2.7 miles south of Talco, Titus County, and 2.8 miles downstream from Lick Creek.

Drainage area.--494 sq mi.

Records available.--December 1949 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 286.45 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--14 years (1950-64), 378 cfs (273,600 acre-ft per year).

Extremes.--Maximum discharge during year, 3,970 cfs Sept. 18 (gage height, 16.72 ft); no flow Oct. 7-24, Oct. 29 to Nov. 18, Aug. 3-6.
1949-64: Maximum discharge, 26,600 cfs Apr. 28, 1958 (gage height, 19.52 ft); no flow Aug. 8 to Sept. 11, 1954, Aug. 8-16, 27-31, 1956, Oct. 7-24, Oct. 29 to Nov. 18, 1963, Aug. 3-6, 1964.
Maximum stage since at least 1870, 22.9 ft Mar. 31, 1945, from levels to floodmarks, from information by local residents.

Remarks.--Records good. Small diversions above station for municipal supply.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 29, May 3-30, June 5-20, Aug. 3-21)

2.6	0.9	8.0	252
2.8	2.2	11.0	592
3.0	4.4	13.0	930
3.2	7.7	14.0	1,180
3.5	15	15.0	1,560
4.0	31	16.0	2,430
5.0	66	16.5	3,430
6.0	114	17.0	4,970

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0	2.3	1.1	3.1	2.9	7.2	906	1,180	1.5	0.1	100
2	.2	0	2.0	1.0	2.9	89	8.1	288	1,320	1.3	.1	32
3	.1	0	1.7	1.0	2.5	523	*8.8	101	1,360	1.1	0	16
4	.1	0	1.4	1.0	3.7	262	8.5	60	1,250	1.0	0	9.2
5	.1	0	1.2	1.0	216	120	56	44	463	.9	*0	6.3
6	.1	0	1.0	1.0	460	67	123	33	89	.8	0	4.3
7	0	0	.9	1.0	412	43	219	26	*40	.7	.1	3.2
8	*0	0	.8	1.1	196	28	325	21	26	.6	.6	2.5
9	0	0	.8	1.1	85	199	186	*19	18	.6	.6	2.0
10	0	0	.9	1.1	43	652	62	16	14	.5	.4	1.7
11	0	0	3.9	1.1	26	757	30	15	10	*.5	.3	*1.5
12	0	0	6.6	1.5	18	637	19	14	8.1	.5	.3	1.8
13	0	*0	4.6	3.0	14	380	14	13	6.6	.4	.3	1.4
14	0	0	2.5	3.4	11	121	11	13	5.6	.4	.4	1.0
15	0	0	6.3	3.3	10	51	8.5	12	4.6	.4	.4	.8
16	0	0	8.5	3.0	11	32	7.3	10	8.9	.3	.5	406
17	0	0	7.2	2.7	9.6	22	6.4	9.0	26	.3	.4	1,740
18	0	0	5.0	2.4	9.8	16	5.8	11	9.8	.2	.3	3,620
19	0	.1	*3.6	2.2	9.8	18	4.8	11	12	.2	6.2	3,080
20	0	.4	2.9	2.1	8.8	42	4.0	9.8	142	.2	14	2,010
21	0	1.0	2.3	1.9	7.3	32	13	9.6	98	.2	18	1,270
22	0	1.7	2.1	*1.7	6.1	26	868	9.4	40	.2	33	346
23	0	3.8	2.1	1.7	5.3	18	1,320	8.8	20	.2	30	61
24	0	2.2	2.1	1.7	4.8	14	*2,240	7.9	12	.3	26	25
25	.1	1.2	1.9	1.5	4.4	14	3,190	7.2	7.9	.4	24	15
26	.1	.8	1.7	1.3	*3.8	13	3,190	6.6	5.9	.3	16	14
27	.1	.6	1.5	1.2	3.6	12	3,310	6.1	4.4	.2	7.9	180
28	.1	.5	1.3	1.5	3.2	12	2,770	5.6	3.3	.2	5.3	652
29	0	.6	1.2	2.3	3.1	11	2,060	5.8	2.5	.1	34	637
30	0	1.8	1.2	3.0	----------	9.2	1,510	374	2.0	.1	441	652
31	0	----------	1.1	3.4	----------	7.9	----------	908	----------	.1	426	----------
Total	1.2	14.7	82.6	56.3	1,593.8	4,231.0	21,585.4	2,980.8	6,189.6	14.7	1,086.2	14,891.7
Mean	0.04	0.49	2.66	1.82	55.0	136	720	96.2	206	0.47	35.0	496
Cfsm	0.0001	0.0010	0.0054	0.0037	0.111	0.275	1.46	0.195	0.417	0.0010	0.071	1.00
In.	0.0001	0.001	0.006	0.004	0.12	0.32	1.62	0.22	0.47	0.001	0.08	1.12
Ac-ft	2.4	29	164	112	3,160	8,390	42,810	5,910	12,280	29	2,150	29,540

Calendar year 1963: Max 4,970 Min 0 Mean 115 Cfsm 0.233 In. 3.17 Ac-ft 83,410
Water year 1963-64: Max 3,620 Min 0 Mean 144 Cfsm 0.291 In. 3.97 Ac-ft 104,600

Peak discharge (base, 9,000 cfs).--No peak above base.

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

7-3442. Texarkana Reservoir near Texarkana, Tex.

Location.--Lat 33°18'16", long 94°09'38", in intake structure of Texarkana Dam on the Sulphur River on U. S. Highway 59, and 10 miles southwest of Texarkana, Bowie County.
Drainage area.--3,443 sq mi.
Records available.--July 1953 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1941, levels by Corps of Engineers. July 19 to Dec. 31, 1953, staff gage about 125 ft upstream at datum 200 ft higher.
Extremes.--Maximum contents during year, 442,800 acre-ft May 4 (elevation, 230.14 ft); minimum, 149,100 acre-ft Feb. 4 (elevation, 220.18 ft).
1953-64: Maximum contents, 1,700,000 acre-ft June 12, 1957 (elevation, 250.36 ft); minimum observed since first appreciable storage, 2,580 acre-ft Sept. 21-30, 1954.
Remarks.--Reservoir is formed by an 18,500-foot earth-fill dam, a 200-foot uncontrolled concrete spillway and a mile-long dike. Flood-control outlet works consist of two 20-foot diameter conduits controlled by four 10- by 20-foot electrically driven broome-type gates. Flow over spillway is discharged into an outlet channel and then to the Sulphur River. Sulphur River was blocked and storage began July 2, 1953; first passage of water through conduits began July 18, 1953; gates closed and impoundment of water began June 27, 1956. Dam completed in December 1957. Reservoir built for flood control and conservation. Capacity table based on 1948 survey. Storage capacity by monthly allocation is reserved for the cities of Texarkana, Texas, and Arkansas, and varies from 200 acre-ft in February to a maximum of 13,400 acre-ft in April. At end of year, flow from 26.4 sq mi above this station was partly controlled by 19 floodwater-retarding structures with a total combined capacity of 9,530 acre-ft below the flood spillway crests, of which 8,340 acre-ft is floodwater-retarding capacity and 1,190 acre-ft is sediment-pool capacity. Two structures were built during the current year and have a total combined capacity below flood spillway crests of 1,560 acre-ft, of which 174 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Data regarding dam and reservoir are shown in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	286.0	-
Crest of spillway	259.5	2,654,300
Top of conservation pool	220.0	145,300
Invert of two 20-foot diameter conduits	200.0	2,600

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

Capacity table (elevation, in feet, and total contents, in acre-feet)

220	145,300	224	240,200	228	364,100
221	166,400	225	268,400	229	399,700
222	189,300	226	298,500	230	437,200
223	213,800	227	330,400	231	476,800

Contents, in acre-feet, at 0700 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	191,300	176,300	161,400	156,500	151,400	153,600	166,200	413,200	267,000	329,400	301,700	295,200
2	191,000	176,300	161,200	156,500	151,200	153,800	167,400	429,000	268,400	327,500	300,700	294,900
3	190,300	175,600	161,400	156,500	150,600	154,600	166,000	437,200	270,600	327,200	299,800	293,100
4	189,800	175,400	160,500	155,900	149,500	157,400	166,200	441,600	274,500	326,800	299,100	292,500
5	189,100	174,900	159,900	155,700	155,400	157,800	168,000	440,800	278,400	325,900	298,200	292,800
6	188,800	174,200	159,900	155,900	155,000	157,600	168,000	436,900	284,100	324,900	296,400	291,900
7	188,400	173,100	159,700	155,900	154,600	158,600	167,800	429,000	290,100	324,900	295,500	289,200
8	187,900	171,700	159,700	155,900	154,600	160,700	169,000	420,000	295,500	324,000	295,500	288,900
9	187,500	171,000	159,500	158,600	155,900	166,000	170,600	405,300	302,300	323,000	294,300	288,600
10	187,000	171,000	157,800	155,900	156,900	165,600	174,000	389,400	308,100	322,100	293,700	288,000
11	186,800	171,000	162,800	154,400	155,700	164,300	177,200	368,400	315,700	321,100	294,300	287,100
12	186,100	170,300	164,600	156,300	155,700	165,000	180,400	348,200	319,800	319,800	293,400	285,000
13	185,400	170,300	163,100	154,000	155,900	166,400	182,200	330,700	321,100	317,600	293,400	283,200
14	184,700	168,700	162,600	152,100	154,400	166,400	182,400	312,500	320,500	315,700	292,800	283,500
15	184,300	168,500	161,600	151,400	156,700	164,800	182,700	293,400	318,900	314,700	294,000	282,900
16	184,000	168,300	160,500	151,400	153,800	166,200	182,900	284,400	318,200	314,400	293,200	282,600
17	183,800	168,000	159,700	151,900	152,900	167,800	182,400	277,800	319,200	312,800	298,800	300,400
18	183,100	168,700	159,500	151,600	154,200	169,600	182,400	272,400	319,200	311,900	297,900	301,000
19	182,400	168,300	158,400	152,100	154,800	169,600	183,100	268,400	318,900	311,900	300,700	300,400
20	182,200	170,100	157,400	151,900	153,300	170,600	182,700	266,200	319,200	311,600	299,800	303,300
21	181,800	169,200	157,600	151,600	152,500	165,200	182,700	265,100	321,800	310,000	298,500	304,200
22	181,300	172,200	156,500	151,400	152,500	161,000	189,600	265,100	324,900	309,000	300,100	302,300
23	181,100	171,200	158,800	151,600	152,700	160,100	194,000	264,800	328,100	308,700	299,500	300,100
24	180,400	169,000	158,200	152,300	152,500	160,100	206,500	264,500	332,000	307,700	298,800	297,900
25	179,900	165,800	158,000	152,500	152,900	161,200	236,200	264,200	336,600	307,400	299,800	292,500
26	179,700	164,300	158,000	151,600	153,100	162,800	260,000	263,600	339,100	305,800	297,900	289,500
27	179,000	162,600	158,000	151,600	152,500	163,100	259,200	263,400	338,100	304,600	298,200	290,700
28	178,300	162,200	157,800	150,800	154,400	164,300	325,200	263,400	334,400	304,200	298,500	291,300
29	177,600	162,200	157,600	150,800	153,600	164,300	361,400	260,500	332,700	303,600	297,900	290,700
30	177,200	162,200	156,100	151,200	----------	165,600	393,600	263,100	330,700	303,300	297,000	290,400
31	176,700	----------	156,100	152,300	----------	165,400	----------	264,200	----------	301,700	296,400	----------
(†)	221.4	220.8	220.5	220.3	220.4	221.0	228.8	224.8	227.0	226.1	225.9	225.7
(‡)	-14,800	-14,500	-6,100	-3,800	+1,300	+11,800	+228,200	-129,400	+66,500	-29,000	-5,300	-6,000

Calendar year 1963..... ‡ -2,100
Water year 1963-64..... ‡ +98,900

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

7-3450. Boggy Creek near Daingerfield, Tex.

Location.--Lat 33°02'05", long 94°47'10", on right bank at downstream side of bridge on State Highway 11, a quarter of a mile upstream from Louisiana & Arkansas Railway Co. bridge, 3.8 miles west of Daingerfield, Morris County, and 9 miles upstream from mouth.

Drainage area.--72 sq mi.

Records available.--March 1943 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 258.41 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1954, at site 1,700 ft downstream at same datum.

Average discharge.--21 years, 85.9 cfs (62,190 acre-ft per year).

Extremes.--Maximum discharge during year, 1,550 cfs Apr. 25 (gage height, 10.83 ft); no flow at times.
1943-64: Maximum discharge, 28,900 cfs Apr. 27, 1958 (gage height, 17.80 ft), from rating curve defined by current-meter measurements below 13,000 cfs; no flow at times.
Maximum stage since 1900, that of Apr. 27, 1958; flood in January 1938 reached a stage of 17½ ft (adjusted to present site), from information by local residents.

Remarks.--Records good. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Jan. 18-31, June 3-18, 20-30, Aug. 16-22, Aug. 27 to Sept. 16, Sept. 21-28)

3.5	0	6.0	58
3.6	.1	7.0	100
3.7	.3	8.0	165
3.8	.8	8.7	245
4.0	2.9	9.3	400
4.3	8.3	9.7	600
4.6	16	10.0	780
5.0	27	10.4	1,100

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0	1.4	6.8	7.2	14	41	8.3		0	1.0
2			0	1.3	8.8	13	13	39	5.5		0	.6
3			0	1.2	7.2	57	*13	38	3.4		0	.4
4			0	1.1	6.8	98	12	33	2.5		0	.3
5			0	1.1	28	113	15	25	2.0		*0	.1
6			0	1.1	45	119	23	20	1.8		0	.1
7			0	1.1	36	66	28	17	*1.5		0	0
8			0	1.1	21	38	18	15	1.4		0	0
9	(*)		0	1.1	15	60	13	14	1.2		0	0
10			0	1.1	12	115	10	*13	1.0		0	0
11			.2	1.2	9.7	161	9.0	12	.8	(*)	0	0
12			5.1	1.3	8.3	112	9.5	11	.6		0	*0
13			13	1.2	9.0	55	11	8.5	.5		0	0
14		(*)	7.7	1.1	15	41	10	6.2	.3		0	0
15			3.2	1.0	17	36	8.5	4.8	.3		0	0
16			1.9	1.2	24	31	7.2	3.8	.8		1.6	4.3
17			1.4	1.4	24	26	5.7	3.4	1.5		.7	42
18			*1.0	1.7	20	23	4.9	2.8	5.5		1.0	50
19			.8	2.4	18	27	4.4	2.2	12		.4	24
20			.8	3.0	16	45	4.0	1.8	5.3		.1	4.4
21			.8	2.9	13	50	19	1.6	2.2		0	2.6
22			1.0	*2.4	11	33	117	1.2	1.3		50	1.6
23			1.1	2.0	9.3	25	168	1.0	.8		62	1.3
24			1.3	1.9	8.5	23	215	.9	.6		72	.9
25			1.6	1.9	8.1	27	1,050	.8	.4		20	.6
26			1.8	1.7	7.9	44	477	.7	.2		4.4	.6
27			2.0	1.6	*7.7	31	274	.5	.1		3.0	1.6
28			2.2	1.3	7.5	23	229	.5	0		1.9	29
29			2.2	1.2	7.7	19	153	.4	0		1.4	62
30			2.0	1.3	----------	16	68	.8	0		1.0	30
31		---------	1.6	2.4	----------	14	----------	1.7	----------		1.5	----------
Total	0	0	52.7	47.7	428.3	1,548.2	3,003.2	321.6	61.8	0	221.0	257.4
Mean	0	0	1.70	1.54	14.8	49.9	100	10.4	2.06	0	7.13	8.58
Cfsm	0	0	0.024	0.021	0.206	0.694	1.39	0.145	0.029	0	0.099	0.119
In.	0	0	0.03	0.02	0.22	0.80	1.55	0.17	0.03	0	0.11	0.13
Ac-ft	0	0	105	95	850	3,070	5,960	638	123	0	438	511

Calendar year 1963: Max 556 Min 0 Mean 18.9 Cfsm 0.263 In. 3.57 Ac-ft 13,680
Water year 1963-64: Max 1,050 Min 0 Mean 16.2 Cfsm 0.225 In. 3.07 Ac-ft 11,790

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
4-25	0800	10.83	1,550

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

7-3459. Lake O' the Pines near Jefferson, Tex.

Location.--Lat 32°45'06", long 94°30'10", in intake structure of Ferrell's Bridge Dam on Cypress Creek on State Highway 726, and 9.0 miles west of Jefferson, Marion County.
Drainage area.--850 sq mi.
Records available.--August 1957 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, supplementary adjustment of 1941. Prior to Nov. 12, 1957, staff gage at same site and datum.
Extremes.--Maximum contents during year, 264,300 acre-ft Apr. 28 (elevation, 229.00 ft); minimum, 219,700 acre-ft Nov. 16 (elevation, 226.54 ft).
1957-64: Maximum contents, 515,800 acre-ft May 7, 1958 (elevation, 239.71 ft); minimum observed since conservation pool first filled in April 1958, 4,890 acre-ft Sept. 24, 25, Oct. 3, 1959.
Remarks.--Lake is formed by a 10,600-foot rolled earth-fill dam and a 200-foot concrete spillway. Flood-control outlet works consist of two 10-foot diameter conduits controlled by two 8.0- by 12.5-foot electrically driven broome-type gates. Low-flow outlet works consist of one 14-inch pipe and valve. Flow over spillway is discharged into a 2,000-foot channel and then into Cypress Creek. Coffer dam closure was made Aug. 21, 1957; water began flowing through conduits Sept. 25, 1957. Dam completed in December 1957. Capacity table based on 1950 survey. Lake built for flood control, conservation, and water supply. A total of 250,000 acre-ft of storage capacity is allocated to the Northeast Texas Municipal Water District for domestic and industrial use. Data regarding dam and lake are shown in the following table:

	Elevation (feet)	Capacity (acre-feet)
Crest of spillway	249.5	842,100
Invert of 14-inch intake to wet well	202.5	5,760
Invert of two 10-foot diameter conduits	200.0	2,860

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

Capacity table (elevation, in feet, and contents, in acre-feet)

226	210,400
227	227,600
228	245,600
229	264,300

Contents, in acre-feet, at 0700 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	229,800	224,400	223,000	226,300	228,900	237,500	256,800	261,300	252,500	248,800	237,200	241,500
2	229,600	223,700	223,300	226,300	228,700	238,400	255,500	260,900	252,000	248,400	237,000	241,100
3	229,400	223,800	223,000	226,300	228,600	238,200	254,800	259,200	251,800	248,200	236,400	240,900
4	229,300	222,700	223,300	226,400	228,200	240,900	254,400	258,500	251,000	248,000	236,300	240,600
5	229,100	222,700	223,200	227,000	231,100	240,600	256,100	257,700	251,000	247,300	235,900	240,600
6	228,700	222,700	223,200	227,300	231,600	240,600	255,900	257,700	251,000	247,100	235,400	240,800
7	228,400	222,500	222,700	227,500	232,300	240,600	255,700	257,200	251,000	246,700	234,800	240,400
8	228,000	222,100	224,000	227,800	231,400	241,100	255,700	256,200	250,600	246,400	234,500	240,200
9	227,600	222,100	222,700	228,200	232,000	244,700	255,100	256,100	250,600	246,200	234,300	239,900
10	227,500	222,100	221,600	227,800	232,100	248,800	254,400	256,100	250,300	244,700	233,900	239,700
11	227,300	221,800	225,400	227,500	232,100	248,800	253,300	256,100	249,900	244,700	233,600	239,300
12	227,300	221,300	226,300	228,400	232,100	249,900	253,600	255,900	249,900	244,500	233,400	238,800
13	227,100	221,600	225,800	228,900	234,300	251,000	254,400	255,700	249,900	244,200	232,500	238,200
14	227,000	221,100	226,100	227,500	233,900	252,500	254,900	254,800	249,300	243,300	234,500	237,700
15	226,600	220,400	224,900	227,100	235,600	255,100	254,900	253,600	249,300	242,400	234,600	237,300
16	226,300	220,100	224,700	227,500	235,200	255,900	254,800	253,800	249,300	242,200	238,200	238,200
17	226,300	220,100	224,700	227,800	235,000	257,200	254,400	254,200	250,100	241,800	238,200	244,500
18	226,300	221,100	225,200	227,600	237,200	257,600	254,600	254,000	251,600	241,100	238,600	244,700
19	226,100	220,900	224,900	227,600	237,700	257,600	254,800	254,000	251,200	240,800	238,600	244,500
20	226,100	222,700	225,200	227,800	236,400	257,900	254,800	253,800	251,200	240,800	238,400	244,300
21	225,600	222,800	225,900	228,000	236,300	256,200	254,800	253,600	251,200	240,600	238,600	244,200
22	225,200	222,800	226,100	228,000	236,400	255,500	257,700	253,400	251,000	240,200	240,800	244,200
23	224,900	224,400	227,100	228,000	236,400	254,400	258,100	253,100	250,800	239,500	241,100	244,000
24	224,600	223,300	226,300	228,400	236,600	254,400	259,800	253,100	250,800	239,100	241,100	243,800
25	224,400	222,800	226,300	228,400	236,400	255,300	260,000	252,900	250,600	239,000	241,500	243,800
26	224,400	222,800	226,400	228,400	237,000	256,400	259,600	252,900	250,300	238,800	241,500	243,800
27	224,400	222,800	226,800	228,700	236,800	255,500	262,400	253,100	250,300	238,600	242,000	244,000
28	224,400	223,300	226,600	228,900	236,800	256,800	262,600	253,100	249,700	238,400	241,600	246,000
29	224,600	223,900	226,400	228,200	237,200	256,800	262,600	252,000	249,300	238,100	241,500	246,000
30	223,700	223,000	226,300	227,800	----------	256,200	262,200	252,300	249,200	237,700	241,600	246,200
31	223,200	----------	226,300	229,100	----------	256,800	----------	253,100	----------	237,300	241,500	----------
(†)	226.7	226.7	226.9	227.1	227.5	228.6	228.9	228.4	228.2	227.5	227.8	228.0
(‡)	-6,800	-200	+3,300	+2,800	+8,100	+19,600	+5,400	-9,100	-3,900	-11,900	+4,200	+4,700

Calendar year 1963..... ‡ -30,300
Water year 1963-64..... ‡ +16,200

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

7-3460.5. Little Cypress Creek near Ore City, Tex.

Location.--Lat 32°40'21", long 94°45'03", on right bank at downstream side of bridge on U. S. Highway 259, 4 miles downstream from Clear Creek, 7.5 miles downstream from Gum Creek, 9 miles south of Ore City, Upshur County, and 12 miles north of Longview.

Drainage area.--383 sq mi.

Records available.--December 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 232.67 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 455 cfs Apr. 27 (gage height, 7.42 ft); no flow at times.
1962-64: Maximum discharge, 2,960 cfs Apr. 29, 1963 (gage height, 11.58 ft); no flow at times.
Maximum stage since at least 1902 occurred in March 1945; maximum stage since 1945, 19.4 ft in April 1958, from information by local resident. The flood in March 1945 was 1.3 ft higher than flood in April 1958 at a point 6 miles upstream, from information by State Highway Department.

Remarks.--Records good. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 13 to Aug. 25, Aug. 27 to Sept. 17, Sept. 20-28)

1.9	0	2.8	7.0
2.0	.1	3.0	11
2.1	.2	3.5	27
2.2	.6	4.0	50
2.3	1.1	5.0	122
2.4	1.8	6.0	234
2.6	4.0	8.0	575

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	12	19	29	34	56	221	12	0.5	0	2.3
2		0	12	*17	33	42	54	184	15	.4	0	1.4
3		0	12	16	33	66	*54	136	17	.3	0	.8
4		0	14	17	37	84	53	109	14	.2	0	.5
5		0	14	18	57	109	57	113	11	.1	*0	.4
6		0	14	20	89	113	73	105	8.7	.1	0	.3
7		0	15	19	94	113	77	80	7.6	.1	0	.2
8		0	15	20	92	118	79	63	*6.7	0	0	.2
9	(*)	0	15	23	87	156	76	53	5.1	0	0	.2
10		0	17	24	70	248	65	49	*4.7	0	0	.1
11		0	29	24	53	277	58	*47	4.3	*0	0	.1
12		0	37	22	43	234	53	42	3.8	0	0	*.1
13		0	49	20	42	202	51	38	2.8	0	3.5	0
14		0	54	20	46	196	48	35	2.3	0	2.8	0
15		0	45	19	54	196	46	31	2.0	0	.4	0
16		0	31	18	68	184	43	27	2.3	0	69	0
17		0	22	23	70	156	39	22	3.6	0	29	54
18		0	18	39	70	126	35	18	4.3	0	25	105
19		0	*14	42	74	109	32	16	5.7	0	16	78
20		*0	14	44	71	113	29	13	8.5	0	8.9	29
21		0	22	44	65	109	45	12	8.0	0	4.6	14
22		0	28	42	58	113	140	11	5.9	0	4.0	6.4
23		0	29	40	50	109	178	9.8	4.3	0	4.0	4.0
24		3.6	29	36	44	104	151	9.1	3.0	0	3.3	3.4
25		16	29	31	40	99	184	9.1	2.6	0	19	3.9
26		25	30	29	38	94	262	8.0	2.0	0	44	5.9
27		19	29	24	*39	87	446	6.5	1.0	0	34	12
28		15	27	*22	37	79	437	6.0	.8	0	15	25
29		11	27	20	35	72	345	6.2	.6	0	6.2	51
30		11	23	19	----------	64	270	6.5	.6	0	4.6	42
31		---------	21	22	----------	59	----------	8.3	----------	0	3.3	----------
Total	0	100.6	747	793	1,618	3,865	3,536	1,494.5	170.2	1.7	296.6	440.2
Mean	0	3.35	24.1	25.6	55.8	125	118	48.2	5.67	0.05	9.57	14.7
Cfsm	0	0.0087	0.063	0.067	0.146	0.326	0.308	0.126	0.015	0.00013	0.025	0.038
In.	0	0.01	0.07	0.08	0.16	0.38	0.34	0.15	0.02	0.0002	0.03	0.04
Ac-ft	0	200	1,480	1,570	3,210	7,670	7,010	2,960	338	3.4	588	873

Calendar year 1963: Max 2,460 Min 0 Mean 91.1 Cfsm 0.238 In. 3.24 Ac-ft 65,980
Water year 1963-64: Max 446 Min 0 Mean 35.7 Cfsm 0.093 In. 1.28 Ac-ft 25,900

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

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

7-3460.7. Little Cypress Creek near Jefferson, Tex.

Location.--Lat 32°42'46", long 94°20'44", near center of channel at downstream side of bridge on U. S. Highway 59, 0.3 mile downstream from Texas and Pacific Railway Co. bridge, 3.3 miles downstream from Grays Creek, and 3.5 miles south of Jefferson, Marion County.
Drainage area.--675 sq mi.
Records available.--June 1946 to September 1964 (monthly discharge only for June 1946 to September 1963).
Gage.--Water-stage recorder. Datum of gage is 174.60 ft above mean sea level, datum of 1929. Prior to Sept. 19, 1947, staff gage at upstream side of bridge at same datum.
Average discharge.--18 years, 546 cfs (395,300 acre-ft per year).
Extremes.--Maximum discharge during year, 568 cfs May 3 (gage height, 8.07 ft); no flow at times.
1946-64: Maximum discharge, 23,900 cfs Apr. 30, 1958 (gage height, 20.63 ft); no flow at times.
Flood in May 1944 reached a stage of 21.1 ft and is the highest since that time.
Remarks.--Records good except those for period of no gage-height record and those prior to 1964, which are fair.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 21 to Mar. 7, May 7-14)

2.0	0	3.2	25
2.1	.1	3.5	38
2.2	.6	4.0	66
2.4	2.8	5.0	140
2.6	6.8	6.5	305
2.8	12	8.1	580

Yearly discharge, in cubic feet per second

Year	Water year ending Sept. 30					Calendar year	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1946	9,500	June 4, 5, 1946	15	-	-	-	-
1947	3,100	Nov. 15, 1946	.6	694	502,300	555	401,700
1948	5,400	May 17, 1948	0	681	494,300	597	433,300
1949	2,260	May 7, 1949	0	387	280,000	560	405,200
1950	10,200	Feb. 16, 1950	36	1,082	783,200	937	678,100
1951	2,260	Feb. 20, 1951	.2	357	258,700	342	247,300
1952	2,900	Apr. 21, 1952	0	349	253,200	345	250,800
1953	11,800	May 19, 1953	0	597	432,500	619	448,300
1954	1,490	May 13, 1954	0	284	205,800	261	189,300
1955	3,810	Mar. 26, 1955	0	366	264,700	362	262,200
1956	2,080	May 6, 1956	0	170	123,800	159	115,200
1957	18,400	Apr. 27, 1957	0	754	545,700	1,106	800,600
1958	23,900	Apr. 30, 1958	10	1,260	912,000	957	692,600
1959	3,420	Apr. 26, 1959 May 4, 1959	15	533	386,100	548	396,600
1960	4,500	Jan. 20, 1960	.9	464	337,000	717	520,800
1961	12,000	Dec. 11, 1960	15	931	674,000	781	565,100
1962	3,940	Dec. 23, 1961	.3	632	457,300	500	362,100
1963	3,680	May 3, 1963	0	214	155,000	-	-

7-3460.7. Little Cypress Creek near Jefferson, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	6.1	41	39	66	136	545	19	2	0	27
2		0	7.8	38	40	73	126	568	21	2	0	19
3		0	13	*35	42	79	122	568	25	1	0	13
4		0	15	33	44	131	*114	555	23	1	0	8.6
5		0	14	31	64	245	136	485	20	.5	*0	6.4
6		0	14	30	81	305	162	383	19	.5	0	5.0
7		0	13	29	98	312	177	281	20	.5	0	4.1
8		0	13	28	110	293	177	209	19	0	0	3.3
9		0	13	28	118	275	167	177	17	0	0	2.7
10		0	14	28	126	281	154	158	15	0	0	1.8
11		0	25	28	122	293	144	*131	13	0	0	1.2
12		0	29	29	118	305	136	114	*11	0	0	.8
13		0	34	29	114	305	131	98	9.7	*0	0	*.5
14		0	40	30	106	312	126	88	8.4	0	0	.4
15		0	44	32	98	326	114	78	6.8	0	0	.2
16		0	*47	34	94	333	106	70	6.4	0	0	.3
17		0	50	35	94	326	98	61	5.9	0	0	3.7
18		0	52	40	98	312	94	53	6	0	0	4.2
19		0	49	46	106	319	91	48	8	0	0	2.7
20		*0	45	51	114	326	84	42	11	0	21	17
21		0	43	56	114	305	80	36	10	0	70	81
22		0	42	60	114	281	78	31	9	0	59	102
23		0	44	61	106	251	78	29	8	0	36	88
24		0	44	60	98	221	131	29	9	0	25	63
25		2	48	57	91	209	215	26	8	0	31	38
26		4	50	54	84	203	293	24	6	0	36	26
27		6	52	52	*78	197	495	21	4	0	32	22
28		6	53	*48	73	192	545	19	3	0	27	26
29		6.4	52	44	69	177	545	18	3	0	22	38
30		6.6	49	42	----------	162	535	18	2	0	27	114
31		----------	46	40	----------	149	----------	17	----------	0	31	----------
Total	0	31.0	1,060.9	1,249	2,653	7,564	5,590	4,980	346.2	7.5	417	719.9
Mean	0	1.03	34.2	40.3	91.5	244	186	161	11.5	0.24	13.5	24.0
Cfsm	0	0.0015	0.051	0.060	0.136	0.361	0.276	0.239	0.017	0.0004	0.020	0.036
In.	0	0.002	0.06	0.07	0.15	0.42	0.31	0.27	0.019	0.0004	0.023	0.040
Ac-ft	0	61	2,100	2,480	5,260	15,000	11,090	9,880	687	15	827	1,430

Calendar year 1963: Max 3,550 Min 0 Mean 182 Cfsm 0.270 In. 3.80 Ac-ft 131,400
Water year 1963-64: Max 568 Min 0 Mean 67.3 Cfsm 0.100 In. 1.36 Ac-ft 48,830

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record Nov. 24-28, Dec. 3-5, June 18 to July 11.

8-172. Cowleech Fork Sabine River at Greenville, Tex.
(Formerly published as Sabine River at Greenville, Tex.)

Location.--Lat 33°08'00", long 96°04'35", on right bank at downstream side of bridge on U. S. Highway 67 (Interstate Highway 30), 0.3 mile downstream from Horse Creek, 0.9 mile downstream from Louisiana and Arkansas Railroad Co. bridge, and 1.8 miles east of Greenville, Hunt County.
Drainage area.--77.7 sq mi.
Records available.--February 1959 to September 1964. Prior to October 1963 published as Sabine River at Greenville.
Gage.--Water-stage recorder. Datum of gage is 485.07 ft above mean sea level, datum of 1929.
Average discharge.--5 years, 51.6 cfs (37,360 acre-ft per year).
Extremes.--Maximum discharge during year, 7,860 cfs May 30 (gage height, 16.58 ft); no flow at times.
1959-64: Maximum discharge, 8,820 cfs Dec. 16, 1959 (gage height, 16.68 ft); no flow at times in August and September 1964.
Maximum stage since 1895, 22 ft in May 1935, from information by local resident and city engineer of Greenville. Flood of July 3, 1913, reached a stage of 20 ft, from information by local resident.
Remarks.--Records good except those below 1 cfs for period Oct. 1 to Mar. 1, which are fair. City of Greenville annually diverts about 3,500 acre-ft of water above station for municipal supply and returns about 830 acre-ft of sewage effluent below station. Extreme low flow is sustained largely by water returned from water treatment plant. Recording rain gage located at station.

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

Oct. 1 to Dec. 10

2.1	0.4
2.2	.8
2.3	1.2
2.4	1.9
2.6	3.5
3.0	7.8
3.5	16

Dec. 11 to Sept. 30

1.8	0	5.0	52
1.9	.1	6.0	86
2.0	.3	8.0	190
2.1	.5	10.0	340
2.2	.9	12.0	556
2.4	2.2	14.0	885
2.6	4.0	15.0	1,280
3.0	8.7	15.3	1,520
3.5	16	15.6	2,160
4.0	26	16.0	3,770

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.7	0.4	0.6	0.5	1.2	1.0	0.5	2.7	12	0.2	0.2	0.1
2	.6	.6	1.0	.5	1.1	2.0	.5	2.6	4.0	.4	.1	.1
3	.5	.6	.6	.5	.8	1.0	.5	1.9	*1.7	.4	.1	.1
4	.5	.5	.5	1.0	9.5	2.2	.6	1.0	1.8	.5	*0	0
5	.6	.4	.5	1.2	5.0	1.0	30	.7	.6	.6	0	.6
6	.8	.4	.5	.9	1.5	.8	5.1	2.9	.6	.4	.3	.4
7	*.8	.4	.5	.7	.8	1.4	1.5	*12	.9	*.4	.4	.1
8	.7	.4	.9	.6	1.0	2.9	.8	47	.4	.5	.2	0
9	.6	.6	.8	.5	1.2	826	.4	301	.5	.4	.1	.1
10	.7	.6	7.8	.7	1.0	112	.3	15	.2	.2	.3	*0
11	.7	.5	12	1.1	.7	6.5	.7	10	.3	.7	1.1	.1
12	.7	*.4	1.7	1.4	.8	2.6	.7	9.9	.3	.5	.8	.3
13	.7	.4	.9	.8	4.0	2.4	1.4	10	.8	.3	.2	.4
14	.6	.4	.8	.6	.9	2.3	.4	9.6	4.0	.2	.1	.1
15	.6	.6	1.3	.5	1.2	1.8	.4	9.6	2.0	.2	2.9	0
16	.6	1.0	1.1	3.1	1.1	1.2	.5	10	175	.3	4.5	16
17	.6	1.0	.8	2.9	.9	1.0	.5	9.6	603	.3	.4	99
18	.6	1.2	.6	2.9	.7	1.1	.7	5.4	13	.5	.4	5.4
19	.8	7.7	.6	2.0	.6	129	.8	.4	2.5	.7	.7	1.1
20	.8	2.5	1.2	1.1	.5	56	.3	.3	1.2	.2	.2	2.2
21	.8	1.0	*1.3	*.8	.4	3.8	57	.3	1.0	.1	.2	765
22	.6	1.0	1.2	.7	.7	1.9	237	.1	.5	.2	.5	956
23	.6	1.2	.9	.6	1.0	.9	*337	.3	.4	.1	.7	235
24	1.5	1.1	.7	.5	*.8	.7	19	.7	.4	.2	3.1	15
25	.9	.8	.6	1.2	.6	.7	234	.3	.4	.4	.7	2.8
26	.8	.5	1.1	1.1	.5	.8	609	.3	.5	.4	.1	2.2
27	.9	.5	.8	.8	.4	.9	394	.2	.7	.3	.1	1.190
28	.8	1.0	1.1	.5	.4	1.1	8.2	.3	.6	.1	.1	1.270
29	.5	.7	1.3	.4	.4	1.3	2.6	2.1	.3	.1	.4	22
30	.4	.7	.9	1.9	----------	.8	2.0	3.560	.3	.1	.4	5.2
31	.4	---------	.6	3.5	----------	* .4	----------	*983	----------	.6	.1	----------
Total	21.4	29.1	45.2	35.5	39.7	1,167.5	1,946.4	5,009.2	829.9	10.5	19.4	4,589.3
Mean	0.69	0.97	1.46	1.14	1.37	37.7	64.9	162	27.7	0.34	0.63	153
Cfsm	0.0089	0.012	0.019	0.015	0.018	0.485	0.835	2.08	0.356	0.0044	0.0081	1.97
In.	0.01	0.01	0.02	0.02	0.02	0.56	0.93	2.40	0.40	0.005	0.009	2.20
Ac-ft	42	58	90	70	79	2,320	3,860	9,940	1,650	21	38	9,100

Calendar year 1963: Max 4,080 Min 0.4 Mean 28.4 Cfsm 0.366 In. 4.97 Ac-ft 20,590
Water year 1963-64: Max 3,560 Min 0 Mean 37.5 Cfsm 0.483 In. 6.58 Ac-ft 27,260

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
3- 9	1500	14.96	1,220	9-22	0600	15.46	1,800
4-26	2300	15.37	1,620	9-27	2200	15.91	3,340
5-30	1700	16.58	7,860				

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record Oct. 1-8, 9-12, 14-18, 22-23, Oct. 25 to Nov. 11, Nov. 13-15.

8-173. South Fork Sabine River near Quinlan, Tex.

Location.--Lat 32°53'52", long 96°15'11", on right bank at downstream side of bridge on Farm Road 1565, 2.4 miles upstream from Dry Creek, 6.2 miles upstream from Bearpen Creek, 7 miles southwest of Quinlan, Hunt County, and 25 miles upstream from mouth.

Drainage area.--78.7 sq mi.

Records available.--February 1959 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 461.40 ft above mean sea level, datum of 1929.

Average discharge.--5 years, 44.3 cfs (32,070 acre-ft per year).

Extremes.--Maximum discharge during year, 1,700 cfs Mar. 9 (gage height, 15.02 ft); no flow for many days.
1959-64: Maximum discharge, 11,500 cfs Apr. 28, 1963 (gage height, 16.70 ft); no flow at times.
Maximum stage known since at least 1890, 21 ft July 29, 1902, from information by local resident. Flood of Apr. 27, 1957, reached a stage of 17.76 ft, from floodmarks.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Rain gage located at station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0	0.8	0	0	3.0	*15		0	0
2				0	.2	0	0	18	*3.8		0	0
3				0	.1	0	0	4.7	1.3		*0	0
4				0	18	0	0	1.2	.3		0	0
5				0	16	0	11	.6	.2		0	0
6				0	4.2	0	5.2	.2	.7		0	0
7	(*)			0	1.0	0	1.0	*.2	.2	(*)	0	0
8				0	.2	0	.1	.3	0		0	0
9				0	.1	1,080	0	1.0	0		0	0
10				0	0	146	0	2.2	0		0	*0
11				0	0	10	0	1.0	0		0	0
12		(*)		0	0	3.5	0	.4	0		0	0
13				0	.1	2.1	.1	0	0		0	0
14				0	.5	1.0	0	0	0		0	0
15				0	.3	.5	0	0	0		0	0
16				a10	.1	.2	0	0	33		0	1.6
17	(*)			a5	.1	.1	0	0	528		3.0	7.5
18				a3	.1	.1	0	0	23		.7	.6
19				a2	0	220	0	0	4.2		0	0
20				*.8	.1	55	0	0	1.4		0	.2
21			(*)	.2	0	6.4	30	0	.2		45	14
22				.1	0	2.3	300	0	.1		46	258
23				.1	0	.9	26	0	0		.1	182
24				0	*0	.4	9.3	0	1.4		0	68
25				0	0	.4	*3.5	0	.1		0	7.8
26				0	0	.2	51	0	0		0	2.9
27				0	0	.1	38	0	0		0	347
28				0	0	0	4.8	0	0		0	518
29				0	0	0	1.4	0	0		0	20
30				0	----------	0	.4	* 298	0		0	6.9
31		---------		3.4	---------	*0	----------	* 525	---------		0	---------
Total	0	0	0	24.6	41.9	1,529.2	481.8	855.8	612.9	0	94.8	1,434.5
Mean	0	0	0	0.79	1.44	49.3	16.1	27.6	20.4	0	3.06	47.8
Cfsm	0	0	0	0.010	0.018	0.627	0.205	0.351	0.259	0	0.039	0.608
In.	0	0	0	0.01	0.02	0.72	0.23	0.40	0.29	0	0.04	0.68
Ac-ft	0	0	0	49	83	3,030	956	1,700	1,220	0	188	2,850

Calendar year 1963: Max 3,610 Min 0 Mean 25.2 Cfsm 0.320 In. 4.34 Ac-ft 18,220
Water year 1963-64: Max 1,080 Min 0 Mean 13.9 Cfsm 0.177 In. 2.39 Ac-ft 10,070

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
3-9	1100	15.02	1,700

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.

8-174. Lake Tawakoni near Wills Point, Tex.

Location.--Lat 32°48'40", long 95°54'56", in stairwell at left end of spillway of Iron Bridge Dam on Sabine River, 750 ft upstream from bridge on Farm Highway 47, 3 miles upstream from McBee Creek, and 9.0 miles northeast of Wills Point, Van Zandt County.
Drainage area.--756 sq mi.
Records available.--June 1960 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929.
Extremes.--Maximum contents during year, 884,200 acre-ft June 1 (elevation, 436.04 ft); minimum, 816,400 acre-ft Sept. 15 (elevation, 434.06 ft).
1960-64: Maximum contents, 911,400 acre-ft June 1, 1963 (elevation, 436.81 ft); minimum since first appreciable storage in 1960, 412,100 acre-ft Nov. 21, 1961.
Remarks.--Lake is formed by a rolled earth-fill dam, 31,460 ft long including a 480-foot uncontrolled concrete gravity spillway with ogee weir section. Outlet works consist of two 4- by 6-foot sluice gates and two 20-inch steel pipes controlled by service valves. Closure of earth dam made July 1, 1960, and deliberate impoundment of water began Oct. 7, 1960. Capacity table based on 1956 survey. Records furnished by Sabine River Authority show that during the year the city of Dallas diverted 26,110 acre-ft of water for municipal use in the Trinity River basin and 13 other users in the Sabine River basin diverted a total of 140 acre-ft. Lake built for water conservation. Data regarding dam and lake are given in the following table:

	Elevation (feet)	Contents (acre-feet)
Crest of spillway	437.5	936,200
Invert of lowest intake to wet well	416.5	342,700
Invert of two 4- by 6-foot sluice gates	378.0	0

Capacity table (elevation, in feet, and contents, in acre-feet)

434	814,300
435	848,200
436	882,800
437	918,200

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	863,800	848,500	841,700	834,000	835,000	831,300	841,400	869,300	883,800	870,700	845,100	829,600
2	863,100	846,100	841,400	832,900	835,000	832,600	842,100	869,600	883,500	870,300	844,500	828,900
3	862,700	845,100	841,100	834,600	832,900	832,900	843,100	870,300	882,800	868,900	843,800	828,500
4	862,400	845,800	840,100	833,300	837,300	832,900	843,100	869,600	881,700	868,200	843,400	827,500
5	861,700	845,800	840,100	833,300	838,700	830,900	847,200	867,900	881,700	867,600	842,400	826,900
6	861,700	845,500	839,400	832,900	840,100	831,600	847,800	869,600	881,700	866,600	842,100	826,200
7	861,300	844,800	839,700	832,300	836,300	832,300	848,900	868,600	881,400	865,500	841,100	825,200
8	861,000	844,800	839,100	835,300	836,700	835,300	846,500	870,000	881,100	864,100	840,400	824,500
9	860,300	844,100	837,300	831,900	835,700	839,400	845,100	871,400	880,700	863,400	839,000	823,800
10	859,900	844,100	840,400	829,600	835,700	845,100	844,100	870,700	880,400	862,400	837,700	823,500
11	859,200	843,100	841,400	836,000	833,600	846,500	844,100	872,100	880,000	861,700	837,000	822,800
12	858,600	842,400	839,700	834,000	835,700	845,500	846,500	871,000	880,000	860,600	836,000	821,100
13	857,900	842,400	840,400	830,600	836,000	845,100	845,500	870,000	879,700	858,900	834,000	819,400
14	857,200	840,400	838,700	829,600	834,600	846,500	844,800	869,300	879,300	857,500	833,600	818,700
15	856,800	838,700	837,300	832,300	836,300	845,100	843,400	868,600	879,000	856,500	835,700	817,400
16	855,800	838,700	836,700	834,600	835,000	845,100	845,800	867,900	879,000	855,100	837,000	824,200
17	855,400	840,400	836,700	834,300	836,000	845,100	845,100	867,600	879,000	854,400	836,700	822,800
18	854,800	842,400	837,000	834,600	836,000	845,800	844,800	867,200	880,000	853,400	836,300	822,800
19	854,100	846,500	836,000	834,600	835,000	846,500	844,100	866,900	879,600	853,000	835,300	822,500
20	853,400	845,500	836,300	834,000	835,300	849,200	844,500	866,500	879,000	851,600	834,000	822,800
21	853,000	845,800	836,000	833,600	834,300	846,800	859,900	866,200	878,300	850,900	835,700	825,800
22	852,700	848,900	838,700	834,300	832,900	845,800	864,400	865,100	877,600	849,900	836,000	831,900
23	852,300	844,800	835,000	834,300	833,300	845,800	867,200	864,800	877,600	848,900	835,300	838,000
24	852,700	843,400	835,000	835,000	832,900	846,100	868,900	864,400	876,900	848,500	835,300	838,700
25	852,700	843,400	834,600	833,600	832,600	849,200	867,200	864,100	876,200	848,200	833,600	837,700
26	852,700	843,400	835,000	834,000	832,600	844,800	868,200	863,800	875,200	847,200	832,900	837,300
27	852,400	842,800	835,000	834,300	832,600	845,100	871,700	863,100	874,500	846,100	831,900	843,100
28	851,600	846,800	835,000	832,900	830,900	845,100	871,400	862,000	873,400	844,800	831,600	850,300
29	849,600	843,100	835,000	833,300	830,200	844,800	870,700	863,100	872,400	846,100	831,300	853,400
30	847,200	842,400	834,600	835,000	----------	844,100	869,300	868,200	871,700	847,500	830,600	853,400
31	848,200	----------	834,000	835,000	----------	843,400	----------	879,300	----------	846,100	830,200	----------
(†)	435.00	434.83	434.58	434.61	434.47	434.86	435.61	435.90	435.68	434.94	434.47	435.15
(‡)	-16,200	-5,800	-8,400	+1,000	-4,800	+13,200	+25,900	+10,000	-7,600	-25,600	-15,900	+23,200
(††)	82	24	143	154	1,850	2,580	2,840	3,050	3,550	5,110	3,900	2,970

Calendar year 1963..... ‡ +49,800 †† -
Water year 1963-64..... ‡ -11,000 †† 26,250

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.
†† Diversions, in acre-feet.

8-175. Sabine River near Emory, Tex.

Location.--Lat 32°46'23", long 95°47'56", on left bank at downstream side of bridge on State Highway 19, 3.5 miles upstream from Sandy Creek, 7 miles south of Emory, Rains County, 9.4 miles downstream from McBee Creek, and 13 miles downstream from Lake Tawakoni. Records include flow in Little and Yellow Steer Sloughs.

Drainage area.--888 sq mi.

Records available.--July 1952 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 350.28 ft above mean sea level, unadjusted (Texas Reclamation Department bench mark).

Average discharge.--12 years, 394 cfs (285,200 acre-ft per year).

Extremes.--Maximum discharge during year, 4,650 cfs Apr. 22 (gage height, 13.42 ft); no flow at times.
1952-64: Maximum discharge, 74,000 cfs Apr. 27, 1957 (gage height, 25.06 ft); no flow at times.
Maximum stage since at least 1900, 25.7 ft in June 1943, from information by local resident and State Highway Department.

Remarks.--Records good. Flow largely regulated by Lake Tawakoni (see preceding page) since October 1960.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 11 to Jan. 13, Apr. 21-27, Aug. 6-10, Sept. 12-16)

Oct. 1 to Apr. 24

4.5	0	6.5	56
4.6	.1	7.0	103
4.7	.3	7.5	177
4.8	.6	8.0	275
4.9	1.2	9.0	525
5.0	2.1	10.0	860
5.2	4.7	11.0	1,360
5.5	10	12.0	2,190
6.0	28	13.0	3,680

Apr. 25 to Sept. 30

4.3	0	5.0	4.7
4.4	.1	5.3	12
4.5	.3	6.0	47
4.6	.7	7.0	138
4.8	2.1	8.0	268

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.7	1.5	4.9	0.3	0.3	*3.7	2.1	8.0	23		0	1.6
2	3.9	1.6	3.3	.2	.2	12	2.5	6.8	5.1		.3	.6
3	2.6	4.3	2.0	1.0	.2	7.8	2.7	5.6	2.1		.5	1.3
4	2.2	2.7	1.4	1.8	1.1	6.0	2.6	5.5	1.0		.2	1.3
5	2.8	1.5	1.3	1.7	6.0	7.2	8.2	4.9	.6		0	1.1
6	5.7	.7	1.5	1.2	34	5.7	44	4.7	.4		2.1	2.8
7	3.6	.5	1.6	.7	23	4.4	*25	4.7	.3		7.1	1.8
8	2.6	.5	2.8	.4	9.6	3.7	8.2	4.6	.2		2.3	.8
9	2.5	.5	2.5	.3	6.0	26	4.9	3.6	.1		*4.4	.3
10	4.4	.7	2.7	.1	4.1	218	3.2	2.6	.1		5.1	.2
11	3.6	.8	4.4	.1	3.6	47	2.7	1.9	0		2.6	.1
12	2.3	.7	3.7	.2	3.3	14	3.2	1.6	0		3.1	.2
13	2.0	.6	4.0	5.8	3.4	7.6	3.3	1.2	0		4.2	1.8
14	1.9	.5	4.4	15	3.6	5.5	3.3	*1.0	0		2.3	1.2
15	2.0	*.5	3.3	14	4.0	5.2	2.7	1.0	0		1.7	.6
16	*2.1	.6	2.3	14	4.7	3.7	2.0	1.1	0	(*)	1.3	*.4
17	2.9	.8	1.8	11	4.6	3.2	2.1	1.0	*0		.6	.7
18	5.3	2.3	1.3	6.1	3.7	2.8	2.2	1.1	0		.2	.8
19	3.6	2.9	.9	5.5	3.3	3.1	2.2	.9	0		.1	2.8
20	2.6	2.9	*.7	4.4	3.3	3.1	2.7	.6	0		0	2.5
21	1.9	2.6	.6	3.1	4.1	5.5	755	.3	0		.2	1.8
22	1.8	4.4	1.0	2.2	3.3	8.2	*3,300	.2	0		.6	38
23	1.9	3.7	1.2	1.6	2.9	4.0	2,390	.1	0		5.0	67
24	2.7	7.2	1.1	1.0	2.8	2.7	362	0	0		5.3	70
25	6.0	5.2	1.4	.7	2.8	2.5	52	0	0		2.0	54
26	3.9	2.9	2.6	.4	2.8	2.6	37	0	0		.8	14
27	2.6	1.8	2.3	*.3	2.8	5.2	20	0	0		.9	11
28	2.0	1.5	1.6	.2	3.3	3.4	16	0	0		7.6	235
29	1.7	1.1	1.1	.2	4.3	2.9	10	0	0		5.6	120
30	1.5	2.6	.6	.2	----------	2.6	8.5	.2	0		4.4	33
31	1.5	----------	.5	.4	----------	2.0	----------	37	----------		4.1	----------
Total	92.8	60.1	64.8	94.1	151.1	431.3	7,080.3	100.2	32.9	0	74.6	666.7
Mean	2.99	2.00	2.09	3.04	5.21	13.9	236	3.23	1.10	0	2.41	22.2
Ac-ft	184	119	129	187	300	855	14,040	199	65	0	148	1,320

Calendar year 1963: Max 4,720 Min 0.5 Mean 52.1 Ac-ft 37,750
Water year 1963-64: Max 3,300 Min 0 Mean 24.2 Ac-ft 17,550

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

8-190. Lake Fork Creek near Quitman, Tex.

Location.--Lat 32°46', long 95°28', near center of main channel at upstream side of bridge on State Highway 37, half a mile downstream from Dry Creek and 2.5 miles south of Quitman, Wood County.
Drainage area.--585 sq mi.
Records available.--June 1924 to April 1926, February 1939 to September 1964. Discharge for some high-water periods in 1925-26 published in WSP 1342. Monthly discharge only for some periods, published in WSP 1312. Prior to October 1961 published as Lake Fork Sabine River near Quitman.
Gage.--Wire-weight gage read twice daily, more often during floods. Datum of gage is 317.42 ft above mean sea level, datum of 1929. June 27, 1924, to Apr. 30, 1926, staff gage at site 1,000 ft downstream at same datum.
Average discharge.--26 years (1924-25, 1939-64), 424 cfs (307,000 acre-ft per year).
Extremes.--Maximum discharge during year, 1,920 cfs Apr. 25 (gage height, 14.15 ft); no flow at times.
1924-26, 1939-64: Maximum discharge, 75,600 cfs Mar. 30, 1945 (gage height, 29.85 ft, from floodmark), from rating curve defined by current-meter measurements below 49,000 cfs; no flow at times.
Maximum stage since at least 1890, that of Mar. 30, 1945. Flood in July 1895 reached a stage of about 25.9 ft, from information by local resident.
Remarks.--Records good. No large diversion above station. At end of year, flow from 41.3 sq mi above this station was partly controlled by 14 floodwater-retarding structures with a total combined capacity of 15,330 acre-ft below the flood spillway crests, of which 14,020 acre-ft is floodwater-retarding capacity and 1,310 acre-ft is sediment-pool capacity. Three structures were built during the current year and have a total combined capacity below flood spillway crests of 3,960 acre-ft, of which 320 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

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

1.7	0	3.0	19
1.8	.1	4.0	46
1.9	.4	5.0	86
2.0	.8	6.0	142
2.1	1.6	8.0	300
2.2	2.8	10.0	602
2.3	4.6	12.0	1,030
2.5	8.2	14.0	1,800

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0	0.8	5.0	*5.5	11	115	19	0.2	0	0
2			0	.8	5.9	15	11	74	112	.1	0	0
3			0	.7	5.0	42	10	60	101	.1	0	0
4			0	.6	8.4	56	9.0	37	44	.1	0	0
5			0	.6	31	63	23	36	24	0	0	0
6			0	.6	69	56	46	30	17	0	0	0
7			0	.6	78	42	*48	27	12	0	0	0
8			0	.6	86	30	213	23	8.4	0	*0	0
9			0	.6	51	43	145	22	5.9	0	0	0
10			0	.6	45	130	64	21	4.4	0	0	0
11			.1	.5	34	215	42	20	3.3	0	0	0
12			.1	.5	20	324	31	19	2.4	0	0	0
13			.3	.4	18	309	26	16	1.5	0	0	0
14			.5	.4	13	115	22	*15	1.2	0	0	0
15		(*)	.3	.6	15	60	19	9.2	1.1	*0	0	*0
16	(*)		.1	1.0	17	46	16	10	3.3	0	0	0
17			0	2.5	17	37	15	8.8	*11	0	8.9	0
18			0	5.5	18	31	14	7.7	12	0	4.3	0
19			*0	7.7	20	28	13	5.9	7.8	0	.7	0
20			.1	8.6	17	28	12	5.1	4.1	0	.4	0
21			.1	9.5	16	26	34	4.1	11	0	.2	0
22			.1	8.2	14	25	562	3.3	14	0	.1	12
23			.2	7.3	11	26	*980	3.0	7.3	0	.3	14
24			.3	6.9	9.5	27	1,190	2.4	4.1	0	.4	8.0
25			.8	6.4	8.4	24	1,800	2.2	2.3	0	.8	5.1
26			.9	5.9	7.7	22	1,400	1.9	1.2	0	5.9	5.5
27			1.0	*4.4	6.9	16	956	1.7	.6	0	4.2	6.6
28			1.2	4.1	6.4	14	584	1.4	.4	0	.3	10
29			1.3	3.2	5.9	13	416	2.7	.3	0	.1	8.4
30			1.2	3.7	---	12	264	3.7	.2	0	0	12
31		---	.8	4.4	---	12	---	8.4	---	0	0	---
Total	0	0	9.4	98.2	659.1	1,892.5	8,976.9	596.5	436.8	0.5	26.6	81.6
Mean	0	0	0.30	3.17	22.7	61.0	299	19.2	14.6	0.02	0.86	2.72
Cfsm	0	0	0.00051	0.0054	0.039	0.104	0.511	0.033	0.025	0.000034	0.0015	0.0046
In.	0	0	0.0006	0.006	0.04	0.12	0.57	0.04	0.03	0.00003	0.002	0.005
Ac-ft	0	0	19	195	1,310	3,750	17,810	1,180	866	1.0	53	162

Calendar year 1963: Max 6,890 Min 0 Mean 124 Cfsm 0.212 In. 2.88 Ac-ft 89,590
Water year 1963-64: Max 1,800 Min 0 Mean 34.9 Cfsm 0.060 In. 0.81 Ac-ft 25,350

Peak discharge (base, 6,600 cfs).--No peak above base.
* Discharge measurement or observation of no flow made on this day.

8-193.--Lake Winnsboro.--See page 84.

8-195. Big Sandy Creek near Big Sandy, Tex.

Location.--Lat 32°36'12", long 95°05'32", on left bank at downstream side of bridge on State Highway 155, 0.8 mile upstream from St. Louis Southwestern Railway Lines bridge, 1.3 miles northeast of Big Sandy, Upshur County, and 7.1 miles upstream from mouth.
Drainage area.--231 sq mi.
Records available.--February 1939 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 278.38 ft above mean sea level, datum of 1929, supplementary adjustment of 1942. Prior to Oct. 5, 1940, wire-weight gage and Oct. 5, 1940, to Nov. 26, 1951, water-stage recorder, at site 0.7 mile upstream at datum 3.00 ft higher.
Average discharge.--25 years, 189 cfs (136,800 acre-ft per year).
Extremes.--Maximum discharge during year, 322 cfs Apr. 27 (gage height, 8.79 ft); minimum, 7.6 cfs Aug. 6-7.
1939-64: Maximum discharge, 24,000 cfs Mar. 31, 1945 (gage height, 24.1 ft, present site and datum, from floodmark), from rating curve defined by current-meter measurements below 13,000 cfs and extended by logarithmic plotting; minimum, 5.0 cfs Aug. 15, 1956.
Maximum stage since about 1875, that of Mar. 31, 1945, from information by local residents.
Remarks.--Records good except those for period of no gage-height record, which are fair. Flow partly regulated by Lake Winnsboro (see page 84) since June 1962.
Revisions.--Revised figures of discharge, in cubic feet per second, for the water years 1945-46, superseding previously published figures, are given herewith:

1945		1945-Con.		1946	
Mar. 30	9,540	Apr. 3	2,770	June 1	4,000
31	17,900	June 13	3,360	2	3,650
Apr. 1	8,050	14	6,000	3	3,520
2	4,190	15	2,640	17	210

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
March 1945	56,136	17,900	388	1,811	111,300
April	27,719	8,050	254	924	54,980
June	17,855	6,000	48	595	35,410
Water year 1944-45	153,546	17,900	19	421	304,500
Calendar year 1945	162,251	17,900	27	445	321,800
June 1946	21,135	4,000	131	704	41,920
Water year 1945-46	139,884	4,000	30	383	277,400
Calendar year 1946	152,408	4,000	30	418	302,300

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 12 to Feb. 7, Mar. 30 to Apr. 21)

2.49	8.0	3.5	30	6.0	124
2.6	11	4.0	43	8.0	251
3.0	19	5.0	78	10.0	480

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	30	37	37	58	50	57	163	36	14	10	12
2	16	26	35	37	60	60	55	157	32	14	10	12
3	15	24	33	36	57	76	55	124	28	13	9.6	12
4	16	23	32	36	58	102	55	122	26	14	8.4	16
5	16	22	32	36	99	116	66	114	25	13	8.0	14
6	16	21	32	36	102	122	*78	92	26	13	8.4	14
7	17	20	32	35	97	132	74	76	26	12	8.0	14
8	16	20	32	36	90	132	70	64	24	11	*8.4	13
9	15	20	31	37	86	157	70	57	22	11	9.6	12
10	15	20	34	37	86	175	70	53	21	11	9.6	12
11	*15	20	80	36	82	151	66	50	20	11	12	12
12	15	20	76	36	72	145	60	47	19	11	12	11
13	16	20	64	35	70	157	58	*44	18	10	12	10
14	17	20	52	34	70	169	55	40	18	9.3	11	9.6
15	16	20	46	34	70	157	50	37	18	*9.3	13	*8.8
16	17	20	43	40	68	132	49	35	*23	9.6	16	12
17	19	20	41	50	70	104	46	32	31	9.6	18	22
18	18	*36	*39	58	82	88	44	30	34	9.8	18	26
19	17	41	37	60	84	92	44	28	30	9.8	17	23
20	16	52	37	60	84	94	41	27	25	9.6	16	20
21	16	52	44	60	80	88	61	25	22	9.0	15	18
22	15	58	46	58	74	82	99	25	21	9.0	15	16
23	15	70	43	*58	70	80	88	24	20	9.0	16	20
24	15	58	43	*58	64	78	97	24	20	9.8	20	28
25	25	43	43	52	60	76	114	24	19	11	23	25
26	23	35	44	49	58	74	209	23	17	11	18	21
27	22	34	43	46	55	76	312	23	16	9.8	16	26
28	21	37	41	44	53	80	275	22	16	9.0	15	41
29	20	43	40	41	*52	78	209	27	15	9.0	14	46
30	20	41	39	44	----------	68	163	34	14	9.8	13	44
31	20	----------	37	55	----------	60	----------	39	----------	10	13	----------
Total	536	966	1,308	1,371	2,111	3,251	2,790	1,682	682	331.4	413.0	570.4
Mean	17.3	32.2	42.2	44.2	72.8	105	93.0	54.3	22.7	10.7	13.3	19.0
Ac-ft	1,060	1,920	2,590	2,720	4,190	6,450	5,530	3,340	1,350	657	819	1,130

Calendar year 1963: Max 1,310 Min 12 Mean 69.8 Ac-ft 50,560
Water year 1963-64: Max 312 Min 8.0 Mean 43.7 Ac-ft 31,760

Peak discharge (base, 1,500 cfs).--No peak above base.

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 18 to Nov. 17.

8-200. Sabine River near Gladewater, Tex.

Location.--Lat 32°32', long 94°57', on right bank on downstream side of bridge on U. S. Highway 271, half a mile downstream from Glade Creek and 1 mile southwest of Gladewater, Gregg County.

Drainage area.--2,791 sq mi.

Records available.--October 1932 to September 1964.

Gage.--Water-stage recorder and wire-weight gage. Datum of gage is 243.85 ft above mean sea level (Texas Reclamation Department bench mark based on Geological Survey datum). Prior to Oct. 13, 1933, chain gage at same site and datum.

Average discharge.--32 years, 1,890 cfs (1,368,000 acre-ft per year).

Extremes.--Maximum discharge during year, 3,280 cfs May 1 (gage height, 18.56 ft); minimum, 10 cfs Aug. 9-11.
1932-64: Maximum discharge, 138,000 cfs Apr. 2, 1945 (gage height, 44.16 ft, from floodmark), from rating curve defined by current-meter measurements below 91,000 cfs; minimum, 5.6 cfs Aug. 16, 1939.
Maximum stage since at least 1892, that of Apr. 2, 1945. Flood in May 1914 reached a stage of about 41.7 ft (discharge, 85,900 cfs), from information by local resident.

Remarks.--Records good. Flow partly regulated by Lake Tawakoni (station 8-174) since October 1960. Small diversions above station for oilfield operations and municipal supply. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Lake Fork Creek near Quitman (station 8-190).

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

3.8	8.5	6.0	285
3.9	12	9.0	885
4.0	17	11.0	1,320
4.2	28	15.0	2,280
4.5	52	19.0	3,410
5.0	111		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	35	41	131	150	190	207	236	3,240	146	34	14	18
2	34	40	125	165	210	271	209	2,880	157	31	13	16
3	33	42	114	191	231	360	210	2,020	139	28	13	15
4	32	43	105	200	275	407	230	1,140	118	26	12	15
5	30	43	100	191	347	415	245	681	133	24	12	18
6	28	41	96	175	460	425	*325	487	168	23	12	17
7	27	41	103	170	571	460	385	387	154	22	11	16
8	27	41	104	150	570	550	399	327	131	20	*11	16
9	26	41	93	133	510	779	365	285	112	19	10	15
10	26	40	100	125	427	992	373	269	95	18	10	15
11	*25	39	155	135	385	1,060	461	241	81	18	10	14
12	24	38	277	141	371	1,080	469	225	70	17	11	13
13	23	37	307	141	345	1,070	397	*205	61	16	18	*12
14	23	37	281	141	345	1,020	331	182	55	*16	16	12
15	24	36	230	135	345	938	281	163	*51	15	14	12
16	26	37	190	133	345	860	245	147	58	14	44	19
17	25	37	160	190	345	739	222	135	77	14	22	96
18	25	*48	*152	280	360	545	207	122	104	14	22	43
19	26	81	143	335	395	483	198	111	144	13	22	95
20	25	125	149	345	430	485	191	100	162	14	22	85
21	24	143	159	345	440	520	225	91	151	14	20	52
22	24	165	157	325	380	465	569	85	122	14	19	40
23	24	200	165	*279	315	399	637	81	96	13	19	41
24	26	232	173	251	277	380	853	77	80	13	20	50
25	28	227	173	229	260	361	1,210	73	65	16	29	55
26	29	187	173	210	249	345	1,810	70	59	16	32	56
27	33	146	173	187	249	343	2,530	66	53	17	26	89
28	41	128	173	173	240	310	2,820	64	48	16	22	144
29	50	124	173	173	*216	285	3,040	64	41	14	20	307
30	45	128	155	180	----------	275	3,220	84	37	13	18	375
31	42	----------	149	180	----------	257	----------	114	----------	14	18	----------
Total	910	2,608	4,938	6,158	10,083	17,086	22,893	14,216	2,968	556	562	1,771
Mean	29.4	86.9	159	199	348	551	763	459	98.9	17.9	18.1	59.0
Ac-ft	1,800	5,170	9,790	12,210	20,000	33,890	45,410	28,200	5,890	1,100	1,110	3,510

Calendar year 1963: Max 9,520 Min 22 Mean 584 Ac-ft 422,700
Water year 1963-64: Max 3,240 Min 10 Mean 232 Ac-ft 168,100

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 2-3, Dec. 15-17, 23, 25-26, 30, Jan. 1-2, 4, 6, 8, 10-11, 15, 17-18, 26, Jan. 30 to Feb. 2, Feb. 4, 6, 8-9, 14, 18, 20-22, 25, 28, Mar. 3, 5-8, 13-14, 16, 20-21, 24, 28, Apr. 3-4; discharge computed from graph based on U. S. Weather Bureau gage readings Dec. 22, 24, 27-29, 31, Jan. 3, 5, 7, 9, 12-14, 16, 19, 22, 27-29, Feb. 3, 5, 7, 10-13, 15-17, 19, 23-24, 26-27, Mar. 2, 4, 9-12, 15, 17-19, 22-23, 25-27, Mar. 29 to Apr. 2, Apr. 5.

8-207. Rabbit Creek at Kilgore, Tex.

Location.--Lat 32°23'17", long 94°54'11", near center of channel on downstream side of bridge on State Highway 31, at Kilgore, Gregg County, 0.4 mile upstream from Big Caney Creek, 4 miles upstream from Peavine Creek, and 12 miles upstream from mouth.

Drainage area.--75.8 sq mi.

Records available.--October 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 299.80 ft above mean sea level, datum of 1929 (State Highway Department bench mark).

Extremes.--Maximum discharge during year, 292 cfs Mar. 4 (gage height, 7.34 ft); no flow at times. Maximum stage since at least 1943, 19.6 ft July 11, 1945, from information by local resident and State Highway Department.

Remarks.--Records good except those prior to Dec. 5, which are poor. Small diversions and effluents above station from oilfield operations.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 14-23)

1.8	0	3.0	24
1.9	.1	3.5	46
2.0	.3	4.0	70
2.1	.8	5.0	127
2.2	1.8	6.0	194
2.4	5.4	7.0	268
2.6	10		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	5	7.7	16	15	18	27	14	0.8	0	0
2		0	5	8.0	13	29	18	197	8.3	.7	0	0
3		0	5	8.0	12	32	19	68	6.5	.6	0	0
4		0	5	8.0	17	196	19	34	5.8	.6	0	0
5		0	*4.8	7.7	78	102	*79	23	4.8	.6	0	0
6		0	4.8	7.7	42	50	*60	18	5.0	.4	0	0
7		0	5.0	8.0	24	36	34	17	5.2	.4	*0	0
8		0	5.6	9.1	18	33	24	16	4.2	.3	0	0
9		0	6.1	11	16	111	20	15	3.4	.2	0	0
10		0	14	8.8	15	98	19	15	2.9	.2	0	0
11		0	46	8.0	14	52	19	14	2.9	.2	0	0
12		0	24	8.3	14	37	20	13	2.6	.1	0	0
13		0	12	8.0	26	32	20	*10	2.3	.2	0	0
14		0	11	8.0	30	45	17	8.3	1.9	.2	0	0
15		0	9.4	8.0	30	55	15	7.5	1.9	*0	0	*0
16		0	7.5	31	27	38	15	6.7	*6.0	0	0	0
17		0	6.7	56	22	29	14	6.3	14	0	0	24
18		0	6.7	34	42	27	14	5.6	7.7	0	0	5.0
19		0	6.7	22	30	38	15	5.2	4.2	0	0	.8
20		20	36	17	21	39	13	4.8	2.6	0	0	.4
21		15	42	14	19	28	12	4.6	1.8	0	0	.6
22		10	17	14	17	25	13	4.6	1.5	0	0	2.4
23		8	14	14	17	24	12	5.0	1.4	0	0	2.1
24		7	14	14	16	24	11	5.8	1.2	0	.5	.7
25		6	14	13	17	25	11	5.4	1.0	0	0	.3
26		6	14	11	17	22	58	4.8	.8	0	0	.3
27		6	11	11	18	20	60	4.0	.7	0	0	38
28		5	9.7	11	*18	20	23	3.8	.6	0	0	28
29		5	8.8	*10	15	19	15	5.7	.6	0	0	6.7
30		5	8.3	11	----------	18	13	28	.6	0	0	2.8
31		---------	8.0	16	----------	18	----------	20	----------	0	0	----------
Total	0	93	387.1	423.3	661	1,337	700	603.1	116.4	5.5	1.0	112.1
Mean	0	3.10	12.5	13.7	22.8	43.1	23.3	19.5	3.88	0.18	0.03	3.74
Cfsm	0	0.041	0.165	0.181	0.301	0.568	0.307	0.257	0.051	0.0024	0.00040	0.049
In.	0	0.05	0.19	0.21	0.32	0.66	0.34	0.30	0.06	0.003	0.0005	0.06
Ac-ft	0	184	768	840	1,310	2,650	1,390	1,200	231	11	2.0	222

Calendar year	Max	Min	Mean	Cfsm	In.	Ac-ft
Water year 1963-64:	Max 197	Min 0	Mean 12.1	Cfsm 0.160	In. 2.19	Ac-ft 8,810

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

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

Note.--No gage-height record Oct. 1 to Dec. 4, Aug. 8 to Sept. 14.

8-215. Lake Cherokee.--See page 84.

8-220. Sabine River near Tatum, Tex.

Location.--Lat 32°22'11", long 94°27'28", near right bank on downstream side of pier of bridge on State Highway 43, 5.1 miles northeast of Tatum, Rusk County, 5.2 miles upstream from Potters Creek, and 5.6 miles downstream from Cherokee Bayou.
Drainage area.--3,493 sq mi.
Records available.--October 1938 to September 1964. Monthly discharge only for some periods, published in WSP 1312.
Gage.--Water-stage recorder. Datum of gage is 204.18 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Sept. 21, 1945, wire-weight gage at same site and datum.
Average discharge.--26 years, 2,486 cfs (1,800,000 acre-ft per year).
Extremes.--Maximum discharge during year, 3,310 cfs Apr. 27 (gage height, 11.08 ft); minimum observed, 2.4 cfs Aug. 11-12.
1938-64: Maximum discharge, 123,000 cfs Apr. 4, 1945 (gage height, 33.80 ft, from graph based on gage readings), from rating curve defined by current-meter measurements below 66,000 cfs and extended above on basis of partly estimated measurement of 88,900 cfs; minimum observed, that of Aug. 11-12, 1964.
Maximum stage since at least 1884, that of Apr. 4, 1945. Flood in May 1884 reached a stage of about 32 ft, from information by local residents.
Remarks.--Records good. Discharge affected by operation of Lake Tawakoni (station 8-174) since October 1960. Small diversions above station and below Lake Tawakoni for oilfield operation and municipal and industrial use. There are several small reservoirs on tributaries above this station, the largest of which are Lakes Cherokee and Gladewater with capacities of 62,400 and 6,950 acre-ft, respectively. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Lake Fork Creek near Quitman (station 8-190). Records of chemical analyses and water temperatures for water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 12)

0.39	2.4	1.0	31	6.0	1,110
.4	2.6	1.5	73	8.0	1,850
.5	5.1	2.0	137	10.0	2,750
.6	8.6	3.0	307	11.0	3,260
.8	18	4.0	534		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63	47	110	191	233	327	370	3,000	214	54	18	46
2	58	48	117	183	242	347	347	3,050	209	46	19	43
3	55	48	129	178	269	393	327	3,150	214	34	14	39
4	54	46	122	175	288	505	347	2,850	214	37	12	37
5	52	45	91	170	347	1,020	*416	2,000	201	42	7.2	37
6	51	45	75	170	485	1,110	586	1,270	181	46	6.8	35
7	50	44	74	166	586	1,050	638	870	162	46	*2.6	32
8	48	46	81	166	638	1,050	612	664	177	43	6.8	32
9	47	48	77	162	638	1,020	586	560	*175	43	5.1	32
10	*45	45	94	166	612	1,250	534	508	158	40	2.8	32
11	44	45	150	170	560	1,460	485	462	140	38	2.4	28
12	42	44	251	172	485	1,390	485	*439	119	37	2.4	25
13	40	44	307	169	462	1,320	560	393	97	35	4.5	24
14	40	44	327	164	462	1,250	534	347	82	*30	107	*30
15	39	43	327	161	462	1,220	485	307	*73	30	219	28
16	37	43	307	172	485	1,220	416	278	70	28	100	26
17	36	42	260	209	508	1,140	370	251	81	24	46	35
18	36	45	*196	278	485	990	327	233	102	30	66	160
19	36	*45	150	327	534	870	307	216	140	28	73	233
20	36	59	164	347	560	810	288	206	150	24	41	158
21	36	91	261	393	534	780	269	191	164	23	31	110
22	34	146	327	393	485	750	260	177	173	24	38	110
23	34	172	298	*393	462	638	362	167	169	24	45	70
24	37	185	260	370	416	586	638	161	160	25	76	60
25	40	196	251	347	370	534	900	156	114	27	199	70
26	41	191	251	307	347	534	1,580	149	86	27	201	50
27	41	167	233	298	347	508	3,020	143	72	28	108	43
28	40	152	233	278	347	462	3,200	136	60	27	76	277
29	33	134	224	251	347	439	3,050	130	66	23	68	612
30	33	113	216	242	----------	416	3,000	131	66	18	58	383
31	40	----------	202	233	----------	393	----------	159	----------	14	52	----------
Total	1,318	2,463	6,165	7,401	12,996	25,782	25,299	22,754	4,089	995	1,707.6	2,897
Mean	42.5	82.1	199	239	448	832	843	734	136	32.1	55.1	96.6
Ac-ft	2,610	4,890	12,230	14,680	25,780	51,140	50,180	45,130	8,110	1,970	3,390	5,750

Calendar year 1963: Max 7,360 Min 33 Mean 674 Ac-ft 487,700
Water year 1963-64: Max 3,200 Min 2.4 Mean 311 Ac-ft 225,900

* Discharge measurement made on this day.

Note.--Discharge computed from once-daily wire-weight gage readings Oct. 1-23, Oct. 25 to Nov. 20, June 28 to July 3, July 5-10, 12-23, July 25 to Aug. 13, Aug. 17, 20-23.

8-222. Murvaul Lake near Gary, Tex.

Location.--Lat 32°02'04", long 94°25'15", at outlet structure of Murvaul Lake Dam on Murvaul Bayou, 3.0 miles west of Gary, Panola County, and 9.0 miles southwest of Carthage.
Drainage area.--115 sq mi.
Records available.--December 1957 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929.
Extremes.--Maximum contents during year, 43,830 acre-ft Apr. 28 (elevation, 264.79 ft); minimum, 28,000 acre-ft Nov. 16-17 (elevation, 260.33 ft).
1957-64: Maximum contents, 57,240 acre-ft Jan. 8, 1961 (elevation, 268.05 ft); minimum since lake first filled in 1958, 26,670 acre-ft about Sept. 19, 1958 (elevation, 259.9 ft).
Remarks.--Lake is formed by a rolled-fill earthen dam 8,300 ft long. Spillway is an uncontrolled concrete flat-crested weir section 270 ft long at right end of dam and designed to discharge 26,700 cfs under a 10-foot head. Storage began in November 1957; dam completed in June 1958. Outlet works consist of three sluice gates to the control tower which discharge through a 36-inch valve and conduit. The lake is the property of Panola County Fresh Water Supply District No. 1, Carthage, and was built to impound water for municipal and industrial use. No diversion during year. Occasional releases. Figures given herein represent total contents. Data regarding dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Crest of spillway	265.3	45,840
Invert of lowest sluice gate	235.0	25

Cooperation.--Capacity table from data furnished by Forrest and Cotton, Consulting Engineers, based on survey made in 1955.

Capacity table (elevation, in feet, and contents, in acre-feet)

260	26,980
261	30,160
262	33,550
263	37,090
264	40,790
265	44,650

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30,130	28,670	28,860	29,080	31,150	32,820	40,900	43,680	43,400	41,550	38,920	37,630
2	30,090	28,570	28,960	29,080	31,080	33,720	40,900	43,680	43,440	41,440	38,850	37,520
3	30,030	28,480	28,920	29,210	31,050	34,180	40,900	43,640	43,400	41,400	38,770	37,450
4	30,000	28,540	28,860	29,180	31,520	34,420	40,940	43,640	43,320	41,280	38,700	37,410
5	29,930	28,540	28,860	29,210	32,030	34,500	42,270	43,520	43,280	41,250	38,550	37,340
6	29,900	28,480	28,830	29,400	32,200	34,530	42,860	43,520	43,440	41,170	38,440	37,230
7	29,830	28,410	28,860	29,370	32,200	34,600	43,010	43,440	43,360	41,090	38,330	37,160
8	29,760	28,380	28,760	29,900	32,240	34,740	42,900	43,480	43,280	41,020	38,250	37,090
9	29,730	28,350	28,670	30,000	32,200	35,300	42,860	43,480	43,280	40,870	38,140	37,020
10	29,730	28,320	28,800	30,060	32,170	35,620	42,780	43,440	43,250	40,790	38,030	36,980
11	29,700	28,280	28,920	30,260	32,100	35,760	42,820	43,440	43,170	40,680	37,880	36,910
12	29,660	28,250	28,860	30,230	32,170	35,790	43,010	43,360	43,050	40,520	37,770	36,770
13	29,600	28,160	28,890	30,090	32,340	35,870	42,930	43,280	42,970	40,410	37,810	36,660
14	29,530	28,090	28,890	30,060	32,340	37,130	42,900	43,170	42,930	40,300	37,960	36,550
15	29,470	28,030	28,860	30,060	32,510	38,770	42,900	43,090	42,900	40,180	37,920	36,440
16	29,500	28,000	28,800	30,660	32,440	39,100	42,780	43,050	42,780	40,030	38,030	36,550
17	29,470	28,000	28,830	30,820	32,580	39,220	42,820	42,970	42,780	39,960	38,030	36,800
18	29,400	28,350	28,800	31,020	32,650	39,360	42,900	42,900	42,700	39,880	38,290	36,730
19	29,340	28,540	28,730	31,150	32,610	40,260	42,900	42,900	42,580	39,840	38,290	36,690
20	29,280	28,730	29,180	31,180	32,650	40,750	42,820	42,820	42,540	39,770	38,180	36,660
21	29,240	28,860	29,150	31,180	32,650	40,750	42,820	42,740	42,470	39,660	38,140	36,770
22	29,180	29,050	29,240	31,220	32,610	40,790	42,740	42,700	42,390	39,590	38,030	36,730
23	29,150	28,960	29,210	31,250	32,610	40,790	42,740	42,930	42,270	39,480	38,070	36,690
24	29,120	28,860	29,180	31,250	32,680	40,870	42,740	42,930	42,200	39,550	38,180	36,550
25	29,080	28,830	29,180	31,220	32,710	40,980	42,860	42,900	42,080	39,440	38,140	36,480
26	29,050	28,800	29,180	31,180	32,780	40,940	43,400	42,820	42,010	39,330	38,030	36,440
27	29,020	28,800	29,180	31,180	32,820	40,940	43,680	42,740	41,930	39,290	38,000	36,770
28	28,960	29,020	29,180	31,120	32,850	40,940	43,710	42,780	41,820	39,250	37,920	36,690
29	28,890	28,960	29,150	31,080	32,850	40,940	43,640	42,860	41,740	39,180	37,850	36,690
30	28,800	28,920	29,120	31,150	----------	40,900	43,560	43,090	41,660	39,100	37,740	36,660
31	28,760	----------	29,120	31,150	----------	40,900	----------	43,280	----------	39,030	37,670	----------
(†)	260.57	260.62	260.68	261.30	261.80	264.03	264.72	264.65	264.23	263.53	263.16	262.88
(‡)	-1,430	+160	+200	+2,030	+1,700	+8,050	+2,660	-280	-1,620	-2,630	-1,360	-1,010

Calendar year 1963..... ‡ -6,420
Water year 1963-64..... ‡ -6,470

† Contents, in acre-feet, at end of month.
‡ Change in contents, in acre-feet.

8-223. Murvaul Bayou near Gary, Tex.

Location.--Lat 32°01'54", long 94°22'31", near center of main channel on downstream side of bridge on Farm Road 10, 0.3 mile downstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, 1 mile downstream from Indian Creek, 1.5 miles north of Gary, Panola County, and 3 miles downstream from Murvaul Lake.

Drainage area.--134 sq mi.

Records available.--April 1958 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 217.82 ft above mean sea level, datum of 1929.

Average discharge.--6 years, 78.6 cfs (56,900 acre-ft per year).

Extremes.--Maximum discharge during year, 181 cfs Mar. 14 (gage height, 7.78 ft); minimum daily, 3.2 cfs Nov. 1.
1958-64: Maximum discharge, 3,450 cfs Dec. 8, 1960 (gage height, 11.53 ft); minimum daily, 0.2 cfs June 13-15, 1958, Aug. 29, 1961.
Maximum stage known since at least 1928, about 14.5 ft in July 1933, from information by local resident.

Remarks.--Records good. No diversion above station. Discharge largely regulated by Murval Lake (see preceding page).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 21 to Mar. 2, Mar. 4-9, 11-14, 16-19)

2.6	2.3
2.8	4.5
3.0	7.1
3.5	15
4.0	24
5.0	50
6.0	85
7.0	132

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.1	3.2	4.9	4.1	4.4	5.2	5.9	5.8	16	5.4	5.0	5.3
2	5.3	3.4	5.4	4.1	4.1	69	5.7	6.6	7.7	5.4	5.0	5.3
3	4.6	3.4	5.3	4.3	4.0	55	5.5	6.2	6.2	5.4	5.0	5.2
4	4.8	3.4	4.8	4.5	4.5	21	*5.4	5.7	5.9	5.5	5.0	5.2
5	4.9	3.8	4.1	4.3	41	13	69	5.5	5.7	5.4	4.9	5.2
6	4.8	3.7	4.1	6.6	31	9.6	68	5.5	6.2	5.4	4.9	5.3
7	4.8	3.4	4.3	6.2	12	7.8	21	5.4	5.8	5.4	* 4.9	5.3
8	4.8	3.4	3.9	7.0	7.4	7.5	9.7	5.3	5.8	5.4	4.9	5.2
9	4.8	3.4	4.1	17	6.3	45	7.2	5.2	*5.7	5.4	5.0	5.2
10	* 4.9	3.5	4.6	9.2	5.7	52	6.6	5.0	5.7	5.5	5.2	5.2
11	4.8	3.7	5.4	5.3	4.8	21	6.4	5.0	5.5	5.5	5.2	5.2
12	4.8	3.7	5.4	4.8	4.4	11	6.6	* 5.0	5.5	5.5	5.2	5.2
13	4.8	3.7	4.6	4.5	6.3	8.5	8.2	4.9	5.5	* 5.4	6.2	5.2
14	4.8	3.7	4.6	4.5	9.1	58	7.2	4.9	5.5	5.4	6.2	* 5.3
15	4.8	3.9	4.4	4.4	11	124	6.1	4.9	5.7	5.4	5.4	5.4
16	4.8	4.0	4.4	15	9.4	37	5.5	4.9	5.7	5.3	5.7	5.5
17	4.8	4.1	*3.9	28	7.7	15	5.4	4.9	5.8	5.3	5.7	7.0
18	4.8	4.5	3.9	27	7.9	11	5.8	4.9	5.7	5.3	6.6	5.9
19	4.6	* 4.5	3.5	17	7.4	80	5.5	4.9	5.4	5.3	6.3	5.7
20	4.6	6.2	6.6	10	6.3	62	5.3	5.0	5.4	5.2	5.2	5.7
21	4.6	* 5.8	12	7.2	5.3	21	5.2	5.0	5.3	5.2	5.2	5.9
22	4.6	7.8	5.4	6.6	4.8	12	5.0	5.2	5.4	5.2	5.2	6.6
23	4.6	5.7	4.8	6.1	4.4	10	4.9	5.4	5.3	5.2	5.4	5.7
24	4.6	4.8	4.6	5.4	4.4	9.4	5.2	7.9	5.3	5.2	5.4	5.5
25	4.4	4.5	4.5	5.0	5.8	9.6	5.7	6.7	5.3	5.3	5.7	5.4
26	4.4	4.4	4.4	4.6	5.8	9.8	13	5.4	5.3	5.3	5.4	5.4
27	3.9	4.4	4.3	4.4	6.4	7.8	23	5.2	5.3	5.3	5.3	5.8
28	3.8	5.4	3.8	4.3	*6.8	7.4	11	5.5	5.4	5.2	5.3	5.9
29	3.4	5.3	3.5	*4.0	5.5	7.0	6.6	6.4	5.4	5.2	5.3	5.4
30	3.5	4.8	3.9	4.0	----------	6.6	5.9	7.9	5.4	5.2	5.3	5.4
31	3.5	----------	4.1	4.4	----------	6.2	----------	18	----------	5.2	5.3	----------
Total	142.7	129.5	147.5	243.8	243.9	818.6	351.5	184.1	179.8	165.3	166.3	165.5
Mean	4.60	4.32	4.76	7.86	8.41	26.4	11.7	5.94	5.99	5.33	5.36	5.52
Ac-ft	283	257	293	484	484	1,620	697	365	357	328	330	328

Calendar year 1963: Max 102 Min 3.2 Mean 13.8 Ac-ft 9,980
Water year 1963-64: Max 124 Min 3.2 Mean 8.03 Ac-ft 5,830

* Discharge measurement made on this day.

8-224. Socagee Creek near Carthage, Tex.

Location.--Lat 32°13'54", long 94°05'31", on right bank at downstream side of bridge on Farm Road 123, 1.4 miles upstream from Salt Creek, 15 miles east of Carthage, Panola County, and 16 miles upstream from mouth.

Drainage area.--82.6 sq mi.

Records available.--February 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 230.00 ft (revised) above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 1,090 cfs Apr. 28 (gage height, 9.77 ft); no flow for many days.
1962-64: Maximum discharge, 1,820 cfs May 2, 1962 (gage height, 10.28 ft); no flow for many days.

Remarks.--Records good below 200 cfs and fair above. No known diversion or regulation above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 5-11, 15-22, Mar. 2-3, 5-15, 17-20, 22-31, Apr. 5, 8-14, 26)

3.0	0	5.5	40
3.1	.2	6.0	58
3.2	.6	7.0	110
3.5	2.5	8.0	182
3.9	5.9	8.5	255
4.4	13	8.9	405
4.7	19	9.6	910
5.0	25	10.0	1,370

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	(*)	0	0	0.9	1.3	5.2	7.0	37	1.0			
2		0	0	.8	1.2	41	6.4	22	*.8			
3		0	0	.6	1.2	126	6.0	17	.9			
4		*0	0	.6	1.2	*187	5.9	13	1.0			
5		0	0	.5	7.9	108	66	11	.7			
6		0	0	1.4	35	46	160	8.4	.4			
7		0	0	1.6	56	31	225	*6.8	.3			
8		0	0	4.2	34	20	112	5.8	.2	(*)		
9		0	0	15	19	24	32	5.2	.1			
10		0	*0	26	12	77	18	4.8	0		(*)	
11		0	0	26	8.4	158	12	4.5	0			
12		0	.1	16	6.6	91	9.4	4.4	0			
13		0	0	*8.6	6.0	34	8.6	3.9	0			
14		0	0	5.5	7.3	29	7.8	3.5	0			
15		0	0	4.1	14	87	7.0	3.0	0			
16		0	0	5.2	22	170	6.2	2.6	0			(*)
17		0	0	16	21	94	5.4	2.2	0			
18		0	0	31	19	38	5.0	1.8	0			
19		0	0	33	*14	53	4.6	1.4	0			
20		0	.8	23	12	131	4.2	1.2	0			
21		0	2.9	14	11	192	3.9	1.0	0			
22		.3	1.7	9.4	9.0	92	3.5	.8	0			
23		.3	11	6.8	7.3	34	3.1	.6	0			
24		0	14	5.2	6.0	23	2.9	.6	0			
25		0	10	4.2	5.6	*18	3.0	.5	0			
26		0	4.3	3.4	5.4	24	92	.4	0			
27		0	3.1	2.9	5.2	22	376	2.6	0			
28		0	2.2	2.5	5.0	18	*955	1.9	0			
29		0	1.8	2.0	5.2	14	576	1.2	0			
30		0	1.3	1.7	----------	10	172	.9	0			
31		----------	1.0	1.5	----------	8.2	----------	1.2	----------			----------
Total	0	0.6	54.2	273.6	358.8	2,005.4	2,895.9	171.2	5.4	0	0	0
Mean	0	0.02	1.75	8.83	12.4	64.7	96.5	5.52	0.18	0	0	0
Ac-ft	0	1.2	108	543	712	3,980	5,740	340	11	0	0	0

Calendar year 1963: Max 101 Min 0 Mean 5.84 Ac-ft 4,230
Water year 1963-64: Max 955 Min 0 Mean 15.8 Ac-ft 11,440

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
4-28	0500	9.77	1,090

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

8-225. Sabine River at Logansport, La.

Location.--Lat 31°58'44", long 94°00'58", at Logansport, De Soto Parish, on left bank 4,700 ft upstream from bridge on U. S. Highway 84, 4,800 ft upstream from Texas and New Orleans Railroad Co. bridge, and 4 miles upstream from Bayou Castor.
Drainage area.--4,839 sq mi.
Records available.--July 1903 to September 1964. Monthly discharge only for some periods, published in WSP 1312. Gage-height records collected at site 4,700 ft downstream since 1903 are contained in reports of U. S. Weather Bureau.
Gage.--Water-stage recorder used for gage heights below 24.0 ft, and supplementary wire-weight gage, 4,700 ft downstream (used as regular gage Feb. 14, 1941, to Sept. 30, 1956) used for gage heights above 24.0 ft. Datum of gage is 147.72 ft above mean sea level, datum of 1929. July 1, 1903, to Dec. 31, 1906, chain gage at site of supplementary gage at datum 2.0 ft lower. Jan. 1, 1907, to Feb. 13, 1941, chain gage at site of supplementary gage at present datum.
Average discharge.--61 years, 3,261 cfs (2,361,000 acre-ft per year).
Extremes.--Maximum discharge during year, 5,780 cfs Apr. 29 (gage height, 14.55 ft, at site of supplementary gage); minimum, 25 cfs Aug. 13.
1903-64: Maximum discharge, 92,000 cfs Apr. 8, 1945 (gage height, 44.07 ft, at site of supplementary gage, from floodmark); minimum observed during periods of daily records, 16 cfs Sept. 26-28, Oct. 3, 4, 1939.
Maximum stage since at least 1884, that of Apr. 8, 1945. Flood in May 1884 reached a stage of 39.4 ft, present datum, at site of supplementary gage.
Remarks.--Records good. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Lake Fork Creek near Quitman (station 8-190). Some regulation by Lake Tawakoni (station 8-174). Diversions above station for oilfield operation and municipal and industrial use.
Cooperation.--Gage-height record collected in cooperation with U. S. Weather Bureau.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 13-25, Jan. 20 to Feb. 18, Mar. 23 to Apr. 6, Apr. 27, May 2-7)

Recording gage						Wire-weight gage			
2.7	22	3.4	174	7.0	2,000	-0.4	180	4.0	1,160
2.8	33	3.6	250	10.0	3,350	0	230	6.0	1,840
3.0	66	4.0	440	11.0	3,800	1.0	384	9.0	3,050
3.2	112	5.0	995			2.0	590	12.0	4,450
						3.0	860	15.0	6,000

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*85	52	203	282	292	515	705	4,850	304	94	42	97
2	90	50	192	264	280	732	678	4,000	*282	90	42	85
3	94	50	178	250	270	1,430	650	3,500	360	90	38	74
4	90	*52	174	246	278	1,780	622	3,320	340	85	33	68
5	85	59	174	259	350	1,680	845	3,180	304	76	31	61
6	81	64	174	259	566	1,580	2,000	2,780	282	68	30	57
7	76	64	167	282	980	1,680	2,810	*2,110	259	61	28	53
8	74	62	144	282	1,100	1,530	2,540	1,380	230	*59	28	52
9	72	62	126	400	1,050	1,430	1,820	1,020	203	62	27	52
10	70	62	*118	551	950	1,860	1,280	845	192	61	*28	48
11	68	62	129	540	860	2,320	965	788	192	61	28	46
12	64	62	144	450	776	2,400	815	815	181	59	27	44
13	62	62	180	*380	706	2,180	788	788	164	57	74	41
14	62	62	230	326	653	1,960	788	661	154	57	467	41
15	61	62	300	282	653	2,940	788	568	141	55	385	39
16	61	64	358	295	700	3,530	760	500	126	52	185	*38
17	59	64	358	490	776	3,220	678	450	115	50	250	57
18	57	66	342	666	804	2,500	639	400	104	48	290	61
19	57	70	316	694	*788	2,270	578	360	97	48	350	61
20	55	97	278	720	732	3,080	530	326	100	46	272	59
21	55	104	300	666	732	2,990	480	295	126	45	171	135
22	55	132	320	578	732	2,450	450	272	161	44	126	203
23	53	178	360	522	694	1,820	425	250	171	42	94	174
24	53	218	393	511	650	1,380	420	230	181	42	81	148
25	53	238	402	470	628	*1,160	584	218	185	42	81	132
26	53	250	385	440	584	1,060	1,500	210	185	42	107	107
27	53	254	360	402	551	995	3,590	210	167	42	144	100
28	53	268	345	384	535	965	5,150	206	141	44	230	100
29	53	264	326	350	520	905	5,720	199	124	45	196	100
30	53	238	313	324	----------	815	5,560	210	104	*42	141	114
31	52	----------	295	300	----------	760	----------	340	----------	42	107	----------
Total	2,009	3,392	8,084	12,865	19,190	55,917	45,158	35,281	5,675	1,751	4,133	2,447
Mean	64.8	113	261	415	662	1,804	1,505	1,138	189	56.5	133	81.6
Cfsm	0.013	0.023	0.054	0.086	0.137	0.373	0.311	0.235	0.039	0.012	0.027	0.017
In.	0.02	0.03	0.06	0.10	0.15	0.43	0.35	0.27	0.04	0.01	0.03	0.02
Ac-ft	3,980	6,730	16,030	25,520	38,060	110,900	89,570	69,980	11,260	3,470	8,200	4,850

Calendar year 1963: Max 6,960 Min 50 Mean 838 Cfsm 0.173 In. 2.36 Ac-ft 606,600
Water year 1963-64: Max 5,720 Min 27 Mean 535 Cfsm 0.111 In. 1.51 Ac-ft 388,600

* Discharge measurement made on this day.
Note.--Discharge computed from once-daily wire-weight gage readings Dec. 13-25, Jan. 20 to Feb. 18, Apr. 26 to May 7.

8-232. Tenaha Creek near Shelbyville, Tex.

Location.--Lat 31°45'56", long 94°05'02", near center of span at downstream side of bridge on State Highway 87, 1 mile northwest of Shelbyville, Shelby County, 4.2 miles downstream from Gulf, Colorado and Santa Fe Railway Co. bridge, and 5.0 miles upstream from Beauchamp Creek.

Drainage area.--97.8 sq mi.

Records available.--March 1952 to September 1964.

Gage.--Water-stage recorder. Prior to May 9, 1963, wire-weight gage at same site and datum. Datum of gage is 205.71 ft above mean sea level, datum of 1929.

Average discharge.--12 years, 84.3 cfs (61,030 acre-ft per year).

Extremes.--Maximum discharge during year, 780 cfs Apr. 6 (gage height, 9.38 ft); no flow at times.
1952-64: Maximum discharge, 15,200 cfs Mar. 11, 1953 (gage height, 13.85 ft); no flow at times.
Maximum stage since at least 1884, 15 ft Nov. 23, 1940, from information by local residents.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Records furnished by the city of Center show that they diverted an average of 1.5 cfs during the 1964 water year of which about 70 percent was returned to the creek as sewage effluent one mile downstream from gage.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*1.6	0.3	2.9	1.3	10	10	18	25	128	1.4	0.4	0
2	.8	.2	2.0	1.2	10	356	18	90	*35	1.4	.2	0
3	.5	.1	1.7	1.4	9.8	490	18	50	23	1.3	.2	0
4	.2	*.1	1.6	1.3	9.4	177	17	30	16	1.0	.2	0
5	.2	.2	1.6	1.2	26	54	326	20	13	.8	.1	0
6	.1	1.3	1.1	3.4	51	36	678	18	11	.6	.1	0
7	.1	1.6	.8	7.7	35	27	328	*16	10	*.4	.1	0
8	.1	.8	.9	5.7	23	24	61	14	9.8	.3	.1	0
9	.1	.6	.9	4.6	17	51	35	12	9.2	.2	.1	0
10	0	.5	.9	5.4	14	202	28	11	9	.1	.1	0
11	0	.6	*1.2	4.1	13	87	26	9.8	9	.1	.1	0
12	0	1.0	1.5	4.1	10	36	24	9.2	8	.1	**.1	0
13	0	1.0	2.2	5.1	10	26	61	8.1	8	.6	.1	0
14	0	.9	2.0	*4.1	11	25	47	6.8	10	.4	.1	0
15	0	1.0	2.9	3.4	13	63	26	6.2	12	.3	.1	0
16	.1	1.0	2.5	12	18	42	20	5.8	10	.2	.1	*0
17	.1	1.2	2.0	97	16	26	20	5.7	9	.2	.1	9.2
18	.7	1.5	1.7	78	14	21	200	5.5	10	.2	.1	16
19	.4	1.8	1.6	52	14	140	150	5.4	9	.1	.4	6.3
20	.2	2.8	3.4	36	13	340	50	5.1	7	.1	1.3	3.1
21	.1	3.4	34	26	11	174	20	4.9	5	.1	.6	1.3
22	.1	4.5	19	21	10	48	16	4.9	4	.1	.4	.8
23	.1	4.9	8.2	18	9.4	37	14	4.9	4	.1	4.6	.5
24	.1	5.5	4.9	16	9.2	33	12	5.1	3	.1	4.4	.5
25	.1	4.5	3.5	14	11	*34	20	14	2	.1	2.0	.5
26	.1	3.4	3.0	13	14	35	300	15	2	.1	1.2	.4
27	.1	2.8	2.7	12	14	30	500	6.6	1	.1	.9	.5
28	.2	3.5	2.3	11	12	26	200	5.5	.7	.1	.7	.9
29	.1	4.1	2.0	9.8	11	23	50	6.8	1.4	.4	.4	2.0
30	.7	4.5	1.6	9.4	----------	21	30	19	1.2	.3	.1	.7
31	.5	----------	1.4	9.6	----------	19	----------	188	----------	.2	.1	----------
Total	7.4	59.6	118.0	488.8	438.8	2,713	3,313	628.3	380.3	11.5	19.5	42.7
Mean	0.24	1.99	3.81	15.8	15.1	87.5	110	20.3	12.7	0.37	0.63	1.42
Cfsm	0.0025	0.020	0.039	0.161	0.154	0.894	1.12	0.207	0.130	0.0038	0.0064	0.015
In.	0.003	0.02	0.04	0.19	0.17	1.03	1.26	0.24	0.14	0.004	0.007	0.02
Ac-ft	15	118	234	970	870	5,380	6,570	1,250	754	23	39	85

Calendar year 1963: Max 710 Min 0 Mean 17.3 Cfsm 0.177 In. 2.39 Ac-ft 12,500
Water year 1963-64: Max 678 Min 0 Mean 22.5 Cfsm 0.230 In. 3.12 Ac-ft 16,310

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

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record Apr. 16 to May 6, June 10-27, July 11-16, 23-30.

8-244. Sabine River near Milam, Tex.

Location.--Lat 31°28'01", long 93°44'41", on right bank 104 ft upstream from bridge on State Highway 21, 2.8 miles downstream from Patroon Bayou, 6.5 miles northeast of Milam, Sabine County, and 7.2 miles upstream from Palo Gaucho Bayou.

Drainage area.--6,508 sq mi.

Records available.--October 1923 to September 1925 (published as "at Sabinetown"), January 1939 to September 1964. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 97.96 ft above mean sea level, datum of 1929, supplementary adjustment of 1941. Oct. 9, 1923, to Aug. 31, 1925, staff gage 7.4 miles downstream at different datum. Jan. 19, 1939, to Dec. 21, 1945, wire-weight gage 104 ft downstream at present datum.

Average discharge.--27 years, 5,091 cfs (3,686,000 acre-ft per year).

Extremes.--Maximum discharge during year, 11,200 cfs Apr. 28 (gage height, 23.49 ft); minimum, 42 cfs Aug. 14.
1923-25, 1939-64: Maximum discharge, 83,400 cfs Apr. 12, 1945 (gage height, 48.87 ft); minimum, 25 cfs Oct. 14-19, 1956.
Maximum stage since at least 1884, that of Apr. 12, 1945. Flood of July 28, 1933, reached a stage of 48.0 ft, from information by former observer. Flood in May 1884 reached a stage about 2 ft lower than that of 1945 at ferry about 10 miles upstream, from information by local resident.

Remarks.--Records good. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Lake Fork Creek near Quitman (station 8-190). Some regulation by Lake Tawakoni (station 8-174). Diversions above station for oilfield operation and municipal and industrial use.

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

5.35	40	8.0	792
5.5	53	10.0	1,680
5.7	80	14.0	3,980
6.0	134	18.0	6,820
6.5	266	23.0	10,800
7.0	434		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	94	62	322	373	468	659	1,110	9,360	3,860	195	80	212
2	*94	63	312	356	434	4,310	972	8,160	3,490	178	76	184
3	91	65	285	342	420	7,760	910	6,520	*2,230	159	66	148
4	90	*70	260	329	407	8,080	850	5,070	2,130	140	60	128
5	91	93	234	315	570	6,220	1,660	4,370	1,360	128	57	114
6	98	91	226	359	950	4,720	7,030	4,110	811	120	54	105
7	98	73	214	431	1,060	4,040	8,800	3,600	604	114	51	94
8	96	69	206	468	1,260	3,480	7,840	2,940	485	105	49	86
9	100	83	203	468	1,440	3,180	6,820	2,230	414	*100	49	80
10	94	83	192	451	1,440	3,060	5,630	1,730	366	91	47	73
11	86	79	189	485	1,310	3,480	4,110	1,360	329	83	*46	69
12	79	73	*186	640	1,180	3,720	2,820	1,130	298	83	44	63
13	76	69	186	716	1,020	3,720	2,880	1,020	282	83	44	59
14	73	65	228	640	910	3,540	3,360	995	272	86	43	55
15	73	63	253	553	850	3,240	2,820	910	260	80	48	*54
16	73	65	276	*674	830	3,920	2,280	811	250	80	148	53
17	73	65	380	1,790	850	4,720	1,880	716	244	80	376	65
18	73	66	427	2,280	*910	4,580	2,030	622	234	77	332	79
19	73	67	434	2,030	950	4,180	2,400	570	217	76	301	85
20	70	80	468	1,830	972	4,720	1,930	519	189	85	301	83
21	69	101	870	1,580	950	5,350	1,580	468	171	73	332	79
22	67	277	910	1,310	910	5,210	1,260	434	159	70	329	76
23	66	386	678	1,110	870	4,510	995	403	161	66	285	80
24	66	325	570	972	850	*3,720	830	376	176	65	266	114
25	66	247	570	850	830	3,000	754	359	195	66	301	164
26	65	234	587	783	811	2,520	2,220	352	203	62	195	164
27	65	256	570	697	792	2,180	8,320	335	209	58	156	161
28	66	288	502	622	735	1,880	10,500	322	217	65	140	152
29	65	315	451	570	678	1,630	10,700	329	220	63	148	142
30	63	322	417	536	----------	1,440	9,920	332	200	63	181	134
31	60	---------	397	502	----------	1,260	----------	846	----------	74	214	---------
Total	2,413	4,195	12,003	25,062	25,657	118,029	115,211	61,299	20,236	2,868	4,819	3,155
Mean	77.8	140	387	808	885	3,807	3,840	1,977	675	92.5	155	105
Cfsm	0.012	0.022	0.059	0.124	0.136	0.585	0.590	0.304	0.104	0.014	0.024	0.016
In.	0.01	0.02	0.07	0.14	0.15	0.67	0.66	0.35	0.12	0.02	0.03	0.02
Ac-ft	4,790	8,320	23,810	49,710	50,890	234,100	228,500	121,600	40,140	5,690	9,560	6,260

Calendar year 1963: Max 6,900 Min 60 Mean 1,044 Cfsm 0.160 In. 2.16 Ac-ft 756,000
Water year 1963-64: Max 10,700 Min 43 Mean 1,079 Cfsm 0.166 In. 2.26 Ac-ft 783,400

* Discharge measurement made on this day.

8-245. Palo Gaucho Bayou near Hemphill, Tex.

Location.--Lat 31°23'10", long 93°50'07", near center of span at downstream side of bridge on State Highway 87, 0.2 mile upstream from Boregas Creek, 3.6 miles north of Hemphill, Sabine County, 4.2 miles downstream from Sandy Creek, and 13 miles upstream from Sabine River. Prior to May 6, 1964, at site 140 ft upstream.

Drainage area.--123 sq mi.

Records available.--March 1952 to September 1964.

Gage.--Wire-weight gage read twice daily. Datum of gage is 159.88 ft above mean sea level, datum of 1929. Prior to May 6, 1964, wire-weight gage at site 140 ft upstream at present datum.

Average discharge.--12 years, 97.6 cfs (70,660 acre-ft per year).

Extremes.--Maximum discharge during year, 2,250 cfs Apr. 27 (gage height, 17.30 ft, from graph based on gage reading); no flow at times.
1952-64: Maximum discharge, 17,000 cfs Apr. 29, 1953 (gage height, 22.50 ft); no flow at times.
Maximum stage since at least 1907, 26.6 ft in July 1933, from information by local resident. Flood in June 1950 reached a stage of 23.0 ft, from information by State Highway Department.

Remarks.--Records good except those for periods of no gage-height record, which are fair, and those for periods of backwater or indefinite stage-discharge relationship, which are poor. No known diversion above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0		5	25	43	56	146	87			
2	(*)	0		5	24	*c634	56	140	28			
3		*0	10	4.6	22	*1,260	56	134	*22		2	
4		0		4.6	22	962	56	115	16	0.5		0.2
5				4.6	120	*290	171	90	13			
6				14	173	167	689	*56	11		.5	
7		3		20	90	134	732	48	9.7			
8				18	60	115	225	43	8.5	0		
9			8	14	50	115	115	38		*0		2
10				13	41	179	82	35		0		
11				13	39	146	73	32		0	(**)	
12			(*)	13	37	108	71	29		0	.2	
13				15	36	85	362	27		0		
14			20	12	39	82	422	24	5	0		.2
15		2		10	41	90	152	20		0		(*)
16				*21	41	105	131	17		0		
17			*20	284	41	82	155	16		0		
18			17	272	*42	69	431	14		0		
19			15	179	39	193	343	12		0		
20			36	100	36	377	152	9.8		0		2
21			71	58	34	200	102	8.2		0		
22			66	47	32	120	80	7.0	2	0	2	
23		25	45	40	32	88	73	6.4		0		
24			18	42	32	*82	64	5.8		0		
25			13	39	40	80	56	5.4		0		.5
26			8.5	32	54	76	c382	4.9		0		
27			8.2	28	48	71	*1,640	4.5		0		
28		8	7.2	26	48	66	1,480	4.2	.2	0		
29			6.8	24	44	62	550	7.1			1	2
30			6.2	23	---	58	166	17		2		
31		---	5.4	24	---	58	---	61	---			---
Total	0	203	529.3	1,404.8	1,382	6,197	9,123	1,177.3	260.2	9.5	38.1	32.7
Mean	0	6.77	17.1	45.3	47.7	200	304	38.0	8.67	0.31	1.23	1.09
Cfsm	0	0.055	0.139	0.368	0.388	1.63	2.47	0.309	0.070	0.0025	0.010	0.0089
In.	0	0.06	0.16	0.42	0.42	1.87	2.76	0.36	0.08	0.003	0.01	0.01
Ac-ft	0	403	1,050	2,790	2,740	12,290	18,100	2,340	516	19	76	65

Calendar year 1963: Max 561 Min 0 Mean 30.5 Cfsm 0.248 In. 3.36 Ac-ft 22,070
Water year 1963-64: Max 1,640 Min 0 Mean 55.6 Cfsm 0.452 In. 6.15 Ac-ft 40,390

Peak discharge (base, 900 cfs)

Date	Time	Gage height	Discharge
3- 3	1900	16.60	1,450
4- 7	0400	14.20	928
4-27	2000	17.30	2,250

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
c Backwater from Boregas Creek.
Note.--Stage-discharge relationship indefinite Nov. 5 to Dec. 16, June 9 to Sept. 30; no gage-height record Nov. 9, 24-26, 28, Dec. 9-16, Jan. 1-2, 11, Feb. 5, 9, 16, 23, Mar. 15, 22, June 28, July 5, Aug. 16, 24, Sept. 7, 20, 27.

8-260. Sabine River below Toledo Bend, near Burkeville, Tex.

Location.--Lat 31°03'50", long 93°31'10", near left edge of low-water channel at downstream side of bridge on State Highway 63, about 200 ft downstream from Pearl Creek, 10 miles northeast of Burkeville, Newton County, 16 miles downstream from Bayou Toro, and 23 miles downstream from Toledo Bend Dam, now under construction.

Drainage area.--7,482 sq mi.

Records available.--September 1955 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 70.59 ft above mean sea level, datum of 1929, supplementary adjustment of 1941. Prior to Aug. 23, 1958, wire-weight gage at same site and datum.

Average discharge.--9 years, 4,796 cfs (3,472,000 acre-ft per year).

Extremes.--Maximum discharge during year, 16,500 cfs Apr. 28 (gage height, 19.83 ft); minimum, 84 cfs Nov. 3, 4. 1955-64: Maximum discharge, 52,900 cfs May 15, 1957 (gage height, 32.43 ft); minimum, 60 cfs Sept. 28-30, 1956.

Maximum stage since at least 1860, 35.9 ft in May 1884, from information by local resident. Flood of Apr. 15, 1945, reached a stage of 35.8 ft, and flood of May 23, 1953, reached a stage of 35.3 ft, from flood-marks.

Remarks.--Records good except those for periods of no gage-height record, which are fair. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Lake Fork Creek near Quitman (station 8-190). Diversion above station for oilfield operation and municipal and industrial use.

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

2.6	78	7.0	1,820
2.8	110	10.0	4,210
3.0	150	14.0	8,400
3.5	265	18.0	13,600
4.0	400	20.0	16,800
5.0	760		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	126	88	379	535	750	1,070	1,580	10,700	1,460	330	140	218
2	*122	88	400	500	700	4,830	1,460	9,840	3,760	355	134	235
3	122	*88	400	482	660	11,900	1,340	8,520	*3,400	335	130	240
4	122	88	373	465	620	12,800	1,220	6,860	2,440	295	126	230
5	122	100	340	448	620	10,300	1,900	*5,400	2,020	255	124	222
6	122	120	320	500	1,000	7,300	5,740	4,700	1,580	232	122	210
7	122	140	300	588	1,400	5,600	9,240	4,300	1,140	220	114	188
8	122	120	282	640	1,600	4,600	9,480	3,850	860	198	100	174
9	124	100	270	820	1,800	4,030	8,180	3,230	720	138	102	162
10	122	120	260	800	1,600	3,760	7,080	2,590	622	*112	99	150
11	122	130	282	760	1,600	3,670	5,700	2,090	552	130	*118	138
12	122	126	322	740	1,500	3,850	4,210	1,760	500	138	120	126
13	120	124	412	780	1,500	3,940	4,210	1,580	465	136	107	116
14	112	120	622	860	1,400	3,940	6,530	1,370	430	132	100	110
15	107	112	660	840	1,400	3,940	5,800	1,310	415	130	96	105
16	107	108	680	*945	1,300	3,580	3,850	1,250	400	134	96	102
17	105	107	588	1,500	1,300	4,120	2,990	1,120	391	134	126	*122
18	107	105	535	2,500	*1,200	4,700	3,760	1,020	379	130	190	120
19	107	105	552	2,900	1,200	5,200	4,120	900	367	126	365	116
20	104	105	588	2,800	1,200	5,500	3,760	820	349	124	623	116
21	102	114	750	2,500	1,200	5,700	2,830	760	325	130	379	124
22	99	200	850	2,200	1,170	5,700	2,230	700	300	130	376	128
23	97	350	1,000	2,000	1,120	5,400	1,820	680	280	124	418	124
24	97	500	900	1,800	1,100	*4,700	1,520	660	278	116	415	122
25	96	535	820	1,600	1,820	3,940	1,340	622	278	112	376	126
26	96	412	760	1,400	2,020	3,310	2,470	570	272	107	275	130
27	94	330	760	1,200	1,700	2,910	11,900	552	282	107	295	156
28	94	332	740	1,100	1,430	2,590	16,000	535	288	110	305	186
29	91	361	680	1,000	1,200	2,230	15,500	535	295	134	290	195
30	89	364	622	900	----------	1,950	12,600	535	335	146	260	200
31	88	---------	570	800	----------	1,760	----------	740	----------	140	228	---------
Total	3,382	5,692	17,017	36,903	37,110	148,820	160,360	80,099	25,183	5,140	6,749	4,691
Mean	109	190	549	1,190	1,280	4,801	5,345	2,584	839	166	218	156
Cfsm	0.015	0.025	0.073	0.159	0.171	0.642	0.715	0.345	0.112	0.022	0.029	0.021
In.	0.02	0.03	0.08	0.18	0.18	0.74	0.80	0.40	0.13	0.03	0.03	0.02
Ac-ft	6,710	11,290	33,750	73,200	73,610	295,200	318,100	158,900	49,950	10,200	13,390	9,300

Calendar year 1963: Max 6,700 Min 88 Mean 1,250 Cfsm 0.167 In. 2.27 Ac-ft 904,800
Water year 1963-64: Max 16,000 Min 88 Mean 1,451 Cfsm 0.194 In. 2.64 Ac-ft 1,054,000

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 5-11, 22-24, Dec. 21-24, Jan. 17 to Feb. 17.

8-285. Sabine River near Bon Wier, Tex.

Location.--Lat 30°45'00", long 93°36'30", near left bank at downstream side of bridge on U. S. Highway 190, 0.7 mile upstream from Quicksand Creek, 0.8 mile upstream from Gulf, Colorado and Santa Fe Railway Co. bridge, 2.0 miles east of Bon Wier, Newton County, and 2.4 miles upstream from Caney Creek.

Drainage area.--8,229 sq mi.

Records available.--October 1923 to September 1964. Monthly discharge only for some periods, published in WSP 1312. Gage-height records collected in this vicinity since 1913 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 46.42 ft above mean sea level, datum of 1929. Prior to July 8, 1931, chain gage at site 0.8 mile downstream at same datum. July 8, 1931, to Oct. 15, 1958, chain gage or wire-weight gage at present site and datum.

Average discharge.--41 years, 6,955 cfs (5,035,000 acre-ft per year).

Extremes.--Maximum discharge during year, 17,600 cfs Apr. 29 (gage height, 14.72 ft); minimum, 193 cfs Nov. 3.
1923-64: Maximum discharge, 115,000 cfs May 19, 1953 (gage height, 25.70 ft); minimum, 160 cfs Sept. 29, 1956.
Maximum stage since at least 1833, 30.5 ft Apr. 23 or 24, 1913, from information by Gulf, Colorado and Santa Fe Railway Co. and local residents. Flood in May 1884 reached a stage of 26 ft. Floods occurring about 1844 and 1860 were higher than flood in May 1884, from information by local residents.

Remarks.--Records good. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Lake Fork Creek near Quitman (station 8-190). Diversions above station for oilfield operation and municipal and industrial use.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 27 to Sept. 30)

-0.3	172	1.0	685	8.0	6,700
0	267	2.0	1,230	12.0	12,000
.4	410	4.0	2,700	15.5	18,200

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	277	212	760	860	1,430	1,880	2,460	13,500	2,140	566	383	402
2	260	202	735	810	1,320	5,040	2,220	14,200	2,700	*584	338	383
3	247	199	860	785	1,200	14,500	2,140	12,800	4,150	612	314	390
4	244	202	860	785	1,140	16,400	1,990	9,620	3,480	589	300	390
5	244	528	*760	785	1,290	16,000	1,990	7,420	2,700	551	287	394
6	244	1,080	660	835	1,920	12,800	4,750	5,930	2,300	483	284	406
7	277	771	612	*1,110	2,220	8,550	3,550	5,270	1,880	439	277	402
8	257	474	575	1,260	2,380	6,700	10,500	4,850	1,400	461	277	394
9	250	533	533	1,460	2,140	5,820	9,760	4,250	1,140	589	257	*364
10	250	735	510	1,710	2,060	5,270	8,160	3,570	995	580	247	327
11	247	589	510	1,500	2,060	4,950	7,060	2,940	885	537	*241	300
12	244	444	589	1,290	*2,060	4,750	5,710	2,620	810	547	237	277
13	244	371	968	1,260	1,920	4,850	5,160	2,220	760	580	247	254
14	241	334	2,120	1,200	1,780	4,850	7,540	2,140	710	589	244	237
15	237	317	2,780	1,260	1,710	4,850	8,420	1,920	685	575	241	224
16	234	303	1,920	1,360	1,780	4,750	6,590	1,780	685	570	241	224
17	231	293	1,400	3,050	1,780	4,650	4,850	1,640	685	589	241	264
18	228	284	1,140	4,050	1,680	*5,160	8,160	1,540	685	556	244	290
19	228	280	968	4,250	1,680	6,040	7,060	1,360	636	528	349	293
20	224	277	968	3,750	1,640	7,780	5,820	1,260	589	533	612	274
21	224	274	1,400	3,120	1,600	7,300	4,750	1,170	570	524	835	260
22	221	334	1,880	2,700	1,600	6,820	3,660	1,110	542	528	636	250
23	218	694	1,850	2,380	1,570	6,480	3,030	1,080	510	524	589	250
24	215	785	1,850	2,220	1,500	5,930	2,620	1,140	483	533	660	257
25	215	860	1,570	3,850	2,540	5,270	2,300	1,080	510	524	636	250
26	212	860	1,290	4,350	3,850	4,650	3,120	*995	589	492	584	247
27	212	735	1,170	3,300	3,390	4,150	7,800	940	570	492	496	250
28	208	660	1,110	2,380	2,700	3,660	*15,200	885	524	465	470	290
29	208	760	1,080	1,920	2,220	3,300	17,400	885	514	364	483	331
30	*205	860	995	1,640	----------	2,940	16,200	1,080	528	448	474	364
31	205	---------	940	1,500	----------	2,700	----------	1,290	---------	483	439	---------
Total	7,251	15,250	35,363	62,730	56,160	198,790	194,970	112,485	35,355	16,435	12,163	9,238
Mean	234	508	1,141	2,024	1,937	6,413	6,499	3,629	1,178	530	392	308
Cfsm	0.028	0.062	0.139	0.246	0.235	0.779	0.790	0.441	0.143	0.064	0.048	0.037
In.	0.03	0.07	0.16	0.28	0.25	0.90	0.88	0.51	0.16	0.07	0.05	0.04
Ac-ft	14,380	30,250	70,140	124,400	111,400	394,300	386,700	223,100	70,130	32,600	24,120	18,320

Calendar year 1963: Max 8,420 Min 199 Mean 1,735 Cfsm 0.211 In. 2.86 Ac-ft 1,256,000
Water year 1963-64: Max 17,400 Min 199 Mean 2,066 Cfsm 0.251 In. 3.40 Ac-ft 1,500,000

* Discharge measurement made on this day.

8-295. Big Cow Creek near Newton, Tex.

Location.--Lat 30°49'10", long 93°47'05", near center of span at downstream side of bridge on State Highway 87, 2.6 miles southwest of Newton, Newton County, 5.0 miles downstream from Melhomes Creek, and 8.0 miles upstream from Whiteoak Creek.

Drainage area.--128 sq mi.

Records available.--April 1952 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 134.69 ft above mean sea level, datum of 1929 (levels by Topographic Division). Prior to Dec. 19, 1957, wire-weight gage at same site and datum.

Average discharge.--12 years, 103 cfs (74,570 acre-ft per year).

Extremes.--Maximum discharge during year, 2,050 cfs Mar. 3 (gage height, 15.42 ft); minimum, 19 cfs Sept. 15.
1952-64: Maximum discharge, 20,200 cfs Apr. 29, 1953 (gage height, 19.45 ft); minimum observed, 12 cfs Aug. 23-26, 1956.
Maximum stage since at least 1907, 27.5 ft in April 1922, from information by local resident.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 7-19, Sept. 28-30)

5.4	19	10.0	339
5.7	28	12.0	590
6.0	39	13.0	740
6.5	61	14.0	1,000
7.0	88	14.5	1,210
8.0	154	15.0	1,550

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	23	76	62	90	91	71	112	103	37	33	22
2	36	23	96	62	85	*835	68	667	66	38	30	21
3	33	23	188	61	80	1,500	68	507	52	*35	27	24
4	30	24	109	65	75	403	68	194	46	35	25	23
5	29	538	*79	66	75	204	300	112	43	33	24	23
							731					
6	28	507	68	133	300	144	731	94	42	29	24	25
7	28	96	64	218	150	119	240	85	41	27	25	29
8	27	58	62	*122	100	119	130	79	40	26	25	26
9	26	346	58	115	90	122	97	74	38	25	25	*24
10	26	193	56	106	80	133	85	71	37	24	*25	23
11	25	85	74	82	75	109	76	68	36	24	25	22
12	25	59	162	106	*71	91	76	68	34	24	24	21
13	24	49	466	103	71	85	167	71	34	24	23	20
14	24	45	933	79	74	88	186	64	34	24	23	20
15	24	43	682	70	125	109	103	56	34	24	23	20
16	24	42	196	200	166	97	79	54	35	24	24	20
17	25	42	126	800	103	*79	128	52	35	24	30	24
18	26	42	103	400	91	74	562	50	34	23	34	29
19	24	41	91	150	94	390	286	48	31	23	30	33
20	24	41	110	120	76	579	119	46	31	22	30	28
21	24	43	472	100	71	180	95	45	30	32	27	26
22	23	374	234	90	76	115	85	44	29	30	24	25
23	24	872	130	80	74	100	80	57	28	26	25	24
24	24	301	100	75	78	94	75	65	28	24	34	25
25	24	115	91	500	647	94	70	68	28	26	47	24
26	24	85	85	200	372	97	70	*57	27	26	34	30
27	24	71	82	150	158	97	400	49	27	27	30	27
28	24	100	76	100	119	85	*284	46	27	29	29	40
29	24	150	71	90	97	79	122	46	29	32	27	60
30	*23	106	66	80	----------	76	94	46	32	43	25	40
31	22	----------	64	100	----------	71	----------	74	----------	42	24	----------
Total	810	4,537	5,270	4,685	3,763	6,459	5,015	3,169	1,131	882	855	798
Mean	26.1	151	170	151	130	208	167	102	37.7	28.5	27.6	26.6
Cfsm	0.204	1.18	1.33	1.18	1.02	1.62	1.30	0.797	0.295	0.223	0.216	0.208
In.	0.24	1.32	1.53	1.36	1.09	1.88	1.46	0.92	0.33	0.26	0.25	0.23
Ac-ft	1,610	9,000	10,450	9,290	7,460	12,810	9,950	6,290	2,240	1,750	1,700	1,580

Calendar year 1963: Max 933 Min 19 Mean 73.0 Cfsm 0.570 In. 7.75 Ac-ft 52,850
Water year 1963-64: Max 1,500 Min 20 Mean 102 Cfsm 0.797 In. 10.87 Ac-ft 74,130

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
11- 6	0200	14.06	1,040	1-17	unknown	14.01	1,000
11-23	1000	14.11	1,040	3- 3	0600	15.42	2,050
12-14	2200-2400	14.23	1,080				

* Discharge measurement made on this day.
Note.--No gage-height record Jan. 15 to Feb. 11, Apr. 21-27.

8-300. Cypress Creek near Buna, Tex.

Location.--Lat 30°25'45", long 93°54'20", near center of span at downstream side of bridge on Farm Road 253, 1.0 mile downstream from unnamed tributary, 3.2 miles east of Buna, Jasper County, and 10 miles upstream from Little Cypress Creek.

Drainage area.--69.2 sq mi.

Records available.--March 1952 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 46.16 ft above mean sea level, datum of 1929. Prior to Oct. 23, 1957, wire-weight gage at same site and datum.

Average discharge.--12 years, 74.7 cfs (54,080 acre-ft per year).

Extremes.--Maximum discharge during year, 1,960 cfs Mar. 2 (gage height, 10.70 ft); no flow at times.
1952-64: Maximum discharge, 7,100 cfs Sept. 18, 1963 (gage height, 13.28 ft); no flow at times.

Remarks.--Records good except those below 10 cfs in October and November and periods of no gage-height record, which are poor. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 31 to Apr. 7, Apr. 11-13, 22-25, May 9-11, 16-30, June 4-11, July 31 to Aug. 10, Aug. 17-20, Aug. 25 to Sept. 11, Sept. 16-17, 24-27)

1.69	0	4.0	30
1.76	.1	5.0	64
1.9	.3	6.0	114
2.0	.6	7.0	187
2.2	1.4	8.0	315
2.5	3.5	9.0	620
3.0	9.2	10.0	1,250
3.5	18	11.0	2,350

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.1	0	85	8.6	90	43	4.6	11	163	0	2.6	0.5
2	4.1	0	49	7.2	56	1,030	3.8	180	32	.1	1.5	.2
3	2.5	0	*52	6.5	36	1,740	3.3	207	12	*0	1.0	.1
4	1.8	0	44	63	28	*1,520	2.9	141	5.2	0	.6	0
5	1.4	1.1	32	64	199	860	2.5	67	2.6	0	.4	0
6	1.1	9.2	21	169	229	*530	2.6	28	1.6	0	.6	0
7	1.0	5.8	15	212	163	236	4.9	14	1.0	0	*.8	0
8	.8	4.0	15	155	93	95	15	7.4	.7	0	.6	0
9	.7	64	13	296	48	78	12	5.8	.5	0	.9	*1
10	.6	103	8.4	305	30	86	7.9	5.2	.4	0	.6	.8
11	.5	48	7.0	221	*22	56	5.0	28	.4	0	.2	.4
12	.5	21	66	130	16	34	3.3	92	.3	0	.1	.1
13	.4	11	523	127	13	24	72	56	.3	0	.1	.1
14	.4	6.0	1,010	100	16	20	202	20	.3	0	.1	0
15	.4	3.8	980	62	20	20	167	7.0	.2	0	.1	0
16	.5	2.5	786	206	34	16	90	6	.1	0	.2	.2
17	.4	1.8	526	685	22	*11	33	5	.1	0	.5	63
18	.4	1.4	243	620	18	8.1	26	4	.2	0	.9	55
19	.3	1.2	93	464	18	234	21	3	.2	0	1.0	24
20	.3	1.0	80	297	13	554	13	2	.2	0	.5	50
21	.2	1.4	272	129	8.9	392	8.5	1	.1	0	.3	30
22	.2	274	241	70	19	250	5.7	1	.1	0	.2	12
23	*.1	748	192	56	20	102	3.8	2	0	0	.2	6.0
24	.1	802	117	129	22	44	2.6	5	0	0	.2	3.5
25	.1	635	70	355	399	33	3.6	*6	0	0	.4	2.0
26	.1	342	49	288	424	28	228	3.6	0	0	.5	1.3
27	.1	100	37	173	259	20	748	1.9	0	0	.6	4.2
28	*0	213	28	80	141	13	*373	1.1	0	2	.4	15
29	0	345	20	50	76	10	117	.6	0	12	.6	17
30	0	183	15	34	----------	7.6	40	4.2	0	8.4	1.8	27
31	0	---------	11	97	----------	5.9	----------	206	----------	5.2	1.3	----------
Total	26.1	3,928.2	5,700.4	5,659.3	2,532.9	8,100.6	2,222.0	1,121.8	221.5	27.7	19.8	313.4
Mean	0.84	131	184	183	87.3	261	74.1	36.2	7.38	0.89	0.64	10.4
Cfsm	0.012	1.89	2.66	2.64	1.26	3.77	1.07	0.523	0.107	0.013	0.0092	0.150
In.	0.01	2.11	3.06	3.04	1.36	4.35	1.19	0.60	0.12	0.01	0.01	0.17
Ac-ft	52	7,790	11,310	11,230	5,020	16,070	4,410	2,230	439	55	39	622

Calendar year 1963: Max 5,350 Min 0 Mean 64.5 Cfsm 0.932 In. 12.65 Ac-ft 46,700
Water year 1963-64: Max 1,740 Min 0 Mean 81.6 Cfsm 1.18 In. 16.03 Ac-ft 59,270

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
12-14	1600	9.78	1,100
3- 2	2400	10.70	1,960

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record May 16-25, July 26-28, Sept. 2-9.

8-305. Sabine River near Ruliff, Tex.

Location.--Lat 30°18'13", long 93°44'37", near right bank at downstream side of bridge on State Highway 12, 2.4 miles north of Ruliff, Newton County, 4.2 miles upstream from The Kansas City Southern Railway Co. bridge, and 4.5 miles downstream from Cypress Creek.

Drainage area.--9,329 sq mi.

Records available.--October 1924 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 4.08 ft above mean sea level, datum of 1929, supplementary adjustment of 1941. Prior to Mar. 1, 1941, staff gage at The Kansas City Southern Railway Co. bridge 4.2 miles downstream at datum 2.02 ft lower. Mar. 1, 1941, to Dec. 8, 1948, wire-weight gage at present site and datum.

Average discharge.--40 years, 8,552 cfs (6,191,000 acre-ft per year).

Extremes.--Maximum discharge during year, 22,800 cfs Mar. 7 (gage height, 14.45 ft); minimum, 308 cfs Nov. 4.
1924-64: Maximum discharge, 121,000 cfs May 22, 1953 (gage height, 19.98 ft); minimum, 270 cfs Sept. 27-30, Oct. 1-3, 17-20, 1956.
Maximum stage since at least 1835, 22.2 ft in May or June 1884 (adjusted to present site and datum on basis of slope of flood of June 8-9, 1950); flood of Apr. 26-29, 1913, reached a stage of 19.5 ft, present site and datum, from information by local resident.

Remarks.--Records good. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Lake Fork Creek near Quitman (station 8-190). Diversions above station for oilfield operation and municipal and industrial use. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

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

1.0	315	3.5	1,080	12.0	8,300
1.5	425	4.0	1,280	13.0	11,400
2.0	575	7.0	2,720	14.0	17,600
2.5	730	9.0	4,150	14.5	23,500
3.0	905	11.0	6,400		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,120	315	2,360	1,680	3,030	4,700	3,910	13,000	2,840	*940	852	680
2	975	315	2,210	1,560	2,900	4,510	3,520	15,900	3,590	1,010	818	635
3	765	315	*1,910	1,480	2,720	6,830	3,240	17,200	3,990	1,040	712	605
4	665	315	1,720	1,560	2,480	10,700	3,030	17,600	4,420	1,010	635	575
5	590	483	1,810	1,810	2,420	15,900	2,900	17,600	4,510	1,010	590	575
6	545	605	1,680	2,010	3,030	20,100	2,840	16,700	3,990	975	560	575
7	515	981	1,480	*2,480	3,520	22,800	4,140	14,200	3,450	905	530	590
8	500	1,640	1,280	2,900	3,990	21,400	6,080	11,400	2,840	818	530	605
9	485	1,560	1,160	3,170	3,910	18,000	7,880	8,780	2,360	765	530	605
10	470	1,440	1,040	3,240	3,590	14,800	9,300	7,100	2,010	800	500	575
11	440	1,600	1,010	3,380	*3,240	11,400	9,950	5,800	1,720	870	470	545
12	425	1,760	975	3,310	3,030	9,300	10,300	5,100	1,560	852	455	500
13	412	1,400	1,500	3,030	2,960	7,880	9,600	4,600	1,440	835	440	455
14	398	1,040	3,140	2,720	2,840	7,100	8,520	4,070	1,360	835	500	412
15	398	852	5,000	2,540	2,720	6,560	8,300	3,520	1,280	852	515	398
16	398	730	6,400	2,480	2,600	6,400	8,780	3,100	1,200	870	470	386
17	386	665	6,740	3,380	2,660	6,240	9,600	2,840	1,160	870	455	455
18	373	605	5,800	5,000	2,780	*6,080	9,040	2,600	1,120	870	470	575
19	362	575	4,510	6,740	2,660	6,400	8,520	2,360	1,120	888	455	680
20	362	545	3,450	7,680	2,540	7,480	9,300	2,210	1,120	852	455	680
21	351	530	2,900	7,680	2,480	8,780	9,950	2,060	1,040	818	560	650
22	351	650	3,170	6,740	2,420	9,950	10,300	1,910	1,010	800	835	620
23	342	1,280	3,910	5,300	2,360	10,600	8,780	1,760	975	800	940	530
24	342	2,060	3,990	4,330	2,360	10,300	6,560	1,720	905	800	905	470
25	342	3,310	3,670	4,240	2,720	9,600	4,900	1,760	870	852	*870	425
26	332	3,380	3,170	5,200	3,910	8,520	4,330	1,910	852	888	888	412
27	332	3,030	2,720	6,400	5,420	7,480	5,300	*1,910	870	835	905	412
28	332	2,660	2,360	6,740	6,240	6,400	7,480	1,760	940	782	870	425
29	*324	2,600	2,110	5,540	5,800	5,540	9,600	1,600	905	818	782	470
30	315	2,480	1,960	4,240	----------	5,000	*11,400	1,560	888	835	712	560
31	315	----------	1,810	3,450	----------	4,420	----------	1,810	----------	800	695	----------
Total	14,262	39,721	86,945	122,010	93,330	301,170	217,350	195,440	56,335	26,895	19,904	16,080
Mean	460	1,324	2,805	3,936	3,218	9,715	7,245	6,305	1,878	868	642	536
Cfsm	0.049	0.142	0.301	0.422	0.345	1.04	0.777	0.676	0.201	0.093	0.069	0.057
In.	0.06	0.16	0.35	0.49	0.37	1.20	0.87	0.78	0.22	0.11	0.08	0.06
Ac-ft	28,290	78,790	172,500	242,000	185,100	597,400	431,100	387,600	111,700	53,350	39,480	31,890

Calendar year 1963: Max 20,700 Min 315 Mean 2,705 Cfsm 0.290 In. 3.95 Ac-ft 1,959,000
Water year 1963-64: Max 22,800 Min 315 Mean 3,250 Cfsm 0.348 In. 4.75 Ac-ft 2,359,000

* Discharge measurement made on this day.
Note.--Discharge computed from once-daily wire-weight gage readings May 25, 26, and June 1-9.

8-310. Cow Bayou near Mauriceville, Tex.

Location.--Lat 30°11'10", long 93°54'30", near center of span at downstream side of bridge on State Highway 12, half a mile upstream from Kansas City Southern Railway Co. bridge, and 3 miles southwest of Mauriceville, Orange County.

Drainage area.--83.3 sq mi.

Records available.--March 1952 to September 1964 (October 1956 to September 1957, monthly discharge only).

Gage.--Water-stage recorder. Datum of gage is 4.73 ft above mean sea level, datum of 1929. Prior to Oct. 23, 1957, wire-weight gage at same site and datum.

Average discharge.--12 years, 97.2 cfs (70,370 acre-ft per year).

Extremes.--Maximum discharge during year, 644 cfs Mar. 5; maximum gage height, 8.71 ft Mar. 2; no flow Aug. 4.
1952-64: Maximum discharge, 4,600 cfs Sept. 19, 1963 (gage height, 18.15 ft); no flow at times.
Maximum stage since at least 1940, that of Sept. 19, 1963.

Remarks.--Records good below 40 cfs and fair above. No large diversion above station. Base flow partly maintained by springs.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 1-12, Feb. 24 to Mar. 12, Mar. 19-27, Apr. 27 to May 8, May 30 to June 7, Sept. 19-24, 28-30)

1.1	0	2.5	29
1.2	.2	3.0	55
1.4	1.2	4.0	125
1.5	2.0	6.0	300
1.6	3.2	9.0	620
1.8	6.6	10.0	740
2.0	11		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	0.1	255	34	125	214	18	210	291	0.8	0.1	0.6
2	29	.1	*246	29	109	500	13	196	320	.9	.1	.7
3	19	.1	214	27	102	*500	10	170	330	.7	.1	.5
4	12	.1	183	92	95	584	7.4	174	291	*.5	**0	.4
5	7.6	1.9	*153	95	170	*644	6.2	188	228	.4	.2	.4
6	4.9	16	129	*198	188	620	5.4	174	161	.4	.2	.8
7	3.2	12	109	210	196	524	4.7	133	73	.3	.2	2.0
8	2.4	8.3	92	228	192	400	4.1	69	30	.2	.2	*1.7
9	1.6	57	66	246	174	300	3.2	30	14	.2	.3	1.1
10	1.2	78	46	228	*149	224	2.7	18	7.0	.2	.2	.8
11	.8	73	33	206	117	161	2.0	10	3.2	.2	.2	.6
12	.6	60	36	178	83	113	1.8	5.8	1.6	.2	.2	.5
13	.5	49	151	141	60	75	1.8	4.9	.9	.2	.1	.4
14	.4	38	330	106	47	53	1.8	5.4	.5	.1	.1	.3
15	.4	27	410	83	47	44	1.8	5.2	.4	.1	.1	.3
16	.3	20	490	170	40	36	1.7	6.0	.3	.1	.3	.4
17	.3	15	500	255	33	*28	1.5	8.3	.2	.2	.4	7.8
18	.3	11	430	282	31	23	1.2	9.0	.2	.2	.4	40
19	.3	7.0	340	310	26	282	1.0	6.6	.1	.2	.3	81
20	.2	5.2	282	310	22	228	1.0	3.8	.1	.1	.3	133
21	.2	4.7	273	273	21	219	2.0	2.0	.1	.1	.3	192
22	.2	51	228	237	25	237	2.3	1.2	.1	.1	.3	174
23	.2	113	192	192	24	228	1.8	.9	.1	**.1	.5	121
24	.2	161	170	183	56	201	1.6	.8	.1	.1	.4	58
25	.2	214	153	157	246	161	1.5	*.6	.1	.1	.3	22
26	.2	246	133	141	228	121	8.7	.5	.1	.1	.6	12
27	.2	219	117	141	246	95	86	.5	.1	.1	.6	13
28	.2	310	95	149	255	62	133	.4	.1	.1	.5	88
29	*.1	273	75	145	237	40	*174	.5	.1	.1	.5	113
30	.1	273	56	133	----------	29	206	122	.2	.1	.5	117
31	.1	----------	42	137	----------	22	----------	320	----------	.1	.6	----------
Total	131.9	2,343.5	6,029	5,316	3,344	6,968	707.2	1,876.4	1,753.6	7.3	9.1	1,183.3
Mean	4.25	78.1	194	171	115	225	23.6	60.5	58.5	0.24	0.29	39.4
Cfsm	0.051	0.937	2.33	2.05	1.38	2.70	0.283	0.726	0.702	0.0029	0.0035	0.473
In.	0.06	1.05	2.69	2.37	1.49	3.11	0.32	0.84	0.78	0.003	0.004	0.53
Ac-ft	262	4,650	11,960	10,540	6,630	13,820	1,400	3,720	3,480	14	18	2,350

Calendar year 1963: Max 4,460 Min 0.2 Mean 109 Cfsm 1.31 In. 17.84 Ac-ft 79,220
Water year 1963-64: Max 644 Min 0 Mean 81.1 Cfsm 0.973 In. 13.25 Ac-ft 58,840

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

* Discharge measurement made on this day.
** Field estimate made on this day.

Reservoirs in Sabine River basin, Tex.

8-174. Lake Tawakoni on Sabine River.--See page 64.

8-193. Lake Winnsboro.--Lat 32°53'10", long 95°20'40", near left end of dam on Big Sandy Creek, 0.8 mile upstream from bridge on State Highway 37, 2.5 miles upstream from Indian Creek, and 5.8 miles southwest of Winnsboro, Wood County. Drainage area, 27.1 sq mi. Records available, June 1962 to September 1964. Water-stage recorder. Datum of gage is mean sea level, datum of 1929. Prior to Jan. 19, 1963, staff gage at same site and datum. Maximum contents during year, 3,550 acre-ft Apr. 28 (elevation, 412.12 ft); minimum, 2,480 acre-ft Jan. 12 (elevation, 409.91 ft). Maximum contents during period 1962-64, 3,810 acre-ft May 4-6, 1963 (elevation, 412.60 ft); minimum since first appreciable storage, that of Jan. 12, 1964.

Lake is formed by a rolled earth-fill dam, 2,500 ft long. Storage began June 11, 1962, and dam completed August 1962. Dam built by Wood County to impound water for flood control and recreation. Service spillway is a 20-foot square drop outlet, uncontrolled. Emergency spillway is 300 ft wide cut through natural ground near right end of dam. Capacity of lake, 16,270 acre-ft (elevation, 427.0 ft, at emergency spillway), 6,590 acre-ft (elevation, 417.0 ft, at service spillway). There is no dead storage at invert of 18-inch service outlet (elevation, 392.2 ft). Capacity curve based on Geological Survey topographic map from survey made in 1960 furnished by Wisenbaker, Fix and Associates, Consulting Engineers.

8-215. Lake Cherokee.--Lat 32°22'36", long 94°38'30", on left wingwall of intake structure of electric generating plant of Southwestern Gas and Electric Co., 2.3 miles upstream from dam on Cherokee Bayou, 10 miles upstream from Sabine River, and 10.3 miles southwest of Longview, Gregg County. Drainage area, 158 sq mi. Records available, April 1951 to September 1964. Prior to October 1960, elevations only. Staff gage read once daily. Datum of gage is mean sea level, datum of 1929. Maximum contents observed during year, 47,480 acre-ft Mar. 4, 7-10, 18-19 (elevation, 280.2 ft); minimum observed, 38,250 acre-ft Sept. 22-26 (elevation, 277.7 ft). Maximum contents observed during period 1951-64, 71,170 acre-ft May 3, 1959 (elevation, 285.5 ft); minimum observed, 34,620 acre-ft Oct. 16-18, 31, 1956, Aug. 9, 18-21, Aug. 31 to Sept. 8, Sept. 11-18, 1958 (elevation, 276.6 ft).

Lake is formed by a rolled earth-fill dam, 4,000 ft long with an uncontrolled concrete spillway 828 ft long. There is an emergency spillway in natural ground. Storage began in October 1948 and dam completed Nov. 19, 1948; date valve closed is not known. Lake built for recreational purposes, to supply cooling water for generating plant of Southwestern Gas and Electric Co., and for municipal use by city of Longview. Capacity of lake, 68,700 acre-ft (elevation, 285.0 ft, at crest of emergency spillway), 46,700 acre-ft (elevation, 280.0 ft, at crest of service spillway), 4,150 acre-ft (elevation, 260.0 ft, at invert of intake). Dead storage is 4,510 acre-ft. Record of lake elevations furnished by Southwestern Gas and Electric Co. and record of diversions for municipal use furnished by city of Longview. Data for capacity curve from "Report of Sedimentation of Lake Cherokee, Gregg and Rusk Counties, April 4-May 13, 1960" by Soil Conservation Service.

8-222. Murvaul Lake on Murvaul Bayou.--See page 71.

Month-end elevations, contents, and diversions, water year October 1963 to September 1964

Date	Elevation (feet)	Capacity (acre-feet)	Change in contents (acre-feet)	Diversions for municipal supply (acre-feet)
	Lake Winnsboro†			
Sept. 30	410.47	2,740	-	
Oct. 31	410.07	2,550	-190	
Nov. 30	410.08	2,560	+10	
Dec. 31	410.06	2,550	-10	
Calendar year 1963	-	-	+1,330	
Jan. 30	410.14	2,580	+30	
Feb. 29	410.27	2,640	+60	
Mar. 31	410.94	2,960	+320	
Apr. 30	412.10	3,540	+580	
May 31	411.81	3,390	-150	
June 30	411.40	3,180	-210	
July 31	410.62	2,800	-380	
Aug. 31	410.58	2,790	-10	
Sept. 30	410.38	2,690	-100	
Water year 1963-64	-	-	-50	
	Lake Cherokee‡			
Sept. 30	278.9	42,530	-	-
Oct. 31	278.4	40,710	-1,820	591
Nov. 30	278.4	40,710	0	578
Dec. 31	279.0	42,900	+2,190	438
Calendar year 1963	-	-	-4,580	6,800
Jan. 31	279.6	45,150	+2,250	456
Feb. 29	280.0	46,700	+1,550	469
Mar. 31	280.0	46,700	0	433
Apr. 30	280.0	46,700	0	472
May 31	279.8	45,920	-780	532
June 30	279.4	44,390	-1,530	676
July 31	278.2	40,000	-4,390	1,060
Aug. 31	278.2	40,000	0	981
Sept. 30	277.8	38,600	-1,400	590
Water year 1963-64	-	-	-3,930	7,280

† Elevation at 2400.
‡ Elevation at 0800.

8-312. Kickapoo Creek near Brownsboro, Tex.

Location.--Lat 32°18'34", long 95°36'19", on left bank 94 ft downstream from bridge on Farm Road 314, and 1 mile northeast of Brownsboro, Henderson County.

Drainage area.--232 sq mi.

Records available.--April 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 358.62 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 272 cfs Mar. 5 (gage height, 7.05 ft); no flow for many days.
1962-64: Maximum discharge, 4,200 cfs Apr. 30, 1963 (gage height, 12.08 ft); no flow for many days.
Maximum stage since 1935, 16.4 ft in 1936 or 1937, from information by local residents.

Remarks.--Records good.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 15 to Feb. 4)

1.5	0	2.4	8.4
1.6	.1	2.7	14
1.7	.2	3.0	21
1.8	.6	3.5	32
1.9	1.0	4.0	47
2.0	2.0	5.0	90
2.1	3.1	6.0	160
2.2	4.8	7.0	265

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0	3.8	18	22	*21	29	139	0.2		0
2		0	0	4.0	18	31	21	46	88	.1		0
3		0	0	4.0	17	45	21	82	36	.1		0
4		0	0	3.8	22	180	20	99	22	.1		0
5		0	0	3.6	38	265	30	*114	14	0		0
6		0	0	3.6	49	215	39	127	10	0		0
7		0	0	3.8	49	139	45	102	7.6	0		0
8	(*)	0	0	4.2	45	105	45	56	5.6	0		0
9		0	0	4.5	40	117	47	42	4.5	0		0
10		0	1.1	4.3	36	151	40	39	*3.0	0		0
11		0	2.0	4.5	30	174	31	32	2.4	0		0
12		0	6.8	4.3	26	151	25	26	1.7	0		0
13		*0	8.6	3.8	27	114	22	20	1.1	0		0
14		0	5.4	3.1	29	87	20	16	.8	0		0
15		0	2.5	3.1	31	76	18	12	.8	*0		0
16		0	1.5	7.1	31	59	17	10	4.8	0		0
17		0	*1.3	13	35	42	16	8.4	17	0		0
18		0	1.0	21	42	36	15	7.0	24	0		0
19		0	.9	24	47	38	14	5.9	23	0	(*)	0
20		.2	2.2	24	45	40	13	4.6	21	0		0
21		0	2.9	24	39	39	13	3.6	16	0		0
22		1.6	4.2	22	38	34	12	3.0	9.8	0		0
23		.1	5.0	20	32	32	12	2.4	6.4	0		0
24		0	4.3	18	29	30	13	2.0	4.2	0		0
25		0	4.3	16	*27	29	18	1.5	2.5	0		*0
26		0	4.6	18	24	26	28	1.3	1.6	0		0
27		0	4.6	18	24	24	31	1.1	.9	0		.4
28		.1	4.6	16	24	23	30	1.2	.6	0		.1
29		.1	4.3	*15	23	24	26	26	.4	0		0
30		0	4.0	15	---	23	27	39	.3	0		0
31		---	3.8	17	---	22	---	79	---	0		---
Total	0	2.1	79.9	346.5	935	2,393	730	1,038.0	469.0	0.5	0	0.5
Mean	0	0.07	2.58	11.2	32.2	77.2	24.3	33.5	15.6	0.02	0	0.02
Cfsm	0	0.00030	0.011	0.048	0.139	0.333	0.105	0.144	0.067	0.000086	0	0.000086
In.	0	0.0003	0.01	0.06	0.15	0.38	0.12	0.17	0.08	0.00008	0	0.00008
Ac-ft	0	4.2	158	687	1,850	4,750	1,450	2,060	930	1.0	0	1.0

Calendar year 1963: Max 3,620 Min 0 Mean 44.7 Cfsm 0.193 In. 2.61 Ac-ft 32,350
Water year 1963-64: Max 265 Min 0 Mean 16.4 Cfsm 0.071 In. 0.97 Ac-ft 11,890

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

8-314. Lake Palestine near Frankston, Tex.

Location.--Lat 32°03'12", long 95°26'12", in outlet tower near right bank, 140 ft upstream from Blackburn Crossing Dam on Neches River, 5 miles east of Frankston, Anderson County, and 11 miles upstream from gage Neches River near Neches.

Drainage area.--839 sq mi.

Records available.--February 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942. Prior to Sept. 20, 1962, staff gage read once daily.

Extremes.--Maximum contents during year, 40,270 acre-ft Apr. 13, May 12 (elevation, 319.13 ft); minimum, 31,050 acre-ft Nov. 16 (elevation, 317.13 ft).
1962-64: Maximum contents observed, 72,450 acre-ft Feb. 27, 28, 1962 (elevation, 324.0 ft); minimum since first appreciable storage, that of Nov. 16, 1964.

Remarks.--Lake is formed by compacted earth fill embankment 3,500-ft long. Spillway is also earthen with some rip-rap and is 500 ft long. Dam completed and deliberate impoundment of water began May 1, 1962. Total capacity, 57,550 acre-ft (elevation, 322.0 ft, crest of spillway). Water used for municipal and industrial purposes in the Palestine area.

Cooperation.--Capacity table furnished by Forrest and Cotton, Consulting Engineers, based on Geological Survey 15-minute quadrangle sheets dated November 1957.

Capacity table (elevation, in feet, and contents, in acre-feet)

317	30,500
318	34,750
319	39,560
320	45,000

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	32,240	31,560	33,900	35,230	36,190	36,290	38,840	38,360	39,370	39,180	36,720	36,290
2	32,200	31,480	34,160	35,130	36,050	36,630	39,080	38,600	39,460	39,130	36,670	36,240
3	32,160	31,440	34,110	35,280	36,190	36,630	39,180	38,600	39,510	39,080	36,630	36,140
4	32,120	31,390	34,240	35,280	36,430	36,910	39,320	38,740	39,670	38,980	36,580	36,100
5	32,070	31,440	34,240	35,280	36,430	36,820	39,890	38,840	39,830	38,840	36,480	35,950
6	32,030	31,440	34,240	35,330	36,390	36,910	39,270	39,180	39,780	38,740	36,390	35,860
7	31,990	31,440	34,540	35,230	36,240	37,440	39,610	39,320	39,460	38,690	36,240	35,810
8	31,900	31,480	34,410	35,470	36,140	37,730	39,560	39,670	39,320	38,600	36,190	35,760
9	32,030	31,520	34,370	35,470	36,240	39,030	39,780	39,940	39,370	38,500	36,100	35,710
10	31,990	31,520	34,850	35,280	36,580	39,030	39,890	40,000	39,420	38,450	35,900	35,660
11	31,940	31,520	35,330	35,570	36,580	39,080	40,000	40,050	39,320	38,310	35,760	35,660
12	31,860	31,480	35,230	35,660	36,430	39,180	40,100	40,160	39,270	38,410	35,760	35,470
13	31,820	31,260	35,380	35,470	36,670	39,130	40,210	39,830	39,180	38,210	35,570	35,330
14	31,780	31,220	35,470	35,380	36,430	39,560	40,000	39,460	39,180	38,020	35,470	35,230
15	31,690	31,100	35,470	35,470	36,430	39,320	39,610	39,320	39,670	37,880	35,570	35,130
16	31,650	31,100	35,470	36,100	36,240	38,840	39,420	39,270	39,830	37,780	35,470	35,570
17	31,600	31,310	35,470	36,190	36,240	38,410	39,320	39,220	39,720	37,730	35,380	36,190
18	31,560	31,440	35,660	36,190	36,390	38,500	39,370	39,180	39,720	37,590	35,330	36,290
19	31,560	31,820	35,470	36,530	36,190	38,840	39,180	39,130	39,890	37,400	35,180	36,430
20	31,560	32,120	35,950	36,630	36,140	38,980	39,180	39,030	40,050	37,350	35,280	36,530
21	31,560	32,120	35,860	36,670	36,050	38,790	39,270	38,980	40,000	37,350	35,180	36,670
22	31,560	32,840	35,860	36,670	35,950	38,690	39,180	38,930	39,890	37,200	35,330	36,870
23	31,520	32,840	35,620	36,630	36,000	38,890	39,270	38,840	39,940	37,160	35,710	36,960
24	31,560	32,920	35,520	36,670	36,140	38,980	39,320	38,890	39,890	37,060	36,000	36,910
25	31,560	33,090	35,470	36,390	36,140	39,320	39,460	38,890	39,780	36,960	36,340	36,870
26	31,560	33,260	35,520	36,190	36,340	39,180	38,840	38,840	39,670	36,820	36,430	36,820
27	31,560	33,480	35,520	36,100	36,340	38,980	38,410	38,790	39,560	36,770	36,290	37,680
28	31,560	33,940	35,470	35,950	36,390	39,180	38,260	38,930	39,460	36,670	36,290	37,680
29	31,560	33,860	35,470	35,950	36,190	39,130	38,210	39,030	39,370	36,580	36,290	37,640
30	31,480	33,900	35,420	36,100	----------	39,080	38,210	39,320	39,320	36,820	36,290	37,680
31	31,560	----------	35,380	36,290	----------	38,980	----------	39,460	----------	36,770	36,290	----------
(†)	317.25	317.80	318.13	318.32	318.30	318.88	318.72	318.98	318.95	318.42	318.32	318.61
(‡)	-720	+2,340	+1,480	+910	-100	+2,790	-770	+1,250	-140	-2,550	-480	+1,390

Calendar year 1963..... ‡ -4,340
Water year 1963-64..... ‡ +5,400

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.
Note.--Contents computed from once-daily staff-gage readings Oct. 9 to Nov. 12.

8-320. Neches River near Neches, Tex.

Location.--Lat 31°53'32", long 95°25'50", near right bank on downstream side of pier of bridge on U. S. Highway 79, 1 mile downstream from Missouri Pacific Railroad Co. bridge, 1.4 miles downstream from Walnut Creek, 4.4 miles northeast of Neches, Anderson County, and 11 miles downstream from Lake Palestine.

Drainage area.--1,145 sq mi.

Records available.--February 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 264.06 ft above mean sea level, datum of 1929. Prior to Oct. 27, 1945, wire-weight gage at present site and datum.

Average discharge.--25 years, 749 cfs (542,300 acre-ft per year).

Extremes.--Maximum discharge during year, 880 cfs Apr. 28 (gage height, 11.17 ft); minimum daily, 3.3 cfs Nov. 1-3.
1939-64: Maximum discharge, 45,500 cfs Apr. 2, 1945 (gage height, 22.07 ft); no flow Oct. 3-5, 1939.
Flood in May 1908, stage 24.3 ft, was the highest since flood in May 1884, which was probably higher.

Remarks.--Records good. Some regulation by Lake Palestine (capacity, 57,500 acre-ft). No large diversion above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	3.3	41	138	194	216	*224	330	294	25	18	4.8
2	18	3.3	41	132	216	232	187	276	258	24	14	4.8
3	18	3.3	41	120	216	276	170	312	180	22	11	4.7
4	18	3.4	39	109	216	360	156	249	142	21	10	4.6
5	18	3.8	37	96	267	476	212	*180	123	21	9.9	4.6
6	18	4.4	36	94	350	464	430	162	126	20	9.7	5.0
7	18	4.7	36	94	360	428	560	152	138	19	9.5	5.0
8	*18	4.8	35	94	360	404	488	148	132	15	9.5	4.7
9	18	5.2	34	96	350	416	350	145	96	8.5	9.3	4.7
10	18	5.2	37	96	294	560	276	156	*72	5.8	9.3	4.6
11	18	5.0	66	94	232	700	232	187	50	4.7	9.1	4.4
12	18	5.4	96	94	249	775	224	216	42	4.2	8.9	4.1
13	18	*5.4	129	94	303	775	240	224	41	9.3	8.7	3.7
14	18	5.4	138	92	350	745	276	240	38	11	8.9	3.4
15	18	5.6	135	89	360	730	303	201	38	*10	9.3	3.4
16	18	6.2	126	109	370	715	285	166	53	10	10	4.2
17	18	6.7	*123	180	360	715	232	117	128	10	10	7.0
18	18	7.2	126	201	370	715	187	96	224	9.9	9.7	12
19	17	9.1	126	201	380	630	176	86	258	9.7	6.2	15
20	11	20	129	201	360	536	162	77	240	9.9	*6.0	20
21	6.0	32	162	208	350	488	138	72	201	10	6.3	12
22	4.6	30	194	240	340	440	132	66	176	11	5.3	9.5
23	4.0	35	201	276	294	392	129	61	135	11	4.8	7.8
24	3.7	40	201	285	232	330	126	55	79	11	5.6	*6.8
25	3.7	41	201	276	*224	312	183	52	63	10	5.6	6.3
26	3.8	37	187	249	232	303	476	49	53	10	22	5.6
27	4.2	34	159	249	240	294	745	45	40	10	24	8.3
28	4.2	33	152	*224	232	285	865	41	33	11	12	17
29	3.7	38	148	187	224	267	790	50	26	11	7.0	27
30	3.4	43	142	162	----------	249	560	190	25	11	5.8	26
31	3.4	----------	142	156	----------	240	----------	321	----------	12	5.2	----------
Total	396.7	480.4	3,460	4,936	8,525	14,468	9,514	4,722	3,504	388.0	300.6	251.0
Mean	12.8	16.0	112	159	294	467	317	152	117	12.5	9.70	8.37
Ac-ft	787	953	6,860	9,790	16,910	28,700	18,870	9,370	6,950	770	596	498

Calendar year 1963: Max 1,780 Min 3.3 Mean 237 Ac-ft 171,600
Water year 1963-64: Max 865 Min 3.3 Mean 139 Ac-ft 101,100

* Discharge measurement made on this day.

8-325. Neches River near Alto, Tex.

Location.--Lat 31°34'45", long 95°09'55", near left bank on downstream side of pier of bridge on State Highway 21, 600 ft downstream from Bowles Creek and 7½ miles southwest of Alto, Cherokee County.

Drainage area.--1,945 sq mi.

Records available.--January 1944 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 198.29 ft above mean sea level, datum of 1929, supplementary adjustment of 1937.

Average discharge.--20 years, 1,171 cfs (847,800 acre-ft per year).

Extremes.--Maximum discharge during year, 1,240 cfs Apr. 28 (gage height, 11.04 ft); minimum, 5.3 cfs Sept. 13-16.

1944-64: Maximum discharge, 42,800 cfs Apr. 4, 1945 (gage height, 26.85 ft); minimum, 0.1 cfs Sept. 27, 28, 1954.

Maximum stage since at least 1861, 28.2 ft in May 1884, from information by local residents (discharge, about 50,000 cfs).

Remarks.--Records good. Some regulation by Lake Palestine (station 8-314). No large diversion above station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 18-30)

1.1	3.1	2.5	76
1.2	5.5	3.0	122
1.4	12	6.0	440
1.6	20	9.0	860
1.8	30	11.0	1,240
2.0	40		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	34	98	207	308	341	407	950	968	61	22	*25
2	34	32	*92	202	297	363	385	1,020	950	52	23	21
3	30	29	93	197	275	407	374	1,040	828	47	20	17
4	29	26	98	197	*286	429	363	812	658	44	19	14
5	28	30	92	192	352	418	440	602	488	41	17	11
6	28	36	88	192	418	476	644	500	363	38	19	10
7	28	36	85	187	418	512	644	429	286	35	18	8.8
8	28	34	82	192	385	560	536	363	237	33	16	8.5
9	28	34	80	197	396	616	588	319	212	32	14	8.5
10	28	33	79	197	407	*686	644	297	202	30	14	8.5
11	28	34	87	182	418	732	616	308	192	28	12	7.6
12	26	34	107	172	407	686	536	297	167	26	11	7.0
13	26	32	132	167	385	686	464	275	142	23	11	6.1
14	26	30	147	162	374	780	407	264	113	20	10	5.3
15	26	31	167	157	396	1,080	374	264	98	18	10	5.3
16	26	30	187	187	418	1,140	352	275	107	16	10	6.1
17	28	29	187	286	440	1,040	363	275	147	14	19	18
18	32	32	187	385	464	968	374	253	167	12	28	60
19	32	34	182	352	476	968	374	*222	177	13	44	56
20	32	46	197	319	476	1,060	352	192	207	14	28	45
21	35	65	300	319	464	1,060	308	162	237	13	21	32
22	*37	88	275	308	464	968	286	147	253	13	17	37
23	39	87	253	297	464	860	264	137	248	13	16	89
24	40	99	253	297	452	764	248	137	222	13	17	50
25	39	98	248	297	440	672	253	152	197	13	22	48
26	40	86	253	308	429	616	528	177	167	13	39	45
27	38	83	264	319	396	548	1,080	147	127	13	36	36
28	37	88	253	319	374	500	1,140	118	99	*14	28	36
29	34	91	248	308	352	464	896	105	87	13	23	50
30	33	99	242	297	----------	440	878	226	72	14	20	55
31	34	----------	217	297	----------	418	----------	588	----------	14	24	----------
Total	987	1,540	5,273	7,695	11,631	21,258	15,118	11,053	8,418	743	628	826.7
Mean	31.8	51.3	170	248	401	686	504	357	281	24.0	20.3	27.6
Cfsm	0.016	0.026	0.087	0.127	0.206	0.353	0.259	0.184	0.144	0.012	0.010	0.014
In.	0.02	0.03	0.10	0.15	0.22	0.41	0.29	0.21	0.16	0.01	0.01	0.02
Ac-ft	1,960	3,050	10,460	15,260	23,070	42,160	29,990	21,920	16,700	1,470	1,250	1,640

Calendar year 1963: Max 1,690 Min 26 Mean 346 Cfsm 0.178 In. 2.41 Ac-ft 250,200
Water year 1963-64: Max 1,140 Min 5.3 Mean 233 Cfsm 0.120 In. 1.63 Ac-ft 168,900

* Discharge measurement made on this day.
Note.--Discharge computed from once-daily staff-gage readings Dec. 23-30.

8-330. Neches River near Diboll, Tex.

Location.--Lat 31°07'55", long 94°48'30", near center of main span on upstream side of bridge on U. S. Highway 59, 630 ft downstream from Texas and New Orleans Railroad Co. bridge, 2.9 miles downstream from Alabama Creek, and 3.8 miles south of Diboll, Angelina County.

Drainage area.--2,724 sq mi.

Records available.--October 1923 to September 1925, March 1939 to September 1964. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Wire-weight gage read twice daily. Datum of gage is 134.46 ft above mean sea level, datum of 1929. Prior to July 10, 1925, chain gage at site 630 ft upstream, July 10 to Aug. 31, 1925, chain gage and Mar. 30, 1939, to Sept. 24, 1943, wire-weight gage, at site 500 ft upstream, all at present datum.

Average discharge.--27 years (1923-25, 1939-64), 1,694 cfs (1,226,000 acre-ft per year).

Extremes.--Maximum discharge during year, 4,960 cfs Apr. 28 (gage height, 13.23 ft); minimum daily, 7.9 cfs Sept. 15-16.

1923-25, 1939-64: Maximum discharge, 49,900 cfs May 4, 1944 (gage height, 18.70 ft); no flow Aug. 15-22, 1925.

Maximum stage since at least 1874, 21 ft in May 1884 (discharge, about 110,000 cfs from rating curve defined by current-meter measurements below 40,000 cfs); flood in 1900 reached a stage of 19.9 ft (discharge, about 80,000 cfs); from information by local residents.

Remarks.--Records good. No large diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 10-26, June 12-28)

1.3	6.2	6.0	676
1.5	14	8.0	1,140
1.7	27	10.0	1,750
2.0	60	11.0	2,160
2.5	125	12.0	2,980
3.0	190	13.0	4,400
4.0	330	13.5	5,580

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	37	31	106	246	323	442	544	3,210	636	113	19	33
2	36	29	*100	239	323	1,130	508	2,870	846	94	19	30
3	35	28	96	225	*323	1,820	474	2,410	1,010	78	19	27
4	35	26	107	218	323	1,490	458	2,060	1,090	68	19	24
5	35	29	111	204	338	1,340	871	1,750	1,110	60	19	27
6	35	36	106	204	362	1,090	1,820	1,550	962	54	22	24
7	33	41	102	204	410	780	1,940	1,430	824	53	24	21
8	31	40	100	204	490	636	2,270	1,140	676	48	24	*19
9	29	41	99	204	508	*636	2,270	914	490	47	24	18
10	27	36	96	204	490	716	1,980	758	362	42	22	16
11	26	36	97	204	442	758	1,460	562	316	39	21	15
12	25	39	98	204	442	824	1,030	458	267	37	19	11
13	24	39	99	211	442	824	*938	410	225	36	17	9.6
14	24	36	170	204	442	824	846	386	211	33	15	8.2
15	24	35	161	190	426	802	676	354	190	31	14	7.9
16	24	35	170	218	426	802	580	338	*177	29	14	7.9
17	24	36	177	295	410	824	598	330	159	28	15	12
18	24	38	184	346	426	868	1,430	*316	159	26	16	15
19	24	39	190	426	458	1,140	1,250	309	170	24	18	19
20	23	42	204	526	474	1,310	962	302	246	21	18	21
21	*23	46	239	526	490	1,430	780	288	260	21	15	22
22	24	55	267	458	490	1,490	716	260	260	21	15	49
23	27	61	295	426	490	1,370	442	239	253	21	44	60
24	27	70	309	386	490	1,220	370	211	246	21	39	61
25	29	80	309	346	490	1,140	338	190	246	21	34	52
26	33	90	288	330	490	1,090	1,200	184	232	19	31	49
27	37	102	274	323	474	1,010	4,110	184	218	*19	27	55
28	37	107	267	316	474	938	4,730	184	190	19	23	59
29	37	111	260	323	458	846	4,020	184	170	19	31	53
30	37	109	*260	330	----------	824	3,580	190	142	19	37	49
31	34	---------	260	330	----------	616	----------	338	----------	19	41	----------
Total	920	1,543	5,601	9,070	12,624	31,030	43,191	24,309	12,343	1,180	715	874.6
Mean	29.7	51.4	181	293	435	1,001	1,440	784	411	38.1	23.1	29.2
Cfsm	0.011	0.019	0.066	0.108	0.160	0.367	0.529	0.288	0.151	0.014	0.0085	0.011
In.	0.01	0.02	0.08	0.12	0.17	0.42	0.59	0.33	0.17	0.02	0.01	0.01
Ac-ft	1,820	3,060	11,110	17,990	25,040	61,550	85,670	48,220	24,480	2,340	1,420	1,730

Calendar year 1963: Max 1,980 Min 23 Mean 441 Cfsm 0.162 In. 2.20 Ac-ft 319,400
Water year 1963-64: Max 4,730 Min 7.9 Mean 392 Cfsm 0.144 In. 1.95 Ac-ft 284,400

* Discharge measurement made on this day.

8-333. Piney Creek near Groveton, Tex.

Location.--Lat 31°08'30", long 95°05'10", on left bank at downstream side of bridge on State Highway 94, 4 miles upstream from Caney Creek and 6½ miles northeast of Groveton, Trinity County.

Drainage area.--79.0 sq mi.

Records available.--October 1961 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 251.40 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 670 cfs Apr. 28 (gage height, 12.10 ft); no flow for many days.
1961-64: Maximum discharge, 1,540 cfs May 1, 1962 (gage height, 13.20 ft); no flow at times.
Maximum stage since at least 1921, 17 ft in May 1942, from information by local residents.

Remarks.--Records good. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 6-9)

1.2	0	4.0	46
1.4	.2	5.0	75
1.6	1.0	6.0	108
1.8	2.2	9.0	260
2.1	4.8	11.0	452
2.5	10	12.0	640
3.0	21		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			*0	0	0.1	0.1	0.3	26	9.0			
2			0	0	0	*77	.3	24	8.6			
3			0	0	*0	*103	.3	16	6.5			
4			0	0	.1	36	.2	12	3.2			
5			0	0	.2	17	70	9.0	1.9			
6			0	0	10	7.7	274	7.2	1.4			
7			0	0	20	3.9	267	6.1	1.1			
8			0	0	12	2.1	124	5.3	.8			
9			0	0	6.6	*1.7	26	4.6	.6			
10			0	0	3.9	1.6	14	4.0	.5			
11			0	0	2.6	8.9	8.8	3.4	.4			
12			0	0	1.9	12	6.5	3.1	.4			
13			0	0	1.3	6.5	*5.1	2.6	.3			
14			0	0	.9	3.8	4.9	2.1	.2			
15			0	0	.6	2.6	4.4	1.9	.3			
16			0	.3	.4	1.8	3.1	1.7	*.4			
17			0	.5	.3	1.4	4.3	1.5	.3			
18			0	29	.2	1.2	13	*1.2	.3			
19			0	36	.2	12	13	1.1	1.0			
20			0	16	.1	64	14	1.0	.8			
21	(*)		0	9.0	.1	21	7.2	.9	.5			
22			15	5.0	.1	7.6	4.2	.8	.3			
23			8.6	3.1	.1	4.0	2.9	.7	.2			
24			3.1	2.1	.1	2.6	2.3	.7	.1			
25			1.3	1.3	.1	1.8	2.0	.7	.1			
26			.7	.8	.1	1.3	208	.7	.1			
27			.4	.4	.1	1.1	536	.7	0	(*)		
28			.2	.2	.1	.9	*622	.7	0			
29			.1	.1	.1	.7	*382	.6	0			
30			**.1	.1	----------	.5	*52	19	0			
31		---------	.1	.1	----------	.4	----------	33	----------		(*)	----------
Total	0	0	29.6	104.0	62.3	406.2	2,671.8	192.3	39.3	0	0	0
Mean	0	0	0.95	3.35	2.15	13.1	89.1	6.20	1.31	0	0	0
Cfsm	0	0	0.012	0.042	0.027	0.166	1.13	0.078	0.017	0	0	0
In.	0	0	0.01	0.05	0.03	0.19	1.26	0.09	0.02	0	0	0
Ac-ft	0	0	59	206	124	806	5,300	381	78	0	0	0

Calendar year 1963: Max 514 Min 0 Mean 9.35 Cfsm 0.118 In. 1.60 Ac-ft 6,770
Water year 1963-64: Max 622 Min 0 Mean 9.58 Cfsm 0.121 In. 1.65 Ac-ft 6,950

Peak discharge (base, 400 cfs)

Date	Time	Gage height	Discharge
4-28	1100	12.10	670

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

8-335. Neches River near Rockland, Tex.

Location.--Lat 31°01'45", long 94°23'46", on left bank 2,100 ft upstream from Texas and New Orleans Railroad Co. bridge, 2,200 ft downstream from bridge on U. S. Highway 69, 1 mile north of Rockland, Tyler County, and 3.6 miles downstream from Billams Creek.

Drainage area.--3,637 sq mi.

Records available.--July 1903 to September 1964. Monthly discharge only for some periods, published in WSP 1312. Gage-height records collected in this vicinity since 1903 are contained in reports of U. S. Weather Bureau.

Gage.--Staff gage read twice daily. Datum of gage is 91.41 ft above mean sea level, datum of 1929.

Average discharge.--61 years, 2,303 cfs (1,667,000 acre-ft per year).

Extremes.--Maximum discharge during year, 9,280 cfs May 2 (gage height, 15.35 ft); minimum, 19 cfs Sept. 15-16.
1903-64: Maximum discharge, 49,800 cfs May 6, 1944 (gage height, 31.84 ft); minimum observed during period of daily records, 1.6 cfs Sept. 28-30, Oct. 1, 2, 1956.
Historical flood information begins with flood in May 1884 which reached a stage of 34.9 ft, from information by local resident (discharge, about 62,000 cfs).

Remarks.--Records good. No large diversion above station. Some regulation by Lake Palestine near Frankston (station 8-314, capacity, 57,550 acre-ft).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 14-31)

-1.0	19
-.8	37
-.5	71
0	158
.5	278
1.0	438
9.0	5,000
15.0	9,000

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	41	139	275	431	851	885	7,320	988	224	34	33
2	51	43	170	272	431	4,910	791	9,000	1,040	178	29	33
3	50	43	176	267	421	5,730	702	8,650	1,070	168	29	42
4	47	43	150	258	421	5,730	658	8,300	1,150	154	28	46
5	47	65	131	253	960	5,420	988	7,740	1,210	131	26	41
6	45	58	131	307	1,020	4,700	2,000	6,640	1,240	118	23	40
7	45	50	131	319	885	3,560	3,260	5,240	1,240	109	22	36
8	45	47	130	304	791	2,540	3,440	3,860	1,150	100	22	32
9	45	53	120	292	702	2,000	2,900	2,660	1,020	94	25	28
10	44	62	118	278	658	2,000	2,720	1,880	768	75	28	28
11	42	54	115	258	636	*1,760	2,840	1,290	573	70	31	36
12	40	46	115	256	573	1,460	2,840	935	449	64	30	37
13	38	43	204	270	532	1,340	3,200	746	384	60	27	32
14	32	41	658	264	512	1,240	3,020	594	338	59	25	25
15	29	41	552	253	532	1,210	*2,660	532	332	54	25	19
16	29	41	364	620	532	1,370	1,760	512	326	51	23	19
17	29	41	272	1,460	532	1,240	1,290	449	292	50	32	45
18	29	41	240	1,700	552	1,120	1,020	431	272	47	41	45
19	28	41	245	1,340	532	2,090	1,820	421	258	47	30	44
20	27	45	284	1,100	532	3,500	2,060	*401	237	47	27	41
21	27	52	532	1,020	552	3,860	1,880	387	219	44	27	38
22	27	78	552	910	552	3,380	1,640	373	234	38	27	41
23	*25	202	501	746	552	2,780	1,120	357	247	37	32	41
24	25	145	418	615	552	2,360	791	322	256	37	56	38
25	26	126	394	532	1,340	2,000	702	310	261	32	54	50
26	29	97	380	485	1,260	1,760	2,760	292	281	29	60	74
27	34	92	370	449	1,040	1,580	7,180	261	292	29	62	77
28	37	128	348	407	910	1,400	7,460	242	301	29	56	77
29	37	168	322	390	814	1,290	7,530	240	287	36	50	77
30	36	152	*307	377	----------	1,150	7,460	264	247	*57	43	77
31	37	----------	*287	421	----------	1,020	----------	367	----------	42	36	----------
Total	1,134	2,179	8,856	16,698	19,757	76,351	79,377	71,016	16,962	2,310	1,060	1,292
Mean	36.6	72.6	286	539	681	2,463	2,646	2,291	565	74.5	34.2	43.1
Cfsm	0.010	0.020	0.079	0.148	0.187	0.677	0.728	0.630	0.155	0.020	0.0094	0.012
In.	0.01	0.02	0.09	0.17	0.20	0.78	0.81	0.73	0.17	0.02	0.01	0.01
Ac-ft	2,250	4,320	17,570	33,120	39,190	151,400	157,400	140,900	33,640	4,580	2,100	2,560

Calendar year 1963: Max 3,680 Min 25 Mean 647 Cfsm 0.178 In. 2.42 Ac-ft 469,400
Water year 1963-64: Max 9,000 Min 19 Mean 811 Cfsm 0.223 In. 3.02 Ac-ft 589,000

* Discharge measurement made on this day.

8-340. Lake Tyler near Whitehouse, Tex.

Location.--Lat 32°14'24" (revised), long 95°10'40", at intake tower of pumphouse, 2.0 miles north of Whitehouse Dam on Prairie Creek, 3.2 miles northeast of Whitehouse, Smith County, and 4.3 miles upstream from Mud Creek.

Drainage area.--45.3 sq mi.

Records available.--March 1949 to September 1964.

Gage.--Water-stage recorder. Datum of gage is mean sea level (city of Tyler bench mark). Prior to May 3, 1949, staff gage at dam at same datum. May 3, 1949, to July 11, 1951, staff gage at pumphouse 660 ft shoreward at same datum.

Extremes.--Maximum contents during year, 37,140 acre-ft Oct. 1-3 (elevation, 372.7 ft); minimum, 29,800 acre-ft Sept. 14-16 (elevation, 369.2 ft).
1949-64: Maximum contents, 48,040 acre-ft May 3, 1959 (elevation, 377.45 ft); minimum since first appreciable storage in 1950, that of Sept. 14-16, 1964.

Remarks.--Lake is formed by rolled earth-fill dam, 4,708 ft long. Spillway is concrete flume, 200 ft wide, located about 800 ft to left of dam. Storage began Jan. 8, 1949, and dam completed May 13, 1949. Capacity curve based on 1948-49 survey. Water used for municipal supply for city of Tyler. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	390.0	-
Crest of spillway	375.5	43,400
Invert of upper sluice gates	362.0	17,000
Invert of intermediate sluice gates	356.0	9,700
Invert of lower sluice gates	350.0	4,400

Month-end elevations, contents, and monthly diversions, water year October 1963 to September 1964

Date	Elevation (feet)†	Contents (acre-feet)	Change in contents (acre-feet)	Diversions for municipal use (acre-feet)
Sept. 30	372.9	37,580	-	-
Oct. 31	372.1	35,820	-1,710	959
Nov. 30	371.8	35,160	-660	773
Dec. 31	371.8	35,160	0	742
Calendar year 1963	-	-	-7,280	9,367
Jan. 31	371.8	35,160	0	730
Feb. 29	371.9	35,380	+220	663
Mar. 31	372.4	36,480	+1,100	729
Apr. 30	372.3	36,260	-220	805
May 31	371.9	35,380	-880	842
June 30	371.4	34,280	-1,100	752
July 31	370.4	32,200	-2,080	1,017
Aug. 31	369.7	30,800	-1,400	752
Sept. 30	369.3	30,000	-800	687
Water year 1963-64	-	-	-7,580	9,451

† Elevation at 2400 hours.

8-345. Mud Creek near Jacksonville, Tex.

Location.--Lat 31°58'35", long 95°09'38", on right bank on downstream side of pile bent of bridge on U. S. Highway 79, 0.6 mile downstream from Caney Creek, 3.9 miles downstream from another Caney Creek, 4 miles downstream from Missouri Pacific Railroad Co. bridge, and 6.9 miles east of Jacksonville, Cherokee County.

Drainage area.--376 sq mi.

Records available.--May 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 271.64 ft above mean sea level, datum of 1929.

Average discharge.--25 years, 277 cfs (200,500 acre-ft per year).

Extremes.--Maximum discharge during year, 394 cfs May 31 (gage height, 6.71 ft); no flow for many days.
1939-64: Maximum discharge, 23,400 cfs May 3, 1944 (gage height, 14.09 ft), from rating curve defined by current-meter measurements below 11,000 cfs and extended above; no flow at times.
Maximum stage since May 1884, 20 ft in May 1908 and December 1913; flood in May 1884 was higher, stage unknown; from information by local residents.

Remarks.--Records good. Flow slightly regulated by Lake Tyler on Prairie Creek (see preceding page). Some diversions above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 3 to May 11, May 30 to June 2)

1.13	0	2.5	26
1.2	.3	3.5	65
1.3	1.0	5.0	146
1.4	1.8	6.0	223
1.6	4.2	6.5	286
1.8	7.6	7.0	390
2.0	12		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.6	1.8	18	29	44	48	*58	43	138	1.8	0	1.0
2	1.7	1.4	21	28	49	51	56	65	65	1.5	0	.6
3	1.8	1.2	20	28	51	79	58	65	39	1.4	0	.3
4	1.8	1.3	17	28	46	122	58	70	24	1.3	0	.1
5	1.4	1.4	15	28	53	238	76	*77	18	1.3	0	0
6	1.3	1.8	15	28	72	204	152	50	16	1.3	0	0
7	1.3	2.2	15	28	84	191	143	38	14	1.1	0	0
8	*1.1	2.4	15	28	89	158	143	32	12	1.0	0	0
9	1.1	2.8	15	28	74	137	114	31	11	.7	0	0
10	1.0	3.0	16	28	56	187	79	31	*9.2	.5	0	0
11	.9	3.1	22	30	49	191	65	30	7.8	.3	0	0
12	.8	3.1	38	32	44	204	61	26	6.8	.2	0	0
13	.6	*3.0	45	32	46	204	61	24	6.0	.1	0	0
14	.6	3.1	52	30	58	195	58	20	5.1	0	0	0
15	.4	3.4	48	28	67	143	56	17	5.1	*0	0	0
16	.3	3.6	38	34	72	114	52	15	9.0	0	0	0
17	.3	4.1	*32	70	70	116	46	13	14	0	0	0
18	.2	5.0	29	82	74	122	43	12	21	0	0	0
19	.2	6.0	26	86	77	110	41	12	38	0	0	.3
20	.6	9.6	28	89	77	125	39	11	29	0	*0	18
21	.9	15	41	74	74	131	38	9.6	19	0	0	26
22	1.1	17	54	61	61	134	36	9.0	13	0	0	15
23	1.2	18	61	51	53	119	34	8.6	10	0	0	9.2
24	1.3	18	58	46	49	97	33	9.4	8.0	0	0	6.5
25	1.4	17	50	44	*48	89	38	11	6.0	0	0	*4.8
26	1.5	19	45	42	48	84	55	14	4.6	0	0	3.9
27	1.8	17	44	39	49	79	82	12	3.8	0	9.1	4.8
28	2.0	16	42	*37	50	74	74	11	3.0	0	9.0	6.5
29	2.2	15	38	34	49	70	74	10	2.5	0	5.8	8.4
30	2.3	17	34	34	----------	65	56	19	2.1	0	3.4	19
31	2.2	---------	31	37	----------	63	----------	313	----------	0	1.6	----------
Total	36.9	232.3	1,023	1,293	1,733	3,944	1,979	1,108.6	560.0	12.5	28.9	124.4
Mean	1.19	7.74	33.0	41.7	59.8	127	66.0	35.8	18.7	0.40	0.93	4.15
Cfsm	0.0032	0.021	0.088	0.111	0.159	0.338	0.176	0.095	0.050	0.0011	0.0025	0.011
In.	0.004	0.02	0.10	0.13	0.17	0.39	0.20	0.11	0.06	0.001	0.003	0.01
Ac-ft	73	461	2,030	2,560	3,440	7,820	3,930	2,200	1,110	25	57	247

Calendar year 1963: Max 425 Min 0 Mean 59.4 Cfsm 0.158 In. 2.14 Ac-ft 43,010
Water year 1963-64: Max 313 Min 0 Mean 33.0 Cfsm 0.088 In. 1.20 Ac-ft 23,950

Peak discharge (base, 1,400 cfs).--No peak above base.

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

8-365. Angelina River near Alto, Tex.

Location.--Lat 31°40'10", long 94°57'24", near center of rectified channel at downstream side of pier of bridge on State Highway 21, 0.4 mile upstream from Allen Creek, 1.5 miles upstream from Bingham Creek, and 7.5 miles east of Alto, Cherokee County.

Drainage area.--1,276 sq mi.

Records available.--May to August 1940 (discharge measurements only), September 1940 to March 1949 (fragmentary for 1941-42, 1944-49), February 1959 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 204.30 ft above mean sea level, datum of 1929. May 9, 1940, to Mar. 31, 1949, chain gage on bridge at natural channel 1,400 ft to right at same datum. Feb. 18 to Sept. 15, 1959, wire-weight gage at same site and datum.

Average discharge.--6 years (1943, 1959-64), 764 cfs (553,100 acre-ft per year).

Extremes.--Maximum discharge during year, 810 cfs Mar. 19 (gage height, 7.80 ft); minimum, 2.0 cfs Aug. 14-15.
1940-49, 1959-64: Maximum gage height observed, 21.52 ft May 5, 1944 (discharge not determined), but may have been higher during period of no gage-height record in November 1940; minimum discharge, that of Aug. 14-15, 1964.
Maximum stage since at least 1905, about 22 ft in May 1908, from information by local residents. Flood in 1932 reached a stage of 21.5 ft and flood in May 1958 reached a stage of 20.3 ft, from floodmarks and information by local residents.

Remarks.--Records good. No large diversion above station. Recording rain gage located at station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	37	85	103	140	223	265	554	172	26	46	*11
2	13	27	*84	98	140	241	247	490	319	26	46	10
3	14	22	85	93	150	295	241	381	462	26	34	10
4	22	20	77	89	*155	319	235	307	538	24	20	10
5	57	21	72	87	205	368	271	343	490	22	12	9.1
6	82	19	71	92	253	420	343	355	307	19	8.2	7.6
7	95	20	69	100	283	420	420	319	177	17	6.5	7.0
8	100	22	65	122	331	420	538	241	130	15	5.5	8.2
9	100	23	61	177	355	420	618	194	105	13	4.3	18
10	100	25	59	172	319	*448	650	166	88	12	3.9	24
11	100	24	65	172	265	476	618	155	73	10	3.4	23
12	101	23	77	205	229	522	538	145	62	9.4	2.8	21
13	98	23	90	188	217	554	407	150	55	8.5	2.3	19
14	71	22	114	150	223	586	*319	135	51	7.3	2.1	18
15	39	22	140	125	229	762	271	122	47	6.5	9.4	18
16	25	22	135	140	265	714	247	160	49	6.0	40	18
17	20	22	125	217	295	714	229	177	*51	5.8	48	44
18	16	26	121	259	295	746	211	125	52	5.2	59	34
19	14	29	108	295	295	794	194	*85	62	5.8	52	30
20	13	34	117	343	283	778	177	69	65	22	54	29
21	54	44	155	355	289	682	172	61	66	37	48	34
22	*80	57	150	343	289	586	160	57	68	42	30	34
23	85	72	155	295	259	554	150	54	67	42	19	31
24	87	82	177	247	241	522	135	53	59	42	15	30
25	92	79	188	217	235	462	160	53	49	43	16	41
26	96	75	160	188	235	420	405	69	43	43	19	42
27	96	75	140	172	229	381	521	111	38	44	18	31
28	94	90	135	155	235	355	448	150	37	*45	20	25
29	91	95	125	145	229	331	490	135	32	45	20	22
30	85	90	118	140	----------	307	554	110	28	46	18	19
31	64	---------	*110	140	----------	283	----------	123	----------	45	14	----------
Total	2.017	1.242	3.433	5.624	7.168	15.103	10.234	5.649	3.842	760.5	696.4	677.9
Mean	65.1	41.4	111	181	247	487	341	182	128	24.5	22.5	22.6
Cfsm	0.051	0.032	0.087	0.142	0.194	0.382	0.267	0.143	0.100	0.019	0.018	0.018
In.	0.06	0.04	0.10	0.16	0.21	0.44	0.30	0.16	0.11	0.02	0.02	0.02
Ac-ft	4,000	2,460	6,810	11,160	14,220	29,960	20,300	11,200	7,620	1,510	1,380	1,340

Calendar year 1963: Max 1,030 Min 9.7 Mean 241 Cfsm 0.189 In. 2.58 Ac-ft 174,300
Water year 1963-64: Max 794 Min 2.1 Mean 154 Cfsm 0.121 In. 1.64 Ac-ft 112,000

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 25 to Dec. 1.

8-370. Angelina River near Lufkin, Tex.

Location.--Lat 31°27'26", long 94°43'34", near right bank at downstream side of bridge on U. S. Highway 59, 200 ft upstream from Procella Creek, 1.5 miles downstream from Bayou Loco, 1.5 miles upstream from Southern Pacific Lines bridge, and 8 miles north of Lufkin, Angelina County.

Drainage area.--1,600 sq mi.

Records available.--October 1923 to September 1934, July 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 164.72 ft above mean sea level, datum of 1929. Oct. 29, 1923, to Jan. 17, 1926, chain gage at Southern Pacific Lines bridge 1.5 miles downstream at datum 1.39 ft lower; Jan. 18, 1926, to Sept. 30, 1934, chain gage at Lufkin-Nacogdoches highway bridge 1,400 ft upstream at present datum.

Average discharge.--36 years, 1,238 cfs (896,300 acre-ft per year).

Extremes.--Maximum discharge during year, 2,720 cfs Apr. 28 (gage height, 10.37 ft); minimum, 5.3 cfs Aug. 15-16. 1923-34, 1939-64: Maximum discharge, 38,200 cfs Feb. 24, 1932; maximum gage height, 18.55 ft May 7, 1944; minimum discharge, 0.8 cfs Oct. 29, 30, 1956.

Flood in May 1884 reached a stage of 26.5 ft and is the highest known since at least that date and flood in May 1908 reached a stage of 25 ft; from information by local residents.

Remarks.--Records good. No large diversion above station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 30 to July 3, July 24 to Aug. 5, Aug. 24-25, Sept. 18-30)

0.1	4.0	4.5	205
.4	9.2	6.0	368
.8	18	7.0	570
1.4	37	8.0	900
2.0	62	9.0	1,460
3.0	110	10.5	2,920

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	75	85	125	177	265	368	1,000	322	38	43	20
2	18	64	*82	116	174	455	340	975	322	34	43	18
3	16	45	82	110	*170	508	328	1,050	328	32	43	16
4	16	32	88	108	170	482	310	925	390	29	43	14
5	16	29	90	110	213	432	1,090	715	450	28	39	12
6	16	23	85	113	286	432	1,670	558	508	27	31	11
7	31	21	78	113	310	441	1,460	508	470	25	23	12
8	64	19	73	119	316	470	1,000	482	347	23	17	11
9	80	18	70	116	328	*508	785	432	235	21	13	11
10	88	17	68	140	354	558	732	368	174	19	10	9.2
11	90	18	68	174	361	582	750	316	143	17	8.2	8.2
12	90	18	68	184	340	558	750	275	122	16	6.6	10
13	90	19	75	188	304	570	768	250	105	15	5.8	18
14	90	19	90	194	280	595	*715	226	88	13	5.8	21
15	90	19	105	174	270	635	582	209	88	12	5.4	20
16	73	19	122	177	275	698	441	191	*95	12	5.8	19
17	49	19	128	240	280	768	382	177	92	11	123	25
18	32	19	131	328	298	802	423	*194	88	10	90	37
19	24	19	122	328	316	1,020	460	198	80	10	64	42
20	19	25	137	322	322	1,150	368	167	73	10	64	44
21	*16	38	177	347	322	1,180	316	131	73	11	57	38
22	14	55	198	375	310	1,050	280	108	73	11	55	35
23	17	64	188	390	316	925	260	95	73	17	51	33
24	52	80	170	375	310	802	235	90	73	34	41	36
25	68	80	167	334	298	732	256	90	70	39	32	38
26	73	82	177	292	292	665	924	122	64	40	25	35
27	78	80	174	260	280	595	2,350	110	55	41	25	36
28	82	85	170	226	275	532	2,600	119	49	*42	26	43
29	82	92	155	205	270	482	2,190	146	44	41	27	41
30	82	95	143	191	----------	432	1,460	170	40	42	22	35
31	80	---------	*134	180	----------	398	----------	265	----------	43	*21	----------
Total	1,655	1,288	3,700	6,654	8,217	19,722	24,593	10,662	5,134	763	1,065.6	748.4
Mean	53.4	42.9	119	215	283	636	820	344	171	24.6	34.4	24.9
Cfsm	0.033	0.027	0.074	0.134	0.177	0.398	0.512	0.215	0.107	0.015	0.022	0.016
In.	0.04	0.03	0.09	0.15	0.19	0.46	0.57	0.25	0.12	0.02	0.02	0.02
Ac-ft	3,280	2,550	7,340	13,200	16,300	39,120	48,780	21,150	10,180	1,510	2,110	1,480

Calendar year 1963: Max 1,760 Min 14 Mean 297 Cfsm 0.186 In. 2.52 Ac-ft 214,900
Water year 1963-64: Max 2,600 Min 5.4 Mean 230 Cfsm 0.144 In. 1.96 Ac-ft 167,000

* Discharge measurement made on this day.

8-380. Attoyac Bayou near Chireno, Tex.

Location.--Lat 31°30'15", long 94°18'15", on right bank on downstream side of pier of bridge on State Highway 21, 2.2 miles upstream from Amaladeros Creek, 2.8 miles east of Chireno, Nacogdoches County, 5.4 miles downstream from Arenoso Creek, and 41 miles upstream from mouth.

Drainage area.--503 sq mi.

Records available.--January 1924 to September 1925, July 1939 to November 1954, October 1955 to September 1964 (October 1957 to September 1958, monthly discharge only). Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 169.58 ft above mean sea level, datum of 1929, releveling of 1949 and 1952. Jan. 24, 1924, to Aug. 29, 1925, chain gage, July 31, 1939, to Nov. 18, 1954, and Sept. 24, 1955, to Sept. 5, 1957, water-stage recorder; and Sept. 6, 1957, to Oct. 27, 1958, reference point; all at same site and datum.

Average discharge.--25 years, 474 cfs (343,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,380 cfs Apr. 5 (gage height, 14.84 ft); minimum, 4.2 cfs Sept. 13. 1924-25, 1939-54, 1955-64: Maximum discharge, 31,900 cfs Nov. 24, 1940 (gage height, 25.97 ft); minimum, 0.8 cfs Aug. 26, 27, 1956.

Maximum stage since at least 1865, 29.9 ft June 29, 1902, from information by local residents. Flood in August 1915 reached a stage of about 5 ft less than that of June 29, 1902, from information by local residents.

Remarks.--Records good. No large diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 9 to Mar. 2, June 2-3)

2.1	4.0	6.0	175
2.2	5.5	10.0	500
2.5	11	12.0	750
3.0	24	14.0	1,150
4.0	63	15.0	1,450

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*20	15	70	60	86	119	137	798	600	17	16	9.4
2	17	14	76	60	86	755	128	446	*464	18	14	7.9
3	18	14	78	58	86	866	125	455	410	19	10	6.9
4	16	15	70	58	86	848	125	510	218	18	9.4	6.0
5	14	*24	60	58	119	688	835	*346	128	18	8.6	5.7
6	14	40	54	76	196	520	1,290	203	93	16	7.7	5.4
7	14	36	50	110	242	402	1,260	155	78	* 14	8.1	5.0
8	14	27	48	108	274	282	1,180	131	66	13	7.0	5.0
9	13	26	46	103	234	258	848	113	56	12	6.2	6.5
10	12	27	34	105	175	354	550	105	50	11	5.5	5.7
11	11	25	*56	98	137	386	330	98	45	11	5.2	5.0
12	11	23	78	122	116	386	226	90	41	10	*5.2	4.6
13	11	23	78	131	108	362	242	85	37	9.4	5.0	4.3
14	11	23	88	108	110	330	274	80	36	9.0	4.4	4.3
15	21	22	105	*90	122	394	196	75	40	8.8	5.4	4.3
16	34	22	96	137	134	346	203	70	45	9	5.0	*4.4
17	50	22	83	346	140	346	225	65	41	9	9.6	7.0
18	52	23	76	419	149	378	410	60	42	8	10	21
19	46	25	66	402	*143	599	378	55	44	8	9.8	36
20	43	30	82	362	128	750	298	50	39	8	14	41
21	37	45	182	306	122	750	234	45	34	8	14	36
22	27	68	218	218	116	674	182	40	31	7.7	14	25
23	23	134	203	164	108	634	152	40	27	7.9	14	18
24	20	143	175	137	103	598	131	60	24	8.1	12	17
25	17	113	134	119	110	*493	125	100	23	8.5	12	17
26	22	88	100	105	125	338	490	80	21	10	12	15
27	23	68	86	98	119	250	1,000	60	19	11	11	14
28	20	60	78	93	122	203	980	40	18	12	11	14
29	18	80	73	88	119	189	960	60	17	18	11	16
30	18	83	68	83	----------	164	920	80	17	14	10	21
31	17	---------	66	83	----------	149	----------	400	----------	12	11	----------
Total	684	1,358	2,777	4,505	3,915	13,811	14,434	4,995	2,804	363.4	298.1	388.4
Mean	22.1	45.3	89.6	145	135	446	481	161	93.5	11.7	9.62	12.9
Cfsm	0.044	0.090	0.178	0.288	0.268	0.887	0.956	0.320	0.186	0.023	0.019	0.026
In.	0.05	0.10	0.21	0.33	0.29	1.02	1.07	0.37	0.21	0.03	0.02	0.03
Ac-ft	1,360	2,690	5,510	8,940	7,770	27,390	28,630	9,910	5,560	721	591	770

Calendar year 1963: Max 1,520 Min 9.4 Mean 118 Cfsm 0.235 In. 3.18 Ac-ft 85,420
Water year 1963-64: Max 1,290 Min 4.3 Mean 138 Cfsm 0.274 In. 3.73 Ac-ft 99,840

Peak discharge (base, 2,500 cfs).--No peak above base.

* Discharge measurement made on this day.
Note.--No gage-height record May 12 to June 1, July 16-21.

8-385. Angelina River near Zavalla, Tex.

Location.--Lat 31°12'41", long 94°17'40", near right bank on downstream side of pier of abandoned bridge on former State Highway 147, just downstream from Harvey Bayou, 3 miles downstream from Attoyac Bayou and State Highway 147, and 8½ miles northeast of Zavalla, Angelina County.

Drainage area.--2,892 sq mi.

Records available.--October 1951 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 104.48 ft above mean sea level, datum of 1929.

Average discharge.--13 years, 1,829 cfs (1,324,000 acre-ft per year).

Extremes.--Maximum discharge during year, 5,450 cfs Apr. 27 (gage height, 18.23 ft); minimum, 31 cfs Sept. 9.
1951-64: Maximum discharge, 37,300 cfs May 18, 1953 (gage height, 27.72 ft); minimum, 22 cfs Sept. 22-24, 1954, Oct. 5, 6, 1956.
Maximum stage since at least 1883, 29.4 ft in June 1902. Second highest flood occurred in 1932, exact stage unknown. Floods in 1941 and 1944 reached about the same stage as the May 1953 flood, from information by local residents.

Remarks.--Records good except those above 2,500 cfs and those for periods of no gage-height record, which are fair. Prior to August 1956, Southland Paper Mills pumped about 22 cfs from wells, of which about 18 cfs was later discharged into Mill Creek, 20 miles above station. Since August 1956, about 28 cfs is pumped from wells and about 24 cfs is discharged into Mill Creek. This discharge is continuous and fairly constant. The town of Nacogdoches discharges about 2 cfs sewage effluent into LaNana Bayou, 27 miles above station. Some diversion above station into Lake Kurth near Lufkin (capacity, 16,200 acre-ft).

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

0.9	29	5.0	824
1.0	35	8.0	1,680
1.2	50	12.0	3,180
1.4	69	15.0	4,500
2.0	150	17.0	5,500
3.0	342		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	134	213	288	444	648	1,010	5,000	397	140	70	79
2	64	132	229	278	420	2,320	902	5,100	540	132	70	*74
3	66	131	229	268	408	4,040	824	4,800	696	126	70	73
4	67	130	222	252	397	3,310	772	4,360	798	119	70	65
5	63	131	215	240	*432	3,100	948	3,860	850	113	65	63
6	59	125	233	242	528	2,700	2,620	3,260	824	105	65	47
7	55	122	211	244	600	2,260	3,220	2,500	772	100	65	38
8	53	115	198	258	648	1,940	3,690	1,870	696	95	70	33
9	52	115	188	278	672	1,740	4,040	1,460	672	90	75	32
10	53	112	179	309	720	1,870	4,090	1,140	624	86	70	45
11	69	97	176	309	772	*1,810	3,860	954	552	84	68	53
12	95	79	170	309	772	1,620	3,470	850	444	82	61	85
13	108	77	172	320	746	1,490	3,140	746	353	81	54	65
14	116	69	197	353	720	1,400	2,980	648	288	80	54	47
15	122	70	231	375	696	1,430	*2,380	576	258	78	48	44
16	124	69	229	432	672	1,550	1,840	516	*246	76	41	44
17	125	70	242	696	648	1,490	1,550	468	229	73	59	55
18	125	71	258	876	648	1,430	1,650	432	224	70	85	61
19	122	71	268	954	624	1,740	1,680	386	215	67	97	61
20	131	84	268	954	624	2,780	1,620	*364	211	64	116	63
21	126	82	288	954	624	2,700	1,550	364	200	63	160	70
22	*118	131	353	928	648	2,660	1,430	353	193	62	153	80
23	101	130	456	902	648	2,580	1,230	320	179	59	131	85
24	91	150	504	850	648	2,540	1,030	288	169	58	118	90
25	82	198	516	798	648	2,460	876	258	164	56	113	85
26	77	258	480	720	696	2,300	2,390	238	158	54	112	80
27	77	268	420	672	696	2,080	5,350	227	153	54	111	80
28	96	254	375	624	696	1,870	5,000	238	150	59	104	85
29	112	231	342	564	672	1,620	4,950	298	148	*76	97	90
30	125	216	309	516	----------	1,400	5,050	320	144	75	87	90
31	134	---------	298	468	----------	1,170	----------	320	----------	75	80	----------
Total	2,875	3,922	8,669	16,231	18,167	64,048	75,142	42,514	11,547	2,552	2,639	1,962
Mean	92.7	131	280	524	626	2,066	2,505	1,371	385	82.3	85.1	65.4
Cfsm	0.032	0.045	0.097	0.181	0.216	0.714	0.866	0.474	0.133	0.028	0.029	0.023
In.	0.04	0.05	0.11	0.21	0.23	0.82	0.97	0.55	0.15	0.03	0.03	0.03
Ac-ft	5,700	7,780	17,190	32,190	36,030	127,000	149,000	84,330	22,900	5,060	5,230	3,890

Calendar year 1963: Max 2,820 Min 52 Mean 588 Cfsm 0.203 In. 2.77 Ac-ft 425,700
Water year 1963-64: Max 5,350 Min 32 Mean 684 Cfsm 0.237 In. 3.22 Ac-ft 496,300

* Discharge measurement made on this day.
Note.--No gage-height record July 30 to Aug. 10, Sept. 22-30.

8-391. Ayish Bayou near San Augustine, Tex.

Location.--Lat 31°23'46", long 94°09'03", near center of span at downstream side of pier of bridge on State Highway 103, 3.0 miles upstream from Turkey Creek, and 9½ miles south of San Augustine, San Augustine County.

Drainage area.--89.0 sq mi.

Records available.--February 1959 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 190.22 ft above mean sea level, datum of 1929. Prior to June 2, 1959, wire-weight gage at same site and datum.

Average discharge.--5 years, 76.6 cfs (55,460 acre-ft per year).

Extremes.--Maximum discharge during year, 4,000 cfs Apr. 5 (gage height, 13.38 ft); no flow for many days. 1959-64: Maximum discharge, 7,750 cfs Apr. 18, 1959 (gage height, 14.50 ft), from rating curve defined by current-meter measurements below 3,500 cfs and extended above by logarithmic plotting; no flow at times. Flood of Sept. 21 or 22, 1958, reached a stage of 17.5 ft, from floodmarks.

Remarks.--Records good except those for periods of backwater, which are fair. No diversion above station. Recording rain gage located at station.

Rating table, except periods of backwater (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 2-4, 10, 15-16, 20-21, Apr. 6-7, 14, 27-28)

1.46	0	4.0	58
1.5	.1	6.0	161
1.6	.4	7.5	260
1.8	1.4	9.0	410
2.0	3.0	10.0	580
2.2	5.4	11.0	870
2.5	10	12.0	1,580
3.0	16	12.5	2,250

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0	8.6	5.5	22	28	44	90	*64	0.7	0	1.0
2	*.1	0	6.7	5.4	19	*1,170	44	98	34	.8	0	.6
3	.1	0	5.5	5.5	18	*1,060	44	85	15	.6	0	.6
4	.1	0	6.0	5.7	18	*406	44	67	9.8	.6	0	1.0
5	0	*0	5.5	5.7	104	*184	1,020	54	7.4	.6	0	.6
6	0	0	5.3	15	138	127	1,480	*47	6.4	*.5	0	.4
7	0	0	4.5	49	75	102	501	42	5.8	.4	0	.2
8	0	2.4	4.0	31	48	95	178	38	4.8	.4	0	.1
9	0	5.3	3.8	20	36	146	113	34	4.0	.3	0	.1
10	0	3.4	3.7	15	32	344	90	31	3.4	.2	0	0
11	0	2.8	4.2	12	28	165	78	29	3.0	.1	0	0
12	0	2.4	*4.4	28	24	112	75	29	2.6	.1	*0	0
13	0	2.1	7.6	34	25	90	239	33	2.4	.1	0	0
14	0	2.0	12	20	30	88	227	25	2.4	.1	0	0
15	0	2.1	16	*16	35	348	108	18	2.7	0	5.1	*0
16	0	2.0	12	51	56	209	75	16	2.8	0	9.5	0
17	0	1.8	8.8	271	39	116	69	14	3.2	0	7.9	0
18	0	1.8	7.0	228	36	88	284	12	3.2	0	4.4	.2
19	0	1.8	6.0	124	33	301	218	11	2.7	0	2.9	.3
20	0	2.7	12	75	*27	707	108	8.9	2.3	0	2.6	.5
21	0	5.4	95	50	23	198	78	8.1	1.8	0	2.4	.8
22	0	13	65	40	23	119	62	7.1	1.5	0	2.0	1.0
23	0	29	30	36	22	98	56	6.5	1.2	0	1.7	.8
24	0	24	14	35	22	88	48	6.8	1.0	0	2.1	.9
25	0	13	12	33	42	88	57	9.7	.9	0	2.2	.8
26	0	7.1	11	27	54	*100	632	7.8	.8	0	2.9	.8
27	0	5.1	10	25	43	75	1,800	6.7	.8	0	3.2	2.9
28	0	5.5	8.8	24	37	67	595	7.3	.6	0	2.7	5.0
29	0	6.7	7.3	21	31	60	176	7.9	.6	0	1.8	9.8
30	0	9.5	6.5	19	----------	52	113	10	.6	0	1.4	9.8
31	0	----------	6.1	20	----------	46	----------	47	----------	0	1.4	----------
Total	0.4	150.9	409.3	1,346.8	1,140	6,877	8,656	906.8	191.7	5.5	56.2	38.2
Mean	0.01	5.03	13.2	43.4	39.3	222	289	29.3	6.39	0.18	1.81	1.27
Cfsm	0.00011	0.057	0.148	0.489	0.442	2.50	3.25	0.329	0.072	0.0020	0.020	0.014
In.	0.0002	0.06	0.17	0.56	0.48	2.87	3.62	0.38	0.08	0.002	0.02	0.02
Ac-ft	0.8	299	812	2,670	2,260	13,640	17,170	1,800	380	11	111	76

Calendar year 1963: Max 658 Min 0 Mean 26.5 Cfsm 0.298 In. 4.04 Ac-ft 19,180
Water year 1963-64: Max 1,800 Min 0 Mean 54.1 Cfsm 0.608 In. 8.26 Ac-ft 39,230

Peak discharge (base, 900 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
3- 2	1800	13.01	3,100	4- 5	2000	13.38	4,000
3-20	0600	11.27	1,000	4-27	0300	12.92	2,900

* Discharge measurement or observation of no flow made on this day.
Note.--Backwater Mar. 2-4, 10, 15-16, 20-21, Apr. 6-7, 14, 27-28.

8-395. Angelina River at Horger, Tex.

Location.--Lat 31°02'08", long 94°07'48", on right bank 0.4 mile downstream from Jordans Creek, 4 miles northeast of the abandoned town of Horger, Jasper County, and 7.6 miles downstream from McGee Bend Dam.

Drainage area.--3,486 sq mi (prior to July 13, 1962, 3,510 sq mi).

Records available.--March 1928 to April 1951, February 1958 to September 1964 (medium and high-water records only).

Gage.--Water-stage recorder. Datum of gage is 68.54 ft above mean sea level, datum of 1929, supplementary adjustment of 1954. Prior to Oct. 17, 1963, staff gage at same site and datum. Apr. 17, 1951, to July 13, 1962, water-stage recorder and prior to Apr. 17, 1951, wire-weight gage 4.8 miles downstream at same datum. Water-stage recorder for Dam B Reservoir (station 8-400) used as auxiliary gage for this station Apr. 17, 1951, to July 13, 1962.

Average discharge.--22 years (1928-50), 3,280 cfs (2,375,000 acre-ft per year).

Extremes.--Maximum discharge during year, 12,000 cfs Apr. 28; maximum gage height, 23.22 ft Apr. 28; minimum discharge not determined because of insufficient fall to auxiliary gage; minimum gage height not determined.
1928-51, 1958-64: Maximum discharge, 49,900 cfs May 6, 1944 (gage height, 36.90 ft); minimum observed, 13 cfs Sept. 22, 1937.
Maximum stage since 1885, 39.5 ft (at site 4.8 miles downstream) in August 1915 (discharge, 82,000 cfs, from rating curve defined by current-meter measurements below 50,000 cfs), from information by local residents. Floods in 1884 and 1885 were probably higher, from information by local residents.

Remarks.--Records good above 3,000 cfs, and fair between 1,000 and 3,000 cfs. Daily discharge computed using fall as a factor. Discharge not computed for days of insufficient fall. No large diversions above station. Recording rain gage located at auxiliary gage.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				-	-	-	1,380	7,720		-		-
2				-	-	3,440	-	8,840		-		-
3				-	-	*6,770	-	8,080		-		-
4				-	-	*7,750	-	7,040		-		-
5				-	(*)	*6,660	-	5,840		-		-
6				-	-	5,930	1,960	4,840		-		-
7				-	1,450	4,680	3,540	3,920		-		-
8				-	-	3,900	4,180	3,060		-		-
9				-	-	*3,170	4,790	2,410		-		-
10				-	-	2,590	5,570	1,840		-		-
11				-	-	*2,340	5,430	1,460		-		-
12				-	-	2,180	4,900	1,390		-		(a)
13				-	-	1,980	4,840	-		-		(a)
14				-	-	1,860	4,560	-		-		(a)
15				-	-	1,620	4,460	-		-		(a)
16				-	-	1,480	*3,610	-		-		(a)
17				1,400	-	1,510	3,680	-		-		(a)
18				1,690	-	1,500	4,540	-		-		(a)
19				1,920	-	1,650	3,320	-		-		(a)
20				1,680	-	2,460	3,030	-		-		(a)
21				1,620	-	3,190	2,630	-		-		(a)
22				1,570	-	3,080	2,340	-		-		(a)
23				1,540	-	2,960	1,980	-		-		(a)
24				1,400	-	3,120	1,670	-		-		(a)
25				1,820	-	3,150	1,580	-		(a)		-
26				1,350	-	2,880	4,950	-		(a)		-
27				-	-	2,440	9,240	-		(a)		-
28				-	-	2,180	*11,800	-		(a)		-
29				-	-	1,820	*10,800	-		(a)		-
30				-	----------	1,780	*9,070	-		-		-
31		----------		-	----------	1,460	----------	-	----------	-		----------

Calendar year 1963: Max 5,060
Water year 1963-64: Max 11,800

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

8-400. Dam B Reservoir at Town Bluff, Tex.

Location.--Lat 30°47'43", long 94°10'48", near right bank 70 ft upstream from outlet structure of Dam B on Neches River and about 0.4 mile north of Town Bluff, Tyler County.
Drainage area.--7,573 sq mi.
Records available.--April 1951 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, Galveston-Houston supplementary adjustment. Prior to Oct. 25, 1954, at site 490 ft upstream at same datum.
Extremes.--Maximum contents during year, 102,200 acre-ft Apr. 27 (elevation, 83.56 ft); minimum, 20,720 acre-ft Sept. 16 (elevation, 74.69 ft).
1951-64: Maximum contents, 128,400 acre-ft May 22, 1953 (elevation, 85.21 ft); no storage Sept. 18 to Oct. 13, 1954.
Remarks.--Reservoir is formed by earth-fill dam with a concrete section. Total length of dam, 6,698 ft including concrete spillway and non-overflow section. There is a 6,100-foot uncontrolled emergency spillway on left bank with crest at elevation 85.0 ft. There is also a 326-foot gated spillway with six 40- by 35-foot tainter gates with sill at elevation 50.0 ft. Capacity of service spillway, 80,000 cfs with pool level at 85.0 ft. Total spillway capacity, 218,300 cfs at elevation 93.0 ft, maximum design level. Dam completed in June 1951 and deliberate impoundment of water began Apr. 16, 1951. Water used for industrial and municipal and irrigation supplies. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Uncontrolled spillway and top of tainter gates	85.0	124,700
Invert of sluice intake	52.0	20
Sill, 6 tainter gates	50.0	0

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey. Capacity curve based on survey made in 1945.

Capacity table (elevation, in feet, and contents, in acre-feet)

74.0	17,510	79.0	50,090
75.0	22,300	80.0	59,320
76.0	27,960	82.0	81,280
77.0	34,460	84.0	108,700
78.0	41,830		

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	56,730	37,020	56,730	77,780	90,340	93,160	93,560	94,250	94,250	72,910	37,520	28,890
2	55,500	37,160	58,840	76,240	89,930	98,140	92,340	94,390	95,350	73,590	37,600	28,150
3	54,300	37,090	59,720	75,300	89,680	95,350	92,610	93,840	96,320	73,700	37,600	27,300
4	53,020	36,730	60,500	74,160	90,740	93,560	92,610	90,070	97,440	73,820	37,600	26,650
5	51,760	37,450	60,900	73,250	94,520	91,670	97,020	91,130	97,860	73,820	37,380	26,120
6	50,440	37,450	61,200	73,130	95,480	90,600	98,420	91,000	96,320	72,790	36,370	25,950
7	48,880	37,600	61,600	73,230	94,250	86,810	98,000	89,150	94,390	70,560	35,020	26,010
8	48,110	38,040	61,900	72,790	93,700	87,060	93,290	85,520	93,430	68,260	33,440	26,010
9	47,350	39,600	61,800	72,680	93,560	91,540	95,620	87,190	93,840	66,020	32,020	26,060
10	46,510	40,140	61,500	71,890	93,430	94,520	97,020	90,600	93,980	63,320	30,400	26,010
11	45,430	40,440	62,710	72,120	93,290	94,520	96,740	93,980	93,700	60,310	28,700	25,430
12	44,210	40,670	63,120	71,670	92,480	92,210	94,940	96,040	92,880	58,650	27,780	24,300
13	43,090	40,820	65,340	71,220	92,480	89,810	95,620	95,760	92,340	56,440	27,660	23,050
14	41,910	40,820	70,000	70,340	92,210	91,130	93,020	95,070	92,210	54,390	27,720	22,300
15	40,900	40,820	72,230	70,340	91,940	91,670	92,610	94,520	91,940	52,750	27,660	21,320
16	39,830	40,820	73,360	73,820	91,000	92,210	93,160	94,110	91,270	51,590	28,030	20,770
17	38,700	40,900	73,700	79,090	90,740	92,610	93,700	93,430	90,740	50,790	27,960	21,320
18	37,600	41,050	73,820	84,380	90,740	93,020	96,600	92,750	90,200	49,740	27,840	21,780
19	36,580	41,130	73,480	89,680	91,000	96,880	97,300	92,610	89,540	48,880	27,480	22,460
20	36,220	41,440	76,010	92,880	91,270	96,600	96,740	92,610	87,840	48,110	26,940	22,830
21	36,300	41,600	77,300	93,840	92,610	93,980	93,980	92,340	86,040	47,100	25,890	23,210
22	36,300	45,270	78,850	93,560	93,290	91,940	93,840	92,070	84,260	45,760	26,180	23,530
23	36,300	47,180	79,450	92,880	93,430	92,210	94,940	91,800	82,140	44,460	27,240	24,030
24	36,370	48,960	80,060	93,290	95,620	92,340	95,620	91,540	79,820	42,690	27,660	24,750
25	36,370	50,090	80,660	91,940	96,040	92,750	96,180	91,270	78,020	41,050	28,150	25,200
26	36,370	50,970	81,400	91,940	95,070	91,000	99,560	90,870	76,720	39,150	28,580	25,490
27	36,440	51,760	81,770	91,670	92,750	92,340	100,100	90,470	75,430	37,740	28,890	26,300
28	36,440	53,930	81,890	90,740	91,130	96,180	94,660	90,340	74,850	36,800	29,320	26,880
29	36,440	54,850	81,890	89,930	91,270	97,860	90,340	90,340	74,040	36,440	29,760	27,420
30	36,440	55,880	80,910	90,340	----------	97,300	91,000	92,210	72,910	36,730	30,140	28,030
31	36,440	----------	79,210	90,870	----------	95,480	----------	94,110	----------	37,230	29,570	----------
(†)	77.28	79.64	81.83	82.75	82.78	83.09	82.76	82.99	81.29	77.39	76.26	76.01
(‡)	-21,340	+19,440	+23,330	+11,660	+400	+4,210	-4,480	+3,110	-21,200	-35,680	-7,660	-1,540

Calendar year 1963..... ‡ -7,210
Water year 1963-64..... ‡ -29,750

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-405. Neches River at Town Bluff, Tex.

Location.--Lat 30°47'36", long 94°10'28", on left bank 2,000 ft downstream from Dam B, half a mile northeast of Town Bluff, Tyler County, 2.5 miles upstream from Walnut Run, and 8 miles downstream from Wolf Creek.

Drainage area.--7,573 sq mi.

Records available.--March 1951 to September 1964.

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, Galveston-Houston supplementary adjustment. Prior to May 21, 1953, water-stage recorder and May 21, 1953, to Dec. 3, 1954, staff gage, at present site and datum.

Average discharge.--13 years, 4,406 cfs (3,190,000 acre-ft per year).

Extremes.--Maximum discharge during year, 23,900 cfs Apr. 29 (elevation, 71.77 ft); minimum daily, 29 cfs Sept. 21-24.

1951-64: Maximum discharge, 90,900 cfs May 21, 22, 1953 (elevation, 82.85 ft); no flow at times due to regulation by Dam B.

Flood of May 1884 (stage about 86.8 ft, discharge, about 120,000 cfs) is the highest since at least that date, from information by Corps of Engineers.

Remarks.--Records good except those for periods of backwater, which are poor. Flow largely regulated by Dam B Reservoir (see preceding page) except during major floods. Some diversions above station.

Rating table, except periods of backwater (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 1-10, 18-20, Dec. 24 to Jan. 5, Jan. 8-15, 20-23, Apr. 27-30, July 30 to Aug. 5)

47.2	24	56.0	4,150
47.6	72	60.0	7,500
48.0	130	65.0	12,800
49.0	325	70.0	19,200
50.0	640	72.6	23,900
52.0	1,540		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	740	116	234	1,440	1,340	1,000	3,310	16,700	1,290	596	90	427
2	820	130	226	*1,490	1,340	7,850	2,750	18,900	1,120	254	90	*390
3	760	260	*300	1,390	1,340	15,800	2,250	20,300	1,160	236	117	450
4	800	481	*350	1,290	1,340	*15,700	1,590	18,900	1,340	232	156	420
5	800	900	338	1,240	1,340	15,200	2,130	16,300	1,770	230	265	325
6	800	700	338	1,200	*2,090	12,600	3,940	12,900	2,680	566	491	246
7	760	325	325	1,200	2,960	11,200	6,640	12,200	3,170	1,170	700	143
8	582	312	325	1,160	2,750	8,450	9,700	10,200	2,490	1,340	800	125
9	495	280	362	1,090	2,010	4,430	7,410	6,120	1,770	1,220	800	124
10	495	260	435	1,090	2,010	3,590	7,140	2,750	1,440	1,390	760	130
11	591	240	440	1,060	1,950	4,290	7,900	1,540	1,440	1,540	820	298
12	680	214	440	1,060	2,010	*5,060	8,400	1,830	1,440	1,340	571	465
13	680	166	650	1,090	1,950	4,740	8,700	2,070	1,210	1,120	237	512
14	680	156	850	1,060	1,950	4,010	9,200	2,070	980	1,120	132	380
15	680	187	850	1,060	1,950	3,170	8,100	1,890	980	981	125	401
16	680	226	850	1,100	2,010	3,100	* 5,700	1,710	900	804	125	385
17	680	220	850	1,100	1,830	3,100	4,500	1,650	*820	530	156	*104
18	680	216	840	1,100	1,590	3,100	3,870	1,540	820	512	216	64
19	680	214	840	1,100	1,440	3,660	4,430	1,240	840	512	281	31
20	408	214	860	1,290	1,240	6,420	5,220	1,040	1,310	512	362	30
21	216	210	850	2,070	900	8,500	6,240	*1,120	1,390	593	480	*29
22	208	200	850	2,820	1,050	8,300	4,660	1,160	1,340	720	387	29
23	*206	200	850	2,820	1,340	6,600	2,960	1,160	1,540	740	151	29
24	206	200	840	3,170	1,340	6,240	2,370	1,160	1,650	860	160	29
25	204	200	840	3,590	2,800	5,540	2,680	1,000	1,440	960	138	71
26	200	200	880	2,310	3,800	5,540	5,950	900	1,140	960	122	108
27	200	200	900	2,190	3,800	4,540	13,800	920	1,090	860	119	103
28	188	200	900	2,070	3,170	2,430	21,000	800	920	644	107	103
29	138	200	880	1,770	2,160	2,550	* 23,200	660	840	514	82	79
30	140	220	1,120	1,540	----------	3,240	* 19,300	620	720	279	82	44
31	138	----------	1,440	1,340	----------	3,450	----------	852	----------	*100	276	----------
Total	15,535	7,847	21,053	49,300	56,800	193,400	215,040	162,202	41,040	23,435	9,398	6,074
Mean	501	262	679	1,590	1,959	6,239	7,168	5,232	1,368	756	303	202
Ac-ft	30,810	15,560	41,760	97,790	112,700	383,600	426,500	321,700	81,400	46,480	18,640	12,050

Calendar year 1963: Max 12,400 Min 96 Mean 1,596 Ac-ft 1,155,000
Water year 1963-64: Max 23,200 Min 29 Mean 2,189 Ac-ft 1,589,000

* Discharge measurement made on this day.

Note.--Backwater from Walnut Run Nov. 5-6, 9-11, 21-30, Dec. 11-17, 21-23, Jan. 6-7, 16-19, Feb. 5; Discharge computed from once-daily staff-gage readings Oct. 29 to Nov. 2, May 7-11, July 31 to Aug. 3, Aug. 5-10, 14-17, 19-22, 25-30, Sept. 7-30.

8-410. Neches River at Evadale, Tex.

Location (revised).--Lat 30°21'22", long 94°05'36", near center of channel on downstream side of pier of bridge on U. S. Highway 96 at Evadale, Jasper County, 0.8 mile upstream from Mill Creek and 16 miles upstream from Village Creek. Prior to Nov. 9, 1963, at site 1.2 miles downstream.

Drainage area (revised).--7,951 sq mi.

Records available.--July 1904 to December 1906, April 1921 to September 1964. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 8.25 ft above mean sea level, datum of 1929, Galveston-Houston supplementary adjustment of 1936. July 1, 1904, to Dec. 31, 1906, reference point on Gulf, Colorado and Santa Fe Railway Co. bridge at site 1.2 miles downstream at datum 5.5 ft lower; Apr. 1, 1921, to Dec. 7, 1948, staff gages at site 1.2 miles downstream at present datum; Dec. 8, 1948, to Nov. 8, 1963, water-stage recorder at site 1.2 miles downstream at present datum.

Average discharge.--45 years, 6,308 cfs (4,567,000 acre-ft per year).

Extremes.--Maximum discharge during year, 21,300 cfs May 2 (gage height, 17.21 ft); minimum, 164 cfs Nov. 4. 1904-6, 1921-64: Maximum discharge, 92,100 cfs May 11, 1944 (gage height, 23.58 ft, from floodmark, at site then in use); minimum daily, 63 cfs Nov. 26-28, 1956.

Flood in May 1884 (stage, 26.2 ft at former site, discharge, about 125,000 cfs) and flood in August 1915 (stage, 24.5 ft at former site, discharge, about 102,000 cfs) are the highest since at least 1884. Stages by Gulf, Colorado and Santa Fe Railway Co.

Remarks.--Records good. Some regulation by Dam B Reservoir 58 miles upstream (station 8-400). Some diversions upstream for municipal use.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	374	202	680	1,660	1,900	3,420	3,660	*19,300	1,140	988	445	198
2	479	196	660	1,840	1,840	3,490	3,820	21,300	1,380	*920	348	330
3	743	191	620	1,840	1,720	5,860	3,420	20,800	1,350	740	300	480
4	812	*170	*585	1,900	1,720	*9,380	3,030	*20,300	1,270	602	264	498
5	830	451	640	1,780	1,900	13,400	2,340	20,300	1,270	550	249	532
6	848	658	680	1,780	2,340	16,800	2,340	20,300	1,490	498	*279	550
7	848	1,090	640	1,900	2,820	16,800	3,500	19,300	2,080	480	345	480
8	848	884	640	2,080	3,340	15,400	4,880	16,300	2,750	852	515	410
9	794	743	602	*2,140	3,500	13,400	6,680	14,200	2,890	1,300	660	*312
10	658	602	602	2,020	2,890	10,100	7,980	11,700	2,340	1,300	720	255
11	574	602	640	1,840	2,470	6,870	7,820	7,900	1,840	1,320	720	228
12	558	550	720	1,780	2,340	5,350	7,660	4,860	1,660	1,490	720	220
13	641	462	988	1,720	*2,280	5,250	8,140	2,820	1,600	1,490	740	336
14	709	392	1,680	1,720	2,210	5,450	8,480	2,400	1,540	1,240	568	480
15	726	339	3,100	1,660	2,210	5,150	8,840	2,280	1,320	1,110	428	550
16	726	306	3,260	1,780	2,280	4,380	9,020	2,140	1,240	1,080	330	498
17	726	297	2,470	2,280	2,340	3,900	8,300	1,840	1,190	942	318	550
18	726	315	1,840	2,960	2,210	3,660	6,800	1,720	1,080	808	309	480
19	726	315	1,540	2,960	2,020	*4,060	5,350	1,660	1,040	700	303	327
20	726	312	1,440	2,470	1,840	4,790	4,970	1,490	1,010	660	333	252
21	692	324	1,540	2,080	1,600	5,760	5,150	1,220	1,160	640	382	215
22	494	873	1,900	2,340	1,380	7,220	5,760	1,160	1,440	640	445	202
23	346	2,140	1,960	3,030	1,240	8,300	5,870	1,220	1,490	720	602	198
24	315	3,030	1,720	3,420	1,440	8,300	4,790	1,240	1,490	785	532	195
25	290	2,110	1,490	3,740	1,840	7,660	3,740	1,240	1,720	830	382	192
26	282	1,140	1,380	4,300	2,800	6,940	3,820	*1,190	1,660	898	345	190
27	272	785	1,320	3,980	3,980	6,440	5,450	1,060	1,440	920	318	190
28	*265	720	1,320	3,260	4,380	5,870	7,500	988	1,320	942	294	198
29	258	700	1,320	2,750	4,140	4,540	10,400	965	1,190	830	279	249
30	251	700	1,270	2,400	----------	3,500	14,600	898	1,110	700	249	246
31	221	----------	1,320	2,140	----------	3,420	----------	988	----------	585	222	----------
Total	17,758	21,599	40,567	73,550	68,970	224,860	184,110	225,079	45,500	27,560	12,944	10,041
Mean	573	720	1,309	2,373	2,378	7,254	6,137	7,261	1,517	889	418	335
Ac-ft	35,220	42,840	80,460	145,900	136,800	446,000	365,200	446,400	90,250	54,660	25,670	19,920

Calendar year 1963: Max 14,200 Min 170 Mean 2,026 Ac-ft 1,467,000
Water year 1963-64: Max 21,300 Min 170 Mean 2,603 Ac-ft 1,889,000

* Discharge measurement made on this day.

8-415. Village Creek near Kountze, Tex.

Location.--Lat 30°23'43", long 94°15'45", on left bank 2,000 ft downstream from bridge on Farm Road 418, 1.2 miles upstream from Gulf, Colorado and Santa Fe Railway Co. bridge, 2.7 miles upstream from Cypress Creek, 3.2 miles northeast of Kountze, Hardin County, and 4½ miles downstream from Beech Creek.

Drainage area.--861 sq mi.

Records available.--May 1924 to November 1929 (October 1927 to November 1929, discharge measurements only), April 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 25.12 ft above mean sea level, datum of 1929. Prior to Apr. 30, 1939, inverted chain gage at site 1.2 miles downstream at different datum.

Average discharge.--28 years (1924-27, 1939-64), 823 cfs (595,800 acre-ft per year).

Extremes.--Maximum discharge during year, 4,250 cfs Mar. 7 (gage height, 14.67 ft); minimum daily, 42 cfs July 23.

1924-27, 1939-64: Maximum discharge, 67,200 cfs Nov. 26, 1940 (gage height, 27.6 ft, from floodmark), from rating curve defined by current-meter measurements below 32,000 cfs and extended above by logarithmic plotting; minimum not determined, probably occurred during period of no gage-height record Sept. 16 to Oct. 3, 1956; minimum daily, 16 cfs Oct. 1, 2, 1956.

Maximum stage known since at least 1884, about 34 ft in August 1915, present site and datum. Flood of May 27, 1929, reached a stage of about 32 ft, present site and datum. Above stages were determined on basis of information by engineers of Gulf, Colorado and Santa Fe Railway Co. for site 1.2 miles downstream.

Remarks.--Records good except those for period of no gage-height record, which are poor. No diversion above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	116	69	421	370	766	1,360	451	1,020	992	70	108	78
2	112	66	378	360	788	2,040	421	876	944	82	93	74
3	104	64	*336	340	727	*3,510	406	992	854	*80	81	69
4	99	64	310	330	655	4,020	392	1,180	566	75	74	64
5	95	277	304	320	1,010	4,020	392	1,330	316	74	69	61
6	92	549	285	320	1,570	3,800	920	1,140	231	74	*67	59
7	89	255	255	450	1,790	4,130	1,670	727	189	71	65	58
8	86	220	231	*650	1,760	3,250	1,990	483	164	66	63	68
9	84	364	214	619	1,510	2,240	1,950	378	149	62	57	*74
10	81	515	199	637	1,040	1,510	1,420	336	139	59	53	65
11	80	378	194	601	727	1,180	944	320	130	56	51	59
12	77	336	225	549	*601	1,040	655	300	120	54	52	57
13	76	273	685	499	532	944	566	280	112	53	52	55
14	74	209	1,360	451	515	854	637	260	108	52	51	53
15	72	174	1,900	421	515	766	655	250	108	50	50	50
16	71	154	2,000	500	619	709	727	245	108	50	51	50
17	69	134	1,800	1,160	673	673	619	240	104	52	80	54
18	68	125	1,450	1,600	655	619	483	225	108	49	77	55
19	66	120	968	1,700	601	*952	436	210	125	52	108	61
20	66	116	655	1,700	549	1,790	467	200	149	51	164	86
21	65	116	898	1,510	499	2,150	467	200	116	44	149	97
22	64	130	1,260	1,140	483	2,110	392	195	104	43	116	104
23	64	272	1,310	832	532	1,950	350	195	94	42	134	97
24	63	406	1,180	691	532	1,570	316	190	86	44	159	85
25	62	451	898	1,020	918	1,260	297	*190	82	47	159	76
26	62	406	673	1,360	1,570	992	484	189	78	58	134	70
27	64	336	549	1,600	1,790	766	1,180	194	75	55	112	65
28	*75	291	483	1,420	1,910	673	1,630	189	70	53	104	69
29	76	350	420	1,020	1,760	619	*1,670	164	69	78	95	77
30	74	392	400	709	----------	549	1,480	209	67	92	90	82
31	71	---------	380	673	----------	499	----------	572	----------	97	83	----------
Total	2,417	7,612	22,621	25,552	27,597	52,545	24,467	13,479	6,557	1,885	2,801	2,072
Mean	78.0	254	730	824	952	1,695	816	435	219	60.8	90.4	69.1
Cfsm	0.091	0.295	0.848	0.957	1.11	1.97	0.947	0.505	0.254	0.071	0.105	0.080
In.	0.10	0.33	0.98	1.10	1.19	2.27	1.06	0.58	0.28	0.08	0.12	0.09
Ac-ft	4,790	15,100	44,870	50,680	54,740	104,200	48,530	26,740	13,010	3,740	5,560	4,110

Calendar year 1963: Max 4,250 Min 52 Mean 352 Cfsm 0.409 In. 5.55 Ac-ft 254,600
Water year 1963-64: Max 4,130 Min 42 Mean 518 Cfsm 0.602 In. 8.18 Ac-ft 376,100

* Discharge measurement made on this day.
Note.--No gage-height record Dec. 15-17, Dec. 29 to Jan. 8, May 11-25.

8-420. Taylor Bayou near LaBelle, Tex.

Location.--Lat 29°52'30", long 94°09'34", near center of stream at downstream side of bridge on county road, 0.7 mile south of LaBelle, Jefferson County, 6.0 miles upstream (along rectified channel) from mouth of Hillebrandt Bayou, 7.2 miles upstream (along rectified channel) from State Highway 73, 8.3 miles upstream (along rectified channel) from Vaughan's Fish Camp, and 11.2 miles upstream (along rectified channel) from salt water gates and barge locks.

Drainage area.--262 sq mi.

Records available.--April 1954 to September 1964 (all discharges above 1,000 cfs and complete records for storms of 1-inch or more runoff, except for the period Sept. 10-22, 1961).

Gage.--Water-stage recorder. Datum of gage is 4.63 ft below mean sea level, datum of 1929, adjustment of 1957 (determined by several comparisons of water surface with auxiliary gage 7.2 miles downstream during times of no flow and ideal weather conditions). Auxiliary water-stage recorder 7.2 miles downstream and auxiliary staff gages 8.3 and 11.2 miles downstream.

Extremes.--Maximum discharge during year, 3,270 cfs Nov. 9 (gage height, 7.49 ft); minimum discharge not determined (affected by tides and pumping); minimum gage height recorded, 3.60 ft, Jan. 14.

1954-64: Maximum discharge, 9,590 cfs Sept. 22, 1963; maximum gage height, 11.78 ft Sept. 20, 1963 (backwater from Hillebrandt Bayou); minimum discharge not determined (affected by tides and pumping); minimum gage height, 2.31 ft July 17, 1954.

Flood in 1941 reached a stage of 11.3 ft, from information by Corps of Engineers. Flood in 1946 reached a stage of 10.4 ft, from county bridge plans; information by local residents gives a stage of 12.6 ft. Flood of Sept. 13, 1961 (Hurricane Carla) reached a stage of 11.51 ft.

Remarks.--Records fair above 1,000 cfs and poor below. Discharge above 1,000 cfs computed from daily mean gage heights, using fall as a factor. Discharge below 1,000 cfs not computed because of insufficient fall. For storms producing 1 inch or more of runoff, discharge below 1,000 cfs estimated. Low flow regulated by drainage from rice fields and operation of salt water gates and barge locks. An unknown amount of water is diverted above and below gage for rice irrigation.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Nov. 8	200	Dec. 14	a1,000	Feb. 5	1,880	Feb. 26	2,020	June 1	1,000
9	2,930	15	a200	6	2,160	27	700	2	500
10	2,590	Jan. 16	200	7	1,000	Mar. 2	1,370	Sept. 17	900
11	1,120	17	1,100	8	200	3	2,390	18	1,940
12	100	18	800	24	200	4	1,030	19	1,020
Dec. 13	a500	19	200	25	2,130	5	200	20	200

Calendar year 1963..... Max 9,390
Water year 1963-64..... Max 2,930

a No gage-height record.

8-425. Hillebrandt Bayou near Lovell Lake, Tex.

Location.--Lat 29°55'44", long 94°06'35", near center of stream at downstream side of bridge on county road, 1.3 miles southeast of Lovell Lake, Jefferson County, and 4.4 miles upstream (along rectified channel) from Taylor Bayou.

Drainage area.--128 sq mi.

Records available.--April 1954 to September 1964 (all discharges above 1,000 cfs and complete records for storms of 1-inch or more runoff, except for the period Sept. 11-18, 1961).

Gage.--Water-stage recorder. Datum of gage is 4.63 ft below mean sea level, datum of 1929, Houston supplementary adjustment of 1957 (determined by comparisons of water surface with Taylor Bayou near LaBelle, auxiliary gage, 5.6 miles downstream, during times of no flow and ideal weather conditions). Since June 24, 1954, wire-weight gage and since Aug. 28, 1963, auxiliary water-stage recorder, at Farm Road 365 bridge 3.0 miles downstream. Prior to Aug. 28, 1963, auxiliary water-stage recorder on Taylor Bayou 1.2 miles downstream from Hillebrandt Bayou, auxiliary staff gages on Taylor Bayou 2.3 and 5.2 miles downstream from Hillebrandt Bayou.

Extremes.--Maximum discharge during year, 2,000 cfs Nov. 9; maximum gage height, 7.20 ft Nov. 9; minimum discharge not determined (affected by tides and pumping); minimum gage height, 3.48 ft Dec. 23.

1954-64: Maximum discharge, 15,000 cfs Sept. 18, 1963; maximum gage height, 12.34 ft Sept. 19, 1963; minimum discharge not determined (affected by tides and pumping); minimum gage height, 2.33 ft July 17, 1954.

Maximum stage since 1941, 12.34 ft Sept. 19, 1963. A stage of 11.56 ft occurred Sept. 13, 1961 (backwater caused by Hurricane Carla).

Remarks.--Records poor. Discharges not determined for storms producing less than 1 inch of runoff. Low flow regulated by drainage from rice fields and operation of salt water gates and barge locks. An unknown amount of water is diverted above and below gage for rice irrigation and industry.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Nov. 8..... e100
9..... e1,200
10..... e400

Calendar year 1963..... Max 13,900
Water year 1963-64..... Max 1,200

e Stage-discharge relationship indefinite.

8-427. North Creek near Jacksboro, Tex.

Location.--Lat 33°16'55", long 98°17'55", on left bank at downstream side of bridge on U. S. Highway 281, 1.5 miles upstream from Henderson Creek, 9.3 miles northwest of Jacksboro, Jack County, and 14 miles upstream from mouth.

Drainage area.--21.6 sq mi.

Records available.--August 1956 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,016.33 ft above mean sea level, unadjusted (State Highway Department bench mark).

Average discharge.--8 years, 7.25 cfs (5,250 acre-ft per year).

Extremes.--Maximum discharge during year, 1,360 cfs May 29 (gage height, 13.60 ft); no flow most of time.
1956-64: Maximum discharge, 6,990 cfs Apr. 28, 1957 (gage height, 24.45 ft); no flow at times each year.
Flood of May 3, 1956, reached a stage of 21.58 ft, from floodmarks.

Remarks.--Records fair. No diversion above station. Five rain gages (2 standard and 3 recording, one at station) are operating in the basin above this station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 29-30, Aug. 17, Sept. 16)

4.7	0	5.4	9.0
4.8	.1	5.6	16
4.9	.5	6.0	37
5.0	1.4	6.5	78
5.1	2.6	7.0	138
5.2	4.2	8.0	310

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0		0	0.2		0	0	1.6		0	0
2		0		0	.1		0	0	.6		0	0
3		0		*0	.1		0	0	.2		0	0
4		0		0	6.2		0	0	.4		0	0
5		0		0	1.8		0	0	.2		0	0
6		0		0	.2		0	0	0		0	0
7		0		0	.1		0	0	0		0	0
8	(*)	0		0	0		0	*.1	0		0	0
9		0		0	0		0	0	*0		0	0
10		0		0	0		0	0	0		0	0
11		0		0	0		0	0	2.6		0	0
12		0		0	0		0	0	1.4		0	0
13		0		0	0		0	0	.7		0	0
14		0		0	0		*0	*0	0		0	0
15		*0		0	0		0	0	0		0	0
16		0		*0	0	(*)	0	0	0		.3	11
17		0		0	0		0	0	0	(*)	*16	1.4
18		0		0	*0		0	0	0		1.0	0
19		70	(*)	0	0		0	0	0		0	0
20		1.5		0	0		0	0	0		0	0
21		0		0	0		0	0	0		0	0
22		0		0	0		0	0	0		2.2	**1.1
23		0		0	0		0	0	0		0	.6
24		0		0	0		1.4	0	0		0	0
25		0		0	0		5.8	0	0		0	0
26		0		0	0		.6	0	0		.2	0
27		0		0	0		0	0	0		.4	1.9
28		0		0	0		0	0	0		0	.2
29		0		0	0		0	*233	0		0	0
30		0		14	----------		0	*230	0		0	0
31		---------		2.7	----------		----------	6.4	----------		0	----------
Total	0	71.5	0	16.7	8.7	0	7.8	469.5	7.7	0	20.1	16.2
Mean	0	2.38	0	0.54	0.30	0	0.26	15.1	0.26	0	0.65	0.54
Cfsm	0	0.110	0	0.025	0.014	0	0.012	0.699	0.012	0	0.030	0.025
In.	0	0.12	0	0.03	0.01	0	0.01	0.81	0.01	0	0.03	0.03
Ac-ft	0	142	0	33	17	0	15	931	15	0	40	32
(††)	1.38	3.31	1.04	2.49	1.10	1.65	2.16	6.43	1.14	0.41	3.84	3.20

Calendar year 1963: Max 241 Min 0 Mean 1.77 Cfsm 0.082 In. 1.11 Ac-ft 1,280 †† 20.78
Water year 1963-64: Max 233 Min 0 Mean 1.69 Cfsm 0.078 In. 1.05 Ac-ft 1,220 †† 28.16

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
5-29	1515	13.60	1,360

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
†† Weighted mean rainfall, in inches, during month.

8-428. West Fork Trinity River near Jacksboro, Tex.

Location.--Lat 33°17'30", long 98°04'40", on left bank at downstream side of bridge on State Highway 24, 4 miles downstream from North Creek, 7 miles upstream from Carroll Creek, and 7 miles northeast of Jacksboro, Jack County.

Drainage area.--683 sq mi.

Records available.--March 1956 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 869.28 ft above mean sea level (State Highway Department bench mark). Sept. 20, 1960, to May 30, 1961, staff gage at same site and datum.

Average discharge.--8 years, 127 cfs (91,900 acre-ft per year).

Extremes.--Maximum discharge during year, 1,620 cfs May 30 (gage height, 19.58 ft); no flow for many days.
1956-64: Maximum discharge, 35,100 cfs Apr. 27, 1957 (gage height, 32.10 ft, from floodmark); no flow at times in each year.
Maximum stage since at least 1900, that of Apr. 27, 1957. Flood in June 1941 reached a stage of 30 ft, from information by local residents.

Remarks.--Records good. At end of year, flow from 28.5 sq mi above this station was partly controlled by six floodwater-retarding structures with a total combined capacity of 11,200 acre-ft below the flood-spillway crests, of which 9,440 acre-ft is floodwater-retarding capacity and 1,760 acre-ft is sediment-storage capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

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

4.5	0	5.1	7.2	6.0	103
4.6	.2	5.2	12	7.0	211
4.7	.4	5.3	18	9.0	406
4.8	1.0	5.4	25	12.0	750
4.9	2.2	5.5	35	16.0	1,300
5.0	4.1	5.7	59	18.0	1,740

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.2	1.1	0.2	161	0	0.4	15	1,040		0	0.1
2	0	.2	.8	.1	121	0	.3	8.4	976		0	.1
3	0	.1	.7	.1	56	0	.3	4.9	825		0	0
4	0	.1	.5	.1	78	0	.2	3.0	281		0	0
5	0	.1	.4	.1	127	0	.2	2.2	51		0	0
6	0	.1	.3	.1	102	0	.2	1.7	38		0	0
7	0	0	.3	.1	152	0	.1	1.1	34		0	0
8	*0	0	.1	.1	118	0	.1	1.6	31		0	0
9	0	0	.1	0	46	0	.1	209	*29		0	0
10	0	0	.2	0	23	0	.1	247	26		0	0
11	0	0	3.0	0	12	0	.1	177	14		0	0
12	0	0	33	0	5.8	0	.1	69	14		0	0
13	0	0	76	0	3.6	0	0	34	8.0		0	0
14	0	0	50	0	2.2	.8	*0	*20	3.6		0	0
15	0	*0	23	0	1.6	1.2	0	8.0	1.8		0	0
16	0	0	12	*0	1.2	*2.8	0	4.1	1.1		0	1.5
17	0	0	7.2	0	.9	3.2	0	2.0	1.0	(*)	*22	40
18	0	0	4.4	0	*.7	3.4	0	1.6	1.3		202	19
19	0	113	*2.8	0	.5	6.4	0	1.1	.9		121	6.8
20	0	504	1.9	0	.4	17	0	.7	.8		50	2.8
21	0	427	1.4	0	.3	20	0	.4	1.3		20	3.9
22	0	215	1.2	0	.2	12	0	.4	1.0		12	*3.4
23	0	55	1.0	0	.2	9.6	0	.3	.6		7.2	26
24	0	29	.9	0	.2	6.4	0	.2	.4		5.2	141
25	0	14	.8	0	.1	3.8	45	.1	.3		2.3	139
26	0	8.8	.5	0	.1	2.5	537	.1	.2		1.3	54
27	1.3	7.2	.4	0	.1	1.9	654	0	.1		2.2	31
28	1.3	4.9	.3	0	.1	1.2	352	0	.1		.6	52
29	.8	2.8	.2	.3	0	.9	132	132	0		.5	38
30	.4	1.8	.2	100	----------	.6	34	*1,310	0		.5	44
31	.3	----------	.2	286	----------	.5	----------	1,390	----------		.3	----------
Total	4.1	1,383.3	225.1	387.2	1,014.2	94.2	1,756.2	3,644.9	3,381.5	0	447.1	602.6
Mean	0.13	46.1	7.26	12.5	35.0	3.04	58.5	118	113	0	14.4	20.1
Ac-ft	8.1	2,740	446	768	2,010	187	3,480	7,230	6,710	0	887	1,200

Calendar year 1963: Max 856 Min 0 Mean 16.0 Ac-ft 11,610
Water year 1963-64: Max 1,390 Min 0 Mean 35.4 Ac-ft 25,670

Peak discharge (base, 2,500 cfs).--No peak above base.
* Discharge measurement or observation of no flow made on this day.

8-430. Bridgeport Reservoir above Bridgeport, Tex.

Location.--Lat 33°13'22", long 97°49'54", at left end of Bridgeport Dam on West Fork Trinity River, 4.6 miles west of Bridgeport, Wise County, and 13 miles upstream from Big Sandy Creek.
Drainage area.--1,111 sq mi.
Records available.--April 1932 to September 1964 (prior to October 1950, monthly figures only).
Gage.--Staff gage read once daily. Datum of gage is 0.06 ft above mean sea level, datum of 1929. Prior to Jan. 26, 1944, staff gages at various sites in vicinity of present gage at present datum.
Extremes.--Maximum contents observed during year, 246,600 acre-ft June 5-7, 17-18 (gage height, 823.7 ft); minimum observed, 192,600 acre-ft Sept. 14-16 (gage height, 817.8 ft).
1932-64: Maximum contents observed, 407,600 acre-ft Apr. 29, 30, 1942 (gage height, 836.2 ft); minimum since reservoir first filled in 1941, 7,170 acre-ft Oct. 12-16, 1956.
Remarks.--Reservoir is formed by a rolled-fill earthen dam containing a concrete spillway with three 20-foot bays, two of which are equipped with vertical lift gates and the other left open. There are two emergency spillways of natural ground. Dam completed Dec. 15, 1931; storage began Apr. 1, 1932. Reservoir used for flood control and municipal supply for city of Fort Worth. At end of year, flow from 38.0 sq mi above this station was partly controlled by 10 floodwater-retarding structures with a total combined capacity of 13,650 acre-ft below the flood spillway crests, of which 11,380 acre-ft is floodwater-retarding capacity and 2,270 acre-ft is sediment-pool capacity. These structures were built during the period December 1948 to April 1952. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Figures given herein represent total contents. Data regarding dam and reservoir are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Crest of service spillway	826.1	270,900
Invert of three 48-inch conduits	751.4	0

Cooperation.--Capacity curve based on surveys made in 1952 and 1956 and records of daily gage heights furnished by Tarrant County Water Control and Improvement District No. 1.

Capacity table (gage height, in feet, and contents, in acre-feet)

817	185,900	823	239,800
819	203,000	824	249,600
821	220,900		

Contents, in acre-feet, at 0730 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	240,800	229,300	220,900	214,600	211,800	213,600	212,700	214,600	238,800	240,800	206,500	196,900
2	240,800	228,400	220,900	214,600	211,800	213,600	212,700	214,600	241,700	239,800	206,500	196,900
3	240,800	228,400	220,900	214,600	211,800	212,700	212,700	214,600	243,700	237,900	205,600	196,000
4	239,800	227,400	220,900	213,600	212,700	213,600	212,700	214,600	245,600	236,900	204,700	196,000
5	239,800	226,500	220,900	213,600	213,600	213,600	212,700	214,600	246,600	235,000	204,700	196,000
6	239,800	225,600	220,900	213,600	213,600	212,700	211,800	214,600	246,600	233,100	203,800	196,000
7	238,800	224,600	220,900	212,700	213,600	212,700	211,800	214,600	246,600	232,200	203,000	195,200
8	237,900	223,700	220,900	212,700	213,600	212,700	211,800	214,600	245,600	231,200	203,000	195,200
9	237,900	222,800	220,000	212,700	213,600	213,600	211,000	215,500	245,600	229,300	202,100	194,300
10	236,900	222,800	220,000	211,800	214,600	213,600	210,100	215,500	245,600	228,400	201,200	194,300
11	236,900	221,900	220,900	211,800	214,600	213,600	210,100	216,400	245,600	227,400	200,300	194,300
12	236,900	221,900	220,000	211,800	213,600	213,600	210,100	216,400	245,600	226,500	199,500	193,400
13	236,000	220,900	220,000	211,000	214,600	213,600	209,200	216,400	245,600	224,600	199,500	193,400
14	236,000	220,900	220,000	211,000	214,600	213,600	209,200	216,400	245,600	223,700	198,600	192,600
15	235,000	220,000	220,000	210,100	214,600	213,600	208,300	216,400	245,600	222,800	198,600	192,600
16	235,000	220,000	219,100	210,100	214,600	213,600	208,300	216,400	245,600	221,900	199,500	192,600
17	234,100	219,100	219,100	210,100	213,600	213,600	208,300	216,400	246,600	220,900	199,500	193,600
18	234,100	219,100	219,100	210,100	213,600	213,600	207,400	216,400	246,600	220,000	199,500	193,600
19	233,100	219,100	219,100	210,100	213,600	213,600	207,400	215,500	245,600	219,100	199,500	193,600
20	233,100	220,900	218,200	209,200	213,600	213,600	207,400	215,500	245,600	217,300	199,500	193,600
21	232,200	220,900	218,200	209,200	213,600	213,600	206,500	215,500	245,600	216,400	199,500	199,500
22	232,200	221,900	217,300	209,200	213,600	213,600	206,500	215,500	245,600	215,500	199,500	199,500
23	232,200	221,900	217,300	208,300	213,600	213,600	207,400	215,500	245,600	214,600	199,500	199,500
24	231,200	221,900	217,300	208,300	213,600	213,600	208,300	215,500	244,700	213,600	199,500	199,500
25	230,300	221,900	217,300	208,300	213,600	213,600	210,100	215,500	244,700	212,700	199,500	199,500
26	230,300	221,900	216,400	208,300	213,600	213,600	211,800	214,600	244,700	211,800	198,600	199,500
27	230,300	221,900	216,400	208,300	213,600	213,600	212,700	213,600	244,700	211,000	198,600	201,200
28	230,300	221,900	215,500	208,300	213,600	213,600	213,600	212,700	243,700	210,100	198,600	202,100
29	230,300	221,900	215,500	207,400	213,600	213,600	214,600	211,800	243,700	209,200	197,700	202,100
30	230,300	221,900	215,500	208,300	----------	213,600	214,600	222,800	242,700	208,300	197,700	202,100
31	229,300	----------	214,600	211,000	----------	212,700	----------	233,100	----------	207,400	196,900	----------
(†)	821.9	821.1	820.3	819.9	820.2	820.1	820.3	822.3	823.3	819.5	818.3	818.9
(‡)	-12,400	-7,400	-7,300	-3,600	+2,600	-900	+1,900	+18,500	+9,600	-35,300	-10,500	+5,200

Calendar year 1963..... ‡ -56,300
Water year 1963-64..... ‡ -39,600

† Gage-height, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-440. Big Sandy Creek near Bridgeport, Tex.

Location.--Lat 33°13'54", long 97°41'40", on downstream side of bridge on State Highway 24, 1.9 miles upstream from Greathouse Branch, 4.0 miles east of Bridgeport, Wise County, and 4.4 miles upstream from mouth.
Drainage area.--333 sq mi.
Records available.--October 1936 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 727.44 ft above mean sea level, datum of 1929.
Average discharge.--28 years, 81.3 cfs (58,860 acre-ft per year); median of yearly mean discharge, 54 cfs (39,090 acre-ft per year).
Extremes.--Maximum discharge during year, 840 cfs Apr. 26 (gage height, 7.86 ft); no flow at times.
1936-64: Maximum discharge, 53,000 cfs June 10, 1941 (gage height, 15.69 ft, from floodmark), from rating curve defined by current-meter measurements below 22,000 cfs and extended above by logarithmic plotting; no flow at times.
Maximum stage since at least 1887 occurred in 1908 and 1915 and reached about same stage as that of June 10, 1941.
Remarks.--Records good except those for periods of ice effect, which are fair. Flow from 103 sq mi modified since May 1, 1956, by Amon Carter Reservoir, capacity, 20,050 acre-ft at elevation 920.0 ft (fixed service outlet) and 32,290 acre-ft at elevation 927.0 ft (emergency flood spillway). Records furnished by city of Bowie show that during the year 540 acre-ft of water was diverted from Amon Carter Reservoir for municipal use and 314 acre-ft of sewage effluent was discharged into a tributary above station. At end of year, flow from 10.5 sq mi above this station was partly controlled by five floodwater-retarding structures with a total combined capacity of 3,110 acre-ft below the flood spillway crests, of which 2,580 acre-ft is floodwater-retarding capacity and 525 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

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

Oct. 1 to Jan. 30

1.8	0
1.9	.3
2.0	1.1
2.2	3.6
2.5	8.2
3.0	18
4.0	48

Jan. 31 to Sept. 30

1.6	0	3.0	26
1.7	.2	3.5	42
1.8	.6	4.0	60
1.9	1.6	5.0	111
2.0	2.9	6.0	222
2.2	6.5	7.0	460
2.5	13	8.0	940

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	4.2	4.6	106	8.4	7.6	10	*62		0	0
2		0	4.4	4.7	35	9.0	7.6	10	27		0	0
3		0	4.6	4.7	*21	9.3	8.0	9.7	13		0	0
4		0	4.7	4.6	18	9.7	8.2	9.0	7.6		0	0
5		0	5.3	4.6	26	9.7	8.8	8.2	5.3		0	0
6		0	5.8	4.6	38	9.7	9.5	8.4	4.2		0	0
7		0	6.1	*4.7	25	9.5	9.0	8.6	3.5		0	0
8		0	6.3	4.9	16	9.9	7.6	11	2.9	(*)	0	0
9		0	6.3	4.9	13	14	6.9	11	2.6		0	0
10		0	6.8	4.7	12	23	6.7	12	2.2		0	0
11		0	8.2	4.7	10	16	6.7	28	1.9		*0	0
12		0	11	4.6	9.7	*11	6.9	78	1.7		0	0
13		0	8.7	4.5	9.7	9.3	*6.7	36	1.6		0	0
14		0	6.4	4.5	9.7	8.8	6.5	19	1.3		0	0
15		0	5.0	4.5	9.5	8.2	6.5	*12	1.1		0	*0
16		0	4.3	5.0	9.0	7.6	6.5	8.4	3.0		2.3	40
17		.6	4.4	6.6	8.6	7.6	6.5	5.5	20		55	402
18		.4	4.6	6.0	8.4	7.8	6.7	3.3	13		38	95
19		4.2	4.4	6.3	8.4	11	6.7	2.0	5.9		92	28
20		38	4.6	6.8	8.0	16	6.5	1.4	3.2		42	16
21		37	4.6	6.4	8.2	16	6.7	1.1	1.3		15	21
22		16	4.6	6.1	8.4	12	7.3	1.1	1.0		8.2	300
23		8.2	4.3	6.0	8.4	10	8.4	.9	.9		8.6	247
24	(*)	4.3	4.1	5.8	8.6	9.7	11	.7	.7		4.2	104
25		3.1	3.9	5.3	8.6	9.3	72	.4	.4		2.6	34
26		*3.3	5.0	5.2	8.6	8.8	537	.3	.2		1.7	19
27		3.1	5.5	5.2	8.6	8.4	155	.2	0		1.3	126
28		3.3	4.9	5.2	8.4	8.0	44	.1	0		.9	256
29		4.0	4.7	5.6	8.4	7.6	22	5.5	0		.6	78
30		4.0	4.6	17	---	7.3	14	*345	0		.2	30
31		---	4.6	124	---	7.3	---	*286	---		0	---
Total	0	129.5	166.9	292.3	477.2	319.9	1,023.5	932.8	187.5	0	272.6	1,796
Mean	0	4.32	5.38	9.43	16.5	10.3	34.1	30.1	6.25	0	8.79	59.9
Ac-ft	0	257	331	580	947	635	2,030	1,850	372	0	541	3,560

Calendar year 1963: Max 2,010 Min 0 Mean 27.0 Ac-ft 19,520
Water year 1963-64: Max 537 Min 0 Mean 15.3 Ac-ft 11,100

* Discharge measurement or observation of no flow made on this day.
Note.--Stage-discharge relation affected by ice Dec. 23-24, Jan. 13-16.

8-445. West Fork Trinity River near Boyd, Tex.

Location.--Lat 33°05'08", long 97°33'30", on right bank at downstream side of bridge on Farm Road 730, 0.6 mile northeast of Boyd, Wise County, and 3.5 miles downstream from Boggy Creek.

Drainage area.--1,725 sq mi.

Records available.--January 1947 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 660.57 ft above mean sea level, datum of 1929. Prior to Dec. 14, 1954, at site 2.2 miles downstream at datum 5.48 ft lower.

Average discharge.--17 years, 226 cfs (163,600 acre-ft per year).

Extremes.--Maximum discharge during year, 3,810 cfs May 30 (gage height, 17.55 ft); minimum daily, 0.9 cfs June 29, Sept. 15.
1947-64: Maximum discharge, 27,300 cfs Oct. 5, 1959 (gage height, 22.17 ft); no flow at times.
Maximum stage since at least 1880, 25 ft in May 1908, from information by local residents, who also report a flood of about the same height in the period 1870-80. Flood in April 1942 reached a stage of 20.6 ft, from information by State Highway Department.

Remarks.--Records good. Flow largely regulated by Bridgeport Reservoir since 1932 and Amon Carter Reservoir near Bowie since May 1956; combined capacity, 292,000 acre-ft. Sustained flow during several periods is released from Bridgeport Reservoir, 21 miles upstream. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Big Sandy Creek near Bridgeport (station 8-440).

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.5	168	12	130	138	9.6	8.3	28	876	682	220	39
2	8.3	168	6.8	122	76	10	8.3	23	135	682	215	38
3	8.3	168	5.7	122	*32	10	59	19	59	698	215	38
4	94	168	5.3	122	26	13	126	18	36	698	215	38
5	160	168	4.9	122	28	12	134	16	*31	698	215	38
6	245	168	4.7	*122	34	11	134	16	18	682	215	38
7	290	168	4.7	122	33	11	134	16	15	540	215	38
8	240	168	41	122	24	11	130	18	12	*510	210	38
9	173	168	118	122	19	125	126	30	9.9	510	210	37
10	173	168	122	122	17	98	126	37	8.3	425	210	37
11	104	144	130	122	15	29	126	37	7.5	399	*172	37
12	85	150	82	122	13	*18	126	37	7.2	399	158	24
13	134	150	20	122	14	14	*122	45	6.7	399	158	4.4
14	150	150	13	122	13	12	122	31	6.3	399	158	1.7
15	150	150	58	122	13	10	138	*18	5.6	399	185	*.9
16	150	150	142	126	12	9.6	142	14	5.9	399	215	51
17	150	150	142	122	12	9.2	142	11	46	399	236	881
18	150	150	142	122	12	9.4	142	9.6	44	386	195	398
19	150	155	142	126	11	15	142	8.1	18	386	157	57
20	150	174	142	126	11	17	146	7.0	10	386	112	29
21	150	160	142	104	11	18	146	6.4	7.0	386	62	601
22	193	134	142	97	11	16	388	5.9	5.0	386	51	377
23	200	75	142	94	11	12	1,540	5.5	3.9	373	47	874
24	*215	23	142	94	10	11	290	55	3.3	373	46	312
25	178	13	142	94	10	10	285	107	2.8	373	42	74
26	164	*8.1	142	94	10	9.6	346	223	2.3	373	42	29
27	164	25	142	94	9.8	9.4	666	260	2.1	373	68	152
28	164	67	146	94	9.6	8.7	180	270	1.5	373	59	439
29	164	66	142	97	9.6	8.5	59	591	.9	373	42	235
30	164	52	142	146	----------	8.3	36	*3,000	511	373	40	59
31	164	----------	142	206	----------	8.3	----------	2,800	----------	230	39	----------
Total	4,693.1	3,826.1	2,904.1	3,674	645.0	573.6	6,269.6	7,762.5	1,897.2	14,062	4,424	5,015.0
Mean	151	128	93.7	119	22.2	18.5	209	250	63.2	454	143	167
Ac-ft	9,310	7,590	5,760	7,290	1,280	1,140	12,440	15,400	3,760	27,890	8,770	9,950

Calendar year 1963: Max 3,450 Min 4.7 Mean 119 Ac-ft 85,880
Water year 1963-64: Max 3,000 Min 0.9 Mean 152 Ac-ft 110,600

* Discharge measurement made on this day.

8-450. Eagle Mountain Reservoir above Fort Worth, Tex.

Location.--Lat 32°52'39", long 97°28'29", at right end of main dam on West Fork Trinity River, 3.0 miles downstream from Ash Creek, 4.1 miles downstream from Walnut Creek, and 14.6 miles northwest of Fort Worth, Tarrant County.

Drainage area.--1,970 sq mi.

Records available.--February 1934 to September 1964 (prior to October 1950, monthly figures only).

Gage.--Staff gage read once daily. Datum of gage is mean sea level, datum of 1929. Prior to Feb. 24, 1943, staff gages at several sites within 1 mile of present site at present datum.

Extremes.--Maximum contents observed during year, 176,900 acre-ft June 3, Sept. 30 (elevation, 648.4 ft); minimum observed, 157,400 acre-ft Oct. 1-6, Dec. 11, 16-29 (elevation, 646.0 ft).

1934-64: Maximum contents observed, 333,500 acre-ft Apr. 26, 1942 (elevation, 659.9 ft); minimum since reservoir first filled in 1937, 57,690 acre-ft Nov. 19, 20, 1956.

Remarks.--Reservoir is formed by a composite rolled-fill and hydraulic-fill earthen dam containing a concrete service spillway with four 25-foot bays, three of which are equipped with vertical lift gates, and the other left open. There is an emergency spillway of natural ground. Dam completed Oct. 24, 1932, and storage began Feb. 28, 1934. Dead storage negligible. Reservoir used for flood control and to maintain level of Lake Worth from which the city of Fort Worth derives its municipal supply. Figures given herein represent total contents. For storage above reservoir see Remarks on preceding page. Capacity figures since Oct. 1, 1951, are based on redetermination of reservoir capacity during fall of 1952. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Crest of service spillway	649.1	182,700
Invert of four 48-inch outlet conduits	599.9	0

Cooperation.--Capacity curve and records of daily elevations furnished by Tarrant County Water Control and Improvement District No. 1.

Capacity table (elevation, in feet, and capacity, in acre-feet)

646	157,400
647	165,300
648	173,500
649	181,900

Contents, in acre-feet, at 0800 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	157,400	159,000	159,000	158,200	161,400	159,000	158,200	168,600	173,500	165,300	171,000	169,400
2	157,400	159,000	159,000	158,200	162,100	159,000	158,200	169,400	176,000	166,100	171,000	169,400
3	157,400	158,200	159,000	158,200	162,100	159,000	158,200	168,600	176,900	166,100	170,200	169,400
4	157,400	158,200	159,000	158,200	162,100	159,000	158,200	168,600	176,000	166,900	170,200	168,600
5	157,400	158,200	159,000	158,200	162,900	159,800	159,000	168,600	176,000	167,800	170,200	168,600
6	157,400	158,200	158,200	158,200	162,900	159,000	159,000	167,800	176,000	167,800	170,200	167,800
7	158,200	158,200	158,200	158,200	162,900	159,000	159,000	167,800	175,200	168,600	170,200	167,800
8	158,200	158,200	158,200	158,200	162,900	159,000	159,000	167,800	175,200	168,600	170,200	167,800
9	158,200	158,200	158,200	158,200	162,100	159,800	159,000	168,600	174,300	169,400	169,400	166,900
10	159,000	158,200	158,200	158,200	162,100	160,600	158,200	167,800	173,500	169,400	169,400	166,100
11	159,000	158,200	157,400	158,200	162,100	159,800	158,200	167,800	173,500	169,400	169,400	166,100
12	159,000	158,200	158,200	158,200	161,400	159,800	159,000	167,800	172,700	169,400	169,400	165,300
13	159,000	158,200	158,200	158,200	162,100	159,800	159,000	167,800	172,700	170,200	169,400	165,300
14	159,000	158,200	158,200	158,200	161,400	159,800	159,000	166,900	172,700	170,200	168,600	164,500
15	159,000	158,200	158,200	158,200	161,400	159,800	159,000	166,900	171,900	170,200	169,400	164,500
16	159,000	158,200	157,400	158,200	161,400	159,800	159,000	166,100	171,900	169,400	169,400	164,500
17	159,000	158,200	157,400	158,200	160,600	159,800	159,000	166,100	171,900	170,200	169,400	166,100
18	159,000	158,200	157,400	158,200	160,600	159,000	159,000	166,100	171,900	170,200	170,200	166,900
19	159,000	158,200	157,400	158,200	160,600	160,600	159,000	165,300	171,000	170,200	171,000	167,800
20	158,200	159,000	157,400	158,200	160,600	160,600	159,000	165,300	171,000	169,400	171,000	167,800
21	158,200	159,000	157,400	158,200	160,600	160,600	159,000	164,500	170,200	170,200	171,000	169,400
22	158,200	159,000	157,400	158,200	160,600	159,800	159,800	164,500	170,200	170,200	171,000	171,900
23	158,200	159,800	157,400	159,000	160,600	159,800	163,700	164,500	170,200	170,200	171,000	174,300
24	158,200	159,800	157,400	159,000	159,800	159,800	165,300	163,700	169,400	170,200	171,000	175,200
25	159,000	159,800	157,400	159,000	159,800	159,800	166,900	163,700	169,400	170,200	171,000	175,200
26	159,000	159,800	157,400	159,000	159,800	159,800	166,900	163,700	168,600	170,200	171,000	175,200
27	159,000	159,000	157,400	159,000	159,800	159,800	168,600	162,900	167,800	170,200	171,000	176,000
28	159,000	159,000	157,400	159,000	159,800	159,800	169,400	162,900	166,900	170,200	171,000	176,000
29	159,000	159,000	157,400	159,000	159,000	159,000	169,400	162,900	166,900	170,200	171,000	176,000
30	159,000	159,000	158,200	159,800	----------	159,000	169,400	166,100	166,100	171,000	170,200	176,900
31	159,000	----------	158,200	161,400	----------	159,000	----------	169,400	----------	171,000	170,200	----------
(†)	646.2	646.2	646.1	646.5	646.2	646.2	647.5	647.5	647.1	647.7	647.6	648.4
(‡)	+800	0	-800	+3,200	-2,400	0	+10,400	0	-3,300	+4,900	-800	+6,700

Calendar year 1963..... ‡ -23,700
Water year 1963-64..... ‡ +18,700

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-460. Clear Fork Trinity River near Aledo, Tex.

Location.--Lat 32°38'25", long 97°33'50", on left bank 3 miles downstream from Turkey Creek, 3½ miles upstream from bridge on U. S. Highway 377, 4 miles southeast of Aledo, Parker County, and 11.8 miles upstream from Benbrook Dam.

Drainage area.--251 sq mi.

Records available.--August 1947 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 723.33 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--17 years, 35.7 cfs (25,850 acre-ft per year).

Extremes.--Maximum discharge during year, 571 cfs Sept. 23 (gage height, 5.45 ft); no flow at times.
1947-64: Maximum discharge, 34,000 cfs May 25, 1957 (gage height, 29.00 ft); no flow at times.
Maximum stage since at least 1858, 34 ft in April 1922, from information by local resident.

Remarks.--Records good. Since Dec. 15, 1956, Lake Weatherford has modified runoff from 105 sq mi above station. Reservoir has a capacity of 19,470 acre-ft at elevation 896.0 ft (fixed glory hole outlet) and 35,180 acre-ft at elevation 906.0 ft (emergency flood spillway). At end of year, flow from 79.7 sq mi above this station was partly controlled by 34 floodwater-retarding structures with a total combined capacity of 25,710 acre-ft below flood spillway crests, of which 21,750 acre-ft is floodwater-retarding capacity and 3,959 acre-ft is sediment-storage capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. During year the city of Weatherford reported diversion of 1,360 acre-ft of water from Lake Weatherford for municipal use and returned 1,070 acre-ft as sewage effluent above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 20 to Jan. 29)

2.2	0	2.7	5.6	3.2	50
2.3	.1	2.8	10	3.5	97
2.4	.4	2.9	17	4.0	187
2.5	1.2	3.0	26	4.5	305
2.6	2.8				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.7	1.6	10	4.2	4.2	3.4	11		0	0
2		0	.7	1.6	6.0	5.0	4.2	4.2	4.2		0	0
3		0	.7	1.6	*6.0	4.5	3.9	3.7	2.5		0	0
4		0	.7	1.4	8.7	6.4	3.7	2.8	1.7		*0	0
5		0	* .8	1.4	16	6.4	5.3	2.7	1.9		0	0
6		0	.8	*1.6	7.4	4.5	6.9	3.4	3.4		0	0
7		0	.9	1.6	5.3	4.5	3.7	3.7	1.6		0	0
8		0	.8	1.6	4.7	6.0	2.8	5.0	.6		0	*0
9		0	.7	1.4	4.5	41	3.1	14	.3		0	0
10		0	1.0	1.4	4.5	14	3.4	6.9	.1		0	0
11		0	1.9	1.4	3.9	*8.2	3.7	5.6	0		0	0
12		0	1.4	1.4	3.9	6.9	3.7	3.7	0		0	0
13		0	1.1	1.1	4.7	6.9	3.4	3.9	0		0	0
14		0	1.1	1.1	6.9	7.4	2.8	2.8	0		0	0
15		0	1.1	1.4	4.5	6.0	3.1	3.9	0		8.8	0
16		0	1.1	1.4	3.9	5.6	3.1	3.4	0		13	0
17		0	1.1	1.7	3.9	5.6	3.4	2.8	.1		3.5	0
18		0	1.1	2.8	3.9	6.9	3.4	2.5	.5		3.4	0
19		0	1.1	4.7	3.9	58	3.4	2.0	1.0		.1	0
20		0	1.2	2.7	3.9	14	*3.9	1.7	.1		0	33
21		.1	1.4	1.9	3.9	5.0	5.0	1.9	0		0	151
22		.1	1.4	1.4	3.9	4.5	10	2.0	0		0	167
23		.3	1.2	1.4	4.2	4.2	8.7	1.7	0		0	259
24		.2	1.2	1.2	3.9	4.2	8.7	1.6	0		0	39
25		.2	1.4	1.1	3.9	4.5	4.7	*1.1	0		0	29
26		.3	1.4	1.0	3.9	3.9	8.6	1.0	0		0	20
27		.4	1.4	1.0	3.9	4.2	25	.4	0		0	36
28		.6	1.4	1.0	3.9	4.2	6.4	.4	0		0	48
29	(*)	.7	1.4	1.7	3.9	4.7	3.9	1.8	*0		0	9.2
30		.7	1.4	81	----------	3.9	3.4	119	0		0	3.4
31		----------	1.6	54	----------	3.7	----------	69	----------		0	----------
Total	0	3.6	35.2	181.6	151.9	269.0	159.5	282.0	29.0	0	28.8	794.6
Mean	0	0.12	1.14	5.86	5.24	8.68	5.32	9.10	0.97	0	0.93	26.5
Ac-ft	0	7.1	70	360	301	534	316	559	58	0	57	1,580

Calendar year 1963: Max 718 Min 0 Mean 18.5 Ac-ft 13,430
Water year 1963-64: Max 259 Min 0 Mean 5.29 Ac-ft 3,840

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

8-465. Benbrook Reservoir near Benbrook, Tex.

Location.--Lat 32°39'02", long 97°26'54", in intake structure of Benbrook Dam on Clear Fork Trinity River, 2.5 miles south of Benbrook, Tarrant County, 3.5 miles upstream from Marys Creek, and 15 miles upstream from mouth of Clear Fork.
Drainage area.--429 sq mi.
Records available.--September 1952 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942.
Extremes.--Maximum contents during year, 76,900 acre-ft Oct. 1 (elevation, 690.87 ft); minimum, 64,630 acre-ft Sept. 15 (elevation, 687.18 ft).
1952-64: Maximum contents, 185,000 acre-ft June 6, 1957 (elevation, 713.35 ft); minimum since reservoir first filled in 1957, that of Sept. 15, 1964.
Remarks.--Reservoir is formed by a rolled earth-fill dam 9,130 ft long including a 500-foot uncontrolled off-channel concrete gravity spillway with ogee weir section with a 100-foot notch in center. Outlet works consist of a 13-foot diameter concrete conduit controlled by two 6.5- by 13-foot broome-type gates and two 30-inch steel pipes controlled by slide gates. Deliberate impoundment of water began Sept. 29, 1952. From August 1950 to Sept. 28, 1952, reservoir operated as detention basin only. Figures given herein represent total contents. Capacities are from survey made in 1945. Reservoir built for flood control, navigation, and low-flow regulation. For storage above reservoir see Remarks on preceding page concerning Soil Conservation Service reservoirs and Lake Weatherford. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Crest of spillway	724.0	258,600
Crest of notch in spillway	710.0	164,800
Top of conservation storage	694.0	88,250
Inverts at intakes to wet wells	656.0	6,550
Invert of two 6.5- by 13-foot broome-type gates	622.0	12

Cooperation.--Records of elevation and contents furnished by Corps of Engineers and reviewed by Geological Survey.

Capacity table (elevation, in feet, and capacity, in acre-feet)

687	64,060	690	73,900
688	67,250	691	77,350
689	70,530		

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	76,830	74,240	72,790	71,880	73,060	73,260	75,170	75,800	75,140	72,520	69,450	66,740
2	76,800	74,170	72,750	71,880	73,060	73,290	75,170	75,830	75,140	72,420	69,350	66,710
3	76,760	74,100	72,720	71,840	73,160	73,320	75,100	75,830	75,100	72,150	69,280	66,490
4	76,730	74,070	72,720	71,840	73,360	73,360	75,100	75,830	75,070	72,080	69,250	66,230
5	76,690	74,070	72,720	71,840	73,390	73,220	75,280	75,800	75,070	72,040	69,190	66,170
6	76,620	74,030	72,680	71,840	73,390	73,060	75,310	75,800	75,070	71,940	68,920	66,100
7	76,590	73,960	72,650	71,810	73,390	73,120	75,100	75,800	75,040	71,840	68,530	66,040
8	76,350	74,000	72,580	71,780	73,360	73,360	75,040	76,040	75,000	71,780	68,430	65,980
9	76,110	73,960	72,480	71,780	73,320	73,690	75,040	76,110	74,930	71,540	68,400	65,910
10	76,000	73,930	72,750	71,710	73,360	73,730	75,040	76,380	74,860	71,200	68,330	65,690
11	75,930	73,860	72,750	71,680	73,360	73,730	75,040	76,380	74,660	71,140	68,200	65,400
12	75,860	73,800	72,750	71,610	73,460	73,760	75,100	76,280	74,340	70,870	68,010	65,270
13	75,800	73,730	72,680	71,570	73,460	73,760	75,040	76,210	74,280	70,770	67,740	65,210
14	75,690	73,660	72,620	71,540	73,460	73,760	75,000	76,040	74,170	70,670	67,510	64,920
15	75,590	73,590	72,580	71,710	73,460	73,760	75,000	75,800	74,100	70,600	67,780	64,630
16	75,520	73,560	72,520	71,940	73,460	73,760	74,860	75,760	74,100	70,460	67,580	65,370
17	75,280	73,490	72,480	71,910	73,460	73,760	74,690	75,730	74,070	70,370	67,840	65,340
18	75,070	73,460	72,450	71,910	73,490	74,070	74,690	75,660	74,030	70,300	67,740	65,270
19	74,970	73,660	72,450	71,940	73,460	75,140	74,720	75,620	73,960	70,200	67,710	65,240
20	74,900	73,660	72,420	71,940	73,460	75,140	74,760	75,550	73,900	70,140	67,640	66,260
21	74,830	73,590	72,380	71,980	73,460	75,140	75,590	75,350	73,800	70,100	67,710	68,100
22	74,790	73,590	72,380	72,010	73,420	75,170	75,690	75,100	73,660	69,840	67,740	69,380
23	74,760	73,560	72,380	72,010	73,420	75,170	75,760	75,070	73,560	69,580	67,710	69,880
24	74,830	73,490	72,350	72,010	73,390	75,170	75,800	75,070	73,420	69,520	67,640	69,910
25	74,790	73,460	72,350	71,980	73,390	75,210	75,800	75,040	73,160	69,430	67,580	69,910
26	74,760	73,420	72,110	71,940	73,360	75,210	75,860	75,000	72,820	69,350	67,510	69,940
27	74,760	73,420	71,940	71,940	73,320	75,210	75,860	74,930	72,750	69,250	67,320	70,170
28	74,660	73,420	71,910	71,940	73,260	75,210	75,800	74,830	72,680	69,220	67,030	70,240
29	74,550	73,190	71,880	72,310	73,220	75,210	75,690	75,040	72,620	69,380	66,930	70,240
30	74,480	72,950	71,880	72,890	----------	75,170	75,690	75,100	72,580	69,480	66,870	70,240
31	74,410	----------	71,880	73,060	----------	75,170	----------	75,140	----------	69,380	66,800	----------
(†)	690.15	689.72	689.40	689.75	689.80	690.37	690.52	690.36	689.61	688.65	687.86	688.91
(‡)	-2,490	-1,460	-1,070	+1,180	+160	+1,950	+520	-550	-2,560	-3,200	-2,580	+3,440

Calendar year 1963..... ‡ -16,370
Water year 1963-64..... ‡ -6,660

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-470. Clear Fork Trinity River near Benbrook, Tex.

Location.--Lat 32°39'54", long 97°26'30", on left bank 1½ miles downstream from Benbrook Dam, 1.7 miles southeast of Benbrook, Tarrant County, and 2.9 miles upstream from Marys Creek.

Drainage area.--431 sq mi.

Records available.--July 1947 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 604.22 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark)

Average discharge.--17 years, 57.8 cfs (41,850 acre-ft per year).

Extremes.--Maximum discharge during year, 432 cfs Sept. 21 (gage height, 4.60 ft); no flow at times.
1947-64: Maximum discharge, 82,900 cfs May 17, 1949 (gage height, 28.72 ft), from rating curve defined by current-meter measurements below 11,000 cfs, velocity-area studies, and slope-area measurement of 82,900 cfs; no flow at times.
Maximum stage known since at least 1922, that of May 17, 1949.

Remarks.--Records good. Flow regulated by Benbrook Reservoir since September 1952 (see preceding page). Diversions one mile upstream for Benbrook Golf Course.

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

1.9	0	2.4	17
2.0	.6	2.7	41
2.1	3.0	3.0	74
2.2	6.1	3.5	144

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	2.4	0.3	0.3	0.2	0.4	0.4	4.5	0.4	5.5	0	2.2
2	0	1.9	.2	.4	.3	.4	60	4.2	.3	70	0	.1
3	0	2.2	.3	.4	*.3	.3	110	3.9	.3	110	0	67
4	0	1.5	.2	.4	1.7	.8	3.0	4.2	.3	.1	0	117
5	0	.8	*.3	.4	.8	55	3.9	5.1	.3	0	*0	.2
6	0	1.0	.1	*.3	.3	106	3.3	5.5	.3	0	66	.1
7	0	1.5	.4	.2	.2	1.9	2.7	5.5	.2	0	110	.1
8	69	2.2	.4	.2	.2	2.2	2.4	7.3	3.4	0	.4	*.1
9	105	2.4	.6	.2	.2	9.3	2.4	5.1	.6	66	.8	0
10	.3	2.4	1.2	.2	.1	1.9	2.4	8.4	.2	108	.8	67
11	.1	2.4	.3	.2	.1	.6	3.0	4.2	71	1.9	1.0	116
12	.2	1.7	.1	.2	.1	*.6	3.3	3.3	109	0	.4	.2
13	.8	2.4	.1	.3	.2	.6	3.3	3.6	.8	0	65	.1
14	.3	1.9	.1	.3	.1	.3	3.6	70	.3	0	112	76
15	.3	2.4	.1	.4	.1	.3	3.9	109	.3	0	6.0	115
16	.4	3.0	.1	.8	.2	.4	67	1.2	.3	0	2.7	12
17	73	4.2	.1	.6	.3	.3	108	1.0	.3	0	4.8	2.1
18	109	3.6	.1	1.5	.4	1.0	3.9	.8	.2	0	.3	.6
19	2.4	4.8	0	1.9	.6	12	3.6	1.2	.2	0	.1	.4
20	2.7	3.6	0	.4	.6	1.0	*3.9	1.2	.2	0	.1	14
21	2.4	4.2	.1	.4	.8	.8	4.2	68	.2	0	.1	73
22	2.2	3.9	.1	.4	.6	.6	3.9	111	.1	65	1.7	13
23	2.2	.6	.1	.3	.4	.3	4.2	.4	1.5	114	.3	3.6
24	2.4	2.3	.1	.3	.4	.1	4.5	.2	2.4	.1	.4	1.5
25	2.7	2.4	.1	.2	.4	.1	4.2	*.2	71	0	.4	1.0
26	2.4	3.9	73	.2	.4	.1	5.5	.1	113	0	.1	1.2
27	2.4	3.6	102	.2	.6	.1	4.8	.1	4.8	0	69	4.2
28	2.7	4.2	.6	.2	.6	.1	4.5	.2	4.8	0	116	1.7
29	*2.2	81	.4	1.0	.4	.3	4.5	4.7	*5.5	0	3.6	1.5
30	2.2	103	.4	8.7	----------	.3	3.6	1.2	4.5	.2	3.6	1.2
31	1.5	----------	.3	.6	----------	.3	----------	.4	----------	0	3.3	----------
Total	388.8	257.4	182.2	22.1	11.6	198.4	437.9	435.7	396.7	540.8	568.9	692.1
Mean	12.5	8.58	5.88	0.71	0.40	6.40	14.6	14.1	13.2	17.4	18.4	23.1
Ac-ft	771	511	361	44	23	394	869	864	787	1,070	1,130	1,370

Calendar year 1963: Max 815 Min 0 Mean 21.2 Ac-ft 15,330
Water year 1963-64 Max 117 Min 0 Mean 11.3 Ac-ft 8,190

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

8-475. Clear Fork Trinity River at Fort Worth, Tex.

Location.--Lat 32°44'02", long 97°21'33", near right bank on downstream side of right pier of bridge on Vickery Boulevard at Fort Worth, Tarrant County, 100 ft upstream from East-West Expressway bridge, 310 ft downstream from the Texas and Pacific Railway Co. bridge, 3 miles upstream from mouth, 5 miles downstream from Marys Creek, and 10 miles downstream from Benbrook Dam.

Drainage area.--518 sq mi.

Records available.--March 1924 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 532.91 ft above mean sea level, datum of 1929. Prior to June 23, 1925, staff gage at site 338 ft upstream at datum 8.37 ft higher. June 23, 1925, to Dec. 7, 1938, water-stage recorder at site 88 ft upstream at present datum.

Average discharge.--40 years, 97.1 cfs (70,300 acre-ft per year), unadjusted.

Extremes.--Maximum discharge during year, 8,210 cfs Sept. 21 (gage height, 11.88 ft); no flow at times.
1924-64: Maximum discharge, 107,000 cfs May 17, 1949 (gage height, 28.20 ft), from rating curve defined by current-meter measurements below 16,000 cfs and by contracted-opening measurement of 107,000 cfs; no flow at times.
Maximum stage since at least 1900, that of May 17, 1949. Flood of Apr. 25, 1922, reached a stage of 27.5 ft, present datum (discharge, 74,300 cfs by slope-area measurement of peak flow, data furnished by city engineer of Fort Worth).

Remarks.--Records good. Flow regulated by Benbrook Reservoir (station 8-465). The city of Fort Worth reported diversion of 260 acre-ft above this station for municipal use and returned sewage effluent to the West Fork Trinity River below the Fort Worth gaging station.

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

2.8	0	3.4	84
2.9	.8	3.6	168
3.0	4.8	4.0	420
3.1	14	4.5	820
3.2	30	5.0	1,300
3.3	53	6.0	2,390

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	4.8	1.2	8.9	5.5	7.0	*17	14	0.8	0.1	0.8
2	0	0	1.0	1.0	5.5	9.9	14	18	7.0	3.6	0	1.0
3	0	.1	.8	1.2	*7.0	5.5	172	13	4.8	166	0	.5
4	0	0	.6	1.0	61	35	12	7.0	2.6	2.8	0	185
5	0	.2	1.0	1.0	15	4.8	77	4.8	4.2	.2	*0	11
6	0	.4	1.2	*1.0	7.9	182	17	11	1.2	0	0	3.6
7	*0	.2	2.2	1.2	7.0	12	15	7.0	.8	0	150	2.2
8	0	0	2.2	1.5	7.0	48	12	44	.2	0	4.9	*.8
9	139	.5	2.2	1.5	7.9	194	11	17	.2	0	.3	0
10	2.8	1.5	46	1.5	7.9	20	7.9	44	.5	151	0	0
11	0	1.8	*11	1.5	7.9	11	8.9	32	.8	3.1	0	165
12	0	1.2	3.6	1.5	14	*8.9	20	12	178	.6	0	4.5
13	0	.5	1.5	1.5	24	7.9	11	7.9	7.9	0	0	.6
14	0	.2	1.2	2.2	7.0	6.2	9.9	6.4	1.8	0	153	.2
15	0	.2	1.2	4.2	5.5	4.8	14	189	1.2	0	159	170
16	0	.2	1.2	11	5.5	4.2	17	7.9	1.8	0	18	272
17	0	2.2	1.8	24	5.5	3.6	210	2.6	3.1	0	190	56
18	150	3.6	1.2	25	5.5	41	12	3.1	*1.8	0	26	5.5
19	3.5	26	1.5	8.9	4.8	463	8.9	2.2	.2	0	3.2	2.6
20	.5	4.2	3.6	4.2	5.5	51	8.9	.5	0	0	.2	220
21	.2	2.2	1.8	2.2	9.9	24	37	1.8	0	0	22	2,280
22	0	3.6	2.6	1.8	7.0	18	17	214	0	0	110	296
23	0	1.5	4.2	1.8	7.0	15	14	7.0	0	125	13	136
24	3.5	.8	4.2	1.8	6.2	14	16	3.6	0	2.2	5.5	46
25	1.0	1.0	3.1	1.8	5.5	14	14	2.2	0	0	2.6	26
26	1.0	.6	2.2	1.8	4.2	15	60	*.5	157	0	2.2	40
27	.8	2.2	170	1.5	4.2	14	14	.2	3.1	0	1.5	176
28	.5	25	7.9	1.5	3.6	11	8.9	.2	1.5	0	180	44
29	.2	3.4	3.1	58	4.2	7.0	7.0	*328	*.6	101	9.4	26
30	*.1	181	1.5	249	----------	7.9	7.0	79	.5	28	2.6	18
31	0	----------	1.2	38	----------	7.0	----------	30	----------	1.5	1.8	----------
Total	303.1	264.3	291.6	455.3	272.1	1,265.2	860.4	1,112.9	394.8	585.8	1,055.3	4,189.3
Mean	9.78	8.81	9.41	14.7	9.38	40.8	28.7	35.9	13.2	18.9	34.0	140
Ac-ft	601	524	578	903	540	2,510	1,710	2,210	783	1,160	2,090	8,310

Calendar year 1963: Max 982 Min 0 Mean 30.3 Ac-ft 21,920
Water year 1963-64: Max 2,280 Min 0 Mean 30.2 Ac-ft 21,920

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

8-480. West Fork Trinity River at Fort Worth, Tex.

Location.--Lat 32°45'40", long 97°19'55", on left bank 125 ft upstream from Texas Electric Service Co.'s concrete dam, 980 ft downstream from centerline of Paddock Viaduck (North Main Street) at Fort Worth, Tarrant County, and 2,600 ft downstream from Clear Fork Trinity River.
Drainage area.--2,615 sq mi.
Records available.--October 1920 to September 1964. Gage-height records collected in this vicinity since 1910 are contained in reports of U. S. Weather Bureau.
Gage.--Water-stage recorder and concrete dam control with angle-iron-crested notch for flow below 50 cfs. Datum of gage is 519.24 ft above mean sea level, datum of 1929 (Texas Reclamation Department bench mark based on Coast and Geodetic Survey datum). Prior to Aug. 21, 1954, water-stage recorder at site 1,200 ft upstream at same datum. Aug. 22, 1954, to Oct. 15, 1955, at site 2,000 ft upstream at same datum.
Average discharge.--44 years, 394 cfs (285,200 acre-ft per year), unadjusted.
Extremes.--Maximum discharge during year, 10,800 cfs Sept. 21 (gage height, 5.49 ft); minimum daily, 1.4 cfs Aug. 6.
1920-64: Maximum discharge, 85,000 cfs Apr. 25, 1922 (gage height, 23.95 ft, site then in use), by slope-area measurement of peak flow by city engineer of Fort Worth; maximum gage height, 25.91 ft (site then in use) May 17, 1949 (discharge, 64,300 cfs); no flow at times.
Maximum stage since at least 1866, that of May 17, 1949. Maximum stages have been affected by levee construction, levee breaks, and channel rectification.
Remarks.--Records good except those below 30 cfs, which are fair. Flow largely regulated by Bridgeport Reservoir (station 8-430) since 1932, Eagle Mountain Reservoir (station 8-450) since 1934, Benbrook Reservoir (station 8-465) since 1952, and Lake Worth (capacity, 33,300 acre-ft). Records furnished by city of Fort Worth show that during year 64,490 acre-ft of water was diverted above station for municipal use and 41,850 acre-ft of sewage effluent was returned below station. Several small diversions above station.

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

0.3	1.2	0.8	38	1.5	645
.4	4.2	.9	63	2.0	1,320
.5	9.4	1.0	119	2.5	2,150
.6	16	1.1	199	3.0	3,120
.7	24	1.2	295	3.5	4.300

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.5	4.2	25	7.6	31	13	16	*40	30	5.0	7.0	6.5
2	7.6	4.2	12	6.5	23	20	16	76	20	9.4	3.4	5.5
3	6.5	4.2	8.2	6.5	24	17	199	29	14	151	1.8	4.6
4	6.5	4.6	8.2	6.0	141	93	31	21	11	22	1.6	129
5	7.0	4.6	8.2	6.5	44	26	170	20	11	11	*1.8	50
6	6.0	4.2	8.2	6.0	26	199	36	31	13	5.5	1.4	27
7	5.0	4.2	8.2	5.5	*22	39	26	27	13	2.6	130	11
8	6.0	3.8	7.6	5.5	21	100	21	99	11	2.6	22	8.2
9	112	4.2	7.0	7.6	20	435	19	47	8.8	2.3	9.4	5.0
10	19	5.5	127	7.6	18	57	18	79	7.0	124	5.0	*4.2
11	7.0	5.5	42	7.6	18	33	16	77	6.5	20	2.6	121
12	5.0	6.0	*21	7.6	21	*23	20	31	146	7.6	2.3	22
13	4.6	6.0	15	6.5	69	19	34	23	21	4.2	1.6	9.4
14	5.0	5.0	12	6.0	27	16	21	21	10	2.6	107	8.2
15	4.6	3.8	10	*8.2	20	12	19	211	13	2.0	421	155
16	4.6	3.8	9.4	17	16	11	20	34	17	1.8	52	597
17	4.2	4.6	9.4	33	16	12	222	20	19	3.0	402	130
18	137	5.0	8.8	36	18	97	32	17	11	3.0	55	29
19	22	53	8.2	24	16	858	21	20	6.5	3.0	20	23
20	9.4	28	11	12	14	77	18	18	3.8	2.0	13	471
21	5.5	14	11	8.8	14	47	81	15	3.0	1.8	20	3,610
22	4.2	14	11	8.8	14	34	38	205	2.6	1.8	172	501
23	3.8	11	11	9.4	14	29	26	33	2.0	90	32	221
24	14	8.2	12	9.4	13	27	31	16	1.8	19	20	69
25	11	7.0	10	7.6	13	26	36	12	1.8	6.5	15	49
26	6.0	7.0	9.4	7.6	12	24	119	*6.0	117	4.2	11	75
27	5.0	8.3	165	7.6	11	22	34	5.0	20	3.0	11	387
28	4.2	48	25	7.0	11	20	25	4.2	9.4	2.3	147	73
29	3.8	17	14	147	11	19	22	516	7.0	133	25	52
30	*4.2	182	11	612	----------	17	18	244	*5.5	170	12	40
31	3.8	----------	8.8	83	----------	16	----------	52	----------	16	8.8	----------
Total	451.0	480.9	654.6	1,131.4	718	2,438	1,405	2,049.2	562.7	832.2	1,733.7	6,893.6
Mean	14.5	16.0	21.1	36.5	24.8	78.6	46.8	66.1	18.8	26.8	55.9	230
Ac-ft	895	954	1,300	2,240	1,420	4,840	2,790	4,060	1,120	1,650	3,440	13,670

Calendar year 1963: Max 2,010 Min 2.0 Mean 71.1 Ac-ft 51,500
Water year 1963-64: Max 3,610 Min 1.4 Mean 52.9 Ac-ft 38,380

* Discharge measurement made on this day.

8-488. Big Fossil Creek at Haltom City, Tex.

Location.--Lat 32°48'26", long 97°14'54", on right bank at downstream side of downstream bridge on State Highways 121 and 183, near east boundary of Haltom City, Tarrant County, 1.5 miles upstream from Chicago, Rock Island and Pacific Railroad Co. bridge, 2.0 miles upstream from Little Fossil Creek, and 3.5 miles upstream from mouth.

Drainage area.--52.8 sq mi.

Records available.--January 1959 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 491.48 ft above mean sea level, datum of 1929.

Average discharge.--5 years, 14.4 cfs (10,430 acre-ft per year).

Extremes.--Maximum discharge during year, 4,310 cfs Sept. 21 (gage height, 17.90 ft); no flow at times. 1959-64: Maximum discharge, 27,000 cfs Sept. 7, 1962 (gage height, 24.90 ft); no flow at times each year. Maximum stage since at least 1900, that of Sept. 7, 1962. Flood of Apr. 20, 1942, reached a stage of 24.8 ft, from floodmarks. The floods in April 1922 and May 1949 reached stages of 24.0 and 23.8 ft, respectively, from floodmarks (possibly backwater effects from West Fork Trinity River), from information by Corps of Engineers.

Remarks.--Records good prior to June 9, fair thereafter. Recording rain gage located at station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 29-30, Aug. 19-21, Sept. 17-20)

Oct. 1 to June 30

2.8	0	3.7	11
2.9	.1	4.0	19
3.0	.9	4.5	41
3.1	1.8	5.0	72
3.2	2.8	6.0	150
3.4	5.0	7.5	325

July 1 to Sept. 30

2.8	0	5.0	28
2.9	.1	6.0	68
3.0	.3	7.0	124
3.1	.6	8.0	215
3.3	1.2	9.0	328
3.5	2.3	11.0	670
3.7	3.7	13.0	1,200
4.0	6.8	14.0	1,610
4.5	14		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.4	0	0.1	0.2	0.9	1.3	10	0	0	0
2		0	.4	0	0	.2	.9	1.5	6.1	0	0	0
3		0	.3	0	.2	.1	.9	.9	3.2	0	0	0
4		0	.3	0	2.7	.7	.9	2.3	2.0	0	0	0
5		0	.3	0	1.0	.1	2.6	*1.6	1.8	0	0	.2
6		0	.2	0	.2	.1	.5	1.6	1.4	0	0	0
7		0	.3	0	*0	a.1	.2	1.0	1.1	0	0	0
8		0	.3	0	0	a.1	.2	2.1	.7	0	0	0
9		0	.3	0	.1	a7.0	.2	1.4	.5	0	0	0
10		0	2.0	0	.1	a.1	.2	1.6	.3	0	0	0
11		0	*.6	0	.1	a.1	.2	2.6	*.2	0	0	0
12		0	0	0	.5	a.1	.2	1.5	.2	0	0	0
13		0	0	0	.8	a.1	.2	1.2	.2	*0	0	0
14		0	0	0	.2	a.1	.2	.6	.1	0	0	0
15		0	0	*0	.2	a.1	.2	.3	.1	0	44	*0
16		0	0	.5	.1	a.1	.3	.3	.8	0	9.1	43
17		0	0	1.1	.1	*.2	.3	.2	.3	0	*55	*13
18		0	0	1.0	.1	1.3	.5	.2	*.2	0	*11	*2.2
19		1.0	0	.2	.1	93	.3	.2	.2	0	.7	.5
20		0	0	0	.1	10	.2	0	.2	0	*.5	24
21		0	0	0	.2	4.2	2.1	.5	.1	0	.4	1,270
22		0	0	0	.1	1.3	1.0	1.0	.1	*0	.2	48
23		0	0	0	.1	.7	.6	.3	.1	0	.1	18
24		0	0	0	.1	.6	1.8	.2	.1	0	.1	1.0
25		0	0	0	.1	.5	3.0	.2	0	0	.3	.3
26		.1	0	0	.1	.4	12	.1	0	0	.1	.6
27		.4	0	0	.1	.5	3.1	*.1	0	0	.1	57
28		1.1	0	0	.1	.6	1.7	.1	0	0	.1	2.8
29		.2	0	1.5	.1	.7	.9	*40	0	7.6	0	.4
30		.3	0	7.7	----------	.7	.7	*296	*0	11	0	.1
31	(*)	----------	0	.8	----------	.8	----------	42	----------	0	0	----------
Total	0	3.1	5.4	12.8	7.7	124.8	37.0	402.9	30.0	18.6	121.7	1,481.1
Mean	0	0.10	0.17	0.41	0.27	4.03	1.23	13.0	1.00	0.60	3.93	49.4
Ac-ft	0	6.1	11	25	15	248	73	799	60	37	241	2,940

Calendar year 1963: Max 224 Min 0 Mean 2.11 Ac-ft 1,530
Water year 1963-64: Max 1,270 Min 0 Mean 6.13 Ac-ft 4,460

Peak discharge (base, 700 cfs)

Date	Time	Gage height	Discharge
5-30	1500	10.36	838
9-21	0830	17.90	4,310

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.
Note.--Stage-discharge relation indefinite June 9-25, Aug. 22-28.

8-492. Lake Arlington at Arlington, Tex.

Location.--Lat 32°43'04", long 97°11'36", in pumphouse at right end of Lake Arlington Dam on Village Creek near western boundary of Arlington, Tarrant County, 1.5 miles upstream from The Texas and Pacific Railway Co. bridge, 8 miles upstream from mouth of Village Creek, and 8.5 miles east of Fort Worth.
Drainage area.--143 sq mi.
Records available.--March 1957 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942. Prior to Sept. 9, 1957, staff gage at same site and datum.
Extremes.--Maximum contents during year, 41,580 acre-ft May 30 (elevation, 548.07 ft); minimum, 32,930 acre-ft Sept. 16 (elevation, 543.65 ft).
1957-64: Maximum contents, 55,750 acre-ft May 23, 1957 (elevation, 554.3 ft, from graph based on gage readings); minimum since first filled in April 1957, that of Sept. 16, 1964.
Remarks.--Reservoir is formed by a rolled earth-fill dam 6,482 ft long. Service spillway is uncontrolled circular drop inlet designed to discharge 4,000 cfs through 10-foot diameter concrete conduit. Emergency spillway 882 ft wide is cut through natural ground near right end of dam. Dam completed and storage began Mar. 31, 1957. Figures given herein represent total contents. Dam built by city of Arlington to impound water for municipal and industrial use. Records furnished by city of Arlington show that during year 7,710 acre-ft of water was diverted for municipal use and 3,720 acre-ft of sewage effluent was discharged into West Fork Trinity River. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Crest of service spillway	550.0	45,710
Invert of lowest valve	505.0	180

Cooperation.--Capacity curve based on 1955 survey and records of diversions furnished by city of Arlington.

Capacity table (elevation, in feet, and capacity, in acre-feet)

543	31,740
544	33,570
545	35,460
546	37,390
547	39,380
548	41,430
549	43,540

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38,480	36,670	35,560	34,760	35,210	34,780	38,400	40,730	41,470	39,200	35,940	34,230
2	38,420	36,610	35,500	34,760	35,210	34,800	38,360	40,710	41,410	39,120	35,820	34,130
3	38,360	36,560	35,460	34,700	35,190	34,800	38,360	40,710	41,370	39,040	35,730	34,060
4	38,300	36,500	35,400	34,680	35,350	34,800	38,360	40,670	41,330	38,940	35,610	33,960
5	38,260	36,460	35,380	34,660	35,380	34,800	38,720	40,670	41,290	38,860	35,540	33,870
6	38,200	36,400	35,380	34,620	35,360	34,800	38,720	40,670	41,240	38,740	35,400	33,830
7	38,160	36,340	35,310	34,600	35,360	34,800	38,620	40,650	41,200	38,620	35,290	33,720
8	38,100	36,300	35,250	34,570	35,330	34,800	38,580	40,790	41,120	38,500	35,190	33,630
9	38,060	36,270	35,210	34,510	35,310	36,020	38,520	40,770	41,040	38,380	35,140	33,570
10	37,980	36,210	35,360	34,490	35,270	36,060	38,500	40,920	40,980	38,260	35,040	33,480
11	37,940	36,190	35,360	34,400	35,250	36,020	38,480	40,850	40,920	38,100	34,870	33,370
12	37,880	36,110	35,330	34,340	35,210	36,020	38,480	40,770	40,850	37,920	34,740	33,260
13	37,810	36,040	35,270	34,320	35,210	36,040	38,420	40,750	40,770	37,810	34,620	33,160
14	37,730	35,980	35,230	34,300	35,210	35,960	38,380	40,690	40,690	37,730	34,550	33,060
15	37,690	35,960	35,190	34,360	35,210	35,940	38,380	40,650	40,580	37,590	34,760	32,960
16	37,610	35,920	35,180	34,490	35,210	35,920	38,340	40,580	40,610	37,450	34,720	33,370
17	37,550	35,840	35,140	34,490	35,180	35,900	38,300	40,540	40,540	37,310	35,160	33,350
18	37,450	35,820	35,100	34,550	35,160	36,040	38,300	40,480	40,440	37,200	35,100	33,310
19	37,370	35,920	35,080	34,530	35,120	38,580	38,280	40,420	40,340	37,100	35,060	33,290
20	37,310	35,900	35,060	34,510	35,060	38,620	38,260	40,360	40,220	37,020	34,980	33,590
21	37,240	35,860	35,020	34,510	35,040	38,600	39,930	40,340	40,160	36,900	34,910	35,270
22	37,200	35,810	35,020	34,490	35,020	38,580	40,090	40,300	40,050	36,810	34,950	35,960
23	37,200	35,750	34,980	34,490	34,980	38,580	40,180	40,240	39,950	36,690	34,890	36,150
24	37,140	35,710	34,970	34,450	34,970	38,620	40,220	40,180	39,830	36,580	34,850	36,090
25	37,100	35,670	34,950	34,420	34,950	38,560	40,320	40,140	39,730	36,460	34,800	36,060
26	37,060	35,630	34,890	34,400	34,890	38,520	40,810	40,090	39,640	36,340	34,700	36,250
27	37,020	35,650	34,890	34,360	34,850	38,500	40,770	39,990	39,560	36,230	34,600	37,240
28	36,940	35,670	34,850	34,320	34,810	38,440	40,710	39,910	39,480	36,150	34,530	37,270
29	36,890	35,630	34,810	34,550	34,800	38,400	40,710	41,450	39,380	36,190	34,440	37,250
30	36,810	35,590	34,800	35,120	----------	38,360	40,690	41,560	39,300	36,130	34,380	37,220
31	36,710	----------	34,780	35,190	----------	38,380	----------	41,510	----------	36,040	34,300	----------
(†)	545.65	545.07	544.64	544.86	544.65	546.50	547.64	548.04	546.96	545.30	544.39	545.91
(‡)	-1,830	-1,120	-810	+410	-390	+3,580	+2,310	+ +820	-2,210	-3,260	-1,740	+2,920
(††)	656	470	449	431	396	433	459	572	870	1,260	960	754

Calendar year 1963..... ‡ -8,510 †† 6,650
Water year 1963-64..... ‡ -1,320 †† 7,710

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.
†† Diversions, in acre-feet.

8-495. West Fork Trinity River at Grand Prairie, Tex.

Location.--Lat 32°45'46", long 96°59'42", on left bank at upstream side of bridge on Belt Line Road, 1.3 miles northeast of Grand Prairie, Dallas County, 4 miles upstream from Bear Creek, and 7 miles upstream from Mountain Creek.
Drainage area.--3,065 sq mi.
Records available.--March 1925 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 410.42 ft above mean sea level, datum of 1929. Prior to Dec. 6, 1933, chain gage at bridge on old channel 2,500 ft southeast of present site at datum 2.56 ft higher. Dec. 6, 1933, to May 24, 1956, water-stage recorder at site 440 ft downstream from site of chain gage at datum 2.56 ft higher than present datum. May 25, 1956, to Apr. 18, 1957, staff gage at site 1.5 miles downstream at different datum. Apr. 19 to Aug. 13, 1957, reference point on bridge at present site and datum.
Average discharge.--39 years, 540 cfs (390,900 acre-ft per year).
Extremes.--Maximum discharge during year, 11,600 cfs Sept. 22 (gage height, 22.92 ft); minimum daily, 53 cfs July 28.
1925-64: Maximum discharge, 62,000 cfs May 17, 1949 (gage height, 28.00 ft, site and datum then in use), from rating curve defined by current-meter measurements below 36,000 cfs and extended by logarithmic plotting; minimum observed, 3.2 cfs June 6, 1925.
Maximum stage since at least 1900, 30.6 ft (former site and datum) in May 1908, from information by local resident. Flood in April 1922 reached a stage of 29.0 ft (former site and datum), from floodmarks.
Remarks.--Records good. Flow largely regulated by Bridgeport Reservoir (station 8-430) since 1932, Eagle Mountain (station 8-450) since 1934, Benbrook Reservoir (station 8-465) since 1952, Lake Worth (capacity, 33,300 acre-ft), and Lake Arlington (station 8-492) since 1957. Cities of Fort Worth and Arlington discharge sewage effluent between station at Fort Worth and this station. Several diversions above Arlington for municipal and other uses. The river channel at station was relocated in 1956.

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

0.88	53	3.0	734
1.0	72	5.0	1,450
1.2	110	8.0	2,590
1.5	194	13.0	5,000
2.0	374	21.0	10,000

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	70	247	76	252	83	106	102	248	69	127	79
2	70	72	124	67	148	85	110	162	148	*69	90	81
3	76	67	86	69	106	100	110	188	124	76	70	81
4	76	61	83	69	211	139	219	129	110	168	70	79
5	74	61	81	64	*403	223	458	108	100	110	74	132
6	70	72	*79	59	*216	115	294	117	102	67	74	165
7	66	70	70	64	124	244	162	117	96	66	*70	134
8	67	67	66	67	106	165	124	151	81	69	124	98
9	74	70	59	67	96	1,200	110	302	83	67	127	85
10	162	64	123	*67	85	*553	106	156	88	67	81	*83
11	110	58	348	66	90	216	100	244	88	129	69	79
12	83	64	198	64	90	148	100	230	88	110	70	145
13	74	72	112	56	142	134	110	122	197	67	69	132
14	62	72	94	62	165	122	124	102	120	56	66	88
15	69	70	83	72	106	104	110	98	77	66	398	76
16	76	70	72	88	92	90	100	234	85	64	943	175
17	72	70	77	134	81	94	100	118	115	61	444	*1,800
18	74	66	83	248	86	100	223	81	115	67	1,300	305
19	184	88	79	273	85	*1,840	140	86	96	64	237	156
20	117	184	81	178	86	*1,150	102	83	88	56	134	367
21	77	148	88	108	86	302	240	83	76	58	100	6,380
22	*74	96	83	92	86	212	428	96	66	67	176	9,730
23	94	88	70	88	79	175	175	230	66	66	291	3,190
24	100	83	85	83	72	156	148	110	69	104	148	756
25	88	70	86	77	79	142	154	79	66	108	108	403
26	86	74	72	72	83	134	464	81	64	70	100	428
27	70	79	74	67	83	127	361	*74	152	56	92	1,700
28	58	104	220	72	83	117	162	79	108	53	88	1,510
29	61	191	112	85	83	106	*127	157	67	61	162	392
30	67	115	74	888	----------	98	106	1,850	62	811	134	313
31	70	----------	74	1,200	----------	102	----------	806	----------	303	81	----------
Total	2,567	2,536	3,283	4,742	3,504	8,576	5,373	6,572	3,045	3,325	6,117	29,142
Mean	82.8	84.5	106	153	121	277	179	212	102	107	197	971
Ac-ft	5,090	5,030	6,510	9,410	6,950	17,010	10,660	13,040	6,040	6,600	12,130	57,800

Calendar year 1963: Max 3,140 Min 58 Mean 172 Ac-ft 124,700
Water year 1963-64: Max 9,730 Min 53 Mean 215 Ac-ft 156,300

* Discharge measurement made on this day.

8-496. Mountain Creek near Cedar Hill, Tex.

Location.--Lat 32°35'03", long 97°01'23", on right bank 50 ft downstream from county road bridge, 3.5 miles downstream from Texas and New Orleans Railroad Co. bridge, 4.5 miles southwest of Cedar Hill, Dallas County, and 12 miles upstream from Mountain Creek Lake Dam.

Drainage area.--119 sq mi.

Records available.--October 1960 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 478.31 ft above mean sea level, datum of 1929. Prior to Nov 25, 1960, staff gage at same site and datum.

Extremes.--Maximum discharge during year, 10,400 cfs Apr. 21 (gage height, 22.25 ft); no flow most of time.
1960-64: Maximum discharge, that of Apr. 21, 1964; no flow at times each year.
Maximum stage since at least 1910, 30 ft May 25, 1922, from information by local resident. Flood of May 1957 reached a stage of 23.7 ft, from floodmark.

Remarks.--Records good except those below 3 cfs, which are fair. At end of year, flow from 14.2 sq mi above this station was partly controlled by three floodwater-retarding structures with a total combined capacity of 6,750 acre-ft below flood spillway crests, of which 5,680 acre-ft is floodwater-retarding capacity and 1,070 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. One of these floodwater-retarding structures was completed in October 1956 and the other two in August 1957.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 4, 12-13, Mar. 8, 12-14, 22-24)

5.0	0	6.0	16	12.0	500
5.1	.4	6.5	31	14.0	925
5.2	1.1	7.0	48	17.0	1,900
5.3	2.2	8.0	92	19.0	3,000
5.5	4.6	9.0	155	20.0	3,680
5.7	8.1	10.0	240		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0	0	0	0	2.3	20	(*)		0
2				0	0	0	0	1.5	*8.5			0
3				0	0	0	0	1.0	5.2			0
4				0	**.3	*0	0	.6	3.6			0
5				0	0	0	9.0	*.4	2.9			0
6			(*)	0	0	0	1.0	.4	2.5		(*)	0
7				0	0	*0	0	.4	2.3			0
8				*0	0	2.4	0	.3	2.0			0
9				0	0	448	0	.3	1.5			*0
10				0	0	21	0	.3	1.0			0
11				0	0	5.7	0	.3	.6			0
12				0	.8	1.6	0	.3	.4			0
13				0	1.9	.5	0	.2	.2			0
14				0	0	.1	0	.2	.1			0
15				0	0	0	0	.2	.1			0
16				0	0	0	0	.2	0			0
17				0	0	*0	0	.2	0			0
18				0	0	0	0	.2	0			0
19				0	0	385	0	.2	0			0
20				0	0	28	0	.2	0			0
21				0	0	6.2	*3,170	.2	0			0
22				0	0	1.9	*367	.2	0			.5
23				0	0	.6	86	.2	0			.9
24				0	0	.3	68	.2	105			.1
25				0	0	.1	68	1.1	5.1			0
26				0	0	0	100	.2	2.4			0
27				0	0	0	40	.2	1.0			33
28				0	0	0	*12	.2	.5			2.3
29				0	0	0	5.2	798	.1			.5
30				.9	----------	0	3.1	1,160	0			.1
31	(*)	----------		0	----------	0	----------	59	----------			----------
Total	0	0	0	0.9	3.0	901.4	3,929.3	2,029.2	165.0	0	0	37.4
Mean	0	0	0	0.03	0.10	29.1	131	65.5	5.50	0	0	1.25
Ac-ft	0	0	0	1.8	6.0	1,790	7,790	4,020	327	0	0	74

Calendar year 1963: Max 654 Min 0 Mean 4.45 Ac-ft 3,210
Water year 1963-64: Max 3,170 Min 0 Mean 19.3 Ac-ft 14,010

Peak discharge (base, 1,500 cfs)

Date	Time	Gage height	Discharge
4-21	1500	22.25	10,400
5-30	0100	20.45	4,030

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record Mar. 25, May 2-4, 7-24, 26-28, June 8-23, Sept. 24, 29-30.

8-497. Walnut Creek near Mansfield, Tex.

Location.--Lat 32°34'50", long 97°06'05", on right bank at downstream side of bridge on county road, 2.6 miles northeast of Mansfield, Tarrant County, 3 miles downstream from Texas and New Orleans Railroad Co. bridge, and 9 miles upstream from mouth.

Drainage area.--62.8 sq mi.

Records available.--October 1960 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 531.08 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 2,090 cfs May 29 (gage height, 19.78 ft); no flow for many days.
1960-64: Maximum discharge, 5,550 cfs June 25, 1961 (gage height, 26.32 ft); no flow at times each year.
Maximum stage since at least 1900 occurred May 25, 1922, stage unknown.

Remarks.--Records good. Recording rain gage located at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 24 to May 29)

6.3	0	6.9	2.2	8.5	73
6.4	.1	7.0	3.5	9.0	116
6.5	.2	7.2	7.2	10.0	215
6.6	.3	7.4	13	12.0	444
6.7	.7	7.7	24	15.0	900
6.8	1.3	8.0	39		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0	0.2	0.2	0.1	0.3	*1.0	(*)		0
2				0	.2	.2	.1	.3	.8			0
3				0	.2	.2	.1	.3	.8			0
4				0	*.6	.4	.1	.3	.8			0
5				0	.4	.2	6.9	.3	.8			0
6			(*)	.1	.2	.2	.4	.3	.8		(*)	0
7				.1	.1	.2	.1	.3	.8			0
8				*.1	.1	7.6	.1	.4	.6			0
9				0	.2	340	.1	.4	.4			*0
10				0	.2	3.0	.1	.2	.3			0
11				0	.2	.2	.1	.2	.3			0
12				0	.2	.2	.1	.2	.3			0
13				0	.4	.1	.1	.2	.3			0
14				0	.2	.1	.1	.2	.2			0
15				0	.2	.1	.1	.2	.2			0
16				.1	.2	.1	.1	.2	.2			0
17				.1	.2	*.1	.1	.2	.3			0
18				.1	.2	.1	.1	.1	.2			0
19				.1	.2	247	.1	.1	.2			0
20				.1	.2	5.7	.1	.1	.1			0
21				.1	.2	.2	810	.1	.1			5.7
22				.1	.2	.1	*86	.1	0			.1
23				.1	.2	.1	3.7	.1	0			0
24				.1	.2	.1	1.1	.1	0			0
25				.1	.2	.1	1.2	.1	0			0
26				.1	.2	.1	31	.1	0			0
27				.1	.2	.1	7.5	.1	0			10
28				1.0	.2	.1	*1.0	.1	0			.6
29				9.7	.2	.1	.5	569	0			.1
30				17	----------	.1	.3	238	0			0
31	(*)	----------		1.1	----------	.1	----------	2.2	----------			----------
Total	0	0	0	30.3	6.4	607.1	951.4	814.8	9.5	0	0	16.5
Mean	0	0	0	0.98	0.22	19.6	31.7	26.3	0.32	0	0	0.55
Ac-ft	0	0	0	60	13	1,200	1,890	1,620	19	0	0	33

Calendar year 1963: Max 705 Min 0 Mean 4.65 Ac-ft 3,360
Water year 1963-64: Max 810 Min 0 Mean 6.66 Ac-ft 4,840

Peak discharge (base, 700 cfs)

Date	Time	Gage height	Discharge
3- 9	0430	14.17	761
4-21	2030	18.33	1,640
5-29	2230	19.78	2,090

8-500.5. Mountain Creek Lake near Grand Prairie, Tex.

Location.--Lat 32°43'55", long 96°56'35", at right end of spillway in Mountain Creek Lake Dam on Mountain Creek, 2.5 miles upstream from Texas and Pacific Railway Co. bridge, and 3.7 miles southeast of Grand Prairie, Dallas County.
Drainage area.--295 sq mi.
Records available.--October 1960 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929. Prior to Oct. 21, 1960, staff gage at powerplant at same datum.
Extremes.--Maximum and minimum contents for the water years 1961-64 are contained in the following table:

Water year	Maximum			Minimum		
	Date	Contents (acre-feet)	Elevation (feet)	Date	Contents (acre-feet)	Elevation (feet)
1961	June 26, 1961	23,040	457.07	Dec. 3, 1960	17,580	454.86
1962	Aug. 2, 1962	23,100	457.09	Nov. 13, 1961	18,880	455.42
1963	Apr. 28, 1963	22,900	457.02	Sept. 26, 1963	17,980	455.04
1964	May 30, 1964	24,340	457.52	Jan. 12, 1964	16,420	454.34

1960-64: Maximum contents, 24,340 acre-ft May 30, 1964 (elevation, 457.52 ft); minimum, 16,420 acre-ft Jan. 12, 1964 (elevation, 454.34 ft).
Remarks.--Lake is formed by a rolled earth-fill dam 5,800 ft long including a gated spillway with six 34- by 27-foot tainter gates. Dam completed about Jan. 1, 1937, and deliberate impoundment of water began on Mar. 24, 1937. Figures given herein represent total contents. Capacity curve based on survey made in 1963 and furnished by Dallas Power and Light Co. Lake built and operated by Dallas Power and Light Co. to supply cooling water for generating plant. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Mountain Creek near Cedar Hill (station 8-496). Data regarding dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	467.0	-
Top of tainter gates	458.0	25,720
Top of dry weather conservation storage	457.0	22,840
Top of wet weather conservation storage	456.0	20,260
Sill of tainter gates	431.0	-

Capacity table (elevation, in feet, and contents, in acre-feet)

454.0	15,670	456.5	21,550
454.5	16,780	457.0	22,840
455.0	17,890	457.5	24,280
455.5	19,080	458.0	25,720
456.0	20,260		

Contents, in acre-feet, at 2400 hours, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18,360	18,200	17,600	21,860	21,600	21,810	21,650	21,990	20,960	22,530	20,980	19,410
2	18,360	18,150	17,580	21,860	21,650	21,860	21,760	22,010	20,880	22,300	20,900	19,340
3	18,360	18,130	17,580	21,880	21,630	21,940	21,680	22,010	20,800	22,320	20,850	19,190
4	18,250	18,130	17,620	21,910	21,650	21,940	21,810	22,070	20,750	22,480	20,750	19,120
5	18,250	18,060	17,620	21,880	22,090	21,990	21,600	22,120	20,930	22,480	20,750	19,080
6	18,250	17,980	18,290	21,940	21,240	21,960	21,630	22,070	21,090	22,430	20,650	19,050
7	18,250	17,980	18,880	20,880	21,060	21,940	21,630	22,200	21,060	22,400	20,570	18,980
8	18,130	17,960	19,740	21,340	21,880	21,860	21,730	21,940	21,110	22,380	20,570	18,960
9	18,130	17,850	21,010	21,190	21,700	21,860	21,680	22,010	21,090	22,320	20,470	18,880
10	18,130	17,850	20,700	21,500	21,880	21,860	21,700	22,010	21,030	22,270	20,440	18,840
11	18,060	17,850	21,030	21,700	22,040	21,880	21,680	21,960	20,980	22,220	20,390	18,880
12	18,010	17,820	21,340	21,400	22,270	21,830	21,600	21,940	20,960	22,220	20,310	19,880
13	18,360	17,820	21,500	21,400	21,580	21,810	21,860	21,860	20,880	22,170	20,190	19,670
14	18,480	17,910	21,520	21,650	21,700	21,810	21,470	21,760	21,110	22,090	20,210	19,570
15	18,480	17,870	21,520	21,780	21,760	21,810	21,500	21,700	21,190	22,040	20,160	19,520
16	18,480	17,820	21,580	21,860	21,470	21,600	21,450	21,680	21,580	21,960	20,090	19,480
17	18,440	17,800	21,580	21,910	21,630	21,270	21,450	21,630	21,470	21,940	20,050	19,430
18	18,480	17,800	21,600	21,340	21,550	21,400	21,450	21,600	21,910	21,910	20,000	19,380
19	18,360	17,760	21,730	21,470	21,630	21,600	21,550	21,520	22,270	21,830	19,930	19,360
20	18,360	17,850	21,500	21,450	21,860	21,780	21,600	21,470	22,380	21,780	19,880	19,380
21	18,340	17,870	21,520	21,600	21,470	21,730	21,500	21,400	22,380	21,680	19,860	19,310
22	18,360	17,800	21,520	21,580	21,760	21,760	21,470	21,290	22,380	21,630	19,720	19,310
23	18,320	17,820	21,550	21,550	21,650	21,780	21,420	21,290	22,320	21,630	19,640	19,260
24	18,320	17,820	21,520	21,550	21,730	21,810	21,400	21,270	22,350	21,520	19,600	19,120
25	18,410	17,820	21,580	21,680	21,780	21,830	21,220	21,320	22,320	21,470	19,550	19,120
26	18,410	17,850	21,500	21,650	21,810	21,270	21,240	21,270	22,480	21,420	19,500	19,100
27	18,410	17,940	21,500	21,700	21,780	21,090	21,190	21,220	22,480	21,370	19,480	19,050
28	18,390	17,710	21,550	21,780	21,780	21,600	21,190	21,160	22,530	21,290	19,430	19,050
29	18,390	17,670	21,600	21,810	---------	21,910	21,340	21,110	22,560	21,220	19,450	19,050
30	18,270	17,650	21,680	21,500	----------	21,270	21,650	21,060	22,560	21,160	19,430	18,960
31	18,250	----------	21,780	21,520	----------	21,500	----------	21,010	----------	21,060	19,410	----------
(†)	455.15	454.89	456.59	456.49	456.59	456.48	456.54	456.29	456.89	456.31	455.64	455.45
(‡)	-110	-600	+4,130	-260	+260	-280	+150	-640	+1,550	-1,500	-1,650	-450

Water year 1960-61..... ‡ +600

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-500.5. Mountain Creek Lake near Grand Prairie, Tex.--Continued

Contents, in acre-feet, at 2400 hours, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18.910	19.260	20.290	21.420	21.830	21.780	21.700	21.500	20.470	21.680	21.420	20.020
2	19.340	19.260	20.260	21.420	21.830	21.810	21.680	21.550	20.440	21.650	21.780	20.000
3	19.310	19.240	20.290	21.500	21.880	21.810	21.700	21.550	20.440	21.630	21.340	19.980
4	19.290	19.190	20.210	21.500	21.880	21.780	21.880	21.520	20.420	21.550	21.450	20.090
5	19.260	19.050	20.420	21.420	21.780	21.700	21.600	21.520	20.360	21.470	21.400	20.310
6	19.220	19.000	20.440	21.450	21.780	21.730	21.630	21.420	20.420	21.400	21.320	20.600
7	19.190	18.980	20.390	21.420	21.810	21.780	21.680	21.400	20.340	21.340	21.240	20.780
8	19.170	18.960	20.440	21.370	21.780	21.780	21.580	21.320	20.600	21.270	21.190	20.140
9	19.480	18.960	21.400	21.370	21.780	21.780	21.600	21.240	20.850	21.220	21.140	20.830
10	19.550	19.000	21.800	21.370	21.780	21.830	21.780	21.220	21.090	21.140	21.110	21.030
11	19.720	18.960	21.400	21.400	21.830	21.760	21.760	21.160	21.190	21.060	21.030	21.090
12	19.790	18.960	21.400	21.420	21.810	21.700	21.730	21.090	21.190	20.960	20.980	21.110
13	19.720	18.910	21.400	21.420	21.810	21.680	21.730	20.980	21.140	20.880	20.880	21.110
14	19.670	18.930	21.370	21.470	21.780	21.730	21.680	20.930	21.090	20.780	20.800	21.090
15	19.640	19.030	21.400	21.520	21.960	21.730	21.600	20.850	21.030	20.650	20.720	21.010
16	19.620	18.930	21.270	21.550	21.960	21.680	21.600	20.830	20.980	20.670	20.670	20.980
17	19.570	18.930	21.420	21.580	22.040	21.700	21.550	20.750	20.900	20.650	20.620	20.930
18	19.520	18.930	21.420	21.600	21.940	21.730	21.550	20.720	20.850	20.620	20.570	20.780
19	19.450	18.930	21.450	21.550	21.940	21.730	21.550	20.670	20.830	20.600	20.490	20.720
20	19.430	18.930	21.470	21.600	21.940	21.700	21.520	20.620	20.780	20.540	20.470	20.650
21	19.410	19.050	21.550	21.680	21.940	21.700	21.500	20.570	20.700	20.520	20.430	20.570
22	19.410	19.520	21.470	21.650	21.910	21.680	21.550	20.470	20.650	20.470	20.390	20.520
23	19.360	19.980	21.450	21.680	21.550	21.680	21.810	20.490	20.600	20.420	20.350	20.440
24	19.360	20.140	21.470	21.700	21.550	21.680	21.580	20.440	20.540	20.360	20.310	20.390
25	19.240	20.260	21.550	21.780	21.600	21.600	21.580	20.310	20.850	20.360	20.270	20.570
26	19.220	20.260	21.470	21.810	21.780	21.600	21.600	20.260	20.900	20.700	20.230	20.520
27	19.220	20.210	21.470	21.810	21.760	21.630	21.290	20.210	20.960	21.470	20.190	20.520
28	19.240	20.210	21.470	21.810	21.730	21.680	21.470	20.310	21.030	21.600	20.160	20.470
29	19.190	20.210	21.450	21.830	---------	21.470	21.700	20.440	21.240	21.580	20.090	20.440
30	19.220	20.260	21.450	21.830	----------	21.450	21.060	20.420	21.550	21.520	20.120	20.360
31	19.240	----------	21.400	21.830	----------	21.810	----------	20.490	----------	21.450	19.950	----------
(†)	455.57	456.00	456.44	456.61	456.57	456.60	456.31	456.09	456.50	456.46	455.87	456.04
(‡)	+280	+1,020	+1,140	+430	-100	+80	-750	-570	+1,060	-100	-1,500	+410

Calendar year 1961..... ‡ -380
Water year 1961-62..... ‡ +1,400

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-500.5. Mountain Creek Lake near Grand Prairie, Tex.--Continued

Contents, in acre-feet, at 2400 hours, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20,290	19,900	20,850	21,140	21,030	20,750	20,240	22,320	22,500	21,760	20,440	19,050
2	20,260	19,860	20,930	21,140	20,930	20,720	20,190	22,350	22,480	21,700	20,360	19,000
3	20,260	19,810	20,960	21,110	20,960	20,750	20,050	22,380	22,430	21,680	20,310	18,980
4	20,210	19,830	20,900	21,240	20,960	20,720	20,020	22,380	22,350	21,600	20,210	18,960
5	20,190	19,790	20,900	21,220	20,960	20,700	20,140	22,580	22,300	21,630	20,160	18,880
6	20,140	19,790	20,980	21,220	20,960	20,650	20,190	22,300	22,270	21,550	20,090	18,840
7	20,120	19,980	20,880	21,240	20,960	20,650	20,190	22,530	22,200	21,500	20,020	18,770
8	20,360	19,980	20,830	21,270	20,960	20,670	20,140	22,530	22,120	21,420	20,000	18,720
9	20,390	19,950	20,830	21,290	20,960	20,650	20,140	22,580	22,070	21,290	19,950	18,670
10	20,420	20,020	20,850	21,160	20,900	20,700	20,120	22,500	21,940	21,240	19,900	18,620
11	20,390	19,860	20,700	21,030	20,900	20,700	20,070	22,430	21,910	21,190	19,860	18,580
12	20,340	19,860	20,720	21,010	20,900	20,700	20,020	22,380	21,860	21,160	19,790	18,580
13	20,340	19,830	20,750	21,030	20,900	20,570	20,020	22,320	21,810	21,060	19,720	18,550
14	20,360	19,860	20,750	21,030	20,880	20,600	20,020	22,250	21,760	21,580	19,760	18,510
15	20,290	19,860	20,720	21,030	20,850	20,650	20,000	22,220	21,700	21,700	19,810	18,460
16	20,260	19,720	20,720	21,030	20,850	20,650	19,950	22,140	21,760	21,630	19,760	18,410
17	20,210	19,720	20,720	21,090	20,850	20,650	19,900	22,010	21,760	21,500	19,670	18,360
18	20,190	19,690	20,750	21,060	20,880	20,720	19,900	21,960	21,730	21,450	19,620	18,340
19	20,160	19,720	20,780	21,030	20,900	20,600	19,810	21,880	21,730	21,400	19,570	18,320
20	20,090	19,830	21,030	21,030	20,780	20,570	19,810	21,880	21,630	21,290	19,520	18,290
21	20,020	19,830	21,090	21,110	20,780	20,520	19,810	21,830	21,550	21,240	19,450	18,270
22	19,980	19,810	21,090	20,960	20,780	20,520	19,670	21,780	21,500	21,160	19,430	18,200
23	19,880	19,810	21,030	20,960	20,780	20,520	19,600	21,760	21,420	21,090	19,380	18,150
24	19,860	19,930	21,090	20,960	20,780	20,520	19,740	21,760	21,370	20,980	19,310	18,080
25	19,810	19,980	21,030	20,960	20,780	20,390	19,740	21,780	21,320	20,850	19,260	18,010
26	19,790	20,440	21,090	20,900	20,780	20,390	20,090	21,760	21,270	20,780	19,190	17,980
27	19,810	20,670	21,090	20,930	20,780	20,360	21,030	21,730	21,190	20,720	19,170	18,010
28	20,020	20,780	21,160	20,960	20,750	20,390	22,350	21,730	21,160	20,650	19,100	18,010
29	20,000	20,800	21,110	20,980	---------	20,340	21,780	21,680	21,090	20,600	19,000	18,100
30	19,930	20,830	21,140	21,010	----------	20,340	22,270	22,320	21,600	20,540	19,000	18,080
31	19,930	----------	21,140	21,030	----------	20,260	----------	22,530	----------	20,490	19,050	----------
(†)	455.86	456.22	456.34	456.30	456.19	456.00	456.78	456.88	456.52	456.09	456.49	456.08
(‡)	-430	+900	+310	-110	-280	-490	+2,010	+260	-930	-1,110	-1,440	-970

Calendar year 1962..... ‡ -260
Water year 1962-63..... ‡ -2,280

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-500.5. Mountain Creek Lake near Grand Prairie, Tex.--Continued

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18.030	16.850	16.560	16.650	17.310	17.310	21.650	21.650	22.900	21.420	19.480	18.250
2	18.010	16.820	16.540	16.780	17.310	17.380	21.630	21.630	22.930	21.370	19.410	18.200
3	17.980	16.800	16.540	16.620	17.220	17.340	21.550	21.630	22.930	21.290	19.310	18.170
4	17.960	16.800	16.510	16.620	17.420	17.400	21.500	21.600	22.980	21.220	19.240	18.130
5	17.910	16.780	16.510	16.620	17.470	17.420	21.780	21.650	22.840	21.160	19.170	18.150
6	17.890	16.760	16.560	16.620	17.420	17.420	21.810	21.630	22.810	21.090	19.080	18.100
7	17.870	16.740	16.510	16.620	17.420	17.420	21.600	21.600	22.760	21.010	19.000	18.030
8	17.850	16.690	16.450	16.580	17.400	17.710	21.580	21.500	22.680	20.900	18.930	17.980
9	17.820	16.690	16.450	16.560	17.380	19.640	21.550	21.520	22.610	20.830	18.880	17.960
10	17.780	16.670	16.690	16.560	17.340	20.700	21.550	21.580	22.580	20.720	18.840	17.910
11	17.740	16.650	16.690	16.470	17.360	20.700	21.630	21.450	22.530	20.650	18.700	17.820
12	17.710	16.620	16.710	16.420	17.470	20.750	21.520	21.370	22.480	20.490	18.600	17.760
13	17.670	16.580	16.600	16.450	17.490	20.880	21.520	21.320	22.450	20.440	18.550	17.690
14	17.620	16.560	16.670	16.450	17.490	20.650	21.500	21.270	22.380	20.390	18.530	17.650
15	17.600	16.600	16.670	16.560	17.450	20.650	21.500	21.240	22.320	20.290	18.700	17.600
16	17.560	16.600	16.670	16.740	17.450	20.620	21.500	21.190	22.320	20.260	18.720	17.820
17	17.540	16.510	16.650	16.780	17.450	20.620	21.470	21.160	22.300	20.190	18.860	17.820
18	17.490	16.510	16.650	16.890	17.420	20.700	21.470	21.140	22.220	20.160	18.840	17.800
19	17.470	16.690	16.650	16.850	17.400	21.760	21.500	21.110	22.140	20.090	18.810	17.760
20	17.450	16.690	16.650	16.850	17.380	21.650	21.450	21.060	22.040	20.020	18.790	18.150
21	17.400	16.690	16.620	16.870	17.380	21.680	20.090	21.030	21.940	19.980	18.720	18.510
22	17.380	16.600	16.650	16.890	17.400	21.700	21.500	20.960	21.880	19.900	18.720	18.620
23	17.380	16.600	16.670	16.890	17.340	21.680	21.400	20.930	21.780	19.830	18.700	18.600
24	17.340	16.580	16.670	16.850	17.360	21.780	21.630	20.880	21.760	19.760	18.670	18.580
25	17.140	16.560	16.740	16.850	17.340	21.630	21.810	20.830	21.760	19.690	18.600	18.510
26	17.110	16.540	16.670	16.820	17.310	21.650	21.600	20.780	21.700	19.620	18.550	18.620
27	17.110	16.560	16.670	16.760	17.290	21.650	21.630	20.750	21.650	19.550	18.550	19.050
28	17.020	16.580	16.670	16.740	17.290	21.520	21.650	20.650	21.600	19.500	18.460	19.100
29	17.000	16.600	16.650	16.910	17.310	21.470	21.630	20.930	21.550	19.640	18.390	19.100
30	16.980	16.580	16.650	17.220	----------	21.520	21.600	23.960	21.500	19.620	18.340	19.080
31	16.850	----------	16.650	17.270	----------	21.550	----------	22.870	----------	19.550	18.290	----------
(†)	454.53	454.41	454.44	454.72	454.74	456.50	456.52	457.01	456.48	455.70	455.17	455.50
(‡)	-1,230	-270	+70	+620	+40	+4,240	+50	+1,270	-1,370	-1,950	-1,260	+790

Calendar year 1963..... ‡ -4,490
Water year 1963-64..... ‡ +1,000

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-501. Mountain Creek at Grand Prairie, Tex.

Location.--Lat 32°44'52", long 96°55'33", on right bank at downstream side of downstream bridge on Jefferson Street, 1,000 ft upstream from bridge on U. S. Highway 80, 1.2 miles upstream from Texas and Pacific Railroad Co. bridge, 1.5 miles downstream from Mountain Creek Lake Dam, and 4.4 miles east of Grand Prairie, Dallas County.

Drainage area.--298 sq mi.

Records available.--October 1960 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 407.31 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 5,160 cfs Apr. 22 (gage height, 15.44 ft); no flow Jan. 25-28.
1960-64: Maximum discharge, 8,160 cfs Apr. 28, 1963 (gage height, 18.40 ft); no flow Jan. 25-28, 1964.

Remarks.--Records good. Flow regulated by Mountain Creek Lake 1.5 miles upstream.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 9-17, 20)

2.4	0	3.8	44
2.5	.1	4.0	68
2.6	.7	4.5	135
2.7	2.3	5.0	210
2.8	3.9	6.0	418
3.0	6.6	8.0	970
3.2	10	10.0	1,780
3.4	15	12.0	2,880
3.6	26	14.0	4,180

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	0.3	0.3	0.1	0.3	0.2	2.2	1.0	3.2	*0.6	0.7	1.3
2	.5	.3	*.3	.1	.2	.2	3.6	1.5	1.0	.6	.6	1.1
3	.5	.3	.3	.1	.1	.2	1.5	1.8	.6	.6	.6	.7
4	.5	.3	.3	.1	.3	.2	.7	1.6	.5	.6	.4	.5
5	.5	.3	.3	.1	.3	.2	1.8	1.6	*.5	.6	.5	.5
6	.4	.3	.3	.1	*.2	.2	.7	2.2	2.5	.6	*2.6	.6
7	.4	.3	.3	.1	.2	.2	.6	2.3	1.3	.6	2.2	.6
8	.5	.3	.2	.1	.1	.6	.6	137	1.8	.6	.7	.6
9	.5	.3	.3	.1	.1	11	.6	3.4	1.8	.6	.5	*1.3
10	.4	.3	1.0	** .1	.1	1.5	.6	.8	1.5	.5	.4	1.5
11	.4	.3	.6	.1	.1	.4	.5	.6	1.1	.5	.4	1.5
12	.4	.3	.6	.1	.2	.3	.7	.5	1.0	.5	.3	2.2
13	.4	.3	.5	.1	.3	*.3	1.0	.5	.8	.4	.4	3.3
14	.3	.3	.5	.1	.2	.5	.7	.5	.8	.5	.4	2.9
15	.3	.3	.5	.1	.2	.2	.7	.5	.8	.4	.6	1.6
16	.3	.3	.5	.3	.1	.2	.7	.4	1.0	.4	.7	1.3
17	.3	.3	.4	.3	.1	.2	.7	.4	.8	.4	2.2	2.2
18	.3	.2	.3	.3	.1	.3	.7	.4	1.0	.3	1.6	1.3
19	.3	.4	.3	.3	.1	273	.5	.4	1.1	.3	.8	.8
20	.3	.3	.4	.1	.1	550	.5	.4	1.0	.3	.7	2.0
21	.3	.3	.3	.1	.1	4.9	1,760	.3	.8	.3	.7	c 5
22	.3	.2	.3	.1	.2	4.2	3,580	.3	.7	.3	1.3	c 3
23	.3	.2	.3	.1	.2	3.6	251	.4	.6	.3	1.1	c 2
24	.4	.3	.3	.1	.1	2.0	3.1	.3	.6	.3	.8	1.5
25	*.4	.3	.2	0	.1	2.9	1.1	.3	.6	.2	.8	1.1
26	.3	.3	.2	0	.1	2.8	442	.2	.6	.3	1.3	1.3
27	.3	.3	.1	0	.2	2.8	4.0	.2	.6	.5	1.5	6.8
28	.3	.5	.1	0	.2	2.2	1.3	.2	.6	.6	1.8	3.1
29	.3	.3	.1	.1	.2	2.0	*1.0	.7	.6	.5	1.6	2.0
30	.3	.3	.1	.8	----------	1.6	1.0	353	.6	1.3	1.5	1.6
31	.3	----------	.1	.4	----------	2.3	----------	1,150	----------	.8	1.3	----------
Total	11.5	9.0	10.3	4.5	4.8	871.2	6,064.1	1,663.7	35.4	15.3	31.0	55.2
Mean	0.37	0.30	0.33	0.15	0.17	28.1	202	53.7	1.18	0.49	1.00	1.84
Ac-ft	23	18	20	8.9	9.5	1,730	12,030	3,300	70	30	61	109

Calendar year 1963: Max 3,930 Min 0.1 Mean 21.9 Ac-ft 15,840
Water year 1963-64: Max 3,580 Min 0 Mean 24.0 Ac-ft 17,410

* Discharge measurement made on this day.
** Field estimate made on this day.
c Backwater from West Fork Trinity River.

8-502. Elm Fork Trinity River subwatershed No. 6-0 near Muenster, Tex.

Location.--Lat 33°37'13", long 97°24'15", near center of earth-fill dam on unnamed tributary of Elm Fork Trinity River, 1.0 mile west of Farm Road 373 and 2.6 miles southwest of Muenster, Cooke County.

Drainage area.--0.77 sq mi.

Records available.--October 1956 to September 1964.

Gage.--Water-stage recorder and flat-crested weir on concrete drop inlet. Datum of gage is 941.75 ft above mean sea level, datum of 1929 (Soil Conservation Service bench mark).

Average outflow.--8 years, 273 acre-ft per year).

Extremes.--Maximum outflow during year, 6.9 cfs Sept. 27 (gage height, 21.78 ft); no outflow at times. Maximum inflow, 261 cfs (average for 15-minute interval) Sept. 21, computed from outflow and change in pool contents, adjusted for rainfall on pool surface during time of peak inflow.

1956-64: Maximum outflow, 14.1 cfs Apr. 29, 1957 (gage height, 28.77 ft); maximum gage height, 30.77 ft, from floodmarks, May 3, 1958; no outflow for many days each year. Maximum inflow, 842 cfs (average for 15-minute interval) Oct. 3, 1959.

Remarks.--Records fair. Records of daily discharge are outflow from pool, determined from stage-discharge relation for outlet structure. Pool is formed by earthen dam; dam completed and storage began in August 1956. Outlet structure is a 2.5-foot square concrete drop inlet connected to a 17-inch concrete pipe which has a steel baffle plate over entrance with an 8-inch circular opening. Top of drop outlet is at gage height 19.83 ft, emergency spillway at gage height 34.2 ft. There is a valve controlled 8-inch diameter water supply outlet at bottom of drop inlet at gage height 9.33 ft. Pool capacity, 290 acre-ft at emergency spillway crest, 84.0 acre-ft at top of drop inlet, and 22.9 acre-ft at controlled outlet pipe. Records of suspended sediment loads for the water year 1964 are available in the Austin District Office. Recording rain gage located at station.

Pool water budget, in acre-feet, water year October 1963 to September 1964

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Inflow[1/]	0	0.5	0.4	0.8	1.2	8.2	8.9	7.7	0.7	0.	0.2	97.8
Outflow	0	0	0	0	0	0	0	0	0	0	0	55.9
(††)	1.05	2.59	1.54	2.43	.66	2.69	2.72	4.62	.98	.02	4.33	9.35

Calendar year 1963: Inflow 56.7 Outflow 88.1 †† 19.32
Water year 1963-64: Inflow 127 Outflow 55.9 †† 32.98

1/ Inflow adjusted for rainfall on pool and for pool losses.
†† Weighted mean rainfall, in inches.

8-503. Elm Fork Trinity River near Muenster, Tex.

Location.--Lat 33°36'37", long 97°22'58", on left bank 40 ft upstream from bridge on Farm Road 373, 2.5 miles south of Muenster, Cooke County, 2.5 miles downstream from Long Branch, and 6.5 miles upstream from Brushy Elm Creek.
Drainage area.--46.0 sq mi.
Records available.--October 1956 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 889.33 ft above mean sea level, datum of 1929 (Soil Conservation Service bench mark).
Average discharge.--8 years, 17.6 cfs (12,740 acre-ft per year).
Extremes.--Maximum discharge during year, 970 cfs Sept. 21 (gage height, 9.08 ft); no flow for many days.
1956-64: Maximum discharge, 5,900 cfs May 1, 1958 (gage height, 20.20 ft), from rating curve defined by current-meter measurements below 1,300 cfs; no flow at times.
Maximum stage since at least 1900, about 23 ft in May 1935, from information by local resident.
Remarks.--Records good, At end of year, flow from 31.0 sq mi above this station was partly controlled by 11 floodwater-retarding structures with a total combined capacity of 11,560 acre-ft below the flood spillway crests, of which 9,840 acre-ft is floodwater-retarding capacity and 1,720 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Station operated as part of Elm Fork Trinity River basin hydrologic cooperative program to evaluate rainfall-runoff relation, soil conservation practices, and the effects of flood-retarding structures. Recording rain gage located at station. Records of suspended sediment loads and water temperatures for the water year 1964 are available in the Austin District Office.
Revisions.--Revised figures of discharge, in cubic feet per second, for the period Mar. 17, 1961, superseding previously published figures, are given herewith:

Mar. 17, 1961..... 137

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
March 1961.....	1,542.0	239	7.2	49.7	3,060
Water year 1960-61.....	3,742.7	239	0	10.3	7,420

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

2.6	0	3.2	14	4.0	78
2.7	.2	3.4	26	4.5	131
2.8	.8	3.6	41	5.0	193
2.9	3.0	3.8	58	6.0	350
3.0	6.0				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.1	0.1	0.1	0.2	0.9	1.2	0.7		0	0
2		0	.1	0	.1	.3	.8	1.1	.4		0	0
3		0	.1	0	.1	.7	.9	.9	.4		0	.1
4		0	.1	0	.2	2.7	.9	.8	*.3		0	.1
5		0	*.1	0	.2	.7	2.6	.8	.3		0	.1
6		0	.1	0	.2	.6	1.2	.9	.2		0	.1
7		0	.1	0	.2	.6	.8	.9	.2	(*)	0	.1
8		0	.1	0	.2	.6	.7	1.5	.1		0	.1
9		0	.1	0	.1	2.1	.6	1.4	.1		0	.1
10		0	.5	0	.1	1.6	.4	21	.1		0	.1
11		0	.2	0	.1	*1.1	.4	7.8	.1		0	.1
12		0	.1	0	.1	.9	.4	*2.4	.1		0	.1
13		0	.1	.1	.2	.8	.4	2.1	.1		*0	.1
14		0	.1	.1	.2	.8	.4	1.6	.1		0	.1
15		0	.1	.1	.2	.7	*.4	1.4	.1		0	**.1
16		0	.1	*.1	.1	.7	.5	1.2	.1		.2	72
17		0	.1	.1	.2	.6	.5	1.1	.1		0	*5.6
18		0	.1	.1	*.2	.7	.5	.8	.1		.1	.9
19		1.5	.1	.1	.2	3.1	.6	.7	.1		0	.8
20		.1	.1	.1	.2	1.8	.6	.6	.1		0	.7
21		.1	.1	.1	.2	1.2	.6	.6	0		0	*227
22	(*)	.1	.1	.1	.2	1.1	.6	.6	0		.2	*252
23		.1	.1	.1	.2	1.1	.6	.6	0		.1	141
24		.1	.1	.1	.2	1.1	1.2	.5	0		0	111
25		.1	.1	.1	.2	1.1	25	.5	0		0	100
26		.1	.1	.1	.2	1.1	7.1	.5	0		.1	96
27		.1	.1	.1	.2	.9	3.3	.8	0		.1	262
28		.1	.1	.1	.2	.9	2.1	.7	0		0	142
29		.1	.1	.1	.2	.9	1.8	1.7	0		0	120
30		.1	.1	.5	----------	.8	1.4	15	0		0	99
31		----------	.1	.2	----------	.8	----------	1.7	----------		0	----------
Total	0	2.6	3.6	2.5	5.0	32.3	58.2	73.4	3.8	0	0.8	1631.3
Mean	0	0.09	0.12	0.08	0.17	1.04	1.94	2.37	0.13	0	0.03	54.4
Ac-ft	0	5.2	7.1	5.0	9.9	64	115	146	7.5	0	1.6	3,240
(†)	854	819	833	898	886	1,120	1,270	1,390	1,310	1,090	974	2,350
(††)	0.73	2.32	1.92	2.45	0.84	2.60	3.15	4.56	1.15	0.09	3.80	10.41

Calendar year 1963: Max 189 Min 0 Mean 5.41 Ac-ft 3,910 †† 19.65
Water year 1963-64: Max 262 Min 0 Mean 4.95 Ac-ft 3,690 †† 34.02

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
† Total contents, in acre-feet, at end of month, in Soil Conservation Service reservoirs above station.
†† Weighted mean rainfall, in inches, during month.

8-505. Elm Fork Trinity River near Sanger, Tex.

Location.--Lat 33°23'11", long 97°05'05", on right bank on downstream side of pier of bridge on Farm Road 455, 4.1 miles downstream from Spring Creek, 5.0 miles upstream from Isle du Bois Creek, and 5.4 miles northwest of Sanger, Denton County.
Drainage area.--381 sq mi.
Records available.--April 1949 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 553.93 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942 (Corps of Engineers bench mark). Prior to May 7, 1955, at site 500 ft downstream at same datum.
Average discharge.--15 years, 123 cfs (89,050 acre-ft per year).
Extremes.--Maximum discharge during year, 6,300 cfs Sept. 23 (gage height, 22.9 ft); no flow for many days. 1949-64: Maximum discharge, 27,500 cfs May 2, 1958 (gage height, 29.10 ft, from floodmarks); no flow at times.
Maximum stage since at least 1903, 30.7 ft in May 1908, from information by local residents. Flood of May 18, 1935, reached a stage of 29.7 ft, from floodmarks.
Remarks.--Records good except those for periods of no gage-height record, which are fair. At end of year, flow from 94.6 sq mi above this station was partly controlled by 41 floodwater-retarding structures with a total combined capacity of 30,920 acre-ft below the flood spillway crests, of which 26,680 acre-ft is floodwater-retarding capacity and 4,240 acre-ft is sediment-pool capacity. Twelve structures were built during the current year and have a total combined capacity below flood spillway crests of 2,600 acre-ft, of which 307 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

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

Oct. 1 to Jan. 31

1.7	0	2.1	4.8
1.75	.1	2.2	7.5
1.8	.3	2.4	15
1.9	1.2	2.6	24
2.0	2.7	3.0	46

Feb. 1 to Sept. 30

1.70	0	2.5	30
1.73	.1	3.0	66
1.76	.2	4.0	180
1.8	.4	7.0	630
1.9	1.2	11.0	1,240
2.0	3.0	15.0	2,260
2.1	6.0	19.0	3,730
2.2	10		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	0.7	4.5	1.8	18	2.6	3.5	7	50	1.0	0	0.6
2	.6	.7	5.3	1.8	6.4	4.0	3.5	10	*25	1.2	0	.2
3	.7	1.8	6.0	.8	4.4	3.8	3.5	8	17	1.4	0	0
4	.6	1.9	6.3	.3	*6.0	4.6	3.5	7	13	1.2	0	0
5	.7	1.8	6.6	.3	12	31	3.5	6	10	.7	0	0
6	.9	1.9	6.3	1.0	12	22	3.5	25	8.7	*.4	*0	0
7	.8	2.1	6.9	*.6	5.2	10	3.5	10	7.4	.7	0	0
8	.7	1.9	7.5	.9	4.0	6.9	3.5	7	5.6	.7	0	0
9	.6	1.4	7.5	1.6	4.0	743	3.5	8	5.0	.3	0	0
10	.5	1.2	9.0	1.0	3.5	157	3.5	100	4.6	.1	*0	0
11	.5	1.5	17	2.4	2.8	*49	3.5	60	3.8	.1	0	0
12	.4	1.1	11	2.6	2.8	26	3.5	40	3.8	0	0	0
13	.2	2.6	4.8	2.6	3.2	16	3.5	25	3.5	0	0	0
14	.2	4.3	2.7	2.7	3.0	11	* 3.2	*18	4.0	0	0	*0
15	.1	4.1	2.2	2.9	3.8	7.8	3.5	12	5.2	0	.2	0
16	0	2.9	1.9	4.5	2.8	6.0	3.5	9.2	4.4	0	1.5	652
17	.1	2.9	1.9	4.5	2.4	5.2	3.2	12	23	0	.1	*1,710
18	1.2	3.5	1.8	4.3	2.4	5.0	3.2	5.2	15	0	1.9	76
19	.6	4.8	1.8	5.0	1.9	704	3.8	5.0	3.2	0	1.2	28
20	.2	6.8	1.8	5.0	1.0	268	3.8	4.0	2.2	0	1.2	20
21	.1	10	1.9	4.8	.9	90	4.6	4.0	2.2	0	1.6	3,050
22	0	5.8	1.9	4.3	.9	25	73	4.6	1.9	0	46	2,690
23	*1.2	3.9	1.8	4.1	1.9	17	124	4.4	1.7	0	48	3,540
24	4.5	3.1	1.8	3.9	2.0	14	21	4.0	2.2	0	2.6	630
25	1.8	2.2	1.8	3.9	2.2	10	1,610	4.6	2.2	0	1.2	266
26	1.5	2.4	1.9	3.7	2.0	8	100	3.8	2.0	0	.8	110
27	1.4	*2.6	1.9	3.3	2.0	6	35	3.5	1.7	0	.8	1,690
28	1.4	3.3	1.9	3.3	2.2	5	15	20	1.7	0	2.3	1,450
29	1.1	4.5	1.8	3.9	2.4	4	10	11	1.2	0	2.6	272
30	1.4	4.3	1.9	6.0	----------	4	8	615	1.0	0	1.2	50
31	1.2	----------	1.8	25	----------	4	----------	150	----------	0	.8	----------
Total	25.8	92.0	133.2	112.8	118.1	2,269.9	2,070.3	1,203.3	232.2	7.8	114.0	16,234.8
Mean	0.83	3.07	4.30	3.64	4.07	73.2	69.0	38.8	7.74	0.25	3.68	541
Ac-ft	51	182	264	224	234	4,500	4,110	2,390	461	15	226	32,200

Calendar year 1963: Max 2,500 Min 0.1 Mean 35.6 Ac-ft 25,750
Water year 1963-64: Max 3,540 Min 0 Mean 61.8 Ac-ft 44,860

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record Mar. 21 to Apr. 13, Apr. 26 to May 13, Sept. 30; Computed from once-daily wire-weight gage readings Sept. 17-25, 26-29.

8-510. Isle du Bois Creek near Pilot Point, Tex.

Location.--Lat 33°24'23", long 97°00'45", on left bank at downstream side of bridge on Farm Road 372, 2.4 miles downstream from Wolf Creek, 3.0 miles west of Pilot Point, Denton County, and 6.3 miles upstream from mouth.

Drainage area.--266 sq mi.

Records available.--April 1949 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 555.48 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942 (Corps of Engineers bench mark). Prior to Feb. 8, 1958, at site 1 mile upstream at datum 4.22 ft higher.

Average discharge.--15 years, 96.7 cfs (70,010 acre-ft per year).

Extremes.--Maximum discharge during year, 4,050 cfs Sept. 22 (gage height, 21.43 ft); no flow at times.
1949-64: Maximum discharge, 22,700 cfs Apr. 26, 1957 (gage height, 28.2 ft, present site and datum); no flow at times in each year.
Maximum stage since at least 1900, 30.4 ft in May 1908, present site and datum, from information by local resident.

Remarks.--Records good. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 4-6)

1.4	0	3.0	116
1.5	.3	4.0	195
1.6	1.2	7.0	491
1.7	2.5	10.0	924
1.8	4.8	14.0	1,730
2.0	13	18.0	2,760
2.2	26	21.0	3,860
2.5	55		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0	0.2	0	1.1	8.8	168	0.1	0	0
2				0	.1	1.4	.7	6.4	*22	.2	0	0
3				0	0	.5	1.1	4.5	8.8	.2	0	0
4				0	*.1	.1	1.4	2.9	4.2	.1	0	0
5				0	.6	.1	1.3	2.2	2.5	.1	0	0
6				0	.2	0	.6	2.4	1.8	0	0	0
7				*0	0	0	.3	4.7	1.3	*0	0	0
8				0	0	1.0	.2	18	.9	0	0	0
9				0	0	*38	.2	60	.6	0	0	0
10				0	0	230	.2	51	.5	0	*0	0
11				0	0	89	.2	18	.3	0	0	0
12				0	0	40	.2	*6.4	.4	0	0	0
13				0	.1	12	.4	2.7	.2	0	0	0
14				0	.2	4.0	.2	1.8	.1	0	0	*0
15				0	.1	1.8	*.1	1.6	.1	0	0	0
16				0	0	.8	.1	1.2	16	0	0	534
17				0	0	.4	.4	.7	646	0	0	1,770
18				0	0	.3	.6	.5	873	0	0	1,320
19				0	0	591	.7	.2	54	0	0	60
20				0	0	1,560	.8	.2	16	0	0	20
21				0	0	270	.9	.1	7.2	0	.4	g2,400
22	(*)			0	0	27	9.1	.2	3.5	0	51	g3,720
23				0	0	11	368	.3	2.2	0	2.5	g2,410
24				0	0	5.4	295	.1	1.4	0	.5	g1,080
25				0	0	3.0	1,890	.1	.9	0	0	g108
26				0	0	1.8	1,380	.2	.6	0	0	20
27		(*)		0	0	1.4	666	.5	.2	0	0	80
28				0	0	1.1	89	.5	.1	0	0	g1,230
29				0	0	.9	26	1.8	.1	0	0	g508
30				0	----------	.7	13	1,040	.1	0	0	g140
31		----------		.1	----------	.7	----------	872	----------	0	0	----------
Total	0	0	0	0.1	1.6	2,893.4	4,747.8	2,110.0	1,833.0	0.7	54.4	15,400
Mean	0	0	0	0.003	0.06	93.3	158	68.1	61.1	0.02	1.75	513
Ac-ft	0	0	0	0.2	3.2	5,740	9,420	4,190	3,640	1.4	108	30,550

Calendar year 1963: Max 1,450 Min 0 Mean 20.3 Ac-ft 14,670
Water year 1963-64: Max 3,720 Min 0 Mean 73.9 Ac-ft 53,650

Peak discharge (base, 2,500 cfs)

Date	Time	Gage height	Discharge
9-22	1200	21.43	4,050

* Discharge measurement or observation of no flow made on this day.
g Computed from daily wire-weight gage readings.

8-515. Clear Creek near Sanger, Tex.

Location.--Lat 33°20'10", long 97°10'45", on right bank at downstream side of bridge on county road (formerly U. S. Highway 77), 1,000 ft downstream from Interstate Highway 35 and U. S. Highway 77, 1,350 ft downstream from Duck Creek, 1.1 miles upstream from Gulf, Colorado and Santa Fe Railway Co. bridge, and 1.8 miles south of Sanger, Denton County.

Drainage area.--295 sq mi.

Records available.--March 1949 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 587.23 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942 (Corps of Engineers bench mark).

Average discharge.--15 years, 63.3 cfs (45,830 acre-ft per year).

Extremes.--Maximum discharge during year, 4,130 cfs Sept. 22 (gage height, 14.37 ft); no flow for many days. 1949-64: Maximum discharge, 18,200 cfs Sept. 13, 1950 (gage height, 24.80 ft); no flow at times in each year.

Maximum stage since at least 1880, 31.5 ft in May 1908, from information by Gulf, Colorado and Santa Fe Railway Co. Flood in May 1935 reached a stage of 29.0 ft, from information by State Highway Department.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No large diversions above station. At end of year, flow from 87.8 sq mi above this station was partly controlled by 44 floodwater-retarding structures with a total combined capacity of 25,450 acre-ft below the flood spillway crests, of which 22,570 acre-ft is floodwater-retarding capacity and 2,880 acre-ft is sediment-pool capacity. Nine structures were built during the current year and have a total combined capacity below flood spillway crests of 3,990 acre-ft, of which 570 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

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

0.1	0	0.6	9.0	2.0	154
.2	.3	.7	15	3.0	318
.3	1.0	.8	22	5.0	738
.4	2.4	1.0	38	8.0	1,500
.5	4.8	1.4	79	10.0	2,180

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0	0	13	0.4	1.2	18	103		0	0
2		0	0	0	6.2	2.4	1.6	58	*45		0	0
3		0	0	0	3.9	2.8	2.0	21	35		0	0
4		0	0	0	*4.2	4.8	2.0	13	21		0	0
5		0	0	0	8.0	14	3.4	10	12		0	0
6		0	0	0	8.5	5.4	9.5	15	9.0	(*)	*0	0
7		0	0	*0	4.5	3.2	4.8	21	5.4		0	0
8		0	0	0	2.6	3.4	2.2	90	3.0		0	0
9		0	0	0	1.6	190	1.2	53	2.0		0	0
10		0	0	0	1.4	43	.7	22	1.6		*0	0
11		0	17	0	1.4	17	.6	81	1.3		0	0
12		0	11	0	1.4	*9.0	1.1	28	1.1		0	0
13		0	2.6	0	2.6	5.4	1.5	11	.9		0	0
14		0	.5	0	3.0	3.9	*.9	*7.0	a.8		0	*0
15		0	.1	0	2.8	2.8	.5	5.1	a.7		15	0
16		0	0	0	1.8	2.0	.3	3.6	a.6		336	410
17		0	0	0	1.4	1.4	.2	2.8	a.5		14	905
18		0	0	0	1.2	1.5	.2	2.0	a.4		17	127
19		0	0	0	1.3	121	.7	1.4	a.3		25	29
20		74	0	0	1.2	40	1.4	1.1	a.3		1.4	13
21	(*)	3.2	0	2.9	.9	12	2.4	.7	a.2		.1	2,070
22		.2	0	1.6	.6	7.0	239	.6	a.2		104	1,400
23		0	0	1.5	.5	5.4	201	.5	a.1		9.5	1,240
24		0	0	.9	.5	5.1	13	.4	a.1		.6	421
25		0	0	.4	.7	4.8	999	.4	a.1		0	262
26		0	0	.1	.9	3.4	876	.4	a.1		0	104
27		*0	0	0	.7	2.8	237	.5	a0		0	1,110
28		0	0	0	.6	2.4	79	1.7	a0		0	631
29		0	0	0	.4	1.8	46	66	a0		0	268
30		0	0	7.7	----------	1.3	32	1,220	a0		0	186
31		----------	0	59	----------	1.1	----------	244	----------		0	----------
Total	0	77.4	31.2	74.1	77.8	520.5	2,760.4	1,999.2	244.7	0	522.6	9,176
Mean	0	2.58	1.01	2.39	2.68	16.8	92.0	64.5	8.16	0	16.9	306
Ac-ft	0	154	62	147	154	1,030	5,480	3,970	485	0	1,040	18,200

Calendar year 1963: Max 1,530 Min 0 Mean 32.2 Ac-ft 23,280
Water year 1963-64: Max 2,070 Min 0 Mean 42.3 Ac-ft 30,720

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.

8-527. Little Elm Creek near Aubrey, Tex.

Location.--Lat 33°17'00", long 96°53'33", on left bank at downstream side of bridge on Farm Road 1385, 1 mile upstream from Mustang Creek, 5.5 miles east of Aubrey, Denton County, and 18 miles upstream from Lewisville Dam.

Drainage area.--75.5 sq mi.

Records available.--June 1956 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 534.76 ft above mean sea level (State Highway Department bench mark).

Average discharge.--8 years, 38.7 cfs (28,020 acre-ft per year).

Extremes.--Maximum discharge during year, 4,080 cfs Sept. 21 (gage height, 16.11 ft); no flow for many days. 1956-64: Maximum discharge, 7,830 cfs Apr. 26, 1957 (gage height, 17.34 ft); no flow at times each year. Maximum stage known since about 1900, 18.2 ft in May 1941, from information by local residents.

Remarks.--Records good. No diversion above station. Nine rain gages (6 standard and 3 recording) are operating in the basin above this station.

Corrections.--Corrected figures of annual second feet per square mile, for the water year 1963, superseding previously published figures, are given herewith:

Calendar year 1963..... 0.532 cfsm
Water year 1962-63..... 0.245 cfsm

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	0	1.8	14		0	0
2						0	0	1.2	5.2		0	0
3						0	0	.7	1.6		0	0
4						0	0	.5	*.7		0	0
5					(*)	0	0	.5	.4		0	0
6						0	0	3.6	.2		*0	0
7				(*)		0	0	6.3	.1	(*)	0	0
8						0	0	21	0		0	0
9						*0	0	37	0		0	0
10						0	0	12	0		*0	0
11						6.8	0	*3.6	0		0	0
12						3.0	0	1.3	0		0	0
13						.5	0	.4	0		0	0
14						.2	0	.1	0		0	*0
15						0	*0	0	0		0	0
16						0	0	0	0		16	519
17						0	0	0	0		2.6	1,420
18						0	0	0	0		.8	106
19						305	0	0	0		.3	13
20						322	0	0	0		.1	3.1
21						24	0	0	0		0	2,720
22						5.0	213	0	0		0	1,260
23	(*)					1.6	1,250	0	0		0	*695
24						.4	106	0	0		0	90
25						.2	682	0	0		0	20
26						0	186	0	0		0	65
27		(*)				0	94	0	0		0	522
28						0	24	0	0		0	253
29						0	8.1	19	0		0	37
30					----------	0	3.5	738	0		0	16
31		----------			----------	0	----------	105	----------		0	----------
Total	0	0	0	0	0	668.7	2,566.6	952.0	22.2	0	19.8	7,739.1
Mean	0	0	0	0	0	21.6	85.6	30.7	0.74	0	0.64	258
Cfsm	0	0	0	0	0	0.286	1.13	0.407	0.0098	0	0.0085	3.42
In.	0	0	0	0	0	0.33	1.26	0.47	0.01	0	0.01	3.81
Ac-ft	0	0	0	0	0	1,330	5,090	1,890	44	0	39	15,350
(††)	0.20	0.93	1.11	1.80	1.60	4.66	5.37	4.48	1.49	1.06	4.03	10.64

Calendar year 1963: Max 1,080 Min 0 Mean 13.5 Cfsm 0.179 In. 2.42 Ac-ft 9,750 †† 19.33
Water year 1963-64: Max 2,720 Min 0 Mean 32.7 Cfsm 0.433 In. 5.89 Ac-ft 23,740 †† 37.37

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-23	0130	15.42	2,410	9-17	0330	15.31	2,230
4-25	1600	14.12	1,170	9-21	1100	16.11	4,080
5-30	1200	14.20	1,170				

* Discharge measurement or observation of no flow made on this day.
†† Average rainfall, in inches, during month.

8-528. Garza-Little Elm Reservoir near Lewisville, Tex.

Location.--Lat 33°04'09", long 96°57'51", in intake structure of Lewisville Dam on Elm Fork Trinity River, 2 miles upstream from bridge on State Highway 121, 2.4 miles northeast of Lewisville, Denton County, and 12 miles upstream from Denton Creek.
Drainage area.--1,660 sq mi.
Records available.--November 1954 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929. Prior to May 17, 1955, staff gage at site 4,000 ft upstream at same datum.
Extremes.--Maximum contents during year, 542,500 acre-ft Sept. 28 (elevation, 518.18 ft); minimum, 307,200 acre-ft Feb. 29 (elevation, 507.00 ft).
1954-64: Maximum contents, 1,146,000 acre-ft June 3, 1957 (elevation, 535.57 ft); minimum since reservoir first filled in 1957, that of Feb. 29, 1964.
Remarks.--Reservoir is formed by a rolled earth-fill dam, 32,888 ft long including a 560-foot uncontrolled off-channel concrete gravity spillway with ogee weir section. Outlet works consists of a 16-foot diameter concrete conduit controlled by three 6.5- by 13-foot broome-type gates and two 60-inch steel pipes controlled by service valves. Deliberate impoundment of water began Nov. 1, 1954, and main dam was completed in August 1955. Figures given herein represent total contents. Reservoir built for flood control and water conservation. Capacity curve based on 1960 survey. At end of year, flow from 182.5 sq mi above this station was partly controlled by 85 floodwater-retarding structures with a total combined capacity of 56,370 acre-ft below the flood spillway crests, of which 49,250 acre-ft is floodwater-retarding capacity and 7,120 acre-ft is sediment-pool capacity. Nine structures were built during the current year and have a total combined capacity below flood spillway crests of 3,990 acre-ft, of which 570 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Crest of spillway	532.0	989,700
Top of designated power storage	515.0	464,500
Inverts of lowest intakes to wet wells	481.0	44,080
Invert of three 6.5- by 13-foot broome-type gates	448.0	0

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

Capacity table (elevation, in feet, and contents, in acre-feet)

507.0	307,200	515.0	464,500
509.0	340,800	517.0	512,600
511.0	377,100	519.0	563,600
513.0	419,300		

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	373,200	346,900	331,500	320,000	313,400	307,400	324,500	389,200	426,000	403,200	365,900	345,500
2	372,400	345,900	331,300	319,700	313,000	307,700	324,300	389,000	426,000	402,100	364,500	344,800
3	371,700	345,200	330,800	319,200	313,400	307,700	324,200	388,800	425,500	401,100	363,400	344,100
4	370,900	344,800	330,300	318,800	313,700	307,400	324,700	388,600	425,100	399,800	362,300	343,200
5	370,000	344,500	329,600	318,500	313,700	307,400	324,500	388,400	424,900	398,200	361,000	341,800
6	369,000	343,600	329,100	318,000	313,400	307,400	324,500	389,200	424,200	396,800	359,700	341,300
7	368,100	342,700	328,700	317,500	313,000	307,500	324,000	389,200	423,100	395,500	358,300	340,300
8	367,400	342,500	328,200	317,300	312,900	308,400	323,300	391,200	422,200	394,100	356,800	339,400
9	366,200	342,000	327,600	316,800	312,700	310,400	322,800	392,500	421,100	392,900	355,500	338,600
10	365,100	341,300	328,900	316,500	312,500	312,000	322,200	392,700	420,200	391,400	354,300	337,900
11	364,200	340,800	328,700	316,000	312,400	312,000	321,700	392,900	419,100	390,200	352,900	337,000
12	363,400	339,900	327,900	315,500	312,500	312,200	322,000	393,100	418,000	388,800	351,300	336,000
13	362,300	339,300	327,400	315,000	312,400	312,200	321,500	392,500	416,900	387,300	349,900	335,200
14	361,200	338,200	326,900	314,500	312,200	312,000	321,000	392,100	415,800	385,700	348,500	334,000
15	360,800	337,200	326,500	315,000	311,900	311,500	320,500	391,200	415,400	384,500	351,500	333,300
16	359,800	337,000	325,900	315,500	311,500	311,400	320,200	390,400	415,400	383,300	353,800	351,500
17	358,700	336,900	325,500	315,000	311,200	311,000	319,800	390,000	415,200	381,800	354,300	372,600
18	357,600	336,700	325,200	314,700	311,000	312,000	319,500	389,400	415,200	380,600	355,000	379,000
19	356,800	337,700	324,700	314,400	310,500	319,700	319,200	388,800	415,200	379,600	354,700	380,200
20	355,900	337,200	324,700	314,000	310,400	325,700	319,000	388,000	415,000	378,100	354,000	382,200
21	355,000	336,700	324,200	313,700	310,000	327,600	319,300	387,100	413,900	376,700	353,400	458,100
22	354,300	336,400	323,700	313,500	309,700	327,600	333,300	386,300	412,800	375,400	353,100	495,000
23	353,800	335,700	323,200	313,400	309,500	327,400	354,700	385,900	412,300	373,900	352,500	524,700
24	353,100	334,700	322,800	313,200	309,200	327,400	357,300	385,100	411,300	372,600	352,000	534,800
25	352,400	334,700	322,500	312,900	309,000	327,200	370,200	384,300	410,000	371,100	351,300	532,300
26	351,800	334,200	322,200	312,400	308,700	326,700	382,000	383,700	409,300	369,600	350,600	528,300
27	351,300	333,800	321,800	312,200	308,000	326,200	389,600	382,800	408,400	368,100	349,700	536,600
28	350,300	333,200	321,500	311,700	307,700	326,000	390,200	382,200	407,100	366,600	348,900	542,500
29	348,900	332,600	321,200	312,500	307,200	325,700	390,000	385,700	405,800	369,600	348,000	539,100
30	347,800	332,000	320,800	313,700	----------	325,000	389,800	418,400	404,500	368,900	347,100	531,000
31	347,600	----------	320,300	313,500	----------	324,500	----------	424,700	----------	367,500	346,400	----------
(†)	509.39	508.48	507.79	507.38	507.00	508.04	511.62	513.24	512.32	510.49	509.32	517.73
(‡)	-26,700	-15,600	-11,700	-6,800	-6,300	+17,300	+65,300	+34,900	-20,200	-37,000	-21,100	+184,600

Calendar year 1963..... ‡ -161,700
Water year 1963-64..... ‡ +156,700

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.
Note.--New capacity table, based on 1960 survey, put into use Oct. 1, 1963. Contents on Sept. 30, 1963, from new table, 374,300 acre-ft. Change in contents for October and for calendar year 1963 and water year 1963-64 based on new table.

8-530. Elm Fork Trinity River near Lewisville, Tex.

Location.--Lat 33°02'45", long 96°57'40", on left bank at downstream side of pier of bridge on State Highway 121, 1.8 miles east of Lewisville, Denton County, 1.9 miles downstream from Garza-Little Elm Reservoir, and 8.3 miles upstream from Denton Creek.

Drainage area.--1,673 sq mi.

Records available.--March 1949 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 432.39 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Jan. 6, 1950, wire-weight gage 0.6 mile upstream at datum 3.26 ft lower.

Average discharge.--15 years, 448 cfs (324,300 acre-ft per year), unadjusted.

Extremes.--Maximum peak discharge during year, 4,630 cfs Sept. 21 (gage height, 22.17 ft); a higher discharge and stage occurred at midnight, 4,930 cfs Sept. 30 (gage height, 22.88 ft), on a rising stage preceding a peak on Oct. 2, 1964; minimum daily discharge, 80 cfs Feb. 21-22.
1949-64: Maximum discharge, 21,700 cfs Sept. 15, 1950 (gage height, 30.75 ft); minimum daily, 0.8 cfs Jan. 19, 1955.
Maximum stage since at least 1907, 33.8 ft in 1908, present site and datum, from floodmarks.

Remarks.--Records good. Flow regulated by Garza-Little Elm Reservoir (see preceding page).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 14, June 30 to Sept. 20)

3.5	79	13.0	1,650
4.0	113	17.0	2,800
5.0	200	20.0	3,800
7.0	435	23.0	4,980
10.0	926		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*258	200	136	148	124	91	128	124	180	358	396	304
2	258	205	136	148	124	88	124	124	171	358	396	304
3	270	180	136	148	124	96	128	124	*158	358	396	298
4	292	*176	136	148	124	91	109	*120	162	358	396	270
5	310	195	136	148	116	91	102	110	162	358	396	270
6	310	195	136	148	113	99	120	106	190	358	396	264
7	310	195	140	148	106	96	113	96	210	346	396	226
8	310	171	140	144	106	85	106	102	231	346	396	264
9	310	162	*140	*140	106	99	116	99	253	370	396	270
10	310	180	136	140	*106	110	132	99	253	370	383	258
11	310	195	128	144	106	116	140	102	253	370	383	258
12	310	185	128	144	99	116	140	113	253	370	*370	258
13	334	162	128	166	96	110	140	120	264	*370	358	258
14	322	166	128	166	96	102	136	120	270	358	370	258
15	310	176	128	166	96	102	136	132	231	358	231	*248
16	304	176	128	166	96	*110	136	140	162	358	132	304
17	304	176	128	158	91	128	136	162	153	358	157	196
18	304	171	128	140	85	113	136	176	200	358	140	171
19	310	162	128	140	92	133	136	176	236	358	180	180
20	310	148	128	153	89	88	136	190	258	358	231	164
21	298	148	128	158	80	96	99	215	264	370	179	3,410
22	286	148	128	144	80	96	100	185	292	409	158	1,020
23	258	140	136	144	87	102	147	185	304	409	176	239
24	231	140	158	140	88	120	102	185	292	409	176	515
25	231	140	162	132	87	116	99	195	*322	409	185	1,740
26	280	140	158	132	91	99	102	220	322	409	215	3,020
27	275	136	148	132	88	106	102	210	334	409	248	3,290
28	253	136	148	140	96	106	113	190	304	409	248	3,460
29	231	136	148	140	102	113	124	171	322	396	253	4,090
30	220	136	148	128	----------	132	124	542	358	264	242	4,670
31	215	----------	148	124	----------	132	----------	171	----------	322	280	----------
Total	8,834	4,976	4,262	4,517	2,894	3,282	3,662	5,004	7,364	11,411	8,859	30,477
Mean	285	166	137	146	99.8	106	122	161	245	368	286	1,016
Ac-ft	17,520	9,870	8,450	8,960	5,740	6,510	7,260	9,930	14,610	22,630	17,570	60,450

Calendar year 1963: Max 3,560 Min 23 Mean 247 Ac-ft 179,000
Water year 1963-64: Max 4,670 Min 80 Mean 261 Ac-ft 189,500

* Discharge measurement made on this day.

8-535. Denton Creek near Justin, Tex.

Location.--Lat 33°07'08", long 97°17'25", on right bank at downstream side of bridge on Farm Road 156, 100 ft upstream from Gulf, Colorado and Santa Fe Railway Co. bridge, 2.2 miles north of Justin, Denton County, 3.0 miles upstream from Olivers Creek, 12.9 miles upstream from Harriet Creek, and 32.9 miles upstream from Grapevine Dam.

Drainage area.--400 sq mi.

Records available.--October 1949 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 606.66 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942.

Average discharge.--15 years, 75.2 cfs (54,440 acre-ft per year).

Extremes.--Maximum discharge during year, 4,680 cfs Apr. 22 (gage height, 14.15 ft, from floodmark); no flow at times.

1949-64: Maximum discharge, 29,800 cfs May 24, 1957 (gage height, 17.64 ft); no flow at times.

Flood in May 1935 was highest flood since 1908 and reached a stage of 20.6 ft at site about 1,500 ft upstream, from information by local resident. Flood in May 1908 reached a stage about 1 ft higher than flood in May 1935, from information by local resident.

Remarks.--Records good. Several small diversions above station. At end of year, flow from 38.6 sq mi above this station was partly controlled by 10 floodwater-retarding structures with a total combined capacity of 11,920 acre-ft below the flood spillway crests, of which 10,320 acre-ft is floodwater-retarding capacity and 1,600 acre-ft is sediment-pool capacity. Two structures were built during the current year and have a total combined capacity below flood spillway crests of 2,910 acre-ft, of which 380 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

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

1.15	0	1.5	4.4	3.0	101	8.0	1,040
1.2	.2	1.7	10	4.0	214	10.0	1,790
1.3	1.0	2.0	26	6.0	540	11.0	2,280
1.4	2.4	2.4	52				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0	0	1.1	16	198		0	0
2					0	0	1.1	15	106		0	0
3					0	0	1.2	13	52		0	0
4					0	11	1.1	11	26		0	0
5					*0	49	1.5	8.8	*115		0	0
6				(*)	0	16	1.5	13	24	(*)	0	0
7					.9	7.0	1.5	11	13		0	0
8					3.9	4.6	1.5	22	8.8		0	0
9					2.2	153	1.2	55	6.6		0	0
10					1.0	90	.9	20	6.4		0	0
11					.4	29	.7	13	5.8		*0	0
12					.1	12	.6	15	5.4		0	0
13					0	*7.0	.6	26	5.1		0	0
14					0	4.1	.7	*27	3.7		0	0
15					0	2.9	.8	17	3.1		0	*0
16					0	2.2	.7	9.8	3.1		0	106
17					0	1.9	*.8	6.6	4.1		0	216
18					0	1.9	.7	5.4	3.2		0	254
19					0	68	.6	4.6	1.8		0	105
20					0	21	.5	3.9	1.1		0	40
21					0	12	.5	2.9	1.0		0	547
22					0	6.1	774	2.8	.8		0	518
23	(*)				0	3.9	952	2.6	.4		0	552
24					0	3.1	42	2.2	.2		0	299
25					0	2.6	467	1.5	0		0	124
26		(*)			0	2.1	347	1.0	0		0	50
27					0	1.8	312	.8	0		2.6	260
28					0	1.6	93	.7	0		.4	272
29					0	1.5	41	2.1	0		0	152
30					----------	1.2	23	*1,860	0		0	94
31		----------			----------	1.1	----------	413	----------		0	----------
Total	0	0	0	0	8.5	517.6	3,070.8	2,602.7	594.6	0	3.0	3,589
Mean	0	0	0	0	0.29	16.7	102	84.0	19.8	0	0.10	120
Ac-ft	0	0	0	0	17	1,030	6,090	5,160	1,180	0	6.0	7,120

Calendar year 1963: Max 2,570 Min 0 Mean 37.8 Ac-ft 27,400
Water year 1963-64: Max 1,860 Min 0 Mean 28.4 Ac-ft 20,600

Peak discharge (base, 3,000 cfs)

Date	Time	Gage height	Discharge
4-22	about 2300	14.15	4,680
5-30	0530	13.69	4,110

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

8-545. Grapevine Reservoir near Grapevine, Tex.

Location.--Lat 32°58'21", long 97°03'22", in intake structure of Grapevine Dam on Denton Creek, 2.7 miles northeast of Grapevine, Tarrant County, 4.3 miles upstream from bridge on State Highway 121, and 11.7 miles upstream from mouth of Denton Creek.

Drainage area.--695 sq mi.

Records available.--July 1952 to September 1964.

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929. Prior to May 16, 1953, staff gage at site 1,000 ft upstream at present datum.

Extremes.--Maximum contents during year, 180,300 acre-ft Sept. 30 (elevation, 533.87 ft); minimum, 114,000 acre-ft Mar. 6 (elevation, 523.33 ft).

1952-64: Maximum contents, 445,800 acre-ft June 6, 1957 (elevation, 560.80 ft); minimum since reservoir first filled in 1957, that of Mar. 6, 1964.

Remarks.--Reservoir is formed by a rolled earth-fill dam, 12,850 ft long including a 500-foot uncontrolled off-channel concrete gravity spillway with ogee weir section. Dam completed in June 1952 and deliberate impoundment of water began July 3, 1952. Figures given herein represent total contents. Capacity curve from survey made in May 1946. Reservoir built for flood control, navigation, and water conservation. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see station 8-535. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Crest of spillway	560.0	435,500
Top of conservation storage	535.0	188,500
Inverts of lowest intakes to wet wells	500.5	24,750
Invert of two 6.5- by 13-foot broome-type gates	475.0	832

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

Capacity table (elevation, in feet, and capacity, in acre-feet)

523	112,200
524	117,800
526	129,300
528	141,400
530	154,000
532	167,300
534	181,300

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	122,500	119,000	116,700	115,000	115,200	114,200	116,700	139,400	149,300	145,400	136,500	132,700
2	122,400	118,800	116,500	115,000	115,100	114,200	116,600	139,400	149,400	145,200	136,200	132,600
3	122,300	118,700	116,400	114,900	115,100	114,200	116,600	139,400	149,500	145,000	136,000	132,500
4	122,200	118,600	116,400	114,900	115,400	114,100	116,900	139,500	149,500	144,800	135,700	132,400
5	122,100	118,600	116,300	114,800	115,400	114,100	117,000	139,300	150,100	144,500	135,400	132,200
6	122,000	118,600	116,300	114,700	115,300	114,000	116,900	139,700	150,100	144,200	135,100	132,000
7	122,000	118,400	116,300	114,700	115,100	114,100	116,800	139,700	150,000	143,800	134,800	131,800
8	121,800	118,300	116,100	114,600	115,100	114,600	116,600	140,200	149,800	143,300	134,500	131,700
9	121,700	118,200	115,900	114,600	115,100	115,300	116,500	140,300	149,600	143,000	134,400	131,600
10	121,600	118,200	116,400	114,400	115,000	115,500	116,400	140,500	149,400	142,700	134,000	131,400
11	121,500	118,000	116,500	114,400	114,900	115,600	116,400	140,400	149,300	142,400	133,800	131,400
12	121,300	117,900	116,200	114,300	115,200	115,600	116,400	140,400	149,100	142,000	133,500	131,100
13	121,300	117,800	116,200	114,200	115,200	115,600	116,400	140,200	148,900	141,600	133,300	130,900
14	121,100	117,600	116,000	114,100	115,000	115,500	116,200	140,100	148,800	141,200	133,100	130,800
15	121,000	117,500	115,900	114,200	115,000	115,500	116,100	140,000	148,700	140,700	134,500	130,700
16	120,800	117,400	115,800	114,700	114,900	115,400	116,100	140,000	148,900	140,600	134,400	135,100
17	120,700	117,400	115,700	114,600	114,800	115,400	116,000	139,900	148,700	140,300	134,400	136,300
18	120,500	117,300	115,600	114,600	114,900	115,700	116,000	139,900	148,600	139,900	134,500	137,000
19	120,500	117,700	115,600	114,600	114,700	117,400	116,000	139,800	148,300	139,700	134,400	137,100
20	120,300	117,600	115,600	114,500	114,700	117,500	116,000	139,600	148,200	139,300	134,200	138,400
21	120,300	117,500	115,600	114,500	114,700	117,400	116,200	139,600	147,900	139,100	134,100	164,700
22	120,200	117,500	115,500	114,500	114,600	117,300	119,700	139,500	147,700	138,800	134,100	170,100
23	120,100	117,400	115,400	114,500	114,500	117,300	133,800	139,300	147,500	138,500	133,900	173,500
24	120,000	117,200	115,300	114,500	114,500	117,200	134,200	139,200	147,100	138,100	133,800	174,400
25	119,900	117,200	115,200	114,400	114,400	117,100	135,300	139,000	146,900	137,900	133,600	174,700
26	119,900	117,100	115,200	114,400	114,400	117,100	137,900	138,900	146,700	137,600	133,500	175,100
27	119,800	117,000	115,200	114,400	114,300	117,000	138,900	138,700	146,400	137,300	133,300	173,900
28	119,600	117,000	115,100	114,300	114,200	117,000	139,100	138,500	146,200	137,000	133,200	179,800
29	119,400	116,900	115,100	114,700	114,100	116,900	139,100	138,700	145,900	137,300	133,000	180,100
30	119,300	116,800	115,000	115,200	----------	116,800	139,100	147,500	145,700	137,100	132,900	180,300
31	119,200	----------	115,000	115,200	----------	116,700	----------	148,900	----------	136,800	132,700	----------
(†)	524.25	523.82	523.50	523.55	523.35	523.81	527.63	529.20	528.69	527.25	526.58	533.87
(‡)	-3,500	-2,400	-1,800	+200	-1,100	+2,600	+22,400	+9,800	-3,200	-8,900	-4,100	+47,600

Calendar year 1963..... ‡ -74,700
Water year 1963-64..... ‡ +57,600

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-550. Denton Creek near Grapevine, Tex.

Location.--Lat 32°59'13", long 97°00'45", on left bank at downstream side of left pier of bridge on State Highway 121, 1.3 miles downstream from Bakers Branch, 4.3 miles downstream from Grapevine Dam, 5.0 miles northeast of Grapevine, Tarrant County, and 6.1 miles upstream from mouth.

Drainage area.--705 sq mi.

Records available.--October 1947 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 439.11 ft above mean sea level, datum of 1929.

Average discharge.--17 years, 119 cfs (86,150 acre-ft per year), unadjusted.

Extremes.--Maximum discharge during year, 6,430 cfs Sept. 21 (gage height, 26.50 ft); minimum daily, 4.3 cfs Sept. 29.
1947-64: Maximum discharge, 13,900 cfs Feb. 26, 1948 (gage height, 30.38 ft), from rating curve defined by current-meter measurements below 6,000 cfs and extended by conveyance-slope method; no flow at times.
Maximum stage occurred in May 1908 and was slightly higher than the flood in April 1942, which reached a stage of 35.9 ft, from floodmarks, from information by local resident.

Remarks.--Records good. Flow regulated by Grapevine Reservoir (see preceding page).

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	12	11	8.7	12	13	11	9.0	17	58	59	21
2	12	11	11	8.7	12	14	12	12	16	59	59	8.7
3	5.7	9.4	11	9.0	11	14	12	*9.0	16	59	61	8.3
4	5.7	*9.0	12	9.4	13	15	12	9.0	14	59	59	7.5
5	5.0	7.9	13	9.8	12	14	13	9.4	14	59	59	7.9
6	6.0	7.5	12	8.7	*11	15	11	11	16	59	59	8.7
7	5.3	7.9	13	9.0	12	14	11	9.8	29	65	59	8.7
8	6.4	7.9	13	9.8	12	13	11	19	32	201	59	9.4
9	8.3	7.9	*13	*9.8	11	16	11	10	46	78	59	9.0
10	7.1	7.9	14	11	9.8	8.3	11	9.0	45	73	53	8.7
11	7.9	9.0	12	12	9.8	7.9	12	8.7	45	73	25	8.7
12	7.1	9.0	12	12	11	8.7	12	8.3	43	73	*17	8.7
13	7.5	9.4	12	11	12	9.0	12	7.9	42	*73	16	8.7
14	8.7	9.4	12	11	11	9.0	12	7.9	42	73	16	8.7
15	9.8	10	12	12	10	8.7	12	7.9	33	73	22	*8.7
16	9.8	9.4	11	13	11	*10	12	8.3	12	73	7.9	180
17	9.8	10	12	12	11	9.4	12	8.3	13	72	9.8	32
18	7.9	10	12	12	11	9.8	12	8.3	23	71	9.4	15
19	8.3	11	12	12	12	61	11	8.3	27	71	8.3	11
20	8.3	12	12	12	14	13	12	8.3	42	71	7.9	51
21	7.9	10	12	12	14	11	11	19	41	71	7.9	2,840
22	7.5	11	12	12	13	11	28	37	41	70	8.7	143
23	7.1	9.8	12	12	12	11	19	37	41	70	8.7	28
24	7.1	10	12	12	13	11	9.8	37	42	70	7.9	16
25	7.9	11	12	12	13	11	9.8	*37	45	71	7.9	11
26	7.1	11	11	12	13	11	15	37	57	71	7.9	11
27	7.9	11	10	12	14	11	*9.0	34	57	71	8.3	68
28	8.3	11	9.0	12	14	11	7.9	24	57	71	8.7	7.9
29	8.7	11	9.8	13	13	11	8.3	23	58	72	8.7	4.3
30	9.0	11	8.7	16	----------	10	8.7	93	57	73	7.9	4.6
31	9.8	----------	8.7	12	----------	10	----------	18	----------	70	15	----------
Total	249.9	294.4	359.2	349.9	347.6	401.8	360.5	585.4	1,063	2,273	822.9	3,564.2
Mean	8.06	9.81	11.6	11.3	12.0	13.0	12.0	18.9	35.4	73.3	26.5	119
Ac-ft	496	584	712	694	689	797	715	1,160	2,110	4,510	1,630	7,070

Calendar year 1963: Max 1,100 Min 5.0 Mean 125 Ac-ft 90,690
Water year 1963-64: Max 2,840 Min 4.3 Mean 29.2 Ac-ft 21,170

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

8-555. Elm Fork Trinity River near Carrollton, Tex.

Location.--Lat 32°57'57", long 96°56'40", near left bank at downstream side of pier of highway bridge, 40 ft upstream from Carrollton Dam, 0.3 mile downstream from Denton Creek, 1 mile upstream from St. Louis Southwestern Railway Lines bridge, and 2.3 miles northwest of Carrollton, Dallas County.

Drainage area.--2,459 sq mi.

Records available.--January 1907 to September 1964. Monthly discharge only for some periods, published in WSP 1312. Prior to November 1923, published as "near Dallas".

Gage.--Water-stage recorder and concrete control. Datum of gage is 433.40 ft above mean sea level, datum of 1929. Prior to November 1923, staff gage at site 15.5 miles downstream at different datum. Nov. 1, 1923, to Nov. 13, 1934, staff gage and Nov. 14, 1934, to July 6, 1938, water-stage recorder, at present site at same datum. July 7, 1938, to Apr. 14, 1939, staff gage at site 9.3 miles downstream at datum 22.94 ft lower. Apr. 15, 1939, to Sept. 30, 1955, water-stage recorder at site 8.5 miles downstream at datum 22.94 ft lower.

Average discharge.--57 years, 768 cfs (556,000 acre-ft per year).

Extremes.--Maximum discharge during year, 33,000 cfs Sept. 21 (gage height, 10.95 ft); no flow Feb. 22-23.
1907-64: Maximum gage height, about 17 ft May 25, 1908, present site and datum, from information by local resident (discharge not determined); maximum gage height subsequent to 1908, 14.5 ft Apr. 26, 1942, present site and datum, from observation by U. S. Weather Bureau (discharge at site 8.5 miles downstream, 90,700 cfs); no flow at times.
Flood in 1866 reached about same stage as flood of May 25, 1908.

Remarks.--Records excellent. Flow largely regulated by Garza-Little Elm Reservoir (station 8-528) since November 1954 and Grapevine Reservoir (station 8-545) since July 1952. According to records furnished by city of Dallas, 65,190 acre-ft of water was diverted above station for municipal use, of which about 400 acre-ft was returned immediately below station. According to records furnished by Dallas Power and Light Co., an additional 5,130 acre-ft of water was diverted above station for cooling water at electric generating plant.

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

0.3	0	0.7	14	1.4	165	4.0	2,700
.4	.6	.8	24	1.6	265	5.0	4,300
.5	3.1	1.0	54	2.0	575	7.0	8,720
.6	7.8	1.2	98	3.0	1,450	9.0	16,100

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	165	128	84	107	54	14	139	88	113	272	238	174
2	154	116	84	107	70	2.4	132	91	122	265	238	174
3	150	119	88	110	49	6.2	143	86	98	265	226	165
4	165	98	93	116	49	6.7	128	*86	*96	243	221	139
5	170	*119	101	116	54	3.1	110	76	91	254	216	139
6	174	101	101	119	60	7.2	128	74	107	248	216	150
7	174	122	101	122	44	7.2	116	64	135	216	226	113
8	178	104	101	104	46	7.2	113	70	139	216	232	132
9	178	88	98	*101	44	24	132	84	183	265	221	143
10	188	86	93	96	*46	13	139	70	158	243	221	143
11	183	107	*81	101	40	29	158	70	174	260	221	135
12	183	107	91	96	17	44	158	76	165	248	*238	146
13	192	93	91	101	6.7	51	158	91	165	272	232	132
14	196	79	91	113	7.8	32	158	79	188	254	238	132
15	174	113	91	113	6.7	27	158	93	174	254	192	*139
16	170	98	91	113	9.0	24	158	81	132	254	76	337
17	170	113	91	104	11	47	128	91	107	243	98	337
18	174	101	98	101	2.4	47	110	86	135	248	86	93
19	170	98	79	98	5.2	169	139	113	150	238	96	91
20	183	91	72	113	5.7	46	139	101	178	243	132	76
21	178	98	91	76	1.8	42	45	143	174	243	107	*15,200
22	183	104	91	74	0	32	.3	128	178	243	88	3,600
23	161	88	96	64	0	51	149	119	206	248	104	676
24	158	88	110	66	6.2	113	30	119	183	254	104	387
25	143	91	119	70	.4	119	20	113	221	254	104	1,350
26	165	84	119	72	1.1	101	37	146	238	254	119	2,700
27	158	86	116	62	2.1	113	30	150	279	248	158	3,600
28	139	88	110	51	2.7	116	46	128	238	254	146	5,500
29	122	81	110	70	12	116	60	121	232	243	143	5,000
30	119	91	110	51	----------	143	76	1,160	248	192	132	4,500
31	128	----------	110	49	----------	143	----------	211	----------	188	135	----------
Total	5,145	2,980	3,002	2,856	653.8	1,696.0	3,237.3	4,208	5,007	7,622	5,204	45,603
Mean	166	99.3	96.8	92.1	22.5	54.7	108	136	167	246	168	1,520
Ac-ft	10,200	5,910	5,950	5,660	1,300	3,360	6,420	8,350	9,930	15,120	10,320	90,450
(††)	8,230	4,420	3,160	3,570	4,940	3,660	1,700	4,640	6,630	10,130	7,830	6,280

Calendar year 1963: Max 4,300 Min 72 Mean 273 Ac-ft 199,700 †† 78,160
Water year 1963-64: Max 15,200 Min 0 Mean 240 Ac-ft 173,000 †† 65,190

* Discharge measurement made on this day.
†† Diversions, in acre-feet, by city of Dallas.

8-557. Bachman Branch at Dallas, Tex.

Location.--Lat 32°51'26", long 96°50'12", on right bank at downstream side of bridge on Midway Road at Dallas, Dallas County, 1,400 ft south of Northwest Highway, 1.5 miles upstream from Bachman Lake Dam, and 6.0 miles northwest of Dallas City Hall.

Drainage area.--10.0 sq mi.

Records available.--October 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, supplementary adjustment of 1953.

Extremes.--Maximum discharge during year, 3,620 cfs Sept. 21 (elevation, 459.30 ft), from rating curve defined by current-meter measurements below 600 cfs and contracted opening measurement of 9,200 cfs; no flow at times.

Maximum stage known since at least 1900, 465.6 ft Oct. 8, 1962, from information by local residents (discharge, 9,200 cfs, by contracted opening measurement).

Remarks.--Records good except those below 10 cfs, which are fair, and those for periods of no elevation record, which are poor. Low flows are affected by lawn sprinkling and storm sewer effluents entering the stream at various points above the station.

Rating table (elevation, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 23-27, Dec. 25 to Jan. 13, Sept. 18-19, 28-30)

448.6	0	449.4	6.3
448.7	.1	449.6	14
448.8	.2	449.8	26
448.9	.4	450.0	44
449.0	.7	450.3	86
449.1	1.3	451.0	220
449.2	2.4	452.0	425
449.3	4.0	454.0	990

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.2	1.1	4.8	13.0	4.2	4.0	2.2	0.7	0	0.1
2		0	.2	1.0	3.4	11.0	3.6	15	1.7	.8	0	.1
3		0	.2	1.0	3.3	2.3	3.3	3.0	1.5	.8	0	.2
4		0	.2	.9	*39	1.9	3.4	2.3	1.1	.8	0	.2
5		0	.2	.9	*10	1.5	24	*2.3	1.4	.7	0	.2
6		0	.2	.8	*4.0	1.5	4.2	4.6	1.2	.6	0	.2
7		0	.2	.7	2.7	2.3	3.4	3.4	1.0	.6	0	.2
8		0	.2	.7	2.3	32	3.3	11	1.0	.6	0	.1
9	(*)	0	.2	.7	2.2	*184	3.0	3.1	1.4	.5	0	.1
10		0	20	.6	2.0	12	3.0	3.0	*.9	.5	0	.1
11		0	10	.6	1.8	6.8	3.1	2.8	.8	.5	0	.1
12		0	4	.6	2.2	5.1	3.8	1.6	.7	.6	0	.1
13		0	2	.6	3.1	4.6	5.3	1.4	.8	.6	0	.1
14		0	1	*.5	2.3	4.4	3.0	1.4	.9	.5	0	.1
15		0	1	.5	2.0	4.0	3.0	1.3	.9	.4	59	.1
16		0	1	8.2	1.7	3.6	3.0	1.4	1.6	.4	61	21
17		0	1	8.2	*2.0	3.4	3.0	1.3	1.9	.4	.9	*7.1
18		0	1	9.3	2.0	10	2.8	1.3	1.0	.4	1.2	.6
19		.6	1	6.6	1.8	121	2.7	1.3	.7	.4	.9	.5
20		.5	1	1.9	1.6	11	2.5	1.4	.7	.4	.7	19
21		.4	1	1.5	1.6	7.1	64	1.5	.7	.3	.6	760
22	(*)	.3	1	1.5	1.6	6.1	8.4	1.6	.8	.3	.5	298
23		.2	2	1.5	1.5	4.8	6.8	1.8	.5	.2	.5	65
24		.2	1.6	1.4	1.6	4.4	5.1	1.3	.5	.2	*.4	9.5
25		.2	1.6	1.5	1.5	4.2	4.4	1.2	.6	.2	.4	3.6
26		.2	1.6	1.9	1.5	3.6	51	1.0	.7	.2	.3	6.6
27		*.2	1.6	2.2	1.5	*3.6	5.1	1.0	.8	.2	.4	94
28		1	1.5	1.9	1.4	3.6	3.3	1.1	.6	.1	.3	17
29		.5	1.4	4.2	1.3	3.3	2.8	14	.6	.1	.2	6.1
30		.2	1.3	78	----------	3.3	2.7	55	1.0	0	.2	2.5
31		----------	1.2	8.1	----------	3.6	----------	3.3	----------	0	.1	----------
Total	0	4.5	60.6	149.1	107.7	483.0	241.2	149.7	30.2	13.0	127.6	1,312.5
Mean	0	0.15	1.95	4.81	3.71	15.6	8.04	4.83	1.01	0.42	4.12	43.8
Cfsm	0	0.015	0.195	0.481	0.371	1.56	0.804	0.483	0.101	0.042	0.412	4.38
In.	0	0.01	0.23	0.55	0.40	1.80	0.90	0.56	0.11	0.05	0.47	4.88
Ac-ft	0	8.9	121	296	214	958	478	297	60	26	253	2,600
(††)	0.09	2.18	1.81	3.05	1.36	4.62	2.94	3.14	0.41	0.07	3.68	11.38

Water year 1963-64: Max 760 Min 0 Mean 7.32 Cfsm 0.732 In. 9.96 Ac-ft 5,310 †† 34.73

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
3- 8	2400	454.60	1,200
9-21	0145	459.30	3,620

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

Note.--No gage-height Nov. 19-22, Nov. 28 to Dec. 24, Aug. 19-23.

8-565. Turtle Creek at Dallas, Tex.

Location.--Lat 32°48'26", long 96°48'08", on left bank 68 ft upstream from Hall Street Dam, 210 ft upstream from Hall Street at Dallas, Dallas County, and 2.0 miles north of Dallas County Courthouse.

Drainage area.--7.98 sq mi.

Records available.--October 1951 to September 1964 (records for April 1948 to September 1951, published in WSP 1392, are unreliable and should not be used).

Gage.--Water-stage recorder and concrete control. Datum of gage is 428.13 ft above mean sea level, datum of 1929. Prior to Dec. 17, 1951, at site 52 ft upstream at same datum.

Average discharge.--13 years, 6.69 cfs (4,840 acre-ft per year).

Extremes.--Maximum discharge during year, 3,240 cfs Sept. 21 (gage height, 6.79 ft), from rating curve defined by current-meter measurements below 2,460 cfs and extended above on basis of weir formula; minimum daily, 0.3 cfs Oct. 13, Mar. 28.
1951-64: Maximum discharge, 4,650 cfs Oct. 1, 1959 (gage height, 8.10 ft), from rating curve explained above; no flow at times.
Maximum stage since at least 1903, that of Oct. 1, 1959.

Remarks.--Records good except those for periods of indefinite stage-discharge relation and no gage-height record, which are poor.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Discharge adjusted for flow through valve Feb. 24-25, Mar. 2, 4, 8-14, 18-25, 27)

1.3	0.1	2.0	31
1.4	.5	2.2	64
1.5	1.2	2.5	148
1.6	2.4	3.0	355
1.7	4.8	3.5	600
1.8	10	4.0	910

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.1	0.9	0.8	0.8	3.4	1.5	1.8	14	2.6	0.6	0.6	0.8
2	.6	.5	.8	.8	3.4	5.7	1.9	11	1.9	.6	.6	*.8
3	.6	.4	.6	.7	5.9	8	1.9	2.4	1.8	.6	.6	1.8
4	.4	.4	.6	.7	34	11	2.8	2.3	1.6	.6	.6	1.2
5	.4	.4	.6	.8	5.5	8	26	*2.1	1.6	.6	.9	.6
6	.4	.4	.7	.9	3.6	6	2.6	12	1.6	.6	1.0	.6
7	.4	.4	.8	.8	2.8	1.5	1.9	3.4	1.2	.8	.9	.5
8	.4	.7	.8	.8	3.2	65	1.9	30	.6	.7	.6	.5
9	.4	.5	1.2	*1.5	2.4	164	1.9	3.6	.6	.6	.6	.5
10	.4	.6	55	.6	2.3	*8.0	1.9	2.4	.6	.9	.5	.5
11	.4	.5	16	.6	1.9	5.3	2.1	2.4	*.5	.6	.6	.5
12	.4	.6	3.2	.8	10	4.2	3.8	2.1	.6	.5	.6	.5
13	.3	1.0	1.8	.8	14	4.0	4.0	1.6	.6	.6	.7	.5
14	.3	.7	1.3	.5	2.8	3.6	1.0	1.5	.6	.6	.9	.5
15	.4	.6	1.0	1.1	4.2	3.5	1.1	1.3	.6	*.5	56	.5
16	.4	.7	1.0	36	2.1	3.5	1.8	1.5	3.0	.6	33	20
17	*.4	.5	1.1	23	3.9	3.5	1.9	1.1	1.7	.6	4.3	5
18	.4	.6	1.1	14	2.8	17	1.7	.8	.8	.6	3.0	1
19	.5	78	1.1	6.3	1.9	113	1.3	.9	.8	.6	1.9	1
20	.5	3.5	3.5	3.4	1.8	7.1	1.1	.8	.6	.6	1.2	20
21	.4	1.2	1.5	3.4	2.4	5.1	127	.8	.6	.6	1.9	750
22	.4	3.3	1.3	2.8	1.8	4.5	10	1.0	.6	.7	2.4	290
23	.4	1.6	1.2	2.1	1.8	4.2	5.1	1.3	.5	.9	1.7	65
24	.4	.8	1.4	1.7	*3.7	4.0	3.6	1.2	.5	.9	1.0	10
25	.5	.6	1.3	1.4	*8	3.9	3.4	1.0	.5	.6	.8	4
26	.5	*.7	1.1	1.5	6	3.6	70	1.0	.5	.6	.8	7
27	.4	1.0	.8	1.5	2	*3.5	4.2	.9	.6	.5	.8	95
28	.4	15	.8	1.3	1.5	.3	3.2	.9	.6	.8	.8	17
29	.4	1.5	.8	18	1.5	2.4	2.4	71	.6	3.7	.8	6
30	.4	1.1	.8	64	----------	1.9	2.3	56	.6	1.4	.8	3
31	.5	----------	.7	6.6	----------	1.9	----------	3.4	----------	.7	.8	----------
Total	13.8	118.7	104.7	199.2	140.6	478.7	295.6	235.7	29.5	23.8	121.7	1,304.3
Mean	0.45	3.96	3.38	6.43	4.85	15.4	9.85	7.60	0.98	0.77	3.93	43.5
Cfsm	0.056	0.496	0.424	0.806	0.608	1.93	1.23	0.952	0.123	0.096	0.492	5.45
Ac-ft	27	235	208	395	279	949	586	468	58	47	241	2,590
(†)	0.06	0.55	0.49	0.93	0.66	2.23	1.38	1.10	0.14	0.11	0.57	6.08
(††)	0.01	2.78	1.75	3.29	1.34	4.56	3.45	3.45	0.20	0.22	2.59	8.39

Calendar year 1963: Max 421 Min 0.3 Mean 4.83 Cfsm - Ac-ft 3,500 †† 22.19
Water year 1963-64: Max 750 Min 0.3 Mean 8.38 Cfsm 1.05 Ac-ft 6,080 †† 32.03

Peak discharge (base, 880 cfs)

Date	Time	Gage height	Discharge
3- 8	2345	4.79	1,510
9-21	about 0200	6.79	3,240

* Discharge measurement made on this day.
† Runoff, in inches, during month.
†† Mean rainfall, in inches, during month.
Note.--No gage-height record Feb. 26 to Mar. 1, Mar. 3, 5-7, 15-17, 26, Aug. 24 to Sept. 1, Sept. 8-30. Water below crest of dam, discharge from valve rating Feb. 24-25, Mar. 2, 4, 8-14, 18-25, 27.

8-570. Trinity River at Dallas, Tex.

Location.--Lat 32°46'30", long 96°49'10", on left bank on downstream side of left pier of Commerce Street viaduct at Dallas, Dallas County, and 5¼ miles downstream from confluence of West and Elm Forks.

Drainage area.--6,106 sq mi.

Records available.--October 1898 to December 1899 (gage heights only published in WSP 28 and 37), July 1903 to September 1964. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 368.02 ft above mean sea level, datum of 1929, supplementary adjustment of 1954. Oct. 1, 1898, to Dec. 31, 1899, sliding pointer at site 2 miles upstream at different datum. July 1, 1903, to July 20, 1930, chain gage at present site and datum. July 21, 1930, to Sept. 30, 1932, chain gage at site 6 miles downstream at datum 3.08 ft lower.

Average discharge.--61 years, 1,458 cfs (1,056,000 acre-ft per year).

Extremes.--Maximum discharge during year, 32,600 cfs Sept. 22; maximum gage height, 38.06 ft Sept. 22; minimum daily, 81 cfs Nov. 11-12.

1903-64: Maximum discharge, 184,000 cfs May 25, 1908 (gage height, 52.6 ft), from rating curve defined by current-meter measurements below 109,000 cfs; minimum observed for periods 1903-6, 1920-64, 1.2 cfs July 4, 1953.

Maximum stage since at least 1840, that of May 25, 1908. Flood in 1866 reached about the same stage.

Remarks.--Records good. Flow largely regulated by Bridgeport Reservoir (station 8-430) since 1932, Eagle Mountain Reservoir (station 8-450) since 1934, Benbrook and Grapevine Reservoirs (stations 8-465, 8-545) since 1952, Garza-Little Elm Reservoir (station 8-528) since 1954, and several smaller reservoirs, all of which have a total combined capacity of 2,323,000 acre-ft. During year the city of Dallas diverted 117,400 acre-ft of water above station and brought in 34,800 acre-ft of water from outside the watershed for municipal use and returned 89,080 acre-ft of sewage effluent below station, from records furnished by city of Dallas. Sewage effluent from cities of Fort Worth, Arlington, and Grand Prairie enters above station. During year this was reported as 46,920 acre-ft. Other diversions above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Rate of change adjustments used Mar. 8-9, 19-20, Apr. 21-23, May 30-31, Sept. 17-18, 21-30)

7.7	79	12.0	861	30.0	8,600
8.0	112	15.0	1,620	33.0	12,100
9.0	251	20.0	3,210	36.0	19,200
10.0	431	25.0	5,400	38.0	30,700

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	163	117	191	118	420	113	170	171	701	177	227	134
2	150	119	170	123	212	224	191	310	301	*177	191	150
3	145	130	110	133	170	150	184	292	227	184	150	145
4	141	116	101	102	353	177	275	205	177	219	127	145
5	141	91	105	107	481	243	731	177	*184	227	129	150
6	141	120	139	110	283	147	560	207	177	170	123	227
7	140	*96	102	*101	177	205	259	212	177	137	124	212
8	136	93	101	116	163	374	205	466	156	120	156	133
9	136	93	106	106	150	2,620	170	476	156	203	205	140
10	144	88	*341	107	147	1,410	163	251	163	150	*150	138
11	177	81	510	99	*174	340	163	259	163	177	127	125
12	177	81	270	105	165	198	207	328	170	219	138	147
13	163	91	156	112	251	*191	217	191	235	177	150	191
14	156	89	134	110	267	170	198	163	227	156	150	*156
15	156	88	120	124	163	150	177	142	205	145	476	133
16	170	92	112	281	142	133	163	227	205	150	1,420	530
17	156	89	100	312	134	124	184	170	177	142	404	*2,360
18	150	96	102	319	133	170	235	132	145	156	1,420	965
19	205	739	101	391	128	2,700	212	133	156	163	395	249
20	212	243	113	251	124	2,950	177	132	163	156	212	723
21	170	191	107	163	124	843	1,860	134	156	147	191	10,250
22	145	132	118	147	122	364	4,210	170	150	138	140	*25,500
23	150	127	118	132	116	275	1,460	259	150	130	355	15,100
24	170	122	101	129	110	243	334	205	149	134	219	5,010
25	147	113	111	114	106	267	243	150	156	198	156	3,650
26	147	100	137	111	106	227	1,160	136	170	177	145	3,330
27	156	101	118	111	110	236	898	163	227	156	146	6,400
28	124	156	196	105	106	205	267	170	227	137	163	7,170
29	133	191	177	164	107	184	191	420	170	142	170	5,120
30	116	144	130	971	----------	177	*170	2,310	156	472	198	4,800
31	106	----------	116	1,570	----------	163	----------	3,320	----------	708	141	----------
Total	4,723	4,129	4,613	6,944	5,244	15,973	15,634	12,081	5,976	5,944	8,498	93,483
Mean	152	138	149	224	181	515	521	390	199	192	274	3,120
Ac-ft	9,370	8,190	9,150	13,770	10,400	31,680	31,010	23,960	11,850	11,790	16,860	185,400

Calendar year 1963: Max 11,800 Min 81 Mean 440 Ac-ft 318,800
Water year 1963-64: Max 25,500 Min 81 Mean 501 Ac-ft 363,500

* Discharge measurement made on this day.

8-571. White Rock Creek at Keller Springs Road, Dallas, Tex.

Location.--Lat 32°58'13", long 96°48'19", on left bank at downstream side of bridge on Keller Springs Road at Dallas, Dallas County, 0.5 mile upstream from St. Louis Southwestern Railway Lines bridge, 0.9 mile upstream from Spanky Branch, and 13 miles north of Dallas County Courthouse.

Drainage area.--29.4 sq mi.

Records available.--August 1961 to September 1964.

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, supplementary adjustment of 1953. Prior to Oct. 25, 1961, wire-weight gage at same site and datum.

Extremes.--Maximum and minimum discharge for the water years 1961-64 are contained in the following table:

Water year	Maximum			Minimum	
	Date	Discharge (cfs)	Elevation (feet)	Date	Discharge (cfs)
1961†	Sept. 13, 1961	26	546.70	(‡)	0
1962	July 27, 1962	9,410	565.88	Nov. 19-20, 1961	††.7
1963	Oct. 28, 1962	2,620	556.11	(‡)	0
1964	Sept. 21, 1964	37,900	574.51	(‡)	0

† Period August to September.
‡ Many days.
†† Minimum daily.

1961-64: Maximum discharge, 37,900 cfs Sept. 21, 1964 (elevation, 574.51 ft), from rating curve defined by current-meter measurements below 5,000 cfs and contracted-opening measurement at 37,900 cfs; no flow for many days in 1961, 1963-64.

Maximum elevation known since at least 1886, that of Sept. 21, 1964. Flood of Apr. 19, 1942, reached an elevation of 569.6 ft, from information by local resident.

Remarks.--Records fair except those for periods of indefinite stage-discharge relation when valve in control was open and those for periods of no elevation record, which are poor. The Preston Trail Golf Club has a permit to divert a maximum of 320 acre-ft per annum for irrigation. Three recording rain gages are operated in the basin above this station.

Rating tables, except periods of indefinite stage-discharge relation (elevation, in feet, and discharge, in cubic feet per second)

Aug. 1, 1961, to Sept. 21, 1964

546.1	0	548.0	205
546.2	.2	550.0	678
546.3	.7	552.0	1,200
546.4	3.7	555.0	2,180
546.5	14	560.0	4,200
546.7	26	563.0	6,300
547.0	42	566.0	9,600
547.5	110		

Sept. 22-30, 1964

546.5	14
546.7	33
547.0	70
547.5	147
548.0	237
550.0	678

Discharge, in cubic feet per second, during period August and September 1961

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	0	0	6	0	0	11	0	0.2	16	0.7	0.9	21	0.1	0.6	26	0	0.7
2	0	0	7	0	0	12	0	0	17	.5	.6	22	0	.6	27	0	.9
3	.2	0	8	0	0	13	0	20	18	.3	.6	23	0	.5	28	0	1.0
4	.1	0	9	0	0	14	0	4.4	19	.2	.6	24	0	.6	29	0	1.0
5	0	0	10	0	0	15	2.3	1.2	20	.2	.6	25	0	.6	30	0	.9
															31	0	
Total																4.6	36.5
Mean																0.15	1.22
Cfsm																0.0051	0.041
In.																0.006	0.05
Ac-ft																9.1	72
††																-	3.88

†† Mean rainfall, in inches, during month.

Note.--Discharge measurement or observation of no flow made July 18, Aug. 3, Sept. 5; no elevation record Aug. 1-2, 4.

8-571. White Rock Creek at Keller Springs Road, Dallas, Tex.--Continued

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.0	1.7	2.3	4.3	3.2	8.8	10	19	106	36	6.7	10
2	*31	3.6	2.3	4.3	3.2	10	5.8	16	12	20	131	33
3	*14	2.0	2.3	5.8	3.2	8.8	5.8	12	4.3	16	26	5.8
4	1.7	1.2	2.3	11	3.2	6.7	9.4	11	3.7	11	19	32
5	1.7	1.2	3.2	10	2.3	5.0	22	8.8	2.7	7.7	16	32
6	1.2	*1.2	*5.0	5.8	2.0	5.0	16	7.7	2.7	7.7	14	76
7	1.4	1.2	3.7	5.0	2.3	*4.3	14	6.7	2.7	7.7	10	183
8	1.2	1.4	3.7	*4.3	*2.7	4.3	11	6.7	35	5.0	8.8	340
9	1.7	1.7	20	a 4.3	2.7	4.3	*8.8	6.7	66	4.3	7.7	32
10	4.3	1.7	7.7	a 6.7	2.7	5.8	10	*5.8	23	4.3	6.7	21
11	2.0	2.0	5.8	a 6.7	2.7	7.7	25	5.8	10	4.3	6.7	19
12	1.7	2.0	4.3	a 6.7	2.7	6.7	11	5.0	131	3.7	6.7	14
13	1.7	1.7	3.2	a 8	2.7	6.7	7.6	4.3	*52	3.3	5.8	12
14	1.4	1.7	4.3	a 10	2.7	5.8	7.6	3.7	7.7	3.3	5.0	11
15	2.3	1.4	6.7	a 8	13	5.8	6.7	3.7	4.3	3.3	4.3	11
16	2.0	1.2	16	a 6.5	6.7	5.8	5.8	3.7	3.2	3.3	4.3	8.8
17	1.7	1.2	16	a 5.5	4.3	5.8	5.8	3.7	2.7	3.3	5.7	7.7
18	1.7	1.0	11	a 5	4.3	5.8	6.7	3.2	2.7	6.5	3.7	5.8
19	2.0	.7	7.7	a 5	3.7	5.8	6.7	3.2	2.7	5.0	3.2	5.8
20	2.0	.7	5.8	a 5	3.2	7.7	6.7	3.2	2.7	*3.3	3.2	5.0
21	2.0	1.0	5.8	a 5	3.2	10	6.7	2.7	2.3	3.3	3.2	5.0
22	1.7	*123	5.8	a 6	3.2	6.7	18	2.0	2.3	3.3	3.2	5.0
23	1.7	16	5.8	a 5	8.8	6.7	173	2.0	2.3	3.3	3.2	5.0
24	2.0	6.7	5.8	a 6	8.8	5.8	*82	2.0	2.0	3.3	5.0	5.0
25	2.0	4.3	5.8	a 7.5	5.0	5.8	30	1.7	282	3.3	4.0	7.5
26	2.0	3.2	5.8	a 10	22	5.0	24	1.7	56	*3.3	3.2	4.3
27	2.0	3.2	5.0	10	17	5.0	*378	1.4	396	*1,970	*3.2	4.3
28	2.0	2.7	5.0	10	14	4.3	58	2.3	55	74	3.2	5.3
29	1.4	2.3	4.3	8.8	----------	4.3	24	20	737	22	3.2	5.3
30	1.4	2.3	4.3	7.7	----------	10	21	7.7	156	16	3.2	5.3
31	1.4	----------	4.3	5.0	----------	22	----------	3.7	----------	10	3.2	----------
Total	97.3	195.2	191.0	208.9	155.5	212.2	1,017.1	187.1	2,168.0	2,270.8	332.3	859.3
Mean	3.14	6.51	6.16	6.74	5.55	6.85	33.9	6.04	72.3	73.2	10.7	28.6
Cfsm	0.011	0.022	0.021	0.023	0.019	0.023	0.115	0.021	0.246	0.249	0.036	0.097
In.	0.12	0.25	0.24	0.26	0.20	0.27	1.28	0.24	2.74	2.81	0.42	1.09
Ac-ft	193	387	379	414	308	421	2,020	371	4,300	4,500	659	1,700
(††)	2.44	2.95	1.77	0.77	1.97	1.63	4.61	1.69	9.16	7.10	2.15	6.93

Water year 1961-62: Max 1,970 Min 0.7 Mean 21.6 Cfsm 0.73 In. 9.92 Ac-ft 15,650 †† 43.17

Peak discharge (base, 1,500 cfs)

Date	Time	Elevation	Discharge
6-27	2000	558.43	3,550
6-29	1900	560.73	4,560
7-27	0830	565.88	9,410

* Discharge measurement made on this day.

†† Mean rainfall, in inches, during month.

a No elevation record.

Note.--Stage-discharge relation affected by opening of valve in concrete control July 6-26, Aug. 5-31, Sept. 28-30 elevation from reference gage Oct. 1-24.

8-571. White Rock Creek at Keller Springs Road, Dallas, Tex.--Continued

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	e5.3	16	23	10	5.0	6.7	1.7	5.0	2.3	0.6		
2	e5.3	*14	24	10	4.3	4.3	1.7	4.3	2.0	.4		
3	e5.3	11	30	7.7	5.0	4.3	1.7	5.0	1.7	.3		
4	*e5.3	11	23	10	3.7	5.0	1.7	2.7	1.7	.3		
5	5.3	11	20	16	2.7	5.0	2.3	3.7	1.4	.2	(*)	
6	5.3	11	19	12	2.7	5.0	5.0	112	1.2	.2		(*)
7	5.3	11	19	10	3.7	5.8	4.3	23	1.0	.2		
8	*279	11	18	7.7	4.3	6.7	2.7	11	.9	0		
9	22	10	16	*5.0	3.7	5.8	2.3	6.7	.9	0		
10	14	8.8	16	5.0	3.7	5.8	1.7	5.0	.7	0		(*)
11	3.2	7.7	*14	5.0	*4.3	74	1.7	4.3	.6	0		
12	2.7	7.7	14	5.8	3.2	5.8	1.4	2.7	.7	*0		
13	2.7	8.8	14	5.8	3.7	4.3	1.4	2.7	.7	0		
14	2.7	10	14	5.8	3.7	*4.3	1.0	3.2	.7	2.7		
15	2.7	11	16	6.7	4.3	5.0	1.0	3.2	1.0	*.6		
16	2.0	11	16	6.7	3.2	5.0	.6	2.0	1.0	.1		
17	1.7	14	16	5.8	3.7	2.7	.7	2.0	1.0	.2		
18	1.4	16	14	5.8	3.2	2.3	.9	2.0	1.2	.1		
19	1.7	14	14	5.8	3.2	2.7	.9	2.0	1.2	0		
20	1.4	16	16	5.8	3.7	2.7	.9	11	1.2	0		
21	2.0	23	16	5.8	3.2	2.3	.9	3.2	1.4	0		
22	1.4	14	14	5.8	3.7	2.0	.7	10	1.2	*0		
23	1.2	12	14	5.8	4.3	1.7	*.9	6.7	.9	0		
24	1.0	12	12	5.0	5.0	1.7	.6	*2.7	*.3	0		
25	1.2	26	14	4.3	5.0	1.7	.7	2.7	.2	0		
26	1.2	106	14	4.3	5.0	1.7	.7	2.0	.2	*0		
27	1.0	252	14	5.0	5.0	1.7	34	1.4	.2	0		
28	611	31	14	5.0	5.8	1.7	120	6.7	.2	0		
29	36	25	14	5.0	----------	1.4	24	2.3	.1	0		
30	21	23	12	5.0	----------	1.4	6.7	5.0	.1	0		
31	17	----------	11	5.0	----------	2.0	----------	5.0	----------	0		----------
Total	1,068.3	755.0	505	208.4	112.0	182.5	224.8	261.2	27.9	5.9	0	0
Mean	34.5	25.2	16.3	6.72	4.00	5.89	7.49	8.43	0.93	0.19	0	0
Cfsm	1.17	0.857	0.554	0.229	0.136	0.200	0.255	0.287	0.032	0.0065	0	0
In.	1.35	0.95	0.64	0.26	0.14	0.23	0.28	0.33	0.04	0.007	0	0
Ac-ft	2,120	1,500	1,000	413	222	362	446	518	55	12	0	0
(††)	5.11	2.83	0.51	0.46	0.27	1.42	3.89	3.94	0.89	2.02	0.55	0.83

Calendar year 1962: Max 1,970 Min 1.0 Mean 26.7 Cfsm 0.908 In. 12.25 Ac-ft 19,320 †† 44.46
Water year 1962-63: Max 611 Min 0 Mean 9.18 Cfsm 0.312 In. 4.24 Ac-ft 6,650 †† 22.72

Peak discharge (base, 1,500 cfs)

Date	Time	Elevation	Discharge
10- 8	0630	555.46	2,360
10-28	1400	556.11	2,620

* Discharge measurement or observation of no flow made on this day.
e Stage-discharge relation affected by opening of valve in concrete control.
†† Mean rainfall, in inches, during month.

8-571. White Rock Creek at Keller Springs Road, Dallas, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	*1.7	1.7	20			*0
2						0	1.4	1.7	5			0
3						0	1.4	1.7	2			0
4					(*)	0	.9	1.7	1.7			0
5						0	.9	1.7	1.7			0
6				(*)		0	.9	1.7	1.7			0
7						0	.9	1.7	0			0
8						0	.7	1.7	0			0
9						*0	.7	1.7	0			0
10						0	.9	1.5	0			0
11						0	.6	1.2	*0			0
12						0	.4	1.1	0			0
13						0	.2	.9	.2			0
14						0	0	.8	.1			0
15						0	0	.7	0	(*)		0
16						0	0	.6	.1			0
17					(*)	0	0	.4	1			*0
18						0	0	.3	.5			0
19						*8.2	0	.2	0			0
20						4.3	0	.1	0			4.8
21	(*)					.7	1	0	0			*3,860
22						.7	6.2	0	0			*78
23						.9	39	0	0			55
24						1.0	1.7	0	0			18
25						.7	11	0	0			14
26						.6	2.5	0	0			14
27		(*)				.6	1.8	0	0			650
28						1.0	1.7	0	0			50
29						.4	1.7	0	0			27
30					----------	*.9	1.7	549	0			21
31		----------			----------	1.4	----------	40	----------			----------
Total	0	0	0	0	0	21.4	79.9	612.1	34.0	0	0	9,791.8
Mean	0	0	0	0	0	0.69	2.66	19.7	1.13	0	0	326
Cfsm	0	0	0	0	0	0.023	0.090	0.670	0.038	0	0	11.1
In.	0	0	0	0	0	0.03	0.10	0.77	0.04	0	0	12.39
Ac-ft	0	0	0	0	0	42	158	1,210	67	0	0	19,420
(††)	0.17	1.70	1.53	2.44	1.37	3.54	2.89	4.88	0.79	0.09	4.12	20.10

Calendar year 1963: Max 120 Min 0 Mean 2.79 Cfsm 0.095 In. 1.29 Ac-ft 2,030 †† 17.67
Water year 1963-64: Max 8,860 Min 0 Mean 28.9 Cfsm 0.980 In. 13.33 Ac-ft 20,900 †† 43.61

Peak discharge (base, 1,500 cfs)

Date	Time	Elevation	Discharge
5-30	1030	553.07	1,520
9-21	0730	574.51	37,900
9-27	0930-0945	558.19	3,460

* Discharge measurement or observation of no flow made on this day.
†† Mean rainfall, in inches, during month.
Note.--No elevation record Apr. 11-13, 21, Apr. 26 to May 7, May 9-19, May 31 to June 3, June 17-18.

8-572. White Rock Creek at Greenville Avenue, Dallas, Tex.

Location.--Lat 32°53'21", long 96°45'23", on left bank 20 ft downstream from bridge on Greenville Avenue at Dallas, Dallas County, 1.1 miles downstream from Texas and New Orleans Railroad Co. bridge, 1.2 miles downstream from Cottonwood Creek, 2.9 miles upstream from White Rock Lake, and 8.2 miles northeast of Dallas County Courthouse.

Drainage area.--66.4 sq mi.

Records available.--August 1961 to September 1964.

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, supplementary adjustment of 1953. Prior to Oct. 24, 1961, wire-weight gage at same site and datum.

Extremes.--Maximum and minimum discharges for the water years 1961-64 are contained in the following table:

Water year	Maximum			Minimum	
	Date	Discharge (cfs)	Elevation (feet)	Date	Discharge (cfs)
1961†	Sept. 12, 1961	711	475.93	Aug. 22-25, Sept. 1, 1961	0.1
1962	July 27, 1962	20,000	488.80	Oct. 1, 1961	4.3
1963	Oct. 8, 1962	24,500	489.23	Sept. 24, 1963	.5
1964	Sept. 21, 1964	38,100	490.43	Aug. 11-13, 1964	††.3

† Period August to September.
†† Minimum daily.

1961-64: Maximum discharge, 38,100 cfs Sept. 21, 1964 (elevation, 490.43 ft); minimum, 0.1 cfs Aug. 22-25, Sept. 1, 1961 (elevation, 469.68 ft).
Maximum elevation known since at least 1886, that of Sept. 21, 1964.

Remarks.--Records good except those for periods of no elevation record, which are poor. Small diversions above station for lawn watering. The city of Richardson discharges a small amount of sewage effluent into a tributary above the station. Twelve recording rain gages are operating in the basin above this station.

Rating table (elevation, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 25 to Sept. 1, 1962, Oct. 31 to Nov. 24, 1962, May 8 to June 25, 1963, Nov. 19, 1963, to Jan. 16, 1964, Feb. 18 to Apr. 29, May 7-10)

Aug. 1, 1961, to June 29, 1962		June 30, 1962, to Sept. 20, 1964				Sept. 21-30, 1964	
469.7	0.1	470.0	0.4	472.0	123	471.6	125
469.8	.4	470.1	.8	474.0	323	472.0	177
469.9	1.3	470.2	1.3	477.0	698	473.0	295
470.0	3.3	470.3	2.3	480.0	1,250	475.0	565
470.1	6.5	470.4	3.8	482.0	1,820	479.0	1,210
470.2	11	470.5	6.1	484.0	2,780	482.0	2,070
470.4	23	470.6	9.6	486.0	4,350	484.0	3,180
470.6	41	470.8	19	487.0	5,810	486.0	5,570
471.0	79	471.0	32	487.5	7,500	487.0	7,120
472.0	177	471.5	76			487.5	8,130
474.0	425					488.0	11,800
477.0	888					488.5	16,900
480.0	1,490						
483.0	2,710						

Discharge, in cubic feet per second, during period August to September 1961

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	0.5	0.3	6	0.4	0.2	11	0.3	0.2	16	9.6	4.6	21	0.3	4.6	26	0.2	6.5
2	.5	.4	7	.7	.2	12	.6	174	17	.9	4.6	22	.1	5.9	27	.6	3.9
3	.6	.6	8	.6	.3	13	.9	71	18	.7	5.2	23	.1	4.6	28	.4	8.3
4	.7	.3	9	.9	.3	14	.6	11	19	.5	4.9	24	.1	5.2	29	5.2	5.2
5	.4	.1	10	.3	.6	15	11	7.4	20	.9	5.9	25	.1	4.6	30	.9	5.2
															31	.4	
Total																40.0	346.1
Mean																1.29	11.5
Cfsm																.019	.17
In																.02	.19
Ac-ft																79	686
††																-	4.25

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

†† Mean rainfall, in inches, during month.
Note.--Discharge measurement made July 18, Aug. 3, Sept. 5.

8-572. White Rock Creek at Greenville Avenue, Dallas, Tex.--Continued

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

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.6	7.8	11	18	16	30	23	57	95	81	65	71
2	*141	55	11	18	16	28	16	44	17	52	245	112
3	*16	14	11	18	16	27	15	39	10	28	134	46
4	10	9.2	11	33	16	24	72	35	4.6	24	104	37
5	7.0	7.8	19	21	16	22	69	32	8.8	21	52	125
6	43	*7.4	*22	18	14	21	36	29	31	19	50	173
7	5.9	7.4	16	18	14	*21	29	26	7.8	16	41	310
8	7.0	7.4	15	*18	*14	21	26	25	108	16	30	1,190
9	7.4	7.4	332	18	14	21	*26	24	115	14	26	109
10	25	7.4	44	20	14	25	42	*22	35	13	24	76
11	16	7.4	34	19	14	22	54	21	18	12	21	68
12	12	7.8	30	19	14	17	28	19	78	11	19	60
13	7.4	9.2	25	21	14	16	23	18	*163	11	17	50
14	7.4	8.8	31	30	14	21	22	16	18	11	16	44
15	7.0	13	30	24	49	19	21	16	15	10	14	40
16	7.4	9.2	82	20	22	17	18	16	12	11	14	36
17	7.4	8.3	56	18	18	15	18	15	11	11	14	34
18	7.4	8.3	43	18	16	15	18	14	11	52	13	30
19	7.4	8.3	32	18	15	14	17	13	10	14	13	28
20	7.8	8.3	29	16	13	29	16	13	10	*10	12	27
21	7.4	* 15	28	17	14	18	15	12	10	9.2	12	26
22	7.8	* 500	27	21	13	16	107	11	9.5	8.8	11	26
23	7.4	33	25	18	102	15	298	11	9.5	8.5	11	23
24	7.8	23	23	21	30	14	*175	11	9.0	7.1	149	21
25	8.8	19	23	23	23	13	69	9.7	720	5.5	40	45
26	7.8	18	25	32	136	13	45	8.8	30	*134	13	30
27	7.4	14	22	21	48	13	*832	8.8	1,120	*6,620	*12	21
28	7.4	13	21	19	38	13	180	7.8	125	220	12	21
29	7.4	11	19	18	----------	13	71	74	2,320	155	11	20
30	7.8	12	20	18	----------	88	86	13	370	130	10	20
31	8.3	----------	18	17	----------	48	----------	8.8	----------	72	11	----------
Total	439.4	877.4	1,135	628	743	689	2,467	669.9	5,501.2	7,807.1	1,216	2,919
Mean	14.2	29.2	37.8	20.3	26.5	22.2	82.2	21.6	183	252	39.2	97.3
Cfsm	0.214	0.440	0.569	0.306	0.399	0.334	1.24	0.325	2.76	3.80	0.590	1.47
In.	0.25	0.49	0.64	0.35	0.42	0.39	1.38	0.38	3.08	4.37	0.68	1.63
Ac-ft	872	1,740	2,250	1,250	1,470	1,370	4,890	1,330	10,910	15,490	2,410	5,790
(††)	2.34	3.50	2.45	0.86	2.20	1.80	5.50	1.65	7.18	8.14	2.74	6.75

Water year 1962: Max 6,620 Min 4.6 Mean 68.7 Cfsm 1.04 In. 14.06 Ac-ft 49,770 †† 45.11

Peak discharge (base, 2,900 cfs)

Date	Time	Elevation	Discharge	Date	Time	Elevation	Discharge
11-22	0900	483.42	2,960	7-27	0900	488.80	20,000
6-29	un-known	487.43†	7,980	9- 8	0230	486.49	5,000

† Floodmarks.

* Discharge measurement made on this day.
†† Mean rainfall, in inches, during month.
Note.--No elevation record June 15 to July 2, Aug. 8-13; stage-discharge relation indefinite Aug. 5-23.

8-572. White Rock Creek at Greenville Avenue, Dallas, Tex.--Continued

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	44	49	61	23	17	15	9.6	22	9.6	50	1.2	3.5
2	20	*43	76	23	16	13	9.2	24	7.7	20	1.0	.8
3	17	38	92	22	15	13	8.8	21	7.4	10	1.0	.6
4	16	34	70	27	14	13	8.5	16	7.1	8.0	1.0	.5
5	*15	34	58	33	14	14	19	16	5.8	7.0	*.9	.6
6	14	32	55	24	13	12	19	348	5.8	6.0	.8	.7
7	14	30	54	20	13	12	9.6	68	5.8	5.0	.8	.7
8	*1,570	28	52	19	13	12	8.1	37	5.8	4.5	.8	1.1
9	212	25	49	*20	13	17	7.7	31	5.0	4.0	.8	.8
10	125	24	46	20	13	*11	6.7	26	4.6	3.6	.8	*.6
11	102	23	*44	20	*13	78	6.1	24	4.4	3.4	1.0	.5
12	89	21	37	20	13	17	6.7	24	4.0	3.2	.9	1.6
13	87	22	37	19	13	12	5.8	21	4.0	3.0	.7	1.3
14	85	25	37	19	13	12	5.8	19	3.4	400	.8	1.0
15	78	26	37	20	13	12	5.8	18	3.2	50	.8	.8
16	70	24	36	20	13	13	5.8	16	4.6	20	.9	.9
17	69	25	34	20	13	13	5.8	16	6.4	10	.9	.9
18	65	28	32	20	13	12	6.1	15	12	8.0	1.1	.9
19	64	26	32	23	12	13	8.1	15	4.6	6.0	1.1	.8
20	63	64	46	19	12	11	5.8	22	3.8	5.0	.9	1.4
21	57	53	30	19	12	11	5.8	16	3.4	4.0	.9	1.0
22	53	32	27	20	11	11	5.8	26	3.1	3.5	.9	.7
23	50	28	26	19	11	11	5.0	24	2.9	3.0	.9	.6
24	45	30	27	17	12	10	*17	*16	2.8	2.8	.9	.5
25	44	78	28	18	12	10	11	14	*2.8	2.6	1.0	.6
26	44	226	25	19	12	10	6.7	12	2.7	2.4	1.0	.7
27	44	589	25	19	12	10	194	11	2.6	2.2	.8	1.2
28	1,880	106	28	19	17	10	645	25	2.5	2.0	.9	.8
29	138	74	28	18	----------	10	102	13	2.4	1.8	.8	.8
30	73	65	24	17	----------	10	32	58	300	1.6	.9	.6
31	55	----------	24	17	----------	10	----------	21	----------	1.4	12	----------
Total	5,302	1,902	1,277	633	368	438	1,192.3	1,035	440.2	654.0	39.2	27.5
Mean	171	63.4	41.2	20.4	13.1	14.1	39.7	33.4	14.7	21.1	1.26	0.92
Cfsm	2.68	0.955	0.620	0.307	0.197	0.212	0.598	0.503	0.221	0.318	0.019	0.014
In.	2.97	1.07	0.72	0.35	0.21	0.25	0.67	0.58	0.25	0.37	0.02	0.02
Ac-ft	10,520	3,770	2,530	1,260	730	869	2,360	2,050	873	1,300	78	55
(††)	7.60	2.84	0.72	0.44	0.30	0.91	4.74	3.60	1.20	2.32	0.64	0.62

Calendar year 1962: Max 6,620 Min 4.6 Mean 85.3 Cfsm 1.28 In. 17.44 Ac-ft 61,730 †† 47.99
Water year 1962-63: Max 1,880 Min 0.5 Mean 36.5 Cfsm 0.550 In. 7.48 Ac-ft 26,400 †† 25.93

Peak discharge (base, 2,900 cfs)

Date	Time	Elevation	Discharge
10- 8	0900	489.23	24,500
10-28	1430	487.40	6,900
4-28	1400	485.64	3,980

* Discharge measurement made on this day.
†† Mean rainfall, in inches, during month.
Note.--No elevation record June 26 to Aug. 4.

8-572. White Rock Creek at Greenville Avenue, Dallas, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	1.3	1.4	1.9	15	3.8	11	60	26	1.0	0.8	*1.5
2	.6	.9	1.4	2.0	10	16	11	20	20	1.1	.9	1.5
3	.6	.8	1.8	2.1	8	4.8	12	18	16	1.0	.4	1.6
4	.6	.8	1.8	1.9	50	15	12	16	13	.7	.5	1.7
5	.5	.8	1.9	1.9	20	5.3	41	15	11	1.0	.4	2.1
6	.6	.8	1.9	2.0	15	4.6	21	15	11	.7	.3	1.7
7	.6	.7	2.2	2.1	10	4.8	16	*14	9.2	.6	.4	1.3
8	.6	.8	1.9	1.8	9	27	12	42	8.1	.6	.4	1.5
9	.6	.9	1.9	1.5	8	232	11	19	8.5	.5	.8	1.6
10	.6	.9	56	1.5	8	28	11	16	7.4	.4	.7	1.5
11	.5	.9	16	1.7	8	19	11	14	*7.7	.6	.3	1.5
12	.6	.9	3.8	1.6	8	15	18	12	8.1	.6	.3	1.3
13	.6	.9	2.8	1.6	15	14	23	10	11	.4	.3	1.3
14	.6	.9	2.3	*1.6	10	13	11	8	14	.4	.5	1.6
15	.6	.9	2.2	1.4	8	8.1	9.6	6	9.2	.4	100	1.7
16	.7	.9	2.1	2.4	6	8.8	9.6	5	10	*.6	94	116
17	.8	.9	2.0	5	5	7.1	9.6	5	11	.5	3.8	*29
18	1.0	.9	2.0	10	* 6.1	14	9.6	5	7.7	.6	5.1	4.2
19	1.2	46	1.9	5	5.3	186	9.2	5	7.7	1.0	2.7	3.4
20	1.4	3.4	2.7	4	4.8	35	9.2	5.3	4.8	.6	2.1	70
21	1.2	2.1	2.3	4	4.6	21	127	4.8	4.4	.7	2.0	*14,700
22	*1.0	2.8	2.2	4	4.6	19	29	4.6	4.8	.6	2.0	1,070
23	1.0	1.9	2.1	4	4.6	19	98	4.6	5.0	.6	1.9	274
24	1.1	1.4	2.3	3	4.4	18	27	6.1	2.8	.6	2.0	158
25	1.1	1.4	2.7	3	4.4	14	32	4.8	2.6	.7	2.0	125
26	1.1	1.5	2.4	3	3.8	14	83	4.6	2.7	1.1	1.8	127
27	1.1	*1.6	2.4	3	4.0	14	29	4.0	2.3	.7	1.5	1,470
28	1.1	7.3	2.2	3	3.8	14	21	4.2	2.1	.8	1.5	228
29	1.1	2.0	2.1	3	3.6	12	19	109	1.2	.8	1.5	167
30	.9	1.6	2.1	90	----------	*11	16	794	1.3	3.5	1.4	144
31	1.0	----------	2.1	30	----------	11	----------	64	----------	.8	1.5	----------
Total	25.6	88.9	134.9	203.0	267.0	828.3	758.8	1,315.0	250.6	24.2	233.8	18,709.0
Mean	0.83	2.96	4.35	6.55	9.21	26.7	25.3	42.4	8.35	0.78	7.54	624
Cfsm	0.012	0.045	0.066	0.097	0.139	0.402	0.381	0.639	0.125	0.012	0.114	9.40
In.	0.02	0.05	0.08	0.11	0.15	0.46	0.42	0.74	0.14	0.01	0.13	11.04
Ac-ft	51	176	268	403	530	1,640	1,510	2,610	497	48	464	37,110
(††)	0.19	2.02	1.52	2.63	1.42	4.23	3.30	4.95	0.55	0.20	3.79	16.97

Calendar year 1963: Max 645 Min 0.5 Mean 13.9 Cfsm 0.209 In. 2.87 Ac-ft 10,070 †† 18.50
Water year 1963-64: Max 14,700 Min 0.3 Mean 62.4 Cfsm 0.940 In. 13.35 Ac-ft 45,310 †† 41.77

Peak discharge (base, 2,900 cfs)

Date	Time	Elevation	Discharge
9-21	0730	490.43	38,100
9-27	1130	486.90	6,940

* Discharge measurement made on this day.
†† Mean rainfall, in inches, during month.
Note.--No elevation record Oct. 15-21, Jan. 17 to Feb. 17, Apr. 30 to May 6, May 11-19.

8-573. White Rock Creek at White Rock Lake, Dallas, Tex.

Location.--Lat 32°48'31", long 96°43'32", on right bank 500 ft upstream from right end of White Rock Lake spillway, 1,500 ft upstream from bridge on Garland Road (State Highway 78) at Dallas, Dallas County, and 10.3 miles upstream from mouth.

Drainage area.--100 sq mi.

Records available.--October 1962 to September 1964.

Gage.--Water-stage recorder and flat-crested concrete control. Datum of gage is mean sea level, datum of 1929, supplementary adjustment of 1961.

Extremes.--1962-63: Maximum discharge during water year, 10,200 cfs Oct. 8 (elevation, 461.90 ft); no flow Feb. 12-15, June 6 to Sept. 30. Maximum discharge for Oct. 8, 1962, published in Geological Survey Open File Report No. 69 April 1964 "Frequency and extent of flooding on Lower White Rock Creek at Dallas, Tex.," is superseded by the value given above.
1963-64: Maximum discharge during water year, 28,300 cfs Sept. 21 (elevation, 465.60 ft); no flow for many days.
1962-64: Maximum discharge, that of Sept. 21, 1964; no flow at times each year.
Maximum elevation since 1910, that of Sept. 21, 1964. Flood of Apr. 20, 1942, reached an elevation of 465.2 ft, from information by city of Dallas.

Remarks.--Records fair except those below 50 cfs and those for period of no elevation record, which are poor. Discharge is outflow of White Rock Lake (capacity, 12,300 acre-ft in 1956 at spillway crest). Storage began in White Rock Lake in 1910 and water has been used at times by city of Dallas as source of municipal supply. Records furnished by city of Dallas show that about 4,000 acre-ft of water was diverted during water year 1963 and 425 acre-ft during water year 1964 for municipal use. Recording rain gage located at station.

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

458.0	0	459.0	1,200
458.1	4.1	459.5	2,320
458.2	29	460.0	3,700
458.3	80	461.0	6,850
458.4	160	463.0	15,000
458.5	270	465.0	25,000
458.7	600	465.6	28,300

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4	*68	112	29	10	2.0	2.5	46	15			
2	4	60	104	29	8.4	2.5	2.0	42	8.4			
3	4	55	120	29	8.4	2.5	1.5	42	4.1			
4	4.1	50	100	33	8.4	2.0	2.5	29	2.5			
5	*5.2	45	80	37	6.6	1.5	4.1	18	.3			
6	5.2	42	50	25	6.6	1.1	6.6	234	0		(*)	(*)
7	6.6	40	25	18	6.6	1.1	13	270	0			
8	*3,940	36	20	18	6.6	1.1	13	80	0			
9	*814	33	15	18	4.1	6.6	13	37	0			(*)
10	*182	30	10	18	2.5	6.6	13	33	0			
11	112	26	8	18	.3	33	6.6	29	0			
12	80	22	6.6	18	0	37	2.0	22	0			
13	68	20	10	15	0	15	2.0	15	0			
14	56	18	15	15	0	13	2.0	13	0			
15	46	15	18	13	0	13	1.5	13	0			
16	37	12	25	13	.3	13	1.1	10	0			
17	29	10	29	13	1.5	10	.3	8.4	0			
18	29	8	29	13	2.0	10	.3	5.2	0			
19	29	6	29	13	3.2	6.6	.3	4.1	0			
20	25	30	33	13	4.1	3.2	.3	3.2	0			
21	18	20	22	13	3.2	2	.3	2.5	0			
22	13	15	18	13	2.0	1.5	1.1	2.5	0			
23	8.4	10	18	13	1.5	1.5	5.2	2.0	0			
24	6.6	10	15	13	1.5	1.5	*5.2	2.0	0			
25	5.2	20	15	13	1.1	1.5	13	2.0	0			
26	5.2	50	15	13	1.1	1.1	13	1.5	*0			(*)
27	6.6	600	13	13	1.5	1.1	357	*1.1	0			
28	1,000	300	18	13	2.0	1.1	*1,480	1.5	0			
29	800	144	22	13	----------	1.1	895	1.5	0			
30	400	112	22	13	----------	1.5	98	5.2	0			
31	100	----------	22	13	----------	2.0	----------	22	----------			----------
Total	7,843.1	1,907	1,038.6	541	93.5	196.7	2,955.4	997.7	30.3	0	0	0
Mean	253	63.6	33.5	17.5	3.34	6.34	98.5	32.2	1.01	0	0	0
Ac-ft	15,560	3,780	2,060	1,070	185	390	5,860	1,980	60	0	0	0
(††)	6.85	3.02	0.70	0.40	0.30	0.93	5.29	3.15	1.52	2.14	0.89	0.57

Water year 1962-63: Max 3,940 Min 0 Mean 42.7 Ac-ft 30,940 †† 25.76

* Discharge measurement or observation of no flow made on this day.
†† Mean rainfall, in inches, during month.
Note.--No elevation record Oct. 1-3, 28-31, Nov. 2-28, Dec. 4-11, 13-16.

8-573. White Rock Creek at White Rock Lake, Dallas, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	6.6	18	80			*0
2						0	8.4	56	62			0
3						0	13	51	42			0
4						0	15	33	33			0
5						0	42	25	22			0
6			(*)	(*)		0	42	29	18			0
7						0	6.6	*37	15			0
8						0	1.1	94	10			0
9						0	.3	112	*8.4	(*)		0
10						0	1.1	62	6.6			0
11						0	1.1	46	5.2			0
12						0	2.0	37	4.1			0
13						0	5.2	30	2.5			0
14						0	6.6	20	1.1			0
15						0	6.6	15	0			0
16						0	6.6	10	0			0
17						0	6.6	9	0			0
18	(*)					0	6.6	9	0			0
19					(*)	*226	8.4	8	0			0
20					(*)	117	6.6	8	0			0
21						51	140	6.6	0			12,100
22						46	182	4.1	0			2,090
23						42	120	4	0			1,010
24						37	74	4	0			182
25						22	37	4.1	0			96
26		(*)				6.6	156	4	*0			51
27						8.4	104	4	0			900
28						8.4	33	4	0			609
29						6.6	22	120	0			156
30					----------	6.6	18	850	0			96
31		----------			----------	*6.6	----------	150	----------			----------
Total	0	0	0	0	0	584.2	1,078.4	1,863.8	309.9	0	0	17,290
Mean	0	0	0	0	0	18.8	35.9	60.1	10.3	0	0	576
Ac-ft	0	0	0	0	0	1,160	2,140	3,700	615	0	0	34,290
(††)	0.13	2.11	1.57	2.59	1.32	4.01	3.08	4.45	0.49	0.18	3.40	14.56

Calendar year 1963: Max 1,480 Min 0 Mean 13.2 Ac-ft 9,540 †† 21.61
Water year 1963-64: Max 12,100 Min 0 Mean 57.7 Ac-ft 41,900 †† 37.89

* Discharge measurement or observation of no flow made on this day.
†† Mean rainfall, in inches, during month.
Note.--No elevation record May 13-20, 23-24, 26-31.

8-574. White Rock Creek at Scyene Road, Dallas, Tex.

Location.--Lat 32°45'57", long 96°43'50", on left bank 30 ft downstream from Texas and New Orleans Railroad Co. bridge, 125 ft downstream from Scyene Road (State Highway 352) at Dallas, Dallas County, 4.5 miles east of Dallas County Courthouse, and 5.8 miles above mouth.
Drainage area.--125 sq mi.
Records available.--October 1962 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, supplementary adjustment of 1961.
Extremes.--1962-63: Maximum discharge during water year, 9,550 cfs Oct. 8 (elevation, 401.60 ft); minimum, 0.5 cfs July 27 (elevation, 393.37 ft). Maximum discharge for Oct. 8, 1962, published in Geological Survey Open File Report No. 69 April 1964 "Frequency and extent of flooding on Lower White Rock Creek at Dallas, Tex.," is superseded by the value given above.

1963-64: Maximum discharge during water year, 30,200 cfs Sept. 21 (elevation, 404.30 ft), from rating curve defined by current-meter measurements below 15,000 cfs and contracted-opening measurement of 30,200 cfs; minimum daily, 0.4 cfs Aug. 2-3.

1962-64: Maximum discharge, that of Sept. 21, 1964; minimum daily, 0.4 cfs Aug. 2-3, 1964.

Maximum elevation since at least 1886, 409.2 ft May 26, 1908; maximum stage was the result of backwater from the Trinity River; maximum discharge since at least 1886, that of Sept. 21, 1964, the second highest discharge occurred Apr. 20, 1942 (28,000 cfs); information from Geological Survey Open File Report "Frequency and extent of flooding on Lower White Rock Creek at Dallas, Tex."

Remarks.--Records good except those for period of no elevation record, which are poor. Flow partly regulated by White Rock Lake (capacity, 12,300 acre-ft) located 4.5 miles upstream. The Dallas Power and Light Co. diverts water for cooling purposes at generating plant and at times city of Dallas diverts water for municipal use. Low flows sustained by waste water from fish ponds and watering of lawns. Recording rain gage located at station.

Rating table (elevation, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 26-30, 1963)

393.4	0.6	395.0	85
393.5	1.2	395.5	164
393.7	2.4	396.0	260
394.0	4.6	397.0	490
394.3	8.2	398.0	800
394.4	12	399.0	1,280
394.5	19	400.0	2,470
394.7	43	400.6	3,990

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3	*85	126	47	4.5	27	2.0	139	5.0	116	1.7	2.5
2	3	60	126	57	69	4.8	2.7	117	4.6	4.6	1.7	2.3
3	2.5	50	126	53	27	5.2	2.3	104	4.8	2.8	1.7	2.3
4	2.5	40	120	85	5.0	8.4	6.2	86	5.4	2.5	1.6	1.7
5	2.1	35	115	115	5.0	58	21	78	4.8	2.5	1.7	1.7
6	2	30	113	76	4.1	12	29	468	4.6	2.7	1.7	1.7
7	2	25	110	61	9.7	5.6	23	490	4.8	2.5	2.2	1.7
8	*3,880	22	110	44	9.4	5.4	10	164	4.8	2.6	2.0	1.5
9	*1,600	20	112	39	6.2	54	9.7	94	4.6	2.9	1.9	*1.3
10	252	18	67	40	15	12	11	78	4.5	2.8	2.0	1.4
11	87	17	132	93	91	55	7.6	51	4.4	2.8	2.1	1.8
12	70	16	72	104	*24	92	18	50	4.3	2.8	1.7	1.9
13	50	15	29	36	4.7	79	6.4	36	4.2	2.9	18	1.9
14	43	14	57	5.9	4.3	74	4.6	23	3.7	208	8.8	2.0
15	36	13	75	5.4	4.0	8.8	4.2	19	3.3	3.8	2.2	2.2
16	31	12	85	4.8	2.6	7.4	4.8	16	40	2.6	2.3	2.3
17	26	11	64	4.6	3.5	11	5.0	13	4.4	2.3	2.5	2.3
18	23	11	81	5.7	3.3	8.5	4.2	6.2	3.4	2.3	2.3	2.2
19	19	11	85	82	5.4	22	6.0	5.8	3.4	2.3	1.8	1.9
20	17	50	138	43	4.6	*24	5.0	11	3.1	2.6	1.8	1.9
21	15	35	136	5.0	61	11	3.7	6.6	2.8	2.4	1.8	1.8
22	13	28	60	5.5	28	9.4	*2.6	9.1	2.7	2.2	2.1	1.6
23	11	23	103	134	4.8	5.4	2.5	9.2	2.5	2.0	2.2	1.7
24	10	20	70	19	4.2	4.5	2.5	5.9	2.5	2.1	1.9	1.1
25	9	18	68	3.1	3.2	3.7	2.5	5.0	2.8	15	1.9	1.1
26	8.5	18	85	9.0	12	7.3	2.5	*4.8	*3.0	2.0	1.9	1.2
27	8	980	*22	30	4.0	5.7	700	4.8	3.0	6	2.1	1.4
28	892	253	57	4.4	5.9	3.4	*2,460	37	4.3	1.1	1.9	1.1
29	1,450	139	85	27		3.7	1,560	5.6	3.0	1.5	1.8	1.1
30	390	131	70	3.9	----------	2.9	293	52	254	2.2	2.1	1.1
31	144	----------	24	3.6	----------	2.3	----------	24	----------	1.7	4.5	----------
Total	9,101.6	2,200	2,723	1,221.6	425.4	633.4	5,212.0	2,213.0	402.7	407.1	85.9	51.7
Mean	294	73.3	87.8	39.4	15.2	20.4	174	71.4	13.4	13.1	2.77	1.72
Ac-ft	18,050	4,360	5,400	2,420	844	1,260	10,340	4,390	799	807	170	103
(††)	6.23	3.08	0.70	0.40	0.24	0.87	5.88	2.90	1.66	2.05	0.98	0.51

Water year 1962-63: Max 3,880 Min 0.6 Mean 67.6 Ac-ft 48,940 †† 25.50

* Discharge measurement made on this day.
†† Mean rainfall, in inches, during month.
Note.--No elevation record Oct. 1-4, 6-7, 12-31, Nov. 2 to Dec. 6, Apr. 23-27, Sept. 29.

8-574. White Rock Creek at Scyene Road, Dallas, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.1	1.7	1.7	1.8	2.2	3.5	3.3	7.6	146	2.0	0.6	1.4
2	1.1	1.7	1.7	1.7	1.7	10	3.3	100	26	1.9	.4	*1.7
3	1.0	1.6	1.7	1.4	2.2	9.0	3.5	50	3.9	1.8	.4	1.7
4	1.0	1.6	1.8	1.2	51	32	3.9	5.2	5.0	1.6	.7	1.9
5	1.2	1.6	1.9	1.1	4.9	7.0	83	4.4	3.8	1.4	.8	1.7
6	1.1	1.6	2.0	1.0	2.0	3.8	13	*27	2.7	1.3	1.0	2.0
7	1.2	1.6	2.0	1	1.8	4.0	46	39	2.4	1.4	1.0	1.7
8	1.1	1.6	1.9	1	1.3	119	37	204	1.2	1.6	1.0	1.4
9	.9	1.6	1.8	1	1.3	646	5.2	162	1.5	1.6	1.1	1.4
10	.9	1.6	79	1	1.3	2.9	3.0	53	1.6	1.6	1.0	1.5
11	.9	1.6	12	1	1.2	2.1	3.0	14	2.1	1.4	.8	1.5
12	.9	1.6	2.3	1	5.8	4.1	3.2	14		1.3	1.0	1.7
13	1.0	1.6	1.9	1	28	3.1	3.5	5.8		1.4	1.1	1.5
14	1.2	1.6	2.0	1	2.1	3.0	5.4	2.4		1.4	1.1	1.6
15	1.4	1.7	2.0	*1.0	2.1	3.0	2.9	.8		1.4	49	1.9
16	1.4	1.9	2.0	40	1.3	2.7	3.8	1.3		1.1	9.2	196
17	1.4	1.9	1.9	30	19	2.3	2.7	1.4		*1.1	15	34
18	*1.2	1.9	1.9	15	3.6	19	2.0	1.5	2	1.3	2.6	1.1
19	1.0	49	2.0	6	1.7	510	2.0	1.6		1.1	1.0	1.1
20	1.2	3.7	5.8	2.5	1.2	269	2.3	2.2		1.1	1.6	118
21	1.3	1.8	2.4	*2.5	1.7	95	303	3.3		1.3	2.0	*11,400
22	1.3	4.8	2.2	2.5	1.3	43	334	3.7		1.3	2.0	3,710
23	1.3	2.0	2.3	2.5	1.2	22	204	3.8		1.3	2.0	*c1,300
24	1.3	2.0	2.3	2.5	*1.2	15	112	3.8		1.5	1.8	229
25	1.3	2.1	2.3	2.3	1.2	46	43	3.8	1.9	1.3	1.6	48
26	1.3	*2.4	2.3	2.1	1.2	15	402	3.8	1.9	1.4	1.6	7.6
27	1.4	2.0	2.2	*2.0	1.1	3.2	196	3.9	2.0	1.6	1.6	1,010
28	1.6	12	2.1	.9	3.3	3.0	68	4.0	1.7	1.7	1.5	974
29	1.6	2.2	2.0	25	3.8	3.0	13	148	1.4	5.4	1.7	224
30	1.4	1.9	1.9	118	----------	3.0	6.2	953	1.8	6.0	1.6	123
31	1.4	----------	1.9	13	----------	*3.1	----------	718	----------	1.0	1.4	----------
Total	37.4	115.9	153.2	284.0	151.7	1,906.8	1,913.2	2,546.3	232.9	52.6	109.2	19,400.4
Mean	1.21	3.86	4.94	9.16	5.23	61.5	63.8	82.1	7.76	1.70	3.52	647
Ac-ft	74	230	304	563	301	3,780	3,790	5,050	462	104	217	38,480
(††)	0.10	2.01	1.54	2.49	1.28	3.93	2.99	4.10	0.42	0.16	3.06	13.08

Calendar year 1963: Max 2,460 Min 0.6 Mean 30.0 Ac-ft 21,740 †† 19.65
Water year 1963-64: Max 11,400 Min 0.4 Mean 73.5 Ac-ft 53,360 †† 35.14

* Discharge measurement made on this day.
†† Mean rainfall, in inches, during month.
c Backwater from Trinity River.
Note.--No elevation record Dec. 24 to Jan. 14, Jan. 16-19, 22-26, June 12-24.

8-574.1. Trinity River below Dallas, Tex.

Location.--Lat 32°42'27", long 96°44'08", on left bank at downstream side of bridge on South Loop Highway 12, 1 mile downstream from White Rock Creek, 1.5 miles upstream from Five Mile Creek, and 6.4 miles southeast of Dallas County Courthouse in Dallas.

Drainage area.--6,278 sq mi.

Records available.--November 1956 to September 1961 (monthly records only), October 1961 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 365.89 ft above mean sea level, datum of 1929.

Average discharge.--7 years (1957-64), 1,206 cfs (873,100 acre-ft per year).

Extremes.--Maximum discharge during year, 26,000 cfs Sept. 23 (gage height, 27.76 ft); minimum daily, 200 cfs Nov. 5.

1956-64: Maximum discharge, 65,700 cfs May 27, 1957 (gage height, 32.02 ft); minimum daily, 131 cfs Dec. 9, 1956.

Flood of May 25, 1908, reached a stage of 41 ft (from Corps of Engineers flood profiles) and is the highest since that time. Floods in 1866 and 1908 reached about same stage at Dallas.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Flow largely regulated by reservoirs above Dallas (station 8-570) and White Rock Lake (capacity, 12,500 acre-ft in 1956). Cities of Fort Worth and Dallas divert water for municipal use and return sewage effluent above station. Low flows are maintained largely by sewage effluent. The city of Dallas brought in 34,800 acre-ft of water from outside the watershed for municipal use.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 13-14, Apr. 28 to May 8, Sept. 23-25, 28-30)

3.8	200	21.0	6,200
4.0	226	24.0	9,300
5.0	383	26.0	13,500
7.0	800	28.0	23,000
12.0	2,300	29.0	29,500
17.0	4,200		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	276	*230	300	240	540	250	308	383	1,130	324	350	292
2	276	230	280	240	330	370	332	571	657	340	310	308
3	262	240	220	250	390	300	324	531	454	332	270	316
4	269	230	*210	220	520	350	366	454	358	349	250	340
5	269	200	220	230	600	390	751	392	349	383	250	300
6	254	230	250	210	400	290	775	*409	332	324	240	360
7	260	226	210	*213	400	350	436	464	316	284	240	350
8	250	220	210	240	280	630	409	636	308	262	280	270
9	250	213	220	233	270	2,900	349	850	300	358	250	280
10	260	200	530	233	270	*1,880	340	531	332	*300	250	270
11	290	206	630	220	*250	650	316	464	316	308	*269	300
12	290	200	380	220	250	418	332	551	324	374	276	280
13	280	213	270	233	427	366	400	392	349	332	308	230
14	270	213	250	230	400	340	358	340	383	308	308	*290
15	270	213	230	240	280	300	340	308	358	292	617	270
16	280	213	220	440	260	292	316	366	358	300	1,500	860
17	270	200	210	460	270	276	340	332	349	292	680	2,530
18	260	213	210	450	260	292	358	284	300	292	1,420	1,100
19	320	461	210	520	250	1,800	358	292	300	284	520	380
20	330	491	230	370	240	3,210	332	292	300	300	330	900
21	280	344	220	280	240	2,770	2,000	292	284	270	310	5,550
22	260	320	230	270	240	571	3,680	324	300	250	260	15,200
23	260	300	230	250	240	464	2,600	383	284	250	473	*24,200
24	280	280	210	250	230	409	791	360	316	250	400	15,000
25	260	260	220	230	230	409	492	300	308	320	324	7,260
26	260	240	250	230	230	400	1,360	284	324	300	300	4,040
27	270	220	230	230	230	383	1,470	316	358	280	292	5,010
28	240	270	310	220	230	349	680	*332	400	260	324	8,000
29	250	300	290	310	230	316	464	512	349	270	316	6,760
30	230	260	240	1,210	----------	316	409	3,000	308	600	349	5,200
31	220	----------	230	1,700	----------	300	----------	4,000	----------	830	316	----------
Total	8,296	7,636	8,150	10,872	8,987	22,341	21,786	18,945	11,104	10,218	12,582	106,446
Mean	268	255	263	351	310	721	726	611	370	330	406	3,548
Ac-ft	16,450	15,150	16,170	21,560	17,830	44,310	43,210	37,580	22,020	20,270	24,960	211,100

Calendar year 1963: Max 11,000 Min 200 Mean 582 Ac-ft 421,600
Water year 1963-64: Max 24,200 Min 200 Mean 676 Ac-ft 490,600

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 7 to Nov. 6, Nov. 22 to Jan. 6, Jan. 14 to Feb. 12, Feb. 15 to Mar. 9, Mar. 19-21, Apr. 21-23, May 24, 30-31, July 21 to Aug. 10, Aug. 19-22, Sept. 6-22.

8-575. Honey Creek subwatershed No. 11 near McKinney, Tex.

Location.--Lat 33°18'12", long 96°41'22", near center of dam on unnamed tributary of Honey Creek, 1.5 miles west of Farm Road 543, and 8.4 miles northwest of McKinney, Collin County.

Drainage area.--2.14 sq mi.

Records available.--September 1952 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 629.00 ft above mean sea level, datum of 1929 (levels by Soil Conservation Service).

Average outflow.--12 years, 448 acre-ft per year.

Extremes.--Maximum outflow during year, 6.9 cfs Sept. 22-23, (gage height, 19.11 ft); no outflow most of time. Maximum inflow, 1,380 cfs (average for 5-minute interval) Sept. 21, computed from outflow and change in pool contents, adjusted for rainfall on pool surface during time of peak inflow.
1952-64: Maximum outflow, 716 cfs May 26, 1957 (gage height, 28.77 ft); no outflow most of time. Maximum inflow, 1,880 cfs (average for 15-minute interval) May 1, 1958, computed and adjusted as above.

Remarks.--Records good. Dam completed Feb. 9, 1952, but no appreciable storage before April 1952. Outflow began Apr. 21, 1957. Rolled-fill earthen dam is 1,303 ft long with earthen spillway section at gage height 26.84 ft. Outlet structure is 2½-foot square concrete drop inlet, gage height of crest 14.84 ft, connected to a 12-inch concrete outlet pipe at gage height 4.8 ft. There is also an 8-inch controlled emergency outlet pipe connected to drop outlet at gage height 4.8 ft. Pool capacity, 1,210 acre-ft at spillway crest, 431 acre-ft at top of drop outlet structure, and 123 acre-ft at controlled outlet pipe. Dam built by Soil Conservation Service for flood control, conservation of stock water and recreation. Recording rain gage located at station. Capacity based on 1960 survey.

Pool water budget, in acre-feet, water year October 1963 to September 1964

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Inflow1/	0	0.2	0.1	0.1	0	5.1	83.7	61.8	10.8	0.1	9.0	392
Outflow	0	0	0	0	0	0	0	0	0	0	0	133
(††)	0	1.20	1.17	1.89	1.56	3.84	5.00	5.09	1.38	.08	6.00	11.44

Calendar year 1963: Inflow 411 Outflow 335 †† 21.00
Water year 1963-64: Inflow 563 Outflow 133 †† 38.65

Peak inflow (base, 100 cfs)

Date	Time	Discharge
4-22	1940	640 (5-min)
9-16	1515	117 (15-min)
9-21	0415	1,380 (5-min)

1/ Inflow adjusted for rainfall on pool and for pool losses.
†† Weighted mean rainfall, in inches.

8-580. Honey Creek subwatershed No. 12 near McKinney, Tex.

Location.--Lat 33°18'20", long 96°40'12", near center of dam on unnamed tributary of Honey Creek, 0.5 mile west of Farm Road 543, and 7.8 miles northwest of McKinney, Collin County.

Drainage area.--1.26 sq mi.

Records available.--September 1952 to September 1964.

Gage.--Water-stage recorder and concrete drop outlet. Datum of gage is 623.00 ft above mean sea level, datum of 1929 (levels by Soil Conservation Service).

Average outflow.--12 years,(340 acre-ft per year).

Extremes.--Maximum outflow during year, 8.1 cfs Sept. 21 (gage height, 21.58 ft); no outflow most of time. Maximum inflow, 850 cfs (average for 5-minute interval) Sept. 21, computed from outflow and change in pool contents, adjusted for rainfall on pool surface during time of peak inflow.

1952-64: Maximum outflow, 766 cfs May 26, 1957 (gage height, 29.23 ft); no outflow most of time. Maximum inflow, 1,490 cfs (average for 15-minute interval) May 21, 1957, computed and adjusted as above.

Remarks.--Records good except those for period of no gage-height record, which are fair. Dam completed Jan. 11, 1952, but no appreciable storage before April 1952. Outflow began May 12, 1954. Rolled-fill earthen dam is 1,253 ft long with earthen spillway section at gage height 27.0 ft. Outlet structure is 2.5-foot square concrete drop outlet, gage height of crest, 14.99 ft, connected to a 12-inch concrete outlet pipe at gage height 5.0 ft. There is also an 8-inch controlled outlet to drop outlet at gage height 5.0 ft. Pool capacity, 507 acre-ft at emergency spillway crest, 122 acre-ft at drop outlet structure, and 5.5 acre-ft at controlled outlet pipe. Dam built by Soil Conservation Service for flood control and conservation. Rainfall record obtained from one recording and two nonrecording rain gages above station.

Pool water budget, in acre-feet, water year October 1963 to September 1964

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Inflow1/	0.7	0.7	2.2	2.6	1.5	9.2	67.3	35.3	4.6	0.4	4.1	221
Outflow	0	0	0	0	0	0	23.6	26.8	2.2	0	0	152
(††)	.01	1.09	1.15	1.74	1.54	3.71	4.87	4.69	.83	.07	3.99	11.22

Calendar year 1963: Inflow 262 Outflow 212 †† 20.12
Water year 1963-64: Inflow 350 Outflow 205 †† 34.91

Peak inflow (base, 100 cfs)

Date	Time	Discharge
4-22	2020	648 (5-min)
9-16	1615	154 (5-min)
9-21	0500	850 (5-min)

1/ Inflow adjusted for rainfall on pool and for pool losses.
†† Weighted mean rainfall, in inches.
Note.--No gage-height record May 13 to June 4, July 23-28, Sept. 21-23.

8-585. Honey Creek near McKinney, Tex.

Location.--Lat 33°16'42", long 96°39'27", on right bank at downstream side of bridge on county road, 4.5 miles downstream from Haw Branch, 5.6 miles upstream from mouth, and 6.0 miles northwest of McKinney, Collin County.

Drainage area.--39.0 sq mi.

Records available.--July 1951 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 563.68 ft above mean sea level, datum of 1929 (Soil Conservation Service reference mark).

Average discharge.--13 years, 14.4 cfs (10,430 acre-ft per year).

Extremes.--Maximum discharge during year, 3,370 cfs Sept. 21 (gage height, 17.66 ft); no flow at times.
1951-64: Maximum discharge, 7,920 cfs May 26, 1957 (gage height, 20.29 ft); no flow at times.
Maximum stage since at least 1930, 23.0 ft in spring of 1950, from information by local resident.

Remarks.--Records good. Station operated as part of the Honey Creek basin hydrologic cooperative program of the Geological Survey and Soil Conservation Service to evaluate rainfall-runoff relations, and the effects of floodwater-retarding structures. Flow from 20.9 sq mi above this station is partly controlled by 12 floodwater-retarding structures with a total combined capacity of 8,320 acre-ft below the flood spillway crests, of which 6,170 acre-ft is floodwater-retarding capacity and 2,150 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Diversions for irrigation above station. Fourteen rain gages (10 standard and 4 recording) are operating in the basin above this station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0	0	0.3	8.0	12			0
2					0	.1	.4	4.8	4.9			0
3			(*)		0	.2	.4	1.8	3.4			0
4					0	.3	.4	1.3	2.3			0
5					0	.1	.9	1.1	2.2			0
6					.4	0	*.7	11	1.8			0
7					.3	.1	.5	5.6	1.3			0
8					0	.2	.3	78	1.1			0
9					0	2.2	.3	35	1.0			0
10					0	1.0	.4	14	.9			0
11					0	.6	.4	8.4	.7			0
12					0	.3	.6	5.0	.6			0
13					0	.2	.5	*2.6	.6			0
14				(*)	0	.2	.3	2.0	.6			0
15					0	.1	.2	1.4	* .8			0
16					0	.1	.3	1.2	1.8			174
17					0	.1	.5	.9	1.8	(*)	(*)	38
18					0	.2	.6	.8	.8			3.3
19					0	42	.4	.6	.5			1.3
20					0	6.9	.4	.6	.3			1.1
21					0	1.0	.8	.4	.2			1,050
22	(*)				0	.4	121	.4	.1			*275
23					.3	.3	*114	.4	0			*187
24					.8	.3	24	.4	0			104
25					* .8	.4	65	.3	0			76
26					.8	.3	27	.2	0			76
27					.6	.3	14	.2	0			274
28					.3	.3	5.2	.2	0			124
29					.1	.2	3.4	1.1	0			69
30					----------	.2	2.7	186	0			49
31		----------			----------	.3	----------	31	----------			----------
Total	0	0	0	0	4.4	58.9	385.9	404.7	39.7	0	0	2,501.7
Mean	0	0	0	0	0.15	1.90	12.9	13.1	1.32	0	0	83.4
Ac-ft	0	0	0	0	8.7	117	765	803	79	0	0	4,960
(†)	1,080	1,020	986	971	955	1,040	1,590	1,870	1,710	1,440	1,320	2,310
(††)	0	1.03	1.16	1.73	1.62	4.13	4.57	5.19	1.09	0.21	4.38	11.44

Calendar year 1963: Maximum 759 Minimum 0 Mean 9.25 Ac-ft 6,700 †† 19.31
Water year 1963-64: Maximum 1,050 Minimum 0 Mean 9.28 Ac-ft 6,730 †† 36.50

* Discharge measurement or observation of no flow made on this day.
† Contents, in acre-feet, at end of month, in Soil Conservation Service pools upstream from station.
†† Weighted mean rainfall, in inches, during month.
Note.--No gage-height record June 20-23, Sept. 25.

8-590. East Fork Trinity River near McKinney, Tex.

Location.--Lat 33°12'13", long 96°35'44", on right bank at downstream side of bridge on State Highway 24, 1.2 miles northeast of McKinney, Collin County, 4.2 miles (revised) downstream from Honey Creek, 11 miles (revised) upstream from Wilson Creek, and 22 miles upstream from Lavon Dam.

Drainage area.--190 sq mi.

Records available.--August 1949 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 511.69 ft above mean sea level, datum of 1929.

Average discharge.--15 years, 85.4 cfs (61,800 acre-ft per year).

Extremes.--Maximum discharge during year, 19,000 cfs Sept. 21 (gage height, 16.86 ft); no flow at times.
1949-64: Maximum discharge not determined; maximum gage height, 17.23 ft June 11, 1950; maximum discharge measured, 23,900 cfs May 26, 1957 (gage height, 16.65 ft); no flow at times.
Maximum stage since at least 1913, 21 ft in April 1942, from information by local residents.

Remarks.--Records good except those above 1,000 cfs, which are poor. Low flow partly sustained by sewage effluent from U. S. Government hospital. Small diversions for irrigation above station. At end of year, flow from 47.9 sq mi above this station was partly controlled by 26 floodwater-retarding structures with a total combined capacity of 18,300 acre-ft below the flood spillway crests, of which 13,660 acre-ft is floodwater-retarding capacity and 4,640 acre-ft is sediment-pool capacity. Five structures were built during the current year and have a total combined capacity below flood spillway crests of 2,070 acre-ft, of which 556 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 17-25, Apr. 23, 25, May 30, Sept. 17, 21-23, 27-28)

3.1	0	3.6	3.8	6.0	113	15.0	1,730
3.2	.1	3.8	8.6	10.0	378	15.3	2,270
3.3	.3	4.0	14	13.0	652	15.6	3,170
3.4	.9	4.5	34	14.0	835	16.0	5,070
3.5	2.0	5.0	58	14.5	1,130	16.5	9,070

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.1	0.4	0.2	0.3	0.2	2.9	32	74	3.8	0.2	0.1
2	0	.1	.4	.1	.2	.6	2.8	150	48	3.3	.2	.1
3	0	.1	.5	.1	.2	.2	2.8	82	38	2.9	.1	.1
4	0	.1	.3	.1	3.0	.3	2.6	52	36	2.8	.2	.1
5	0	.1	.3	.1	1.5	.2	3.8	40	38	2.4	.1	.2
6	.1	.1	.3	.1	.4	.2	*3.8	38	30	2.0	.1	.2
7	0	.1	.3	.1	.3	.2	4.8	68	24	1.6	.1	.1
8	0	.1	.3	.1	.3	1.1	3.8	152	18	1.2	.2	.1
9	.1	.1	.5	.2	.3	12	2.3	227	14	1.1	.2	.2
10	.1	.1	2.4	.2	.3	.6	1.4	79	11	.9	.2	.3
11	.1	.1	1.0	.2	.4	2.8	1.2	56	9.2	.7	.2	.3
12	.1	0	.4	.2	1.0	4.4	2.6	44	8.4	.2	.1	.4
13	.1	.1	.3	.1	1.4	2.9	7.9	*33	7.6	.1	.1	.4
14	.1	.1	.3	.2	.3	2.0	6.9	25	6.9	.1	.1	.3
15	0	.1	.3	.2	.2	1.0	6.4	21	6.6	.1	4.7	.2
16	.1	.1	.3	.6	.2	1.1	6.1	18	*7.6	.2	16	64
17	.1	.1	.4	.3	.2	.7	6.1	16	18	.2	1.2	679
18	.1	*.1	.4	.3	.2	1.1	5.6	16	20	.1	*.6	50
19	.1	1.6	.4	.2	.1	149	5.3	14	9.5	.1	.3	21
20	.1	.3	*.3	.1	.1	239	5.6	13	6.1	.1	.1	21
21	*.1	.2	.1	*.1	.1	22	8.1	12	5.6	.1	.1	*7,580
22	.1	.2	.1	.1	.1	12	41	11	4.6	* .1	.1	*1,970
23	.1	.2	.1	.1	.1	10	*927	10	4.0	.1	.1	1,210
24	.2	.2	.1	.1	.2	8.6	259	9.8	3.1	.1	.1	334
25	.1	.2	.2	.1	* .2	7.9	634	9.5	2.6	.1	.1	204
26	.1	.3	.1	.1	.2	6.9	264	8.1	2.2	.1	.1	165
27	.1	.2	.1	.1	.2	5.6	120	7.1	3.1	.1	.2	2,020
28	.1	.2	.1	.1	.2	4.4	63	6.6	4.0	.1	.1	1,410
29	0	.3	.1	.2	.1	4.0	44	13	4.0	.2	.1	292
30	0	.3	.1	2.4	----------	2.9	36	1,090	4.0	.2	.1	206
31	0	----------	.1	1.0	----------	3.1	----------	216	----------	.2	.1	----------
Total	2.1	5.9	11.0	8.1	12.3	507.0	2,480.8	2,569.1	468.1	25.3	26.2	16,229.1
Mean	0.07	0.20	0.35	0.26	0.42	16.4	82.7	82.9	15.6	0.82	0.85	541
Ac-ft	4.2	12	22	16	24	1,010	4,920	5,100	928	50	52	32,190

Calendar year 1963: Max 2,960 Min 0 Mean 43.0 Ac-ft 31,120
Water year 1963-64: Max 7,580 Min 0 Mean 61.1 Ac-ft 44,330

Peak discharge (base, 1,200 cfs)

Date	Time	Gage height	Discharge
9-21	0800	16.86	19,000

* Discharge measurement made on this day.

8-595. Sister Grove Creek near Princeton, Tex.

Location.--Lat 33°11'35", long 96°28'32", on right bank at upstream side of bridge on Farm Road 1377, 1.4 miles northeast of Princeton, Collin County, 2.3 miles downstream from Stiff Creek, 5 miles upstream from mouth, and 15 miles upstream from Lavon Dam.
Drainage area.--113 sq mi.
Records available.--September 1949 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 487.52 ft above mean sea level, unadjusted (Corps of Engineers bench mark).
Average discharge.--15 years, 54.0 cfs (39,090 acre-ft per year).
Extremes.--Maximum discharge during year, 7,080 cfs Sept. 21 (gage height, 16.38 ft); no flow for many days.
1949-64: Maximum discharge, 9,080 cfs Apr. 26, 1957 (gage height, 16.28 ft, 16.9 ft with present control), from rating curve defined by current-meter measurements below 3,800 cfs and contracted-opening measurement at 7,560 cfs; no flow at times.
Maximum stage since at least 1865, 22 ft in July 1913, from information by local residents.
Remarks.--Records good. At end of year, flow from 52.6 sq mi above this station was partly controlled by 34 floodwater-retarding structures with a total combined capacity of 18,180 acre-ft below the flood spillway crests, of which 13,930 acre-ft is floodwater-retarding capacity and 4,250 acre-ft is sediment-pool capacity. Two structures were built during the current year and have a total combined capacity below flood spillway crest of 725 acre-ft, of which 192 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 11 to Mar. 21)

Oct. 1 to Mar. 19

4.4	0	5.0	2.9
4.5	.1	5.5	8.5
4.6	.4	6.0	17
4.7	.8	6.5	28
4.8	1.3		

Mar. 20 to Sept. 30

4.3	0	7.0	51
4.4	.1	8.0	90
4.5	.4	10.0	220
4.6	.9	12.0	400
4.8	2.4	14.0	1,050
5.0	4.5	14.5	1,820
5.5	12	15.0	2,820
6.0	22	15.5	4,020

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0	0.4	3.8	37	184	6.4		0
2					0	.6	4.0	160	115	6.9		0
3					0	.7	4.0	110	90	6.6		0
4					0	1.0	3.8	78	64	4.7		0
5					0	2.3	4.5	51	42	4.0		0
6					0	2.3	6.2	37	34	3.5		0
7					0	2.3	4.6	44	27	3.2		0
8					0	2.0	*4.0	61	24	2.6		0
9					0	8.1	3.2	183	18	1.9		0
10					0	4.4	2.8	118	16	1.5		0
11					0	3.8	2.6	76	14	1.0		0
12					.3	3.6	2.8	49	13	.7		0
13					.6	2.7	4.5	38	13	.3		0
14					.5	3.1	3.2	*32	12	.1		0
15					.6	4.5	2.8	28	9.1	0		0
16					1.0	4.0	2.6	25	*11	0		.1
17					2.0	3.6	2.6	22	125	0	(*)	173
18		(*)			1.9	3.2	2.4	19	75	0		92
19					1.1	26	2.4	17	38	0		35
20			(*)		.8	58	2.4	16	28	0		23
21	(*)			(*)	.7	20	5.2	15	24	*0		3,600
22					.6	9.8	14	14	16	0		1,360
23					.6	7.4	216	12	13	0		626
24					.5	6.7	245	9.3	11	0		369
25					*.5	6.1	361	8.4	9.6	0		268
26					.4	5.7	224	7.3	8.5	0		244
27					.3	5.2	102	6.5	7.4	0		685
28					.3	4.7	62	6.0	6.9	0		1,050
29					.3	4.3	48	6.1	7.9	0		662
30					----------	4.1	41	851	7.6	0		355
31		----------			----------	3.8	----------	*432	----------	0		----------
Total	0	0	0	0	13.0	214.4	1,387.4	2,568.6	1,064.0	43.4	0	9,542.1
Mean	0	0	0	0	0.4	6.92	46.2	82.9	35.5	1.40	0	318
Ac-ft	0	0	0	0	26	425	2,750	5,100	2,110	86	0	18,930

Calendar year 1963: Max 2,320 Min 0 Mean 33.7 Ac-ft 24,410
Water year 1963-64: Max 3,600 Min 0 Mean 40.5 Ac-ft 29,430

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

8-605. Lavon Reservoir near Lavon, Tex.

Location.--Lat 33°01'55", long 96°28'41", in right abutment of spillway in dam on East Fork Trinity River, three-quarters of a mile upstream from St. Louis Southwestern Railway Lines bridge, 1 mile upstream from bridge on State Highway 78, and 2.5 miles west of Lavon, Collin County.
Drainage area.--770 sq mi.
Records available.--September 1953 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929. Prior to Jan. 20, 1954, staff gage in the approach channel at same datum.
Extremes.--Maximum contents during year, 288,800 acre-ft Sept. 30 (elevation, 482.60 ft); minimum, 104,800 acre-ft Feb. 29 (elevation, 468.18 ft).
1953-64: Maximum contents, 462,800 acre-ft May 26, 1957 (elevation, 491.90 ft); minimum since reservoir first filled in 1957, that of Feb. 29, 1964.
Remarks.--Reservoir is formed by a rolled earth-fill dam 9,499 ft long, including a 568-foot gated spillway with twelve 40- by 28-foot tainter gates. The low-flow outlets consist of five 36-inch diameter gate-controlled sluices with inverts at elevation 453.0 ft. Deliberate impoundment of water began Sept. 14, 1953, and dam completed in October 1953. Capacity table is from survey made in 1952. Water for municipal supply can be withdrawn to elevation 453 ft. At end of year, flow from 134 sq mi above this station was partly controlled by 78 floodwater-retarding structures with a total combined capacity of 48,050 acre-ft below the flood spillway crests, of which 36,360 acre-ft is floodwater-retarding capacity and 11,690 acre-ft is sediment-pool capacity. Nine structures were built during the current year and have a total combined capacity below flood spillway crests of 4,140 acre-ft, of which 1,060 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of tainter gates	490.0	423,400
Top of conservation storage	472.0	143,600
Crest of spillway (sill of tainter gates)	462.0	56,290
Invert at lowest intake	453.0	14,330

Figures given herein represent total contents. Reservoir is designed for flood control and water conservation.
Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

Capacity table (elevation, in feet, and capacity, in acre-feet)

468	103,100	477	205,100
471	132,700	479	233,200
473	154,900	481	263,300
475	179,000	483	295,300

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	120,200	112,900	109,400	107,500	106,700	104,900	110,000	131,000	172,500	141,900	129,100	123,800
2	120,000	112,500	109,300	107,500	106,600	104,900	109,900	131,200	172,200	141,700	128,900	123,500
3	119,800	112,400	109,200	107,400	106,700	105,100	109,700	131,600	171,300	141,300	128,600	123,300
4	119,600	112,300	109,100	107,400	106,900	105,000	109,600	132,000	170,300	140,900	128,100	123,000
5	119,400	112,300	109,100	107,300	107,100	104,900	110,100	132,300	169,400	140,400	127,700	122,700
6	119,100	112,200	109,000	107,200	106,900	104,900	109,900	132,600	168,200	140,100	127,400	122,300
7	119,000	112,000	108,800	107,200	106,800	104,800	109,700	132,800	167,000	139,700	126,900	122,200
8	118,800	111,800	108,600	107,000	106,700	106,800	109,400	134,500	165,500	139,200	126,500	122,000
9	118,600	111,600	108,300	106,800	106,600	107,400	109,100	136,100	164,100	138,800	126,000	121,700
10	118,400	111,500	109,500	106,600	106,600	107,600	108,900	137,000	162,600	138,400	125,500	121,500
11	118,100	111,300	109,800	106,500	106,500	107,700	108,700	137,900	160,600	137,900	125,000	121,100
12	117,800	111,200	109,300	106,400	106,600	107,700	109,000	138,300	158,800	137,500	124,600	120,700
13	117,500	111,000	109,100	106,300	106,600	107,700	108,800	138,000	156,500	136,800	124,000	120,200
14	117,200	110,600	109,000	106,100	106,500	107,700	108,700	137,900	155,000	136,200	123,400	119,900
15	117,000	110,200	108,800	106,500	106,400	107,600	108,500	137,800	153,300	135,800	126,100	119,700
16	116,700	109,800	108,600	107,000	106,300	107,500	108,200	137,700	153,500	135,400	126,900	121,700
17	116,400	110,000	108,500	106,900	106,300	107,500	108,000	137,600	153,400	135,000	126,800	122,400
18	116,200	110,200	108,400	106,800	106,200	108,000	107,900	137,500	154,500	134,600	127,200	124,000
19	116,000	110,900	108,500	106,700	106,200	109,400	107,900	137,400	153,100	134,100	126,800	124,500
20	115,700	110,900	108,800	106,700	106,000	111,100	107,800	137,300	151,500	133,800	126,100	125,300
21	115,500	110,800	108,700	106,600	105,900	111,100	109,400	137,100	149,600	133,400	126,300	200,100
22	115,300	110,700	108,500	106,600	105,700	111,000	110,400	136,800	147,600	133,100	126,400	237,300
23	115,100	110,600	108,300	106,600	105,700	111,000	112,900	136,600	145,900	132,600	126,200	248,300
24	115,000	110,300	108,100	106,500	105,700	110,900	117,300	136,400	144,800	132,300	125,900	251,800
25	114,900	110,200	107,800	106,400	105,500	110,900	120,900	136,300	144,100	132,000	125,700	252,600
26	114,700	110,200	107,900	106,300	105,400	110,800	127,400	136,100	143,800	131,500	125,300	253,800
27	114,500	109,900	107,800	106,200	105,200	110,700	130,300	136,000	143,500	131,100	125,000	265,000
28	114,100	110,300	107,700	106,000	105,000	110,600	130,800	136,000	142,900	130,800	124,800	282,800
29	113,700	110,000	107,700	106,300	104,800	110,400	130,800	137,900	142,600	130,400	124,700	288,300
30	113,100	109,800	107,600	106,800	----------	110,300	130,800	156,900	142,300	129,900	124,500	288,800
31	113,100	----------	107,500	106,700	----------	110,100	----------	170,300	----------	129,400	124,000	----------
(†)	469.06	468.71	468.47	468.38	468.18	468.74	470.81	474.29	471.88	470.68	470.16	482.60
(‡)	-7,500	-3,300	-2,300	-800	-1,900	+5,300	+20,700	+39,500	-28,000	-12,900	-5,400	+164,800
(††)	2,950	1,500	1,500	1,420	1,080	1,510	2,150	2,330	2,830	4,360	3,280	2,250

Calendar year 1963..... ‡ -37,000 †† 25,160
Water year 1963-64..... ‡ +168,200 †† 27,160

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.
†† Diversions for municipal use, in acre-feet, by North Texas Municipal Water District.

8-610. East Fork Trinity River near Lavon, Tex.

Location.--Lat 33°01'23", long 96°28'32", on left bank at downstream side of bridge on State Highway 78, 150 ft downstream from St. Louis Southwestern Railway Lines bridge, 3,500 ft downstream from Lavon Dam, and 2.5 miles west of Lavon, Collin County.

Drainage area.--773 sq mi.

Records available.--October 1953 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 429.58 ft above mean sea level, datum of 1929.

Average discharge.--11 years, 255 cfs (184,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,190 cfs Sept. 30 (gage height, 12.64 ft); no flow most of time.
1953-64: Maximum discharge, 39,000 cfs May 26, 27, 1957, from records of released flow from Lavon Reservoir furnished by Corps of Engineers; maximum gage height, 17.34 ft May 26, 1957; no flow at times.
Maximum stage since at least 1894, 22.3 ft in 1913 and in April 1942, from information by St. Louis Southwestern Railway Lines and local residents.

Remarks.--Records good. Flow regulated by Lavon Reservoir (station 8-605). Records furnished by the North Texas Municipal Water District show that during year 27,160 acre-ft of water was diverted from Lavon Reservoir for municipal use.

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

2.2	0	3.5	64
2.3	.1	4.0	110
2.5	.6	6.0	300
2.6	1.4	8.0	515
2.8	4.7	10.0	760
3.0	12	12.0	1,040
3.2	28		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0.1	0	0	0	0.1	0	182			0
2	0	0	.1	0	0	0	.1	0	551			0
3	0	0	.1	0	0	0	.1	0	671			0
4	0	0	.1	0	.1	.1	.1	0	721			0
5	.1	0	.1	0	.1	0	.2	0	721			0
6	.1	0	.1	0	0	0	.1	0	708			0
7	.1	0	.2	0	0	0	.1	0	708			0
8	.1	0	.2	0	0	.1	*0	.7	708			0
9	0	0	.2	.1	0	2.1	0	.3	708			0
10	0	0	.5	0	0	.2	0	.2	812			0
11	0	0	.6	0	0	4.2	0	.1	932			0
12	0	0	.3	.1	0	.5	0	0	918			0
13	.1	0	.2	.1	.1	.3	.2	0	918			0
14	.1	0	.2	.1	0	.3	0	*0	918			0
15	.1	0	.1	.1	0	.2	0	0	904			0
16	.1	0	.1	.3	0	.2	0	0	*904			0
17	0	0	.1	.1	0	.2	0	0	904			0
18	0	*0	.1	.1	0	.2	0	0	904			0
19	0	.3	.1	.1	.7	1.5	0	0	890		(*)	0
20	0	.3	*.1	0	.3	.4	0	0	890			0
21	*0	.2	.1	*0	.1	.2	.3	0	877	(*)		85
22	0	.2	.2	0	0	.1	.4	0	877			7.2
23	0	.1	.2	0	0	.1	.3	0	864			272
24	0	.1	.2	0	0	.1	.1	0	501			684
25	0	.1	.1	0	*0	.1	.1	0	*101			610
26	0	.2	.1	0	0	.1	.3	0	45			330
27	0	.2	.1	0	0	.1	.2	0	.2			350
28	0	.3	.2	0	0	.1	.1	0	0			*340
29	0	.1	.2	0	0	0	0	0	0			496
30	0	.1	.2	.1	----------	0	0	33	0			944
31	0	----------	.2	.1	----------	0	----------	1.6	----------			----------
Total	0.8	2.2	5.4	1.3	1.4	11.4	2.8	35.9	18,837.2	0	0	4,118.2
Mean	0.03	0.07	0.17	0.04	0.05	0.37	0.09	1.16	628	0	0	137
Ac-ft	1.6	4.4	11	2.6	2.8	23	5.6	71	37,360	0	0	8,170

Calendar year 1963: Max 1,930 Min 0 Mean 162 Ac-ft 117,170
Water year 1963-64: Max 932 Min 0 Mean 62.9 Ac-ft 45,650

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

8-617. Duck Creek near Garland, Tex.

Location.--Lat 32°50'00", long 96°35'45", on right bank at downstream side of bridge on Belt Line Road, 6.0 miles southeast of Garland, Dallas County, and 6.0 miles upstream from mouth.

Drainage area.--31.6 sq mi.

Records available.--January 1958 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 430.02 ft above mean sea level, datum of 1929, adjustment of 1954. Prior to Oct. 1, 1962, at datum 4.00 ft higher.

Average discharge.--6 years, 17.6 cfs (12,740 acre-ft per year).

Extremes.--Maximum discharge during year, 6,200 cfs Sept. 21 (gage height, 17.80 ft); no flow at times.
1958-64: Maximum discharge, 16,000 cfs July 27, 1962 (gage height, 20.80 ft, present datum); no flow at times.
Maximum stage since about 1895, 21.5 ft, present datum, June 13, 1949, from information by local residents.

Remarks.--Records good. Recording rain gage located at station. Drainage basin is largely urban area under development. Small diversion above station for irrigation of golf course.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 20-24, 28-29, Dec. 11-14, 20-21, Jan. 15, Mar. 10 to Apr. 21, May 31 to July 8, Aug. 17-19, Sept. 23-30)

3.0	0	4.4	27
3.1	.1	5.0	48
3.2	.4	6.0	93
3.3	1.0	10.0	294
3.4	2.0	12.0	426
3.5	3.5	13.0	525
3.6	5.5	14.0	781
3.8	10	15.0	1,350
4.0	15	16.0	2,300

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.2	0.3	4.5	0.7	6.9	4.3	7.1	1.0	0	0
2		0	.2	.4	2.5	1.6	6.2	19	4.1	.2	0	0
3		0	.1	.4	3.2	1.5	5.7	5.3	3.0	3.8	0	0
4		0	.1	.4	16	2.4	4.9	3	2.5	0	0	0
5		0	.2	.4	10	2.1	14	3	2.8	.6	0	22
6		0	.3	.4	4.1	1.0	4.9	6.4	2.8	0	0	29
7		0	.2	.3	2.5	1.0	3.0	5.7	2.8	0	0	2.5
8		0	.2	.4	1.9	5.3	*1.8	61	.9	0	0	1.3
9		0	.2	.3	1.6	*394	1.6	17	.7	0	0	1.0
10		0	18	.3	1.5	*20	1.6	8.3	.7	0	0	.8
11		0	10	.3	1.3	8.8	2.6	5.5	.7	0	0	.7
12		0	2.0	.3	1.4	6.9	3.7	4	.6	0	0	.3
13		0	.7	.3	9.7	6.0	11	3	.5	0	0	0
14		0	.6	.2	3.2	7.1	3.2	*2.2	.4	0	0	0
15		0	.4	.4	2.5	5.7	2.3	1.7	.9	0	47	0
16		0	.4	6.9	1.6	5.7	2.2	1.6	*3.2	0	127	75
17		0	.4	16	1.4	6.0	2.2	1.4	3.9	0	4.8	66
18		*0	.4	11	2.0	6.2	2.3	1.2	1.4	0	1.4	4.7
19		7.5	.4	8.0	1.5	199	2.2	1.3	.7	0	*2.2	2.0
20		4.9	*1.0	2.6	1.1	17	1.8	1.2	.3	0	.4	25
21	(*)	1.0	.8	1.5	1.0	9.5	107	1.3	.2	*0	.3	1,660
22		1.6	.4	*1.4	.9	7.3	24	1.3	.1	0	.3	109
23		1.4	.4	1.3	.8	6.4	15	.9	.1	0	.2	97
24		.6	.4	1.0	.7	7.8	7.6	.9	.2	0	.2	18
25		.4	.5	.7	.7	6.9	4.9	.9	.4	0	.2	11
26		.3	.5	.7	*.7	5.3	93	.9	.4	0	.2	8.8
27		.3	.4	.7	.9	5.3	14	.7	.1	0	.2	372
28		2.5	.4	.6	.9	5.7	7.8	.7	0	0	.1	*38
29		1.1	.4	.9	.8	5.3	5.7	44	0	0	.1	17
30		.4	.4	44	----------	5.7	4.5	266	.6	0	0	8.6
31		----------	.4	14	----------	6.0	----------	20	----------	0	0	----------
Total	0	22.0	41.0	116.4	80.9	769.2	367.6	493.7	42.1	5.6	184.6	2569.7
Mean	0	0.73	1.32	3.75	2.79	24.8	12.3	15.9	1.40	0.18	5.95	85.7
Ac-ft	0	44	81	231	160	1,530	729	979	84	11	366	5,100

Calendar year 1963: Max 1,440 Min 0 Mean 7.60 Ac-ft 5,510
Water year 1963-64: Max 1,660 Min 0 Mean 12.8 Ac-ft 9,320

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
3- 9	0300	14.88	1,280
9-21	0600	17.80	6,200
9-27	1200	15.24	1,500

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

8-620. East Fork Trinity River near Crandall, Tex.

Location.--Lat 32°38'20", long 96°29'15", on right bank at downstream side of bridge on U. S. Highway 175, 4,500 ft downstream from Mustang Creek, 1.8 miles northwest of Crandall, Kaufman County, and 2.9 miles upstream from Little Buffalo Creek.

Drainage area.--1,256 sq mi.

Records available.--June 1949 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 343.69 ft above mean sea level, datum of 1929.

Average discharge.--15 years, 503 cfs (364,200 acre-ft per year).

Extremes.--Maximum discharge during year, 10,100 cfs Sept. 23 (gage height, 17.13 ft); minimum daily, 5.3 cfs Nov. 11.
1949-64: Maximum discharge, 33,000 cfs May 28, 1957 (gage height, 22.81 ft); no flow at times.

Remarks.--Records good. Flow largely regulated by Lavon Reservoir (station 8-605) since September 1953. At end of year, flow from 82.6 sq mi above this station was partly controlled by 33 floodwater-retarding structures with a total combined capacity of 27,700 acre-ft below the flood spillway crests, of which 22,440 acre-ft is floodwater-retarding capacity and 5,260 acre-ft is sediment-pool capacity. Eight structures were built during the current year and have a total combined capacity below flood spillway crests of 5,760 acre-ft, of which 1,240 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Low flow maintained by effluent from urban areas.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	g 8.5	8.5	14	11	93	18	42	60	975	22	17	13
2	g 9.6	8.9	12	13	54	19	40	63	935	22	14	14
3	g 9.6	9.2	9.6	13	36	20	44	94	608	22	11	14
4	g 9.6	9.9	9.2	17	31	24	41	63	660	19	10	14
5	g 8.5	9.2	9.6	14	49	31	46	50	720	18	11	14
6	g 8.5	8.9	9.6	12	69	30	72	47	720	16	11	15
7	g 8.5	8.5	9.9	11	49	29	59	46	720	16	14	42
8	g 8.5	8.5	9.6	9.6	37	28	41	55	690	24	14	24
9	g 8.2	8.2	9.2	10	28	210	*34	133	660	21	12	17
10	g 8.2	6.4	9.2	10	23	690	32	128	660	18	7.4	13
11	g 8.5	5.3	16	9.9	21	268	33	75	634	18	12	11
12	g 8.5	7.8	50	9.9	20	93	29	59	660	18	13	13
13	g 8.5	8.5	43	9.9	24	67	31	48	690	17	14	21
14	g 8.5	8.5	25	11	44	57	48	42	720	24	14	14
15	g 8.2	8.5	16	11	43	48	42	*38	750	19	14	8.9
16	g 8.2	8.5	14	16	34	42	30	36	820	18	27	14
17	g 8.2	9.2	*12	23	27	36	28	33	*855	*16	175	135
18	g 8.2	9.6	11	52	24	36	28	30	935	16	62	228
19	g 8.2	*11	11	70	22	199	28	28	935	17	*30	85
20	g 8.2	13	11	57	24	750	27	28	855	16	73	46
21	g 8.2	15	11	39	22	324	122	27	820	14	31	160
22	*8.2	16	11	*23	21	115	634	26	820	16	17	*2,260
23	8.5	11	13	17	21	87	*277	26	785	14	19	3,790
24	8.9	9.9	12	15	20	79	370	25	785	13	16	5,760
25	8.5	11	11	13	18	73	146	23	785	14	15	3,200
26	8.5	11	11	11	*18	66	272	22	425	12	15	2,170
27	8.5	9.9	11	10	17	57	376	23	132	12	14	2,010
28	8.5	11	12	10	17	50	175	24	90	9.2	14	2,170
29	8.2	11	12	11	18	49	98	26	36	12	14	2,500
30	7.8	11	12	18	----------	45	73	169	30	12	14	2,940
31	8.2	----------	11	102	----------	44	----------	720	----------	12	13	----------
Total	262.9	292.9	437.9	659.3	924	3,684	3,318	2,267	19,910	517.2	737.4	32,715.9
Mean	8.48	9.76	14.1	21.3	31.9	119	111	73.1	664	16.7	23.8	1,090
Ac-ft	521	581	869	1,310	1,830	7,310	6,580	4,500	39,500	1,030	1,460	64,900

Calendar year 1963: Max 7,920 Min 3.5 Mean 280 Ac-ft 202,500
Water year 1963-64: Max 8,790 Min 5.3 Mean 180 Ac-ft 130,400

* Discharge measurement made on this day.
g Computed from daily telemark readings.

8-625. Trinity River near Rosser, Tex.

Location.--Lat 32°25'35", long 96°27'45", on left bank at downstream side of left pier of bridge on State Highway 34, 2.5 miles south of Rosser, Kaufman County, and 8.5 miles downstream from East Fork Trinity River.
Drainage area.--8,146 sq mi.
Records available.--July 1924 to September 1925, October 1938 to September 1964. Monthly discharge only for some periods, published in WSP 1312.
Gage.--Water-stage recorder. Datum of gage is 302.65 ft above mean sea level, datum of 1929. July 25, 1924, to Sept. 30, 1925, staff gage at abandoned lock and dam No. 7, 1.7 miles upstream at datum 6.94 ft higher.
Average discharge.--27 years, 2,401 cfs (1,738,000 acre-ft per year).
Extremes.--Maximum discharge during year, 26,000 cfs Sept. 25 (gage height, 31.62 ft); minimum daily, 176 cfs Nov. 13.
1924-25, 1938-64: Maximum discharge not determined, occurred Apr. 23 or 24, 1942, following numerous breaks in levee system on both banks; maximum gage height, 41.55 ft Apr. 22, 1942, just prior to levee breaks; maximum daily discharge, 133,000 cfs Apr. 23, 1942; minimum discharge, 32 cfs for several days in 1924-25.
Flood in May 1908 reached a stage of about 33 ft, present site and datum, from information by Corps of Engineers (discharge believed to have been about the same as that of Apr. 23 or 24, 1942).
Remarks.--Records good. Flow largely regulated by reservoirs above Dallas and by Lavon Reservoir on East Fork Trinity River (station 8-605). Levee system constructed in 1916. At end of year, flow from 117 sq mi above this station and below stations Trinity River at Dallas (station 8-570) and East Fork Trinity River near Lavon (station 8-610) was partly controlled by 47 floodwater-retarding structures with a total combined capacity of 40,060 acre-ft below flood spillway crests, of which 32,630 acre-ft is floodwater-retarding capacity and 7,430 acre-ft is sediment-pool capacity. Eight structures were built during the current year and have a total combined capacity below flood spillway crests of 5,760 acre-ft, of which 1,240 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Cities of Fort Worth and Dallas divert considerable water for municipal supply, of which about 60 percent is returned as sewage. Diversions above station for irrigation and municipal supplies. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

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

3.8	172	10.0	1,730	26.0	11,000
4.3	255	14.0	3,390	29.0	14,700
5.0	386	18.0	5,480	30.0	17,400
6.0	596	22.0	8,060	32.0	26,000
8.0	1,090				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	282	220	291	255	1,760	246	347	519	3,980	309	666	282
2	264	228	282	246	792	246	347	730	1,960	318	347	255
3	264	237	347	264	456	397	376	778	1,460	338	291	282
4	255	228	255	282	396	338	376	684	1,180	338	273	291
5	255	255	220	246	646	386	498	541	980	347	237	309
6	255	212	220	228	778	446	954	476	954	366	237	273
7	237	237	255	246	585	356	793	508	954	309	220	356
8	237	217	228	237	406	376	497	530	928	273	220	376
9	246	206	200	246	356	1,270	436	825	902	264	237	282
10	264	195	228	237	318	3,200	*376	928	902	356	309	273
11	282	184	536	237	318	2,080	366	706	902	291	309	273
12	347	178	778	220	338	1,010	347	640	876	300	273	255
13	291	176	541	220	347	552	376	596	902	356	273	273
14	228	186	356	237	497	466	426	426	928	318	246	328
15	273	187	291	255	497	416	396	366	1,010	300	273	300
16	273	182	255	291	386	366	376	*328	1,030	*282	947	264
17	282	190	246	554	309	338	356	386	1,090	282	1,220	1,050
18	273	217	228	618	309	318	366	347	*1,060	282	802	2,340
19	264	206	*228	662	309	855	396	291	1,030	282	1,480	1,220
20	318	514	228	706	291	3,750	376	282	1,060	273	*591	539
21	347	478	255	541	282	3,820	1,540	291	1,060	291	436	1,960
22	328	376	237	396	282	1,490	7,350	282	1,030	273	366	5,820
23	273	300	228	347	264	730	*5,780	318	1,010	264	291	9,140
24	*282	246	255	*282	255	574	2,680	396	980	255	476	*19,200
25	300	215	237	282	255	519	1,210	386	980	255	376	24,000
26	291	220	220	255	246	508	826	300	980	328	309	16,900
27	264	213	255	237	246	476	2,120	282	736	291	282	11,200
28	273	228	264	246	255	446	1,660	309	476	282	273	10,300
29	264	300	309	246	255	396	826	328	426	255	291	9,800
30	237	328	356	340	----------	366	596	1,560	347	273	300	9,500
31	255	----------	273	1,360	----------	366	----------	3,710	----------	634	328	----------
Total	8,504	7,359	9,102	11,019	12,434	27,103	33,369	19,049	32,113	9,585	13,179	127,641
Mean	274	245	294	355	429	874	1,112	614	1,070	309	425	4,255
Ac-ft	16,870	14,600	18,050	21,860	24,660	53,760	66,190	37,780	63,700	19,010	26,140	253,200

Calendar year 1963: Max 16,100 Min 176 Mean 938 Ac-ft 679,000
Water year 1963-64: Max 24,000 Min 176 Mean 848 Ac-ft 615,800

* Discharge measurement made on this day.
Note.--Discharge computed from once-daily wire-weight gage readings Nov. 10-18, Dec. 9, May 9-13, May 25 to June 17, July 30 to Aug. 19, Sept. 21-22.

8-628. Cedar Creek near Kemp, Tex.

Location.--Lat 32°30'10", long 96°06'25", on left bank at downstream side of bridge on Farm Road 1836, 2 miles upstream from Williams Creek and 8 miles northeast of Kemp, Kaufman County.

Drainage area.--189 sq mi.

Records available.--January 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 341.48 ft above mean sea level, datum of 1929, supplementary adjustment of 1956.

Extremes.--Maximum discharge during year, 5,900 cfs Apr. 22 (gage height, 13.83 ft); no flow at times.
1963-64: Maximum discharge, that of Apr. 22, 1964; no flow at times.
Maximum stage since at least 1889, about 20½ ft in 1945, from information by State Highway Department and local residents.

Remarks.--Records good above 10 cfs and fair below. Flow partly regulated by Terrell Municipal Lake, capacity, 8,300 acre-ft. Records furnished by city of Terrell show that during the water year 1,680 acre-ft of water for municipal use was diverted from Terrell Municipal Lake and sewage effluent was discharged into a tributary of Kings Creek outside the watershed. Recording rain gage located at station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0	0.7	0	0	9.3				0
2				0	.5	1.2	0	58				0
3				0	.6	35	0	35				0
4				0	1.2	36	0	23				0
5				0	51	14	2.6	12				0
6				0	85	6.5	52	7.6				0
7				0	30	3.3	34	5.2				0
8				0	12	2.0	13	3.5				0
9				0	5.8	25	6.1	2.7				0
10				0	3.0	*217	3.8	2.3				0
11				0	2.0	*77	2.5	4.0				0
12				0	1.3	*24	1.5	7.4				0
13				0	1.2	11	1.0	4.5				0
14				0	.9	5.2	.6	2.3				0
15				0	.6	2.7	.1	*1.1				0
16				0	.4	1.8	.1	.4		(*)		0
17			(*)	0	0	1.0	.2	.1	(*)			0
18				a13	0	.1	.1	0				0
19		(*)		a12	0	.1	.1	0				0
20				a12	0	0	0	0				0
21				a8	0	0	48	0			(*)	0
22				a7	.4	0	*3,000	0				0
23				5.7	1.0	0	*1,910	0				2.2
24	(*)			3.3	.9	0	*329	0				45
25				2.4	.6	0	*56	0				31
26				2.0	*.1	0	26	0				8.9
27				1.3	.1	0	18	0				3.8
28				1.0	0	0	20	0				78
29				.7	0	0	13	0				96
30				.8	----------	0	9.5	0				22
31		----------		.7	----------	0	----------	0	----------			----------
Total	0	0	0	69.9	199.3	462.9	5,547.2	178.4	0	0	0	286.9
Mean	0	0	0	2.25	6.87	14.9	185	5.75	0	0	0	9.56
Ac-ft	0	0	0	139	395	918	11,000	354	0	0	0	569

Calendar year 1963: Max 3,140 Min 0 Mean 30.8 Ac-ft 22,300
Water year 1963-64: Max 3,000 Min 0 Mean 18.4 Ac-ft 13,380

Peak discharge (base, 2,000 cfs)

Date	Time	Gage height	Discharge
4-22	1500	13.83	5,900

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.

8-629. Kings Creek near Kaufman, Tex.

Location.--Lat 32°30'50", long 96°19'40", on left bank at downstream side of bridge on Farm Road 1388, 3 miles upstream from Cottonwood Creek, 4 miles downstream from Big Brushy Creek, and 5 miles south of Kaufman, Kaufman County.

Drainage area.--233 sq mi.

Records available.--January 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 343.24 ft above mean sea level, datum of 1929 (levels by State Highway Department).

Extremes.--Maximum discharge during year, 4,630 cfs Apr. 22 (gage height, 18.80 ft); no flow at times.
1963-64: Maximum discharge, 12,700 cfs Apr. 29, 1963 (gage height, 20.66 ft); no flow at times.
Maximum stage since at least 1942, 23.1 ft in 1949, from information by State Highway Department.

Remarks.--Records good except those for periods of no gage-height record, which are poor. At end of year, flow from 16.4 sq mi above this station was partly controlled by 5 floodwater-retarding structures with a total combined capacity of 7,280 acre-ft below the flood spillway crests, of which 5,040 acre-ft is floodwater-retarding capacity and 2,240 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Recording rain gage located at station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	2.0	2.5	11	1.2	2	6	10	0.3		0
2		0	2.0	2.7	6.8	3.6	2	140	6	.2		0
3		0	1.7	2.3	4.1	7.0	2	150	4	.1		0
4		0	1.4	2.0	3.8	6.2	2	40	3	.1		0
5		0	1.4	1.8	43	3.4	10	10	2	0		0
6		0	1.2	2.0	40	2.2	100	7	2	0		0
7		0	1.2	2.2	10	2.1	30	4	1.5	0		0
8		0	1.2	2.2	5.3	2.0	8	3	1.5	0		0
9		0	1.3	2.2	3.3	303	*5.6	4	1	0		0
10		0	1.2	2.2	2.2	*668	5.0	4	1	0		0
11		0	.7	2.2	1.6	*76	4.0	4	1	0		0
12		0	.3	2.1	1.4	*23	3.2	3	1	0		0
13		0	.6	2.1	1.7	12	2.8	3	1	0		0
14		0	3.0	2.2	2.2	8	2.9	3	1	0		0
15		0	1.9	2.2	2.9	6	3.7	*2.9	3	0		0
16		4.5	1.3	4.0	3.4	5	5	2.8	5	0		0
17		2.4	*1.2	4.1	2.3	4	5	2.7	*3.3	*0		140
18		1.9	1.3	15	2.7	4	20	2.4	14	0		20
19		* 1.9	1.4	11	2.3	3	10	2.2	9.4	0		5
20		2.6	2.0	14	1.6	100	20	2	3.8	0		10
21		19	2.1	6.8	1.4	30	700	2	2.7	0	(*)	200
22		6.5	2.1	4.0	1.5	10	3,890	1.5	1.6	0		500
23		3.3	2.1	*3.1	1.4	7	1,220	1.5	1.4	0		*310
24		2.4	2.0	2.6	1.4	5	138	1.5	1.2	0		80
25	(*)	3.2	2.2	2.2	1.3	4	*58	1	1.0	0		12
26		2.0	2.2	1.8	1.2	3	65	1	.8	0		3.0
27		1.5	2.1	1.7	*1.2	3	55	1	.7	0		599
28		1.4	2.0	1.6	1.2	2	35	1	.6	0		766
29		1.6	2.1	1.6	1.2	2	15	1	.5	0		84
30		1.6	2.1	1.9	----------	2	7	50	.4	0		23
31		----------	2.0	4.3	----------	2	----------	20	----------	0		----------
Total	0	55.8	51.3	112.6	163.4	1,309.7	6,426.2	477.5	85.4	0.7	0	2,752.0
Mean	0	1.86	1.65	3.63	5.63	42.2	214	15.4	2.85	0.02	0	91.7
Ac-ft	0	111	102	223	324	2,600	12,750	947	169	1.4	0	5,460

Calendar year 1963: Max 7,690 Min 0 Mean 47.2 Ac-ft 34,160
Water year 1963-64: Max 3,890 Min 0 Mean 31.2 Ac-ft 22,690

Peak discharge (base, 3,000 cfs)

Date	Time	Gage height	Discharge
4-22	0800	18.80	4,630

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

Note.--No gage-height record Mar. 13 to Apr. 8, Apr. 16-21, Apr. 26 to May 14, May 20 to June 16, June 29 to July 16, Sept. 17-22.

8-630. Cedar Creek near Mabank, Tex.

Location.--Lat 32°19'45", long 96°10'05", on right bank at downstream side of bridge on Farm Road 85, 3 miles downstream from Lacys Fork and 4½ miles southwest of Mabank, Kaufman County.

Drainage area.--733 sq mi.

Records available.--October 1938 to September 1964. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 285.54 ft above mean sea level, datum of 1929.

Average discharge.--26 years, 425 cfs (307,700 acre-ft per year).

Extremes.--Maximum discharge during year, 6,340 cfs Apr. 24 (gage height, 16.83 ft); no flow at times.
1938-64: Maximum discharge, 44,800 cfs Mar. 30, 1945 (gage height, 25.43 ft), from rating curve defined by current-meter measurements below 16,000 cfs and slope-area measurement at 35,400 cfs; no flow at times.
Maximum stage since at least 1889, that of Mar. 30, 1945. Flood of Sept. 29, 1936, second highest since 1889, reached a stage of about 23.5 ft, present site, from information by local resident (discharge, 35,400 cfs by slope-area measurement at site 12 miles downstream).

Remarks.--Records fair. At end of year, flow from 23.5 sq mi above this station was partly controlled by 7 floodwater-retarding structures with a total combined capacity of 9,840 acre-ft below the flood spillway crests, of which 7,290 acre-ft is floodwater-retarding capacity and 2,550 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Records furnished by cities of Terrell and Kaufman show that during year 1,920 acre-ft of water for municipal use was diverted.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	1.2	0	1.4	0	0.5	43	14	0.2		0
2		0	1.4	.1	2.2	.1	.3	732	19	.2		0
3		0	1.6	0	9.7	9.3	.2	617	8.3	.1		0
4		0	1.9	0	8.9	*16	.1	166	7.9	.1		0
5		0	2.2	0	6.3	34	.2	64	5.0	.1		0
6		0	2.9	0	35	25	53	38	3.8	0		0
7		0	2.9	0	106	18	123	32	3.1	0		0
8		0	2.3	.1	35	13	42	28	2.6	0		0
9		0	1.0	.1	11	24	11	29	2.2	0		0
10		0	0	0	6.9	484	1.3	36	2.0	0		0
11		0	0	0	5.1	*787	*9.7	34	1.7	0		0
12		0	0	0	4.2	*241	19	28	1.4	0		0
13		0	0	0	3.9	30	28	26	1.2	0		0
14		0	0	0	3.3	9.4	36	27	.8	0		0
15		0	.3	0	3.0	6.1	39	*36	.6	0		0
16		0	.4	.2	2.8	4.9	43	36	.6	*0		0
17		0	*0	.4	3.8	4.2	45	36	*.5	0		0
18		0	0	.4	5.3	3.6	50	33	.5	0		0
19		0	0	3.3	4.6	3.5	56	30	.4	0		0
20		*0	0	9.6	4.0	6.2	60	29	1.2	0		0
21		0	0	11	4.1	56	61	29	2.4	0	(*)	.1
22		0	.2	7.0	3.3	18	1,030	29	1.8	0		61
23		0	.6	*0	2.5	5.2	*3,850	29	1.4	0		148
24	(*)	0	.5	.8	2	6.1	5,250	29	1.1	0		207
25		0	.5	2.0	1.5	4.9	2,040	29	.9	0		*73
26		0	.4	2.3	1	3.2	*492	28	.7	0		13
27		0	.5	1.6	*.5	2.6	*140	28	.6	0		8.3
28		.5	.6	1.7	0	2.1	87	28	.5	0		514
29		2.1	.6	1.6	0	1.6	70	26	.4	0		700
30		2.7	.5	1.7	----------	1.3	*56	57	.3	0		254
31		----------	.4	1.7	----------	1.1	----------	32	----------	0		----------
Total	0	5.3	22.9	45.6	277.3	1,821.4	13,693.3	2,444	86.9	0.7	0	1,978.4
Mean	0	0.18	0.74	1.47	9.56	58.8	456	78.8	2.90	0.02	0	65.9
Ac-ft	0	11	45	90	550	3,610	27,160	4,850	172	1.4	0	3,920

Calendar year 1963: Max 8,770 Min 0 Mean 116 Ac-ft 83,700
Water year 1963-64: Max 5,250 Min 0 Mean 55.7 Ac-ft 40,410

Peak discharge (base, 5,300 cfs)

Date	Time	Gage height	Discharge
4-24	0200	16.83	6,340

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record Feb. 23-26, Feb. 28 to Mar. 1.

8-630.5. Navarro Mills Reservoir near Dawson, Tex.

Location.--Lat 32°57'30", long 96°41'20", in left abutment of spillway of Navarro Mills Dam on Richland Creek, 1.5 miles upstream from bridge on State Highway 31, 2.8 miles upstream from St. Louis Southwestern Railway Lines bridge, 4.0 miles upstream from Post Oak Creek, and 4.5 miles north of Dawson, Navarro County.
Drainage area.--320 sq mi.
Records available.--August 1962 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, supplementary adjustment of 1954 (levels by Corps of Engineers). Prior to Oct. 8, 1962, staff gage in low-water channel at same datum.
Extremes.--Maximum contents during year, 9,470 acre-ft Apr. 6 (elevation, 408.00 ft); minimum, 6,340 acre-ft Sept. 15.
1962-64: Maximum contents, 12,300 acre-ft Oct. 10, 1962 (elevation, 409.70 ft); minimum, 1,570 acre-ft Oct. 5-7, 1962 (elevation, 398.30 ft).
Remarks.--Reservoir is formed by a rolled earth-fill dam 7,570 ft long, including an off-channel 240-foot gated spillway with six 40- by 29-foot tainter gates with sill at elevation 414.0 ft. The low-flow outlet works consist of two 36-inch diameter gate-controlled conduits with inverts at elevation 400.0 ft. Deliberate impoundment began Mar. 15, 1963. From Aug. 27, 1962, to Mar. 14, 1963, reservoir operated as detention basin only. Capacities are from survey made in February 1956 by Corps of Engineers. Reservoir built for flood control and water conservation. At end of year, flow from 33.7 sq mi above this station was partly controlled by 20 floodwater-retarding structures with a total combined capacity of 10,950 acre-ft below the flood spillway crests, of which 9,300 acre-ft is floodwater-retarding capacity and 1,650 acre-ft is sediment-pool capacity. Nine structures were built during the current year and have a total combined capacity below flood spillway crests of 5,340 acre-ft, of which 633 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of tainter gates	443.0	212,200
Top of conservation pool	424.5	63,300
Crest of spillway	414.0	22,100
Invert of two 36-inch diameter conduits	400.0	2,370

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

Capacity table (elevation, in feet, and contents in acre-feet)

404	5,100
406	6,960
408	9,470

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8,060	7,470	7,450	7,370	7,660	7,690	9,300	9,270	9,110	8,400	7,390	6,780
2	8,060	7,460	7,450	7,340	7,660	7,840	9,300	9,270	9,070	8,380	7,350	6,750
3	8,040	7,450	7,430	7,340	7,670	7,850	9,300	9,260	9,060	8,350	7,330	6,730
4	8,020	7,450	7,420	7,330	7,720	7,860	9,310	9,260	9,060	8,240	7,300	6,700
5	7,990	7,420	7,410	7,330	7,730	7,850	9,410	9,240	9,040	8,170	7,260	6,680
6	7,980	7,410	7,400	7,320	7,730	7,840	9,470	9,240	9,030	8,120	7,240	6,650
7	7,970	7,400	7,400	7,320	7,720	7,860	9,470	9,240	9,000	8,090	7,210	6,620
8	7,940	7,470	7,380	7,320	7,700	7,910	9,440	9,280	8,950	8,060	7,190	6,610
9	7,930	7,480	7,350	7,310	7,690	7,960	9,430	9,280	8,920	8,020	7,160	6,590
10	7,910	7,470	7,410	7,290	7,690	7,980	9,400	9,280	8,860	7,970	7,130	6,570
11	7,880	7,460	7,420	7,280	7,690	7,980	9,400	9,270	8,850	7,960	7,010	6,560
12	7,870	7,450	7,400	7,250	7,690	7,980	9,400	9,260	8,810	7,900	6,940	6,520
13	7,840	7,410	7,410	7,240	7,720	7,980	9,400	9,230	8,780	7,870	6,920	6,490
14	7,810	7,390	7,400	7,220	7,730	7,980	9,400	9,180	8,760	7,840	6,890	6,380
15	7,800	7,370	7,390	7,250	7,730	7,970	9,370	9,180	8,840	7,790	6,920	6,340
16	7,790	7,370	7,390	7,370	7,730	7,970	9,330	9,160	8,900	7,750	6,920	6,490
17	7,760	7,380	7,390	7,380	7,760	7,960	9,400	9,110	8,900	7,700	6,940	6,470
18	7,740	7,380	7,380	7,380	7,760	7,960	9,400	9,100	8,860	7,680	6,900	6,430
19	7,720	7,470	7,370	7,380	7,740	9,060	9,400	9,070	8,840	7,640	6,880	6,420
20	7,700	7,460	7,420	7,380	7,730	9,180	9,380	9,040	8,800	7,630	6,860	6,420
21	7,680	7,460	7,400	7,380	7,730	9,180	9,410	9,020	8,760	7,610	6,850	6,420
22	7,660	7,490	7,420	7,380	7,730	9,210	9,410	8,990	8,720	7,570	6,850	6,410
23	7,660	7,450	7,400	7,380	7,720	9,240	9,400	8,970	8,690	7,540	6,970	6,390
24	7,630	7,420	7,400	7,380	7,720	9,280	9,400	8,950	8,630	7,520	6,950	6,380
25	7,630	7,420	7,400	7,380	7,700	9,300	9,400	8,930	8,590	7,500	6,930	6,350
26	7,620	7,410	7,400	7,350	7,700	9,280	9,430	8,900	8,570	7,470	6,900	6,350
27	7,610	7,420	7,390	7,340	7,690	9,280	9,370	8,880	8,540	7,450	6,880	6,440
28	7,570	7,520	7,390	7,340	7,690	9,270	9,330	8,850	8,500	7,420	6,850	6,440
29	7,550	7,480	7,390	7,380	7,680	9,260	9,300	8,990	8,480	7,400	6,830	6,440
30	7,530	7,460	7,380	7,500	----------	9,270	9,280	9,110	8,440	7,420	6,810	6,430
31	7,520	----------	7,370	7,660	----------	9,280	----------	9,130	----------	7,390	6,800	----------
(†)	406.50	406.45	406.37	406.62	406.64	407.87	407.87	407.76	407.25	406.39	405.85	405.49
(‡)	-560	-60	-90	+290	+20	+1,600	0	-150	-690	-1,050	-590	-370

Calendar year 1963..... ‡ +3,090
Water year 1963-64..... ‡ -1,650

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-631. Richland Creek near Dawson, Tex.

Location.--Lat 31°56'18", long 96°40'52", at downstream side of bridge on State Highway 31, 1.3 miles upstream from St. Louis Southwestern Railway Lines bridge, 1.5 miles downstream from Navarro Mills Dam, 2.5 miles upstream from Post Oak Creek, and 3.6 miles northeast of Dawson, Navarro County.

Drainage area.--333 sq mi.

Records available.--October 1960 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 370.52 ft above mean sea level, datum of 1929. Prior to Nov. 21, 1960, wire-weight gage at same site and datum.

Extremes.--Maximum discharge during year, 45 cfs Sept. 14 (gage height, 4.50 ft); no flow most of time.
1960-64: Maximum discharge, 25,500 cfs July 3, 1961 (gage height, 22.50 ft), from rating curve defined by current-meter measurements below 14,000 cfs; no flow at times each year.
Maximum stage known since about 1895, about 28 ft June 19, 1929, from information by local residents. Floods in 1946 and 1957 reached a stage of about 23 ft, from information by local residents.

Remarks.--Records good. Flow regulated since Mar. 15, 1963 by Navarro Mills Reservoir (station 8-630.5). Recording rain gage located at station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0	0.2	* 0	0	0		0	0	0
2				0	.1	.2	0	0		0	0	0
3				0	.1	.1	0	0		0	0	0
4				0	.1	0	0	* 0		4.5	0	0
5				0	.2	0	.1	0		22	0	0
6				0	.2	0	.1	0		1.0	0	0
7				0	.2	0	0	0		.1	0	0
8				0	.1	0	0	0		0	0	0
9				0	.1	.1	0	0		0	0	0
10				0	.1	.1	0	0		0	0	0
11				0	.1	.1	0	0		0	0	0
12				0	.1	0	*0	0	(*)	0	8.7	0
13				0	.1	0	0	0		0	.8	0
14				0	.1	0	0	0		0	.1	10
15				0	.1	0	0	0		* 0	0	14
16			(*)	0	0	0	0	0		0	0	.5
17				0	0	0	0	*0		0	0	.1
18				0	0	0	0	0		0	0	0
19				.5	0	5.6	0	0		0	0	0
20				.1	0	.8	0	0		0	0	0
21		(*)		.1	0	.1	0	0		0	*0	0
22				0	0	0	.1	0		0	0	0
23	(*)			0	0	0	.1	0		0	.3	0
24				0	0	0	.1	0		0	.3	0
25				*0	0	0	.1	0		0	0	0
26				0	0	0	.1	0		0	0	*0
27				0	0	0	0	0		0	0	0
28				0	0	0	0	0		0	0	.1
29				0	0	0	0	0		0	0	0
30				.7	----------	0	0	.4		0	0	0
31		----------		.4	----------	0	----------	.2	----------	0	0	----------
Total	0	0	0	1.8	1.9	7.1	0.7	0.6	0	27.6	10.2	24.7
Mean	0	0	0	0.06	0.07	0.23	0.02	0.02	0	0.89	0.33	0.82
Ac-ft	0	0	0	3.6	3.8	14	1.4	1.2	0	55	20	49

Calendar year 1963: Max 172 Min 0 Mean 3.98 Ac-ft 2,880
Water year 1963-64: Max 22 Min 0 Mean 0.20 Ac-ft 148

* Observation of no flow made on this day.
Note.--No gage-height record Jan. 20-22, Feb. 25-29, Mar. 2.

8-632. Pin Oak Creek near Hubbard, Tex.

Location.--Lat 31°48'05", long 96°43'10", on right bank 85 ft downstream from bridge on State Highway 171, 5.8 miles southeast of Hubbard, Hill County, and 9 miles upstream from Elm Creek.

Drainage area.--17.6 sq mi.

Records available.--September 1956 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 463.08 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942.

Average discharge.--8 years, 10.3 cfs (7,460 acre-ft per year).

Extremes.--Maximum discharge during year, 126 cfs Sept. 17 (gage height, 4.65 ft); no flow most of time.
1956-64: Maximum discharge, 4,340 cfs Aug. 24, 1958 (gage height, 13.86 ft); no flow at times.
Maximum stage known since at least 1900, about 17 ft in August 1919, from information by local resident.

Remarks.--Records good. At end of year, flow from 7.29 sq mi above this station was partly controlled by 5 floodwater-retarding structures with a total combined capacity of 2,540 acre-ft below the flood spillway crests, of which 2,110 acre-ft is floodwater-retarding capacity and 430 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Recording rain gage located at station. Records of suspended sediment loads and water temperatures for the water year 1964 are available in the Austin District Office.

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

2.2	0	3.0	30.1
2.3	.17	3.5	63.6
2.4	1.6	4.0	94
2.5	4.3	4.5	119
2.6	8.2	4.7	128
2.8	17.7		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0		*0						0
2				0		0						0
3				0		0						0
4				0		0		(*)				0
5				0		0						0
6				0		0						0
7				0		0						0
8				0		0						0
9				0		0						0
10				0		0						0
11				0		0						0
12				0		0	(*)		(*)			0
13				0		0						0
14				0		0						0
15				0		0				(*)		0
16			(*)	0		0						14
17				0		0		(*)				25
18				0		0						0
19				0		5.3						0
20				0		0						0
21		(*)		0		0						0
22				0		0					(*)	0
23	(*)			0		0						0
24				0		0						0
25				*0		0						0
26				0		0						*0
27				0		0						0
28				0		0						0
29				0		0						0
30				0	----------	0						0
31		----------		.1	----------	0	----------		----------			----------
Total	0	0	0	0.1	0	5.3	0	0	0	0	0	39
Mean	0	0	0	0.003	0	0.17	0	0	0	0	0	1.30
Cfsm	0	0	0	0.0002	0	0.010	0	0	0	0	0	0.074
In.	0	0	0	0.0002	0	0.01	0	0	0	0	0	0.08
Ac-ft	0	0	0	0.2	0	10	0	0	0	0	0	77
(††)	0.31	3.36	1.21	2.76	1.68	2.13	1.37	1.42	1.31	0.22	2.10	3.56

Calendar year 1963: Max 17 Min 0 Mean 0.07 Cfsm 0.004 In. 0.06 Ac-ft 51 †† 17.33
Water year 1963-64: Max 25 Min 0 Mean 0.12 Cfsm 0.068 In. 0.090 Ac-ft 87 †† 21.43

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

* Discharge measurement or observation of no flow made on this day.
†† Weighted mean rainfall, in inches, during month.

8-635. Richland Creek near Richland, Tex.

Location.--Lat 31°56'55", long 96°25'15", at downstream side of bridge on U. S. Highway 75, 800 ft upstream from Texas and New Orleans Railroad Co. bridge, 1 mile north of Richland, Navarro County, and 3.5 miles downstream from Pin Oak Creek.

Drainage area.--734 sq mi.

Records available.--December 1924 to February 1925 (discharge measurements and monthly runoff only), March 1939 to September 1964.

Gage.--Water-stage recorders. Datum of gage is 299.12 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942. Dec. 11, 1924, to Feb. 11, 1925, chain gage at site 800 ft upstream at same datum. Mar. 17, 1939, to Feb. 14, 1958, at site 50 ft upstream at same datum. Feb. 15, 1958, to Jan. 28, 1959, wire-weight gage at present site at same datum. June 8, 1955, to Feb. 14, 1958, and since Feb. 6, 1959, supplementary water-stage recorder, used for floodflows, 3,900 ft to right of main-channel gage.

Average discharge.--25 years (1939-64), 374 cfs (270,800 acre-ft per year).

Extremes.--Maximum discharge during year, 94 cfs Jan. 31 and May 30; maximum gage height, 7.02 ft Jan. 17; no flow for many days.
1939-64: Maximum discharge, 58,900 cfs May 12, 1948 (gage height, 24.16 ft); no flow at times.
Maximum stage since at least 1899, 25.5 ft in December 1913 (discharge not determined), from information by Texas and New Orleans Railroad Co.

Remarks.--Records fair except those for period Nov. 1 to May 22, which are poor. Flow partly regulated by Navarro Mills Reservoir (station 8-630.5) since October 1962. At end of year, flow from 85.0 sq mi above this station and below Navarro Mills Reservoir was partly controlled by 45 floodwater-retarding structures with a total combined capacity of 30,440 acre-ft below the flood spillway crests, of which 25,700 acre-ft is floodwater-retarding capacity and 4,740 acre-ft is sediment-pool capacity. Thirteen of these structures were built during the current year and have a total combined capacity below flood spillway crests of 9,180 acre-ft, of which 1,330 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

Discharge, in cubic feet per second, water year October 1963to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0	61	1	2.1	0.2	0.4			
2				0	20	.9	1.0	.2	.2			
3				0	15	.8	1.5	.2	0			
4				0	10	.2	2.2	.2	0			
5				0	8	.1	3.0	.1	0			
6				0	6	0	4.0	.1	0			
7				0	5	0	5.0	.1	0			
8				0	4	0	3.2	.1	0			
9				0	4	0	2.1	.1	0			
10				0	3	0	1.0	.1	0			
11				0	3	0	.5	.1	0			
12				0	3	0	*.2	.1	*0			
13				0	10	0	.1	.1	0			
14				0	8	0	.1	.1	0			
15				1	6	0	.1	0	0	(*)		
16			(*)	20	4	0	.1	0	0			
17				50	5	0	0	*0	0			
18				10	8	0	0	0	0			
19				5	6	0	0	0	0			
20		(*)		3	5	49	0	0	0			
21				1	4	68	0	0	0			
22				.5	3	50	.1	*0	0		(*)	
23	(*)			.1	2	32	.1	0	0			
24				0	2	20	.2	0	0			
25				*0	2	10	.3	0	0			
26				0	1.5	6.6	.4	0	0			(*)
27				0	1.5	5.0	.6	0	0			
28				0	1.5	4.0	.4	0	0			
29				0	*1.2	3.5	.2	3.2	0			
30				2	----------	3.2	.2	26	0			
31		----------		26	----------	2.6	----------	1.4	----------			----------
Total	0	0	0	118.6	212.7	256.9	28.7	32.4	0.6	0	0	0
Mean	0	0	0	3.83	7.33	8.29	0.96	1.05	0.02	0	0	0
Ac-ft	0	0	0	235	422	510	57	64	1.2	0	0	0

Calendar year 1963: Max 2,530 Min 0 Mean 19.9 Ac-ft 14,410
Water year 1963-64: Max 68 Min 0 Mean 1.78 Ac-ft 1,290

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

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

Note.--No gage-height record Dec. 23 to Jan. 24, Jan. 26-30, Feb. 2-28, Mar. 1-2, 5, 7-8, 10, 12-13, 15-16, 18, 22, 24-25, 27, 29, 31, Apr. 2, 4-5, 7, 11, 14, 16, 18-20, 22, 26, 28, 30, May 2, 3, 5, 7, 9, 11-12, 14, 16; discharge computed from staff gage readings Feb. 29, Mar. 3-4, 6, 9, 11, 14, 17, 19-21, 23, 26, 28, 30, Apr. 1, 3, 6, 8-10, 12-13, 15, 17, 21, 23-25, 27, 29, May 1, 4, 6, 8, 10, 13, 15, 17.

8-638. Waxahachie Creek near Bardwell, Tex.

Location.--Lat 32°14'28", long 96°38'20", on right bank 1.0 mile downstream from Bardwell Dam (under construction in 1964), 3.8 miles upstream from mouth, 3.8 miles southeast of Bardwell, Ellis County, and 4.0 miles downstream from bridge on State Highway 34.

Drainage area.--178 sq mi.

Records available.--October 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 370.18 ft above mean sea level, datum of 1929 (levels by Corps of Engineers).

Extremes.--Maximum discharge during year, 652 cfs Apr. 22 (gage height, 11.85 ft); no flow at times.
Maximum stage since at least 1944, about 23.0 ft in 1944 and 1945, from information by Corps of Engineers.

Remarks.--Records good except those for period of no gage-height record, which are fair. Small diversions and return effluents above the station by the city of Waxahachie. Lake Waxahachie (capacity, 13,500 acre-ft) modifies flow from 30 sq mi above this station. At end of year, flow from 51.4 sq mi above this station was partly controlled by 22 floodwater-retarding structures with a total combined capacity of 18,040 acre-ft below the flood spillway crests, of which 14,790 acre-ft is floodwater-retarding capacity and 3,250 acre-ft is sediment-pool capacity. All of these structures were built during the period July 1957 to November 1960. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 10-11)

2.1	0	2.8	15
2.2	.1	3.0	22
2.3	.6	4.0	54
2.4	1.8	6.0	150
2.5	4.1	8.0	280
2.6	7.2	10.0	450
2.7	11		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0	0.6	20	1.7	4.1	48	69	0.4		0
2			0	.7	6.5	2.0	4.1	34	50	.3		0
3			0	.7	4.4	2.4	5.0	17	40	.2		0
4			0	.7	3.4	3.1	5.0	15	30	.2		0
5			0	.7	3.1	3.6	4.7	14	29	.1		0
6			0	.7	3.6	2.7	11	13	27	.1		0
7			0	.8	4.4	2.4	9.7	13	24	0		0
8			0	.8	3.6	2.4	5.0	13	19	0		0
9			0	.8	2.9	2.4	3.6	13	14	0		0
10			0	.8	2.4	22.0	3.1	12	11	0		0
11			0	.8	2.2	*18.0	*2.9	12	8.4	0		0
12			0	.8	2.2	8.8	2.9	11	7.2	0		0
13			0	.7	2.2	6.5	2.9	8.8	6.2	0		0
14			0	.6	2.2	5.9	2.9	7.6	5.0	0		0
15			0	.4	4.1	5.0	2.7	6.2	4.7	0		0
16			0	1.0	3.6	4.1	2.7	* 5.0	5.9	*0		0
17			0	1.8	3.4	3.6	2.4	4.4	10	0		0
18			0	2.9	3.4	3.4	2.4	3.6	*7.2	0		0
19			*0	4.4	3.1	49	2.4	3.1	6	0		0
20			0	3.8	3.1	49	2.4	2.4	5	0	(*)	0
21			0	2.4	2.9	29	56	2.4	4	0		0
22			0	.1	2.9	15	*383	2.0	3	0		0
23	(*)	(*)	.2	0	2.4	10	* 80	1.8	2	0		10
24			.6	*.3	2.4	8.8	* 58	1.5	2	0		*44
25			.6	1.1	2.4	7.6	46	1.2	1	0		7.5
26			.6	1.8	2.4	6.5	40	1.1	1	0		11
27			.6	5.5	2.4	5.6	44	1.1	.8	0		19
28			.6	3.5	*2.2	5.0	37	1.1	.7	0		62
29			.6	1.5	1.5	4.7	31	43	.6	0		23
30			.6	1.5	----------	4.1	* 26	316	.5	0		20
31		----------	.6	10	----------	4.1	----------	118	----------	0		----------
Total	0	0	5.0	52.2	105.3	298.4	882.9	745.3	394.2	1.3	0	196.5
Mean	0	0	0.16	1.68	3.63	9.63	29.4	24.0	13.1	0.04	0	6.55
Ac-ft	0	0	9.9	104	209	592	1,750	1,480	782	2.6	0	390

Calendar year Max Min Mean Ac-ft
Water year 1963-64: Max 383 Min 0 Mean 7.33 Ac-ft 5,320

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record June 19 to July 6, Sept. 23.

8-645. Chambers Creek near Corsicana, Tex.

Location.--Lat 32°06'30", long 96°22'15", on right bank at downstream side of bridge on State Highway 31, 500 ft upstream from St. Louis Southwestern Railway Lines bridge, 6,000 ft upstream from city of Corsicana diversion dam, 6 miles east of Corsicana, Navarro County, and 17 miles upstream from Richland Creek.
Drainage area.--963 sq mi.
Records available.--March 1939 to September 1964.
Gage.--Water-stage recorder and concrete control. Datum of gage is 294.28 ft above mean sea level, datum of 1929.
Average discharge.--25 years, 438 cfs (317,100 acre-ft per year).
Extremes.--Maximum discharge during year, 1,390 cfs Apr. 24 (gage height, 16.32 ft); no flow at times.
1939-64: Maximum discharge, 48,000 cfs May 3, 1944; maximum gage height, 28.10 ft May 3, 1958; no flow at times.
Maximum stage since at least 1870, 30 ft Aug. 27, 1887. Flood in December 1913 reached a stage of 27½ ft, from information by local residents.
Remarks.--Records good. Storage began in 1956 in South Prong Reservoir (capacity, 13,500 acre-ft) on South Prong Waxahachie Creek above this station. At end of year, flow from 212 sq mi above this station was partly controlled by 84 floodwater-retarding structures with a total combined capacity of 72,500 acre-ft below the flood spillway crests, of which 61,090 acre-ft is floodwater-retarding capacity and 11,410 acre-ft is sediment-pool capacity. Four structures were built during the current year and have a total combined capacity below flood spillway crests of 5,840 acre-ft, of which 650 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. The first floodwater-retarding structure in this basin was completed in July 1957. Records of city of Corsicana show the city diverted 985 acre-ft of water for municipal supply from pool in which gage is located. Discharge given herein does not include that diverted by the city. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 23-24)

5.8	0	6.6	30
5.9	.3	7.0	70
6.0	.9	8.0	176
6.1	2.4	10.0	447
6.2	5.1	15.0	1,240
6.4	14		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0	7.5	1.8	5.9	46	214			0
2				0	18	2.9	3.7	352	102			0
3				0	13	2.4	8.7	195	68			0
4				0	9.6	3.2	6.3	108	50			0
5				0	6.7	4.8	8.3	32	25			0
6				.1	5.1	5.1	14	24	20			0
7				.1	4.3	4.6	24	19	12			0
8				.1	5.9	4.0	30	18	4.0			0
9				.1	5.5	5.1	16	19	g1.8			0
10				.1	4.3	7.2	11	19	g.8			0
11				.1	3.2	27	*8.3	20	g.3			0
12				.1	2.6	98	7.1	22	*.4			0
13				.1	3.4	43	6.7	18	.7			0
14				.1	2.9	19	7.9	15	.7			0
15				.1	3.4	13	9.1	12	1.4	(*)		0
16			(*)	.7	3.2	12	6.7	*9.1	3.8			0
17				.7	4.8	9.6	7.1	5.1	12			0
18				.6	5.9	7.9	11	3.7	20			0
19				.7	4.6	9.1	8.7	2.4	5.5			0
20		(*)		2.9	4.6	262	5.9	1.4	2.9			0
21				4.6	5.1	517	4.3	.8	.9		(*)	0
22				7.5	5.1	138	228	.6	.5			0
23	(*)			7.1	4.0	58	986	.1	.3			0
24				5.1	2.6	34	*1,090	0	.2			0
25				2.4	3.4	23	367	0	.1			*7.5
26				1.4	2.6	14	147	0	0			15
27				.8	2.4	11	100	0	3.0			3.5
28				.6	2.1	11	83	0	7.5			147
29				.4	*2.0	11	63	0	3.3			94
30				3.2	----------	9.1	55	252	.6			61
31		----------		6.7	----------	8.3	----------	453	----------			----------
Total	0	0	0	46.4	147.8	1,376.1	3,329.7	1,647.2	561.7	0	0	328.0
Mean	0	0	0	1.50	5.10	44.4	111	53.1	18.7	0	0	10.9
Ac-ft	0	0	0	92	293	2,730	6,600	3,270	1,110	0	0	651

Calendar year 1963: Max 2,620 Min 0 Mean 57.6 Ac-ft 41,680
Water year 1963-64: Max 1,090 Min 0 Mean 20.3 Ac-ft 14,750

Peak discharge (base, 13,000 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.
g Computed from once-daily staff-gage readings.

8-648. Catfish Creek near Tennessee Colony, Tex.

Location.--Lat 31°52'51", long 95°52'07", on left bank, 47 ft downstream from bridge on U. S. Highway 287, 2 miles upstream from Beaver Creek, 3½ miles northwest of Tennessee Colony, Anderson County, 12 miles downstream from Coon Creek Lake, and 12 miles upstream from mouth.

Drainage area.--207 sq mi.

Records available.--April 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 234.93 ft above mean sea level, datum of 1929.

Extremes.--1962: Maximum discharge during period April to September, 364 cfs Apr. 27 (gage height, 10.08 ft); minimum, 1.3 cfs Aug. 24.
1962-63: Maximum discharge during water year, 214 cfs Mar. 4-5 (gage height, 9.30 ft); minimum, 1.3 cfs Sept. 3.
1963-64: Maximum discharge during water year, 230 cfs Mar. 7 (gage height, 9.38 ft); minimum daily, 0.8 cfs Aug. 19-21.
Maximum stage since 1927, 22 ft in June 1944 as a result of dam failure at Coon Creek Lake, from information by local residents.

Remarks.--Records for April 1962 to September 1963 good below 60 cfs and fair above; records for October 1963 to September 1964 are fair. Some regulation by Coon Creek Lake. No known diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 12-21, 1962, Oct. 22 to Nov. 19, 1962, Oct. 1, 1963, to Feb. 14, 1964, Apr. 11 to May 29, June 5 to Sept. 30)

4.68	0.8	8.0	62
4.8	1.8	8.3	76
5.0	4.0	9.0	166
5.5	11.0	10.0	344
6.5	29		

Discharge, in cubic feet per second, during period April to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							-	266	25	75	13	5.7
2							-	222	28	90	12	5.8
3							-	179	29	106	11	5.8
4							-	141	*29	86	10	5.8
5							-	104	31	67	9.4	7.2
6							-	84	29	59	8.0	12
7							-	84	26	52	6.5	37
8							-	77	30	48	a 6	54
9							-	65	44	53	a 5	58
10							-	60	54	49	a 4	55
11							-	55	60	45	a 4	44
12							-	49	64	*38	a 3	38
13							-	43	62	29	a 3	38
14							-	39	72	23	* 2.8	39
15							-	35	67	20	3.1	36
16							-	34	58	18	2.8	31
17							-	32	45	16	2.8	26
18							-	31	37	15	2.6	23
19							-	30	44	14	2.4	*21
20							-	29	45	13	2.2	18
21							-	27	42	20	2.0	17
22							-	26	43	40	3.3	15
23							-	25	40	32	1.8	14
24							70	23	36	24	1.5	13
25							134	22	32	19	2.0	12
26							*152	21	29	16	2.0	11
27							272	19	27	15	1.7	12
28							314	17	38	14	2.2	12
29							304	20	59	14	3.1	12
30					----------		304	24	64	14	4.4	12
31		----------			----------		----------	25	----------	14	5.3	----------
Total							-	1,908	1,289	1,138	142.9	690.3
Mean							-	61.5	43.0	36.7	4.61	23.0
Ac-ft							-	3,780	2,560	2,260	283	1,370

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

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

8-648. Catfish Creek near Tennessee Colony, Tex.--Continued

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	34	110	67	64	100	48	25	56	5.7	3.2	3.1
2	31	31	98	65	64	111	46	23	47	* 5.5	4.6	2.4
3	44	28	79	*62	64	144	44	21	40	5.5	7.2	1.8
4	41	26	67	64	65	196	42	22	34	7.4	8.3	2.2
5	33	27	64	69	65	204	49	20	30	12	7.6	2.2
6	28	27	62	75	*62	177	64	18	27	11	6.4	*3.1
7	26	26	60	96	60	153	67	18	24	9.5	5.3	3.3
8	25	27	58	113	60	142	78	17	21	8.8	4.8	3.1
9	36	31	54	114	60	128	79	18	18	8.3	4.0	3.9
10	54	41	52	96	60	110	75	23	17	7.8	3.4	5.7
11	64	42	49	72	60	104	67	25	15	7.7	3.1	7.0
12	76	38	47	64	62	*92	65	24	13	7.6	3.4	7.0
13	73	37	47	60	65	83	60	23	12	7.2	3.8	6.8
14	60	37	47	59	67	75	55	22	11	7.1	5.8	7.4
15	52	36	45	55	65	69	50	21	9.5	7.7	8.4	7.7
16	47	35	44	53	64	72	46	20	9.2	8.3	18	8.2
17	45	34	45	55	62	75	43	19	11	7.7	19	8.2
18	44	35	46	58	62	84	*39	18	11	6.5	14	8.3
19	45	39	49	62	67	98	37	17	12	5.5	10	8.2
20	45	50	50	65	72	102	35	19	12	4.5	8.0	7.7
21	45	59	56	72	84	100	34	*23	12	3.8	6.5	7.2
22	40	65	64	81	87	94	33	33	11	3.1	5.7	6.8
23	*39	72	82	75	79	82	32	55	9.0	2.8	5.1	6.4
24	36	77	110	69	69	69	31	60	8.3	2.6	4.2	5.8
25	32	75	117	69	62	64	30	71	7.6	2.6	3.5	5.5
26	29	70	114	65	60	59	29	a 90	6.8	3.2	3.5	5.2
27	28	*81	104	62	60	58	28	a 90	6.2	3.2	3.1	5.2
28	28	92	88	62	64	55	28	a 90	6.8	3.8	2.8	5.6
29	31	100	75	62	----------	54	30	a 80	6.6	3.8	2.4	5.5
30	31	109	69	62	----------	52	27	a 70	6.1	3.7	2.2	5.5
31	34	----------	67	62	----------	50	----------	a 60	----------	* 3.2	2.0	----------
Total	1,263	1,481	2,119	2,165	1,835	3,056	1,391	1,135	510.1	187.1	189.3	166.0
Mean	40.7	49.4	68.4	69.8	65.5	98.6	46.4	36.6	17.0	6.04	6.11	5.53
Ac-ft	2,510	2,940	4,200	4,290	3,640	6,060	2,760	2,250	1,010	371	375	329

Calendar year 1962: Max - Min - Mean - Ac-ft -
Water year 1962-63: Max 204 Min 1.8 Mean 42.5 Ac-ft 30,740

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

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

8-648. Catfish Creek near Tennessee Colony, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.3	6.0	12	33	49	55	48	30	135	11	2.2	1.0
2	4.8	6.0	12	32	53	58	*46	28	214	9.5	2.2	1.4
3	4.6	6.8	12	32	52	64	46	26	165	8.9	2.2	1.6
4	4.4	7.7	15	32	50	98	46	25	67	8.4	2.0	1.7
5	4.1	8.0	17	32	59	127	55	24	40	8.2	2.0	1.8
6	4.0	8.0	19	32	67	163	65	*23	31	8.0	2.0	1.8
7	3.8	8.4	20	32	69	214	83	23	26	7.7	1.8	1.8
8	3.7	a8.2	21	31	72	198	104	23	23	7.2	1.8	1.8
9	*3.4	a8.0	23	32	67	163	82	23	*21	7.2	1.8	1.7
10	3.4	a7.8	25	32	58	144	62	23	19	7.2	1.6	1.8
11	3.4	a7.6	29	33	53	144	52	23	17	7.0	1.6	1.8
12	3.2	a7.4	32	32	49	163	46	23	16	7.0	1.4	1.8
13	3.2	a7.2	35	30	53	149	45	22	14	7.0	1.2	1.8
14	3.2	*7.0	35	31	55	117	43	21	14	*6.8	1.2	1.8
15	3.0	7.4	34	31	62	94	43	20	13	6.6	1.2	2.2
16	3.0	7.4	34	36	65	94	40	18	15	6.8	1.2	2.8
17	3.0	7.8	33	46	64	102	38	17	18	6.4	1.1	4.7
18	3.0	9.7	*33	52	64	91	36	16	24	6.2	1.0	4.5
19	4.0	10	32	58	62	82	35	15	28	6.1	*.8	6.2
20	4.2	9.5	34	60	62	78	34	14	24	6.1	.8	6.8
21	3.8	9.5	36	60	64	80	31	12	22	6.1	.8	7.0
22	4.0	9.4	39	56	69	84	30	12	26	5.6	1.2	6.5
23	4.8	12	41	53	75	75	29	12	27	5.2	2.0	6.2
24	4.6	14	39	52	71	65	28	12	24	5.0	1.4	*6.1
25	4.8	13	38	49	65	60	29	12	23	4.6	1.3	5.7
26	5.1	12	38	48	*62	59	50	12	27	4.4	1.3	5.3
27	5.7	11	37	46	60	58	53	11	25	3.8	1.3	5.3
28	6.1	11	36	43	59	56	46	11	21	3.7	1.3	5.2
29	6.0	11	35	*42	58	53	44	34	17	3.5	1.2	5.2
30	6.0	12	34	43	----------	52	37	65	13	3.2	1.1	5.2
31	6.0	----------	33	46	----------	50	----------	81	----------	2.8	.9	----------
Total	131.6	270.8	913	1,267	1,768	3,090	1,426	711	1,149	197.2	44.9	108.5
Mean	4.25	9.03	29.5	40.9	61.0	99.7	47.5	22.9	38.3	6.36	1.45	3.62
Ac-ft	261	537	1,810	2,510	3,510	6,130	2,830	1,410	2,280	391	89	215

Calendar year 1963: Max 204 Min 1.8 Mean 32.7 Ac-ft 23,690
Water year 1963-64: Max 214 Min 0.8 Mean 30.3 Ac-ft 21,970

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

* Discharge measurement made on this day.
a No gage-height record.
Note.--Backwater from beaver dams Oct. 1 to Feb. 14, Apr. 11 to May 29, June 5 to Sept. 30.

8-650. Trinity River near Oakwood, Tex.

Location.--Lat 31°38'50", long 95°47'20", on left bank at downstream side of bridge on U. S. Highways 79 and 84, 1½ miles upstream from Missouri Pacific Railroad Co. bridge, and 6 miles northeast of Oakwood, Leon County.

Drainage area.--12,833 sq mi.

Records available.--October 1923 to September 1924 (monthly discharge only), October 1924 to September 1964. Records for January 1905 to September 1923, published in WSP 850 and 878, have been found unreliable and should not be used. Gage-height records collected in this vicinity since 1904 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 175.06 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942. Prior to July 15, 1932, chain gage at site 1½ miles downstream at datum 1.06 ft lower. July 15, 1932, to Oct. 7, 1934, chain gage at present site and datum.

Average discharge.--41 years (1923-64), 4,653 cfs (3,369,000 acre-ft per year).

Extremes.--Maximum peak discharge during year, 6,740 cfs Apr. 26 (gage height, 23.65 ft); a higher discharge and stage occurred at midnight, 11,100 cfs Sept. 30 (gage height, 28.85 ft), on a rising stage preceding a peak on Oct. 3, 1964; minimum discharge, 234 cfs Nov. 15-17.

1923-64: Maximum discharge, 153,000 cfs Apr. 29, 1942 (gage height, 51.64 ft); minimum observed, 28 cfs Aug. 24, 1925.

Flood in May 1890 reached a stage of 53 ft (discharge, about 180,000 cfs) and was the highest since at least that date, from information in local newspapers. Flood of June 4, 1908, reached a stage of 52.2 ft, present site and datum, from information by U. S. Weather Bureau (discharge, about 164,000 cfs).

Remarks.--Records good. Some regulation by reservoirs above Dallas and by Lavon Reservoir (station 8-605) on East Fork Trinity River. At end of year, flow from 532 sq mi above this station was partly controlled by 214 floodwater-retarding structures with a total combined capacity of 190,200 acre-ft below the flood spillway crests, of which 159,100 acre-ft is floodwater-retarding capacity and 31,100 acre-ft is sediment-pool capacity. Seventeen structures were built during the current year and have a total combined capacity below flood spillway crests of 15,770 acre-ft, of which 2,310 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	326	279	292	347	375	407	585	1,730	2,680	585	326	340
2	319	266	312	399	551	439	545	1,230	3,400	509	319	340
3	286	266	340	368	1,450	491	527	1,180	3,860	439	564	361
4	279	260	347	340	1,560	669	509	1,430	3,200	391	645	340
5	292	253	326	326	1,080	1,200	625	1,850	2,090	375	455	312
6	286	260	354	312	750	932	750	*1,640	1,580	383	375	312
7	279	260	333	319	625	750	750	1,180	1,280	383	347	326
8	279	260	292	333	794	687	932	860	1,180	383	326	347
9	*272	266	279	312	884	956	1,180	729	*1,130	399	312	326
10	272	253	286	305	750	1,030	1,150	708	1,080	383	305	368
11	260	266	326	305	645	908	932	750	1,030	354	298	391
12	266	253	326	305	565	2,250	772	1,030	1,000	333	305	340
13	272	246	326	305	545	2,820	645	1,080	980	340	340	312
14	279	*240	470	298	527	2,410	585	838	980	354	333	312
15	319	234	750	298	527	1,700	527	729	980	340	319	305
16	312	234	625	333	545	1,150	527	687	1,000	*375	305	319
17	286	234	455	407	625	932	565	565	1,100	368	347	391
18	266	246	375	439	687	772	545	491	1,150	354	361	383
19	286	260	347	439	645	729	545	455	1,200	340	*872	421
20	286	298	333	585	545	708	509	473	1,230	333	1,130	1,500
21	286	319	354	729	545	708	491	473	1,200	333	1,080	1,880
22	286	319	347	794	527	2,250	509	407	1,150	333	1,130	1,200
23	298	439	347	816	491	3,650	674	399	1,150	326	687	1,090
24	340	509	347	666	473	2,940	3,610	399	1,130	326	491	* 3,460
25	347	407	354	527	491	1,770	5,910	399	1,100	326	423	* 5,450
26	326	361	347	439	*473	1,150	6,620	407	1,080	319	368	6,860
27	312	333	340	399	455	884	6,380	473	1,050	319	423	7,880
28	319	312	340	368	423	772	4,730	473	1,050	312	407	8,720
29	312	298	326	347	407	729	3,320	473	1,030	333	368	9,640
30	292	298	319	*333	----------	666	2,510	932	794	347	333	* 10,500
31	286	----------	340	361	----------	*625	----------	1,630	----------	333	326	----------
Total	9,126	8,729	11,255	12,854	18,960	38,084	48,459	26,100	42,864	11,328	14,620	64,726
Mean	294	291	363	415	654	1,229	1,615	842	1,429	365	472	2,158
Ac-ft	18,100	17,310	22,320	25,500	37,610	75,540	96,120	51,770	85,020	22,470	29,000	128,400

Calendar year 1963: Max 16,800 Min 234 Mean 1,275 Ac-ft 923,200
Water year 1963-64: Max 10,500 Min 234 Mean 839 Ac-ft 609,200

* Discharge measurement made on this day.

8-653.5. Trinity River near Crockett, Tex.

Location.--Lat 31°20'20", long 95°39'25", on right bank 30 ft downstream from bridge on State Highway 7, 6 miles downstream from Upper Keechi Creek, and 12 miles west of Crockett, Houston County.

Drainage area.--13,911 sq mi.

Records available.--January to September 1964.

Gage.--Water-stage recorder. Datum of gage is 136.59 ft above mean sea level, datum of 1929.

Extremes.--Maximum peak discharge during period, 8,520 cfs Apr. 27 (gage height, 21.30 ft); a higher discharge and stage occurred at midnight Sept. 30 (9,560 cfs, 22.71 ft) on a rising stage preceding a peak on Oct. 4, 1964; minimum discharge, 275 cfs Aug. 13.
Maximum stage since at least 1900, 56.1 ft Apr. 30 or May 1, 1942, from information by State Highway Department.

Remarks.--Records good except those for Jan. 1 to Feb. 13, which are fair. Some regulation by reservoirs above Dallas and Lavon Reservoir (station 8-605) on East Fork Trinity River. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Trinity River near Oakwood (station 8-650). Diversions above station for irrigation and municipal and industrial use. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

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

5.8	260	10.0	1,680
6.0	305	12.0	2,630
6.5	430	16.0	4,830
7.0	575	20.0	7,500
8.0	915	23.0	9,800

Discharge, in cubic feet per second, January to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				360	440	*545	758	3,030	2,530	810	328	312
2				380	420	605	705	2,330	3,330	605	318	318
3				400	600	705	670	1,770	3,990	530	312	320
4				400	1,000	775	635	1,360	4,230	442	563	330
5				380	1,600	1,060	828	1,820	3,330	405	635	325
6				360	1,500	1,240	1,440	*2,130	2,280	380	455	294
7				360	1,000	1,200	1,280	1,820	1,680	380	368	291
8				360	900	1,090	1,090	1,320	1,360	380	330	300
9				380	950	1,160	1,280	1,020	1,240	380	305	325
10				400	1,100	1,600	1,520	880	1,160	405	289	310
11				380	1,000	1,440	1,360	845	*1,120	368	282	330
12				360	900	1,400	1,120	880	1,060	342	278	368
13				340	800	2,880	950	1,120	1,060	318	280	330
14				340	758	3,380	810	1,120	1,020	330	310	296
15				360	740	2,930	705	915	1,020	355	312	294
16				380	758	2,040	635	792	1,090	*330	303	310
17				400	775	1,360	620	740	1,200	355	298	380
18				700	862	1,090	652	605	1,200	355	*355	455
19				650	915	1,200	652	530	1,200	342	392	430
20				600	845	1,280	620	470	1,280	328	853	478
21				700	758	1,060	575	470	1,280	322	1,020	1,490
22				800	740	1,040	560	470	1,200	318	1,060	1,720
23				900	705	3,270	590	430	1,200	312	1,060	1,120
24				950	670	3,990	1,150	405	1,160	310	722	*1,460
25				900	670	3,130	5,350	418	1,120	305	530	3,790
26				750	670	1,900	7,640	418	1,120	310	455	5,550
27				650	652	1,320	*8,360	405	1,090	305	392	6,800
28				550	605	1,060	7,360	455	1,060	303	418	7,640
29				500	560	950	*5,130	470	1,060	298	405	8,360
30				480	----------	880	*3,750	696	1,020	325	368	9,160
31		----------		460	----------	810	----------	1,640	----------	342	330	----------
Total				15,930	23,893	48,390	58,795	31,774	47,690	11,590	14,326	53,886
Mean				514	824	1,561	1,960	1,025	1,590	374	462	1,796
Ac-ft				31,600	47,390	95,980	116,600	63,020	94,590	22,990	28,420	106,900

* Discharge measurement made on this day.
Note.--No gage-height record Jan. 1 to Feb. 13, Feb. 22. Discharge computed from once-daily wire-weight gage readings Feb. 14-21, 23-26, Mar. 23-27, Apr. 25-27, May 2-3.

8-655. Trinity River near Midway, Tex.

Location.--Lat 31°04'40", long 95°42'00", near center of channel at upstream side of bridge on State Highway 21, 5 miles northeast of Midway, Madison County, and 8.5 miles downstream from Boggy Creek.

Drainage area.--14,450 sq mi.

Records available.--April 1939 to September 1964.

Gage.--Wire-weight gage read twice daily. Datum of gage is 118.05 ft above mean sea level, datum of 1929.

Average discharge.--25 years, 5,594 cfs (4,050,000 acre-ft per year).

Extremes.--Maximum discharge during year, 9,320 cfs Apr. 27 (gage height, 16.82 ft); minimum observed, 250 cfs Nov. 17.

1939-64: Maximum discharge, 146,000 cfs May 1, 1942 (gage height, 48.58 ft); minimum observed, 87 cfs July 27, 1956.

Maximum stage since at least 1866 and prior to construction of levees in 1916, 45 ft in May 1890 (discharge not determined). Flood in 1866 and June 9, 1908, were about the same stage. Flood of June 9, 1908, reached a stage of 44.3 ft, from floodmarks. Flood of May 27, 1930, was greatest flood during period 1916-38 and reached a stage of 46.7 ft, from floodmark (flow confined within levees). All flood information furnished by local residents.

Remarks.--Records good. Some regulation by reservoirs above Dallas and by Lavon Reservoir (station 8-605) on East Fork Trinity River. For statement regarding regulation by Soil Conservation Service floodwater-regarding structures, see Trinity River near Oakwood (station 8-650). Diversions above station for municipal supplies, industrial use, and irrigation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 25 to Sept. 26)

2.6	250	9.0	3,600
3.0	370	12.0	5,600
4.0	760	15.0	7,800
6.0	1,800	17.0	9,500

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	322	313	364	388	530	570	738	3,540	2,100	900	274	337
2	340	298	352	405	570	715	692	3,120	3,000	692	292	319
3	343	295	364	419	570	738	670	2,280	3,730	550	280	331
4	334	292	364	458	1,000	782	650	*1,620	4,180	475	304	331
5	307	292	405	440	1,500	828	590	1,460	3,860	412	590	349
6	286	286	408	416	1,860	1,120	530	2,040	2,820	374	570	334
7	*301	274	388	398	1,350	1,350	1,470	2,100	1,980	358	405	301
8	304	283	384	394	975	1,300	1,150	1,460	*1,460	352	349	301
9	289	286	384	405	900	1,200	1,080	1,120	1,250	352	325	313
10	286	286	352	419	1,050	1,680	1,350	925	1,150	358	301	328
11	280	286	334	408	1,050	1,740	1,460	828	1,080	358	289	313
12	274	*280	361	391	875	1,510	1,200	805	1,020	334	283	337
13	268	280	436	377	760	1,980	975	900	1,000	304	280	367
14	274	274	492	364	738	3,360	828	1,100	975	286	277	331
15	280	262	570	361	738	3,360	692	975	975	310	310	301
16	286	256	*692	391	715	2,820	630	805	1,050	322	307	298
17	322	250	875	590	738	1,920	570	738	1,250	*307	307	380
18	331	256	692	925	760	1,350	570	650	1,250	328	*307	433
19	298	265	570	828	850	1,560	590	550	1,220	322	367	492
20	286	334	570	715	900	1,800	570	475	1,200	304	441	458
21	292	331	738	670	850	1,400	550	440	1,220	274	975	692
22	298	388	610	850	715	1,100	510	440	1,200	292	1,020	1,920
23	304	440	510	925	692	1,410	510	433	1,150	286	1,100	*1,560
24	304	492	458	975	*670	3,660	650	405	1,120	277	1,180	1,250
25	304	530	440	925	670	3,920	2,520	398	1,120	274	630	2,640
26	377	570	436	760	670	2,700	6,720	416	1,100	274	510	4,970
27	364	492	440	*630	692	1,680	9,140	391	1,080	280	458	6,300
28	346	440	433	550	630	1,180	8,360	391	1,050	274	398	7,480
29	334	412	426	492	610	975	6,580	440	1,020	271	430	8,200
30	331	380	416	475	----------	875	4,640	458	1,000	274	405	8,780
31	328	----------	398	492	----------	*828	----------	2,390	----------	280	367	----------
Total	9,593	10,123	14,662	17,236	24,628	51,411	57,185	34,093	47,610	11,054	14,331	50,746
Mean	309	337	473	556	849	1,658	1,906	1,100	1,587	357	462	1,692
Ac-ft	19,030	20,080	29,080	34,190	48,850	102,000	113,400	67,620	94,430	21,930	28,430	100,700

Calendar year 1963: Max 16,600 Min 250 Mean 1,464 Ac-ft 1,060,000
Water year 1963-64: Max 9,140 Min 250 Mean 936 Ac-ft 679,700

* Discharge measurement made on this day.

8-657. Caney Creek near Madisonville, Tex.

Location.--Lat 30°56'15", long 95°56'00", near center of span at downstream side of pier of bridge on U. S. Highway 190, 1.5 miles southwest of Madisonville, Madison County, and 10 miles upstream from Bedias Creek.

Drainage area.--112 sq mi.

Records available.--July 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 213.74 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942 and Houston supplementary adjustment of 1943.

Extremes.--1963: No flow during period July to September.
1963-64: Maximum discharge during water year, 2,430 cfs Aug. 23 (gage height, 15.52 ft); no flow for many days.
Maximum stages since 1900, 22 ft in 1929, and 21.4 ft in November 1946, from information by local residents.

Remarks.--Records good except those for periods of indefinite stage-discharge relationship or no gage-height record, which are poor. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Jan. 30-31, 1964, Feb. 1, 1964, Mar. 2, 1964)

3.20	0	8.0	65
3.35	.1	9.5	120
3.45	.3	11.0	210
3.6	.7	12.0	286
3.8	1.7	13.0	390
4.2	4.6	14.0	570
4.6	8.2	14.5	740
5.5	18	14.8	980
6.5	32	15.0	1,330

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0	0	2.9	0.1	0.4	31	8.3		0	1.0
2			0	0	1.3	*21	*.4	310	1.7		0	.8
3			0	0	1.0	6.3	.4	243	1.2		0	.6
4			0	0	13	2.2	.3	*23	.8		0	.4
5			0	0	49	1.3	.4	9.8	.5		0	.2
6			0	0	30	.8	.3	5.3	.3		0	a.1
7	(*)		0	0	16	.5	.2	3.3	.1		0	a0
8			0	0	5.5	.4	.2	2.4	.1		0	a0
9			0	0	2.4	8.8	.1	1.8	0		0	a0
10			0	0	1.2	23	.1	1.3	0		0	a0
11			0	0	.7	16	.1	.9	*0		0	a0
12		(*)	0	0	.5	7.1	.1	.7	0		0	a0
13			0	0	.4	3.6	.1	.6	0		0	a0
14			0	0	.3	2.4	.1	.4	0	(*)	0	a0
15			0	0	.3	1.8	.1	.3	0		0	a0
16			*0	1.9	.3	1.4	0	.2	5.8		0	a2
17			0	24	.2	1.1	0	.1	18		*0	a30
18			0	18	.2	.9	.1	.1	2.9		0	a60
19			0	4.6	.2	206	0	0	.5		0	a20
20			77	1.6	.1	208	0	0	.2		0	a10
21			49	.7	.1	45	0	0	0		0	a5
22			3.9	.4	.2	10	0	0	0		0	a3
23			.8	.3	.1	5.0	0	0	0		573	*a1.0
24			.4	.2	.2	2.9	0	0	0		1,000	a.5
25			.2	.1	.3	2.1	.1	.1	0		162	a4
26			.1	.1	.3	1.4	*136	0	0		14	a2
27			.1	*0	.4	1.0	*275	0	0		7.2	a1
28			.1	0	*.2	.8	*139	.8	0		5	a10
29			0	0	.2	.6	14	.5	0		4	a4
30			0	.5	----------	.5	*6.1	.4	0		3	a2
31		----------	0	*10	----------	.5	----------	68	----------		2	----------
Total	0	0	131.6	62.4	127.5	582.5	573.6	704.0	40.4	0	1,770.2	157.6
Mean	0	0	4.25	2.01	4.40	18.8	19.1	22.7	1.35	0	57.1	5.25
Ac-ft	0	0	261	124	253	1,160	1,140	1,400	80	0	3,510	313

Calendar year 1963: Max - Min - Mean - Ac-ft -
Water year 1963-64: Max 1,000 Min 0 Mean 11.3 Ac-ft 8,240

Peak discharge (base, 700 cfs)

Date	Time	Gage height	Discharge
8-23	2130	15.52	2,430

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.
Note.--Indefinite stage-discharge relationship Aug. 28 to Sept. 5.
Observation of no flow made July 25, 1963, Sept. 6, 1963.

8-660. Trinity River at Riverside, Tex.

Location.--Lat 30°51'35", long 95°23'54", near center of channel at upstream side of bridge on State Highway 45, 1,200 ft upstream from Missouri Pacific Railroad Co. bridge, 0.5 mile north of Riverside, Walker County, and three-quarters of a mile downstream from Harmon Creek.

Drainage area.--15,589 sq mi.

Records available.--January 1903 to December 1906 (monthly discharge only, published in WSP 1312), October 1923 to September 1964. Records of daily discharge for January 1903 to December 1906, published in WSP 99, 132, 174 and 210, have been found to be unreliable and should not be used. Gage-height records collected in this vicinity since 1903 are contained in reports of U. S. Weather Bureau.

Gage.--Wire-weight gage read twice daily. Datum of gage is 89.86 ft above mean sea level, datum of 1929, Galveston-Houston supplementary adjustment of 1936. Prior to May 6, 1941, chain, staff, or wire-weight gage at railroad bridge, 1,200 ft downstream. Prior to July 1, 1903, at datum 7.7 ft lower.

Average discharge.--44 years, 6,360 cfs (4,604,000 acre-ft per year).

Extremes.--Maximum discharge during year, 17,000 cfs Apr. 27 (gage height, 18.70 ft, from graph based on gage readings); minimum observed, 271 cfs Aug. 13-14.

1903-6, 1923-64: Maximum discharge, 121,000 cfs May 5, 1942 (gage height, 52.75 ft, from floodmark); minimum observed, 70 cfs Aug. 20-26, Sept. 8-13, 1925, Sept. 29 to Oct. 4, 1931.

Maximum stage since at least 1866, that of May 5, 1942. From newspaper reports a flood in 1866 reached a stage of 50½ ft. Flood of June 11, 1908, reached a stage of 50.1 ft, present site (discharge, 100,000 cfs). Flood of June 7, 1884, was about same as flood of June 11, 1908, from information by local resident.

Remarks.--Records good. Some regulation by reservoirs above Dallas, by Lavon Reservoir (station 8-605) on East Fork Trinity River, and since Mar. 15, 1963, by Navarro Mills Reservoir (station 8-630.5) on Richland Creek. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Trinity River near Oakwood (station 8-650). Diversion for municipal supplies, industrial use, and irrigation above station.

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

1.0	240	8.0	5,280
1.1	284	12.0	9,200
1.5	472	16.0	13,800
2.0	740	19.0	17,400
4.0	2,010		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	306	370	432	442	702	1,560	950	4,920	2,800	1,070	298	412
2	316	370	412	432	800	4,620	860	3,700	2,720	950	306	365
3	365	352	393	432	830	2,150	830	5,280	3,350	734	326	347
4	365	338	398	432	920	1,940	1,200	*3,110	4,020	630	316	352
5	360	365	393	508	2,300	1,760	2,880	2,150	4,380	550	298	352
6	342	360	412	503	2,720	1,400	1,870	2,080	3,750	452	598	352
7	*316	352	447	472	2,360	1,400	1,500	2,360	2,880	412	614	347
8	316	329	437	462	1,730	1,470	1,600	2,220	*2,010	393	462	316
9	329	356	422	482	1,190	1,440	1,310	1,760	1,570	384	393	311
10	326	347	437	477	1,070	1,660	1,250	1,540	1,370	384	320	316
11	306	329	427	472	1,130	2,080	1,500	1,160	1,280	384	293	347
12	306	*329	422	493	1,070	2,010	1,700	1,040	1,250	388	280	365
13	298	334	566	477	980	1,800	1,800	1,040	1,190	356	271	379
14	293	326	980	417	920	2,580	1,280	1,100	1,130	329	271	384
15	293	326	696	422	1,160	3,430	1,010	1,280	1,130	293	302	342
16	302	316	*556	932	788	3,350	860	1,160	1,940	284	316	338
17	320	306	800	1,760	800	3,190	2,030	1,070	2,580	*347	*326	572
18	347	306	890	1,870	830	1,940	2,940	890	2,650	329	311	529
19	374	342	764	1,630	830	2,150	1,250	800	2,150	356	320	493
20	360	412	860	1,440	890	3,510	980	707	1,660	356	356	561
21	329	457	1,660	1,070	920	3,030	860	630	1,540	347	540	630
22	329	432	1,540	890	890	2,800	752	577	1,400	316	1,160	980
23	342	482	1,280	920	800	2,360	707	593	1,340	316	2,010	*1,730
24	360	477	1,010	1,010	770	2,580	668	588	1,280	302	2,010	1,760
25	370	477	674	1,070	890	3,930	1,040	588	1,220	302	1,500	1,800
26	379	556	566	980	860	3,430	9,440	582	1,220	293	1,340	2,720
27	427	619	524	*830	788	2,430	16,100	545	1,190	293	1,160	5,190
28	432	588	514	696	788	1,700	12,500	514	1,160	293	860	6,800
29	398	514	514	614	788	1,440	9,640	514	1,130	284	724	7,800
30	374	457	488	604	----------	1,130	6,500	641	1,130	284	508	8,400
31	370	----------	462	707	----------	*1,010	----------	1,870	----------	284	457	----------
Total	10,650	11,924	20,376	23,946	31,514	71,280	87,807	52,009	58,420	12,695	19,246	45,590
Mean	344	397	657	772	1,087	2,299	2,927	1,678	1,947	410	621	1,520
Ac-ft	21,120	23,650	40,420	47,500	62,510	141,400	174,200	103,200	115,900	25,180	38,170	90,430

Calendar year 1963: Max 16,400 Min 293 Mean 1,675 Ac-ft 1,213,000
Water year 1963-64: Max 16,100 Min 271 Mean 1,217 Ac-ft 883,700

* Discharge measurement made on this day.

8-662. Long King Creek at Livingston, Tex.

Location.--Lat 30°42'58", long 94°57'31", on right bank 64 ft downstream from centerline of bridge on U. S. Highway 190, 2 miles west of Livingston, Polk County, 2 miles upstream from Choates Creek, and 14.8 miles from mouth.

Drainage area.--141 sq mi.

Records available.--January 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 100.12 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 5,240 cfs Mar. 2 (gage height, 15.75 ft); minimum, 0.1 cfs for many days.
1963-64: Maximum discharge, that of Mar. 2, 1964; minimum, 0.1 cfs for many days.
Maximum stage since at least 1870, about 41 ft in May 1929.

Remarks.--Records good except those for periods of no gage-height record, which are fair. No diversion above station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 11-15, 23-25, Aug. 5-9, 11, 12, 21, 22, Aug. 30 to Sept. 5, Sept. 9-17, 21-30)

4.0	0.1	5.0	68
4.1	.8	6.0	247
4.2	3.0	8.0	760
4.3	6.5	10.0	1,520
4.5	17	12.0	2,550
4.7	33	15.0	4,600

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	1.1	4.0	4.6	30	19	16	107	*67	1.1	1.7	0.1
2	.5	1.0	3.3	4.6	16	*4,000	15	1,130	22	1.1	1.1	.1
3	.5	2.8	4.3	4.6	13	*1,120	16	266	14	1.0	.7	.1
4	.5	1.0	3.6	5.7	12	202	16	57	10	1.1	.5	.1
5	.5	*6.5	5.0	5.0	120	109	128	32	8.8	1.0	.2	3.5
6	.5	2.5	4.3	7.0	63	59	60	25	7.0	.7	.2	5.7
7	.6	1.3	4.0	6.1	26	40	30	20	6.5	.6	.1	2.2
8	.5	1.1	3.3	5.7	17	35	19	17	5.7	.4	.1	.8
9	.5	5.0	*2.8	5.0	14	71	15	14	5.3	.4	.1	.5
10	.5	4.0	2.8	5.3	13	121	13	13	5.0	.3	.5	.3
11	.4	2.5	4.0	5.3	12	44	13	*12	4.3	*.2	.4	.3
12	.3	1.7	5.3	4.6	11	28	13	11	4.3	.2	.2	.2
13	.3	1.5	22	4.6	11	24	40	9.6	4.0	.3	*.1	.1
14	.4	1.5	144	36	11	24	57	7.4	4.0	.3	.1	.1
15	.4	1.5	53	400	13	33	21	7.0	10	.2	.1	*.1
16	.4	1.7	18	450	13	28	14	6.1	16	.7	1.0	.3
17	.5	1.7	10	*409	*12	19	14	5.3	13	1.1	4.0	21
18	.6	2.0	7.8	164	12	17	15	5.3	9.2	.7	1.7	14
19	.6	2.2	6.1	52	12	1,040	15	5.0	7.0	.7	1.0	4.6
20	.5	2.2	57	27	11	570	13	4.3	5.7	.6	.4	2.2
21	.5	4.6	141	18	11	83	11	4.3	5.0	.5	.2	1.7
22	.5	5.7	38	14	11	50	9.6	4.0	4.0	.4	.2	1.0
23	.5	4.6	16	13	12	*38	9.2	4.0	3.3	.3	1.3	.6
24	1.1	9.6	10	12	42	36	8.8	4.0	3.0	.2	2.5	.4
25	1.1	4.3	8.8	11	494	32	43	4.6	2.5	.2	1.3	1.0
26	1.1	4.3	7.8	11	106	27	403	4.6	2.0	.2	1.0	.8
27	1.0	4.3	7.0	9.2	40	24	1,090	4.3	1.7	.2	.7	.8
28	1.0	3.6	6.1	8.3	28	20	131	3.6	1.7	.2	.6	1.0
29	1.0	6.5	5.7	7.4	20	18	40	3.3	1.3	2.5	.4	1.1
30	1.1	7.8	5.3	9.2	----------	16	27	8.4	1.1	5.3	.3	1.1
31	1.1	----------	4.6	49	----------	16	----------	219	----------	3.0	.2	----------
Total	19.5	100.1	614.9	1,768.2	1,206	7,963	2,315.6	2,018.1	254.4	25.7	22.9	65.8
Mean	0.63	3.34	19.8	57.0	41.6	257	77.2	65.1	8.48	0.83	0.74	2.19
Cfsm	0.0045	0.024	0.140	0.404	0.295	1.82	0.548	0.462	0.060	0.0059	0.0052	0.016
In.	0.005	0.03	0.16	0.47	0.32	2.10	0.61	0.53	0.07	0.007	0.006	0.02
Ac-ft	39	199	1,220	3,510	2,390	15,790	4,590	4,000	505	51	45	131

Calendar year 1963; Max 1,400 Min 0.1 Mean 29.1 Cfsm 0.206 In. 2.80 Ac-ft 21,070
Water year 1963-64: Max 4,000 Min 0.1 Mean 44.7 Cfsm 0.317 In. 4.33 Ac-ft 32,470

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
3- 2	0800	15.75	5,240	4-27	0900	10.18	1,620
3-19	1000	10.64	1,800	5- 2	1500	9.80	1,440

* Discharge measurement made on this day.
Note.--No gage-height record Jan. 15, 16, Mar. 3, Aug. 13-17.

8-665. Trinity River at Romayor, Tex.

Location.--Lat 30°25'30", long 94°51'02", near right bank on downstream side of pier of bridge on State Highway 105, 1.9 miles south of Romayor, Liberty County, 1.9 miles downstream from Gulf, Colorado and Santa Fe Railway Co. bridge, and 3.7 miles downstream from Big Creek.

Drainage area.--17,186 sq mi.

Records available.--May 1924 to September 1964. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 35.92 ft above mean sea level, datum of 1929. Prior to September 1943, chain gage at datum 53.57 ft higher at railroad bridge 1.9 miles upstream (all readings were negative, giving distance below base of rail).

Average discharge.--40 years, 7,131 cfs (5,163,000 acre-ft per year).

Extremes.--Maximum discharge during year, 22,400 cfs Apr. 27 (gage height, 17.64 ft); minimum, 334 cfs Oct. 17, 18, Aug. 16, 21.
1924-64: Maximum discharge, 111,000 cfs May 9, 1942 (gage height, 35.8 ft, from floodmarks, present site and datum); minimum, 102 cfs Aug. 24, 25, 1956.
Maximum stage known since at least 1908, that of May 9, 1942.

Remarks.--Records good. Some regulation by reservoirs above Dallas and by Lavon Reservoir on East Fork Trinity River (station 8-605). For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Trinity River near Oakwood (station 8-650). Diversions for municipal and industrial use and irrigation above station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 24-30, June 14, 15, June 26 to Sept. 28)

1.28	334	5.0	2,650
1.3	340	8.0	5,900
1.5	400	12.0	11,800
2.0	590	15.0	17,200
3.0	1,120	17.0	21,200

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	385	397	652	570	1,000	1,120	1,220	9,080	2,020	1,090	397	530
2	373	388	590	550	1,030	7,360	1,090	12,200	2,650	1,090	394	498
3	*370	382	570	530	910	15,300	1,030	15,300	2,830	1,090	364	466
4	373	403	530	530	910	9,460	970	8,860	*3,100	940	361	431
5	391	1,000	510	510	1,160	5,180	1,130	5,060	3,600	795	364	400
6	407	880	490	550	2,100	3,820	4,350	3,500	4,040	675	361	388
7	407	652	486	570	3,300	2,740	5,060	2,830	3,930	610	349	397
8	397	550	482	590	3,100	2,140	3,100	2,830	3,200	550	448	391
9	379	610	498	570	2,470	2,020	2,470	2,830	2,380	506	550	391
10	367	550	494	550	1,820	2,220	1,860	2,470	1,860	474	490	382
11	367	*482	498	530	1,400	2,560	1,500	*2,060	1,580	*456	424	367
12	364	445	530	530	1,220	2,470	1,470	1,750	1,440	445	382	364
13	361	424	698	530	1,220	2,560	1,680	1,500	1,360	438	*361	364
14	358	403	1,500	550	1,160	2,300	2,060	1,360	1,300	441	352	*364
15	352	385	2,140	530	1,060	2,220	2,140	1,300	1,300	427	352	367
16	346	382	*1,900	675	1,000	3,100	1,500	1,360	1,330	414	340	407
17	337	379	1,300	2,290	1,000	3,500	1,500	1,440	1,400	403	346	466
18	337	376	910	3,930	940	3,100	1,600	1,300	1,820	420	346	750
19	340	370	970	3,400	880	3,500	4,480	1,160	2,650	410	352	1,030
20	355	376	1,160	*2,830	880	5,540	2,560	1,090	2,470	414	349	770
21	376	441	1,820	2,650	880	5,420	1,580	1,000	1,940	410	337	698
22	379	630	2,220	1,820	970	4,590	1,160	910	1,610	414	357	720
23	370	720	2,140	1,400	1,000	3,930	970	820	1,440	407	510	652
24	370	610	1,820	1,330	1,030	3,100	850	795	1,400	394	880	907
25	424	590	1,640	1,360	*2,140	2,560	795	795	1,360	382	1,680	1,580
26	466	610	1,330	1,300	2,830	*3,500	1,460	770	1,260	373	1,780	1,720
27	414	550	1,000	1,220	2,140	3,930	18,900	770	1,220	370	1,470	1,900
28	397	652	770	1,090	1,680	3,200	20,200	745	1,190	388	1,260	3,640
29	407	745	675	940	1,300	2,380	16,200	745	1,160	376	1,120	5,660
30	420	720	630	820	----------	1,750	12,800	745	1,120	445	850	6,940
31	417	----------	590	850	----------	1,440	----------	795	----------	407	610	----------
Total	11,806	16,102	31,543	36,095	42,530	117,010	117,685	88,170	59,960	16,454	18,536	33,940
Mean	381	537	1,018	1,164	1,467	3,775	3,923	2,844	1,999	531	598	1,131
Ac-ft	23,420	31,940	62,560	71,590	84,360	232,100	233,400	174,900	118,900	32,640	36,770	67,320

Calendar year 1963: Max 16,200 Min 337 Mean 2,103 Ac-ft 1,522,000
Water year 1963-64: Max 20,200 Min 337 Mean 1,612 Ac-ft 1,170,000

* Discharge measurement made on this day.

8-670. Trinity River at Liberty, Tex.

Location.--Lat 30°03'27", long 94°49'05", near center of channel on upstream side of downstream bridge on U. S. Highway 90 in Liberty, Liberty County, and 450 ft downstream from Texas and New Orleans Railroad Co. bridge.

Drainage area.--17,468 sq mi.

Records available.--October 1938 to September 1940 (gage heights, discharge measurements, and some records of daily discharge), October 1940 to September 1964 (high-water records only). Gage-height records collected in this vicinity since 1903 are contained in reports of U. S. Weather Bureau.

Gage.--Wire-weight gage read once daily. Datum of gage is 2.22 ft below mean sea level, datum of 1929. Prior to June 24, 1942, staff gage at same site and datum.

Extremes.--Maximum discharge during year, 19,600 cfs Apr. 28 (gage height, 23.80 ft); minimum not determined (affected by tides); minimum gage height observed, 3.97 ft Sept. 13.
1938-64: Maximum discharge, 114,000 cfs May 12, 1942 (gage height, 29.38 ft); minimum not determined (affected by tides); minimum gage height observed, 2.5 ft Nov. 4, 1939.
Maximum stage since at least 1903, that of May 12, 1942. Flood of May 8-11, 1922, reached a stage of 28.6 ft, present datum, from observation by U. S. Weather Bureau at chain gage on railroad bridge upstream.

Remarks.--Records fair. Discharge not computed below gage height 10 ft because tides affect the stage-discharge relation. Some regulation by reservoirs above Dallas and by Lavon Reservoir (station 8-605) on East Fork Trinity River. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Trinity River near Oakwood (station 8-650). Diversions above station for municipal supplies, industrial use, and irrigation.

Cooperation.--Gage-height record furnished by U. S. Weather Bureau.

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

10.0	3,100
12.0	4,900
16.0	9,000
20.0	13,800
24.0	20,000

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				-	-	-	-	13,900	-			-
2				-	-	-	-	11,700	-			-
3				-	-	11,600	-	14,300	-			-
4				-	-	*14,300	-	14,300	-			-
5				-	-	9,990	-	10,100	-			-
6				-	-	6,800	-	6,300	3,260			-
7				-	-	4,900	4,900	4,130	3,770			-
8				-	3,420	3,590	5,400	-	3,770			-
9				-	3,260	-	3,590	-	3,100			-
10				-	-	-	-	-	-			-
11				-	-	-	-	-	-			-
12				-	-	-	-	-	-			-
13				-	-	-	-	-	-			-
14				-	-	-	-	-	-			-
15				-	-	-	-	-	-			-
16				-	-	-	-	-	-			-
17				-	-	-	-	-	-			-
18				-	-	3,420	-	-	-			-
19				3,590	-	3,340	-	-	-			-
20				3,340	-	4,220	3,950	-	-			-
21				-	-	6,300	-	-	-			-
22				-	-	6,000	-	-	-			-
23				-	-	5,300	-	-	-			-
24				-	-	4,400	-	-	-			-
25				-	-	3,500	-	-	-			-
26				-	-	-	-	-	-			-
27				-	3,100	3,590	4,040	-	-			-
28				-	-	4,130	16,500	-	-			-
29				-	-	3,340	13,400	-	-			-
30				-	----------	-	*16,500	-	-			5,900
31		----------		-	----------	-	----------	-	----------			----------
Total												
Mean												
Ac-ft												

Calendar year 1963: Max 16,100 Min Mean Ac-ft
Water year 1963-64: Max 18,400 Min Mean Ac-ft

* Discharge measurement made on this day.

8-677. Caney Creek near Dobbin, Tex.

Location.--Lat 30°21'13", long 95°48'35", on right bank 46 ft downstream from bridge on State Highway 105, 2.5 miles west of Dobbin, Montgomery County, and 5.0 miles upstream from Lake Creek.

Drainage area.--40.4 sq mi.

Records available.--March 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 207.48 ft above mean sea level, datum of 1929.

Extremes.--1963: Maximum discharge during period March to September, 1,140 cfs May 20 (gage height, 10.24 ft); no flow at times.
1963-64: Maximum discharge during water year, 602 cfs Mar. 2 (gage height, 9.53 ft); no flow at times.
Maximum stage since at least 1940, 20 ft in August 1945, from information by local residents and Gulf, Colorado, and Santa Fe Railway Co.

Remarks.--Records good except those for discharges between 25 and 150 cfs, which are poor. No known diversion.

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

1.93	0	3.5	15
2.0	.05	4.0	25
2.1	.2	5.0	50
2.2	.5	7.0	123
2.3	.9	8.0	175
2.4	1.4	8.5	243
2.6	2.9	9.0	380
3.0	7.3	9.5	585

Discharge, in cubic feet per second, March to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						-	0.4	0	0.1		(*)	
2						-	.3	0	.1			
3						-	.2	.2	*0			
4						-	.2	.4	0			
5						-	6.6	.3	0			
6						-	*138	0	0			
7						-	*58	0	0			
8						-	13	0	0			
9						-	6.0	0	0	(*)		(*)
10						-	3.9	0	0			
11						-	2.5	0	0			
12						-	1.6	0	0			
13						-	1.1	0	0			
14						-	.8	0	0			
15						-	.6	0	0			
16						-	.5	0	0			
17						-	.3	0	0			(*)
18						*1.5	.3	31	0			
19						1.4	.3	49	0			
20						1.0	.3	*420	0			
21						.8	.2	*162	0			
22						.7	.2	*17	0			
23						.7	.2	5.8	0			
24						.7	.1	3.0	0			
25						*.7	.1	1.7	0			
26						.7	.1	1.1	0			
27						.7	0	.7	0			
28						.7	0	.4	0			
29					----------	.5	*0	.3	0			
30					----------	.5	0	.2	0			
31		----------			----------	.4	----------	.1	----------			----------
Total						-	235.8	693.2	0.2	0	0	0
Mean						-	7.86	22.4	0.007	0	0	0
Cfsm						-	0.19	0.55	0.0002	0	0	0
In.						-	0.22	0.64	0.0002	0	0	0
Ac-ft						-	468	1,370	0.4	0	0	0

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
5-20	1500	10.24	1,140

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

8-677. Caney Creek near Dobbin, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0	0.4	34	5.1	0.9	2.6	65			0
2		0	0	.4	9.7	*343	*.8	20	7.5			0
3		0	0	.4	5.8	75	.8	13	2.4			0
4		0	0	.4	14	18	.8	3.6	1.1			0
5		0	0	.4	116	8.4	2.0	1.8	.7			0
6		0	0	.4	30	5.2	2.0	1.3	.4			0
7		0	0	.4	9.3	3.8	2.7	*1.1	.3			0
8		0	0	.4	5.1	3.3	1.8	1.0	.2			0
9	(*)	0	0	.4	3.3	4.1	1.2	.9	.1			0
10		0	0	.4	2.6	6.5	.9	.7	0			0
11		0	0	.4	2.0	6.4	.7	.5	0			0
12		0	0	.5	1.8	4.0	.7	.4	*0			0
13		0	0	.4	1.8	2.8	4.5	.2	0			0
14		*0	51	.3	1.7	2.4	8.0	.2	0	(*)		0
15		0	32	.3	3.8	2.1	2.7	.1	15			0
16		0	6.7	26	5.1	1.9	1.2	.1	163			0
17		0	1.9	122	3.5	1.6	138	0	108		(*)	9.4
18		0	*.7	96	2.8	1.4	288	0	23			18
19		0	.3	24	2.4	192	24	0	5.2			34
20		0	11	7.8	2.2	83	6.6	0	1.9			76
21		0	64	4.3	2.0	12	3.5	0	.9			16
22		.6	13	2.8	1.9	5.6	2.1	0	.4			* 2.4
23		1.7	4.4	2.2	2.4	3.8	1.4	0	.3			1.0
24		.4	2.2	1.9	5.7	3.0	1.1	0	.1			.5
25		0	1.5	1.7	74	2.8	.9	0	.1			.3
26		0	1.2	1.4	24	2.3	*76	0	0			.1
27		0	1.0	1.2	22	1.8	*146	0	0			21
28		0	.8	1.1	*20	1.6	*24	.2	0			34
29		0	.7	1.0	8.4	1.3	5.6	.2	0			5.1
30		0	.5	*29	----------	1.1	2.7	.1	0			2.1
31		---------	.5	*238	----------	1.0	----------	50	---------			---------
Total	0	2.7	193.4	566.3	417.3	806.3	751.6	98.0	395.6	0	0	219.9
Mean	0	0.09	6.24	18.3	14.4	26.0	25.1	3.16	13.2	0	0	7.33
Cfsm	0	0.002	0.15	0.45	0.36	0.64	0.62	0.08	0.33	0	0	0.18
In.	0	0.002	0.18	0.52	0.38	0.74	0.69	0.09	0.36	0	0	0.20
Ac-ft	0	5.4	384	1,120	828	1,600	1,490	194	785	0	0	436

Calendar year 1963: Max - Min - Mean - Cfsm - In. - Ac-ft -
Water year 1963-64: Max 343 Min 0 Mean 9.43 Cfsm 0.23 In. 3.16 Ac-ft 6,840

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
3- 2	1030	9.53	602
4-18	0430	9.35	512

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

8-680. West Fork San Jacinto River near Conroe, Tex.

Location.--Lat 30°14'41", long 95°27'26", near right bank at downstream side of pier of bridge on U. S. Highway 75, 285 ft upstream from Missouri Pacific Railroad Co. bridge, 3½ miles downstream from Lake Creek, and 4¼ miles south of Conroe, Montgomery County.

Drainage area.--809 sq mi.

Records available.--May 1924 to September 1927, July 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 95.03 ft above mean sea level, datum of 1929, supplementary adjustments of 1936 and 1943. May 7, 1924, to Sept. 30, 1927, inverted staff gage (zero at base of rail) at railroad bridge 285 ft downstream at datum 30.10 ft higher. July 13, 1939, to Sept. 30, 1963, at datum 5.00 ft higher

Average discharge --28 years, 521 cfs (377,200 acre-ft per year).

Extremes.--Maximum discharge during year, 3,650 cfs Mar. 2 (gage height, 13.60 ft); minimum daily, 11 cfs Sept. 15

1924-27, 1939-64: Maximum discharge, 110,000 cfs Nov. 25, 1940 (gage height, 30.85 ft, present datum), from rating curve defined by current-meter measurements below 43,000 cfs and extended above on basis of velocity-area studies; no flow June 14, 1956, result of construction dam upstream.

Maximum stage since at least December 1913, that of Nov. 25, 1940. Flood in December 1913 reached a stage of 30.2 ft, present site and datum, from information by Missouri Pacific Railroad Co. (discharge, 101,000 cfs, from rating curve explained above).

Remarks.--Records good. No large diversion above station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	17	53	77	1,010	300	144	1,750	970	32	48	15
2	12	16	56	72	1,050	2,470	136	975	970	31	30	13
3	12	15	58	*68	890	*3,410	130	388	520	30	24	14
4	13	16	73	69	565	2,960	127	260	246	28	21	15
5	12	117	60	67	640	2,470	441	300	148	26	19	15
6	12	291	49	62	850	1,750	1,010	290	110	24	18	15
7	13	254	45	59	970	933	451	191	93	*24	16	16
8	13	109	43	59	*930	438	478	152	77	23	16	16
9	12	77	42	61	710	364	640	130	65	23	15	13
10	12	66	42	62	368	400	478	115	58	22	15	13
11	12	59	45	63	236	388	238	104	54	20	*14	*13
12	12	48	45	64	186	342	179	97	51	20	14	13
13	12	45	63	62	162	310	162	88	48	20	14	12
14	13	42	194	62	148	270	184	80	47	20	15	12
15	14	32	506	62	150	236	170	74	48	19	14	11
16	14	29	535	104	145	210	166	69	101	18	14	13
17	12	27	625	763	160	194	161	64	353	18	16	36
18	12	26	492	1,090	162	178	679	61	451	18	18	42
19	12	25	243	1,170	151	320	970	59	478	20	18	40
20	12	39	221	1,250	138	780	815	58	400	20	16	56
21	12	38	745	1,090	131	1,010	*520	56	242	20	16	77
22	12	77	648	578	130	1,450	300	55	141	18	16	120
23	14	111	506	310	129	*1,170	200	55	93	18	14	105
24	*14	103	464	214	141	625	155	58	69	18	18	76
25	15	90	310	176	720	331	150	65	56	18	18	53
26	16	*81	189	151	745	256	1,060	57	48	20	21	42
27	16	63	141	136	565	220	2,290	64	43	19	18	48
28	16	61	116	124	451	199	2,050	*72	38	18	16	141
29	16	53	101	111	353	179	1,700	121	35	20	14	260
30	18	55	91	116	----------	164	1,930	85	33	23	14	208
31	18	---------	83	552	----------	155	----------	457	----------	101	15	---------
Total	415	2,082	6,884	8,904	12,986	24,482	18,114	6,450	6,086	749	555	1,523
Mean	13.4	69.4	222	287	448	790	604	208	203	24.2	17.9	50.8
Cfsm	0.017	0.086	0.274	0.355	0.554	0.976	0.747	0.257	0.251	0.030	0.022	0.063
In.	0.02	0.10	0.32	0.41	0.60	1.13	0.83	0.30	0.28	0.03	0.03	0.07
Ac-ft	823	4,130	13,650	17,660	25,760	48,560	35,930	12,790	12,070	1,490	1,100	3,020

Calendar year 1963: Max 4,790 Min 12 Mean 184 Cfsm 0.227 In. 3.08 Ac-ft 133,200
Water year 1963-64: Max 3,410 Min 11 Mean 244 Cfsm 0.302 In. 4.12 Ac-ft 177,000

Peak discharge (base, 5,000 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Gage-height record computed from once-daily readings of outside gage for periods Oct. 1-30, Nov. 1-4, 12-16.

8-685. Spring Creek near Spring, Tex.

Location.--Lat 30°06'37", long 95°26'10", near left bank at downstream side of pier of bridge on U. S. Highway 75, 4,500 ft upstream from Missouri Pacific Railroad Co. bridge, 2.4 miles northwest of Spring, Harris County, and 4 miles downstream from Willow Creek.

Drainage area.--409 sq mi.

Records available.--April 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 78.10 ft above mean sea level, datum of 1929. Prior to Jan. 5, 1946, wire-weight gage at present site and datum.

Average discharge.--25 years, 213 cfs (154,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,770 cfs Mar. 3 (gage height, 10.88 ft); minimum, 4.0 cfs Sept. 13-15.

1939-64: Maximum discharge, 42,700 cfs Nov. 25, 1940 (gage height, 28.60 ft, from graph based on gage readings); minimum, 1.1 cfs Oct. 23, 24, 1956.

Maximum stage since at least 1879, 29.3 ft May 30, 1929, from floodmarks identified by local residents (discharge, 48,300 cfs).

Remarks.--Records good except those for periods of no gage-height record, which are fair. No diversion above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.0	4.5	7.7	13	64	45	27	102	116	12	11	8
2	4.8	4.8	7.4	12	83	976	26	295	101	11	10	8
3	4.8	4.8	7.1	12	56	1,370	26	468	47	11	11	7
4	4.8	5.0	7.1	12	45	973	25	336	30	10	9.8	7
5	4.8	5.5	7.1	12	68	427	27	112	23	9.8	7.7	7
6	4.8	5.5	7.1	*12	80	127	50	72	21	9.2	7.1	6
7	4.8	5.2	7.1	12	*92	80	215	59	23	*9.2	6.5	6
8	4.8	6.0	6.8	12	60	65	108	51	18	8.9	6.3	6
9	5.0	8.0	6.8	12	43	57	55	45	16	9	6.5	5
10	5.0	7.4	7.7	12	35	59	41	41	14	8	6.5	5
11	4.8	7.1	8.3	12	31	57	34	37	14	8	*6.5	*g 4.8
12	4.8	6.3	9.8	12	29	53	31	34	12	8	6	5
13	4.8	6.0	12	11	28	*51	29	31	12	8	6	4
14	5.0	5.5	19	11	27	45	27	28	11	8	6	g 4.0
15	5.0	5.5	23	11	28	40	26	24	11	8.0	6	4
16	5.0	5.5	16	17	27	37	24	23	34	8.3	7	g 4.8
17	5.0	5.8	16	33	27	35	124	21	204	8.6	7	10
18	5.0	5.8	16	32	26	33	516	20	329	8.9	8	40
19	5.0	6.0	13	44	26	68	580	19	135	8.9	8	30
20	5.0	6.5	27	36	25	105	520	20	54	8.3	8	25
21	5.0	6.8	65	28	25	154	*158	19	36	8.0	7	25
22	5.2	7.4	64	24	25	95	86	18	27	7.7	7	23
23	6	6.5	53	20	25	57	62	18	22	7.7	7	23
24	*7.7	6.5	32	22	40	45	49	21	20	7.7	7	19
25	16	7.1	24	16	194	40	43	20	18	7.7	10	16
26	11	*6.8	19	15	215	37	90	20	16	10	20	15
27	8.0	7.1	17	13	166	34	523	20	15	12	15	14
28	6.5	8.6	15	13	86	32	620	*21	14	12	13	14
29	5.8	8.0	14	12	59	31	508	35	13	12	11	13
30	5.2	8.3	13	17	----------	30	142	33	12	11	10	13
31	5.0	---------	13	49	----------	28	----------	118	---------	11	9	----------
Total	179.4	189.8	561.0	569	1,735	5,286	4,792	2,181	1,418	287.9	266.9	371.6
Mean	5.79	6.33	18.1	18.4	59.8	171	160	70.4	47.3	9.29	8.61	12.4
Cfsm	0.014	0.015	0.044	0.045	0.146	0.416	0.391	0.172	0.116	0.023	0.021	0.030
In.	0.02	0.02	0.05	0.05	0.16	0.48	0.44	0.20	0.13	0.03	0.02	0.03
Ac-ft	356	376	1,110	1,130	3,440	10,480	9,500	4,330	2,810	571	529	737

Calendar year 1963: Max 1,500 Min 3.8 Mean 48.8 Cfsm 0.119 In. 1.64 Ac-ft 35,300
Water year 1963-64: Max 1,370 Min 4.0 Mean 48.7 Cfsm 0.119 In. 1.63 Ac-ft 35,370

Peak discharge (base, 1,600 cfs)

Date	Time	Gage height	Discharge
3-3	0100	10.88	1,770

* Discharge measurement made on this day.

g Once- or twice-daily wire-weight gage readings.

Note.--No gage-height record Oct. 23, Mar. 9-12, 14-15, May 26-27, July 9-14, Aug. 12 to Sept. 10, Sept. 12-13, 15, 17-21.

8-690. Cypress Creek near Westfield, Tex.

Location.--Lat 30°02'08", long 95°25'44", near left bank at downstream side of pile bent of bridge on U. S. Highway 75, 0.9 mile upstream from Senger Gully, 1.8 miles northwest of Westfield, Harris County, 2.0 miles upstream from Missouri Pacific Railroad Co. bridge, and 11.0 miles upstream from mouth.

Drainage area.--285 sq mi.

Records available.--July 1944 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 63.89 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943. Prior to Mar. 17, 1951, at upstream side of bridge at datum 12.00 ft higher.

Average discharge.--20 years, 144 cfs (104,300 acre-ft per year).

Extremes.--Maximum discharge during year, 4,970 cfs May 31 (gage height, 23.60 ft); minimum, 0.2 cfs Oct. 16-17.
1944-64: Maximum discharge, 22,100 cfs Oct. 8, 1949 (gage height, 33.44 ft, present datum), from rating curve defined by current-meter measurements below 11,000 cfs and extended by logarithmic plotting; no flow at times.

Maximum stage since at least 1875, 34 ft (present datum) in May 1929 (discharge, 26,000 cfs), from information by local resident. Flood in November 1940 reached a stage of about 32 ft (present datum, discharge, 15,000 cfs), from information by State Highway Department.

Remarks.--Records good. No large diversion above station. Between July 1950 and March 1951 the channel below the gage was straightened and the streambed lowered about 3 ft at the gage and as much as 6 ft at some other places.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 1 to Sept. 30)

3.6	0.1	5.5	59
3.7	.4	6.5	128
3.8	1.2	8.0	290
3.9	2.2	10	600
4.0	3.5	13	1,240
4.3	9.1	16	2,150
4.8	24	18	2,900

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.7	1.1	13	2.3	112	26	2.7	28	254	3.0	13	4.0
2	1.6	.6	9.9	1.9	62	2,770	2.2	122	76	4.4	12	2.5
3	4.0	.4	8.0	1.5	37	2,020	2.9	33	35	3.5	11	1.8
4	5.5	.3	5.7	1.3	74	750	2.3	15	18	3.2	9.1	1.6
5	7.3	.3	4.5	1.1	180	348	14	9.4	11	3.8	8.2	.8
6	6.2	2.9	3.2	*1.1	112	161	8.7	6.9	28	3.5	13	3.7
7	6.0	9.9	2.5	.9	*68	85	4.4	5.7	11	*2.8	16	2.3
8	3.5	7.8	1.8	.9	36	56	2.3	5.7	6.4	2.3	14	16
9	2.5	14	1.3	.7	23	38	1.4	4.5	4.4	2.3	18	21
10	1.8	8.7	1.4	.5	15	28	2.5	3.7	2.8	3.2	16	11
11	.9	7.3	1.3	.5	11	26	3.8	4.4	4.5	8.2	14	*8.2
12	4.0	5.2	11	.6	7.8	19	3.7	2.8	2.8	12	*11	6.9
13	2.7	5.2	32	.4	6.9	*15	3.4	2.8	3.1	12	7.8	5.9
14	2.2	4.9	62	.3	5.7	15	4.7	6.4	3.7	9.6	8.4	6.6
15	1.0	4.0	60	.3	6.6	14	3.8	4.5	5.5	9.1	5.9	9.4
16	.2	4.9	42	19	9.1	14	1.7	4.2	264	12	4.7	10
17	3.8	4.5	26	33	6.6	13	1,130	3.4	462	8.2	3.2	49
18	2.7	3.2	20	24	6.2	12	492	2.5	290	6.4	2.8	42
19	1.9	2.6	14	21	4.0	224	77	2.7	113	8.4	3.0	54
20	1.7	2.2	124	15	3.1	112	*29	7.6	49	9.6	2.8	58
21	1.3	6.2	97	12	4.0	61	16	6.9	27	18	3.2	47
22	.9	6.0	57	8.4	4.4	32	10	3.8	18	13	4.4	32
23	22	4.9	31	6.6	3.2	20	6.9	3.0	13	11	4.5	23
24	*38	9.0	19	54	113	15	4.9	11	9.1	14	6.2	28
25	6.6	14	14	19	618	14	4.5	22	9.6	12	9.3	21
26	3.0	*9.4	11	6.6	339	12	68	9.4	5.5	12	15	21
27	18	6.6	8.0	3.8	138	9.9	192	5.9	5.2	11	11	40
28	6.6	12	6.4	2.7	73	8.7	165	*4.0	5.0	12	8.4	45
29	5.7	9.1	4.9	2.0	42	7.8	62	7.6	3.7	12	8.0	32
30	2.6	14	3.8	36	----------	5.9	25	747	2.8	14	7.6	36
31	2.0	---------	3.0	160	----------	3.7	----------	*2,350	----------	12	6.6	---------
Total	167.9	181.2	698.7	437.4	2,120.6	6,936.0	2,346.8	3,445.8	1,743.1	268.5	278.1	639.7
Mean	5.42	6.04	22.5	14.1	73.1	224	78.2	111	58.1	8.66	8.97	21.3
Cfsm	0.019	0.021	0.079	0.049	0.257	0.786	0.274	0.389	0.204	0.030	0.031	0.075
In.	0.02	0.02	0.09	0.06	0.28	0.90	0.31	0.45	0.23	0.04	0.04	0.08
Ac-ft	333	359	1,390	868	4,210	13,760	4,650	6,830	3,460	533	552	1,270

Calendar year 1963: Max 1,000 Min 0 Mean 25.1 Cfsm 0.088 In. 1.18 Ac-ft 18,170
Water year 1963-64: Max 2,770 Min 0.2 Mean 52.6 Cfsm 0.185 In. 2.52 Ac-ft 38,220

Peak discharge (base, 1,500 cfs)

Date	Time	Gage height	Discharge
3- 2	0700	19.80	3,700
4-17	1630	18.88	3,280
5-31	0100	23.60	4,970

* Discharge measurement made on this day.

8-700. East Fork San Jacinto River near Cleveland, Tex.

Location.--Lat 30°20'11", long 95°06'14", near left bank at downstream side of pile bent of bridge on State Highway 105, 1,880 ft downstream from Gulf, Colorado and Santa Fe Railway Co. bridge, 1¼ miles west of Cleveland, Liberty County, and 4.3 miles downstream from Winter Creek.

Drainage area.--325 sq mi.

Records available.--April 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 107.98 ft above mean sea level, datum of 1929, supplementary adjustment of 1936. Prior to Sept. 13, 1955, at site 1,800 ft upstream at datum 5.00 ft higher.

Average discharge.--25 years, 227 cfs (164,300 acre-ft per year).

Extremes.--Maximum discharge during year, 5,750 cfs Mar. 4 (gage height, 15.65 ft); minimum daily, 10 cfs Oct. 10-22, 31, Nov. 1, Sept. 4-15.

1939-64: Maximum discharge, 59,000 cfs Nov. 24, 1940 (gage height, 20.37 ft, former site and datum), from rating curve defined by current-meter measurements below 27,000 cfs and extended above by logarithmic plotting; minimum daily, 3.0 cfs Aug. 23, 24, Sept. 27, 28, 1956.

Maximum stage since at least 1900, that of Nov. 24, 1940. Flood of May 5, 1935, reached a stage of 19.9 ft, former site and datum (discharge, 53,500 cfs), from information by local residents.

Remarks.--Records good. No large diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 8-9, Dec. 14-21, 23-31, Jan. 16-17, Jan. 20 to Feb. 24, Feb. 28 to Mar. 1, Mar. 31 to Apr. 4)

3.25	10	8.0	675
3.5	17	12.0	1,990
4.0	38	13.0	2,410
4.5	70	14.0	3,250
5.0	117	15.0	4,650
6.0	249	15.5	5,550

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	10	29	39	484	145	62	197	377	17	18	11
2	11	11	28	38	410	1,130	61	141	136	17	16	11
3	11	11	39	37	204	2,400	60	206	113	17	15	11
4	11	11	39	36	128	5,270	61	430	*70	17	14	10
5	11	200	30	38	208	*2,660	99	322	49	17	13	10
6	11	*401	27	39	528	979	731	125	41	16	12	10
7	11	165	26	41	600	334	410	99	37	16	12	10
8	11	89	25	39	310	219	176	85	34	16	12	10
9	11	74	*24	38	141	197	109	71	31	15	12	10
10	10	63	24	37	100	249	83	67	31	15	12	10
11	10	40	26	34	87	400	71	62	28	14	12	10
12	10	29	39	38	71	320	68	*58	27	13	11	10
13	10	24	73	36	66	170	72	54	26	13	*11	10
14	10	22	267	33	66	136	119	47	26	*13	11	*10
15	10	21	539	32	72	121	111	44	29	13	11	10
16	10	20	528	71	86	108	80	41	44	12	11	12
17	10	20	332	516	*70	96	324	39	42	13	12	24
18	10	20	112	950	91	85	1,840	37	40	13	13	66
19	10	20	72	1,070	77	306	1,910	36	46	13	12	74
20	10	22	95	706	63	725	1,120	35	41	13	12	84
21	10	30	505	*250	62	612	556	32	29	13	11	57
22	10	37	775	137	69	332	176	32	25	13	11	28
23	11	54	519	104	68	*151	128	31	22	13	14	22
24	11	50	195	152	90	118	107	32	20	12	19	18
25	11	36	102	107	630	108	253	35	22	13	21	16
26	11	29	76	78	830	99	875	36	21	13	21	14
27	11	28	66	67	562	91	1,520	43	20	12	22	14
28	11	34	57	61	274	82	1,520	49	18	13	19	16
29	11	47	51	55	170	76	1,800	81	18	13	16	18
30	11	38	47	62	----------	70	974	127	18	19	13	18
31	10	---------	43	242	----------	66	----------	445	----------	21	12	----------
Total	327	1,656	4,810	5,183	6,617	17,855	15,476	3,139	1,481	448	431	634
Mean	10.5	55.2	155	167	228	576	516	101	49.4	14.5	13.9	21.1
Cfsm	0.032	0.170	0.477	0.514	0.702	1.77	1.59	0.310	0.152	0.045	0.043	0.065
In.	0.04	0.19	0.55	0.59	0.76	2.04	1.77	0.36	0.17	0.05	0.05	0.07
Ac-ft	649	3,280	9,540	10,300	13,120	35,410	30,700	6,230	2,940	889	855	1,260

Calendar year 1963: Max 2,060 Min 9.7 Mean 90.7 Cfsm 0.279 In. 3.75 Ac-ft 64,780
Water year 1963-64: Max 5,270 Min 10 Mean 159 Cfsm 0.489 In. 6.64 Ac-ft 115,200

Peak discharge (base, 2,000 cfs)

Date	Time	Gage height	Discharge
3-4	0700	15.65	5,750

* Discharge measurement made on this day.

8-705. Caney Creek near Splendora, Tex.

Location.--Lat 30°15'36", long 95°18'08", near right bank at downstream side of pile bent of county road bridge, 4 miles downstream from Gulf, Colorado and Santa Fe Railway Co. bridge, and 8 miles west of Splendora, Montgomery County.
Drainage area.--105 sq mi.
Records available.--October 1943 to September 1964. Monthly discharge only for some periods, published in WSP 1312.
Gage.--Water-stage recorder. Datum of gage is 123.44 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943.
Average discharge.--21 years, 70.1 cfs (50,750 acre-ft per year).
Extremes.--Maximum discharge during year, 3,570 cfs Mar. 3 (gage height, 11.60 ft); minimum, 7.4 cfs Aug. 12.
1943-64: Maximum discharge, 14,900 cfs Apr. 1, 1945 (gage height, 18.19 ft), from rating curve defined by current-meter measurements below 6,000 cfs and extended above by logarithmic plotting; minimum, 4.1 cfs Oct. 26, 1956, caused by construction upstream.
Maximum stage since at least 1885, 22.0 ft in November 1940, present site and datum, from information by local resident. Flood in May 1935 reached a stage of 19.3 ft, present site and datum, from information by local resident.
Remarks.--Records good except those for period of no gage-height record or indefinite stage-discharge relation, which are fair. No diversion above station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 17-24, June 8 to July 2)

Oct. 1 to Dec. 8		Dec. 9 to July 22		July 23 to Sept. 30	
-1.5	9.8	-1.7	7.2	-1.25	5.4
-1.3	18	-1.4	20	-1.0	6.6
-1.0	33	-.6	74	-.5	8.8
-.5	67	0	128	0	11
0	108	.5	181	1.0	24
1.0	205	2.8	519	2.0	36
3.0	454	6.0	1,270	3.0	43
5.0	750	9.0	2,320	4.0	50

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	11	35	28	313	60	30	70	*174	15	10	9
2	11	11	30	26	100	865	30	60	60	18	9.0	8
3	10	11	40	25	70	*2,280	30	53	39	18	8.4	10
4	10	11	35	25	60	237	30	43	33	17	8.1	12
5	10	188	30	24	295	148	74	37	29	16	8.1	12
6	10	*561	25	24	264	100	501	36	25	15	8.1	11
7	10	*84	20	24	100	83	120	35	23	14	7.7	12
8	10	38	20	24	80	76	90	33	20	13	7.7	11
9	9.8	35	*18	24	70	81	80	32	18	12	7.6	10
10	9.8	100	18	24	60	173	75	29	18	12	7.5	10
11	9.8	50	19	23	50	106	70	27	17	12	7.5	10
12	9.8	40	23	23	40	77	65	*25	16	*11	7.5	10
13	9.8	35	33	22	40	65	63	24	16	10	7.6	9.9
14	9.8	30	324	21	40	60	98	21	16	10	*7.9	*9.8
15	9.8	25	413	20	50	58	68	19	20	10	14	9.9
16	9.8	25	88	32	40	54	56	18	41	10	12	11
17	10	25	51	677	*35	51	48	17	48	10	14	19
18	9.8	20	38	328	33	48	58	17	40	11	10	46
19	9.8	20	32	150	31	103	80	17	27	10	8.8	39
20	9.8	30	60	*61	28	333	56	16	20	12	8.7	23
21	9.8	50	735	45	28	88	37	15	18	14	8.5	19
22	9.8	70	273	36	32	56	30	15	16	11	9.0	15
23	12	100	90	33	34	*49	28	15	15	9.2	9.6	13
24	12	60	70	31	47	47	26	18	15	8.1	10	12
25	11	40	55	28	*391	46	30	20	15	8.2	12	12
26	14	35	45	23	280	44	290	17	15	8.1	11	11
27	13	30	43	22	100	40	862	15	15	8.0	10	18
28	12	50	38	21	80	37	356	14	14	8.3	10	21
29	11	70	35	20	70	36	100	40	13	8.6	9	14
30	10	50	33	23	----------	33	80	41	14	9.9	9	14
31	10	----------	30	332	----------	31	----------	259	----------	10	9	----------
Total	324.4	2,005	2,799	2,219	2,861	5,565	3,561	1,098	850	359.4	287.3	441.6
Mean	10.5	66.8	90.3	71.6	98.7	180	119	35.4	28.3	11.6	9.27	14.7
Cfsm	0.100	0.636	0.860	0.682	0.940	1.71	1.13	0.337	0.270	0.110	0.088	0.140
In.	0.11	0.71	0.99	0.79	1.01	1.97	1.26	0.39	0.30	0.13	0.10	0.16
Ac-ft	643	3,980	5,550	4,400	5,670	11,040	7,060	2,180	1,690	713	570	876

Calendar year 1963: Max 735 Min 9.8 Mean 38.6 Cfsm 0.368 In. 4.98 Ac-ft 27,940
Water year 1963-64: Max 2,280 Min 7.5 Mean 61.1 Cfsm 0.582 In. 7.92 Ac-ft 44,370

Peak discharge (base, 1,300 cfs)

Date	Time	Gage height	Discharge
3-3	0430	11.60	3,570

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 10 to Dec. 8, Dec. 23-26, Jan. 19, Feb. 2-4, 7-16, Feb. 27 to Mar. 1, Apr. 7-12, Apr. 29 to May 2; stage-discharge relation indefinite Aug. 25 to Sept. 2, Sept. 20-21.

8-710. Peach Creek at Splendora, Tex.

Location.--Lat 30°13'57", long 95°10'05", at right bank on downstream side of pile bent of bridge on county road between Splendora and Conroe, about 1,500 ft west of depot at Splendora, Montgomery County, 2.5 miles upstream from Texas and New Orleans Railroad Co. bridge, 2.5 miles upstream from bridge on U. S. Highway 59, and 9.7 miles upstream from Caney Creek.

Drainage area.--117 sq mi.

Records available.--October 1943 to September 1964. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 86.61 ft above mean sea level, datum of 1929, Galveston-Houston supplementary adjustment of 1936.

Average discharge.--21 years, 72.8 cfs (52,700 acre-ft per year).

Extremes.--Maximum discharge during year, 915 cfs Mar. 3 (gage height, 8.43 ft); minimum, 6.2 cfs Sept. 15-16.
1943-64: Maximum discharge, 28,500 cfs Oct. 8, 1949 (gage height, 17.73 ft), from rating curve defined by current-meter measurements below 8,000 cfs and by slope-area measurement of peak flow; minimum, 1.1 cfs Sept. 28-30, 1956.
Maximum stage since at least 1895, that of Oct. 8, 1949. Flood in November 1940 reached a stage of 17.3 ft (discharge, 24,700 cfs), from information by local residents.

Remarks.--Records good. No large diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 5-11, May 5-29, Aug. 11-24, Aug. 27 to Sept. 16, Sept. 23-28)

0.5	5.8	4.0	142
.6	7.6	5.0	220
.9	14	6.0	340
1.0	16	7.0	520
1.5	29	8.0	780
2.0	45	9.0	1,100
3.0	85		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.1	9.5	24	25	90	50	33	52	182	11	15	8.0
2	8.9	9.3	22	24	74	482	32	47	131	11	15	7.8
3	8.7	9.7	22	24	48	828	32	42	44	11	12	8.0
4	8.7	10	26	24	45	491	32	38	*32	11	11	7.6
5	8.9	61	24	25	70	225	36	34	26	11	9.5	7.4
6	8.9	*121	19	27	82	115	80	32	23	11	9.3	7.2
7	8.7	106	18	27	72	85	121	31	20	9.9	8.7	9.7
8	8.7	47	16	26	47	74	78	31	19	9.3	8.4	7.6
9	8.6	39	*16	26	39	74	47	29	18	8.7	8.2	7.8
10	8.6	37	16	24	36	92	37	27	17	8.6	7.8	7.6
11	8.4	36	17	25	34	82	34	25	16	8.6	7.4	7.4
12	8.2	24	20	24	33	66	32	*25	15	*8.0	7.2	7.2
13	8.2	19	36	24	32	56	33	24	14	8.4	7.1	6.7
14	8.2	16	90	24	32	52	36	22	14	8.6	*6.9	*6.5
15	8.2	15	98	22	36	52	43	21	15	8.6	6.9	6.3
16	8.4	15	72	34	41	48	35	20	18	8.4	7.1	7.6
17	8.6	15	42	80	*43	45	29	19	28	8.4	8.4	14
18	8.7	15	32	103	36	41	33	19	31	8.6	7.8	16
19	8.7	15	28	78	34	173	58	19	24	8.6	8.7	29
20	8.9	16	40	*48	32	210	52	19	22	8.6	8.0	19
21	8.9	17	101	40	31	132	35	20	16	8.6	7.2	23
22	9.1	25	106	36	33	72	29	18	14	8.6	6.9	18
23	14	28	78	33	36	*54	26	17	13	8.6	7.6	13
24	16	25	44	82	47	50	25	18	12	8.0	9.5	11
25	11	21	36	95	239	50	31	20	13	7.4	20	11
26	11	18	34	44	227	48	250	20	13	7.4	14	10
27	13	16	32	35	130	44	668	18	13	7.1	11	11
28	11	20	30	31	76	41	442	17	12	8.4	11	13
29	11	22	28	29	58	38	148	17	11	9.7	10	15
30	11	28	26	31	----------	36	68	60	11	12	9.1	16
31	9.5	---------	25	80	----------	34	----------	159	----------	15	8.4	----------
Total	297.8	855.5	1,218	1,250	1,833	3,940	2,635	960	837	288.1	295.1	339.4
Mean	9.61	28.5	39.3	40.3	60.2	127	87.8	31.0	27.9	9.29	9.52	11.3
Cfsm	0.082	0.244	0.336	0.344	0.514	1.08	0.750	0.265	0.238	0.079	0.081	0.096
In.	0.09	0.27	0.39	0.40	0.58	1.25	0.84	0.36	0.27	0.09	0.09	0.11
Ac-ft	591	1,700	2,420	2,480	3,640	7,810	5,230	1,900	1,660	571	585	673

Calendar year 1963: Max 340 Min 6.7 Mean 26.6 Cfsm 0.227 In. 3.08 Ac-ft 19,270
Water year 1963-64: Max 828 Min 6.3 Mean 40.3 Cfsm 0.344 In. 4.74 Ac-ft 29,260

Peak discharge (base, 900 cfs)

Date	Time	Date height	Discharge
3-3	0600	8.43	915

* Discharge measurement made on this day.

8-720. Lake Houston near Sheldon, Tex.

Location.--Lat 29°54'58", long 95°08'28", at intake structure on San Jacinto River near right bank 100 ft upstream from Lake Houston Dam, 4.0 miles north of Sheldon, Harris County, 4.6 miles upstream from bridge on U. S. Highway 90, and 18 miles northeast of Houston. Upper gage (prior to October 1954, published as West Fork San Jacinto River near Humble), lat 30°01'37", long 95°15'28", at bridge on U. S. Highway 59, half a mile downstream from Spring Creek, 2½ miles north of Humble, and 16 miles upstream from dam.

Drainage area.--2,828 sq mi at dam; 1,741 sq mi at upper gage.

Records available.--April 1954 to September 1964.

Gage.--Water-stage recorders. Datum of gage at dam is 0.70 ft below mean sea level, datum of 1929, adjusted in 1957 and 1959 for ground surface subsidence. Prior to Aug. 3, 1954, staff gage read once daily. Datum of upper gage is 30.53 ft above mean sea level, datum of 1929.

Extremes.--Maximum contents during year, 173,800 acre-ft Mar. 3 (gage height, 45.70 ft); minimum, 108,800 acre-ft Nov. 4 (gage height, 40.03 ft). Maximum gage height at upper gage, 15.63 ft Mar. 3; minimum, 8.80 ft Nov. 5. 1954-64: Maximum contents, 205,000 acre-ft Sept. 12, 1961 (gage height, 47.87 ft); minimum since first filling of reservoir in August 1954, 79,880 acre-ft Dec. 10-12, 14-17, 1956 (gage height, 36.8 ft). Maximum gage height at upper gage, 21.20 ft June 28, 1960; minimum since first filling of reservoir, 5.5 ft Dec. 12, 1956.

Remarks.--Lake is formed by compacted earth-fill embankment sections 4,000 and 4,600 ft long. Spillway is a slab-and-buttress (Ambursen type) structure 3,160 ft long, located near center of dam. Dam completed and storage began Apr. 9, 1954. Total capacity, 158,200 acre-ft (gage height, 44.5 ft, top of spillway). Usable capacity, about 150,000 acre-ft between gage heights 44.5 and 22.0 ft (bottom of 36-inch sluice gate). Water used for municipal supply for city of Houston, for industries in ship-channel area, and for irrigation. Records of diversions furnished by San Jacinto River Authority and city of Houston.

Cooperation.--Capacity table furnished by city of Houston, based on 1916 survey.

Capacity table (gage height, in feet, and contents, in acre-feet)

40.0	108,500	44.0	152,000
41.0	118,600	45.0	164,500
42.0	129,100	46.0	177,800
43.0	140,200		

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	118,400	110,300	116,800	149,400	161,800	161,100	158,800	165,800	164,400	155,200	141,700	133,300
2	118,000	109,700	117,100	149,400	162,200	170,400	159,000	163,500	163,100	154,900	141,300	133,000
3	117,600	109,100	116,800	149,800	162,000	173,500	159,200	162,500	162,000	154,100	140,900	132,400
4	117,300	108,800	116,900	149,800	162,100	170,200	159,200	161,800	161,200	153,600	140,400	132,000
5	116,800	109,500	116,900	150,100	161,800	170,000	161,600	161,000	160,400	153,200	140,400	131,500
6	116,300	111,000	117,000	150,200	162,400	167,400	163,000	161,000	159,500	152,600	139,900	131,100
7	116,100	113,100	117,200	150,200	160,900	164,100	163,200	160,200	159,200	152,100	139,300	130,500
8	115,600	115,800	116,600	150,800	161,800	162,200	160,500	160,200	158,900	151,500	139,300	130,000
9	115,100	116,100	116,400	149,600	161,400	160,400	160,500	159,800	158,800	150,900	138,900	129,200
10	114,800	116,300	116,600	149,600	160,900	160,600	160,800	159,200	158,500	150,200	138,400	128,800
11	114,400	116,400	117,100	150,500	160,100	161,000	160,200	159,200	158,000	149,500	138,100	128,400
12	114,100	116,500	117,800	148,900	160,000	161,000	159,900	159,100	157,900	149,200	137,500	128,000
13	113,800	116,400	119,200	148,000	159,000	160,600	159,800	157,900	157,400	148,800	137,100	127,200
14	113,300	116,100	120,300	147,600	158,900	161,000	159,100	157,800	157,200	148,200	136,300	126,700
15	113,000	115,700	122,800	148,300	157,900	159,600	159,200	157,500	157,600	147,800	136,000	126,300
16	112,600	115,600	125,400	149,500	158,000	159,800	159,200	157,400	158,200	147,500	135,800	126,700
17	112,200	115,600	127,700	151,300	158,200	159,600	161,600	157,100	159,400	146,800	135,500	127,600
18	111,900	115,600	130,000	155,600	157,400	159,600	163,100	157,000	160,500	146,600	135,100	127,600
19	111,500	115,300	131,300	159,500	156,200	164,200	164,800	156,600	160,600	146,600	134,500	128,000
20	111,100	115,300	134,800	161,900	156,800	163,800	165,000	156,400	160,500	146,100	133,800	128,300
21	110,800	114,600	137,100	162,000	156,400	163,100	163,500	156,100	160,000	145,700	132,900	128,900
22	110,500	116,500	141,600	161,200	156,200	163,500	162,000	156,000	159,500	145,200	135,100	129,100
23	111,500	115,800	143,700	160,400	156,400	163,100	160,800	156,000	159,000	144,700	135,100	129,100
24	112,300	115,600	145,900	160,800	159,200	162,200	160,400	156,000	158,600	144,300	134,900	129,100
25	112,200	115,800	147,300	160,400	163,100	161,500	160,100	155,900	158,100	143,900	135,100	129,500
26	112,100	115,700	148,200	160,100	164,200	159,800	162,000	155,500	157,800	143,300	135,000	129,100
27	112,100	117,300	148,600	159,900	163,200	159,800	166,900	155,500	157,000	142,600	134,900	129,700
28	112,000	117,600	149,000	159,500	162,000	159,600	167,400	155,200	156,900	142,300	134,600	129,500
29	111,400	116,800	149,300	159,200	161,400	159,200	166,500	155,900	156,900	141,700	134,200	130,200
30	111,000	116,800	149,500	160,100	----------	159,100	166,100	159,000	156,000	142,300	134,000	130,800
31	110,600	----------	149,300	160,400	----------	159,100	----------	166,100	----------	141,900	133,500	----------
(†)	40.21	40.82	43.77	44.67	44.75	44.57	45.12	45.12	44.32	43.14	42.40	42.15
(‡)	-8,300	+6,200	+32,500	+11,100	+1,000	-2,300	+7,000	0	-10,100	-14,100	-8,400	-2,700
(††)	11,150	9,320	9,730	9,760	8,690	10,170	10,520	12,390	13,440	14,050	12,680	10,920

Calendar year 1963..... ‡ -22,100 †† 134,900
Water year 1963-64..... ‡ +11,900 †† 132,800

† Gage height, in feet, at end of month.
‡ Change in contents, in acre-feet.
†† Diversions, in acre-feet, by city of Houston and San Jacinto River Authority.

8-725. Barker Reservoir near Addicks, Tex.

Location.--Lat 29°46'11", long 95°38'49", at dam on Buffalo Bayou, 45 ft upstream from reservoir outlet works, 1,160 ft upstream from Addicks-Howell County road, 1.1 miles south of Addicks, Harris County, and 1.2 miles upstream from South Mayde Creek. Upper gage, lat 29°43'08", long 95°43'53", on Buffalo Bayou, 2.8 miles west of Clodine, Fort Bend County, 4.8 miles (2.7 miles by reservoir) upstream from Mason Creek, and 9.0 miles (6.4 miles by reservoir) upstream from reservoir outlet works.

Drainage area.--134 sq mi at outlet works; 89.2 sq mi at upper gage. During extreme floods when the capacity of drainage ditches is exceeded, the drainage area is defined by natural ridge lines and is 150 sq mi at lower gage and 105 sq mi at upper gage.

Records available.--August 1945 to September 1964.

Gage.--Water-stage recorders. Datum of both gages is 0.33 ft below mean sea level, datum of 1929, Galveston-Houston supplementary adjustment of 1943.

Extremes.--Maximum gage height at dam during year, 89.37 ft Mar. 5 (contents, 8,030 acre-ft); maximum at upper gage, 97.07 ft Mar. 2.

1945-64: Maximum gage height at dam, 93.54 ft June 28, 1960 (contents, 28,830 acre-ft); maximum at upper gage, 99.35 ft June 26, 1960.

Maximum stage known near site of upper gage prior to construction of reservoir, 98.1 ft in December 1935, from floodmark about 1,100 ft to right of and 1,100 ft downstream from upper gage.

Remarks.--Reservoir is formed by rolled-fill earthen dam 72,844 ft long. Dam completed Feb. 3, 1946, but was first used for flood control in spring of 1945. Reservoir is operated for flood protection of city of Houston. Outlet works consist of five concrete conduits. Originally the middle conduit was controlled by vertical-lift gates. In 1949 gates were installed on the two outside conduits and in May 1962 gates were installed on the two remaining conduits. Capacity, 127,900 acre-ft between gage height 75.0 (bottom of conduits) and 101.9 ft (top of design flood pool). No constructed emergency spillways; runoff considerably in excess of designed capacity will be discharged around ends of dam. Gage heights and contents are not published for floods that do not produce maximum contents of 130 acre-ft or more.

Cooperation.--Capacity table and gage height record at dam furnished by Corps of Engineers. Capacity curve based on survey made in 1940.

Gage heights and contents, at indicated time, January, February, March and May 1964

Date	Time	Gage height at upper gage (feet)	Gage height at dam (feet)	Contents (acre-feet)	Date	Time	Gage height at upper gage (feet)	Gage height at dam (feet)	Contents (acre-feet)
Jan. 30	1500	(*)	75.48	4	Feb. 29	0600	(*)	79.98	55
	2400	91.78	76.71	11		1200	(*)	78.15	26
31	0800	92.45	77.90	23		1800	(*)	76.79	12
	1600	92.08	79.14	41		2400	(*)	76.50	10
	2400	91.52	79.89	53	Mar. 1	2000	(*)	76.15	7
Feb. 1	0800	90.92	80.31	61		2400	(*)	77.30	17
	1600	90.44	80.40	63	2	0300	90.75	79.68	50
	2400	(*)	80.10	57		0700	96.85	80.80	73
2	0800	(*)	79.30	43		1300	96.86	79.75	51
	1600	(*)	77.95	24		1800	96.63	82.20	144
	2400	(*)	76.87	13		2400	96.34	84.70	819
3	1200	(*)	76.55	10	3	0800	95.93	86.47	2,350
	2400	(*)	76.34	8		1600	95.35	87.55	3,940
4	0600	(*)	76.30	8		2400	94.70	88.22	5,220
	1200	92.82	77.50	19	4	1200	93.96	88.85	6,660
	1800	94.10	78.54	31		2400	93.17	89.20	7,560
	2400	94.20	79.84	52	5	1000	92.53	89.37	8,030
5	0800	93.89	81.10	83		2400	91.67	89.27	7,750
	1600	93.36	82.20	144	6	1200	91.02	89.05	7,170
	2400	92.86	83.06	280		2400	90.52	88.49	5,810
6	0800	92.30	83.66	409	7	1200	(*)	87.82	4,420
	1500	91.90	83.52	373		2400	(*)	87.52	3,880
	2400	91.20	83.95	494	8	1200	(*)	87.30	3,520
7	0800	90.62	84.08	538		2400	(*)	87.05	3,130
	1500	(*)	82.95	249	9	1200	(*)	86.60	2,510
	2400	(*)	83.12	282		2400	(*)	86.13	1,970
8	0800	(*)	82.75	214	10	1200	(*)	85.42	1,310
	1600	(*)	81.90	122		2400	(*)	84.69	814
	2400	(*)	80.25	60	11	0800	(*)	84.22	590
9	0600	(*)	78.20	27		1200	(*)	82.15	140
	1200	(*)	76.64	10		1800	(*)	79.35	44
	1800	(*)	76.40	9		2400	(*)	76.44	9
	2400	(*)	76.28	8	12	1200	(*)	75.78	5
10	1200	(*)	76.07	7		2400	(*)	75.71	5
	2400	(*)	75.93	6	May 18	2400	(*)	75.43	3
24	1400	(*)	75.50	4	19	1200	90.60	76.60	10
	1800	(*)	77.30	17		2400	(*)	77.16	16
	2400	94.12	78.66	33	20	1300	(*)	77.08	15
25	0800	94.70	80.05	56		1800	(*)	79.70	50
	1500	94.16	79.37	44		2400	(*)	80.76	72
	1800	93.92	80.90	76	21	1200	(*)	81.65	108
	2400	93.41	82.37	161		2400	(*)	82.01	130
26	0800	92.88	83.36	335	22	2400	(*)	82.33	156
	1400	92.52	82.82	226	23	2400	(*)	82.51	177
	2400	91.90	83.90	478	24	2400	(*)	82.62	193
27	0800	91.36	84.21	586	25	2400	(*)	82.70	205
	1400	90.95	83.38	339	26	0900	(*)	82.73	210
	2400	90.46	83.73	427		1800	(*)	81.54	101
28	0700	(*)	83.64	403		2400	(*)	80.42	63
	1400	(*)	81.78	115	27	0800	(*)	78.25	28
	1500	(*)	82.00	129		1600	(*)	75.94	6
	2400	(*)	81.12	84		2400	(*)	75.83	5

* Water below intake.

8-730. Addicks Reservoir near Addicks, Tex.

Location.--Lat 29°47'28", long 95°37'24", at dam on South Mayde Creek, 65 ft upstream from reservoir outlet works, 2,700 ft upstream from U. S. Highway 90, 1.2 miles east of Addicks, Harris County, and 1.4 miles upstream from mouth. Supplementary gages: lat 29°48'03", long 95°41'32", on South Mayde Creek at Groeschke Road bridge, 3.2 miles west of Addicks, 4.6 miles (3.5 miles by reservoir) upstream from Langham Creek, and 5.5 miles (4.2 miles by reservoir) upstream from reservoir outlet works; lat 29°50'08", long 95°37'30", on Langham Creek at Clay Road bridge, 3.6 miles north of Addicks, 4.4 miles (2.7 miles by reservoir) upstream from mouth, and 5.3 miles (3.1 miles by reservoir) upstream from reservoir outlet works.

Drainage area.--133 sq mi at outlet works; 34.9 sq mi at gage on South Mayde Creek; and 45.1 sq mi at gage on Langham Creek. During extreme floods when the capacity of drainage ditches is exceeded, the drainage area is defined by natural ridge lines and is 129 sq mi at outlet works, 30 sq mi at South Mayde Creek gage and 49 sq mi at Langham Creek gage.

Records available.--June 1948 to September 1964.

Gage.-- Water-stage recorders. Datum of all gages is mean sea level, datum of 1929, Galveston-Houston supplementary adjustment of 1943.

Extremes.--Maximum elevation at dam during year, 92.17 ft Mar. 5 (contents, 4,520 acre-ft); maximum at gage on South Mayde Creek, 106.44 ft Mar. 2; maximum at gage on Langham Creek, 101.40 ft Mar. 2.

1948-64: Maximum elevation at dam, 95.23 ft June 28, 1960 (contents, 12,190 acre-ft); maximum at gage on South Mayde Creek, 107.47 ft June 26, 1960; maximum at gage on Langham Creek, 102.8 ft July 30 or 31, 1954.

Maximum elevation known, 89.9 ft in December 1935 at bridge on U. S. Highway 90, 2,700 ft downstream from outlet works, from information by Corps of Engineers. This flood reached an elevation of 109.3 ft, 0.2 mile downstream and 0.1 mile to right of gage on South Mayde Creek, and an elevation of 104.5 ft, 1,900 ft to left and 700 ft upstream from gage on Langham Creek; from floodmarks, from information by local residents.

Remarks.--Reservoir is formed by rolled-fill earthen dam 61,166 ft long. Dam completed in fall of 1948. Reservoir is operated for flood protection of city of Houston. Outlet works consist of five concrete conduits. Originally the middle conduit was controlled by vertical-lift gates. In 1949 gates were installed on the two outside conduits, and in June 1962 gates were installed on the two remaining conduits. Capacity, 188,030 acre-ft between elevations 73.0 (bottom of conduits) and 113.0 ft (top of design flood pool). No constructed emergency spillways; runoff considerably in excess of designed capacity will be discharged around ends of dam. Elevations and contents not published for floods that do not produce maximum contents of 30 acre-ft or more.

Cooperation.--Capacity table and elevation record at dam furnished by Corps of Engineers. Capacity curve based on survey made in 1940.

Elevation and contents, at indicated time, February, March, May and June 1964

Date	Time	Elevation on South Mayde Creek (feet)	Elevation on Langham Creek (feet)	Elevation at dam (feet)	Contents (acre-feet)	Date	Time	Elevation on South Mayde Creek (feet)	Elevation on Langham Creek (feet)	Elevation at dam (feet)	Contents (acre-feet)
Feb. 4	1800	100.22	97.08	74.70	2	Mar. 5	1400	98.62	95.80	92.17	4,520
	2400	100.88	98.46	77.80	20		2400	98.12	95.25	91.95	4,180
5	0800	100.86	98.98	79.35	37	6	0800	97.80	94.75	91.75	3,900
	1600	100.11	98.38	80.38	52		1600	97.55	94.40	91.61	3,710
	2400	99.34	97.11	80.82	59		2400	97.33	94.11	91.17	3,170
6	0600	98.79	96.28	80.69	57	7	1200	97.05	93.82	90.14	2,140
	1200	98.30	95.60	79.35	37		2400	(*)	93.68	89.40	1,560
	1600	97.95	95.22	77.75	20	8	1200	(*)	93.48	88.81	1,190
	1700	97.90	95.15	78.14	23		2400	(*)	93.52	88.09	833
	2400	97.68	94.67	76.25	8	9	0900	(*)	93.39	87.45	610
7	0600	97.47	94.36	75.20	4		1600	(*)	93.31	85.70	260
	1200	97.30	94.10	74.58	2		2400	(*)	93.21	84.93	184
	2400	97.00	93.60	74.12	1	10	0800	(*)	93.15	83.77	127
24	2000	99.12	97.20	73.50	0		1200	(*)	93.11	81.30	68
	2100	99.82	98.25	75.80	6		1600	(*)	93.07	78.40	26
	2400	101.18	99.49	77.45	16		1800	(*)	93.05	78.65	28
25	0900	102.54	100.08	80.45	53		2400	(*)	92.96	75.00	3
	1500	101.78	99.95	80.40	52	May 19	1200	100.05	92.38	74.40	2
	1800	101.32	99.74	81.30	68		2400	99.47	92.34	74.69	2
	2400	100.42	98.94	82.30	88	20	1400	98.60	92.52	74.51	2
26	0800	99.52	97.18	83.02	106		1500	98.52	92.50	77.00	13
	1500	98.99	96.15	81.05	64		2400	97.90	92.39	78.29	25
	1600	98.93	96.06	81.30	68	21	1200	97.37	92.35	79.00	33
	2400	98.39	95.42	80.85	60		2400	97.07	92.81	79.46	39
27	1000	98.03	94.74	79.30	36	22	2400	(*)	92.51	79.96	46
	1200	97.97	94.65	77.00	13	23	2400	(*)	92.49	80.19	49
	1600	97.82	94.50	75.62	6	24	2400	(*)	92.35	80.34	51
	1700	97.80	94.47	76.20	8	25	0800	(*)	92.32	80.37	52
	2000	97.73	94.40	75.20	4		1200	(*)	92.31	78.63	28
	2400	97.63	94.29	74.92	3		1800	(*)	92.44	74.50	2
Mar. 2	0200	99.72	99.30	73.90	1	31	0600	96.88	99.70	73.84	1
	0400	105.00	100.40	77.35	16		0800	96.92	99.65	75.80	6
	0800	106.38	101.35	80.40	52		0900	97.03	99.56	78.25	24
	0900	106.41	101.39	80.88	61		1200	97.04	99.13	79.24	35
	1000	106.43	101.39	80.57	55		1800	97.13	97.80	80.45	53
	1400	106.38	101.28	81.75	77		2400	(*)	96.85	81.42	70
	1800	106.12	101.11	85.20	206	June 1	0800	(*)	95.69	82.31	88
	2400	105.68	100.87	88.20	879		1200	(*)	95.28	81.40	70
3	0800	105.00	100.57	89.68	1,770		1900	(*)	94.69	79.50	39
	1600	104.06	100.30	90.57	2,530		2000	(*)	94.61	79.96	46
	2400	102.52	99.92	91.14	3,130		2400	(*)	94.32	77.90	21
4	1200	101.15	99.02	91.65	3,760	2	0600	(*)	93.99	75.75	6
	2400	99.72	97.63	91.95	4,180		1200	(*)	93.89	74.28	1

* Water below intake.

8-735. Buffalo Bayou near Addicks, Tex.

Location.--Lat 29°45'42", long 95°36'20", near right bank at downstream side of pile bent of bridge on Dairy-Ashford Road over rectified channel, 1.8 miles downstream from South Mayde Creek, 2.6 miles southeast of Addicks, Harris County, 3.0 miles downstream from outlet works of Addicks Reservoir, and 3.2 miles downstream from outlet works of Barker Reservoir.

Drainage area.--293 sq mi. During extreme floods when capacity of drainage ditches is exceeded, the drainage area is defined by natural ridge lines and is 310 sq mi.

Records available.--August 1945 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 0.31 ft below mean sea level, datum of 1929, Houston supplementary adjustment of 1943. Prior to Feb. 2, 1948, water-stage recorder at bridge on natural channel 1,200 ft to right at same datum. Feb. 2 to May 21, 1948, staff gage at present site and datum.

Average discharge.--19 years, 180 cfs (130,300 acre-ft per year).

Extremes.--Maximum discharge during year, 2,810 cfs Mar. 7 (gage height, 64.67 ft); minimum daily, 3.0 cfs June 10.

1945-64: Maximum discharge, 11,200 cfs Aug. 29, 1945 (gage height, 81.23 ft, former site); no flow at times.

Maximum stage since at least 1896, 85.6 ft in December 1935, present datum (adjusted to former site from floodmark half a mile downstream, on basis of slope of flood of Aug. 29, 1945), from information by local resident.

Remarks.--Records good except those for periods of doubtful or no gage-height record, which are poor. Floodflow regulated by Barker and Addicks Reservoirs (stations 8-725 and 8-730). Extreme low flow sustained by drainage from irrigated lands.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 16-20, July 29 to Aug. 2, Sept. 17-24)

48.96	3.0	49.7	38	58.0	1,120
49.0	4.1	50.5	104	61.0	1,760
49.3	16	53.0	390	64.0	2,600

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	44	14	20	11	604	124	14	15	316	10	208	29
2	58	9.9	*21	9.5	359	1,120	12	13	137	12	139	28
3	55	8.4	16	8.4	164	882	12	12	39	12	100	44
4	42	7.6	14	6.6	300	*175	12	7.2	26	10	72	45
5	38	67	12	5.8	900	591	284	11	19	12	*66	43
6	30	129	11	*5.5	900	1,480	218	9.9	18	12	94	38
7	21	82	10	8.0	*740	2,490	78	8.7	16	12	97	33
8	18	69	9.5	9.5	468	1,240	33	8.0	11	11	114	28
9	18	78	9	10	216	1,380	18	7.6	4.8	10	149	*27
10	15	107	8.5	18	85	1,180	11	8.7	3.0	15	116	27
11	13	66	8	16	51	678	8.7	12	4.1	21	78	32
12	10	39	20	11	38	62	7.2	10	28	23	68	32
13	9	26	99	6.6	30	34	6.6	11	10	21	62	34
14	10	19	312	4.4	26	27	5.5	9.1	13	32	54	38
15	8	13	403	4.1	28	22	4.4	8.4	19	52	49	34
16	7	11	274	38	24	18	4.1	9.1	201	62	40	38
17	10	10	133	120	20	15	3.8	7.2	403	73	36	164
18	17	9	73	111	20	14	3.8	14	*390	91	31	289
19	12	8	43	65	17	499	3.8	152	270	89	32	301
20	9.9	7.5	198	40	14	625	3.5	178	129	82	27	301
21	8.7	7	468	27	12	300	3.5	6.2	81	96	24	259
22	6.9	7	377	30	12	101	3.5	5.8	48	129	19	197
23	5.8	7	189	36	11	46	3.2	4.8	31	108	37	175
24	14	6.5	90	175	205	29	3.5	5	23	92	53	159
25	*12	6.5	52	271	1,020	26	31	5	25	104	73	134
26	5.5	6	34	107	1,120	22	54	*105	20	90	107	111
27	60	8	25	55	917	20	159	87	16	64	124	100
28	122	15	20	34	655	18	136	18	14	53	89	90
29	73	55	17	22	341	17	52	15	12	197	57	200
30	39	40	14	98	----------	14	23	15	11	364	42	250
31	22	----------	13	543	----------	14	----------	64	----------	295	34	----------
Total	813.8	938.4	2,993	1,906.4	9,297	13,263	1,212.1	842.7	2,337.9	2,254	2,291	3,280
Mean	26.3	31.3	96.5	61.5	321	428	40.4	27.2	77.9	72.7	73.9	109
Ac-ft	1,610	1,860	5,940	3,780	18,440	26,310	2,400	1,670	4,640	4,470	4,540	6,510

Calendar year 1963: Max 2,120 Min 2.5 Mean 86.4 Ac-ft 62,560
Water year 1963-64: Max 2,490 Min 3.0 Mean 113 Ac-ft 82,170

* Discharge measurement made on this day.

Note.--No gage-height record Feb. 4-6, May 24-25, Sept. 27-30; doubtful gage-height record Oct. 11-17, 19, Nov. 15-30, Dec. 3-12, Jan. 7-9, June 28 to July 10.

8-737. Buffalo Bayou at Piney Point, Tex.

Location.--Lat 29°44'48", long 95°31'24", on downstream side of bridge on Piney Point Road, village of Piney Point, Harris County, 3.7 miles downstream from Runnel Creek, 10.8 miles downstream from gage, Buffalo Bayou near Addicks, and 12.5 miles upstream from gage, Buffalo Bayou at Houston.

Drainage area.--317 sq mi.

Records available.--October 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, adjustments of 1957 and 1959.

Extremes.--Maximum discharge during year, 2,520 cfs Mar. 7 (elevation, 48.57 ft); minimum daily, 6.7 cfs June 11.
Harris County Flood Control District stated that a stage of 60.5 ft (datum unknown) occurred at this site in October 1949.

Remarks.--Records good except those for periods of no elevation record, which are poor. Floodflow regulated by Barker and Addicks Reservoirs (stations 8-725 and 8-730). Low flow partly sustained by sewage effluent from Houston suburbs.

Rating table (elevation, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 6-11, Sept. 1-17)

30.2	5.3	33.0	96
30.4	9.2	38.0	510
30.7	16	42.0	1,070
31.0	23	46.0	1,820
31.5	36	48.0	2,250
32.0	52		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	23	31	14	606	143	16	28	157	15	222	34
2	50	17	25	12	445	666	15	37	254	17	146	32
3	60	12	22	10	205	1,170	15	21	53	17	104	46
4	50	15	18	9.2	335	*298	15	16	36	15	74	57
5	40	75	16	8.4	826	273	302	18	*32	16	63	50
6	35	125	14	9.0	926	1,120	348	19	31	16	94	46
7	30	91	14	11	812	*2,160	111	17	22	16	91	42
8	25	86	14	17	558	1,680	59	16	21	15	106	42
9	22	111	14	14	288	1,220	33	14	10	17	131	39
10	20	104	20	23	98	1,290	23	15	7.1	18	122	36
11	18	76	30	23	63	904	19	17	6.7	22	84	40
12	16	46	100	20	46	235	16	19	25	30	70	40
13	14	34	250	15	39	68	16	16	20	34	70	42
14	12	26	400	12	34	53	14	16	16	30	59	45
15	10	20	300	10	36	42	12	15	28	50	53	44
16	20	15	200	200	32	38	11	17	132	59	48	44
17	20	17	120	150	27	33	12	13	345	70	40	132
18	20	14	80	100	25	30	10	37	395	84	38	*246
19	20	11	53	80	22	676	10	82	325	94	36	325
20	18	9.6	303	60	18	658	9.9	230	165	84	33	287
21	15	8.6	499	45	22	435	9.2	20	88	88	30	254
22	12	8	435	35	18	143	8.2	12	59	114	32	187
23	10	8	236	39	16	74	7.3	18	42	111	73	159
24	15	8	106	111	155	48	7.7	22	31	88	70	143
25	18	8	68	304	942	38	50	77	31	98	81	116
26	16	8	48	128	1,050	34	74	83	28	94	88	101
27	32	8	40	70	1,010	29	115	118	23	88	114	81
28	119	20	29	44	742	26	152	32	20	59	88	94
29	86	50	25	32	452	23	74	21	17	224	57	284
30	48	55	21	100	----------	19	39	22	15	405	44	296
31	32	----------	16	500	----------	16	----------	86	----------	325	36	----------
Total	943	1,109.2	3,547	2,205.6	9,848	13,642	1,603.3	1,174	2,434.8	2,413	2,397	3,384
Mean	30.4	37.0	114	71.1	340	440	53.4	37.9	81.2	77.8	77.3	113
Ac-ft	1,870	2,200	7,040	4,370	19,530	27,060	3,180	2,330	4,830	4,790	4,750	6,710

Calendar year Max Min Mean Ac-ft
Water year 1963-64: Max 2,160 Min 6.7 Mean 122 Ac-ft 88,660

* Discharge measurement made on this day.
Note.--No elevation record Oct. 1-24, Nov. 22-28, Dec. 2-18, 27, Jan. 13-22, 30-31.

8-740. Buffalo Bayou at Houston, Tex.

Location.--Lat 29°45'36", long 95°24'30", at bridge on Shepherd Drive in Houston, Harris County, and 0.8 mile upstream from Waugh Drive.

Drainage area.--358 sq mi.

Records available.--May 1936 to September 1957, October 1957 to December 1961 (high-water records and discharge measurements), January 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, adjustments of 1957 and 1959, unadjusted for ground surface subsidence resulting from heavy ground-water withdrawals. Prior to January 1962, water-stage recorder and prior to June 19, 1936, reference point 0.8 mile downstream and 4.08 ft below mean sea level, datum of 1929. Auxiliary water-stage recorder (formerly called "Buffalo Bayou at Houston") 0.8 mile downstream.

Average discharge.--23 years (1936-57, 1962-64), 236 cfs (170,900 acre-ft per year).

Extremes.--Maximum discharge during year, 2,650 cfs Mar. 8 (gage height, 9.46 ft); minimum daily, 15 cfs Dec. 8-9.

1936-64: Maximum discharge, 10,900 cfs Aug. 30, 1945 (gage height, 28.82 ft), at site 0.8 mile downstream, present datum; minimum daily, 12 cfs June 9-10, 1963.

Maximum stage since at least 1835, 49.0 ft Dec. 9, 1935 (discharge, 40,000 cfs; furnished by engineer for Harris County). Flood of May 31, 1929, reached a stage of 43.5 ft (discharge, 19,000 cfs at bridge on Capitol Avenue 2.8 miles downstream, from rating curve extended above 15,300 cfs, stage-discharge relation materially affected by bridge; furnished by city of Houston). All above flood data at site 0.8 mile downstream and at present datum.

Remarks.--Records good except those for periods of indefinite stage-fall discharge relationship, which are fair, and those for periods of no gage-height record, which are poor. Floodflow regulated by Barker and Addicks Reservoirs (stations 8-725, 8-730). Flow affected by tides and backwater from Whiteoak Bayou. Low flow partly maintained by sewage effluent from Houston suburbs.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	56	32	60	23	545	265	24	50	67	22	288	47
2	47	26	40	*20	515	446	23	69	327	22	206	53
3	60	21	27	22	322	1,250	22	33	100	25	149	86
4	57	28	21	20	377	683	20	29	48	24	94	98
5	47	366	20	17	792	162	241	26	36	22	80	67
6	43	104	17	17	900	797	470	28	47	24	100	59
7	*37	124	16	18	880	1,830	190	26	32	26	100	51
8	32	*163	15	20	652	2,290	83	26	26	25	120	48
9	27	250	15	25	410	1,300	45	25	22	24	150	49
10	27	95	21	20	160	1,400	32	23	18	28	120	46
11	26	94	27	28	86	1,120	26	28	16	30	100	90
12	24	67	120	29	57	507	24	30	16	39	90	66
13	20	45	377	24	49	74	24	*28	37	51	80	46
14	19	34	530	20	38	51	24	28	22	44	75	47
15	21	28	372	19	69	40	21	28	*80	*54	70	53
16	29	23	372	290	40	36	21	27	124	72	65	60
17	22	20	228	158	33	32	21	28	298	72	60	323
18	23	20	*124	138	30	30	21	51	385	84	*55	*275
19	27	20	73	105	28	*1,250	19	69	372	102	51	322
20	23	20	670	69	25	*724	19	210	245	98	50	372
21	20	18	618	48	41	530	19	121	108	86	47	305
22	20	18	455	35	33	236	18	20	68	108	50	240
23	19	18	335	38	23	95	18	20	44	134	186	194
24	20	18	166	81	334	58	18	35	49	102	153	170
25	26	16	91	268	1,030	44	83	25	34	97	240	153
26	46	16	62	214	1,120	36	127	108	32	104	124	124
27	36	20	49	98	*1,160	34	94	134	28	94	129	100
28	78	40	38	60	845	31	190	67	25	108	127	94
29	121	60	31	44	582	29	114	28	26	130	94	498
30	75	80	27	218	----------	26	55	25	25	515	66	450
31	47	----------	25	600	----------	*25	----------	137	----------	385	52	----------
Total	1,175	1,884	5,042	2,786	11,176	15,431	2,106	1,582	2,757	2,751	3,371	4,586
Mean	37.9	62.8	163	89.9	385	498	70.2	51.0	91.9	88.7	109	153
Ac-ft	2,330	3,740	10,000	5,530	22,170	30,610	4,180	3,140	5,470	5,460	6,690	9,100

Calendar year 1963: Max 2,190 Min 12 Mean 135 Ac-ft 97,670
Water year 1963-64: Max 2,290 Min 15 Mean 149 Ac-ft 108,400

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 17 to Dec. 2, Aug. 5-17; stage-fall discharge relationship indefinite Nov. 4, Apr. 3-4, 17, 22-25, May 1, 4-8, 23-24, 31, June 9-12, 15, July 17, Aug. 22, Sept. 16, 27.

8-745. Whiteoak Bayou at Houston, Tex.

Location.--Lat 29°46'31", long 95°23'54", near right bank at downstream side of pier of Yale Street bridge, in Houston, Harris County, 80 ft downstream from Texas and New Orleans Railroad Co. bridge, 2.5 miles upstream from Little Whiteoak Bayou, and 4.1 miles upstream from mouth.

Drainage area.--84.7 sq mi. During extreme floods when capacity of drainage ditches is exceeded, the drainage area is defined by natural ridges and is 92.0 sq mi.

Records available.--May 1936 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 5.76 ft below mean sea level, datum of 1929, adjustments of 1957 and 1959, unadjusted for ground surface subsidence resulting from heavy ground-water withdrawals. Prior to June 17, 1936, reference point at same site and datum.

Average discharge.--28 years, 70.7 cfs (51,180 acre-ft per year).

Extremes.--Maximum discharge during year, 2,270 cfs Mar. 19 (gage height, 31.92 ft); minimum daily, 1.2 cfs Feb. 10, July 13.

1936-64: Maximum discharge, 9,000 cfs Nov. 13, 1961 (gage height, 43.60 ft; minimum, 0.1 cfs Aug. 16, Sept. 2, 1951.

Maximum stage since at least 1919, 51.5 ft Dec. 9, 1935, present site and datum (discharge, 14,750 cfs, furnished by engineer for Harris County). Flood of May 31, 1929, reached a stage of 47.0 ± 0.5 ft, present site and datum (discharge, 9,360 cfs), computed on basis of current-meter measurement at stage 1 ft below crest, made at bridge 1 block downstream from gage, furnished by city of Houston.

Remarks.--Records good except those for periods of backwater, indefinite stage-discharge relationship, and no gage-height record, which are poor. Low flow partly sustained by industrial waste. No diversion above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.0	8.3	5.8	6.6	52	14	9.2	17	217	5.0	23	3.6
2	4.3	6.2	4.6	5.8	24	877	9.7	17	79	4.6	17	62
3	4.3	5.8	4.6	6.6	18	348	13	11	46	4.6	13	87
4	4.0	35	7.0	6.2	180	153	7.4	8.3	22	4.6	7.9	33
5	4.0	99	11	5.8	216	70	455	7.4	*14	5.0	10	9.7
6	3.2	12	11	6.6	47	28	194	7.0	37	4.6	15	4.3
7	*3.0	7.0	8.8	7.9	16	12	56	7.0	19	3.2	50	2.4
8	3	*62	4.0	9.2	6.6	a9	24	6.6	11	4.3	50	2.4
9	3	66	3.2	12	2.4	a7	13	6.2	7.9	2.7	20	3.0
10	3	18	9.2	7.0	1.2	a6	9.2	5.8	5.4	3.0	10	3.0
11	3	8.3	10	7.4	1.4	a5	8.3	5.8	9.2	2.7	9	*12
12	3	5.8	92	11	1.8	a4.5	7.4	6.6	7.0	1.6	8	19
13	3	4.0	190	6.2	3.2	a4.5	7.9	*5.0	6.6	1.2	10	7.9
14	3	4.0	222	7.0	2.7	a4.0	6.6	4.0	5.8	5.0	30	*2
15	3	3.6	46	8.7	22	a4.0	5.8	4.0	35	*5.4	15	6
16	2.5	3.2	21	201	7.9	a3.5	7.4	4.3	80	5.8	20	22
17	2.5	3.0	14	56	11	a3.5	7.0	5.4	29	12	10	219
18	2.5	3.0	*10	23	10	a3	10	7.4	14	11	*7	*54
19	2.5	3.6	7.9	12	6.2	*1,000	8.8	8.3	8.8	10	7	73
20	2.5	3.2	457	8.3	5.0	178	8.3	5.8	6.2	27	6	70
21	2.5	3.0	187	7.0	33	43	4.0	7.0	5.8	22	6	22
22	2.5	53	43	*7.4	11	a15	2.4	6.2	6.2	9.7	27	14
23	2.5	9.2	24	7.0	5.4	a12	2.4	9.2	6.6	6.2	*177	7.4
24	153	4.0	17	162	*316	a10	2.1	20	18	4.6	32	11
25	42	3.0	13	83	651	a9	38	11	9.2	5.4	116	*6.6
26	117	3.2	11	24	*121	a8	45	6.6	7.4	11	43	20
27	28	22	11	12	49	a7.5	47	5.8	8.3	12	32	40
28	21	132	9.2	6.2	30	a7	19	5.4	8.3	34	24	20
29	14	19	7.9	4.3	17	a6.5	11	5.8	5.8	9.7	15	100
30	8.8	11	6.6	205	----------	*a6	7.9	79	6.2	75	6.2	20
31	7.9	----------	7.0	239	----------	9.2	----------	1,240	----------	36	3.2	----------
Total	463.5	620.4	1,475.8	1,171.2	1,867.8	2,867.2	1,046.8	1,545.9	741.7	348.9	819.3	956.3
Mean	15.0	20.7	47.6	37.8	64.4	92.5	34.9	49.9	24.7	11.3	26.4	31.9
Ac-ft	919	1,230	2,930	2,320	3,700	5,690	2,080	3,070	1,470	692	1,630	1,900

Calendar year 1963: Max 977 Min 2.1 Mean 37.5 Ac-ft 27,180
Water year 1963-64: Max 1,240 Min 1.2 Mean 38.0 Ac-ft 27,630

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
12-20	1500	27.95	1,200	3-19	1000	31.92	2,270
2-24	2300	29.00	1,430	4- 5	1500	28.05	1,200
3- 2	1130	29.85	1,640	5-31	0500	31.39	2,120

* Discharge measurement made on this day.
a No gage-height record.
Note.--Backwater from construction dam June 8-9, 11-12, Aug. 5-20, 27, Sept. 14-15, 26-30; stage-discharge relationship indefinite Oct. 8-23, June 2-3, Aug. 21.

8-746. Buffalo Bayou at Main Street, Houston, Tex.

Location.--Lat 29°45'54", long 95°21'32", on left bank at mouth of Whiteoak Bayou at upstream side of Main Street viaduct in Houston, Harris County, and 3½ miles downstream from the gage Buffalo Bayou at Houston.

Drainage area.--469 sq mi.

Records available.--January 1962 to September 1964 (elevations only).

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, adjustments of 1957 and 1959.

Extremes.--Maximum elevation during year, 5.4 ft Mar. 19; minimum, unknown.
1962-64: Maximum elevation, 10.0 ft June 4, 1962; minimum, unknown.

Elevation, in feet, water year October 1963 to September 1964

	October		November		December		January		February		March		April		May		June		July		August		September	
Day	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	2.0	0.5	1.8	-0.6	1.0	-0.8	0.7	-0.7	0.6	-0.5	2.1	0.7	1.5	-0.1	2.6	0.8	1.2	-0.3	-	-	1.8	0.8	-	-
2	1.9	.4	1.7	-.3	1.2	-.8	.6	-.8	1.2	.4	2.6	.9	2.1	.3	2.0	.4	1.2	-.2	-	-	1.9	.4	2.0	-.1
3	1.9	.3	2.1	.7	.2	-1.4	.6	-.6	2.6	.9	2.6	1.4	3.1	.9	2.1	.2	1.4	0	1.4	.3	1.7	0	2.2	.2
4	1.9	.3	2.5	.8	.7	-.7	.6	-1.0	3.5	1.7	2.6	.6	2.8	.8	3.0	1.2	1.7	.3	1.2	-.2	1.5	-.1	2.0	.4
5	1.8	.2	3.8	.2	.7	-.8	.5	-.4	1.9	-.1	.9	-.6	2.8	1.1	3.6	2.0	1.8	.5	1.2	-.3	2.0	-.6	2.7	.4
6	1.7	.1	1.4	0	.6	-.5	1.2	-.1	.6	-.6	2.0	.4	1.9	.5	2.8	1.6	1.6	.3	1.2	-.4	1.6	-.6	2.6	.8
7	2.0	.6	1.7	.4	1.0	-.8	1.2	.1	.5	-1.0	2.3	1.2	1.5	.2	2.5	1.4	1.6	.2	1.5	-.2	2.8	-.4	2.3	1.1
8	1.9	.6	2.7	1.0	.1	-1.6	1.4	.3	.1	-1.3	2.8	1.6	.4	-1.4	2.6	1.6	2.2	.3	1.7	-.5	2.2	.3	2.3	.9
9	1.9	.2	3.0	1.1	.1	-1.1	.7	-	.1	-1.0	2.6	-.4	1.1	-.5	2.3	1.2	2.6	.8	1.7	-.1	1.7	.2	2.5	1.6
10	1.6	-.1	1.7	.4	1.6	.1	.9	-1.2	.6	-.9	.7	-.5	1.6	.3	2.1	.7	2.3	.4	1.6	-.1	1.5	.1	2.4	.8
11	1.4	-.1	1.9	.2	1.6	.4	1.4	.1	1.1	-1.0	1.3	.2	1.9	.9	2.3	.9	2.2	.1	1.1	-.3	1.5	.3	1.8	.2
12	1.7	.2	2.1	1.1	.7	-.9	.7	-	1.7	.4	1.1	-.2	2.0	.7	2.0	.2	2.2	.3	.7	-.5	1.5	.5	1.1	-.2
13	1.6	.2	1.6	0	1.4	.1	-	-	1.4	-.6	1.7	.3	2.2	.2	1.6	-.2	2.1	.2	.4	-1.2	1.6	.4	1.2	0
14	1.8	.3	1.3	-.4	1.7	-.7	.4	-1.8	1.5	-.1	2.0	.5	1.3	-.3	1.6	-.3	2.2	.3	1.1	-.6	1.9	.8	1.8	.4
15	1.9	.6	1.8	.5	1.5	-.2	1.7	.2	1.8	-.8	1.1	-.5	1.7	-.5	1.8	0	3.3	.8	1.2	-.1	-	-	2.0	.6
16	2.2	1.0	1.9	.6	1.6	.2	2.6	-.2	.5	-1.0	1.5	-.3	1.9	0	2.0	.2	2.2	.8	2.0	.7	-	-	2.7	.8
17	2.4	1.4	1.8	.6	1.8	.1	.1	-1.2	1.7	.3	1.5	.2	2.6	.2	1.7	.3	2.4	1.2	3.5	1.4	-	-	2.9	.8
18	2.2	1.0	1.8	0	1.5	-.3	.7	-.2	1.3	-.6	2.3	-.2	1.7	.4	2.4	.4	2.3	1.1	2.0	.5	-	-	2.0	.6
19	2.1	1.0	2.0	.7	1.0	-.4	1.3	-.2	-.3	-1.5	5.4	2.2	2.1	.1	2.0	.7	2.0	.9	1.8	.3	-	-	2.3	.7
20	2.2	.8	2.1	.6	3.6	.9	1.0	-.5	.9	-1.1	2.2	.1	2.3	.9	1.5	.2	1.7	.5	1.7	.3	-	-	2.3	1.0
21	2.0	1.0	2.4	1.0	1.4	.1	.8	-.2	.8	-.7	.3	-1.2	2.2	1.2	1.5	.5	1.6	.2	1.5	.1	-	-	2.8	1.3
22	2.0	.5	3.4	1.1	1.5	-1.1	1.1	.1	.7	-.9	1.7	-.4	2.5	1.0	2.0	.5	1.6	.3	1.8	.2	-	-	2.7	1.6
23	1.7	.5	1.8	-.6	-1.0	-	1.2	-.1	.9	-.8	2.1	.5	2.2	1.2	2.3	1.0	1.5	0	1.5	.1	-	-	2.2	1.4
24	2.0	.8	1.2	-.4	.2	-1.4	1.3	-.1	3.4	-.2	1.8	.5	2.3	1.3	2.1	.8	1.7	-.5	1.1	-.3	-	-	2.1	1.0
25	2.2	.8	1.6	.5	.5	-.8	.6	-1.0	3.4	.4	2.1	.6	2.3	.7	1.8	.1	1.9	-.2	1.6	-.9	-	-	2.8	1.9
26	1.8	.6	1.7	.4	.8	-.5	.9	-.6	1.5	.1	1.3	-.5	2.8	1.1	1.7	.1	2.1	.1	1.7	-.5	-	-	3.9	1.9
27	1.9	.5	2.0	.4	.7	-.8	1.1	-.4	1.9	.6	1.9	.6	2.1	.6	1.9	.2	-	-	1.7	.2	-	-	3.2	.9
28	1.6	.3	2.4	-.2	1.0	-.9	1.0	-.4	1.7	-.4	1.9	.7	1.7	.2	1.4	.1	-	-	2.0	.4	-	-	2.0	.4
29	1.8	.5	.4	-	1.3	-.5	1.2	-.1	1.9	.1	1.5	.2	1.5	-.3	1.6	-.4	-	-	1.8	.3	-	-	2.8	.5
30	2.1	.8	.4	-1.4	1.3	-.8	2.2	.7	---	---	1.5	0	2.1	.1	2.2	.3	-	-	1.9	.5	-	-	2.2	.7
31	2.0	.9	---	---	.9	-1.2	2.4	-.1	---	---	1.5	.1	---	---	2.8	.9	---	---	2.0	.9	-	-	---	---

Note.--No elevation record Nov. 29, Dec. 23, Jan. 9, 12-13, June 27 to July 2, Aug. 15 to Sept. 1.

8-747. Buffalo Bayou at 69th Street, Houston, Tex.

Location.--Lat 29°45'15", long 95°17'51", at downstream side of bridge on 69th Street in Houston, Harris County, 1.1 miles upstream from Turning Basin, 2.8 miles upstream from Brays Bayou, and 4.8 miles downstream from Whiteoak Bayou.

Drainage area.--476 sq mi.

Records available.--April 1961 to September 1964 (elevations only).

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, adjustments of 1957 and 1959.

Extremes.--Maximum elevation during year, 3.6 ft May 5; minimum, -3.5 ft Jan. 13.
1961-64: Maximum elevation, 15.1 ft Sept. 11, 12, 1961, result of Hurricane Carla; minimum, that of Jan. 13, 1964.

Elevation, in feet, water year October 1963 to September 1964

	October		November		December		January		February		March		April		May		June		July		August		September	
Day	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	2.0	0.6	1.9	-0.5	-	-	0.8	-0.6	0.6	-0.7	1.9	0.7	1.5	0	2.2	0.9	1.1	-0.4	1.2	0	-	-	1.7	0
2	2.0	.5	1.8	-.1	-	-	.6	-.6	1.2	.3	1.9	.6	2.1	.4	2.0	.6	1.1	-.4	1.3	.2	-	-	1.7	0
3	1.9	.5	2.3	.9	0.3	-1.3	.6	-.5	2.6	.9	2.1	.6	3.2	1.0	2.2	.3	1.3	0	1.4	.3	-	-	2.0	-.2
4	2.0	.4	2.6	.9	.7	-.7	.7	-.8	3.5	1.4	2.1	.4	2.9	.9	3.1	1.3	1.6	.3	1.1	-.3	-	-	2.1	.5
5	1.8	.4	2.8	.4	.7	-.6	.8	0	1.6	-.4	.8	-.7	2.8	1.1	3.6	2.1	1.7	.4	1.1	-.4	1.4	-.6	2.5	.6
6	1.8	.3	1.6	0	.7	-.4	1.3	0	.3	-1.1	1.7	.1	1.8	.3	2.8	1.8	1.4	.2	-	-	1.5	-.6	2.7	.8
7	2.1	.7	-	-	1.0	-.6	1.2	.2	.2	-1.6	1.9	.4	-	-	2.5	1.5	1.5	.2	-	-	2.6	-.3	2.3	1.2
8	2.0	.8	-	-	1.0	-1.4	1.5	.5	0	-1.7	2.1	.3	-	-	2.6	1.8	2.1	.3	-	-	2.0	.4	2.4	1.1
9	2.0	.4	-	-	-	-	.8	-1.8	0	-1.1	2.1	-1.3	-	-	2.2	1.0	2.4	.8	-	-	1.5	.2	2.6	1.8
10	1.7	0	-	-	-	-	1.0	-1.1	.5	-.9	.3	-1.5	-	-	2.1	.8	2.8	.4	-	-	1.3	.1	2.5	.9
11	1.5	0	-	-	-	-	1.4	.3	1.0	-1.0	1.0	-.3	-	-	2.3	.9	2.2	.1	-	-	1.4	.3	1.8	.3
12	1.8	.4	-	-	-	-	.6	-2.4	1.6	.3	1.1	-.3	-	-	2.0	.4	2.1	.3	-	-	1.4	.5	1.2	-.1
13	1.8	.4	-	-	-	-	-1.8	-3.5	1.4	-.6	1.7	.3	-	-	1.5	-.2	2.0	.2	-	-	1.5	.5	1.3	.3
14	1.9	.4	-	-	1.0	-.8	.4	-1.8	1.4	-.2	1.9	.5	-	-	1.6	-.2	2.1	.2	-	-	1.7	.8	1.9	.8
15	2.0	.3	-	-	1.4	-.2	1.6	.2	1.6	-.7	1.0	-.5	-	-	1.8	.1	2.9	.9	-	-	2.1	.9	2.1	.8
16	2.3	1.1	-	-	1.6	.2	2.4	-.3	.6	-1.0	1.5	-.3	-	-	2.0	.3	2.1	.8	-	-	1.9	.3	2.6	1.0
17	2.4	1.6	-	-	1.8	.2	.3	-1.2	1.5	.3	1.4	+.3	-	-	1.7	.2	2.2	1.0	-	-	1.6	.4	2.5	.9
18	2.3	1.1	-	-	1.6	-.2	.8	-.2	1.1	-.5	2.6	-.2	-	-	2.4	.5	2.2	1.1	-	-	1.5	.4	2.1	.7
19	2.2	1.2	-	-	1.1	-.4	1.2	-.4	-.3	-1.5	2.7	1.1	-	-	2.0	.8	1.9	.8	-	-	1.7	.1	2.3	.8
20	2.3	.9	-	-	2.0	.3	1.0	-.5	.9	-1.1	1.6	-.4	-	-	1.5	.2	1.5	.5	-	-	2.1	.3	2.4	1.0
21	2.1	1.1	-	-	1.0	0	.9	-.2	.7	-.8	.2	-1.6	2.2	1.2	1.5	.5	1.4	.2	-	-	2.3	.9	2.8	1.5
22	2.1	.7	-	-	1.4	-1.3	1.1	.2	.6	-.9	1.9	-.4	2.4	1.0	1.9	.5	1.4	.1	-	-	2.2	.8	2.9	1.7
23	1.8	.6	-	-	-1.1	-1.9	1.2	0	.8	-1.0	2.0	.6	2.3	1.3	2.3	1.1	1.3	-.1	-	-	1.8	.8	2.7	1.6
24	2.0	.9	-	-	.2	-1.1	1.3	-.1	1.6	-.2	1.8	.6	2.4	1.2	2.1	.8	1.3	-.5	-	-	1.9	.4	2.7	1.2
25	2.3	1.0	-	-	.5	-.7	.5	-1.1	1.5	-.4	2.0	.9	2.1	.8	1.8	.2	1.7	-.2	-	-	1.9	.7	3.0	2.1
26	1.9	.8	-	-	.9	-.4	.9	-.6	1.0	-.5	1.1	-.5	2.8	1.1	1.7	.1	1.7	0	-	-	1.9	.9	3.5	2.0
27	2.0	.6	-	-	.7	-.6	1.1	-.4	1.4	0	1.8	.6	2.0	.6	1.9	.3	1.6	-.2	-	-	2.2	1.3	3.3	1.0
28	1.7	.5	-	-	1.1	-.7	1.0	-.4	1.2	-.8	1.9	.8	1.7	.3	1.4	.2	1.7	0	-	-	2.4	1.1	2.1	.6
29	1.8	.7	-	-	1.4	-.3	1.4	-.1	1.7	-.1	1.5	.3	1.4	-.2	1.6	-.3	2.0	.3	-	-	2.0	.8	2.3	.7
30	2.3	1.0	-	-	1.3	-.6	1.7	.8	----------		1.5	.1	2.2	.2	2.1	.5	1.5	.1	-	-	2.0	.3	2.3	.7
31	2.1	1.0	----------		.9	-1.1	1.5	-.3	----------		1.5	.2	----------		1.3	.2	----------		-	-	1.7	.3	----------	

Note.--No elevation record Nov. 7 to Dec. 2, Dec. 9-13, Apr. 7-20, July 6 to Aug. 4.

8-750. Brays Bayou at Houston, Tex.

Location.--Lat 29°41'49", long 95°24'43", near right bank at downstream side of pile bent of South Main Street bridge in southwest section of Houston, Harris County, 1.6 miles upstream from Harris Gully, and 11.6 miles upstream from Buffalo Bayou.

Drainage area.--88.4 sq mi.

Records available.--May 1936 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 3.90 ft below mean sea level, datum of 1929, unadjusted for ground surface subsidence resulting from heavy ground-water withdrawals. Prior to June 20, 1936, reference point on bridge and June 20, 1936, to Nov. 25, 1959, water-stage recorder, at site 0.8 mile downstream at same datum.

Average discharge.--28 years, 89.0 cfs (64,430 acre-ft per year).

Extremes.--Maximum discharge during year, 4,060 cfs Mar. 19 (gage height, 35.02 ft); minimum daily, 8.0 cfs Oct. 13.

1936-64: Maximum discharge, 12,600 cfs June 26, 1960 (gage height, 49.72 ft); maximum gage height, 51.70 ft Aug. 28, 1945; minimum daily discharge, 0.1 cfs Oct. 11, 12, 1937, Mar. 14, Apr. 1, 1958.

Maximum stage since at least 1911, 56.0 ft in June 1919 before channel rectification, former site and datum, from information by engineer for city of Houston. Flood of May 31, 1929, reached a stage of 50.4 ft. before channel rectification, former site and datum (discharge, 11,095 cfs), from current-meter measurement at Lawndale Avenue Bridge, about 8 miles downstream from former site; furnished by city of Houston.

Remarks.--Records good except those for periods of doubtful or no gage-height record, which are poor. No diversion above station. Low flow partly maintained by sewage effluent from Houston suburbs.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	15	25	22	170	60	35	51	29	21	18	20
2	12	11	25	*21	88	250	36	100	25	18	16	20
3	15	11	25	18	83	180	34	36	27	15	18	32
4	14	84	20	21	853	120	34	36	29	15	17	27
5	13	417	20	25	810	80	75	35	*34	23	67	18
6	11	55	20	22	257	51	138	34	28	21	79	15
7	*15	29	20	16	113	40	79	35	27	18	129	16
8	12	*258	20	22	67	37	47	38	27	17	56	19
9	11	174	20	17	43	41	36	38	29	15	26	18
10	12	60	20	18	37	34	32	30	27	17	18	23
11	11	35	25	18	36	31	27	30	27	14	16	45
12	9.0	25	30	15	35	31	25	33	27	14	16	32
13	8.0	25	500	18	34	32	49	*30	25	48	31	21
14	15	25	600	18	29	35	27	31	21	21	*23	23
15	92	25	300	23	87	34	26	33	115	*19	18	20
16	19	20	100	410	31	33	27	28	62	24	15	51
17	13	20	60	132	28	29	27	26	41	25	20	262
18	14	20	30	76	25	29	26	93	34	22	20	*83
19	15	15	*25	48	21	1,420	22	43	27	20	19	74
20	12	21	813	41	19	350	24	30	25	23	18	38
21	15	24	508	*41	80	120	23	26	21	22	19	34
22	14	149	193	*30	37	60	23	28	23	22	46	27
23	12	36	87	23	21	50	30	42	23	20	132	24
24	13	18	61	31	*584	45	25	52	28	17	74	21
25	15	20	42	26	757	44	149	29	31	30	111	21
26	13	18	37	20	*280	40	102	27	29	13	40	57
27	12	256	35	30	150	37	76	27	23	20	23	23
28	16	270	24	28	120	36	50	29	19	59	22	23
29	13	50	24	26	80	34	40	29	27	28	22	342
30	13	35	24	251	----------	*27	36	25	20	68	15	99
31	13	----------	26	518	----------	31	----------	160	----------	40	18	----------
Total	483.0	2,221	3,759	2,025	4,975	3,441	1,380	1,284	930	749	1,162	1,528
Mean	15.6	74.0	121	65.3	172	111	46.0	41.4	31.0	24.2	37.5	50.9
Ac-ft	958	4,410	7,460	4,020	9,870	6,830	2,740	2,550	1,840	1,490	2,300	3,030

Calendar year 1963: Max 2,090 Min 8.0 Mean 78.1 Ac-ft 56,530
Water year 1963-64: Max 1,420 Min 8.0 Mean 65.4 Ac-ft 47,500

Peak discharge (base, 3,000 cfs)

Date	Time	Gage height	Discharge
3-19	0600	35.02	4,060

* Discharge measurement made on this day.

Note.--No gage-height record Nov. 30 to Dec. 19, Feb. 11-12; doubtful or no gage-height record Nov. 6-8, 10-18, Feb. 8-10. Feb. 26 to Mar. 5, Mar. 21-24.

8-755. Sims Bayou at Houston, Tex.

Location.--Lat 29°40'27", long 95°17'21", on left bank at downstream side of bridge on State Highway 35 in southeast section of Houston, Harris County, 5.6 miles upstream from mouth.
Drainage area.--64.0 sq mi.
Records available.--October 1952 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 0.61 ft below mean sea level, datum of 1929, adjustment of 1957.
Average discharge.--12 years, 57.1 cfs (41,340 acre-ft per year).
Extremes.--Maximum discharge during year, 2,120 cfs Feb. 4 (gage height, 19.93 ft); minimum daily, 6 cfs for many days.
1952-64: Maximum discharge, 8,030 cfs June 26, 1960 (gage height, 29.76 ft); minimum daily, 0.9 cfs Aug. 7, 1955.
Remarks.--Records good except those for periods of doubtful gage-height record, which are fair. Diversions for irrigation above station prior to 1960. Low flow is largely sewage effluent from Houston suburbs and industrial wastes.
Revisions.--Revised figures of discharge, in cubic feet per second, for the water year 1960, superseding previously published figures, are given herewith:

1960		1960		1960-Con.	
June 25	1,520	Aug. 12	140	Aug. 25	238
27	3,230	22	249	30	512
28	969	23	149	31	275
29	231	24	331		

Month	Cfs-days	Maximum	Mean	Runoff in acre-feet
June 1960	11,580.7	-	386	22,970
August	2,665.9	512	86.0	5,290
Water year 1959-60	33,433.2	-	91.3	66,310

Revised peak discharge.--1960: Aug. 24 (6 p.m.) 1,380 cfs (16.80 ft).

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 13-14, 20-21, Mar. 22 to Apr. 25)

Oct. 1 to Dec. 11				Dec. 12 to Sept. 30	
7.14	6.0	9.0	109	10.0	189
7.5	16	10.0	189	12.0	400
8.0	40	12.0	380	15.0	900
				17.0	1,320

Same as preceding table below 10.0 ft.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.7	7.0	13	9.7	55	19	14	17	14	8	8	8
2	7.4	8.2	12	9.7	25	223	14	34	*9.0	7	7	9.0
3	7.7	7.7	9.7	10	57	91	15	16	8.2	7	7	12
4	8.7	52	9.2	10	*1,300	52	15	*12	7.4	7	7	9.7
5	8.2	297	8.7	9.7	*774	25	19	11	6.8	7	7	12
6	8.2	22	8.4	11	*186	16	18	11	6.6	*7	7	9.4
7	8.4	10	7.7	10	60	13	15	11	6.4	7	15	9.0
8	8.4	135	7.2	12	30	14	16	11	6	7	57	8.4
9	8.4	284	7.0	16	20	13	14	11	6	7	20	8.2
10	8.2	27	8.0	10	18	12	14	11	6	7	15	9.2
11	7.7	12	9.0	9.4	18	12	14	11	6	7	10	9.7
12	8.2	10	38	10	16	11	14	11	6	7	*8	10
13	7.7	8.7	644	10	16	11	19	11	6	7	8	9.2
14	8.2	7.7	825	*11	*16	11	15	11	6	7	10	9.0
15	8.0	7.4	221	12	21	12	14	10	30	7	10	*8.4
16	7.7	7.2	55	255	15	11	14	10	15	7	8	20
17	8.0	7.2	24	101	14	11	14	10	10	6	7	159
18	8.0	7.2	16	30	15	11	14	11	8	6	7	53
19	8.2	7.2	13	20	14	700	14	12	7	6	7	54
20	8.4	7.7	602	16	14	209	13	11	7	6	7	18
21	8.4	8.0	428	13	25	56	13	10	7	6	7	13
22	8.4	18	99	13	19	29	13	10	7	6	31	10
23	10	18	34	12	14	*22	13	10	6	7	35	9.2
24	9.7	9.2	23	14	382	20	13	12	10	7	20	8.7
25	*9.2	7.4	16	13	755	18	45	11	10	40	15	8.2
26	17	7.2	14	12	186	17	34	10	8	25	10	31
27	9.2	*11	12	12	*88	16	19	9	8	10	9	16
28	8.2	361	12	12	52	16	12	9	25	15	8	9.0
29	9.0	48	11	12	24	16	12	9	10	10	7	124
30	8.4	17	10	102	----------	15	12	10	9	9	7	56
31	7.2	----------	10	260	----------	15	----------	44	----------	9	6	----------
Total	266.1	1,437.0	3,206.9	1,057.5	4,229	1,717	485	397	277.4	281	387	7303
Mean	8.58	47.9	103	34.1	146	55.4	16.2	12.8	9.25	9.06	12.5	24.3
Ac-ft	528	2,850	6,360	2,100	8,390	3,410	962	787	550	557	768	1,450

Calendar year 1963: Max 1,070 Min 4.2 Mean 40.4 Ac-ft 29,270
Water year 1963-64: Max 1,300 Min 6 Mean 39.5 Ac-ft 28,710

Peak discharge (base, 1,300 cfs)

Date	Time	Gage height	Discharge
2- 4	1430	19.93	2,120
2-24	2330	17.68	1,500

* Discharge measurement made on this day.
Note.--Doubtful gage-height record Feb. 8-14, May 21-30, June 8 to Aug. 7, Aug. 9 to Sept. 1.

8-760. Greens Bayou near Houston, Tex.

Location.--Lat 29°55'05", long 95°18'24", on right bank at downstream side of bridge on U. S. Highway 59, 10.5 miles northeast of Houston, Harris County, and 12.0 miles upstream from Halls Bayou.

Drainage area.--72.7 sq mi.

Records available.--October 1952 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 0.66 ft below mean sea level, datum of 1929, adjustment of 1957.

Average discharge.--12 years, 41.7 cfs (30,190 acre-ft per year).

Extremes.--Maximum discharge during year, 5,950 cfs May 31 (gage height, 64.98 ft); minimum, 1.1 cfs Nov. 27.
1952-64: Maximum discharge, 7,000 cfs July 30, 1954 (gage height, 64.75 ft); maximum gage height, 65.75 ft Sept. 12, 1961; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor. No known diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 8-15, 19-25, June 27 to July 28, Aug. 23 to Sept. 11)

49.29	1.3	52.5	137
49.4	2.4	54.0	310
49.7	6.2	55.5	580
50.0	12	57.0	1,000
50.5	24	58.5	1,520
51.0	42	61.0	2,800
51.5	66	64.5	5,450

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.8	6.5	1.8	6.0	61	11	5.3	20	1,030	4.6	8.6	4.8
2	3.6	7.3	1.6	5.0	22	562	5.2	440	220	4.0	7.5	6.0
3	3.3	6.2	1.4	4.8	*13	356	5.3	54	93	4.1	5.9	7.5
4	3.3	4.3	1.3	5.8	29	134	4.6	17	43	4.2	4.4	5.2
5	3.1	4.4	3.1	4.7	112	59	210	9.5	20	3.6	4.0	5.2
6	3.8	4.3	4.4	4.6	59	30	180	7.3	15	3.2	5.0	4.8
7	5.0	4.3	4.3	5.0	25	17	54	*6.5	15	3.0	5.4	4.8
8	4.0	5.2	3.7	5.2	11	12	23	5.4	9.2	3.3	5.8	4.6
9	3.4	10	3.1	5.4	9.1	10	12	5.0	6.7	2.9	4.8	4.4
10	*4.7	12	4.0	5.0	6.4	8.5	6.7	4.3	6.2	3.0	4.2	5.0
11	4.4	6.4	4.1	4.6	6.0	8.1	5.4	4.7	5.6	3.3	4.3	5.3
12	4.3	4.0	11	5.8	5.3	6.5	6.4	4.7	*4.6	2.9	4.1	a5
13	4.1	3.6	33	3.3	5.3	6.0	4.7	4.1	4.4	*2.9	4.3	a5
14	4.3	3.0	87	2.6	4.6	5.3	4.1	4.4	4.3	4.0	5.3	a5
15	4.1	*3.4	61	4.3	9.6	4.8	4.4	3.7	9.7	3.0	6.0	a5
16	3.8	4.1	22	43	6.8	4.3	4.3	3.7	12	3.3	4.7	a5
17	3.4	3.4	11	38	5.6	4.3	668	3.7	23	4.4	4.1	a70
18	4.0	3.1	7.3	16	7.0	4.0	792	3.7	12	3.4	3.8	a15
19	4.2	3.0	*5.6	9.9	7.6	*536	182	3.8	6.8	3.8	4.3	a20
20	5.0	3.1	63	7.3	6.2	162	71	3.2	5.8	4.2	3.8	a20
21	5.3	3.0	165	5.6	5.3	47	30	3.3	5.3	4.8	3.3	a10
22	5.4	4.4	64	4.8	5.6	19	18	3.6	5.0	3.2	8.9	a8
23	164	3.6	24	4.4	5.3	12	11	4.1	4.8	3.1	25	a6
24	1,340	2.7	13	63	50	9.5	7.8	5.6	7.0	3.1	13	a5
25	191	2.4	8.5	136	*325	9.5	7.5	5.6	6.2	3.1	13	a5
26	66	1.6	6.8	37	*106	8.6	34	4.8	13	3.8	*10	a10
27	33	1.8	5.6	15	44	6.7	80	4.0	6.2	3.0	9.3	a15
28	20	11	5.6	9.3	25	6.5	33	3.1	4.7	8.8	10	*a8
29	14	6.2	5.0	6.5	16	4.8	13	4.0	4.7	5.2	7.6	a25
30	9.5	3.0	5.3	24	----------	* 3.8	8.1	719	4.4	54	5.9	a10
31	6.8	----------	6.2	120	----------	3.6	----------	*5,300	----------	17	5.8	----------
Total	1,935.6	141.3	642.7	611.9	993.7	2,071.8	2,490.8	6,665.8	1,607.6	180.2	212.1	309.6
Mean	62.4	4.71	20.7	19.7	34.3	66.8	83.0	215	53.6	5.81	6.84	10.3
Ac-ft	3,840	280	1,270	1,210	1,970	4,110	4,940	13,220	3,190	357	421	614

Calendar year 1963: Max 1,340 Min 1.3 Mean 22.2 Ac-ft 16,040
Water year 1963-64: Max 5,300 Min 1.3 Mean 48.8 Ac-ft 35,420

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-24	0200	60.95	2,800	4-17	2000	59.85	2,110
3- 2	1400	57.19	1,060	5-31	1000	64.98	5,950

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

8-765. Halls Bayou at Houston, Tex.

Location.--Lat 29°51'42", long 95°20'05", on right bank at downstream side of bridge on Jensen Drive, in northeast section of Houston, Harris County, and 11.0 miles upstream from mouth.

Drainage area.--24.7 sq mi.

Records available.--October 1952 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 0.66 ft below mean sea level, datum of 1929, adjustment of 1957.

Average discharge.--12 years, 19.3 cfs (13,970 acre-ft per year).

Extremes.--Maximum discharge during year, 1,470 cfs May 31 (gage height, 55.27 ft); minimum, 0.2 cfs Oct. 21.
1952-64: Maximum discharge, 3,400 cfs Sept. 12, 1961; maximum gage height, 60.65 ft July 30, 1954; no flow at times.

Remarks.--Records good. No diversion above station. Low flow is partly sustained by sewage effluent from Houston suburbs.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-24, May 31 to Sept. 30)

44.7	0.3	46.5	54
44.8	.8	47.0	87
45.0	2.6	48.0	175
45.3	7.4	50.0	425
45.6	15	52.0	760
46.0	29	54.0	1,160

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.0	1.4	1.0	1.0	5.1	2.6	2.4	3.9	*154	1.2	1.5	2.0
2	1.0	1.4	1.0	1.0	*2.4	*53	2.0	12	33	1.0	1.0	13
3	1.0	1.4	.8	1.1	*2.4	16	2.2	3.9	12	1.0	1.0	14
4	1.0	2.2	.8	1.2	17	8.1	2.2	2.4	6.0	.9	.9	3.6
5	1.0	2.6	.7	1.4	30	4.5	99	2.0	3.7	.8	1.0	2.4
6	1.0	1.8	.8	1.4	6.3	3.3	32	2.2	2.8	.9	1.0	2.0
7	1.2	1.5	.7	1.4	2.9	2.6	11	*2.2	2.4	.8	1.0	1.8
8	1.0	4.6	.5	1.5	2.0	2.6	5.8	2.0	2.2	.8	1.0	1.8
9	1.0	14	.9	1.8	1.6	2.6	3.3	2.2	2.0	.8	1.0	1.8
10	*1.0	4.0	1.0	1.4	1.5	2.4	2.4	2.0	1.8	.8	1.1	1.5
11	.8	2.4	1.4	1.4	1.5	2.2	2.2	2.2	1.6	.8	1.0	1.5
12	1.0	1.4	19	1.8	1.4	2.0	2.4	2.2	*1.6	.8	1.0	1.8
13	1.1	1.0	40	1.8	1.5	2.0	2.4	1.8	1.6	*1.0	1.0	1.4
14	1.2	1.0	49	1.8	1.5	2.0	2.2	1.8	1.5	.8	1.0	1.4
15	1.3	*.8	7.3	2.0	3.6	2.0	2.0	1.6	4.4	1.0	1.5	1.4
16	1.2	.8	2.6	42	2.4	2.0	2.0	1.6	7.0	1.0	1.1	1.8
17	.8	.8	1.6	13	1.8	1.8	211	1.5	2.4	2.0	1.0	151
18	.6	.8	1.2	3.3	2.0	1.8	61	1.6	1.5	1.8	1.0	19
19	.6	.6	*1.0	2.2	1.4	*343	11	1.6	1.4	1.6	.9	28
20	.4	.8	106	1.6	1.3	29	5.3	1.4	1.2	1.5	.8	25
21	.6	.8	33	1.5	2.6	8.9	3.5	1.4	1.1	2.6	1.0	5.4
22	.5	6.0	4.5	1.5	3.2	5.8	2.9	1.5	1.1	1.4	58	3.1
23	.5	3.9	2.4	1.4	2.0	4.5	2.4	1.5	1.1	1.0	221	2.4
24	80	1.3	2.4	15	69	4.2	2.4	2.0	3.9	1.0	26	2.0
25	7.8	.9	1.8	10	*93	4.0	5.4	2.8	4.2	.9	19	1.6
26	3.1	.9	1.6	2.4	12	3.6	17	1.8	1.5	.8	*46	6.2
27	2.2	1.1	2.4	1.8	6.0	3.1	11	1.6	1.1	.9	53	8.5
28	1.8	14	1.3	1.4	4.3	3.1	3.6	1.5	1.2	1.1	4.6	*5.6
29	1.6	4.3	.9	1.2	2.9	2.6	2.4	1.5	1.4	1.4	2.9	49
30	1.5	.6	1.0	21	----------	* 2.4	2.0	* 562	1.3	5.8	2.4	37
31	1.4	----------	1.0	39	----------	2.4	----------	*1,090	----------	4.0	2.2	----------
Total	120.2	79.1	289.6	180.3	284.6	530.1	516.4	1,719.7	262.0	42.2	456.9	397.0
Mean	3.88	2.64	9.34	5.82	9.81	17.1	17.2	55.5	8.73	1.36	14.7	13.2
Ac-ft	238	157	574	358	564	1,050	1,020	3,410	520	84	906	787

Calendar year 1963: Max 401 Min 0.2 Mean 8.92 Ac-ft 6,460
Water year 1963-64: Max 1,090 Min 0.4 Mean 13.3 Ac-ft 9,670

Peak discharge (base, 600 cfs)

Date	Time	Gage height	Discharge
3-19	0700	52.62	880
4-17	1730	52.08	780
5-31	0700-0900	55.27	1,470

* Discharge measurement made on this day.

8-770. Clear Creek near Pearland, Tex.

Location.--Lat 29°35'50", long 95°17'10", at downstream side of pier of bridge on State Highway 35, 0.7 mile downstream from Gulf, Colorado and Santa Fe Railway Co. bridge, 1.2 miles upstream from Hickory Slough, 2.3 miles north of Pearland, Brazoria County, and about 30 miles upstream from head of Clear Lake.

Drainage area.--38.8 sq mi.

Records available.--July to October 1944, March to October 1946, April 1947 to December 1959, March 1963 to September 1964. Discharge for some high-water periods in 1944 and 1946 published in WSP 1392.

Gage.--Water-stage recorder. Datum of gage is 28.34 ft above mean sea level, datum of 1929, adjustments of 1957 and 1959. Prior to June 9, 1948, staff gage and June 9, 1948, to Apr. 22, 1952, water-stage recorder at same site and datum 5.80 ft higher. Apr. 23, 1952, to Dec. 31, 1959, water-stage recorder at present site and datum.

Average discharge.--13 years (1947-59, 1963-64), 31.0 cfs (22,440 acre-ft per year).

Extremes.--Maximum discharge during year, 820 cfs Feb. 4 (gage height, 11.63 ft); no flow at times.
1947-59, 1963-64: Maximum discharge, 2,170 cfs Mar. 18, 1957; maximum gage height, 18.98 ft Oct. 8, 1949, present datum; no flow at times.
Maximum stage known since at least 1932, that of Oct. 8, 1949 (discharge, 1,840 cfs, before channel rectification); maximum discharge, that of Mar. 18, 1957. Flood of June 26, 1960, probably exceeded that of Mar. 18, 1957 (stage and discharge unknown), from records of rainfall and nearby stations.

Remarks.--Records good. Large area of riceland above station is irrigated with water from the Brazos River. Low flow from April to October is largely drainage from irrigated lands. Diversions for irrigation above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 3 to Sept. 17, Sept. 22-30)

2.96	0	3.7	8.8	6.0	84
3.0	.1	4.0	15	7.0	150
3.1	.7	4.5	27	8.0	245
3.2	1.6	5.0	42	10.0	515
3.4	4.0				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.3	0	6.2	2.1	22	19	1.2	5.4	11	5.0	21	8.4
2	2.0	0	4.2	1.4	12	104	1.2	47	*16	4.6	20	6.2
3	1.8	0	3.0	1.5	14	67	1.5	78	7.9	5.5	20	5.8
4	1.5	0	2.2	1.4	*400	41	1.3	*28	3.7	6.4	16	5.5
5	1.2	3.4	1.4	1.0	*497	25	1.9	11	8.6	6.1	11	4.5
6	.9	2.2	1.0	1.2	*154	14	1.6	6.4	6.0	*5.0	8.1	5.4
7	.7	4.6	1.0	1.2	68	10	1.6	3.7	3.1	6.2	9.2	5.6
8	1.2	6.5	.6	1.4	36	7.9	1.9	2.1	1.4	8.4	17	4.5
9	.9	20	.3	1.3	24	7.0	1.6	.6	.3	9.9	26	5.0
10	.5	18	.6	1.0	17	5.8	1.4	.4	0	9.4	19	6.8
11	.3	9.2	.6	1.0	12	4.5	1.4	.4	0	7.2	13	6.1
12	.2	6.0	2.2	1.0	9.6	3.7	1.4	.2	1.0	5.5	*8.3	7.4
13	.1	4.3	*65	.8	7.7	3.4	1.5	.1	.6	4.6	5.0	7.9
14	0	3.4	225	*.5	*6.7	3.5	1.2	.4	.1	8.6	11	*7.2
15	0	3.0	114	.5	7.0	3.1	.9	0	1.3	9.4	8.6	9.8
16	*.4	2.8	46	11	6.6	2.4	.9	0	3.3	6.7	4.3	14
17	.9	2.3	24	26	6.0	2.1	2.4	.6	5.8	4.5	3.5	40
18	.7	1.5	*15	14	5.2	2.1	4.5	3.0	6.1	3.7	4.5	53
19	.5	1.0	10	9.2	4.5	*30	6.0	5.5	4.2	6.7	10	74
20	.4	*.9	57	7.0	3.9	*40	6.7	2.2	2.8	18	14	57
21	.4	.6	157	4.9	4.3	14	6.4	1.8	2.9	33	7.7	41
22	.3	2.2	64	3.7	3.9	7.5	2.9	8.6	4.8	29	4.8	26
23	.2	1.0	31	3.0	4.5	5.2	4.8	13	6.1	19	6.0	16
24	.2	.9	17	3.1	39	4.2	9.2	10	3.0	12	8.3	9.2
25	.2	1.9	12	2.5	266	3.5	9.8	8.4	3.9	9.9	13	5.8
26	.7	1.3	9.6	2.1	103	3.0	27	8.3	3.0	17	22	5.5
27	.6	1.0	7.2	1.9	59	2.5	30	7.5	5.8	14	19	9.9
28	.5	17	5.6	1.5	48	2.4	9.0	6.2	8.4	13	16	10
29	.1	28	4.5	1.3	30	1.9	4.2	5.8	9.6	18	11	10
30	.1	11	3.4	3.4	----------	1.4	3.7	7.4	5.8	19	9.2	16
31	.1	----------	2.6	26	----------	1.3	----------	8.8	----------	24	9.2	----------
Total	19.9	154.0	893.2	137.9	1,870.9	442.4	149.1	280.8	136.5	349.3	375.7	483.5
Mean	0.64	5.13	28.8	4.45	64.5	14.3	4.97	9.06	4.55	11.3	12.1	16.1
Ac-ft	39	305	1,770	274	3,710	877	296	557	271	693	745	959

Calendar year 1963: Max - Min - Mean - Ac-ft -
Water year 1963-64: Max 497 Min 0 Mean 14.5 Ac-ft 10,500

Peak discharge (base, 600 cfs)

Date	Time	Gage height	Discharge
2-4	2200	11.63	820

* Discharge measurement made on this day.

8-780. Chocolate Bayou near Alvin, Tex.

Location.--Lat 29°22'19", long 95°19'14", on right bank 800 ft downstream from bridge on Farm Road 1462, 5.9 miles southwest of Alvin, Brazoria County, and 6.9 miles upstream from State Highway 35.
Drainage area.--87.7 sq mi.
Records available.--August to October 1944 and March to December 1946 (low-water records during irrigation season), January 1947 to February 1958, March 1958 to February 1959 (discharge measurements only), March 1959 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 10.31 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943. Prior to Nov. 26, 1949, staff gage at site 1,360 ft upstream on old channel at datum 3.00 ft higher. Nov. 26, 1949, to June 11, 1952, staff gage and June 12, 1952, to Feb. 9, 1958, water-stage recorder at site 1,400 ft upstream at bridge on old channel at datum 3.00 ft higher. Feb. 10, 1958, to May 3, 1959, staff gage at site 900 ft upstream on old channel and at datum 3.00 ft higher.
Average discharge.--15 years (1947-57, 1959-64), 92.0 cfs (66,610 acre-ft per year).
Extremes.--Maximum discharge during year, 758 cfs Feb. 5 (gage height, 9.18 ft); minimum, 1.1 cfs Nov. 26-27.
1947-64: Maximum discharge, 7,400 cfs Oct. 8, 1949 (gage height, 21.80 ft, present datum, from floodmark before channel rectification), from rating curve defined by current-meter measurements below 3,800 cfs and extended above by logarithmic plotting; no flow at times.
Maximum stage in recent years, 22.9 ft July 14, 1939, former site and present datum (adjusted from floodmark 1,700 ft to right and 550 ft upstream from present gage, on basis of slope of flood of Oct. 8, 1949), from information by local residents.
Remarks.--Records good except those for period of no gage-height record, which are poor. Large area of riceland above station is irrigated with water from Brazos River. Low flow from April to October is largely drainage from the irrigated lands. Diversions for irrigation above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 4-5, Mar. 2-3, May 20 to July 8, Aug. 10 to Sept. 30)

1.4	1.1	2.4	35
1.5	1.7	3.0	75
1.6	3.3	4.0	154
1.7	5.3	6.0	366
1.8	8.0	8.0	630
2.0	15		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.9	4.0	8.0	8	109	28	3.3	26	62	66	92	6.6
2	14	2.9	7.2	7	55	492	3.3	40	59	56	79	7.2
3	17	2.3	9.6	6.5	83	311	3.3	43	43	50	52	7.2
4	17	2.8	5.8	6	330	149	3.3	31	35	53	69	13
5	23	5.6	3.7	5.5	*624	68	3.7	26	31	72	60	19
6	28	6.1	2.6	5	264	34	4.0	43	38	59	74	20
7	33	3.7	2.0	5	110	24	4.0	46	43	63	69	27
8	38	4.4	1.6	4.5	51	20	3.8	47	40	60	92	26
9	32	69	1.3	4.5	31	16	4.4	45	34	80	88	28
10	27	75	1.2	4	20	*12	*7.7	38	25	70	53	27
11	24	45	1.2	4	14	9.0	7.2	42	20	65	36	24
12	22	31	1.2	3.5	10	7.7	11	64	18	60	28	24
13	19	18	68	3.5	9.0	6.9	24	51	16	55	28	22
14	19	10	276	3	8.3	7.2	22	31	20	50	26	22
15	19	5.8	174	3	8.6	6.6	29	24	30	80	28	49
16	*19	3.7	82	26	8.0	5.6	26	17	60	70	22	150
17	24	2.4	48	48	6.9	5.1	28	22	70	60	18	500
18	28	2.0	*34	30	6.6	4.6	27	38	*50	50	22	350
19	24	1.6	25	20	5.6	*203	30	83	39	80	16	150
20	18	*1.4	112	16	4.4	93	28	71	32	150	14	80
21	12	1.3	242	14	4.2	31	31	43	28	200	16	40
22	9.6	1.4	122	12	5.1	15	32	*42	31	150	27	30
23	12	1.4	60	10	4.4	10	22	49	31	80	33	25
24	13	1.4	32	9	12	8.6	28	100	26	70	55	20
25	12	1.2	24	8	148	8.0	63	94	60	60	61	15
26	12	1.2	20	7	98	6.6	108	61	67	80	56	15
27	12	1.1	16	6.5	60	5.3	86	47	69	*70	*49	50
28	14	12	14	6	67	4.9	56	45	75	87	41	*54
29	11	26	12	*5.6	42	4.6	38	43	74	104	26	53
30	7.5	15	10	20	----------	3.8	27	33	70	116	17	92
31	5.6	----------	9	225	----------	3.3	----------	54	----------	124	10	----------
Total	575.6	358.7	1,425.4	536.1	2,199.1	1,603.8	764.0	1,439	1,296	2,490	1,357	1,946.0
Mean	18.6	12.0	46.0	17.3	75.8	51.7	25.5	46.4	43.2	80.3	43.8	64.9
Ac-ft	1,140	711	2,830	1,060	4,360	3,180	1,520	2,850	2,570	4,940	2,690	3,860

Calendar year 1963: Max 771 Min 1.1 Mean 48.6 Ac-ft 35,220
Water year 1963-64: Max 624 Min 1.1 Mean 43.7 Ac-ft 31,710

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

* Discharge measurement made on this day.
Note.--No gage-height record Dec. 25 to Jan. 15, Jan. 19-29, June 10-18, July 9-27, Sept. 16-27.

8-790. Oyster Creek near Angleton, Tex.

Location.--Lat 29°09'30", long 95°28'30", near center of low-water channel at downstream side of bridge on State Highway 35, 2.8 miles west of Angleton, Brazoria County, 4.1 miles upstream from Missouri Pacific Railroad Co. bridge, 4.4 miles downstream from another Missouri Pacific Railroad Co. bridge, and about 45 miles upstream from Gulf of Mexico.

Drainage area.--211 sq mi (revised).

Records available.--October 1944 to September 1964. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 1.31 ft below mean sea level, datum of 1929. Prior to Apr. 30, 1958, at site 500 ft downstream at same datum.

Average discharge.--20 years, 168 cfs (121,600 acre-ft per year).

Extremes.--Maximum discharge during year, 446 cfs Feb. 5 (gage height, 15.21 ft); minimum daily, 30 cfs Nov. 6-7.
1944-64: Maximum discharge, 10,600 cfs May 10, 1957 (gage height, 31.45 ft, present site, overflow from Brazos River); minimum daily, 0.3 cfs at times in 1955-56.
Maximum stage since about 1900, 32.2 ft in December 1913; flood of Dec. 5, 1940, reached a stage of 30.9 ft, from information by State Highway Department. At extreme high stages the Brazos River overflows into Oyster Creek above this station.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Diversions above station for irrigation. A large part of flow is water released from Harris Reservoir (capacity, 12,000 acre-ft) for industrial use below station. Harris Reservoir is supplied with water diverted from Brazos River during periods of floodflow.

Cooperation.--Records of releases from Harris Reservoir into Oyster Creek above station furnished by Dow Chemical Co.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	154	86	150	175	172	140	150	154	158	76	140	136
2	154	34	150	168	132	250	150	161	154	67	118	140
3	*154	32	154	161	125	170	147	172	150	68	132	144
4	158	31	158	158	279	140	147	154	150	68	154	147
5	154	31	158	158	*398	130	150	158	147	77	158	144
6	158	30	158	154	261	130	150	154	144	71	150	144
7	158	30	158	144	158	150	147	158	147	70	154	147
8	154	33	154	136	154	170	147	158	147	67	158	147
9	150	56	154	140	158	200	147	154	150	64	150	150
10	147	78	158	144	158	*196	*147	150	150	65	150	150
11	144	79	158	140	114	182	140	154	150	67	147	150
12	144	86	158	140	101	175	132	150	150	67	147	150
13	144	88	168	140	100	175	132	158	144	71	147	150
14	147	84	182	140	98	172	136	*154	144	67	147	150
15	147	79	196	144	100	172	140	150	158	65	144	147
16	147	102	189	164	160	168	147	147	164	71	140	147
17	147	140	182	164	140	164	150	150	164	121	140	161
18	147	158	*182	144	130	164	158	154	*150	150	144	168
19	147	164	182	132	160	196	158	164	147	168	144	161
20	147	161	212	129	140	210	161	164	147	175	140	161
21	147	*158	252	136	140	196	154	147	154	172	136	158
22	144	158	238	144	140	189	150	129	150	158	136	150
23	147	158	217	147	140	182	164	125	147	150	140	144
24	147	154	210	154	140	158	161	118	144	*147	150	144
25	147	150	210	154	140	144	154	118	147	140	154	144
26	147	147	203	147	300	136	150	110	147	144	150	147
27	147	147	203	144	170	147	150	110	140	147	*144	147
28	150	154	196	140	140	150	150	140	144	150	144	147
29	150	154	196	*114	130	150	147	147	140	158	140	168
30	147	150	182	106	----------	150	147	158	106	182	140	189
31	144	----------	182	203	----------	150	----------	164	----------	182	136	----------
Total	4,619	3,112	5,650	4,564	4,678	5,206	4,463	4,584	4,434	3,445	4,474	4,532
Mean	149	104	182	147	161	168	149	148	148	111	144	151
Ac-ft	9,160	6,170	11,210	9,050	9,280	10,330	8,850	9,090	8,790	6,830	8,870	8,990
(†)	9,000	6,120	10,080	8,090	4,840	8,320	8,540	8,760	8,540	6,420	8,950	8,680

Calendar year 1963: Max 350 Min 30 Mean 147 Ac-ft 106,600 † 95,340
Water year 1963-64: Max 398 Min 30 Mean 147 Ac-ft 106,600 † 96,340

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

* Discharge measurement made on this day.
† Water released, in acre-feet, from Harris Reservoir.
Note.--No gage-height record Feb. 16 to Mar. 9.

8-796. Double Mountain Fork Brazos River at Justiceburg, Tex.
(Formerly published as Sand Creek or South Fork Double Mountain Fork Brazos River at Justiceburg, Tex.)

Location.--Lat 30°02'25", long 101°11'40", on right bank at downstream side of bridge on U. S. Highway 84, 250 ft downstream from Panhandle and Santa Fe Railroad, and at Justiceburg, Garza County.

Drainage area.--1,272 sq mi, of which 1,003 sq mi is probably noncontributing.

Records available.--November 1961 to September 1964. Prior to October 1963 published as Sand Creek or South Fork Double Mountain Fork Brazos River at Justiceburg.

Gage.--Water-stage recorder. Datum of gage is 2,222.47 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 2,130 cfs Sept. 23 (gage height, 6.81 ft); no flow at times.
1961-64: Maximum discharge, 27,300 cfs May 23, June 1, 1963 (gage height, 14.0 ft); no flow at times.
Maximum stages since at least 1895 were 25.8 ft in 1914 and 22.2 ft in September 1955, from information by local resident. Flood of July 1961 reached a stage of 18.2 ft from floodmark.
Revisions.--The maximum discharge for the water year 1962, has been revised to 19,200 Sept. 6, 1962, superseding figures published in Surface Water Records of Texas, 1962.

Remarks.--Records fair. No diversion above station.

Revisions.--Revised figures of discharge, in cubic feet per second, for the periods Sept. 1, 5-6, 1962, superseding previously published figures, are given herewith:

1962	
Sept. 1	1,430
5	1,040
6	6,580

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
September 1962	9,617.3	6,580	0	321	19,080
Calendar year 1962	15,004.6	6,580	0	41.1	29,770

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	0.5	0.1	0.1	2.7	0		0	1.9		0	0
2	0	.4	0	.1	.2	0		0	*.2		0	0
3	*0	.2	0	0	.3	0		0	0		0	0
4	0	.2	0	0	.9	0		0	116		0	3.2
5	0	** .1	0	0	.4	0		0	a150		0	.5
6	0	.1	0	0	.2	0		0	a5		0	0
7	0	.1	0	0	.2	0		0	a0	(*)	0	0
8	0	.3	0	0	.2	.1		0	a0		0	0
9	0	.5	0	0	.2	.1		0	*0		0	0
10	0	.5	.1	0	.1	.1		0	0		0	*0
11	0	.4	**.3	0	.1	.1		0	0		*14	0
12	0	.3	.2	0	.1	.1		0	0		12	7.9
13	0	.3	.3	.2	.1	0		0	220		0	.3
14	0	.3	.4	.3	.1	0		0	56		0	0
15	0	.3	.4	**.1	.1	0		0	4.4		15	0
16	0	.4	.4	.1	.1	0		46	2.4		0	62
17	0	.4	.2	.1	.1	0		4.4	1.3		186	*.1
18	0	4.5	.1	0	**.1	.1		0	0		38	0
19	24	383	.1	0	0	.5		0	0		105	0
20	369	26	.1	0	.1	.2		0	8.0		4.8	0
21	143	.5	.1	0	.4	.1		0	188		0	0
22	25	104	.2	0	.3	.1		0	146		0	0
23	1.7	2.9	.4	0	.2	.1		0	9.5		0	215
24	1.3	.4	.3	0	.2	*0		0	3.2		0	143
25	1.1	.3	.2	0	.1	0		0	.7		0	3.8
26	.9	.2	.1	0	.1	0		0	0		124	.3
27	.9	.2	0	0	.1	0		0	0		126	35
28	.9	.3	0	0	0	0	(*)	237	0		.6	19
29	.7	.1	.1	0	0	0		187	0		21	0
30	.5	.1	.3	102	----------	0		246	0		13	0
31	.4	----------	.2	47	----------	0	----------	21	----------		0	----------
Total	569.9	527.8	4.6	150.0	7.7	1.6	0	741.4	912.6	0	659.4	490.1
Mean	18.4	17.6	0.15	4.84	0.27	0.05	0	23.9	30.4	0	21.3	16.3
Ac-ft	1,130	1,050	9.1	298	15	3.2	0	1,470	1,810	0	1,310	972

Calendar year 1963: Max 3,900 Min 0 Mean 49.3 Ac-ft 35,710
Water year 1963-64: Max 383 Min 0 Mean 11.1 Ac-ft 8,070

Peak discharge (base, 1,500 cfs)

Date	Time	Gage height	Discharge
10-20	0030	6.87	1,880
9-23	2100	6.81	2,130

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
a No gage-height record.

8-805. Double Mountain Fork Brazos River near Aspermont, Tex.

Location.--Lat 33°00', long 100°11', near right bank on downstream side of pier of bridge on U. S. Highway 83, 8 miles downstream from Mountain Creek and 10 miles south of Aspermont, Stonewall County.

Drainage area.--7,980 sq mi, approximately, of which 6,470 sq mi is probably noncontributing.

Records available.--December 1923 to September 1934, June 1939 to September 1964.

Gage.--Water-stage recorder and wire-weight gage read once daily. Datum of gage is 1,627.5 ft above mean sea level, datum of 1929 (State Highway Department bench mark). Dec. 3, 1923, to Sept. 30, 1934, chain gage at site 90 ft downstream at same datum.

Average discharge.--35 years (1924-34, 1939-64), 179 cfs (129,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,010 cfs June 11 (gage height, 2.87 ft); no flow for many days. 1923-34, 1939-64: Maximum discharge, 91,400 cfs Sept. 26, 1955 (gage height, 27.50 ft); no flow at times. Maximum stage since at least 1899, that of Sept. 26, 1955.

Remarks.--Records fair except those for periods of ice effect, which are poor. Small diversions above station for oilfield operations. Records of chemical analyses and water temperatures for water year 1964 are available in the Austin District Office.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.1	4.2	17	7.2	18	1.4	0.2	0.1	0	0	0.1	9.6
2	2.7	3.7	14	8.0	12	.9	.1	.1	0	71	.1	5.0
3	1.4	3.1	12	5.6	11	.5	.1	.1	0	18	.1	3.3
4	1.3	2.1	10	4.4	51	.4	.1	.1	3.3	2.2	.1	2.9
5	*.9	1.7	9.2	4.0	41	.3	.1	.1	1.0	.2	.1	2.9
6	.8	1.3	8.4	3.5	30	.2	.1	.1	.4	0	.1	2.5
7	.7	.8	7.2	3.1	22	.1	.1	4.1	1.0	0	.2	2.7
8	.6	.8	6.2	2.7	16	.4	.1	300	0	0	.2	2.7
9	.4	.8	4.7	2	14	.8	.1	31	0	0	.1	2.7
10	.4	.7	6.2	2	13	.4	.1	2.7	0	0	.2	2.5
11	.4	.6	6.2	2.0	12	.1	.1	1.4	362	0	.2	2.9
12	.3	.4	5.6	1.5	11	.1	.1	*.3	*483	0	.2	3.5
13	.3	*.4	5.2	1	11	.1	**.1	.2	359	0	.2	2.9
14	.3	.4	6.4	*1	10	.1	.1	.1	444	0	.2	3.1
15	.3	.4	6.4	1	8.0	.1	.1	0	201	*0	64	20
16	.3	.3	5.8	1	6.2	.1	.1	0	122	0	15	236
17	.3	.2	5.6	1	5.2	**.1	.1	0	46	0	7.2	281
18	.3	.4	*5.2	1.2	*4.2	1.1	.1	0	20	0	13	107
19	.6	*143	5.0	.8	3.3	2.1	.1	0	7.5	0	*31	25
20	.6	178	5.2	1.0	3.4	1.3	.1	0	3.1	0	10	10
21	35	140	5.2	1.0	5.6	.6	.1	0	1.2	0	2.5	39
22	443	287	5	.8	5.8	.4	.1	0	.1	0	1.8	32
23	264	136	5	.7	5.6	.2	.1	0	0	0	1.5	5.6
24	*128	100	6	**.6	4.7	.1	.1	0	0	0	1.2	5.6
25	66	65	6.4	.6	4.0	.1	.1	0	0	0	1.2	*26
26	37	57	5.0	.7	2.7	.1	.1	0	0	0	19	14
27	26	47	4.2	.6	2.3	.1	.1	0	0	0	147	29
28	16	37	3.5	.7	1.8	.1	.1	0	0	0	9.8	21
29	10	27	3.1	1.2	1.4	.2	.1	0	0	0	116	9.6
30	7.2	22	6.2	5.0	----------	.1	.1	3.3	0	16	62	4.7
31	5.2	----------	7.6	14	----------	.2	----------	.8	----------	.5	13	----------
Total	1,053.4	1,261.3	208.7	79.9	336.2	12.8	3.1	344.5	2,054.6	107.9	517.3	914.7
Mean	34.0	42.0	6.73	2.58	11.6	0.41	0.10	11.1	68.5	3.48	16.7	30.5
Ac-ft	2,090	2,500	414	158	667	25	6.1	683	4,080	214	1,030	1,810

Calendar year 1963: Max 7,250 Min 0 Mean 164 Ac-ft 119,000
Water year 1963-64: Max 483 Min 0 Mean 18.8 Ac-ft 13,680

Peak discharge (base, 8,800 cfs).--No peak above base.

* Discharge measurement of observation of no flow made on this day.
** Field estimate made on this day.
Note.--Stage-discharge relation affected by ice Dec. 22-24, Jan. 9-10, 12-17.

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

Location.--Lat 34°31'55", long 103°12'05", in W½NE¼ sec. 31, T. 4 N., R. 36 E., on left bank a quarter of a mile upstream from State Highway 18 and 8 miles north of Clovis.
Drainage area.--109 sq mi, of which about 14 sq mi is probably noncontributing.
Records available.--October 1952 to September 1956 (annual maximum only), October 1956 to September 1964 (discontinued).
Gage.--Water-stage recorder. Altitude of gage is 4,250 ft (from topographic map). Prior to October 1956, crest-stage gage at site 900 ft downstream at datum 0.4 ft lower.
Average discharge.--8 years, 1.79 cfs (1,300 acre-ft per year).
Extremes.--Maximum discharge during year, 84 cfs Sept. 15 (gage height, 4.47 ft); no flow most of year.
1952-64: Maximum discharge, 7,090 cfs Sept. 6, 1957 (gage height, 9.95 ft, from floodmarks), from rating curve extended above 1,800 cfs on basis of indirect measurements of flow at gage heights 7.73 and 9.95 ft; no flow most of time.
Remarks.--Records fair. Precipitation at Clovis (8 miles south) was 10.78 inches during year, and at Clovis 13 N (5 miles north), 10.56 inches.

Discharge, in cubic feet per second, water year October 1963 to September 1964

June 13	3.2	Aug. 18	0.4	Sept. 14	0.3
Aug. 13	.2	29	.1	15	.14
14	.4	30	.7	16	1.9
15	.2	31	.5	20	3.0
16	.1	Sept. 1	.4	21	.1
17	.1	2	.1		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1964	3.2	3.2	0	0.11	6.3
August	2.7	.7	0	0.09	5.4
September	19.8	14	0	0.66	39
Calendar year 1963	-	997	0	5.64	4,090
Water year 1963-64	-	14	0	0.07	50.7

Peak discharge (base, 150 cfs).--No peak above base.
Note.--Flow occurred only on days listed above. During the year there were 11 observations of no flow.

8-807. Running Water Draw at Plainview, Tex.
(Formerly published as White River at Plainview, Tex.)

Location.--Lat 34°10'50", long 101°42'00", at bridge on Broadway Street in Plainview, Hale County, and 0.4 mile upstream from Atchison, Topeka and Santa Fe Railway Co. bridge.
Records available.--June 1939 to September 1953, October 1956 to April 1960, February 1961 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 3,341.11 ft above mean sea level, datum of 1929, supplementary adjustment of 1942.
Average discharge.--20 years, (1939-53, 1956-59, 1961-64), 3.61 cfs (2,610 acre-ft per year).
Extremes.--Maximum discharge during year, 236 cfs June 15 (gage height, 4.25 ft); no flow for many days.
1939-53, 1956-64: Maximum discharge, 12,000 cfs June 6, 1941 (gage height, 8.75 ft), from rating curve defined by current-meter measurements below 800 cfs and slope-area measurement at 12,000 cfs; no flow most of time.
Maximum discharge since at least 1880, that of June 6, 1941; maximum stage, 9.38 ft July 8, 1960 (discharge, 9,130 cfs, by contracted-opening measurement). A flood in 1890, stage not determined, was probably the second highest, from information by local residents.
Remarks.--Records fair except those for period of no gage-height record, which are poor. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 14-17)

0.7	0.02	1.2	2.3	2.4	16	3.0	32
.8	.1	1.5	5.2	2.6	19	3.4	66
.9	.3	2.0	11	2.8	23	4.0	151
1.0	.7						

Yearly discharge, in cubic feet per second

Year	Water year ending Sept. 30					Calendar year	
	Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
	Discharge	Date					
1949	-	-	-	-	-	0.17	120
1950	71	July 6, 1950	0	0.19	140	.20	144
1951	1,070	May 17, 1951	0	5.93	4,290	5.92	4,280
1952	23	Apr. 20, 1952	0	.03	25	.03	25
1953	16	July 18, 1953	0	.01	8.7	-	-
1957	760	June 1, 1957	0	4.99	3,610	5.05	3,660
1958	38	June 29, 1958	0	.26	186	.20	142
1959	650	June 4, 1959	0	5.48	3,960	5.54	4,010

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.1	0	0	0	0		0	0	0	0	0
2	0	0	0	0	0	0		0	0	0	0	0
3	0	0	0	0	.1	*0		0	0	0	0	0
4	0	0	0	0	.8	0		0	.4	0	0	0
5	0	0	0	0	2.5	0		0	0	0	0	0
6	0	0	0	0	.5	0		0	0	0	0	0
7	0	0	0	0	0	0		0	0	0	0	0
8	0	0	0	0	0	0		0	0	0	2	0
9	0	0	0	0	0	0		0	0	0	0	*0
10	0	0	0	0	0	0		0	0	0	0	0
11	0	0	0	0	0	0		0	2.1	0	*0	0
12	0	0	0	0	0	0		0	3.4	0	3.1	0
13	0	0	0	0	0	0		0	49	0	0	.5
14	0	0	0	0	0	0		0	139	0	.4	.1
15	0	0	0	0	0	0		.4	*102	0	.3	.3
16	0	0	0	0	0	.1		0	*148	0	0	7.7
17	0	0	0	0	0	.6		0	*61	.3	0	1
18	0	.4	0	0	0	0		0	*14	0	0	0
19	.1	7.3	*0	0	0	0		0	* 3.1	0	0	0
20	.1	0	0	0	0	0		*0	.2	0	0	.5
21	0	*0	0	0	.6	0		0	0	0	0	0
22	*0	0	0	0	.1	0		0	0	0	0	0
23	.1	0	0	0	0	0		0	0	0	0	0
24	0	0	0	*0	0	0		0	0	0	0	25
25	0	0	0	0	0	0		0	0	0	2	8
26	0	0	0	0	0	0		0	0	0	2	.5
27	0	0	0	0	0	*0		6.0	0	0	0	3
28	0	0	0	0	0	0		0	0	0	0	.1
29	0	0	.1	.2	0	0		.4	0	0	0	0
30	0	0	.2	.5	----------	0		.5	0	0	0	0
31	.1	----------	0	.1	----------	0	----------	0	----------	0	0	----------
Total	0.4	7.8	0.3	0.8	4.6	0.7	0	7.3	522.2	0.3	9.8	46.7
Mean	0.01	0.26	0.01	0.03	0.16	0.02	0	0.24	17.4	0.01	0.32	1.56
Ac-ft	0.8	15	0.6	1.6	9.1	1.4	0	14	1,040	0.6	19	93

Calendar year 1963: Max 184 Min 0 Mean 2.68 Ac-ft 1,940
Water year 1963-64: Max 148 Min 0 Mean 1.64 Ac-ft 1,200

Peak discharge (base, 50 cfs)

Date	Time	Gage height	Discharge
6-15	0400	4.25	236
9-24	unknown	3.77	114

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record July 18 to Aug. 10, Aug. 23-26, Sept. 17-30.

8-812. Croton Creek near Jayton, Tex.

Location.--Lat 33°17'21", long 100°26'00", on left bank 460 ft upstream from county road, 1.1 miles upstream from mouth, and 8.6 miles northeast of Jayton, Kent County.

Drainage area.--284 sq mi.

Records available.--August 1959 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,694.45 ft above mean sea level, datum of 1929.

Average discharge.--5 years, 16.8 cfs (121,600 acre-ft per year).

Extremes.--Maximum discharge during year, 387 cfs Nov. 19 (gage height, 5.97 ft); no flow for many days.
1959-64: Maximum discharge, 10,600 cfs Oct. 18, 1960 (gage height, 12.40 ft); no flow for many days.
Flood in 1941 or 1942 was the greatest since 1935 and reached a stage of 13.5 ft, from information by local residents.

Remarks.--Records fair except those for periods of no gage-height record or ice effect, which are poor. No diversion above station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 21, Nov. 19, June 11-15, July 1-2, Aug. 31, Sept. 1, 15-16, 21-29)

4.35	0	4.8	20
4.41	.1	4.9	33
4.45	.2	5.0	50
4.5	.8	5.2	98
4.6	4.0	5.5	212
4.7	10		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0.8	1.8	2.8	0.2	0	0	4.6	7.5	0	16
2	0	0	.7	1.5	1.8	.1	0	0	.7	6.9	0	.6
3	0	0	.5	1.0	2.2	.1	0	0	0	.2	0	0
4	0	0	.4	.7	24	0	0	0	0	0	0	0
5	*0	0	.4	.5	10	0	0	0	.7	0	0	0
6	0	0	.4	.4	5.0	0	0	0	.1	0	0	0
7	0	0	.3	.3	2.8	0	0	0	0	0	0	0
8	0	0	.3	.3	1.8	0	0	0	0	0	0	0
9	0	0	.2	.2	1.3	0	0	0	0	0	0	0
10	0	3.2	.5	.2	1.0	0	0	0	0	0	0	0
11	0	2.9	b.4	.1	.8	0	0	0	*72	0	0	0
12	0	*.4	b.4	0	a.7	0	0	*0	47	0	0	0
13	0	.1	b.4	0	a.7	0	0	0	45	0	0	0
14	0	0	b.5	*0	a.6	0	*0	0	71	*0	0	0
15	0	0	b.5	0	a.6	0	0	0	37	0	0	16
16	0	0	1.3	0	a.5	0	0	0	12	0	0	59
17	0	0	1.0	0	a.5	*0	0	0	5.0	0	0	4.9
18	0	0	*.8	0	*.4	.1	8.2	0	2.1	0	0	.3
19	0	108	.8	0	.3	3.6	4.0	0	.7	0	0	0
20	0	*94	1.0	0	.5	1.5	1.3	0	1.2	0	*0	0
21	26	27	1.0	0	1.5	.8	.3	0	37	0	0	.3
22	1.3	20	b.5	0	1.5	.5	.1	0	8.4	0	0	5.1
23	.2	27	b.5	0	1.0	.3	0	0	1.8	0	0	.2
24	0	13	b1	0	.8	.1	0	0	.5	0	0	*0
25	0	5.5	1.8	0	.7	0	0	0	.2	0	0	0
26	0	3.6	1.5	0	.5	0	0	0	.1	0	0	0
27	0	2.4	1.3	0	.3	0	0	0	0	0	0	10
28	0	2.1	1.0	0	.2	0	0	0	0	0	0	.4
29	0	1.5	1.0	.1	.2	0	0	0	0	0	0	0
30	0	1.0	2.4	3.6	----------	0	0	0	0	0	0	0
31	0	----------	2.4	4.4	----------	0	----------	24	----------	0	31	----------
Total	27.5	311.7	25.9	15.1	65.0	7.3	13.9	24	347.1	14.6	31	112.8
Mean	0.89	10.4	0.84	0.49	2.24	0.24	0.46	0.77	11.6	0.47	1.0	3.76
Ac-ft	55	618	51	30	129	14	28	48	688	29	61	224

Calendar year 1963: Max 2,000 Min 0 Mean 22.9 Ac-ft 16,570
Water year 1963-64: Max 108 Min 0 Mean 2.72 Ac-ft 1,980

Peak discharge (base, 1,600 cfs).--No peak above base.

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

8-815. Salt Croton Creek near Aspermont, Tex.

Location.--Lat 33°24'05", long 100°24'30", on left bank 0.1 mile downstream from Haystack Creek, 2.4 miles downstream from Salt Flat Creek, 9.3 miles upstream from Salt Fork Brazos River, and 21 miles northwest of Aspermont, Stonewall County.

Drainage area.--64.3 sq mi.

Records available.--October 1956 to September 1964. Prior to October 1958, published as Dove Creek near Aspermont.

Gage.--Water-stage recorder. Altitude of gage is 1,668 ft, from topographic map.

Average discharge.--8 years, 5.63 cfs (4,080 acre-ft per year).

Extremes.--1962-63: Maximum discharge during water year, 12,800 cfs Sept. 15 (gage height, 6.42 ft), from rating curve defined by current-meter measurements below 240 cfs and slope-area measurements at 6,910 and 11,400 cfs; minimum daily, 0.1 cfs Sept. 7-10.
1963-64: Maximum discharge during water year, 460 cfs July 1 (gage height, 2.58 ft), from rating curve as defined above; minimum daily, 0.1 cfs June 10, Aug. 10-13.
1956-64: Maximum discharge, that of Sept. 15, 1963; minimum daily, 0.1 cfs July 23-24, 1960, Sept. 14, 1961, Sept. 7-10, 1963, June 10, Aug. 10-13, 1964.
Flood in 1941 reached a stage of about 9 ft, from information by local residents.

Remarks.--Records poor. Stage-discharge relation frequently affected by winds. Base flow maintained by springs. No diversion above station. Recording rain gage located at station.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3	0.8	2.0	1.2	0.8	1.0	1.0	2.0	42	1.0	0.3	6.0
2	.3	.8	9.8	1.2	.8	1.0	.8	2.8	2.0	1.0	.3	.8
3	.4	.8	3.8	1.0	.8	1.0	.6	1.5	1.0	1.0	.3	.2
4	.4	.8	1.5	1.0	.8	.8	3.2	2.2	.6	1.0	.3	.2
5	6.9	.8	1.2	1.0	.8	.8	5.6	389	.4	1.0	.3	.2
6	2.0	.8	1.2	1.0	.8	.8	3.5	6.3	.4	1.0	.3	.2
7	.8	.8	1.0	1.2	.8	.8	2.3	*2.0	5.3	1.0	.3	.1
8	.8	.8	1.0	1.2	1.0	.8	1.0	1.0	9.0	4.0	.3	.1
9	.6	1.0	1.2	1.2	1.0	.8	.8	.6	2.0	2.8	.3	.1
10	.6	1.0	1.2	1.0	1.5	1.6	.6	.4	.4	1.4	.3	.1
11	*.6	.8	1.2	1.0	3.1	.6	*.6	.4	260	1.0	.3	.2
12	.6	.8	1.2	1.0	1.4	.6	.8	.4	*33	1.0	.3	*2.8
13	.6	*.8	1.2	1.0	1.2	.4	.8	.4	4.6	1.1	.3	.8
14	.4	.6	*1.2	1.2	1.0	*.8	.8	.4	2.8	4.8	*1.4	.6
15	.4	.6	1.0	1.2	*1.0	.6	.8	.4	2.0	.8	.3	*884
16	.4	.4	1.0	1.2	1.0	.4	.6	.4	1.0	.6	.3	44
17	.4	1.4	1.0	*1.2	1.0	.3	.6	.4	78	.4	.3	1.9
18	1.2	.8	1.0	1.2	.8	.3	.6	.4	5.0	.4	2.4	1.0
19	1.2	.8	1.0	1.0	.6	.3	.4	.4	17	*.4	7.5	.9
20	2.7	.8	.8	1.0	.4	.3	.4	.6	3.2	.6	1.0	.6
21	.4	.6	.8	1.0	.4	.3	.4	4.3	2.3	.6	.4	.6
22	.4	.6	.8	1.0	.6	.3	.4	9.8	1.0	.4	.3	.4
23	.4	.6	.8	1.0	.8	.3	.6	1.7	1.0	.3	.6	.4
24	.4	.6	1.7	.8	.8	.3	1.2	1.2	1.0	.3	.2	.5
25	.4	.8	1.2	.8	.6	.3	1.2	1.6	1.0	.3	.7	.8
26	.4	276	1.0	.6	.6	.3	2.0	1.4	1.0	.3	.2	.5
27	1.8	5.8	1.0	.6	.8	.3	2.0	.4	1.0	.4	.2	.5
28	26	2.8	1.0	.8	1.0	.4	1.5	1.3	1.0	.4	.2	.5
29	1.2	2.3	1.0	.8	----------	.8	.8	.6	1.0	6.6	.2	.4
30	.8	2.0	1.0	.8	----------	3.2	1.2	12	1.0	1.6	.3	.6
31	.8	----------	1.0	.8	----------	3.3	----------	71	----------	.4	31	----------
Total	54.6	308.3	45.8	31.0	26.2	23.8	37.1	517.3	481.0	37.9	51.0	950.0
Mean	1.76	10.3	1.48	1.00	0.94	0.77	1.24	16.7	16.0	1.22	1.65	31.7
Ac-ft	108	612	91	61	52	47	74	1,030	954	75	101	1,880

Calendar year 1962: Max 171 Min 0.2 Mean 4.84 Ac-ft 3,500
Water year 1962-63: Max 884 Min 0.1 Mean 7.02 Ac-ft 5,080

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
11-26	1100	3.58	1,730
5- 5	1300	4.44	3,870
6-11	1900	3.79	2,160
9-15	2100	6.42	12,800

* Discharge measurement made on this day.

8-815. Salt Croton Creek near Aspermont, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.7	0.6	0.8	1.5	0.7	0.5	0.5	0.6	1.2	*50	0.2	0.5
2	.7	.6	.7	1.2	.7	.5	.5	.6	.9	*16	.2	.5
3	.6	.6	.7	1.0	4.0	.5	.5	.6	.9	8.0	.2	.4
4	*.6	.6	.6	1.0	8.3	.5	.5	.6	*1.0	.6	.2	.4
5	.6	.6	.6	1.0	1.4	.5	.5	.6	1.4	.4	* .2	.4
6	.5	.6	.6	1.0	.6	.4	.5	2.7	.8	.4	.2	.5
7	.4	.6	.6	.9	.6	.4	.6	.9	.6	.3	.8	.5
8	.4	15	.6	.9	.6	.6	.6	.6	.4	.3	.2	.5
9	.3	2.8	.6	.8	.7	.5	.6	.8	.3	.3	.2	.5
10	.3	1.2	1.4	.8	.7	.5	.6	.6	* .1	*.3	.1	.5
11	.2	.8	2.4	.7	.7	.4	.6	.4	50	.2	.1	.5
12	.2	.6	1.5	.6	.8	.4	.6	.4	4.2	.2	* .1	.6
13	.2	*.6	1.5	* .6	.8	.3	.6	* .4	14	.4	* .1	.9
14	.2	.6	1.5	.6	.7	.3	.6	.4	1.4	*.4	2.3	.9
15	.2	.6	1.5	.8	.6	.4	* .6	.4	.6	.4	4.0	7.2
16	.2	.6	1.5	.8	* .6	* .6	.6	.4	.5	.5	1.7	49
17	.2	.6	1.5	.8	* .6	.8	.6	.4	.4	.5	1.1	1.6
18	.2	.7	1.1	.7	.6	1.8	.5	.4	.3	.5	.6	.5
19	2.1	14	*1.2	.7	.6	3.0	.5	.4	.5	.5	*.4	.3
20	2.2	1.5	1.2	.7	.6	1.0	.5	.4	3.4	.6	.4	.3
21	4.1	1.5	1.2	.7	1.0	.6	.5	.4	2.8	*.6	.3	.6
22	1.1	4.5	1.4	.6	.6	.6	.5	.4	.5	.4	.4	16
23	.8	1.1	1.4	.6	.5	.5	.6	.4	.3	.4	.4	1.2
24	.8	1.0	1.5	.6	.5	.4	.6	.4	.3	.4	.4	.8
25	.7	1.0	1.7	.6	.5	.3	.6	.4	.3	.4	.4	*1.4
26	.6	1.0	1.4	.5	.6	.4	.7	.4	.4	.6	7.7	1.0
27	.5	1.1	1.0	.5	.6	.5	.7	1.8	.5	*.3	*2.6	8.3
28	.4	1.0	1.0	.5	.6	.5	.7	1.4	.5	*.2	.5	.7
29	.4	.9	1.0	.9	.6	.5	.6	1.7	.6	.2	.5	.7
30	.4	.9	2.4	4.1	----------	.5	.6	4.8	.6	.2	.5	.7
31	.4	----------	1.5	.7	----------	.5	----------	1.5	----------	.2	.5	----------
Total	21.2	57.8	37.6	27.4	30.4	19.2	17.2	26.2	89.7	84.7	27.5	97.9
Mean	0.68	1.93	1.21	0.88	1.05	0.62	0.57	0.85	2.99	2.73	0.89	3.26
Ac-ft	42	115	75	54	60	38	34	52	178	168	55	194

Calendar year 1963: Max 884 Min 0.1 Mean 6.22 Ac-ft 4,510
Water year 1963-64: Max 50 Min 0.1 Mean 1.47 Ac-ft 1,060

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

* Discharge measurement made on this day.

8-820. Salt Fork Brazos River near Aspermont, Tex.

Location.--Lat 33°20', long 100°14', near left bank on downstream side of pier of bridge on U. S. Highway 83, 5½ miles downstream from Salt Croton Creek and 13.2 miles north of Aspermont, Stonewall County.

Drainage area.--4,830 sq mi, approximately, of which 2,770 sq mi is probably noncontributing.

Records available.--December 1923 to August 1925, June 1939 to September 1964.

Gage.--Water-stage recorder and wire-weight gage, read once daily. Datum of gage is 1,588.70 ft above mean sea level, datum of 1929. Dec. 5, 1923, to Aug. 29, 1925, chain gage at site 6.8 miles downstream at different datum.

Average discharge.--25 years (1939-64), 143 cfs (103,500 acre-ft per year).

Extremes.--Maximum discharge during year, 1,560 cfs Sept. 15 (gage height, 4.77 ft); minimum, 0.1 cfs for many days.

1923-25, 1939-64: Maximum discharge, 52,200 cfs Sept. 25, 1955 (gage height, 14.92 ft), from rating curve extended above 29,000 cfs by logarithmic plotting; no flow at times.

Maximum stage since at least 1900, that of Sept. 25, 1955. Flood in December 1913 reached a stage of 14.4 ft and flood in November 1934 reached a stage of 13.7 ft, from information by local residents.

Remarks.--Records fair except those for periods of ice effect, which are poor. No large diversion above station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	0.5	11	15	26	4.6	1.4	0.3	0.2	*0.3	0.1	46
2	.6	.4	9.7	13	17	4.2	1.4	.3	.2	86	.1	13
3	.4	.4	9.1	9.7	17	3.9	1.3	.3	.2	64	.1	1.7
4	*.4	.4	8.6	7.6	82	3.6	1.1	.3	.5	29	.1	.3
5	.5	.3	8.6	6.2	64	3.6	1.4	.4	.1	5.8	.1	.3
6	.4	.3	8.1	6.2	36	3.0	1.3	.5	.1	.8	.1	.2
7	.4	.3	8.1	5.8	24	3.0	1.1	.2	.1	.8	.2	.2
8	.4	31	7.6	5.4	20	3.0	.9	.2	.1	.6	.1	.3
9	.4	36	7.6	4.2	16	4.2	.7	.2	.1	.4	.1	.3
10	.4	7.6	8.6	4.2	15	4.2	.7	.2	**.1	.3	.1	.3
11	.4	3.0	14	3.9	13	3.6	.7	.2	401	.2	.1	.3
12	.4	1.3	17	3.9	13	3.3	.6	.2	292	*.2	.1	.3
13	.3	*1.0	17	*2.8	13	3.3	.5	.2	253	*.2	.1	.3
14	.3	.7	15	b2	13	2.8	.5	*.2	549	.2	.6	.3
15	.3	.5	14	2.5	9.7	2.5	*.4	.2	462	.2	8.5	258
16	.3	.4	12	5.4	8.1	*2.2	.4	.2	207	.3	1.0	385
17	.3	.4	11	5.0	7.1	2.2	.4	.2	a98	.3	.1	265
18	.3	.4	9.7	5.0	*5.8	4.8	.4	.2	46	.2	.1	80
19	.7	149	*8.6	6.2	5.0	17	.4	.2	25	.2	*.1	37
20	.4	153	8.6	5.0	6.3	14	3.2	.2	194	.2	.1	7.8
21	56	76	8.6	3.3	12	8.6	1.5	.1	222	.2	.1	25
22	57	*122	b8	2.8	14	6.2	.8	.1	96	.2	.1	380
23	20	66	b7	3.0	13	5.0	.5	.1	31	.2	.1	67
24	8.6	52	13	*2.7	11	4.2	.4	.1	13	.2	.1	23
25	*4.2	36	16	2.5	9.1	2.8	.3	.1	11	.2	.1	*7.1
26	2.2	26	13	2.5	7.1	2.0	.3	.1	a8	.2	.1	8.8
27	1.4	21	11	2.5	6.2	1.8	.3	.1	a6	.1	9.0	47
28	1.1	18	9.1	2.5	5.4	1.3	.3	.1	3.9	.7	.9	10
29	.9	15	8.6	4.5	5.0	.9	.3	.1	2.0	.3	.3	5.0
30	.7	12	14	19	----------	.7	.3	4.3	1.3	.2	.4	3.3
31	.6	----------	16	33	----------	1.3	----------	.7	----------	.2	.4	----------
Total	160.9	830.9	338.2	197.3	493.8	127.8	23.8	10.8	2,922.9	192.9	23.5	1,672.8
Mean	5.19	27.7	10.9	6.36	17.0	4.12	0.79	0.35	97.4	6.22	0.76	55.8
Ac-ft	319	1,650	671	391	979	253	47	21	5,800	383	47	3,320

Calendar year 1963: Max 3,610 Min 0.2 Mean 73.2 Ac-ft 52,980
Water year 1963-64: Max 549 Min 0.1 Mean 19.1 Ac-ft 13,880

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

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

8-825. Brazos River at Seymour, Tex.

Location.--Lat 33°34', long 99°16', near left bank on downstream side of pier of bridge on U. S. Highways 277 and 283, three-quarters of a mile upstream from Wichita Valley Railway bridge, and 1 mile southwest of courthouse in Seymour, Baylor County.

Drainage area.--14,490 sq mi, approximately, of which 9,240 sq mi is probably noncontributing.

Records available.--November 1923 to September 1964.

Gage.--Water-stage recorder and movable wire-weight gage. Wire-weight gage read once daily. Datum of gage is 1,240.97 ft above mean sea level, datum of 1929, supplementary adjustment of 1942.

Average discharge.--40 years (1924-64), 425 cfs (307,700 acre-ft per year).

Extremes.--Maximum discharge during year, 11,700 cfs Sept. 22 (gage height, 6.48 ft); no flow for many days.
1923-64: Maximum discharge, 95,400 cfs Oct. 16, 1926 (gage height, 15.16 ft, from floodmarks), from rating curve defined by current-meter measurements below 48,000 cfs and slope-area measurement of 95,400 cfs; maximum gage height, 21.00 ft Sept. 28, 1955 (discharge, 71,200 cfs); no flow at times.
Since 1906 the maximum stage was that of Sept. 28, 1955, and maximum discharge was that of Oct. 16, 1926. A flood in 1906 reached about the same stage as flood in 1955.

Remarks.--Records fair except those for periods of ice effect, which are poor. Small diversions above station for irrigation and oilfield operation. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	32	73	29	26	20	3.9	0.7	79	5.4	0	0
2	19	27	65	29	26	19	3.3	.7	38	3.6	0	29
3	13	21	57	24	30	17	4.6	.6	16	1.9	0	10
4	*10	18	50	23	144	14	4.3	.2	7.1	.9	0	2.7
5	8.5	16	47	23	187	14	4.3	.2	*5.0	.1	0	.2
6	6.6	12	46	21	122	13	3.9	**.1	3.3	0	0	0
7	5.8	12	42	21	104	12	3.6	1.7	1.7	0	0	0
8	5.0	13	40	18	99	17	3.0	19	0	0	0	0
9	4.3	20	38	18	79	26	*4.1	15	0	*1.7	0	0
10	2.2	35	38	*18	67	18	3.9	74	0	1.7	0	0
11	1.7	41	38	15	57	15	3.9	92	133	.1	0	0
12	1.5	*54	35	15	47	*14	3.6	39	610	0	0	0
13	1.2	42	35	12	46	12	2.7	22	1,500	0	*0	0
14	.9	28	35	10	*42	11	2.7	12	955	0	.1	0
15	.7	21	35	14	38	10	3.0	7.1	525	0	1.3	2.6
16	.7	20	34	17	35	10	3.0	4.6	525	0	7.8	658
17	.4	13	*34	18	34	9.7	3.0	3.0	454	0	5.8	*1,050
18	.2	11	31	14	32	14	2.7	1.7	261	0	2.4	595
19	.2	311	31	14	29	21	2.7	1.2	175	0	0	442
20	2.2	368	31	12	27	18	3.0	.9	117	0	0	348
21	15	373	31	12	26	16	3.0	.6	86	0	0	225
22	109	*378	b30	11	24	14	1.2	.3	54	0	0	4,730
23	222	329	b30	9.1	24	13	.7	.2	83	0	0	3,520
24	114	265	b25	8.5	23	12	2.1	0	100	0	0	1,540
25	180	292	36	8.0	24	11	3.0	0	47	0	0	940
26	181	190	35	8.0	23	9.1	3.9	0	30	0	0	477
27	127	154	34	8.0	22	7.1	2.2	*0	22	0	0	1,250
28	96	122	30	7.5	23	6.2	1.5	.1	15	0	1.1	718
29	71	96	28	18	22	5.0	1.0	.6	9.7	0	0	546
30	56	79	29	31	----------	4.6	.9	10	7.1	0	0	378
31	40	----------	29	26	----------	4.3	----------	80	----------	0	0	----------
Total	1,317.1	3,393	1,172	512.1	1,482	407.0	88.7	387.5	5,858.9	15.4	18.5	17,461.5
Mean	42.5	113	37.8	16.5	51.1	13.1	2.96	12.5	195	0.50	0.60	582
Ac-ft	2,610	6,730	2,320	1,020	2,940	807	176	769	11,620	31	37	34,630

Calendar year 1963: Max 10,100 Min 0 Mean 262 Ac-ft 189,500
Water year 1963-64: Max 4,730 Min 0 Mean 87.7 Ac-ft 63,690

Peak discharge (base, 11,000 cfs)

Date	Time	Gage height	Discharge
9-22	1900	6.48	11,700

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
b Stage-discharge relation affected by ice.

8-827. Millers Creek near Munday, Tex.

Location.--Lat 33°19'45", long 99°27'50", on right bank at downstream side of bridge on Farm Road 1720, 12.7 miles southeast of Munday, Throckmorton County, and 19 miles upstream from Brazos River.
Drainage area.--113 sq mi.
Records available.--July 1963 to September 1964.
Gage.--Water-stage recorder.
Extremes.--1963: Maximum discharge during period July to September, 7.1 cfs July 29 (gage height, 2.50 ft); no flow most of time.
1963-64: Maximum discharge during water year, 54 cfs June 15 (gage height, 4.33 ft); no flow most of time. Maximum stage since at least 1883 occurred on June 13, 1930 (stage unknown), maximum stage since 1930, 18.0 ft in October 1962 but was several feet below the 1930 flood, from information by local resident.
Remarks.--Records good. No diversion above station.

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

1.3	0	2.0	2.5	2.6	8.4	3.4	23
1.4	.1	2.2	4.1	2.8	11	3.8	34
1.6	.5	2.4	6.0	3.0	15	4.3	52
1.8	1.3						

Discharge, in cubic feet per second, July to September 1963

July 29..... 1.0
30..... .4
31..... .2
Aug. 1..... .1

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
July 1963	1.6	1.0	0	0.05	3.2
August	.1	.1	0	.003	.2
September	0	0	0	0	0

Note.--Flow for period occurred only on days listed above. Observations of no flow made on July 12, Aug. 14, Sept. 13.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0			0			0	2.6			0
2		0			0			0	.7			0
3		0			0			0	.2			0
4		0			9.2			0	0			0
5		0			1.6			0	0			0
6		0			.6			0	0			0
7		0			.2			0	0			0
8		0			0			*12	0			0
9		0			0			32	0	(*)		0
10		0			0			12	*0			0
11	(*)	0			0			*3.0	.1			0
12		*0			0			.9	*4.7			0
13		0		(*)	0		(*)	.2	22			0
14		0			0			*0	49			0
15		0			0			0	38			7
16		0			0	(*)		0	9.5			7.4
17		0			*0			0	2.6			*5.4
18		0			0			0	1.0			2.5
19		.2	(*)		0			0	.5			.4
20		.2			0			0	.2		(*)	0
21		0			0			0	0			0
22		.1			0			0	0			11
23		.1			0			0	0			2.8
24		.1			0			0	0			1.5
25		.1			0			0	0			.7
26		0			0			0	0			.1
27		0			0			0	0			0
28		0			0			0	0			0
29		0			0			0	0			0
30		0			---			*1.0	0			0
31		---			---		---	6.7	---			---
Total	0	0.8	0	0	11.6	0	0	67.8	131.1	0	0	38.8
Mean	0	0.03	0	0	0.40	0	0	2.19	4.37	0	0	1.29
Ac-ft	0	1.6	0	0	23	0	0	134	260	0	0	77

Calendar year Max Min Mean Ac-ft
Water year 1963-64: Max 49 Min 0 Mean 0.68 Ac-ft 496

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

8-831. Clear Fork Brazos River near Roby, Tex.

Location.--Lat 32°47'10", long 100°23'15", on right bank at downstream side of pile bent of bridge on State Highway 70, 3.0 miles north of Roby, Fisher County, and 3.2 miles upstream from Cottonwood Creek.

Drainage area.--216 sq mi.

Records available.--December 1961 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,885.09 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 292 cfs June 13 (gage height, 7.43 ft); no flow at times.
1961-64: Maximum discharge, 1,640 cfs Sept. 7, 1962 (gage height, 12.49 ft); no flow at times.
Maximum stage since the 1890s, about 22 ft in May-June 1935, from information by local residents.

Remarks.--Records fair prior to Jan. 27 and good thereafter. No known diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Jan. 27)

1.8	0.1
1.9	.6
2.0	1.9
2.2	6.0
2.6	14
3.0	25
4.0	64
5.0	117
6.0	183

Discharge in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	0.5	0.8	0.9	0.8	1.0	1.0	1.0	0.4	0.4	0.1	0.3
2	.6	.6	.8	.8	.8	1.0	1.1	1.0	*.4	.5	.1	.1
3	*.5	1.0	.8	.7	1.0	1.0	1.3	.8	.4	.4	0	.1
4	.5	1.0	.8	.7	1.1	1.0	1.1	.7	.4	.4	0	0
5	.5	*.8	.8	.9	1.0	.8	1.3	.3	.4	.3	0	0
6	.5	.7	.8	1.0	.8	1.0	1.1	.2	.2	.2	0	0
7	.5	.8	.8	1.0	.7	1.0	1.0	.4	.2	**.2	0	0
8	.5	.8	.7	.8	.7	1.1	1.0	22	.2	.1	0	0
9	.5	.9	.8	.8	.7	1.3	1.1	1.5	.2	.1	0	0
10	.5	.8	1.0	.8	.7	.7	1.3	.2	.2	.1	0	*0
11	.5	.8	*.9	.8	.8	0	1.0	.2	12	.1	*0	0
12	.5	.7	.8	.8	1.0	0	.8	.2	13	.1	0	0
13	.4	.8	.8	.8	1.0	0	.7	.2	128	.1	0	0
14	.4	.7	.8	.8	.5	1.3	.7	.2	76	.1	0	0
15	.4	.8	.8	*.9	.1	2.5	.7	.2	3.2	.1	.1	0
16	.5	.8	.8	.8	0	1.0	.7	.2	1.1	.1	.2	.2
17	.4	.8	.9	.8	0	1.0	.8	.2	.7	.1	.2	.6
18	.2	.8	.8	.8	3.0	1.1	.8	.3	.6	.1	.2	.4
19	.2	1.6	.8	.9	*1.1	1.4	.8	.3	.5	.1	.2	.3
20	.2	.8	.8	.8	1.1	1.0	1.0	.3	.5	.1	.2	.2
21	.2	.7	.9	1.0	1.1	1.0	1.0	.3	.5	.1	.2	.3
22	.1	1.3	1.0	1.0	1.0	1.0	1.5	.3	.5	.1	.3	.4
23	.1	.7	.9	.9	.8	1.1	3.4	.3	.5	.1	.4	.3
24	.1	.7	.9	.9	1.0	1.1	3.4	.3	.5	.1	.4	.3
25	.1	.6	.8	.8	1.0	*.8	1.3	.4	.5	.2	.4	.3
26	.1	.6	.9	.9	.8	.8	1.1	.4	.5	.2	.4	.3
27	.1	.6	.8	*.8	1.0	.8	1.0	.4	.5	.2	.5	.2
28	.2	.6	.8	.7	.8	.8	*1.0	.5	.5	.2	.5	.2
29	.5	.6	.8	.8	.8	.8	1.0	.4	.4	.2	.5	.2
30	.6	.7	1.1	1.1	----------	.8	1.0	.4	.4	.2	.5	.2
31	.6	----------	1.0	1.0	----------	.8	----------	.4	----------	.1	.4	----------
Total	11.6	23.6	26.2	26.5	25.2	29.0	35.0	34.5	243.4	5.4	5.8	4.9
Mean	0.37	0.79	0.85	0.85	0.87	0.94	1.17	1.11	8.11	0.17	0.19	0.16
Ac-ft	23	47	52	53	50	58	69	68	483	11	12	9.7

Calendar year 1963: Max 300 Min 0 Mean 4.42 Ac-ft 3,200
Water year 1963-64: Max 128 Min 0 Mean 1.29 Ac-ft 936

Peak discharge (base, 300 cfs).--No peak above base.
* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--Stage-discharge relationship indefinite Oct. 1-28.

8-832. Lake Sweetwater.--See page 299.

8-833. Elm Creek near Abilene, Tex.

Location.--Lat 32°21'08", long 99°48'27", on right bank at upstream side of bridge on Farm Road 707, 2.8 miles southeast of Caps, and 7.5 miles southwest of Abilene, Taylor County.

Drainage area.--139 sq mi.

Records available.--September 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,804.15 ft above mean sea level (Texas Highway Department bridge plans).

Extremes.--1963: No flow Sept. 12-30.
1963-64: Maximum discharge during water year,1,820 cfs Aug. 16 (gage height, 9.26 ft), from rating curve defined by current-meter measurements below 400 cfs and above by area-velocity study; no flow most of time.
Maximum stage since 1903 unknown, except that flow has been contained within the banks (less than about 24 ft).

Remarks.--Records good except those above 400 cfs, which are fair. Some regulation since 1921 by Lake Abilene (capacity, 9,700 acre-ft). Rain gage located at station.

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

1.24	0	2.0	26
1.3	.2	2.2	45
1.4	1.2	2.5	78
1.5	3.0	3.0	137
1.6	5.5	4.0	265
1.7	8.8	5.0	424
1.8	13	6.0	610

Discharge, in cubic feet per second, water year October 1963to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0		0	0.1	0	0		0	0	0	0
2	0	0	(*)	0	0	0	0		0	0	0	0
3	0	0		0	30	0	0		0	0	0	0
4	0	0		0	*162	0	0		0	0	0	0
5	0	0		0	2.7	0	0		5.0	0	0	0
6	0	0		*0	*.3	0	0		.2	0	0	0
7	0	0		0	0	0	0		0	0	0	0
8	0	0		0	0	0	0		0	0	0	0
9	0	0		0	0	*0	0		0	0	0	0
10	0	0		.3	0	0	0		0	0	0	*0
11	0	0		.2	0	0	0		0	0	0	0
12	0	0		0	0	0	0		53	0	0	0
13	0	0		0	0	0	0		1.6	0	0	0
14	0	0		0	0	0	*0		0	0	0	0
15	0	0		0	0	0	0		0	0	.8	0
16	0	0		0	0	0	0		*0	0	541	0
17	0	0		0	0	0	0		0	0	217	0
18	0	0		0	0	0	0		0	0	5.5	0
19	0	*88		0	0	4.2	0		0	0	.1	0
20	0	*2.2		0	0	0	0	(*)	0	*0	0	6.2
21	0	.2		0	0	0	0		0	0	.1	43
22	*0	4.7		0	0	0	22		0	0	0	4.8
23	0	.9		0	0	0	*8.3		0	0	0	**37
24	32	0		0	0	0	1.7		0	0	0	22
25	.4	0		0	0	0	0		0	0	*0	.5
26	0	0		0	0	0	128		0	0	0	0
27	0	0		0	0	0	1.7		0	0	9.0	0
28	0	0		0	0	0	.1		0	0	24	0
29	0	0		0	0	0	0		0	6.6	44	0
30	0	0		42	----------	0	0		0	11	29	0
31	0	----------		2.1	----------	0	----------		----------	*1.1	*.6	----------
Total	32.4	96.0	0	44.6	195.1	4.2	161.8	0	59.8	18.7	871.1	113.5
Mean	1.05	3.20	0	1.44	6.73	0.14	5.39	0	1.99	0.60	28.1	3.78
Ac-ft	64	190	0	88	387	8.3	321	0	119	37	1,730	225

Calendar year Max Min Mean Ac-ft
Water year 1963-64: Max 541 Min 0 Mean 4.36 Ac-ft 3,170

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
2- 4	0500	5.78	570
8-16	1100	9.26	1,820
8-17	1400	7.15	890

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

8-835. Fort Phantom Hill Reservoir.--See page 299.

8-840. Clear Fork Brazos River at Nugent, Tex.

Location.--Lat 32°41'25", long 99°40'10", on right bank 33 ft downstream from bridge on Farm Road 1193 at Nugent, Jones County, 2 miles downstream from Elm Creek, and 4 miles upstream from Deadman Creek.

Drainage area.--2,220 sq mi.

Records available.--February 1924 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,531.91 ft above mean sea level (levels by Brazos River Authority). Prior to Dec. 12, 1933, staff gage at site 575 ft downstream at same datum.

Average discharge.--40 years, 124 cfs (89,770 acre-ft per year).

Extremes.--Maximum discharge during year, 645 cfs Aug. 17 (gage height, 4.50 ft, from floodmark); no flow at times.

1924-64: Maximum discharge observed, 47,000 cfs Sept. 8, 1932 (gage height, 27.05 ft, site then in use), from rating curve defined by current-meter measurements below 25,000 cfs; no flow at times.

Maximum stage, 30 ft in 1876; floods in 1900 and May 1923 reached stages of 24 and 24.5 ft, respectively, from information by local residents.

Remarks.--Records good except for periods of no gage-height record, which are fair. Some regulation by reservoirs in Elm Creek basin (see p. 299) and Lakes Sweetwater and Trammel in Sweetwater Creek basin, which have a combined capacity of about 114,700 acre-ft. Diversions above station for municipal supply and oilfield operation materially affect low flow. The city of Abilene reported that during the year 595 acre-ft of water was diverted into Fort Phantom Hill Reservoir (see p. 299) from the river above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 19-30)

1.4	0.2	2.0	35
1.5	1.3	2.3	70
1.6	4.0	2.6	120
1.7	8.9	3.0	205
1.8	16	4.0	485

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	2.0	3.4	5.8	6.7	5.3	4.0	5.3	3.4	0.4	0	32
2	.2	1.7	*3.7	6.2	11	5.3	4.0	4.4	3.6	.4	0	12
3	.3	1.3	3.4	6.2	20	5.3	4.0	4.0	4.4	.2	0	5.3
4	1.2	2.4	3.4	6.2	90	4.8	4.4	3.6	4.4	.1	0	2.4
5	.5	2.0	3.4	6.2	23	5.8	4.4	3.0	4.0	0	0	1.7
6	.2	3.0	3.6	*5.8	*11	5.8	3.6	2.0	13	0	0	.5
7	.2	2.8	4.0	4.8	11	5.3	3.0	1.7	7.8	0	0	0
8	.2	5.5	4.0	4.4	8.3	5.3	2.4	1.3	4.8	0	a0	0
9	.2	3.6	4.0	4.0	7.8	6.7	2.0	3.6	3.4	0	a0	0
10	.9	2.8	5.3	4.0	7.2	5.8	2.2	5.8	2.4	0	a0	0
11	2.4	2.8	5.8	3.6	7.2	*5.5	2.8	4.4	2.2	0	a0	0
12	2.4	3.0	5.8	3.6	6.7	8.3	2.8	6.6	3.9	0	a0	0
13	2.4	2.8	5.8	3.6	7.2	5.8	2.8	6.7	7.1	0	a0	.3
14	2.8	2.4	5.8	3.6	7.2	4.8	*2.2	4.4	58	0	a50	.9
15	2.8	2.2	5.8	3.6	6.2	4.4	2.2	4.0	26	0	a20	.9
16	3.4	2.8	5.8	3.6	6.2	4.0	2.4	3.6	*115	0	a10	.8
17	3.4	3.0	5.8	3.6	5.8	4.0	2.4	2.2	26	0	a400	.9
18	3.6	3.0	5.8	4.0	5.8	4.4	2.4	1.5	11	0	a150	.9
19	4.0	8.4	5.8	3.6	5.3	6.7	3.0	.4	7.2	0	a80	.9
20	4.0	6.2	6.2	4.0	5.3	5.8	2.8	** .2	4.8	* 0	a45	1.3
21	4.0	18	6.2	4.4	6.2	14	2.0	.2	3.4	0	a30	25
22	3.4	14	6.2	4.8	6.2	9.5	2.2	.3	1.2	0	a20	14
23	6.8	6.7	6.2	4.8	6.2	6.2	61	0	.2	0	a10	56
24	3.4	4.0	6.2	4.4	5.8	5.3	172	0	0	0	a6	16
25	1.3	3.6	5.8	4.4	5.8	4.0	40	0	0	0	*4.0	6.7
26	.4	3.4	5.8	4.4	5.3	4.0	13	0	0	0	2.2	4.4
27	.4	3.6	5.8	4.8	5.3	3.6	142	0	0	0	.8	4.0
28	5.4	4.4	5.8	4.8	5.3	3.4	35	0	0	0	0	3.0
29	7.2	4.0	5.8	7.6	5.3	3.6	10	0	0	0	70	2.2
30	4.8	3.6	5.8	15	----------	3.6	6.7	.1	.1	0	268	2.0
31	3.0	----------	5.8	8.3	----------	3.6	----------	1.3	----------	0	*110	----------
Total	75.3	129.0	162.0	158.1	310.3	169.9	543.7	70.6	317.3	1.1	1,276.0	194.1
Mean	2.43	4.30	5.23	5.10	10.7	5.48	18.1	2.28	10.6	0.04	41.2	6.47
Ac-ft	149	256	321	314	615	337	1,080	140	629	2.2	2,530	385

Calendar year 1963: Max 1,220 Min 0 Mean 31.9 Ac-ft 23,060
Water year 1963-64: Max 400 Min 0 Mean 9.31 Ac-ft 6,760

Peak discharge (base, 2,300 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
a No gage-height record.

8-845. Lake Stamford.--See page 299.

8-848. California Creek near Stamford, Tex.

Location.--Lat 32°55'50", long 99°38'30", on right bank at downstream side of bridge on Farm Road 142, 9 miles east of Stamford, Jones County, and 17 miles upstream from Paint Creek.

Drainage area.--465 sq mi.

Records available.--October 1962 to September 1964.

Gage.--Water-stage recorder and wire-weight gage read once daily.

Extremes.--Maximum discharge during year, 412 cfs June 12 (gage height, 11.77 ft); no flow for many days.
1962-64: Maximum discharge, 2,350 cfs May 24, 1963 (gage height, 20.73 ft); no flow at times.
Maximum stage known since at least 1897, 29.6 ft June 10, 1962 (from floodmark); flood of July 1961 (stage unknown) was second highest. Other large floods are reported to have occurred in June 1909, June 24, 1915, May 1957; flood of September 1962 reached a stage of 28.1 ft; from information by local residents.

Remarks.--Records good. Three small diversions above station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 22 to Feb. 3, May 11 to June 12, June 22-24)

6.0	0	6.5	5.0
6.1	.1	6.6	8.0
6.2	.4	7.0	24
6.3	1.2	8.0	74
6.4	2.8	9.0	135

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.1	0.1	0.6	1.5	0.7	0.4	0.4	0.1		0	0
2	.1	.1	.1	.5	1.6	.7	.4	.4	0		0	0
3	.1	.1	.1	.4	2.8	.6	.4	.4	0		0	0
4	.1	.1	.1	.5	26	.7	.3	.3	0		0	0
5	.1	.1	.1	.6	23	.7	.3	.3	0		0	0
6	.1	.1	.1	.6	15	1.0	.3	.5	0		0	0
7	.1	.1	.1	.7	6.0	.7	.5	.6	0		0	0
8	.1	.4	.1	.6	3.6	.9	.4	6.4	0		0	0
9	.1	2.8	.1	.6	2.8	4.7	.3	4.3	0		0	0
10	.1	1.2	.3	.5	2.1	1.4	.2	25	0		0	0
11	*.1	.5	.3	.5	1.6	1.0	.3	*33	0		0	0
12	.1	.3	.3	.5	1.4	.8	.6	5.9	*98		0	0
13	.1	*.4	.4	.6	1.4	.8	*.4	1.5	74		0	0
14	.1	.7	.4	*.7	1.2	.8	.4	.3	107		0	0
15	.1	.5	.4	.8	1.0	.7	.4	.2	54	(*)	0	1.8
16	.1	.5	.4	.7	.9	.7	.4	.1	13		0	3.8
17	.1	.6	.5	.5	.9	.7	.3	0	12		0	.5
18	.1	.6	*.5	.5	1.0	*.9	.2	0	7.2		0	.1
19	.1	1.7	.6	.7	*.9	2.5	.2	0	3.0		*0	.1
20	.1	2.9	.6	1.1	.9	1.6	.4	0	1.0		0	.1
21	.1	2.6	.6	.9	.9	1.1	.4	0	.1		0	5.8
22	.1	4.2	.6	1.1	.9	1.2	.4	0	.1		7.2	1.0
23	.1	.8	.6	1.4	.9	.9	.4	0	.1		.3	.4
24	.1	.5	.5	1.6	.9	.9	.4	0	0		0	.2
25	.1	.4	.6	1.4	.9	1.1	.4	0	0		0	*.1
26	.1	.3	.7	1.4	.9	.8	.5	0	0		0	.1
27	.1	.2	.7	1.4	.8	.7	.7	.4	0		0	.1
28	.1	.2	.5	2.1	.7	.6	1.2	7.1	0		0	.1
29	.1	.1	.5	3.4	.7	.5	.8	11	0		0	.1
30	.1	.1	.6	8.1	----------	.5	.5	3.1	0		0	.1
31	.1	----------	.6	1.8	----------	.4	----------	.3	----------		0	----------
Total	3.1	23.2	12.1	36.8	103.2	31.3	12.8	101.5	369.6	0	7.5	14.4
Mean	0.10	0.77	0.39	1.19	3.56	1.01	0.43	3.27	12.3	0	0.24	0.48
Ac-ft	6.1	46	24	73	205	62	25	201	733	0	15	29

Calendar year 1963: Max 1,700 Min 0 Mean 30.0 Ac-ft 21,730
Water year 1963-64: Max 107 Min 0 Mean 1.95 Ac-ft 1,420

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

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

8-855. Clear Fork Brazos River at Fort Griffin, Tex.

Location.--Lat 32°56', long 99°13', on right bank just downstream from pier of bridge on old Fort Griffin-Throckmorton road, half a mile northeast of Fort Griffin, Shackelford County, 5,100 ft upstream from bridge on U. S. Highway 283, and 1.3 miles upstream from Mill Creek.

Drainage area.--3,974 sq mi.

Records available.--December 1923 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,174.09 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942. Prior to June 23, 1932, chain gage at same site and datum.

Average discharge.--40 years (1924-64), 244 cfs (176,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,070 cfs Feb. 4 (gage height, 5.54 ft); no flow at times.
1923-64: Maximum discharge, 33,600 cfs Sept. 10, 1932 (gage height, 35.09 ft); no flow at times each year. Maximum stage since 1876, 38.0 ft in September 1900; flood in July 1876 was probably higher; from information by local residents.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Some regulation by reservoirs (total combined capacity, 177,800 acre-ft) as follows: Elm Creek basin (combined capacity, 98,230 acre-ft), Sweetwater Creek basin (combined capacity, 16,450 acre-ft), Lake Penick (capacity, 3,100 acre-ft), and Lake Stamford (capacity, 60,000 acre-ft). Diversions above station for irrigation, municipal supply, and oilfield operations materially affect low flow.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 12 to Apr. 4, June 19 to July 15, Aug. 15-22)

1.5	0	2.3	31
1.6	.1	2.6	72
1.7	.6	3.0	152
1.8	2.0	3.5	290
1.9	4.7	4.0	460
2.0	8.6	5.0	870
2.1	14		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.3	4.7	7.3	18	11	24	41	3.5	1.8	0	47
2	.1	.2	6.9	7.7	25	11	24	25	3.5	1.6	0	104
3	.1	.2	6.1	7.3	40	10	23	18	3.8	1.6	0	47
4	0	.2	5.1	7.3	583	10	21	15	3.8	1.6	0	26
5	0	.2	4.7	6.9	178	10	20	12	a 3	1.6	0	18
6	0	.2	4.7	6.9	236	11	18	10	a 3	1.5	0	13
7	0	.1	4.1	6.5	117	12	15	9.0	a 2	1.2	0	10
8	0	.2	3.8	6.5	81	12	12	12	a 2	.9	0	6.9
9	0	.4	3.8	6.9	53	13	9.5	13	a 2	.8	0	5.4
10	0	.4	4.7	6.9	39	13	8.2	13	a 1	.6	0	4.1
11	*0	.3	6.1	6.5	33	13	8.2	*10	a 1	.4	0	3.0
12	0	.2	6.1	6.5	28	13	8.6	8.6	* .8	.2	0	2.3
13	0	.2	5.8	6.1	25	13	7.7	6.9	101	.1	0	1.8
14	0	.2	5.8	6.1	22	17	6.9	17	98	.1	0	2.5
15	0	.2	8.2	*6.5	21	18	*6.1	26	127	0	.7	4.4
16	0	**.2	9.5	6.5	20	16	6.1	18	110	*0	1.0	4.7
17	0	.2	*9.5	6.5	20	15	6.1	13	83	0	.8	3.8
18	0	.2	8.6	6.5	18	*16	6.1	9.5	59	0	.2	3.0
19	0	19	8.6	6.5	*18	19	6.1	7.3	52	0	*0	2.3
20	0	18	8.2	6.1	18	19	6.1	5.8	27	0	30	2.3
21	0	5.8	7.7	5.8	17	19	6.1	5.1	18	0	16	*4.3
22	0	3.5	7.3	5.8	16	19	6.1	4.7	11	0	22	4.4
23	0	1.8	7.3	6.1	16	21	6.1	3.8	7.7	0	21	4.7
24	.1	1.5	6.9	6.9	16	26	5.8	3.5	4.4	0	56	5.1
25	.1	1.3	6.5	7.3	15	25	5.8	3.3	2.8	0	47	4.7
26	.6	1.2	6.1	8.6	14	28	38	3.0	2.0	0	27	4.1
27	.8	1.0	6.1	8.2	13	32	77	3.5	1.8	0	18	22
28	.5	1.0	6.5	6.9	13	29	43	3.5	1.6	0	13	43
29	.4	1.2	6.9	6.9	12	27	26	3.5	1.8	0	9.0	23
30	.4	1.2	7.3	27	----------	25	62	3.8	1.8	0	7.3	17
31	.3	----------	7.3	23	----------	24	----------	3.5	----------	0	5.4	----------
Total	3.5	60.6	200.9	246.5	1,725	547	518.6	331.3	739.3	14.0	274.4	443.8
Mean	0.11	2.02	6.48	7.95	59.5	17.6	17.3	10.7	24.6	0.45	8.85	14.8
Ac-ft	6.9	120	398	489	3,420	1,080	1,030	657	1,470	28	544	880

Calendar year 1963: Max 4,350 Min 0 Mean 90.7 Ac-ft 65,650
Water year 1963-64: Max 583 Min 0 Mean 13.9 Ac-ft 10,120

Peak discharge (base, 3,900 cfs).--No peak above base.

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
a No gage-height record.

8-860.15. Hubbard Creek near Sedwick, Tex.

Location.--Lat 32°36'05", long 99°14'25", at downstream side of bridge on county road, 1.0 mile upstream from Reynolds Creek, and 2.2 miles west of Sedwick, Shackelford County.

Drainage area.--127 sq mi.

Records available.--October 1963 to September 1964.

Gage.--Water-stage recorder. Altitude of gage is 1,310 ft, from AMS topographic map.

Extremes.--Maximum discharge during year, 437 cfs Nov. 19 (gage height, 4.87 ft); no flow most of time. Maximum stage since at least 1941, about 21 ft in 1959. Flood in 1941 was slightly lower.

Remarks.--Records good. No known regulation or diversion.

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

2.1	0	2.8	9.3
2.2	.1	3.0	19
2.3	.4	3.2	34
2.4	1.0	3.5	70
2.5	2.0	3.8	130
2.6	3.6	4.1	205
2.7	6.0		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0		0	0.2				0		0	0
2	0	0		0	.1				0		0	0
3	0	0	(*)	0	.4				0		0	0
4	0	0		0	*152				0		0	0
5	0	0		0	32				0		0	0
6	0	0		0	19				0		0	0
7	0	0		*0	9.3				0		0	0
8	*0	17		0	4.2				0		0	0
9	0	5.9		0	2.3	(*)			0		0	0
10	0	.5		0	1.0				0		0	0
11	0	.1		0	.5				0		0	0
12	0	*0		0	.2				.1		0	0
13	0	0		0	.1		(*)		0		0	0
14	0	0		0	.1				0		0	0
15	0	0		0	0				*0		0	0
16	0	0		0	0				0		0	.2
17	0	0		0	0				0		0	0
18	0	0		0	0			(*)	0		0	0
19	0	*159		0	0				0		0	.3
20	0	*24		0	0				0		0	.2
21	0	* 4.1		0	0				0	(*)	0	4.4
22	0	2.6		0	0				0		.1	.4
23	* 1.4	1.0		0	0				0		0	0
24	31	.3		0	0				0		*0	0
25	.7	0		0	0				0		0	0
26	0	0		0	0				0		0	0
27	0	0		0	0				0		0	0
28	0	0		0	0				0		0	0
29	0	0		0	0				0		0	0
30	0	0		.6	---				0		0	0
31	0	---		.6	---		---		---		0	---
Total	33.1	214.5	0	0.8	221.4	0	0	0	0.1	0	0.1	5.5
Mean	1.07	7.15	0	0.03	7.63	0	0	0	0.003	0	0.003	0.18
Ac-ft	66	425	0	1.6	439	0	0	0	0.2	0	0.2	11

Calendar year Max Min Mean Ac-ft
Water year 1963-64: Max 159 Min 0 Mean 1.30 Ac-ft 943

Peak discharge (base, 300 cfs)

Date	Time	Gage height	Discharge
11-19	1100	4.87	437
2- 4	0900	4.61	348

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

Note.--Gage height from graph based on gage readings Feb. 5-29.

8-860.5. Deep Creek at Moran, Tex.

Location.--Lat 32°33'35", long 99°10'05", at downstream side of bridge on U. S. Highway 380, 0.8 mile northwest of Moran, Shackelford County, 1.4 miles upstream from Post Oak Creek, and 9.5 miles upstream from Hubbard Creek.

Drainage area.--235 sq mi.

Records available.--October 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,296.21 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 1,640 cfs Nov. 19 (gage height, 7.28 ft); no flow at times.
1962-64: Maximum discharge, 6,560 cfs May 30, 1963 (gage height, 15.66 ft); no flow at times.
Maximum stage since 1888, 25.6 ft June 6, 1961, from floodmark. Flood in 1888 reached about the same stage.

Remarks.--Records good. Recording rain gage located at this station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 9, 20-22, Jan. 30 to Feb. 1, Feb. 3-6, Mar. 9-11, Apr. 5-15, 19-24, Apr. 26 to May 6, Aug. 18, 22-26, Sept. 16-30)

1.1	0	2.0	11
1.2	.1	2.2	19
1.3	.2	2.5	40
1.4	.5	2.9	84
1.5	1.1	3.4	170
1.6	2.0	4.0	322
1.7	3.3	5.0	680
1.8	5.1		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0.1	0.1	8.3	0.2	0.1	0.4			0	0.1
2	0	0	.1	.1	2.6	.2	.1	.2			0	*0
3	0	0	**.1	.1	1.9	.1	.1	.1			0	0
4	0	0	.1	.1	166	.1	.1	.1			0	0
5	0	0	.1	.1	*58	.1	.2	.1			0	0
6	0	0	.1	.1	14	.2	.2	0			0	0
7	0	0	.1	.1	4.5	.1	.1	0			0	0
8	0	0	.1	.1	2.1	.1	.1	0			0	0
9	0	17	.1	.1	1.0	**4.4	.1	0			0	0
10	0	5.1	.2	.1	.6	14	.1	0			0	0
11	0	1.2	.2	.1	.4	3.4	.1	0			0	0
12	0	*.4	.2	0	.4	.9	.1	0			0	0
13	0	.2	.2	0	.4	.4	**.1	0			0	0
14	0	.1	.2	0	.3	.2	.1	0			0	0
15	0	0	.2	0	.2	.1	0	0	(*)		0	0
16	0	0	.2	.1	.2	**.1	0	0			374	1.9
17	0	0	.2	*.2	.1	.1	0	0			379	.9
18	0	0	.1	.1	.1	.1	0	*0			100	.2
19	0	484	.1	.1	.2	.3	.1	0			15	.3
20	0	*67	.2	.1	.2	.1	.2	0			5	1.4
21	0	12	.2	.1	.2	.1	.1	0		(*)	3	11
22	0	5.5	.2	.1	.2	.1	.1	0			62	*6.5
23	*0	2.3	.2	.1	.2	.1	.1	0			83	3.8
24	9.8	1.1	.2	.1	.2	.1	0	0			*9.1	1.4
25	.7	.6	.2	.1	.2	.1	0	0			1.6	.7
26	.2	.5	.1	.1	.2	.1	23	0			.4	.3
27	0	.4	.1	.1	.2	.1	15	0			.4	.4
28	0	.5	.1	.1	.1	.1	2.6	0			.3	.3
29	0	.3	.1	.2	.1	.1	1.0	0			.2	.2
30	0	.2	.1	13	----------	.1	.5	0			.2	.1
31	0	----------	.1	36	----------	.1	----------	0	----------		.1	----------
Total	10.7	598.4	4.5	51.7	263.1	26.3	44.3	0.9	0	0	1,033.3	29.5
Mean	0.35	19.9	0.15	1.67	9.07	0.85	1.48	0.03	0	0	33.3	0.98
Ac-ft	21	1,190	8.9	103	522	52	88	1.8	0	0	2,050	59

Calendar year 1963: Max 2,330 Min 0 Mean 13.8 Ac-ft 9,990
Water year 1963-64: Max 484 Min 0 Mean 5.64 Ac-ft 4,100

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
11-19	1600	7.28	1,640
8-16	0330	6.84	1,410
8-17	1500	6.86	1,460

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record Dec. 23 to Jan. 6, Jan. 13-16, Aug. 19-21, Aug. 27 to Sept. 1.

8-861. Hubbard Creek near Albany, Tex.

Location.--Lat 32°41'25", long 99°09'25", on right bank 348 ft upstream from bridge on Farm Road 601, 1.1 miles downstream from Deep Creek, 3.3 miles upstream from Salt Prong Hubbard Creek, 8.1 miles southeast of Albany, Shackelford County, and about 19 miles upstream from Hubbard Creek Reservoir.

Drainage area.--461 sq mi.

Records available.--February 1962 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,224.1 ft above mean sea level (Texas Highway Department survey). Prior to Mar. 20, 1962, staff gage at same site and datum.

Extremes.--Maximum discharge during year, 5,780 cfs Nov. 8 (gage height, 8.54 ft); no flow most of time.
1962-64: Maximum discharge, that of Nov. 8, 1963; no flow at times each year.
Maximum stages since 1897, about 26 ft in 1899 and 20.3 ft in June 1961.

Remarks.--Records good. Record of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

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

1.06	0	1.7	48
1.2	.1	1.8	89
1.3	.6	2.0	204
1.4	2.6	2.4	525
1.5	8.4	2.8	948
1.6	21	3.2	1,460

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	1.1	0	g28	0.1	0	0.3			0	0
2	0	0	*.5	0	g13	.1	0	.1			0	0
3	0	0	.1	0	g5.9	.1	0	0			0	0
4	0	0	.1	0	g310	.1	.8	0			0	0
5	0	0	0	0	g200	.1	18	0			0	0
6	0	0	0	*0	54	.1	4.0	0			0	0
7	0	0	0	0	27	0	1.3	0			0	0
8	0	1,370	0	0	16	0	.3	0			0	0
9	0	145	0	0	10	.1	.1	0			0	0
10	0	20	0	0	7.2	6.1	0	0			0	0
11	0	9.6	0	0	4.0	*9.0	0	0			0	0
12	0	3.1	0	0	3.1	7.2	0	0			0	0
13	0	*1.3	0	0	2.2	4.9	0	0			0	0
14	0	.2	0	0	1.9	2.2	*0	0			0	0
15	0	.1	0	0	1.5	1.1	0	0			0	0
16	0	.1	0	0	.8	.8	0	0	(*)		186	0
17	0	0	0	0	.5	*.4	0	0			294	0
18	0	0	0	0	.2	.2	0	0			103	2.8
19	0	1,230	0	0	.2	.7	0	*0			19	451
20	0	*238	0	0	.1	.5	0	0			5.9	99
21	0	39	0	0	.1	.4	0	0		(*)	3.5	*60
22	*0	34	0	0	.1	.3	0	0			68	89
23	0	19	0	0	.1	.2	0	0			162	*52
24	61	7.8	0	0	.1	.2	0	0			14	7.2
25	17	4.9	0	0	.1	.1	0	0			*5.4	3.1
26	4.6	3.1	0	0	.1	.1	0	0			1.9	1.0
27	.7	2.2	0	0	.1	0	20	0			.5	.8
28	.1	5.6	0	0	.1	0	6.8	0			.1	3.1
29	0	4.7	0	.2	.1	0	2.2	0			.7	1.3
30	0	2.8	0	g97		0	.7	0			.6	.5
31	0		0	g112		0		0			.1	
Total	83.4	3,140.5	1.8	209.2	686.5	36.0	54.2	0.4	0	0	864.7	770.8
Mean	2.69	105	0.06	6.75	23.7	1.16	1.81	0.01	0	0	27.9	25.7
Ac-ft	165	6,230	3.6	415	1,360	71	108	0.8	0	0	1,720	1,530

Calendar year 1963: Max 1,810 Min 0 Mean 26.0 Ac-ft 18,840
Water year 1963-64: Max 1,370 Min 0 Mean 16.0 Ac-ft 11,600

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
11- 8	1400	8.54	5,780	2- 4	unknown	2.95	1,130
11-19	1800	3.94	2,640	8-17	1900	3.10	1,330

* Discharge measurement or observation of no flow made on this day.
g Record based on once-daily gage readings.

8-861.2. Salt Prong Hubbard Creek at U. S. Highway 380, near Albany, Tex.

Location.--Lat 32°40'50", long 99°16'05", on left bank 448 ft downstream from bridge on U. S. Highway 380, 1.4 miles upstream from North Fork Hubbard Creek, and 3.0 miles southeast of Albany, Shackelford County.

Drainage area.--65.2 sq mi.

Records available.--October 1962 to September 1963 (low-flow partial record only), October 1963 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,347.24 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 217 cfs Nov. 19 (gage height, 2.07 ft); no flow most of time.

Remarks.--Records fair. Some regulation by Lake McCarty (capacity, 4,000 acre-ft in 1942). Records of chemical analyses and water temperatures are available in the Austin District Office.

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

1.3	0
1.4	3.3
1.5	20
1.6	43
1.7	72
1.8	106

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0	0.5	0.5	0.5	0	0.2	0.5			
2		0	.1	.2	.2	.3	.2	.2	.3			
3	(*)	0	*.1	.1	.7	.3	.2	.1	.2			
4		0	.1	.2	74	.5	14	.2	.1			
5		0	.1	.2	7.0	.2	1.5	0	.2			
6		0	.1	.3	4.4	.1	1.0	0	.2			
7		0	.1	.1	1.5	.7	.7	0	.1			
8		13	.2	.1	1.5	.7	.7	3.3	0			
9		1.5	.1	.3	.7	.7	1.0	1.0	0			
10		.5	.1	.1	.7	.2	1.0	.2	0			
11		.3	.3	0	.7	.3	.7	.2	0			
12		.1	.3	.2	.5	.3	.5	.2	.1			
13		* 0	.3	.2	.7	.1	**.7	.2	.2			
14		0	.3	.2	.7	.3	*.7	.2	.1			
15		0	.3	.2	.3	.2	.5	.1	*0			
16		0	.3	.2	.5	* .3	.3	.2	0			
17		0	.1	.2	.3	.3	.3	.1	0			
18		0	.2	.2	.5	.5	.5	.1	0			
19		*52	.2	0	.5	.3	.4	**.1	0			
20		*1.5	.3	0	.5	.5	.3	.1	0			
21		.2	.3	0	.5	.5	.7	.1	0	(*)		
22		.3	.3	0	.5	.3	**.7	0	0			
23	(*)	.5	.3	.2	.5	.2	.5	0	0			
24		.2	.3	.1	.5	.3	.5	0	0		(*)	
25		.1	.2	.1	.3	.5	.7	0	0			
26		.1	.2	.1	.5	.5	.2	0	0			
27		.2	.3	.1	.5	.3	.1	0	0			
28		.3	.5	.2	.7	.3	.2	.1	0			
29		.3	.7	.3	.2	.3	.3	.1	0			
30		.1	.7	2.3	----------	.3	.2	.7	0			
31		----------	.5	1.0	----------	.3	----------	.7	----------			----------
Total	0	71.2	7.9	7.9	100.6	11.1	29.3	8.4	2.0	0	0	0
Mean	0	2.37	0.25	0.25	3.47	0.36	0.98	0.27	0.07	0	0	0
Ac-ft	0	141	16	16	200	22	58	17	4.0	0	0	0

Calendar year Max Min Mean Ac-ft
Water year 1963-64: Max 74 Min 0 Mean 0.65 Ac-ft 474

Peak discharge (base, 200 cfs)

Date	Time	Gage height	Discharge
11-19	0800	2.07	217

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

8-861.5. North Fork Hubbard Creek near Albany, Tex.

Location.--Lat 32°42'20", long 99°16'20", on downstream side of bridge on U. S. Highway 380, 1.6 miles upstream from Salt Prong Hubbard Creek, and 1.7 miles southeast of Albany, Shackelford County.

Drainage area.--38.4 sq mi.

Records available.--November 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,340.54 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 269 cfs Feb. 4 (gage height, 4.37 ft); no flow at times.
1962-64: Maximum discharge, that of Feb. 4, 1964; no flow at times.
Historical flood information begins in 1940. Floods of June 10, 1940, and July 18, 1953, reached stages of about 21 ft, from information by local residents.

Remarks.--Records good except those for period of no gage-height record and those above 100 cfs, which are fair. No diversion above station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 11-18, 21-24, Apr. 4-23, May 1 to Aug. 22)

2.1	0	2.7	12
2.2	.2	2.8	18
2.3	.8	3.0	38
2.4	1.8	3.4	86
2.5	3.6	3.8	148
2.6	6.7		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.1	0.2	0.2	0.8	0.6	0.6	g 0.6	0.5	0.1	0	0.1
2	.1	.1	.2	.2	.8	.6	.6	g .6	.4	.1	0	0
3	.1	.1	** .2	.2	12	.5	4.1	g .6	.4	.1	0	0
4	.1	.1	.2	.2	*140	.5	3.6	g .6	.4	.1	0	0
5	.1	.1	.2	.2	30	.5	2.0	g .5	.8	.1	0	0
6	.1	.1	.2	** .2	18	.5	.8	g .5	.5	.1	0	0
7	.1	.1	.2	.2	10	.5	.8	g .5	.4	.1	0	0
8	0	8.2	.2	.2	6.7	.7	.8	g 39	.4	.1	0	0
9	0	.6	.2	.2	4.9	9.4	.8	g 3.1	.3	.1	0	0
10	0	.1	1.3	.2	3.6	* 2.9	.8	g .8	.3	.1	0	0
11	0	.1	.2	.2	2.6	1.3	.7	g .7	.3	.1	0	0
12	0	.1	.2	.2	2.2	.9	* .7	g .7	*3.3	.1	0	0
13	0	* .1	.2	.2	2.6	.8	* .6	g .5	.5	.1	0	0
14	0	.1	.2	.2	2.1	.8	.6	g .5	.3	.1	0	0
15	0	.1	.2	.2	1.9	.7	.5	g .4	.3	.1	0	0
16	0	.1	.2	.2	1.4	* .7	.5	g .4	*.3	0	0	.2
17	0	.1	.2	.2	1.3	.6	.5	g .4	.3	0	0	.2
18	0	.1	.2	.2	1.2	.8	.5	* .3	.2	0	0	.1
19	0	*43	.2	.2	1.1	4.5	.5	.3	.2	0	0	.1
20	0	3.5	.2	.2	1.1	2.2	.6	.3	.2	*0	0	.1
21	0	* .7	.2	.2	1.0	1.2	1.4	.3	.2	0	0	7.1
22	.1	1.9	.2	.2	.9	1.0	.6	.3	.2	0	1.6	5.8
23	** .1	.4	.2	.3	1.1	1.0	.8	.3	.2	0	.2	.5
24	.2	.2	.2	.3	1.0	1.0	.8	.3	.2	0	**.1	.4
25	.1	.2	.2	.3	.9	1.0	.8	.3	.2	0	.1	.3
26	.1	.2	.2	.3	.8	.9	.8	.3	.2	0	0	.3
27	.1	.2	.2	.3	.7	.9	.7	.4	.2	0	.1	.4
28	0	.3	.2	.3	.6	.8	.7	.5	.2	0	.1	.3
29	0	.2	.2	2.9	.6	.8	.7	.5	.2	0	.1	.3
30	.1	.2	.2	6.4	----------	.8	.7	13	.1	0	.1	.3
31	.1	----------	.2	1.2	----------	.7	----------	3.6	----------	0	.1	----------
Total	1.5	61.4	6.3	16.5	251.9	40.1	28.6	71.1	12.2	1.5	2.5	16.5
Mean	0.05	2.05	0.20	0.53	8.69	1.29	0.95	2.29	0.41	0.05	0.08	0.55
Ac-ft	3.0	122	12	33	500	80	57	141	24	3.0	5.0	33

Calendar year 1963: Max 43 Min 0 Mean 0.72 Ac-ft 523
Water year 1963-64: Max 140 Min 0 Mean 1.39 Ac-ft 1,010

Peak discharge (base, 100 cfs)

Date	Time	Gage height	Discharge
11-19	0700	3.78	144
2- 4	0200	4.37	269

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
g From graph based on gage readings.
Note.--No gage-height record Feb. 19-23, Mar. 25 to Apr. 4, Apr. 24-30.

8-862.1. Snailum Creek near Albany, Tex.

Location.--Lat 32°43'15", long 99°10'30", on right bank 196 ft upstream from county low-water crossing 0.6 mile upstream from Salt Prong Hubbard Creek, and 6.6 miles east of Albany, Shackelford County.

Drainage area.--25.5 sq mi.

Records available.--October 1962 to September 1963 (low-flow partial record only), October 1963 to September 1964.

Gage.--Water-stage recorder. Altitude of gage is 1,260 ft (AMS topographic map).

Extremes.--Maximum discharge during year, 468 cfs Feb. 4 (gage height, 6.05 ft), from rating curve defined by current-meter measurements below 100 cfs; no flow most of time.

Remarks.--Records good except those for period of no gage-height record and those above 100 cfs, which are fair. No known regulation or diversion above station. Records of chemical analyses and water temperatures are available in the Austin District Office.

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

3.77	0	4.2	11
3.8	.1	4.4	26
3.9	.6	4.7	56
4.0	2.2	5.0	103
4.1	5.6	5.3	175

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.1	0	0.5	0.1	0	0	0.1			
2		0	*0	0	.2	.1	0	0	0			
3		0	0	0	.2	.1	0	0	0			
4		0	0	0	154	.1	0	0	0			
5		0	0	0	7.6	.1	0	0	0			
6		0	0	*0	1.8	.1	0	0	0			
7		0	0	0	.8	.1	0	0	0			
8		a 22	0	0	.6	.1	0	.7	0			
9		a 4.4	0	0	.4	.3	0	.3	0			
10	(*)	a 0	0	0	.3	**.3	0	.1	0			
11		a 0	0	0	.3	.2	0	0	0			
12		*0	0	0	.3	.2	0	0	0			
13		0	0	0	.3	.2	0	0	.1			
14		0	0	0	.3	.1	*0	0	0			
15		0	0	0	.2	.1	0	0	0			
16		0	0	0	.2	.1	0	0	*0			
17		0	0	0	.2	*0	0	0	0			
18		0	0	0	.2	0	0	0	0			
19		*g51	0	0	.2	.2	0	*0	0			
20		*g 4.0	0	0	.2	.2	0	0	0	(*)		
21		*.6	0	0	.2	.2	0	0	0			
22	(*)	4.6	0	0	.2	.2	*0	0	0			
23		.7	0	0	.2	.2	0	0	0			
24		.3	0	0	.2	.1	.1	0	0			
25		.2	0	0	.2	.1	.1	0	0		(*)	
26		.1	0	0	.2	0	0	0	0			
27		.1	0	0	.1	0	0	0	0			
28		.2	0	0	.1	0	0	0	0			
29		.3	0	0	.1	0	0	0	0			
30		.2	0	.8	----------	0	0	2.2	0			
31		----------	0	1.9	----------	0	----------	.5	----------			----------
Total	0	88.7	0.1	2.7	170.3	3.5	0.2	3.8	0.2	0	0	0
Mean	0	2.96	0.003	0.09	5.87	0.11	0.01	0.12	0.01	0	0	0
Ac-ft	0	176	0.2	5.4	338	6.9	0.4	7.5	0.4	0	0	0

Calendar year		Max		Min		Mean		Ac-ft	
Water year 1963-64:	Max	154	Min	0	Mean	0.74	Ac-ft	535	

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
a No gage-height record.
g Gage height from reference gage.

8-863. Big Sandy Creek near Breckenridge, Tex.

Location.--Lat 32°39'52", long 99°00'01", on left bank at upstream side of bridge on Farm Road 576, 1.5 miles downstream from Battle Creek, 8.2 miles southwest of Breckenridge, Stephens County, and about 13 miles upstream from Hubbard Creek Reservoir.
Drainage area.--298 sq mi.
Records available.--February 1962 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 1,178.42 ft above mean sea level, datum of 1929. Prior to Mar. 19, 1962, staff gage at same site and datum.
Extremes.--Maximum discharge during year, 4,390 cfs Nov. 19 (gage height, 17.74 ft); no flow at times.
1962-64: Maximum discharge, 7,990 cfs May 22, 1963 (gage height, 23.07 ft); no flow at times each year. Floods of May 16, 1959, and July 20, 1953, reached a stage of 24.6 ft and the flood of Apr. 29, 1957, reached a stage of 24.60 ft.
Revisions.--The maximum discharge for the period Feb. 1 to Sept. 30, 1962, has been revised to 3,780 cfs June 10, 1962 (gage height, 16.22 ft), superseding figures published in Surface Water Records of Texas, 1962.
Remarks.--Records good. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.
Revisions.--Revised figures of discharge, in cubic feet per second, for the periods June 10, Sept. 7, 8, 1962, superseding previously published figures, are given herewith:

June 10, 1962..... 1,600
Sept. 7, 1962..... 686
Sept. 8, 1962..... 1,550

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1962	3,051.0	1,600	0	102	6,050
September 1962	2,792.7	1,550	0	93.1	5,540

Revised peak discharge.--1962: June 10 (0830 hrs.) 3,780 cfs (16.22 ft); Sept. 8 (0430 hrs.) 3,520 cfs (15.51 ft).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 28 to Jan. 29, Feb. 12 to Mar. 8, Apr. 5-14, 20-27, May 1-2, 30-31, Aug. 21-22)

1.01	0	1.4	8.7	3.0	245
1.1	.1	1.5	16	5.0	735
1.2	.9	1.8	46	8.0	1,410
1.3	3.6	2.2	101	11.0	2,120

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0.1	0.1	29	0	0.1	0.2			0	1.2
2	0	0	*.1	.1	12	.1	.1	0			0	.6
3	0	0	.1	.1	11	0	.1	0			0	.3
4	0	0	.1	.1	888	0	.2	0			0	.2
5	0	0	.1	.1	*156	0	.5	0			0	.1
6	0	0	.1	**.1	43	0	.2	0			0	.1
7	0	0	.1	.1	16	0	.2	0			0	.1
8	0	1.060	.1	.1	7.5	0	.2	0			0	.1
9	0	558	.1	.1	3.2	109	.1	0			0	0
10	0	31	.1	.1	1.4	*40	.1	0			0	0
11	0	7.3	.1	.1	.8	12	0	0			0	0
12	0	2.2	.1	0	.5	5.3	0	0			0	0
13	0	*.9	.1	0	.4	2.8	0	0			0	0
14	0	.5	.1	0	.3	1.6	*0	0			0	0
15	0	.4	.1	0	.1	.9	0	0			27	.1
16	0	.4	.1	0	.1	.6	0	0	(*)		21	9.8
17	0	.4	.1	0	.1	*.5	0	0			822	40
18	0	.3	.1	.1	.1	.5	0	0			163	7.8
19	0	1,910	.1	.1	.1	.6	0	*0			21	21
20	0	*323	.1	.1	.1	.5	.1	0			4.1	1,200
21	0	39	.1	.1	0	.3	.1	0		(*)	.7	793
22	0	18	.1	.1	0	.2	.1	0			1,440	678
23	*11	6.9	.1	.1	0	.1	.1	0			151	54
24	181	3.2	.1	.1	0	.1	.1	0			20	20
25	16	1.4	.1	.1	0	.1	.1	0			* 4.7	6.9
26	2.8	.9	.1	0	0	.1	2.3	0			1.9	3.6
27	.6	.6	.1	0	0	.1	12	0			4.2	210
28	.2	.7	.1	0	0	.1	4.4	0			368	66
29	.1	.3	.1	.1	0	.1	1.4	0			54	16
30	0	.1	.1	223		.1	.8	.5			11	6.3
31	0		.1	92		.1		0			3.2	
Total	211.7	3,965.5	3.1	317.0	1,169.7	175.8	23.3	0.7	0	0	3,116.8	3,135.2
Mean	6.83	132	0.10	10.2	40.3	5.67	0.78	0.02	0	0	101	105
Ac-ft	420	7,870	6.1	629	2,320	349	46	1.4	0	0	6,180	6,220

Calendar year 1963: Max 4,050 Min 0 Mean 38.1 Ac-ft 27,560
Water year 1963-64: Max 1,910 Min 0 Mean 33.1 Ac-ft 24,040

Peak discharge (base, 1,200 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
11- 8	2130	15.10	3,370	8-22	1800	16.42	3,860
11-19	1600	17.74	4,390	8-28	0330	7.69	1,340
2- 4	1000	7.65	1,320	9-20	0730	14.09	3,030
8-17	1700	12.54	2,550	9-21	2330	11.88	2,370

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

8-864. Hubbard Creek Reservoir near Breckenridge, Tex.

Location.--Lat 32°49'53", long 98°58'03", on left bank just upstream from dam on Hubbard Creek, 1 mile upstream from U. S. Highway 183 and 6.5 miles northwest of Breckenridge, Stephens County.
Drainage area.--1,107 sq mi.
Records available.--October 1962 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942 (levels by Freese, Nichols and Endress, Consulting Engineers).
Extremes.--Maximum contents during year, 23,750 acre-ft Sept. 28 (elevation, 1,147.23 ft); minimum, 6,880 acre-ft Oct. 21 (elevation, 1,139.03 ft).
1962-64: Maximum contents observed, 30,610 acre-ft June 1, 1963 (elevation, 1,149.44 ft); minimum observed, 4,440 acre-ft Apr. 25-26, 1963 (elevation, 1,136.98 ft).
Remarks.--Reservoir is formed by rolled-fill earthen dam 5,630 ft long with rock riprap on the upstream slope. There are two additional levees, the north and south, making an overall length of 3½ miles. Storage began September 1962; dam completed December 1962. Dam is property of West Central Texas Municipal Water District and was built to impound water for municipal use by cities of Abilene, Albany, Anson, and Breckenridge. Service spillway is a partially controlled morning glory type with 12 lift gates designed to discharge 30,000 cfs through a 22-foot diameter concrete conduit. Emergency spillway is a 2,000 ft wide cut through natural ground near left end of dam. Data regarding dam and reservoir is given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Crest of emergency spillway	1,194.0	515,800
Crest of service spillway (top of gates)	1,185.0	349,200
Normal operating level	1,183.0	317,800
Crest of morning glory spillway	1,176.5	227,400
Invert of 5- by 7-foot gate	1,138.0	5,580
Top of concrete box over 48-inch outlet pipe	1,133.8	1,720

Cooperation.--Capacity curve and table which does not include borrow furnished by Freese, Nichols and Endress, Consulting Engineers, based on Geological Survey topographic maps, 1958 edition.

Capacity table (elevation, in feet, and contents, in acre-feet)

1,136.0	3,470	1,144.0	15,600
1,138.0	5,580	1,146.0	20,400
1,140.0	8,250	1,148.0	26,020
1,142.0	11,580	1,150.0	32,530

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.860	7.720	-	10.990	9.920	16.670	-	15.970	15.420	14.110	12.000	17.760
2	7.820	7.660	-	10.910	9.860	16.650	-	15.970	15.400	14.030	11.950	17.660
3	7.730	7.600	-	10.820	10.240	16.650	-	15.950	15.380	13.960	11.910	17.610
4	7.630	7.600	-	10.730	15.060	16.630	-	15.910	15.380	13.900	11.860	17.560
5	7.600	7.560	-	10.650	16.470	16.630	-	15.890	15.380	13.840	11.820	17.490
6	7.510	7.530	-	10.540	16.720	16.600	-	15.710	15.380	13.780	11.780	17.420
7	7.450	7.480	-	10.460	16.840	16.600	-	15.670	15.380	13.700	11.710	17.350
8	7.380	11.000	-	10.340	16.810	16.650	-	15.840	15.340	13.640	11.630	17.300
9	7.340	16.490	-	10.260	16.810	16.900	-	15.820	15.290	13.560	11.580	17.230
10	7.270	16.190	-	10.120	16.810	-	-	15.800	15.250	13.480	11.530	17.160
11	7.200	15.750	-	10.020	16.810	-	-	15.780	15.160	13.400	11.450	17.040
12	7.140	15.270	-	9.880	16.790	-	-	15.730	15.270	13.320	11.380	17.000
13	-	14.740	-	9.810	16.790	-	-	15.670	15.270	13.240	11.310	16.950
14	-	14.380	14.820	9.740	16.790	-	-	15.600	15.200	13.160	11.260	16.930
15	-	14.000	14.510	9.690	16.790	-	16.260	15.530	15.120	13.080	11.310	16.880
16	7.140	13.840	14.240	9.640	16.790	-	16.260	15.490	15.140	13.000	11.490	16.900
17	7.050	13.720	14.000	9.580	16.810	-	16.260	15.420	15.120	12.940	12.200	16.950
18	7.000	13.880	13.680	9.500	16.810	-	16.220	15.380	15.060	12.900	-	16.950
19	6.970	20.190	13.320	9.420	16.810	-	16.220	15.340	14.970	12.840	-	17.180
20	6.900	23.630	13.060	9.340	16.810	-	16.170	15.310	14.870	12.810	-	19.370
21	6.880	-	12.820	9.260	16.810	-	16.150	15.270	14.780	12.750	-	20.560
22	6.890	-	12.620	9.180	16.790	-	16.110	15.270	14.700	12.690	-	22.680
23	7.130	-	12.420	9.100	16.770	-	16.110	15.230	14.610	12.650	-	23.020
24	7.980	-	12.240	9.040	16.740	-	16.110	15.160	14.530	12.620	-	23.180
25	7.980	-	12.060	8.920	16.740	-	16.080	15.160	14.470	12.560	-	23.180
26	8.020	-	11.840	8.840	16.720	-	16.080	15.120	14.380	12.520	17.300	23.210
27	8.070	-	11.650	8.760	16.700	-	16.060	15.060	14.320	12.460	17.280	23.600
28	7.960	-	11.440	8.670	16.700	-	16.040	15.010	14.280	12.410	17.800	23.750
29	7.900	-	11.260	8.750	16.670	-	16.020	14.950	14.220	12.330	17.900	23.690
30	7.770	19.620	11.150	9.420	----------	-	16.000	15.510	14.170	12.200	17.850	23.690
31	7.740	----------	11.040	9.830	----------	16.600	----------	15.490	----------	12.100	17.800	----------
(†)	1,139.66	-	1,141.70	1,141.00	1,144.48	-	1,144.18	1,143.95	1,143.33	1,142.28	1,144.96	1,147.21
(‡)	-180	+11,880	-8,580	-1,210	+6,840	-70	-600	-510	-1,320	-2,070	+5,700	+5,890

Calendar year 1963..... ‡ +4,360
Water year 1963-64..... ‡ +15,770

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.
Note.--No elevation record, contents estimated, Oct. 13-15, Nov. 21 to Dec. 13, Mar. 10 to Apr. 14, Aug. 18-25.

8-865. Hubbard Creek near Breckenridge, Tex.

Location.--Lat 32°50'15", long 98°57'00", near right bank on downstream side of pier of bridge on U. S. Highway 183, 1 mile downstream from Hubbard Creek Reservoir, 6.8 miles northwest of Breckenridge, Stephens County, 7 miles upstream from Gonzales Creek, and 8 miles upstream from Clear Fork Brazos River.

Drainage area.--1,111 sq mi.

Records available.--April 1955 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,092.10 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942. Prior to July 16, 1959, at site 300 ft upstream at same datum.

Average discharge.--9 years, 141 cfs (102,100 acre-ft per year).

Extremes.--Maximum discharge during year, 312 cfs Dec. 5 (gage height, 7.03 ft); no flow for many days.
1955-64: Maximum discharge, 34,500 cfs May 26, 1957 (gage height, 34.00 ft); no flow at times.
Maximum stage known since at least 1925, 34.2 ft July 20, 1953, from information by local resident and State Highway Department.

Remarks.--Records good. Flow regulated by Hubbard Creek Reservoir (capacity, 317,800 acre-ft) since September 1962 (station 8-864). Lake Cisco (capacity, 31,250 acre-ft), Lake McCarty (capacity, 2,800 acre-ft), and several smaller reservoirs with capacities from 100 to 400 acre-ft are on tributaries above gage. Diversions above station for municipal and industrial use. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1, 2, 23, 24, Nov. 8 to Dec. 30)

3.7	0	4.3	13
3.8	.1	4.5	23
3.9	.8	5.2	75
4.0	2.4	6.0	157
4.1	5.1	7.5	361

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	28	104	54	48	1.6	0.2	0	0.1	0	34	0
2	34	28	103	53	47	1.0	.3	4.5	.1	0	.4	0
3	32	28	102	52	58	.4	.3	3.0	0	0	0	0
4	32	27	101	52	94	.5	.3	0	0	0	0	0
5	31	26	193	52	72	.5	.3	0	.2	0	0	0
6	30	26	305	51	39	.8	.2	0	.1	0	0	0
7	29	26	291	50	1.0	1.2	.2	0	0	0	0	0
8	28	34	263	50	.8	1.4	.2	.5	0	0	0	0
9	28	135	249	50	.7	1.5	.2	0	*0	0	0	0
10	27	146	235	49	.7	.2	.2	0	0	0	0	0
11	*27	140	221	49	.6	.3	.2	0	0	0	0	.4
12	26	135	214	48	.6	.3	15	0	0	0	0	.2
13	26	132	195	47	.6	.4	.2	0	0	0	0	0
14	26	126	188	46	.5	.4	.1	*0	0	0	0	0
15	25	120	176	*46	.5	.3	*0	0	0	0	0	0
16	25	*111	169	46	.5	.4	0	0	0	*0	0	0
17	24	107	163	45	.6	.4	0	0	0	0	0	0
18	24	105	152	44	.5	*.4	.1	0	0	0	*0	0
19	24	137	*148	44	*.5	.5	.1	0	0	0	0	0
20	24	214	142	43	.4	.2	.1	0	0	0	0	0
21	24	182	135	43	.4	.2	.1	0	0	0	0	*.8
22	23	136	130	43	.4	.2	.1	0	0	0	1.1	.4
23	26	114	123	42	.4	.2	.1	0	0	0	.1	8.3
24	29	111	118	41	.5	.2	.1	0	0	0	0	3.9
25	30	109	113	41	.5	.3	.1	0	0	0	0	.5
26	30	108	109	40	.5	.2	.1	0	0	0	0	.3
27	30	107	105	40	.5	.2	.1	0	0	0	0	3.0
28	30	107	102	39	.4	.2	0	0	0	0	0	.6
29	30	106	98	40	.3	.2	0	0	0	0	0	.2
30	30	105	82	47	----------	.2	0	2.9	0	8.4	0	.1
31	29	----------	55	47	----------	.2	----------	.6	----------	44	0	----------
Total	867	3,016	4,884	1,434	370.4	15.0	18.9	11.5	0.5	52.4	35.6	18.7
Mean	28.0	101	158	46.3	12.8	0.48	0.63	0.37	0.02	1.69	1.15	0.62
Ac-ft	1,720	5,980	9,690	2,840	735	30	37	23	1.0	104	71	37

Calendar year 1963: Max 305 Min 0.1 Mean 61.2 Ac-ft 44,340
Water year 1963-64: Max 305 Min 0 Mean 29.3 Ac-ft 21,270

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

8-873. Clear Fork Brazos River at Eliasville, Tex.

Location.--Lat 32°57'30", long 98°46'10", on right bank 30 ft upstream from old mill dam, 180 ft upstream from bridge on Farm Road 1974, and 400 ft northwest of Eliasville, Young County.
Drainage area.--5,721 sq mi.
Records available.--November 1915 to April 1920, December 1923 to August 1925, July 1928 to September 1951, published in WSP 1312 as "near Crystal Falls, Tex.", October 1961 to September 1964.
Gage.--Water-stage recorder and concrete control. Datum of gage is 1,027.77 ft above mean sea level, datum of 1929. Oct. 22, 1915, to Apr. 30, 1920, and Dec. 7, 1923, to Aug. 31, 1925, chain gage at site 4 miles downstream at different datum; July 1, 1928, to Aug. 6, 1932, staff gage at site 6 miles upstream at different datum; Aug. 7, 1932, to Sept. 30, 1951, water-stage recorder at site 8½ miles upstream at datum 27.48 ft higher; Oct. 1, 1961, to Dec. 17, 1961, staff gage at same site and datum.
Average discharge.--29 years (1916-19, 1928-51, 1961-64), 409 cfs (296,100 acre-ft per year).
Extremes.--Maximum discharge during year, 3,600 cfs Oct. 24 (gage height, 11.95 ft); minimum, 0.1 cfs for many days.
1915-20, 1923-25, 1928-51, 1961-64: Maximum discharge, 35,800 cfs June 11, 1941 (gage height, 33.45 ft, site and datum then in use), from rating curve extended above 23,000 cfs; no flow at times.
Maximum stage since 1877, 35 ft May 1, 1957, present site and datum; flood in September 1900 reached about same stage, from information by Texas Highway Department and local residents. Other floods are reported to have occurred in 1876, Apr. 27, 1890, 1932, 1941, and 1955.
Remarks.--Records fair. Regulation by upstream reservoirs as follows: Elm Creek basin (combined capacity, 98,230 acre-ft); Sweetwater Creek basin (combined capacity, 16,450 acre-ft); Lake Penick (capacity, 3,100 acre-ft); Lake Stamford (capacity, 60,000 acre-ft); Lake Cisco (capacity, 25,600 acre-ft); Lake McCarty (capacity, 2,800 acre-ft); Hubbard Creek Reservoir (capacity, 317,800 acre-ft); and Lake Daniel (capacity, 10,000 acre-ft). Many small diversions above station for municipal supply and oilfield operations. Records of chemical analyses and water temperatures for water year 1964 are available in the Austin District Office.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 9-17, July 25-31, Aug. 8-15)

Oct. 1 to July 24				July 25 to Sept. 30			
7.2	0.1	7.8	64	7.7	0.1	8.2	23
7.3	1.0	8.0	140	7.8	.5	8.4	55
7.4	4.1	9.0	720	7.9	1.9	8.7	124
7.5	10	10.0	1,460	8.0	5.2	9.0	240
7.6	22	11.0	2,340	8.1	11		
7.7	39						

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	33	119	56	106	24	13	33	15	0.7	0.1	8.9
2	31	35	111	53	76	39	10	56	14	*.2	2.8	5.7
3	31	35	106	53	64	33	12	35	8.1	.2	6.7	37
4	29	33	106	58	1,600	24	20	29	6.2	.2	2.6	73
5	29	29	114	67	1,410	23	48	20	6.2	.2	1.0	46
6	28	28	318	53	423	18	33	14	10	.2	.5	29
7	28	28	324	48	326	16	15	10	4.6	.2	.2	19
8	26	59	306	48	170	22	11	155	2.2	.2	.1	11
9	26	528	289	48	106	55	10	147	1.2	.2	.1	7.7
10	26	206	284	48	73	43	8.8	35	*.7	.2	.1	6.2
11	*24	170	272	46	56	23	9.6	24	.4	.1	.1	3.9
12	24	160	250	46	43	14	10	18	.4	.1	.1	2.1
13	23	145	228	43	35	15	13	11	.3	.1	.1	1.2
14	22	140	218	43	35	26	15	9.6	.2	.1	.1	.7
15	22	132	201	41	29	19	*9.6	*8.8	84	** .1	.1	.3
16	22	*123	190	50	24	14	9.6	6.2	125	** .1	.1	.2
17	22	115	185	*50	23	*22	9.6	7.7	140	.1	65	.2
18	20	111	*175	50	22	23	9.6	15	98	.1	*144	.2
19	19	1,160	165	48	22	24	8.8	12	70	.1	21	1.0
20	22	632	165	46	*33	23	8.1	8.8	76	.1	6.7	1.7
21	22	324	160	46	28	20	10	6.8	50	.1	97	*31
22	22	245	150	46	26	18	8.8	6.2	33	.1	280	134
23	307	165	140	43	24	14	9.6	5.0	41	** .1	200	131
24	1,850	140	136	43	24	14	62	3.7	50	.1	30	248
25	109	136	119	41	24	12	41	2.5	28	.1	8.9	106
26	46	119	115	43	24	12	26	2.2	8.1	.1	7.2	44
27	35	119	111	43	24	13	24	1.0	4.6	.1	20	155
28	33	115	111	43	23	13	54	.7	4.6	.1	30	107
29	31	115	106	56	23	15	64	.4	2.5	** .1	38	30
30	29	119	94	282	----------	18	41	91	1.4	.1	23	33
31	29	----------	70	269	----------	15	----------	222	----------	.1	13	----------
Total	3,018	5,499	5,438	1,950	4,896	664	624.1	996.6	885.7	4.6	998.6	1,274.0
Mean	97.4	183	175	62.9	169	21.4	20.8	32.1	29.5	0.15	32.2	42.5
Ac-ft	5,990	10,910	10,790	3,870	9,710	1,320	1,240	1,980	1,760	9.1	1,980	2,530

Calendar year 1963: Max 4,100 Min 9.7 Mean 200 Ac-ft 144,700
Water year 1963-64: Max 1,850 Min 0.1 Mean 71.7 Ac-ft 52,090

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

* Discharge measurement made on this day.
** Field estimate made on this day.
Note.--Discharge computed from once-daily staff-gage readings Dec. 18 to Jan. 16, Jan. 30-31, May 6-7, 25-26, 31, June 1, June 23 to July 2, July 24, Aug. 23-25; water below crest of control July 4-31, Aug. 9-16 (flow is leakage through dam).

8-880. Brazos River near South Bend, Tex.

Location.--Lat 33°01'30", long 98°38'50", on left bank 265 ft downstream from bridge on State Highway 67, 0.3 mile upstream from Wichita Falls and Southern Railroad bridge, 1.6 miles downstream from Clear Fork Brazos River, and 2.0 miles northeast of South Bend, Young County.

Drainage area.--21,600 sq mi, approximately, of which 9,240 sq mi is probably noncontributing.

Records available.--September 1938 to September 1964.

Gage.--Water-stage recorder. Movable wire-weight gage at site 265 ft upstream read once daily. Datum of gage is 1,002.98 ft above mean sea level, datum of 1929. Prior to Mar. 16, 1961, water-stage recorder, and prior to Feb. 23, 1939, wire-weight gage at site 265 ft upstream at same datum.

Average discharge.--26 years, 953 cfs (689,900 acre-ft per year).

Extremes.--Maximum discharge during year, 5,050 cfs Feb. 4 (gage height, 9.95 ft); no flow Aug. 3-16.
1938-64: Maximum discharge, 87,400 cfs May 4, 1941 (gage height, 27.35 ft); maximum gage height, 32.70 ft Aug. 29, 1957; no flow at times.
Maximum stage known, 36.2 ft in 1876, from information by State Highway Department and Corps of Engineers. Flood of Sept. 24, 1900, reached a stage of 29.5 ft and flood of June 16, 1930, reached a stage of 35.5 ft, from information by local residents.

Remarks.--Records fair. Some regulation by reservoirs (total combined capacity, 534,000 acre-ft) as follows: Elm Creek basin (combined capacity, 98,230 acre-ft); Sweetwater Creek basin (combined capacity, 16,450 acre-ft); Lake Penick (capacity, 3,100 acre-ft); Lake Stamford (capacity, 60,000 acre-ft); Lake Cisco (capacity, 25,600 acre-ft); Lake McCarty (capacity, 2,800 acre-ft); Hubbard Creek Reservoir (capacity, 317,800 acre-ft); and Lake Daniel (capacity, 10,000 acre-ft). Many small diversions above station for municipal supply and oil-operations.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	100	84	222	100	251	48	31	78	930	32	0.1	9.7
2	87	72	202	98	161	72	27	87	382	28	.1	7.6
3	78	64	188	91	115	58	25	87	226	25	0	5.8
4	68	58	176	91	3,570	44	26	66	147	21	0	40
5	64	51	167	91	3,100	39	70	57	100	16	0	42
6	58	48	320	91	1,200	36	99	36	114	13	0	26
7	53	44	378	91	920	31	50	28	91	11	0	16
8	49	47	349	89	560	34	32	147	60	8.6	0	13
9	44	457	328	87	387	93	26	759	39	7.1	0	9.2
10	38	222	316	87	304	147	20	614	*29	5.8	0	10
11	*35	179	316	80	262	115	18	296	21	6.6	0	8.1
12	34	164	324	76	219	78	16	191	25	4.3	0	5.8
13	31	152	296	70	191	57	16	240	549	3.0	0	4.6
14	29	155	266	60	161	44	17	170	3,510	1.9	0	4.3
15	28	*155	251	64	133	51	*21	*94	1,700	1.2	0	4.3
16	26	152	236	*78	118	*41	17	68	1,020	*1.0	0	4.3
17	26	133	222	76	100	38	15	46	920	.8	42	4.0
18	25	122	*205	70	89	55	13	35	890	.6	*418	777
19	25	1,000	202	64	78	72	13	36	716	.6	74	660
20	24	1,220	195	62	*74	55	13	31	480	.5	25	414
21	25	686	188	64	89	53	14	26	353	.4	14	332
22	24	608	176	62	76	53	15	21	247	.3	305	*380
23	144	608	155	60	68	46	17	18	164	.3	263	2,190
24	2,150	565	158	55	66	41	106	13	274	.3	58	2,710
25	476	461	167	53	58	36	229	12	112	.2	18	1,480
26	236	382	152	49	55	35	84	8.6	108	.1	11	1,060
27	141	423	147	46	53	34	268	7.1	96	.1	10	768
28	195	340	144	44	49	32	194	8.6	70	.1	14	1,040
29	155	281	141	60	49	32	173	8.8	57	.1	24	1,350
30	122	247	138	359	----------	32	115	730	41	.1	23	712
31	98	----------	130	633	----------	32	----------	2,260	----------	.1	14	----------
Total	4,688	9,180	6,855	3,101	12,556	1,634	1,780	6,279.1	13,471	190.1	1,313.2	14,087.7
Mean	151	306	221	100	433	52.7	59.3	203	449	6.13	42.4	470
Ac-ft	9,300	18,210	13,600	6,150	24,900	3,240	3,530	12,450	26,720	377	2,600	27,940

Calendar year 1963: Max 14,800 Min 24 Mean 586 Ac-ft 424,200
Water year 1963-64: Max 3,570 Min 0 Mean 205 Ac-ft 149,000

Peak discharge (base, 11,000 cfs).--No peak above base.

* Discharge measurement made on this day.

8-881. Salt Creek at Olney, Tex.

Location.--Lat 33°22'15", long 98°44'30", on right bank 21 ft downstream from bridge on State Highway 199 and 0.5 mile east of Olney, Young County.
Drainage area.--9.6 sq mi.
Records available.--April 1958 to September 1964.
Gage.--Water-stage recorder and concrete control. Datum of gage is 1,164.03 ft above mean sea level, datum of 1929.
Average discharge.--6 years, 1.71 cfs (1,240 acre-ft per year).
Extremes.--Maximum discharge during year, 498 cfs May 29 (gage height, 10.05 ft); no flow most of time.
1958-64: Maximum discharge, 1,040 cfs Oct. 3, 1959 (gage height, 10.16 ft); no flow most of time each year.
Maximum stage since at least 1908, 16.7 ft in June 1915; flood in May or June 1941 reached a stage of 16 ft, from information by local residents.
Remarks.--Records good. No diversion above station. During the year the city of Olney diverted 830 acre-ft from reservoirs in the Red River basin for municipal use, of which 322 acre-ft was returned to Salt Creek below station as sewage effluent. Recording rain gage located at station.
Revisions.--Revised figures of discharge, in cubic feet per second, for the water years 1958-59, superseding previously published figures, are given herewith:

1958		1959	
July 6	75	June 21	1.4
7	5.8	22	43
23	2.9	23	33
Sept. 16	91	24	1.2

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
July 1958	84.2	75	0	2.72	167
September	94.5	91	0	3.15	187
June 1959	81.1	43	0	2.70	161
Water year 1958-59	126.6	43	0	.35	251

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 21, 23, Feb. 4, May 8, 29-30, June 12, Sept. 22)

2.6	0	3.0	3.2	4.0	42
2.7	.3	3.1	5.2	6.0	136
2.8	.8	3.3	11	8.0	216
2.9	1.8				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0	0	0.4	0	0	0.1	1.4		0	0
2	0	0	0	0	.1	0	0	.2	.6		0	0
3	0	0	0	0	18	0	0	0	.3		0	0
4	0	0	0	0	167	0	.4	0	16		0	0
5	0	0	0	0	16	0	.6	0	12		0	0
6	0	0	0	0	5.8	0	0	0	.5		0	0
7	0	0	0	0	1.3	0	0	0	.3		0	0
8	*0	0	0	0	.6	.2	0	*115	.2		0	0
9	0	0	0	0	.4	2.4	0	4.4	.1		0	0
10	0	0	5.9	0	.3	.2	0	2.4	**.1		0	0
11	0	0	.9	0	.2	0	0	.9	.1		0	0
12	0	0	0	0	.2	0	0	.3	91		0	0
13	0	0	0	0	.3	0	0	.1	10		0	0
14	0	0	0	0	.2	0	*0	.1	1.6		0	0
15	0	0	0	0	.1	0	0	*0	.5		1.5	.2
16	0	*0	0	0	.1	0	0	0	.3		1.2	2.0
17	0	0	0	*0	.1	*0	0	0	.2	(*)	*0	0
18	0	0	*0	0	**1	.3	0	0	.1		0	0
19	0	50	0	0	.1	.3	0	0	.1		0	0
20	0	2.0	0	0	.1	0	0	0	.1		0	0
21	*66	.3	0	0	.1	0	0	0	.1		0	*1.0
22	9.1	6.6	0	0	.1	0	0	0	0		0	103
23	23	.7	0	0	.1	0	.1	0	0		0	11
24	20	.1	0	0	.1	0	.2	0	0		0	.4
25	.4	0	0	0	.1	0	7.3	0	0		0	.1
26	0	0	0	0	.1	0	12	0	0		0	0
27	0	0	0	0	.1	0	.9	.2	0		0	6.8
28	0	0	0	0	0	0	.1	.6	0		0	1.2
29	0	0	0	3.8	0	0	0	173	0		0	.2
30	0	0	0	16		0	0	206	0		0	0
31	0		0	2.2		0		7.1			0	
Total	118.5	59.7	6.8	22.0	212.1	3.4	21.6	510.4	135.6	0	2.7	125.9
Mean	3.82	1.99	0.22	0.71	7.31	0.11	0.72	16.5	4.52	0	0.09	4.20
Ac-ft	235	118	13	44	421	6.7	43	1,010	269	0	5.4	250

Calendar year 1963: Max 111 Min 0 Mean 1.06 Ac-ft 768
Water year 1963-64: Max 206 Min 0 Mean 3.33 Ac-ft 2,420

Peak discharge (base, 200 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-21	1930	8.22	245	5-29	1800	10.05	498
2- 4	0400	9.35	350	6-12	1200	7.65	200
5- 8	1000	8.87	280	9-22	1700	8.99	292

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

8-883. Oak Creek near Graham, Tex.

Location.--Lat 33°12'40", long 98°37'05", on downstream side of bridge on Farm Road 1769, 2.5 miles upstream from mouth and 7.0 miles northwest of Graham, Young County.

Drainage area.--19.7 sq mi.

Records available.--April 1958 to September 1964.

Gage.--Water-stage recorder.

Average discharge.--6 years, 2.70 cfs (1,950 acre-ft per year).

Extremes.--Maximum discharge during year, 332 cfs May 30 (gage height, 6.47 ft); no flow for many days.
1958-64: Maximum discharge, 649 cfs Oct. 3, 1959 (gage height, 9.20 ft); no flow most of time.
Maximum stage since at least 1900, 15.2 ft in September 1955. Flood in May 1957 reached a stage of 15.0 ft, from information by local resident.

Remarks.--Records good except those for period of backwater, which are fair. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 16-18)

0.91	0	1.5	9.0
1.0	.2	1.6	14
1.1	.6	2.0	42
1.2	1.5	3.0	112
1.3	3.0	4.0	177
1.4	5.4	5.0	239

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0	0	6.1		0	0.2	9.9		0	
2	0	0	0	0	1.8		0	.1	2.6		0	
3	0	0	0	0	1.1		0	0	.8		0	
4	0	0	0	0	19		0	0	.3		0	
5	0	0	0	0	16		0	0	.1		0	
6	0	0	0	0	9.8		0	0	0		0	
7	0	0	0	0	4.8		0	0	0		0	
8	*0	0	0	0	1.7		0	46	0		0	
9	0	0	0	0	.5		0	24	0		0	
10	0	0	0	0	.2		0	16	*0		0	
11	0	0	0	0	0		0	20	0		0	
12	0	0	0	0	0		0	7	0		0	
13	0	0	.1	0	0		0	3	0		0	
14	0	0	.2	0	0		*0	*0	0		0	
15	0	*0	.1	0	0		0	0	0		.1	
16	0	0	0	0	0		0	0	0	(*)	12	
17	0	0	0	*0	0	(*)	0	0	0		*8.6	
18	0	0	*0	0	*0		0	0	0		1.2	
19	0	37	0	0	0		0	0	0		.2	
20	0	36	0	0	0		0	0	0		0	
21	0	3.9	0	0	0		0	0	0		35	
22	0	1.3	0	0	0		0	0	0		47	(*)
23	.4	.4	0	0	0		0	0	0		6.7	
24	3.2	.1	0	0	0		0	0	0		.8	
25	1.9	0	0	0	0		4.3	0	0		.1	
26	.1	0	0	0	0		2.2	0	0		.1	
27	0	0	0	0	0		1.0	0	0		.8	
28	0	0	0	0	0		.2	0	0		.1	
29	0	0	0	.2	0		0	46	0		0	
30	0	0	0	14	----------		0	235	0		0	
31	0	----------	0	30	----------		----------	57	----------		0	----------
Total	5.6	78.7	0.4	44.2	61.0	0	7.7	454.3	13.7	0	112.7	0
Mean	0.18	2.62	0.01	1.43	2.10	0	0.26	14.6	0.46	0	3.64	0
Ac-ft	11	156	0.8	88	121	0	15	901	27	0	224	0

Calendar year 1963: Max 129 Min 0 Mean 1.44 Ac-ft 1,040
Water year 1963-64: Max 235 Min 0 Mean 2.13 Ac-ft 1,540

Peak discharge (base, 200 cfs)

Date	Time	Gage height	Discharge
5- 8	0800	4.52	208
5-30	0330	6.47	332
8-21	2100	4.41	201

* Discharge measurement or observation of no flow made on this day.
Note.--Backwater from temporary dam May 12-28.

8-884. Lake Graham.--See page 299.

8-885. Possum Kingdom Reservoir near Graford, Tex.

Location.--Lat 32°52', long 98°26', in powerhouse at dam on Brazos River, 2.6 miles upstream from Loving Creek and 11.3 miles southwest of Graford, Palo Pinto County.
Drainage area.--22,550 sq mi, approximately, of which 9,240 sq mi is probably noncontributing.
Records available.--March 1941 to September 1964.
Gage.--Mercury U-tube gage. Datum of gage is 0.10 ft above mean sea level, datum of 1929 (levels by Brazos River Authority).
Extremes.--Maximum contents observed during year, 624,000 acre-ft Feb. 9 to Mar. 4 (gage height, 994.5 ft); minimum observed, 505,500 acre-ft Sept. 14-19 (gage height, 987.1 ft).
1941-64: Maximum contents observed, 743,900 acre-ft Oct. 5, 1941 (gage height, 1,001.0 ft); minimum observed, 273,300 acre-ft Feb. 19 to Mar. 17, 1953 (gage height, 967.0 ft).
Remarks.--Reservoir is formed by reinforced concrete dam of flat slab deck, massive buttress type, with 9 roof-weir gates (modified bear-trap type), 2 bulkhead sections, and an earthen-dike section. Total length of dam is 2,740 ft. The gates are designed to carry 550,000 cfs. Powerhouse is designed for 3 units having a total output of 37,500 kilowatts. Usable capacity for power development, 698,900 acre-ft. Dam completed and storage began Mar. 21, 1941. Water used for power development, industry and irrigation. Contents published prior to Oct. 1, 1944, are from capacity table showing maximum design level, 730,000 acre-ft, and usable capacity for power development, 705,500 acre-ft. Figures given herein represent total contents. Data regarding dam and reservoir are shown in the following table:

	Gage height (feet)	Capacity (acre-feet)
Maximum design level (crest of roof-weir gates, gates raised)	1,000.00	724,700
Crest of roof-weir gates (gates lowered)	987.00	504,100
Sill or powerhouse penstock	911.5	25,810
Invert of 54-in horizontal cylinder valve (high pressure outlet)	874.8	236

Cooperation.--Gage-height record and capacity table furnished by Brazos River Authority. Capacity curve based on surveys made 1935-38.

Capacity table (gage height, in feet, and contents, in acre-feet)

987.0	504,100	991.0	564,000
988.0	518,200	992.0	580,000
989.0	532,700	994.0	615,000
990.0	548,000	996.0	651,000

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	560,800	564,000	591,900	597,000	597,000	624,000	613,600	613,200	616,800	609,600	548,000	518,200
2	560,800	564,000	591,900	597,000	597,000	624,000	613,600	613,200	620,400	609,600	546,500	515,400
3	560,800	564,000	591,900	597,000	597,000	624,000	616,800	613,200	620,400	609,600	543,400	512,600
4	560,800	564,000	591,900	597,000	602,400	624,000	616,800	613,200	620,400	609,600	541,900	511,200
5	560,800	564,000	591,900	597,000	615,000	622,200	616,800	613,200	620,400	609,600	537,300	511,200
6	560,800	564,000	591,900	597,000	618,600	622,200	616,800	613,200	620,400	607,800	535,800	511,200
7	560,800	562,400	591,900	597,000	622,200	622,200	616,800	613,200	620,400	607,800	534,200	509,700
8	559,200	562,400	591,900	597,000	622,200	622,200	616,800	613,200	620,400	606,000	534,200	509,700
9	559,200	562,400	591,900	597,000	624,000	622,200	616,800	613,200	620,400	604,200	532,700	508,300
10	559,200	562,400	593,600	595,300	624,000	622,200	616,800	613,200	616,800	600,600	531,200	508,300
11	559,200	564,000	595,300	595,300	624,000	622,200	616,800	615,000	615,000	598,800	529,800	508,300
12	559,200	564,000	595,300	595,300	624,000	622,200	616,800	615,000	611,400	597,000	528,400	506,900
13	559,200	564,000	595,300	595,300	624,000	618,600	616,800	615,000	607,800	597,000	525,400	506,900
14	557,600	564,000	595,300	595,300	624,000	618,600	615,000	615,000	607,800	595,300	524,000	505,500
15	557,600	564,000	595,300	593,600	624,000	618,600	615,000	615,000	609,600	591,900	524,000	505,500
16	557,600	564,000	595,300	593,600	624,000	618,600	615,000	615,000	613,200	590,200	525,400	505,500
17	557,600	564,000	595,300	593,600	624,000	618,600	613,200	615,000	615,000	586,800	526,900	505,500
18	556,000	564,000	595,300	593,600	624,000	618,600	613,200	615,000	615,000	585,100	526,900	505,500
19	556,000	575,200	595,300	593,600	624,000	618,600	613,200	615,000	616,800	585,100	525,400	505,500
20	556,000	580,000	595,300	593,600	624,000	618,600	611,400	615,000	616,800	583,400	525,400	508,300
21	554,400	585,100	595,300	593,600	624,000	618,600	611,400	615,000	618,600	578,400	524,000	508,300
22	554,400	586,800	595,300	593,600	624,000	618,600	611,400	615,000	618,600	575,200	525,000	512,600
23	554,400	586,800	595,300	593,600	624,000	618,600	611,400	613,200	618,600	572,000	525,000	512,600
24	557,600	586,800	595,300	593,600	624,000	618,600	611,400	613,200	618,600	568,800	525,000	522,600
25	562,400	586,800	595,300	593,600	624,000	618,600	611,400	611,400	618,600	565,600	525,000	528,400
26	564,000	588,500	595,300	593,600	624,000	618,600	615,000	611,400	616,800	564,000	525,000	531,200
27	564,000	590,200	595,300	593,600	624,000	618,600	613,200	611,400	616,800	559,200	525,000	534,200
28	564,000	591,900	597,000	591,900	624,000	618,600	613,200	611,400	616,800	557,600	525,000	534,200
29	564,000	591,900	597,000	591,900	624,000	618,600	613,200	611,400	613,200	552,800	522,600	535,800
30	564,000	591,900	597,000	593,600	----------	618,600	613,200	611,400	611,400	551,200	522,600	538,800
31	564,000	----------	597,000	595,300	----------	618,600	----------	615,000	----------	551,200	519,600	----------
(†)	991.0	992.7	993.0	992.9	994.5	994.2	993.9	994.0	993.8	990.2	988.1	989.4
(‡)	+3,200	+27,900	+5,100	-1,700	+28,700	-5,400	-5,400	+1,800	-3,600	-60,200	-31,600	+19,200

Calendar year 1963..... ‡ -54,000
Water year 1963-64..... ‡ -22,000

† Gage height, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-890. Brazos River near Palo Pinto, Tex.

Location.--Lat 32°51'45", long 98°18'10", on right bank 100 ft upstream from bridge on Palo Pinto-Graford highway, 300 ft downstream from Dark Valley Creek, 6½ miles north of Palo Pinto, Palo Pinto County, and 20 miles downstream from Possum Kingdom Dam.

Drainage area.--22,760 sq mi, approximately, of which 9,240 sq mi is probably noncontributing.

Records available.--January 1924 to September 1964. Monthly discharge only for some periods, published in WSP 1312. Published as "near Mineral Wells" 1924-33.

Gage.--Water-stage recorder. Datum of gage is 831.23 ft above mean sea level, datum of 1929. Prior to December 1933, chain gage at site 19 miles downstream at datum 38.19 ft lower.

Average discharge.--40 years, 1,142 cfs (826,800 acre-ft per year).

Extremes.--Maximum discharge during year, 2,870 cfs June 12-13, July 16-18, 22-28, 30; maximum gage height, 4.52 ft July 26-27, 30; minimum daily discharge, 18 cfs June 9.
1924-64: Maximum discharge, 95,600 cfs June 16, 1930, at site 19 miles downstream near Mineral Wells (gage height, 30 ft, present site and datum); no flow at times.
Maximum stage known occurred in 1876, from data by Corps of Engineers, and was several feet higher than any flood occurring between 1876 and 1936. Highest stage since 1876 was that of June 16, 1930.

Remarks.--Records good. Flow since 1941 largely regulated by Possum Kingdom Reservoir (see preceding page) and several smaller reservoirs in Clear Fork, Hubbard Creek, Lake Graham, and other basins, having a combined capacity of about 1,317,000 acre-ft.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	79	35	38	150	45	30	29	86	997	927	981
2	33	50	33	35	96	41	30	28	46	109	914	1,210
3	27	28	32	30	78	161	29	26	31	54	662	1,030
4	26	24	33	30	282	152	29	26	26	36	1,200	863
5	24	22	33	88	324	173	31	26	23	29	1,370	817
6	23	21	33	77	380	388	30	28	23	23	1,140	100
7	22	20	32	100	166	226	45	30	22	21	1,080	45
8	*22	103	30	148	111	154	248	110	20	103	412	33
9	22	100	30	153	94	109	65	109	*18	795	107	500
10	22	54	70	201	226	72	34	54	436	568	51	107
11	35	33	70	162	457	55	27	32	1,420	971	1,040	68
12	60	25	473	176	95	49	25	26	1,400	888	1,020	36
13	35	24	310	146	65	685	24	25	1,350	452	116	27
14	25	22	75	137	58	489	*122	*23	1,220	83	1,070	23
15	23	*22	44	252	50	84	219	22	1,160	671	948	228
16	23	24	37	*298	46	*45	147	115	437	1,370	141	131
17	23	24	35	262	40	38	91	54	134	*1,310	110	709
18	125	24	139	151	*45	33	54	30	64	1,020	*60	118
19	327	355	*235	80	193	122	34	22	38	108	912	49
20	68	327	67	39	65	171	147	22	30	321	154	366
21	36	108	41	35	105	58	251	23	23	1,330	247	490
22	179	71	36	34	59	38	209	24	20	1,330	500	*310
23	139	54	35	38	43	32	115	25	370	1,310	116	119
24	156	47	138	473	39	32	65	24	415	1,540	49	78
25	64	41	58	87	281	31	44	23	279	1,500	34	57
26	37	39	37	43	297	85	45	460	292	1,520	28	290
27	28	38	35	34	128	81	44	98	262	1,470	247	107
28	25	38	31	31	65	39	34	46	265	1,180	441	81
29	24	39	30	269	47	32	31	32	370	1,470	812	78
30	23	36	30	752	----------	30	30	56	1,270	1,330	104	51
31	22	----------	33	544	----------	29	----------	94	----------	983	47	----------
Total	1,744	1,892	2,350	4,943	4,085	3,779	2,329	1,742	11,550	24,892	16,059	9,102
Mean	56.3	63.1	75.8	159	141	122	77.6	56.2	385	803	518	303
Ac-ft	3,460	3,750	4,660	9,800	8,100	7,500	4,620	3,460	22,910	49,370	31,850	18,050

Calendar year 1963: Max 11,900 Min 19 Mean 676 Ac-ft 489,400
Water year 1963-64: Max 1,540 Min 18 Mean 231 Ac-ft 167,500

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 5-7, Feb. 20-22.

8-903. Lake Palo Pinto.--See page 299.

8-905. Palo Pinto Creek near Santo, Tex.

Location.--Lat 32°37'50", long 98°10'50", on left bank 0.5 mile upstream from The Texas and Pacific Railway Co. bridge, 2.4 miles downstream from Big Sunday Creek, 2.6 miles northeast of Santo, Palo Pinto County, 2.8 miles upstream from Wusser Creek, 4.4 miles upstream from Buck Creek, and 7.9 miles upstream from mouth.

Drainage area.--567 sq mi.

Records available.--October 1924 to September 1925, April 1951 to September 1964. Monthly discharge only for some periods published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 762.63 ft above mean sea level, datum of 1929. Nov. 20, 1924, to Sept. 30, 1925, staff gage at same site and datum.

Average discharge.--14 years (1924-25, 1951-64), 84.7 cfs (61,320 acre-ft per year).

Extremes.--Maximum discharge during year, 3,930 cfs Sept. 21 (gage height, 9.33 ft); no flow at times.
1924-25, 1951-64: Maximum discharge, 45,100 cfs May 26, 1957 (gage height, 31.05 ft, from floodmark), from rating defined by current-meter measurements below 18,000 cfs and slope-area measurement at 45,100 cfs; no flow at times.

Maximum stages since at least 1880 occurred May 8, 1922, and May 26, 1957. Flood of May 8, 1922, reached about the same stage as in 1957, from information by The Texas and Pacific Railway Co., but probably was slightly lower from information by local residents.

Remarks.--Records good. Flow largely controlled since January 1964 by Lake Palo Pinto (see page 299) located about 9.5 miles upstream.

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

1.1	0	2.0	88
1.2	.5	2.3	179
1.3	2.6	2.6	315
1.4	6.6	3.0	535
1.5	13	4.0	1,100
1.7	33	4.6	1,460

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.1	0	4.0	6.1	0.2	0			0	0
2		0	.1	0	1.1	5.6	.2	0			0	0
3		0	.1	0	.4	5.2	.1	0			0	0
4		0	0	0	63	*6.1	.1	0			0	0
5		0	0	0	*47	7.1	.2	0			0	0
6		0	0	0	23	5.2	.1	0			0	0
7		0	0	0	9.3	17	0	0			0	0
8		0	0	0	8.1	18	0	0			0	0
9		30	0	0	7.1	108	0	0		(*)	0	0
10		72	0	0	2.2	34	0	0			0	0
11	(*)	16	.3	0	.3	25	0	20			0	0
12		4.8	.3	0	.2	22	0	4.4	(*)		0	23
13		1.5	.1	0	.2	21	0	.8			0	5.3
14		.3	.1	0	.2	20	0	.2			0	.5
15		.1	.1	0	3.9	19	0	0			104	.1
16		0	.1	0	5.6	18	0	0			19	0
17		0	.1	0	6.1	16	0	0			1.5	11
18		0	*.1	0	6.1	12	0	0			.1	4.1
19		.4	0	0	5.6	11	0	0			3.8	.8
20		160	0	0	5.6	6.6	0	0			1.6	995
21		*44	0	0	6.6	4.4	0	0			0	1,430
22		17	.1	0	13	2.8	0	0			0	154
23		7.6	.1	*0	11	2.6	0	0			0	47
24	(*)	4.0	.1	0	8.7	2.0	0	0			0	8.6
25		2.6	.1	0	8.1	1.1	0	0			*0	3.2
26		1.5	.1	0	7.1	.9	.5	0			0	1.5
27		.5	.1	0	7.1	.6	2.8	0			0	1.5
28		.4	.1	0	6.6	.5	*2.0	0			0	.8
29		.4	.1	1.5	5.6	.4	.5	0			0	1.7
30		.1	.1	123	----------	*.3	.2	0			0	.6
31		----------	0	32	----------	.2	----------	0	----------		0	----------
Total	0	363.2	2.4	156.5	272.8	398.7	6.9	25.4	0	0	130.0	2,688.7
Mean	0	12.1	0.08	5.05	9.41	12.9	0.23	0.82	0	0	4.19	89.6
Ac-ft	0	720	4.8	310	541	791	14	50	0	0	258	5,330

Calendar year 1963: Max 3,000 Min 0 Mean 41.9 Ac-ft 30,320
Water year 1963-64: Max 1,430 Min 0 Mean 11.0 Ac-ft 8,020

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

8-910. Brazos River near Glen Rose, Tex.

Location.--Lat 32°16'15", long 97°39'45", at downstream side of bridge on U. S. Highway 67, 600 ft downstream from Georges Creek, 4.4 miles upstream from Paluxy Creek, 6 miles northeast of Glen Rose, Somervell County.
Drainage area.--24,830 sq mi, approximately, of which 9,240 sq mi is probably noncontributing.
Records available.--October 1923 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 567.82 ft above mean sea level, datum of 1929. Prior to May 7, 1931, staff gage at site 2.5 miles downstream at same datum. May 7, 1931, to Sept. 30, 1957, water-stage recorder at site 2.4 miles downstream at same datum, used as supplementary gage Oct. 1, 1957, to Apr. 1, 1959. Apr. 27, 1950, to Sept. 30, 1957, present gage used as supplementary gage.
Average discharge.--41 years, 1,593 cfs (1,153,000 acre-ft per year).
Extremes.--Maximum discharge during year, 8,110 cfs Sept. 22 (gage height, 11.01 ft); minimum daily, 23 cfs Oct. 21-22.
1923-64: Maximum discharge, 97,600 cfs May 18, 1935; maximum gage height, 33.89 ft May 27, 1957; no flow at times prior to construction of Possum Kingdom Dam.
Maximum stage since at least 1876 that of May 27, 1957. Flood in May 1908 reached a stage of 27 ft at site 2.4 miles downstream, and flood in May 1922 reached a stage of 29.5 ft (could have equaled or exceeded flood in 1957 at present site) at site 2.4 miles downstream; from information by local residents.
Remarks.--Records good except those for period of no gage-height record, which are fair. Flow since 1941 largely regulated by Possum Kingdom Reservoir (station 8-885) except during major floods, by several smaller reservoirs in Clear Fork, Hubbard Creek, and other basins, having a combined capacity of about 1,264,000 acre-ft, and since April 1964 by Lake Palo Pinto (capacity, 34,250 acre-ft). At end of year, flow from 16.2 sq mi above this station was partly controlled by 4 floodwater-retarding structures with a total combined capacity of 4,330 acre-ft below the flood spillway crests, of which 3,720 acre-ft is floodwater-retarding capacity and 610 acre-ft is sediment pool capacity. All of these structures were built during the current year. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Many diversions above station for irrigation, municipal supply, and oilfield operation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1, 8-27, Nov. 4-15, 22-23, Dec. 2-17, 23-24, Dec. 28 to Jan. 12, Jan. 28, Feb. 25-26, Feb. 28 to Mar. 1, May 5-9, 11-12, May 17 to June 1, June 8-15, 25-29, July 9-14)

5.1	20	5.7	200
5.2	32	6.0	420
5.3	50	6.5	980
5.4	76	7.0	1,700
5.5	108	10.0	6,310

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	92	125	116	92	754	108	*79	267	43	206	1,050	198
2	668	98	102	95	1,120	160	79	267	180	200	1,200	450
3	520	79	92	82	1,180	200	79	190	420	306	1,060	309
4	330	70	82	68	708	195	76	137	309	850	754	218
5	236	57	76	60	490	*175	102	108	224	500	814	518
6	175	48	68	55	384	155	102	102	175	316	540	889
7	137	42	65	50	348	133	102	98	133	206	778	730
8	108	40	55	48	357	126	95	95	108	155	1,010	697
9	*89	48	52	44	500	338	89	116	*95	112	1,130	520
10	70	46	62	44	470	302	89	125	79	79	967	339
11	57	48	68	44	402	582	86	98	60	55	560	236
12	48	50	62	38	316	430	82	127	46	55	375	185
13	42	48	62	a35	274	330	73	316	38	32	302	200
14	35	48	62	a32	218	274	70	236	31	*244	218	137
15	32	50	60	a30	274	224	79	170	745	620	711	185
16	30	92	60	a28	316	185	89	137	1,190	490	754	190
17	27	95	*77	a26	254	201	89	108	1,120	393	826	195
18	26	89	254	a25	195	480	89	92	1,050	267	1,120	133
19	25	86	206	a200	170	560	86	73	697	391	697	175
20	25	*89	175	a316	155	420	79	60	440	1,020	*490	425
21	23	73	142	*316	150	288	1,700	50	309	1,050	309	1,760
22	23	68	121	281	133	206	766	44	218	550	254	5,100
23	27	187	73	248	125	175	309	38	170	330	420	6,310
24	46	460	98	206	112	150	200	34	137	278	366	3,420
25	44	348	121	180	108	137	175	35	116	980	274	1,080
26	46	267	155	165	112	180	242	40	92	1,060	309	580
27	80	212	133	133	112	160	420	38	68	1,180	316	420
28	330	200	108	112	112	137	366	35	55	1,260	224	339
29	254	165	95	112	108	116	316	32	97	1,260	170	267
30	180	142	82	345	----------	108	*267	31	224	1,260	142	* 242
31	155	----------	86	384	----------	95	----------	30	----------	1,230	150	----------
Total	3,980	3,470	3,070	3,894	9,957	7,330	6,475	3,329	8,669	16,935	18,290	26,447
Mean	128	116	99.0	126	343	236	216	107	289	546	590	882
Ac-ft	7,890	6,880	6,090	7,720	19,750	14,540	12,840	6,600	17,190	33,590	36,280	52,460

Calendar year 1963: Max 11,500 Min 23 Mean 824 Ac-ft 596,800
Water year 1963-64: Max 6,310 Min 23 Mean 306 Ac-ft 221,800

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

8-915. Paluxy Creek at Glen Rose, Tex.

Location.--Lat 32°13'50", long 97°46'30", on left bank at downstream side of abandoned highway bridge, 500 ft upstream from bridge on U. S. Highway 67, 1 mile upstream from Cross Branch, 1.2 miles southwest of Glen Rose, Somervell County, and 4.7 miles upstream from mouth.

Drainage area.--399 sq mi.

Records available.--October 1923 to September 1925, May 1947 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 609.66 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942. Oct. 27, 1923, to Sept. 30, 1925, chain gage at bridge 1.8 miles downstream at datum 13.62 ft lower.

Average discharge.--18 years (1924-25, 1947-64), 62.0 cfs (44,890 acre-ft per year).

Extremes.--Maximum discharge during year, 9,960 cfs Apr. 21 (gage height, 13.13 ft); no flow Aug. 12, 15.
1923-25, 1947-64: Maximum discharge, 50,000 cfs Oct. 4, 1959 (gage height, 25.4 ft), from rating curve defined by current-meter measurements below 32,000 cfs; no flow at times.
Maximum stage since at least 1877, 27.2 ft Apr. 17, 1908, present site and datum (discharge, 59,000 cfs from rating curve explained above). Flood of May 21, 1922, reached a stage of 26.0 ft, present site and datum (discharge, 53,000 cfs). Flood in November 1918 reached about same stage as that of May 21, 1922, from information by local residents.

Remarks.--Records good. Small diversions above station.

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

1.72	0	2.6	64
1.8	.2	2.8	110
1.9	.8	3.0	168
2.0	2.1	3.4	315
2.1	4.9	4.0	600
2.2	10	5.0	1,200
2.3	18	7.0	2,650
2.4	30	9.0	4,500

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	1.1	6.7	8.8	60	14	20	*43	30	2.1	29	2.1
2	.6	1.0	6.7	8.8	34	14	*19	43	21	1.9	8.5	2.5
3	.5	1.0	6.2	8.8	24	11	18	37	14	1.8	6.2	1.9
4	.5	1.3	6.2	8.2	34	15	18	34	11	1.6	3.8	1.6
5	.5	1.3	6.2	8.2	*60	*13	30	32	11	1.6	2.1	1.1
6	.5	1.3	6.2	8.2	45	12	37	31	10	1.6	1.6	.8
7	.4	1.3	6.2	8.8	28	13	26	31	7.7	1.3	.8	.6
8	.4	3.6	6.2	8.8	22	31	20	31	7.2	1.1	.9	.4
9	*.4	8.8	6.2	8.2	19	183	18	37	*5.8	1.1	.4	.4
10	.4	5.8	7.7	8.2	16	64	16	34	5.8	1.0	.3	.2
11	.3	4.2	8.2	8.2	15	38	16	162	4.9	.9	.2	.2
12	.3	3.8	8.2	8.2	15	28	16	66	4.9	.7	.1	.6
13	.3	3.5	8.8	7.7	17	24	15	40	4.5	.7	.1	.4
14	.3	3.2	8.8	7.7	16	23	15	28	3.8	*.7	.2	5.4
15	.3	3.0	8.8	8.8	15	19	13	24	3.8	.7	.4	5.4
16	.3	2.8	8.2	14	15	17	14	21	8.8	.7	.6	6.2
17	.2	2.8	*8.2	15	14	17	15	19	9.4	.7	.5	44
18	.2	3.0	8.2	12	14	20	14	17	7.2	.7	.4	36
19	.2	4.9	8.2	12	13	129	14	15	4.9	.7	24	13
20	.2	*5.8	8.8	13	12	70	13	14	3.8	.7	*27	84
21	.2	11	8.8	12	14	47	*3,150	13	3.5	.7	8.8	1,060
22	.2	11	9.4	*11	13	37	282	13	3.5	.6	6.7	581
23	.3	8.2	9.4	11	12	36	127	12	3.0	.6	5.4	325
24	.4	6.2	9.4	10	12	32	85	11	2.5	.7	15	54
25	.4	5.8	9.4	9.4	12	30	68	10	2.5	.8	8.8	32
26	.4	5.4	8.8	8.8	12	26	92	9.4	2.3	.6	4.5	21
27	.7	5.8	8.8	8.8	12	26	130	9.4	2.3	.6	3.0	45
28	1.3	7.2	8.8	8.8	11	24	66	11	2.5	.5	2.3	38
29	1.3	7.2	8.8	12	11	22	51	9.4	2.3	.5	1.9	20
30	1.2	6.7	8.8	144	----------	21	45	10	2.3	.4	2.5	*14
31	1.1	----------	8.8	236	----------	20	----------	26	----------	114	3.0	----------
Total	14.9	138.0	248.1	663.4	597	1,076	4,463	893.2	206.2	142.3	169.0	2,396.8
Mean	0.48	4.60	8.00	21.4	20.6	34.7	149	28.8	6.87	4.59	5.45	79.9
Ac-ft	30	274	492	1,320	1,180	2,130	8,850	1,770	409	282	335	4,750

Calendar year 1963: Max 750 Min 0.2 Mean 19.0 Ac-ft 13,750
Water year 1963-64: Max 3,150 Min 0.1 Mean 30.1 Ac-ft 21,820

Peak discharge (base, 4,000 cfs)

Date	Time	Gage height	Discharge
4-21	1330	13.13	9,960

* Discharge measurement made on this day.

8-920. Nolands River at Blum, Tex.

Location.--Lat 32°09'02", long 97°24'10", on right bank 60 ft upstream from bridge on Farm Road 933, 0.6 mile northwest of Blum, Hill County, 2.8 miles downstream from Mustang Creek, 3.0 miles downstream from Gulf, Colorado and Santa Fe Railway Co. bridge, and 3.2 miles upstream from Rock Creek.

Drainage area.--276 sq mi.

Records available.--July 1924 to September 1925, November 1947 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 551.48 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942. July 29, 1924, to Sept. 30, 1925, and Nov. 14, 1947, to May 28, 1949, staff gage at railway bridge (now abandoned) 0.5 mile upstream at datum 5.0 ft higher.

Average discharge.--17 years (1924-25, 1948-64), 66.1 cfs (47,850 acre-ft per year).

Extremes.--Maximum discharge during year, 14,100 cfs Apr. 21 (gage height, 16.42 ft in gage well, 17.2 ft from drawdown curve); no flow July 17-19, 27-29, Aug. 2-16.

1924-25, 1947-64: Maximum discharge, 25,000 cfs May 17, 1949 (gage height, 24.0 ft, from floodmark), from rating curve defined by current-meter measurements below 16,000 cfs; no flow at times.

Maximum stage since at least 1887, 35.0 ft May 8, 1922, present site and datum, from information by local resident.

Remarks.--Records good. No diversion above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	1.0	3.0	2.2	12	4.8	13	32	12	1.1	0.2	0.5
2	.6	.9	2.2	2.2	6.5	5.1	13	*38	6.8	1.2	0	.4
3	.6	1.1	2.0	2.0	4.5	4.8	*12	40	5.8	1.1	0	.3
4	.4	1.6	1.8	2.5	9.0	10	12	27	5.5	1.1	0	.2
5	.3	1.6	2.0	5.7	19	12	124	28	6.1	1.0	0	.3
6	.2	1.4	2.4	3.2	10	*6.1	67	24	5.5	.6	0	.6
7	*2.0	1.0	2.4	2.8	5.8	4.8	28	25	5.8	.8	0	.4
8	1.5	1.7	2.2	2.5	4.2	6.5	16	27	*3.9	.7	0	.4
9	.9	2.8	2.0	2.5	3.4	1,050	12	38	2.5	.5	0	.4
10	.6	4.5	3.0	2.8	3.2	90	12	43	2.0	.5	0	.4
11	.5	2.8	11	2.8	2.8	30	11	26	2.2	.4	0	.3
12	.7	1.9	7.1	2.5	2.8	16	11	22	2.0	.8	0	.9
13	.7	1.4	4.5	2.7	3.9	12	9.8	17	1.8	*.4	0	.8
14	.8	1.0	3.4	2.8	7.3	10	8.3	13	1.2	.4	0	.6
15	1.1	1.0	3.2	2.8	4.8	8.3	7.5	11	.7	.2	0	.5
16	1.2	1.2	*3.2	6.3	4.2	6.5	7.5	9.4	1.5	.1	0	1.7
17	1.0	1.1	2.8	6.8	4.8	5.8	9.0	8.3	1.5	0	.2	2.4
18	1.1	*1.4	2.7	6.3	4.2	6.1	9.0	7.2	4.5	0	*17	3.7
19	1.0	2.0	2.7	13	3.9	1,870	8.3	6.5	8.1	0	4.9	2.4
20	1.1	3.5	3.0	*9.1	4.2	184	7.5	5.8	2.2	.1	1.5	37
21	1.2	5.0	3.4	6.1	4.5	64	*5,000	5.5	.9	.2	.7	22
22	1.6	5.9	4.5	4.8	5.1	41	794	5.5	.6	.3	1.1	373
23	1.5	2.7	3.0	4.2	5.8	32	352	5.1	.4	.2	2.0	131
24	81	1.9	2.7	3.7	4.8	28	122	4.8	1.3	.1	3.7	23
25	6.7	1.5	2.7	3.2	4.5	24	88	5.1	11	.1	1.6	5.7
26	3.0	1.5	3.0	3.2	4.2	21	155	3.9	2.5	.1	1.0	1.8
27	2.0	1.5	3.0	2.8	4.2	17	156	3.4	1.1	0	.7	13
28	1.6	6.0	2.7	2.8	3.9	17	69	4.5	.7	0	.6	*12
29	1.2	13	2.4	3.4	3.9	14	44	4.2	1.4	0	.6	5.7
30	1.1	5.1	2.4	248	----------	13	35	24	1.5	.1	.5	3.2
31	1.0	----------	2.2	54	----------	12	----------	16	----------	.2	.4	----------
Total	118.7	79.0	98.6	419.7	161.4	3,625.8	7,212.9	530.2	103.0	12.3	36.7	644.6
Mean	3.83	2.63	3.18	13.5	5.57	117	240	17.1	3.43	0.40	1.18	21.5
Ac-ft	235	157	196	832	320	7,190	14,310	1,050	204	24	73	1,280

Calendar year 1963: Max 520 Min 0 Mean 8.82 Ac-ft 6,390
Water year 1963-64: Max 5,000 Min 0 Mean 35.6 Ac-ft 25,870

Peak discharge (base, 5,000 cfs)

Date	Time	Gage height	Discharge
4-21	1800	17.2	14,100

* Discharge measurement made on this day.

8-925. Whitney Reservoir near Whitney, Tex.

Location.--Lat 31°52', long 97°22', on State Highway 22, in intake structure of Whitney Dam on Brazos River, 2.4 miles upstream from Coon Creek, 4.0 miles upstream from Iron Creek, and 7.4 miles southwest of Whitney, Hill County.
Drainage area.--26,170 sq mi, approximately, of which 9,240 sq mi is probably noncontributing.
Records available.--December 1951 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929 (levels by Corps of Engineers).
Extremes.--Maximum contents during year, 355,400 acre-ft Apr. 26-27 (elevation, 517.92 ft); minimum, 273,600 acre-ft Sept. 15 (elevation, 511.64 ft).
1951-64: Maximum contents, 1,980,000 acre-ft May 29, 1957 (elevation, 570.25 ft); minimum daily since power pool elevation first reached in April 1954, 250,200 acre-ft Nov. 1, 1956 (elevation, 509.52 ft).
Remarks.--Reservoir is formed by concrete gravity and rolled earth-fill dam 17,695 ft long including spillway. Main dam was completed in April 1951 and deliberate impoundment of water began Dec. 10, 1951. Capacity between gage heights 520.0 and 571.0 ft is 1,630,500 acre-ft and is reserved for flood-control storage. Total spillway capacity, 661,000 cfs at elevation 573.0 ft, maximum design level. Capacity based on survey made in 1937-38. Figures given herein represent total contents. Reservoir used for flood control and power development. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Brazos River near Glen Rose (station 8-910). Data regarding dam and reservoir are shown in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of seventeen 40- by 38-foot tainter gates	571.0	2,017,500
Crest of spillway	533.0	642,200
Top of designated power storage	520.0	387,000
Invert of two 16-foot diameter penstocks	476.0	43,500
Invert of sixteen 5- by 9-foot flood-control outlet conduits	448.83	5,140

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

Capacity table (elevation, in feet, and contents, in acre-feet)

511	266,300	515	314,900
512	277,800	516	328,200
513	289,700	517	342,100
514	302,000	518	356,500

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	331,000	301,300	293,200	285,600	289,200	299,800	323,600	353,300	329,200	304,000	287,500	277,400
2	329,700	300,400	292,800	285,300	290,400	299,600	323,100	353,800	327,600	303,300	288,800	275,500
3	328,600	299,900	292,600	285,500	292,500	300,000	323,100	353,900	326,300	302,200	289,500	274,000
4	326,700	300,000	292,100	284,700	295,000	300,300	323,500	353,000	326,200	302,200	289,400	274,200
5	326,500	299,800	292,000	284,400	296,200	300,300	326,100	351,600	325,500	303,000	289,100	274,200
6	326,300	298,900	291,600	284,000	297,100	300,300	326,500	351,600	325,000	301,900	288,700	274,900
7	324,600	297,500	291,200	283,500	296,900	300,400	326,300	351,000	324,200	300,800	288,100	275,900
8	323,400	299,400	290,800	283,100	297,400	302,300	326,100	350,400	322,600	298,800	288,500	276,100
9	321,200	300,000	290,300	282,600	297,600	306,600	325,700	350,600	321,500	298,100	289,700	276,600
10	320,400	300,000	290,800	282,100	298,600	306,800	325,400	350,100	319,200	297,800	289,500	274,800
11	319,500	299,100	290,500	281,600	299,000	308,000	325,100	349,700	317,000	297,400	289,300	274,600
12	318,000	298,000	290,200	281,200	300,100	308,600	325,000	349,000	314,900	297,300	288,700	274,300
13	317,800	297,000	290,200	280,700	300,300	309,200	324,800	347,800	312,800	295,800	287,700	274,000
14	316,800	295,700	289,200	280,200	300,500	310,100	324,600	346,800	311,000	294,200	286,600	274,000
15	315,700	294,600	288,900	280,500	300,600	310,200	324,000	345,800	310,100	292,800	287,100	273,600
16	315,100	294,400	288,500	281,100	300,900	310,300	323,600	345,800	314,200	292,300	288,200	277,200
17	314,400	294,700	288,100	280,900	301,100	310,300	323,600	345,700	314,900	291,700	288,600	277,100
18	313,300	294,700	288,000	281,100	301,300	311,600	323,500	344,400	315,300	290,000	287,900	277,100
19	313,000	295,000	287,900	281,300	301,100	320,800	323,200	343,300	315,300	288,500	288,000	276,500
20	312,500	293,800	288,500	281,400	301,400	322,800	323,500	342,000	315,700	286,900	287,200	277,400
21	311,700	293,300	288,500	281,800	301,300	323,000	343,800	340,400	315,800	286,900	286,600	280,100
22	311,100	294,100	288,300	282,100	300,900	323,200	351,100	339,200	315,000	286,800	286,800	291,500
23	310,400	292,700	287,700	282,500	300,500	323,800	353,600	338,300	314,100	285,900	286,900	306,600
24	309,700	292,500	287,900	282,500	300,400	323,900	354,600	337,500	312,700	284,700	286,500	315,000
25	308,400	293,100	287,500	282,200	300,300	324,700	354,600	335,900	311,400	283,800	285,700	317,600
26	307,700	293,100	287,400	282,100	300,300	324,300	355,400	334,100	309,800	283,400	284,700	319,100
27	307,200	293,400	287,200	282,200	300,100	324,300	355,400	333,400	309,000	283,800	283,700	320,700
28	305,700	294,300	286,900	281,900	299,900	324,700	355,200	331,900	308,600	284,400	281,900	320,700
29	304,700	293,600	286,800	282,500	299,800	324,700	354,600	330,800	306,100	285,100	281,900	321,000
30	302,400	293,400	286,300	286,600	----------	324,400	354,000	330,400	305,600	285,500	281,400	321,000
31	301,800	----------	286,000	288,500	----------	323,900	----------	330,000	----------	286,400	278,700	----------
(†)	513.98	513.31	512.70	512.90	513.82	515.68	517.83	516.13	514.28	512.73	512.08	515.46
(‡)	-30,500	-8,400	-7,400	+2,500	+11,300	+24,100	+30,100	-24,000	-24,400	-19,200	-7,700	+42,300

Calendar year 1963..... ‡ -98,200
Water year 1963-64..... ‡ -11,300

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-930. Brazos River near Whitney, Tex.

Location.--Lat 31°50'30", long 97°19'30", on right bank 3,000 ft upstream from Iron Creek, 1.0 mile downstream from Coon Creek, 3.4 miles downstream from Whitney Dam, and 7.5 miles south of Whitney, Hill County.

Drainage area.--26,190 sq mi, approximately, of which 9,240 sq mi is probably noncontributing.

Records available.--October 1938 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 417.39 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Nov. 29, 1938, chain gage and Nov. 29, 1938, to Sept. 30, 1948, wire-weight gage at site 8.3 miles upstream at datum 14.67 ft higher.

Average discharge.--26 years, 1,690 cfs (1,224,000 acre-ft per year).

Extremes.--Maximum discharge during year, 5,120 cfs Aug. 31 (gage height, 9.42 ft); minimum daily, 78 cfs Sept. 5.
1938-64: Maximum discharge, 71,800 cfs May 18, 1949 (gage height, 31.03 ft); minimum daily, 0.4 cfs May 9, 1953.
Maximum stage since at least 1853, 45 ft May 9, 1922, from information by local residents.

Remarks.--Records good. Flow regulated by Whitney Reservoir (see preceding page). Recording water-temperature gage located at station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

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

4.0	68
4.5	172
5.0	340
5.5	570
6.0	950
6.5	1,270
7.0	1,740

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,150	275	152	214	213	284	149	*733	320	899	397	880
2	726	244	196	186	243	253	*240	317	746	684	378	1,500
3	1,350	278	238	240	226	230	278	210	731	758	720	1,310
4	1,430	168	220	208	237	203	286	637	710	232	860	130
5	435	216	230	205	237	124	273	659	637	160	920	78
6	250	440	226	207	250	*246	162	650	301	801	825	205
7	1,140	550	234	284	230	225	170	662	204	855	770	158
8	*740	327	179	246	234	175	183	700	694	1,230	540	342
9	1,100	160	302	190	224	230	229	282	*778	248	263	361
10	425	120	284	214	255	188	210	161	1,230	182	854	1,550
11	425	410	229	250	218	224	226	708	1,240	127	930	688
12	768	490	207	224	215	268	252	622	1,080	135	a 630	114
13	243	500	232	195	234	234	218	656	1,090	764	a 640	165
14	341	530	286	160	217	170	191	650	960	813	a 630	148
15	564	480	187	226	192	162	258	740	726	*770	a 425	138
16	282	93	*235	218	186	230	294	253	525	742	a 220	153
17	270	349	226	196	314	226	219	170	730	765	a 650	174
18	390	226	244	164	235	252	222	682	725	1,170	1,510	154
19	250	*202	218	184	234	410	225	752	732	1,130	*772	444
20	175	650	234	200	205	270	217	693	370	1,220	900	347
21	380	255	241	*220	231	259	323	730	214	944	840	234
22	440	160	180	170	284	190	222	672	730	875	590	274
23	250	212	230	198	283	268	353	362	740	916	204	290
24	665	320	140	206	216	254	273	451	756	890	606	205
25	704	180	170	228	234	248	234	938	734	862	772	260
26	303	163	192	182	244	244	187	780	778	887	786	293
27	385	460	195	213	238	224	684	600	446	860	785	192
28	911	230	340	200	234	286	650	789	173	665	1,290	158
29	622	219	212	268	235	208	658	600	1,420	718	218	*196
30	1,230	230	308	250	----------	271	660	410	284	728	338	230
31	698	----------	190	226	----------	326	----------	333	----------	590	1,650	----------
Total	19,042	9,137	6,957	6,572	6,798	7,382	8,746	17,602	20,804	22,620	21,913	11,371
Mean	614	305	224	212	234	238	292	568	693	730	707	379
Ac-ft	37,770	18,120	13,800	13,040	13,480	14,640	17,350	34,910	41,260	44,870	43,460	22,550

Calendar year 1963: Max 4,750 Min 31 Mean 923 Ac-ft 667,800
Water year 1963-64: Max 1,650 Min 78 Mean 434 Ac-ft 315,200

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

8-935. Aquilla Creek near Aquilla, Tex.

Location (revised).--Lat 31°50'40", long 97°12'06", on right bank 50 ft upstream from bridge on Farm Road 1304, three-quarters of a mile upstream from Palls Branch, and 1 mile southeast of Aquilla, Hill County.

Drainage area.--306 sq mi.

Records available.--December 1938 to September 1964. Records of daily discharge for December 1924 to August 1925, published in WSP 608, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 451.48 ft above mean sea level (levels by Corps of Engineers). Dec. 9, 1924, to Aug. 31, 1925, chain gage at same site and datum.

Average discharge.--25 years (1939-64), 108 cfs (78,190 acre-ft per year).

Extremes.--Maximum discharge during year, 2,470 cfs Sept. 24 (gage height, 17.90 ft); no flow for many days. 1938-64: Maximum discharge, 34,200 cfs May 2, 1944 (gage height, 30.84 ft), from rating curve defined by current-meter measurements below 12,000 cfs and slope-area measurement at 74,200 cfs (adjusted to gage site); no flow at times.

Flood of Aug. 31, 1887, reached a stage of 34 ft, from information by local resident. Flood of Sept. 27, 1936, was the highest since 1887 and reached a stage of 33 ft, from floodmark; discharge, 84,500 cfs by slope-area measurement 9 miles downstream, discharge, 74,200 cfs (adjusted to gage site).

Remarks.--Records fair except those for period Sept. 16-27, which are poor. No known diversion above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0	7.9	1.5	4.2	0.3	3.2			0
2				0	4.2	2.2	4.2	*.4	1.5			0
3				0	3.2	3.9	*4.0	1.0	.7			0
4				0	3.9	2.2	3.9	.9	*.3			0
5				0	7.9	*1.9	44	1.0	.3			0
6				0	*4.7	1.9	44	.8	.4			0
7	(*)			0	3.9	1.9	18	.5	.1			0
8				0	3.1	2.0	11	.8	*0			0
9				0	2.5	31	7.9	1.5	0			0
10				0	2.0	19	6.5	3.0	0			0
11				0	1.9	8.2	6.0	2.0	0			0
12				0	1.8	5.3	5.8	.7	0			0
13				0	2.2	4.2	5.3	.3	0			0
14				0	4.2	3.9	5.1	.2	0	(*)		0
15				0	3.1	3.2	4.4	.1	0			0
16			(*)	0	3.0	2.8	3.9	.1	.7			193
17				.5	2.4	2.5	3.9	0	6.1			244
18		(*)		3.1	3.2	2.4	3.9	0	1.6		(*)	5.5
19				38	3.1	462	3.7	0	.5			1.1
20				*3.5	2.4	84	3.4	0	.1			.4
21				2.6	2.0	14	3.2	0	0			.4
22				2.0	2.0	9.5	3.0	0	0			90
23				1.7	2.0	7.9	3.4	0	0			503
24				1.3	2.0	7.0	5.8	0	0			1,030
25				1.2	2.0	7.0	5.5	0	0			21
26				1.0	1.9	6.0	6.0	0	0			a10
27				1.0	1.8	5.3	2.2	0	0			a150
28				.9	1.6	4.9	1.1	0	0			*195
29				.9	1.5	4.9	.6	0	0			18
30				37	----------	4.7	.4	16	0			7.1
31		----------		22	----------	4.4	----------	4.9	----------			----------
Total	0	0	0	116.7	87.4	721.6	224.3	34.5	15.5	0	0	2,468.5
Mean	0	0	0	3.76	3.01	23.3	7.48	1.11	0.52	0	0	82.3
Ac-ft	0	0	0	231	173	1,430	445	68	31	0	0	4,900

Calendar year 1963: Max 380 Min 0 Mean 5.72 Ac-ft 4,140
Water year 1963-64: Max 1,030 Min 0 Mean 10.0 Ac-ft 7,280

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

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.

8-937. North Bosque River at Stephenville, Tex.

Location.--Lat 32°12'55", long 98°11'50", in center of stream at downstream side of bridge on U. S. Highway 67 at Stephenville, Erath County, 0.5 mile southeast of Erath County Courthouse, and 1.5 miles downstream from Gulf, Colorado and Santa Fe Railway Co. bridge.

Drainage area.--93.2 sq mi.

Records available.--March 1958 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,223.60 ft above mean sea level, datum of 1929, supplementary adjustment of 1942.

Average discharge.--6 years, 14.8 cfs (10,710 acre-ft per year).

Extremes.--Maximum discharge during year, 2,040 cfs Sept. 21 (gage height, 13.65 ft); no flow for many days.
1958-64: Maximum discharge, 12,100 cfs Oct. 4, 1959 (gage height, 19.90 ft, from floodmark), from rating curve defined by current-meter measurements below 4,250 cfs and slope-area measurements at 40,000 and 49,000 cfs; no flow for many days each year.
Maximum stage since at least 1854, 23.5 ft May 19, 1955, from floodmarks (discharge, 49,000 cfs, by slope-area measurement of peak flow).

Remarks.--Records good prior to Aug. 15 and fair thereafter. No diversion above station. Recording rain gage located at station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 24-25, Nov. 8-9, Jan. 30-31, Feb. 4, Sept. 27-30)

Oct. 1 to Nov. 7

1.8	0
1.9	.1
2.0	.4
2.1	1.2
2.2	3.0

Nov. 8 to Sept. 30

1.0	0	2.5	48
1.1	.3	3.0	75
1.2	1.9	4.0	146
1.3	3.6	5.0	256
1.5	8.2	6.0	398
1.7	14	8.0	796
2.0	25	10.0	1,310

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0		0	3.5	0	0.1	0.2			0	0
2	0	0		0	1.6	0	.1	.1			0	0
3	0	0		0	1.0	0	.1	.1			0	0
4	0	0		0	*369	*.2	.1	0			0	0
5	0	0		0	*18	0	2.7	0			0	0
6	0	0		0	*3.4	0	.3	0			0	0
7	0	0		0	1.4	0	.1	0			0	0
8	0	98		0	.5	.7	0	.1			0	0
9	0	44		0	.2	6.2	0	.2		(*)	0	0
10	*0	3		0	.1	.8	0	0	(*)		0	0
11	0	1		0	0	.4	0	0			0	0
12	0	.5		0	0	.2	.1	0			0	0
13	0	0		0	.7	.1	0	0			0	0
14	0	0		0	.1	.1	0	0			0	0
15	0	0		0	.1	0	0	0			.4	0
16	0	0		3.6	0	0	0	0			0	8.0
17	0	0		1.1	0	.1	0	0			.2	13
18	0	0	(*)	.8	0	1.3	0	0			0	1.2
19	0	41		.2	0	6.9	0	0			0	.2
20	0	8.2		0	0	1.6	.1	0			0	*377
21	0	*1.0		0	.1	.5	*122	0			0	*1,280
22	0	.3		*0	.1	.3	7.7	0			239	231
23	0	0		0	.1	.2	3.0	0			15	157
24	1.7	0		0	.1	.1	1.6	0			2.3	31
25	.1	0		0	.1	.1	.7	0			*.2	15
26	0	0		0	0	0	41	0			.1	43
27	0	0		0	0	0	8.3	0			0	20
28	0	1.0		0	0	0	2.4	0			32	5.4
29	0	0		2.6	0	0	1.0	0			4.0	1.0
30	0	0		441	----------	*.1	*.4	0			1.0	.3
31	0	----------		51	----------	.1	----------	0	----------		.1	----------
Total	1.8	198.0	0	500.3	400.1	20.0	191.8	0.7	0	0	294.3	2,183.1
Mean	0.06	6.60	0	16.1	13.8	0.65	6.39	0.02	0	0	9.49	72.8
Ac-ft	3.6	393	0	992	794	40	380	1.4	0	0	584	4,330

Calendar year 1963: Max 1,220 Min 0 Mean 11.5 Ac-ft 8,300
Water year 1963-64: Max 1,280 Min 0 Mean 10.4 Ac-ft 7,520

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
1-30	1700	10.20	1,090
2- 4	0800	9.65	1,090
8-22	1500	10.67	1,060
9-21	1500	13.65	2,040

* Discharge measurement or observation of no flow made on this day.
Note.--Stage-discharge relation indefinite Aug. 22-23, 28, Sept. 16-17, 20-21.

8-940. Green Creek subwatershed No. 1 near Dublin, Tex.

Location.--Lat 32°10'00", long 98°20'30", near center of dam on main headwater channel of Green Creek, three-fourths of a mile downstream from county road, 1.0 mile east of Farm Road 219, and 4.0 miles north of Dublin, Erath County.

Drainage area.--3.18 sq mi.

Records available.--May 1955 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,408.00 ft above mean sea level, datum of 1929 (levels by Soil Conservation Service).

Average outflow.--9 years, 404 acre-ft per year).

Extremes.--Maximum outflow during year, 15.8 cfs Sept. 23 (gage height, 16.70 ft); no outflow for many days. Maximum inflow, 2,090 cfs (average for 5-minute interval) Sept. 21, computed from change in pool contents, adjusted for rainfall on pool surface during time of peak inflow; no inflow for many days.
1955-64: Maximum outflow, 709 cfs May 1, 1955 (gage height, 23.21 ft); no outflow for many days. Maximum inflow, 9,910 cfs (average for 15-minute interval) Apr. 30, 1956, computed from outflow and change in pool contents, unadjusted for rainfall on pool surface during time of peak inflow (no rainfall record at time of peak inflow); no inflow for many days each year.

Remarks.--Records good. Pool is formed by earth-fill dam, completed Apr. 25, 1955. Outlet structure is 30-inch square concrete drop inlet connected to 14-inch concrete outlet pipe. Top of drop outlet is at gage height 11.00 ft, emergency spillway at gage height 21.8 ft. There is a clean-out gate valve at end of 8-inch pipe which connects to lower end of drop inlet box at gage height 3.76 ft. Pool capacity at emergency spillway level, 1,131 acre-ft; at top of drop outlet, 240 acre-ft; and at controlled outlet pipe, 57.4 acre-ft. Dam built by Soil Conservation Service for flood control. Rainfall record obtained from one recording rain gage in basin above station. Diversion through 8-inch valve for irrigation not to exceed 181 acre-ft per year. Capacity and surface area based on sedimentation survey of Apr. 9, 1962, by Soil Conservation Service.

Pool water budget, in acre-feet, water year October 1963 to September 1964

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Inflow1/	16.3	139	3.1	25.0	54.4	6.5	87.1	2.5	8.8	1.0	77.1	505
Outflow	0	29.6	0	23.2	60.1	2.3	59.3	3.8	4.8	18.4	0	329
(††)	1.57	6.01	.63	3.03	1.56	1.75	3.47	.45	.93	.96	4.83	10.95

Calendar year 1963: Inflow 336 Outflow 96.6 †† 24.46
Water year 1963-64: Inflow 926 Outflow 530 †† 36.14

Peak inflow (base, 100 cfs)

Date	Time	Discharge
11- 8	1635	703 (5-min)
4-21	0930	296 (5-min)
9-20	0225	263 (5-min)
9-21	0410	2,090 (5-min)
9-23	0900	200 (15-min)

1/ Inflow adjusted for rainfall on pool and for pool losses.
†† Weighted mean rainfall, in inches.
Note.--No gage-height record Sept. 23-30.

8-945. Green Creek near Alexander, Tex.

Location.--Lat 32°04'20", long 98°14'00", at downstream side of bridge on State Highway 6, 0.2 mile upstream from Missouri, Kansas, Texas Railroad Co. bridge, 1.0 mile upstream from Cottonwood Creek, and 1.7 miles northwest of Alexander, Erath County.

Drainage area.--45.5 sq mi.

Records available.--October 1954 to April 1958 (annual maximum only), May 1958 to September 1964.

Gage.--Water-stage recorder and crest-stage gage. Datum of gage is 1,172 ft above mean sea level, datum of 1929. Prior to May 27, 1958, crest-stage gage only.

Average discharge.--6 years, 4.54 cfs (3,290 acre-ft per year).

Extremes.--Maximum discharge during year, 9,160 cfs Sept. 21 (gage height, 17.83 ft); no flow for many days. 1954-64: Maximum discharge, 23,900 cfs Apr. 30, 1956 (gage height, 23.95 ft); no flow at times each year. Maximum stage since at least 1910, 28.0 ft May 23, 1952 (discharge, 55,800 cfs, from contracted-opening measurement).

Remarks.--Records good. At end of year, flow from 22.0 sq mi above this station was partly controlled by eight floodwater-retarding structures with a total combined capacity of 7,840 acre-ft below flood spillway crests, of which 6,864 acre-ft is floodwater-retarding capacity and 976 acre-ft is sediment-pool capacity. Capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Eleven rain gages (8 standard and 3 recording) are in operation in the basin. Station operated as part of Green Creek basin hydrologic cooperative program of the Geological Survey and Soil Conservation Service to evaluate rainfall-runoff relationships, and to assist the Soil Conservation Service in evaluating the effect of floodwater-retarding structures.

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

2.5	0	3.2	11	5.5	270
2.6	.2	3.5	26	6.0	375
2.7	.4	4.0	62	7.0	640
2.8	1.1	4.5	112	8.0	970
2.9	2.4	5.0	180	9.0	1,390
3.0	4.6				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0		0	7.2	0.2	0.1	1.6				0
2		0		0	3.2	.2	.1	1.2				0
3		0		0	1.9	.1	0	.8				0
4		0		0	*69	*.2	.8	.6				0
5		0	(*)	0	*23	.2	4.2	.5				0
6		0		0	* 9.2	.2	.6	.4				0
7		0		0	4.9	.2	.2	.4				0
8		226		0	2.8	.2	.1	5.4				0
9		55		0	1.8	4.1	.1	2.0		(*)		0
10		24		0	1.3	1.8	.1	1.1	(*)			0
11		15		0	.9	.6	.1	.6				0
12		4.4		0	.9	.4	.1	.4				0
13		.9		0	1.2	.3	.1	.3				0
14		.3		0	1.5	.2	0	.2				0
15		.1		0	1.2	.2	0	.2				0
16		0		0	1.0	.2	0	.1				0
17		0		0	.8	.1	.1	.1				0
18		0		0	.8	.1	.1	.1			(*)	0
19		0		0	* .8	6.5	.1	.1				0
20		1.1		0	.6	1.9	.1	.1				30
21		.8		* 0	.7	.6	*578	.1				1,270
22		.2		0	.7	.3	73	.1				92
23	(*)	.1		0	.5	.2	54	.1				262
24		.1		0	.5	.2	34	0				103
25		0		0	.5	.2	24	0				91
26		0		0	.4	.2	20	0				78
27		0		0	.3	.1	11	0				67
28		0		0	.2	.1	5.7	0				59
29		0		0	.2	.1	*3.2	0				53
30		0		52	----------	.1	2.0	0				44
31		----------		22	----------	*.1	----------	0	----------			----------
Total	0	328.0	0	74	138.0	20.1	811.9	16.5	0	0	0	2,149
Mean	0	10.9	0	2.39	4.76	0.65	27.1	0.53	0	0	0	71.6
Ac-ft	0	651	0	147	274	40	1,610	33	0	0	0	4,260
(†)	473	878	831	908	905	874	992	879	688	496	498	1,290
(††)	1.40	5.22	0.68	2.72	1.40	2.10	4.32	1.10	0.99	0.48	3.56	9.30

Calendar year 1963: Max 226 Min 0 Mean 1.59 Ac-ft 1,150 †† 22.04
Water year 1963-64: Max 1,270 Min 0 Mean 9.67 Ac-ft 7,020 †† 33.27

* Discharge measurement or observation of no flow made on this day.
† Contents, in acre-feet, at end of month.
†† Weighted mean rainfall, in inches, during month.

8-948. North Bosque River at Hico, Tex.

Location.--Lat 31°58'39", long 98°02'05", on left bank at downstream side of bridge on U. S. Highway 281, near south boundary at Hico, Hamilton County, 2.5 miles downstream from Gilmore Creek, and 5.0 miles upstream from Honey Creek.
Drainage area.--357 sq mi.
Records available.--January 1962 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 982.46 ft above mean sea level, datum of 1929.
Extremes.--Maximum discharge during year, 9,820 cfs Apr. 21 (gage height, 19.40 ft); no flow at times.
1962-64: Maximum discharge, that of Apr. 21, 1964; no flow at times each year.
Maximum stage since at least 1880, 27.6 ft May 23, 1952, from floodmarks (discharge, 87,800 cfs by contracted-opening measurement).
Revisions.--The maximum discharge for the water year 1963, has been revised to 6,480 cfs Oct. 8, 1962 (gage height, 14.00 ft), superseding figures published in Surface Water Records of Texas, 1963.
Remarks.--Records good. At end of year, flow from 46.2 sq mi above this station was partly controlled by 13 floodwater-retarding structures with a total combined capacity of 15,150 acre-ft below the flood spillway crests, of which 13,340 acre-ft is floodwater-retarding capacity and 1,810 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. These floodwater-retarding structures were built from 1951 to 1957.
Revisions.--Revised figures of discharge, in cubic feet per second, for the period Oct. 8, 1962, superseding previously published figures, are given herewith:

Oct. 8, 1962..... 1,920

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
October 1962.....	3,738.1	1,920	0	121	7,410
Calendar year 1962.....	7,258.1	1,920	0	19.9	14,390
Water year 1962-63.....	8,220.0	1,920	0	22.5	16,310

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.4	0.9	35	1.1	*3.3	15	0.7	0.2	0	0.5
2		0	3.0	.9	12	1.4	2.7	14	.8	.2	0	.3
3		0	2.7	.8	5.3	1.1	2.5	11	.8	.2	0	.1
4		0	2.0	.6	*343	*1.7	2.2	8.5	.8	.3	0	0
5		0	1.2	.4	*159	1.7	36	6.5	1.1	.3	0	0
6		0	.8	.3	*44	1.5	21	6.1	.9	.2	0	0
7		0	.5	.2	20	1.5	9.2	6.1	.7	.2	0	0
8		28	.3	.2	12	18	5.3	6.1	.5	.2	0	0
9		342	.1	.1	8.0	161	4.3	21	.5	.1	0	0
10	(*)	30	.1	0	5.3	21	3.6	14	*.7	.1	0	0
11		13	0	0	3.9	10	3.3	8.0	.5	0	0	0
12		7.8	0	0	3.3	5.3	3.0	5.3	.4	0	0	0
13		3.9	0	0	5.6	4.3	2.5	3.9	.5	*0	0	0
14		.8	0	0	3.6	3.3	2.5	3.0	.5	0	0	0
15		.8	0	0	3.0	2.2	2.0	2.7	.4	0	0	0
16		1.1	0	0	2.2	2.0	2.0	2.5	13	0	0	0
17		1.1	*0	.1	1.9	1.9	2.2	2.5	5.7	0	0	0
18		1.1	0	3.4	1.9	2.7	2.2	1.9	.9	0	0	0
19		.9	0	2.5	1.5	181	2.2	1.7	.7	0	0	0
20		20	0	2.0	1.4	38	2.2	1.7	.5	0	0	*279
21		*15	0	2.2	1.4	18	*2,800	1.7	.5	0	0	*2,900
22		5.7	.6	*2.0	1.4	12	*519	1.7	.5	0	0	572
23		1.9	1.5	1.9	1.4	9.0	224	1.7	.4	0	140	608
24		1.1	1.5	1.2	1.2	7.5	126	1.4	.3	0	17	296
25		.7	1.4	.8	1.2	6.1	93	1.4	.2	0	5.0	189
26		.7	1.4	.6	1.4	5.0	88	1.2	.2	0	*1.9	131
27		.5	1.2	.5	1.2	4.3	107	1.2	.3	0	1.1	113
28		1.4	1.1	.5	1.1	4.3	45	1.4	.3	0	.6	66
29		.6	.9	1.4	1.1	3.6	26	1.2	.3	0	20	51
30		.3	.9	545	----------	3.3	*19	.7	.3	0	4.5	*42
31		----------	.9	264	----------	3.0	----------	.7	----------	0	1.5	----------
Total	0	478.4	22.5	832.5	683.3	536.8	4,161.2	155.8	33.9	2.0	191.6	5,247.9
Mean	0	15.9	0.73	26.9	23.6	17.3	139	5.03	1.13	0.06	6.18	175
Ac-ft	0	949	45	1,650	1,360	1,060	8,250	309	67	4.0	380	10,410

Calendar year 1963: Max 1,110 Min 0 Mean 12.8 Ac-ft 9,300
Water year 1963-64: Max 2,900 Min 0 Mean 33.7 Ac-ft 24,480

Peak discharge (base, 2,500 cfs)

Date	Time	Gage height	Discharge
4-21	1330	19.40	9,820
9-21	1030	19.20	9,600

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

8-950. North Bosque River near Clifton, Tex.

Location.--Lat 31°47'10", long 97°34'00", near left bank on downstream side of bridge on Farm Road 219, 0.5 mile northeast of Clifton, Bosque County, and 2.9 miles downstream from Meridian Creek.

Drainage area.--972 sq mi.

Records available.--October 1923 to September 1964. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder and supplemental wire-weight gage. Datum of gage is 605.43 ft above mean sea level, datum of 1929, supplementary adjustment of 1942. Prior to Oct. 1, 1955, and from Apr. 23, 1957, to Mar. 26, 1958, staff gage at site 1.1 miles upstream at datum 17.02 ft higher; from Oct. 1, 1955, to Apr. 22, 1957, and from Mar. 27, 1958, to Sept. 30, 1959, water-stage recorder (destroyed by flood Apr. 27, 1957, and Oct. 4, 1959) and Oct. 1, 1959, to Jan. 1, 1961, wire-weight gage at present site and datum.

Average discharge.--41 years, 197 cfs (142,600 acre-ft per year).

Extremes.--Maximum discharge during year, 19,500 cfs Nov. 9 (gage height, 21.19 ft); no flow Oct. 22 to Nov. 7. 1923-64: Maximum discharge, 92,800 cfs Oct. 4, 1959 (gage height, 34.88 ft), from rating curve defined by current-meter measurement below 34,000 cfs and contracted opening measurement of 92,800 cfs; no flow at times. Maximum stage since at least 1854, that of Oct. 4, 1959. Flood of May 9, 1922, reached a stage of about 32 ft, from information by local residents.

Remarks.--Records good except those for periods of no gage-height record, which are fair. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see North Bosque River near Hico (station 8-948). Recording rain gage located at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 30 to Nov. 9, Dec. 16 to Jan. 30, Mar. 9, 19, Apr. 5-6, 21-28, May 31, June 16, July 21 to Aug. 1, Sept. 16-17, 21-24)

1.2	0	1.8	3.1	3.5	186
1.3	.1	2.0	6.6	4.0	327
1.4	.2	2.2	12	5.0	750
1.5	.5	2.4	22	7.0	2,000
1.6	1.1	2.7	48	9.0	3,690
1.7	1.9	3.0	90	11.0	5,800

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0	8	3.4	300	24	54	84	86	1.9	0.2	*1.6
2	.1	0	7	3.3	130	27	54	104	38	1.8	.2	1.2
3	.1	0	6	3.1	80	23	53	90	22	1.6	.2	1.0
4	.1	0	5	3.1	150	40	52	70	16	1.4	.2	.7
5	.1	0	4	3.0	600	67	125	61	16	1.2	.2	.5
6	.1	0	4	2.8	250	54	154	56	11	1.1	.2	.4
7	.1	0	4	2.8	130	40	120	52	9.3	.7	.2	.4
8	.1	.1	3	3.1	80	39	82	50	7.1	.6	.2	.4
9	.1	5,570	3	3.3	60	*3,000	61	54	5.4	.3	.2	.3
10	.1	302	4	3.1	50	452	50	54	5.0	.2	.2	.2
11	.1	106	6	3.1	45	182	46	66	4.3	.1	** .2	.3
12	.1	60	5	3.6	45	119	43	59	3.3	.1	.2	.4
13	.1	38	5	3.1	50	93	41	47	2.4	.2	.2	.4
14	.1	26	6	2.7	55	79	39	40	2.0	.2	.2	.3
15	.1	18	4	3.0	55	71	35	34	1.9	.2	.3	.3
16	.1	13	3.6	5.6	50	64	33	30	220	.2	.5	697
17	.1	10	3.4	5.2	40	58	35	27	73	.1	.5	357
18	.1	9.3	3.6	5.8	35	55	38	25	94	.1	.4	24
19	.1	8.3	3.3	6.4	33	1,320	36	23	40	.1	.3	8.3
20	.1	7.3	4.6	6.2	32	528	33	20	20	.1	.3	70
21	.1	6.4	4.5	5.6	32	198	3,330	18	12	.1	.2	1,910
22	0	6.0	4.2	7.1	31	128	2,760	18	8.8	.1	.6	4,210
23	0	8.8	3.7	7.6	30	109	*3,660	16	6.4	.1	.8	1,100
24	0	15	3.4	7.6	29	95	487	16	4.8	.1	.6	805
25	0	11	3.3	9.3	28	88	369	16	3.7	.1	3.1	254
26	0	8.8	3.4	7.8	26	82	274	14	3.1	.2	26	178
27	0	*8.3	2.8	6.0	25	76	250	13	2.4	.1	12	136
28	0	12	4.0	5.0	* 24	71	213	*12	2.2	.1	7.3	117
29	0	10	4.0	*4.8	24	67	132	10	2.0	.1	5.0	*93
30	*0	9	*3.6	1,650	---	61	*95	9.9	*1.8	.2	3.3	74
31	0	---	3.4	*1,280	---	*56	---	127	---	*.3	2.2	---
Total	2.1	6,263.3	132.8	3,066.5	2,519	7,366	12,754	1,315.9	723.9	13.7	66.2	10,041.7
Mean	0.07	209	4.3	98.9	87	238	425	42.4	24.1	0.44	2.14	335
Ac-ft	4.2	12,420	265	6,080	5,000	14,610	25,300	2,610	1,440	27	131	19,920

Calendar year 1963: Max 5,570 Min 0 Mean 35.8 Ac-ft 25,950
Water year 1963-64: Max 5,570 Min 0 Mean 121 Ac-ft 87,810

Peak discharge (base, 8,300 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
11-9	0500	21.19	19,500	4-21	2200	17.55	14,500
3-9	1000	13.71	9,210	9-22	1800	16.00	12,300

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record Oct. 9-29, Nov. 28 to Dec. 15, Feb. 1-27, Feb. 29.

8-952. North Bosque River at Valley Mills, Tex.

Location.--Lat 31°40'10", long 97°28'09", on right bank at downstream side of bridge on Farm Road 56, about 0.8 mile downstream from Thompson Hollow, 0.8 mile north of intersection of State Highway 6, and Farm Road 56 in Valley Mills, Bosque County.

Drainage area.--1,150 sq mi.

Records available.--August 1959 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 524.55 ft above mean sea level, datum of 1929. Prior to Dec. 29, 1959, wire-weight gage at same site and datum.

Average discharge.--5 years, 190 cfs (137,600 acre-ft per year).

Extremes.--Maximum discharge during year, 20,200 cfs Sept. 22 (gage height, 29.35 ft); no flow Oct. 5-12.
1959-64: Maximum discharge, 107,000 cfs Oct. 4, 1959 (gage height, 40.22 ft, from floodmark), from rating curve defined by current-meter measurements below 21,000 cfs and slope-area measurement of 107,000 cfs; no flow Oct. 5-12, 1963.
Maximum stage since at least 1868, 43 ft in May 1908; floods in September 1936 and April 1945 reached a stage of about 38 ft; above information by local residents.

Remarks.--Records good except for periods of no gage-height record, which are fair. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see North Bosque River near Hico (station 8-948). Small diversions above station. Recording rain gage located at station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	1.6	10	6.6	448	25	58	101	121	4.1	1.4	3.6
2	.3	2.4	9.3	6.6	202	90	55	96	44	3.9	2.6	2.9
3	.3	1.8	8.4	6.3	118	26	52	114	25	3.6	1.4	2.4
4	.2	2.0	7.7	5.5	98	30	50	77	18	2.9	1.0	1.6
5	0	2.2	6.8	5.2	745	56	136	66	17	2.6	1.0	1.4
6	0	2.9	6.6	5.2	359	71	167	60	14	2.4	1.2	1.2
7	0	3.6	6.3	4.9	189	47	139	56	11	2.0	1.0	1.2
8	0	4.4	5.5	5.2	119	36	a80	55	9.3	1.4	1.0	.9
9	0	5,350	4.9	4.7	87	*2,720	62	59	8.1	1.4	1.0	.8
10	0	546	4.7	4.9	68	724	50	58	7.1	1.6	.8	.8
11	0	184	5.8	4.7	60	288	44	62	6.6	1.0	.7	.7
12	0	89	6.3	4.4	51	176	40	64	6.0	1.2	.6	.8
13	.2	54	6.8	4.1	55	128	38	51	5.5	1.0	.4	.8
14	.3	37	7.4	4.1	58	104	35	43	4.7	1.0	.6	.9
15	.5	27	6.6	4.4	66	92	32	37	4.4	1.0	2.2	1.2
16	.5	23	7.4	7.7	60	79	32	33	958	1.0	6.2	616
17	.5	18	7.1	8.7	50	69	32	30	239	1.0	4.7	1,730
18	.6	14	6.6	7.4	44	64	33	27	92	1.0	3.3	93
19	.6	13	6.0	8.4	39	1,250	33	24	54	1.0	2.6	38
20	.5	12	6.6	9.3	37	767	31	21	30	1.0	1.8	128
21	.5	11	7.7	9.0	37	312	1,120	18	19	1.0	1.4	600
22	.4	10	8.7	10	36	191	4,610	17	14	1.0	107	5,670
23	36	8.4	8.1	10	35	142	*3,550	17	11	.9	371	2,880
24	11	12	7.7	12	32	122	a780	16	8.4	.9	47	932
25	2.4	20	6.8	11	31	109	a980	16	7.1	.7	9.3	406
26	1.2	14	6.0	13	28	102	a370	15	6.3	.7	6.6	277
27	1.0	*12	4.9	13	27	89	a290	*14	5.8	.7	17	202
28	.9	18	4.9	10	* 26	82	a270	14	5.5	.7	11	*158
29	1.0	15	4.4	* 8.4	24	73	a160	13	*5.2	.8	8.1	131
30	*.9	12	* 5.2	784	----------	66	*118	12	4.7	.9	5.8	96
31	1.2	----------	5.2	2,170	----------	* 62	----------	51	----------	*1.2	*4.4	----------
Total	61.4	6,520.3	206.4	3,168.7	3,229	8,192	13,447	1,337	1,761.7	45.6	624.1	13,978.2
Mean	1.98	217	6.66	102	111	264	448	43.1	58.7	1.47	20.1	466
Ac-ft	122	12,930	409	6,290	6,400	16,250	26,670	2,650	3,490	90	1,240	27,730

Calendar year 1963: Max 5,350 Min 0 Mean 39.4 Ac-ft 28,530
Water year 1963-64: Max 5,670 Min 0 Mean 144 Ac-ft 104,300

Peak discharge (base, 8,500 cfs)

Date	Time	Gage height	Discharge
11- 9	0830	26.86	16,600
4-22	0200	24.02	13,700
9-22	2300	29.35	20,200

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

8-953. Middle Bosque River near McGregor, Tex.

Location.--Lat 31°30'33", long 97°21'56", on downstream side of bridge on county road, 1,100 ft downstream from Pecan Creek, 5.2 miles northeast of McGregor, McLennan County, and 8.2 miles upstream from South Bosque River.

Drainage area.--182 sq mi.

Records available.--August 1959 to September 1964.

Gage.--Water-stage recorder (digital beginning June 25) and concrete control. Datum of gage is 530.51 ft above mean sea level, datum of 1929. Prior to Oct. 27, 1959, wire-weight gage at same site and datum.

Average discharge.--5 years, 92.2 cfs (66,750 acre-ft per year).

Extremes.--Maximum discharge during year, 32,600 cfs June 16 (gage height, 24.30 ft); no flow for many days.
1959-64: Maximum discharge, that of June 16, 1964; no flow at times.
Historical flood information begins with flood in 1889 which reached a stage of 28½ ft; flood in 1957 reached a stage of 28.2 ft; and floods in 1913 and 1942 or 1943 reached a stage of about 28 ft, from information by local residents.

Remarks.--Records good. No diversion above station. Recording rain gage located at station.

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

2.4	0	2.9	27	4.5	800
2.5	.5	3.1	61	5.0	1,300
2.6	3.3	3.3	112	6.0	2,500
2.7	8.2	3.6	228	9.0	5,800
2.8	16	4.0	440	13.1	11,800

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1963 TO SEPTEMBER 1964

DAY	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
1				0	5.2	5.2	22	38	12	31	0.9	0.3
2				0	4.3	6.5	23	48	10	29	.8	.2
3				0	4.8	6.0	22	34	9.5	26	.6	.2
4				0	6.5	6.0	20	30	7.0	24	.5	.1
5				0	5.2	*4.8	53	30	8.2	21	.4	.1
6				0	5.2	5.6	40	32	7.6	18	.4	.1
7	(*)			0	4.8	7.0	26	32	6.0	17	.4	.1
8				0	4.3	7.0	21	34	5.2	15	.4	.1
9				0	4.3	22	20	136	4.3	13	.3	.1
10				0	4.3	21	20	61	3.8	12	.3	.1
11				0	4.3	10	20	46	2.8	11	.3	.1
12				0	4.8	6.5	19	43	2.1	8.5	*.2	.1
13				0	6.5	5.6	19	33	1.5	8.0	.2	.1
14				0	7.0	5.2	16	*30	1.2	7.7	.2	.1
15				0	9.5	4.8	13	27	1.8	7.0	.2	.1
16				0	7.0	4.3	54	24	*11,700	5.9	.4	148
17				0	8.2	4.3	114	21	*518	5.9	.3	313
18		(*)		0	7.6	4.3	27	19	215	5.5	.2	21
19				0	7.0	168	21	18	149	5.1	.2	9.4
20			(*)	0	6.0	59	20	16	115	5.0	.2	6.6
21				0	6.0	38	19	15	92	4.8	.2	11
22				0	6.0	34	19	14	79	3.6	.4	229
23				0	6.0	34	18	14	68	3.2	45	437
24				0	6.0	34	44	13	*57	2.6	39	229
25				0	6.5	33	268	12	52	2.0	8.7	86
26				0	6.5	28	244	11	47	2.0	5.1	94
27				0	6.0	27	73	10	43	1.7	2.9	81
28				0	5.2	27	50	10	41	1.5	1.4	65
29				*0	4.8	23	41	10	37	*1.3	.9	50
30				2.4	------	22	38	11	34	1.1	.6	43
31		------		7.0	------	22	------	17	------	1.0	*.4	------
TOTAL	0	0	0	9.4	169.8	685.1	2,104	869	13,330.0	300.4	112.0	1,824.9
MEAN	0	0	0	.30	5.86	22.1	70.1	28.7	444	9.69	3.61	60.8
AC-FT	0	0	0	19	337	1,360	4,170	1,760	26,440	596	222	3,620

CALENDAR YEAR 1963 MAX 336 MIN 0 MEAN 2.54 AC-FT 1,840
WATER YEAR 1963-64 MAX 11,700 MIN 0 MEAN 53.1 AC-FT 38,520

Peak discharge (base, 5,000 cfs)

Date	Time	Gage height	Discharge
6-16	0730	24.30	32,600

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

8-954. Hog Creek near Crawford, Tex.

Location.--Lat 31°33'20", long 97°21'22", on downstream side of bridge on Farm Road 185, 5.6 miles east of Crawford, McLennan County, and 9.8 miles upstream from South Bosque River.

Drainage area.--78.2 sq mi.

Records available.--August 1959 to September 1964.

Gage.--Water-stage recorder (digital beginning June 25) and concrete control. Datum of gage is 560.54 ft above mean sea level, datum of 1929. Prior to Oct. 27, 1959, wire-weight gage at same site and datum.

Average discharge.--5 years, 41.6 cfs (30,120 acre-ft per year).

Extremes.--Maximum discharge during year, 9,310 cfs June 16 (gage height, 10.79 ft); no flow for many days.
1959-64: Maximum discharge, 15,400 cfs Oct. 4, 1959 (gage height, 14.31 ft); no flow at times.
Maximum stage since 1900, 17.5 ft Sept. 26, 1936. Flood in April or May 1957 reached a stage of 15.7 ft, from information by local residents.

Remarks.--Records good. No known diversions above station. Recording rain gage located at station.

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

Oct. 1 to May 13

1.8	0	2.4	23
1.9	.1	2.6	49
2.0	.6	2.8	86
2.1	2.6	3.0	135
2.2	7.5	3.5	300
2.3	14	4.2	640

May 14 to Sept. 30

1.9	0.1	2.8	84
2.0	.7	3.0	135
2.1	2.7	3.5	300
2.2	6.9	4.0	530
2.3	14	5.0	1,240
2.4	24	6.2	2,470
2.6	48		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1963 TO SEPTEMBER 1964

DAY	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
1	0	0	0.2	0.1	12	3.7	9.3	25	3.7	8.4	1.0	0.3
2	0	0	.2	.1	8.1	16	9.9	43	3.4	7.5	.9	.3
3	0	0	.2	.2	5.7	9.3	9.9	17	3.0	7.5	.8	.2
4	0	0	.2	.2	12	6.9	8.7	14	2.4	7.0	.7	.2
5	0	0	.2	.2	14	*6.3	22	13	2.2	6.4	.7	.2
6	0	0	.2	.1	10	5.1	22	14	1.9	5.5	.6	.2
7	*0	0	.2	.2	7.5	5.1	13	13	1.7	5.1	.6	.2
8	0	0	.3	.1	6.3	5.7	10	14	1.3	4.0	.6	.2
9	0	.1	.2	.2	4.6	66	9.9	24	1.1	3.9	.6	.2
10	0	.1	.4	.2	3.7	26	9.9	19	1.1	3.6	.5	.2
11	0	.1	.3	.2	3.3	12	9.9	15	1.0	3.3	.4	.2
12	0	0	.1	.2	3.3	8.7	9.9	14	1.0	2.9	.4	.2
13	0	0	.2	.1	4.6	7.5	9.9	11	1.0	2.6	.3	.2
14	0	0	.2	.1	4.6	6.9	8.1	*9.5	1.0	2.5	.4	.1
15	0	0	.1	.2	4.1	5.7	6.9	8.9	1.3	2.4	.4	.2
16	0	0	.1	.2	3.7	4.6	8.1	8.9	2,390	2.2	.9	25
17	0	0	.1	.2	3.3	4.6	8.7	7.6	254	2.1	.8	132
18	0	*0	.1	.2	3.3	4.6	8.1	6.4	65	2.0	.6	15
19	0	.2	.1	.2	3.3	162	8.1	5.9	46	2.0	.4	5.5
20	0	.2	**.1	.2	2.9	42	7.5	5.4	35	2.0	.3	2.8
21	0	.1	.1	.2	3.3	24	7.5	5.4	29	1.8	.3	2.5
22	0	.2	.1	.2	3.3	20	7.5	5.0	24	1.6	.5	90
23	244	.1	.1	.1	3.3	17	7.5	4.5	21	1.7	3.6	696
24	49	.1	.1	.1	3.7	16	231	5.0	*17	1.9	6.6	98
25	3.3	0	.1	.1	4.1	14	587	4.5	15	2.2	5.3	47
26	.4	.1	.2	.1	4.1	12	56	4.5	13	2.4	2.4	41
27	.2	.2	.2	.1	3.7	11	30	4.1	12	1.7	1.0	36
28	.1	.4	.2	.1	3.7	10	20	4.1	11	1.5	.6	30
29	0	.2	.2	**.1	3.7	9.9	18	4.1	11	1.1	.5	24
30	0	.2	.2	26	------	9.3	16	4.1	9.6	1.1	.4	20
31	0	------	.2	38	------	9.3	------	4.1	------	1.0	.3	------
TOTAL	297.0	2.3	5.4	68.5	153.2	561.2	1,190.3	338.0	2,979.7	100.9	33.4	1,267.9
MEAN	9.58	.08	.17	2.21	5.28	18.1	39.7	10.9	99.3	3.26	1.08	42.3
AC-FT	589	4.6	11	136	304	1,110	2,360	670	5,910	200	66	2,510

CALENDAR YEAR 1963 MAX 244 MIN 0 MEAN 2.45 AC-FT 1,775
WATER YEAR 1963-64 MAX 2,390 MIN 0 MEAN 19.1 AC-FT 13,870

Peak discharge (base, 1,600 cfs)

Date	Time	Gage height	Discharge
10-23	2000	6.85	3,280
4-24	2400	6.95	3,470
6-16	0830	10.79	9,310
9-23	0130	7.53	4,150

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

8-956. Bosque River near Waco, Tex.

Location.--Lat 31°36'04", long 97°11'36", on downstream side of bridge on Farm Road 1637, 2.5 miles downstream from Lake Waco dam, 2.8 miles upstream from mouth, and 4.7 miles northwest of courthouse in Waco, McLennon County.

Drainage area.--1,655 sq mi.

Records available.--August 1959 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 365.44 ft above mean sea level, datum of 1929, supplementary adjustment of 1942. Prior to Jan. 21, 1960, wire-weight gage, and from Jan. 21 to Aug. 20, 1960, wire-weight gage below 11.38 ft and water-stage recorder above. All gages at same site and datum. Since Dec. 30, 1959, auxiliary water-stage recorder 2.7 miles downstream at datum 4.66 ft lower.

Average discharge.--5 years, 490 cfs (354,700 acre-ft per year).

Extremes.--Maximum discharge during year, 62,000 cfs June 16 (gage height, 38.45 ft); no flow for many days.
1959-64: Maximum discharge, 69,000 cfs Oct. 4, 1959 (gage height, 39.8 ft, from floodmark), from rating curve defined by current-meter measurements below 51,000 cfs and above by computation of peak flow thru gates at Lake Waco; no flow at times.
Maximum stage since at least 1880, 44.5 ft Sept. 27, 1936, from information by local resident (discharge, 96,000 cfs). Maximum stage may be the result of backwater from Brazos River because the discharge on Apr. 22, 1945 (140,000 cfs), and Apr. 20, 1957 (103,000 cfs), exceed the discharge corresponding to the maximum stage. The discharge for the 1936, 1945 and 1957 floods obtained from rating curve for tainter gates at Lake Waco.

Remarks.--Records good. Flow regulated by Lake Waco until July 27, 1964, when closure of Waco Reservoir dam was started. The city of Waco reported 18,820 acre-ft was diverted from Lake Waco for municipal purposes during the water year. Recording rain gage located at station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	26	2.3	661	24	130	87	22	*32	0.1	0
2	0	0	28	2.0	126	67	139	116	22	26	0	0
3	0	0	22	1.6	219	93	116	132	22	22	0	0
4	0	0	2.8	1.7	394	*166	82	130	26	20	0	0
5	0	0	1.7	2.5	38	56	347	118	28	20	0	0
6	0	0	1.4	2.1	82	64	97	110	22	22	0	0
7	0	0	3.3	2.5	347	45	118	103	26	16	0	0
8	*0	.2	2.8	2.1	110	78	*130	103	31	16	0	0
9	0	.6	1.7	2.5	118	1,970	118	891	22	17	0	*0
10	0	.8	1.7	3.0	100	1,030	110	91	21	15	0	0
11	0	.9	3.5	2.5	82	64	107	31	15	16	0	0
12	0	.8	3.3	3.5	89	83	114	36	4.8	14	0	0
13	0	.5	3.0	3.3	110	121	74	*40	4.1	8.8	0	0
14	0	.4	3.3	2.8	85	171	58	48	5.9	8.3	0	0
15	0	.3	2.5	3.3	125	128	56	53	5.5	7.7	0	0
16	0	6.7	2.3	4.8	66	114	62	52	25,500	7.7	0	*.2
17	0	2.3	2.3	4.5	76	103	1,060	52	1,600	8.6	0	7.1
18	0	*1.8	2.3	4.5	101	89	42	46	454	3.3	0	.2
19	0	2.1	2.3	3.5	82	1,740	68	41	538	2.5	0	.2
20	0	2.1	*3.8	3.0	53	1,320	85	38	411	2.3	0	.3
21	0	1.6	2.5	2.1	72	110	524	35	201	5.2	0	108
22	0	3.6	2.3	2.3	62	918	4,620	34	174	3.0	0	2,510
23	0	2.5	2.5	2.3	78	31	3,130	38	*162	2.1	0	5,100
24	0	2.0	2.5	2.0	46	41	649	39	147	1.8	.1	3,880
25	0	2.1	2.5	2.3	73	106	3,490	26	91	1.7	.3	396
26	0	1.7	2.3	2.1	63	121	1,190	26	23	2.5	0	61
27	.1	2.0	2.3	2.0	49	137	230	34	34	2.3	0	32
28	.4	9.2	2.5	*1.7	61	149	22	26	40	.9	0	26
29	.4	14	2.5	2.5	39	130	23	23	41	*.9	0	22
30	.2	25	2.5	31	----------	125	55	22	39	.3	0	18
31	.2	----------	2.3	876	----------	134	----------	23	----------	.2	0	----------
Total	1.3	83.2	146.7	984.3	3,607	9,528	17,046	2,644	29,732.3	306.1	0.5	12,161.0
Mean	0.04	2.77	4.73	31.8	124	307	568	85.3	991	9.87	0.02	405
Ac-ft	2.6	165	291	1,950	7,150	18,900	33,810	5,240	58,970	607	1.0	24,120

Calendar year 1963: Max 210 Min 0 Mean 9.28 Ac-ft 6,720
Water year 1963-64: Max 25,500 Min 0 Mean 208 Ac-ft 151,200

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record Aug. 28 to Sept. 8.

8-965. Brazos River at Waco, Tex.

Location.--Lat 31°33'40", long 97°07'45", on right bank at downstream side of pier of Washington Avenue Bridge in Waco, McLennan County, and 2½ miles downstream from Bosque River.
Drainage area.--28,500 sq mi, approximately, of which 9,240 sq mi is probably noncontributing.
Records available.--September 1898 to September 1964 (January 1912 to September 1914 monthly records only, published in WSP 1312). Gage-height records collected in this vicinity since 1900 are contained in reports of U. S. Weather Bureau.
Gage.--Water-stage recorder. Datum of gage is 356.80 ft above mean sea level, datum of 1929, supplementary adjustment of 1942. Sept. 14, 1898, to Mar. 28, 1918, and May 6, 1922, to Feb. 12, 1925, staff or chain gages at several sites within about 350 ft of present site at same datum. May 28, 1918, to May 5, 1922, and Feb. 13, 1925, to Sept. 29, 1934, water-stage recorder at site about 300 ft downstream at same datum.
Average discharge.--66 years, 2,507 cfs (1,815,000 acre-ft per year).
Extremes.--Maximum discharge during year, 49,500 cfs June 16,(gage height, 25.43 ft); minimum daily, 120 cfs Sept. 6.
1898-1964: Maximum discharge, 246,000 cfs Sept. 27, 1936 (gage height, 40.90 ft, levee on left bank was overtopped and broken by flood); minimum for periods of daily record 1898-1911, 1914-62, no flow Aug. 20, 21, 1918, and probably for several days in August 1923.
Maximum stage since at least 1847, that of Sept. 27, 1936; maximum stage 1847-97, 34.63 ft May 28, 1885, from floodmark.
Remarks.--Records good. Flow largely regulated by Whitney Reservoir (station 8-925). Total combined capacity of all reservoirs above station, about 3,304,000 acre-ft of which 1,630,500 acre-ft is flood-control storage in Whitney Reservoir. Closure of Waco Reservoir dam on Bosque River began July 27, and when completed it will have 574,600 acre-ft of flood control storage. Many small diversions above station for municipal supply, irrigation, and oilfield operation do not appreciably affect flow.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-10, 13, 16, 23, 25-26, Oct. 29 to Nov. 1, Nov. 7-8, 13-16, June 17-30, July 2-5, 7-11, July 14 to Aug. 30, Sept. 1-5, 11-12, 17-18, 20-22, 25, 28)

2.19	120	7.0	4,450
2.6	281	11.0	9,400
3.0	505	17.1	21,250
4.0	1,320		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,880	595	220	228	1,680	276	469	741	374	550	583	1,430
2	737	278	196	200	476	341	409	882	359	934	412	787
3	716	250	158	204	470	363	363	524	732	790	381	1,350
4	1,250	258	216	232	1,180	*409	403	421	734	853	627	1,150
5	1,360	210	220	220	336	281	789	716	761	464	775	302
6	428	158	228	212	341	240	550	796	683	391	854	120
7	232	359	236	212	664	232	385	786	374	720	778	137
8	*849	485	236	287	358	320	*341	818	296	893	724	*169
9	684	457	212	254	358	1,780	286	1,810	642	1,200	546	170
10	900	242	288	216	341	2,250	330	459	796	453	315	330
11	414	166	301	204	330	325	341	258	1,220	448	670	1,280
12	389	309	240	240	330	330	352	635	1,250	240	852	680
13	598	453	232	220	368	385	336	*639	1,110	140	660	230
14	226	456	250	212	330	445	301	694	1,130	573	638	130
15	242	484	272	188	368	336	272	718	1,040	794	678	150
16	464	452	232	254	276	281	346	818	21,100	779	500	154
17	279	281	204	258	268	286	1,550	365	5,290	754	341	2,540
18	245	251	228	216	374	325	301	281	1,430	766	566	500
19	346	*304	254	200	320	3,130	296	618	1,520	1,130	1,420	208
20	270	245	263	185	286	3,160	306	766	1,390	1,100	722	327
21	188	606	236	212	286	557	386	718	878	1,160	816	391
22	293	388	240	240	276	1,360	5,370	752	702	928	901	2,620
23	410	185	220	212	346	379	3,620	704	1,020	824	612	5,780
24	283	158	263	181	363	363	494	446	1,040	892	342	5,780
25	526	292	137	204	325	433	4,630	482	*985	880	487	1,120
26	591	237	154	216	306	415	1,480	931	892	882	708	363
27	320	182	177	208	281	433	914	794	912	881	718	330
28	354	490	196	*200	306	433	600	630	674	*856	702	557
29	707	270	292	240	272	439	633	802	491	692	1,140	286
30	530	212	*248	510	----------	385	680	648	1,380	732	324	204
31	966	----------	282	2,080	----------	380	----------	463	----------	732	221	----------
Total	17,677	9,713	7,131	8,945	12,215	21,072	27,533	21,115	52,205	23,431	20,013	29,575
Mean	570	324	230	289	421	680	918	681	1,740	756	646	986
Ac-ft	35,060	19,270	14,140	17,740	24,230	41,800	54,610	41,880	103,500	46,470	39,700	58,660

Calendar year 1963: Max 4,920 Min 53 Mean 926 Ac-ft 670,800
Water year 1963-64: Max 21,100 Min 120 Mean 685 Ac-ft 497,100

* Discharge measurement made on this day.

8-968. Cow Bayou subwatershed No. 4 near Bruceville, Tex.

Location.--Lat 31°20', long 97°16', near center of dam on Foster Branch, 1.0 mile upstream from South Fork Cow Bayou, 2.1 miles west of Bruceville, McLennan County, and 2.3 miles northwest of Eddy.

Drainage area.--5.25 sq mi.

Records available.--September 1956 to September 1964.

Gage.--Water-stage recorder with drop outlet structure as control. Datum of gage is 574.46 ft above mean sea level, datum of 1929 (levels by Soil Conservation Service).

Average outflow.--8 years, 1,530 acre-ft per year.

Extremes.--No outflow during year; maximum gage height, 12.15 ft June 17. Maximum inflow, 151 cfs (average for 15-minute interval) June 16, computed from outflow and change in pool contents, adjusted for rainfall on pool surface during time of peak inflow.

1956-64: Maximum outflow, 2,280 cfs May 11, 1957 (gage height, 40.16 ft), by slope-area measurement of peak outflow measured below dam during time when spillway partially washed out; no outflow for many days each year. Maximum inflow, 6,900 cfs (average for 15-minute interval) May 11, 1957, computed from outflow and change in pool contents, adjusted for rainfall on pool surface during time of peak inflow.

Remarks.--Records good. Pool is formed by earthen dam, 1,285 ft long, with grass sodded emergency spillway section at gage height 38.1 ft prior to May 11, 1957, and 37.7 ft after being repaired; dam completed in August 1956 but no appreciable storage before Mar. 20, 1957. Outlet structure is 2.5-foot square uncontrolled drop outlet, covered with an antivortex baffle with two 8-inch square uncontrolled portholes on downstream face. Gage-height crest of drop outlet is 18.0 ft and bottom of portholes is 14.76 ft. Outlet structure connects to a 17-inch diameter outlet pipe at base of dam. There is also an 8-inch controlled water-supply outlet at gage height 6.07 ft. Pool capacity, 1,740 acre-ft at spillway crest, 241 acre-ft at crest of drop outlet, 145 acre-ft at bottom of 8-inch portholes, and 13 acre-ft at controlled outlet pipe contents computed from sediment survey of June 1, 1963. Dam built by Soil Conservation Service for flood control and conservation of stock water.

Pool water budget, in acre-feet, water year October 1963 to September 1964.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Inflow1/	0	6.5	0.8	20.5	6.6	21.8	11.8	4.7	30.9	0.4	5.3	4.0
Outflow	0	0	0	0	0	0	0	0	0	0	0	0
(††)	.22	4.34	1.40	3.51	1.69	2.43	3.55	1.70	5.34	.14	3.52	4.52

Calendar year 1963: Inflow 12.9 Outflow 0 †† 18.04
Water year 1963-64: Inflow 113 Outflow 0 †† 32.36

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

1/ Inflow adjusted for rainfall on pool and for pool losses.
†† Weighted mean rainfall, in inches.

8-970. Cow Bayou at Mooreville, Tex.

Location.--Lat 31°18'45", long 97°08'16", on right bank at downstream side of county bridge, 500 ft downstream from confluence of North Cow Bayou and South Cow Bayou, 0.8 mile north of Mooreville, Falls County, and 5.0 miles northwest of Chilton.

Drainage area.--79.6 sq mi.

Records available.--September 1954 to May 1958 (annual maximum only), June 1958 to September 1964.

Gage.--Water-stage recorder and crest-stage gage. Datum of gage is 399.58 ft above mean sea level, datum of 1929 (levels by Soil Conservation Service). Prior to June 10, 1958, crest-stage gage only.

Average discharge.--6 years, 32.4 cfs (23,460 acre-ft per year).

Extremes.--Maximum discharge during year, 3,210 cfs June 16 (gage height, 19.30 ft); no flow for many days.
1954-64: Maximum gage height, 29.4 ft, from floodmarks, May 12, 1957 (discharge not determined); no flow at times.
Maximum stage since at least 1900, 31 ft about May 1, 1944, from information by local resident.

Remarks.--Records fair. At end of year, flow from 30.1 sq mi above this station was partly controlled by 12 floodwater-retarding structures with a total combined capacity of 10,460 acre-ft below the flood spillway crests, of which 8,770 acre-ft is floodwater-retarding capacity and 1,690 acre-ft is sediment-pool capacity. Three structures were built during the current year and have a total combined capacity below flood spillway crests of 696 acre-ft, of which 208 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Ten rain gages (8 standard and 2 recording) are operating in the basin above this station. Small diversion for irrigation above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0	0	7.1	3.2	5.0	*31	0.5	11	0	0
2		0	0	0	4.8	4.0	5.0	16	.1	6.8	0	0
3		0	0	0	4.0	4.2	4.0	11	0	4.8	0	0
4		0	0	0	12	4.2	4.0	9.8	0	3.5	0	0
5		0	0	0	8.2	3.0	4.0	10	0	2.0	0	0
6		0	0	0	5.4	*2.5	4.0	11	0	1.5	0	0
7		0	0	0	4.0	*2.3	4.0	11	0	1.1	0	0
8		0	0	0	3.5	2.5	3.8	11	0	1.1	0	0
9	(*)	0	0	0	3.2	5.4	4.0	34	0	.8	0	0
10		0	0	0	3.0	3.5	*4.0	16	0	.4	0	0
11		0	0	0	2.8	2.5	4.2	11	0	.2	0	0
12		0	0	0	2.5	2.0	4.5	8.5	0	.2	0	0
13		0	0	0	4.2	2.3	4.0	6.8	0	.2	0	0
14		0	.5	0	3.5	2.8	3.2	5.4	2.3	0	0	0
15		0	2.8	0	4.2	2.0	3.0	*3.5	.2	0	0	0
16		0	1.5	.6	3.5	1.1	3.0	3.2	586	0	0	0
17		0	.8	.8	3.8	1.1	92	2.5	*132	0	0	0
18		0	0	1.5	4.8	1.2	34	1.8	78	0	0	0
19		10	0	.8	3.2	71	28	1.5	64	0	0	0
20		6.8	.4	.5	3.0	10	24	1.5	52	0	0	0
21		*0	4.0	.4	4.2	7.4	22	.5	48	0	0	0
22		0	3.5	.2	4.8	7.1	22	.5	42	0	0	0
23		0	.8	.2	3.8	6.8	20	1.5	*37	0	0	0
24		0	.2	.2	3.5	7.1	18	.4	33	0	.4	24
25		0	1.1	.2	3.8	7.4	22	.4	28	0	*.1	1.1
26		0	.4	.2	3.5	6.0	108	*.1	24	0	0	0
27		0	0	.2	3.2	6.4	38	0	21	0	*0	1.0
28		2.5	0	.2	3.2	6.0	26	0	17	0	*0	.8
29		.6	0	.2	3.0	5.7	20	0	15	0	0	0
30		0	0	*43	----------	5.4	16	12	13	*0	0	*0
31		----------	*0	*20	----------	5.0	----------	4.0	----------	0	0	----------
Total	0	19.9	16.0	69.2	123.7	201.1	553.7	225.9	1,193.1	33.6	0.5	26.9
Mean	0	0.66	0.52	2.23	4.27	6.49	18.5	7.29	39.8	1.08	0.02	0.90
Ac-ft	0	39	32	137	245	399	1,100	448	2,370	67	1.0	53
(†)	374	389	378	456	481	617	953	902	1,050	846	724	754
(††)	0.18	3.92	1.59	3.25	1.85	2.53	3.58	1.89	5.02	0.14	3.94	4.81

Calendar year 1963: Max 33 Min 0 Mean 0.58 Ac-ft 417 †† 17.95
Water year 1963-64: Max 586 Min 0 Mean 6.73 Ac-ft 4,890 †† 32.70

* Discharge measurement or observation of no flow made on this day.
† Contents, in acre-feet, at end of month.
†† Weighted mean rainfall, in inches, during month.
Note.--No gage-height record Mar. 31, Apr. 2-7, 9.

8-983. Little Pond Creek at Burlington, Tex.

Location.--Lat 31°01'30", long 96°59'15", on left bank 30 ft downstream from bridge on U. S. Highway 77, 1 mile north of Burlington, Milam County, and 2½ miles downstream from Keys Creek.

Drainage area.--22.2 sq mi.

Records available.--October 1962 to September 1964.

Gage.--Water-stage recorder. Concrete control since Jan. 15, 1964. Datum of gage is 388.51 ft above mean sea level, datum of 1929.

Extremes.--1962-63: Maximum discharge during water year, 418 cfs Nov. 27 (gage height, 7.50 ft); no flow for many days.
1963-64: Maximum discharge during water year, 745 cfs Sept. 24 (gage height, 10.09 ft); no flow for many days.
1962-64: Maximum discharge, that of Sept. 24, 1964; no flow for many days each year.
Maximum stage since at least 1938, 17.5 ft in 1950, from information by local residents.

Remarks.--Records poor prior to Jan. 16, 1964 and good thereafter. No diversions above station. Three recording rain gages are so located that they can be used to compute rainfall on the watershed.

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

1.6	0	2.5	17
1.7	.3	3.0	34
1.8	1.0	3.5	57
1.9	2.1	4.0	88
2.0	3.6	5.0	167
2.1	5.6	6.0	260
2.3	11	7.0	363

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0.3	0.4	0	0.1	0					
2	0	0	7.7	.3	0	.1	0					
3	0	0	7.3	.2	0	.1	0					
4	0	0	1.3	.2	0	.1	0					
5	0	0	.7	.2	0	.1	.1					
6	0	0	.4	.2	0	.1	1.7					
7	0	0	.4	.2	*0	0	1.0					
8	0	0	.2	.2	0	0	.4					
9	2	0	.2	.2	0	0	.2					
10	.5	0	.1	.2	0	*0	.1					
11	** .1	0	0	.2	0	0	.1					
12	.1	0	0	0	0	0	0					
13	0	0	0	0	0	0	0					
14	0	0	0	0	0	0	*0					
15	0	0	0	0	0	0	0					
16	0	0	0	0	0	0	0					
17	0	0	0	0	0	0	0		(*)			
18	0	0	0	0	63	0	0	(*)				
19	0	0	0	0	26	0	0					
20	0	0	.5	0	2.5	0	0	(*)				
21	0	0	** 1.2	0	.9	0	0					
22	0	0	1.0	0	.4	0	0					
23	0	0	.8	0	.3	0	.8			(*)		
24	*0	0	1.0	0	.2	0	.1					
25	0	0	1.1	0	.2	0	0					
26	0	4.7	.8	0	.1	0	0					
27	0	285	.6	0	.1	0	0				(*)	
28	0	16	.5	0	.1	0	0					
29	0	1.2	.5	0		0	0					
30	0	** .5	.5	0	----------	0	0					
31	0	----------	.4	0	----------	0	----------		----------			----------
Total	2.7	307.4	27.5	2.5	93.8	0.6	4.5	0	0	0	0	0
Mean	0.09	10.2	0.89	0.08	3.35	0.02	0.15	0	0	0	0	0
Ac-ft	5.4	610	55	5.0	186	1.2	8.9	0	0	0	0	0

Calendar year — Max — Min — Mean — Ac-ft
Water year 1962-63: Max 285 Min 0 Mean 1.20 Ac-ft 872

Peak discharge (base, 300 cfs)

Date	Time	Gage height	Discharge
11-27	1100	7.50	418

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--Discharge computed from twice-daily wire-weight gage readings Oct. 11-14, 29, Dec. 21 to Jan. 11, Feb. 21-28, Apr. 8-12, 23-25; no gage-height record Oct. 1-10, June 17 to July 22.

8-983. Little Pond Creek at Burlington, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0	0	0	0	0	0.9				0
2	(*)		0	0	0	.2	0	10				0
3			0	0	0	0	0	4.8				0
4			0	0	.4	0	0	1.6				0
5		(*)	0	0	0	0	0	.7				0
6			0	0	0	0	*0	.2				0
7			0	0	0	0	0	**.1				0
8			0	0	0	0	0	0				0
9			0	0	0	0	0	0				0
10			0	0	0	0	0	0				0
11			0	0	0	0	0	0				0
12			0	0	0	0	0	0				0
13			0	0	0	0	0	0				0
14			*0	0	0	0	0	0				0
15			0	0	0	0	0	0				0
16			0	.1	0	0	0	0	(*)			0
17			0	0	0	0	0	0				2.9
18			0	0	0	0	0	0				9.5
19			0	0	0	7.2	0	0				1.0
20			.1	0	0	.5	0	0		(*)		0
21			0	*0	0	0	0	0				.8
22			0	0	0	0	0	0				80
23			0	0	0	0	0	0				9.1
24			0	0	.1	0	0	0				*327
25			0	0	0	0	0	0				*64
26			0	0	0	*0	4.9	0			(*)	*4.8
27			0	0	*0	0	1.2	0				31
28			0	0	0	0	.3	0				*21
29			0	0	0	0	.1	0				*4.3
30			0	.4	----------	0	0	0				1.6
31		----------	0	0	----------	0	----------	0	----------			----------
Total	0	0	0.1	0.5	0.5	7.9	6.5	18.3	0	0	0	557.0
Mean	0	0	0.003	0.02	0.02	0.25	0.22	0.59	0	0	0	18.6
Ac-ft	0	0	0.2	1.0	1.0	16	13	36	0	0	0	1,100

Calendar year 1963: Max 63 Min 0 Mean 0.28 Ac-ft 201
Water year 1963-64: Max 327 Min 0 Mean 1.61 Ac-ft 1,170

Peak discharge (base, 300 cfs)

Date	Time	Gage height	Discharge
9-24	1200	10.09	745

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record Nov. 19 to Dec. 13, Dec. 15-19, Dec. 21 to Jan. 15.

8-990. Leon Reservoir.--See page 300.

8-991. Leon River near De Leon, Tex.

Location.--Lat 32°10'18", long 98°31'54", on left bank at downstream end of bridge on State Highway 16, 1.5 miles upstream from Flat Creek, 4.4 miles northeast of De Leon, Comanche County, and 6 miles downstream from Hog Creek.
Drainage area.--463 sq mi.
Records available.--September 1960 to September 1964.
Gage.--Water-stage recorder. Prior to Nov. 22, 1960, wire-weight gage at same site and datum. Datum of gage is 1,209.93 ft above mean sea level, datum of 1929.
Extremes.--Maximum discharge during year, 2,470 cfs Sept. 21 (gage height, 14.27 ft); no flow at times.
1960-64: Maximum discharge, 3,000 cfs Sept. 7, 1962 (gage height, 15.02 ft); no flow at times.
A stage of 19.3 ft occurred in May 1908 at a point 2,000 ft downstream from gage site, and is the highest since at least that time, from information by local resident.
Revisions.--Figures of maximum discharge for the water years 1961-62 have been revised to 1,800 cfs June 18, 1961 (gage height, 13.24 ft), and 3,000 cfs Sept. 7, 1962 (gage height, 15.02 ft), superseding previously published figures.
Remarks.--Records good except those for period of no gage-height record, which are fair. Flow partly regulated by Leon Reservoir (see p. 300). Diversions above station for municipal, steam powerplant operation, and other uses. Recording rain gage located at station.
Revisions.--Revised figures of discharge, in cubic feet per second, for the periods January, June, and July 1961, and July and September 1962, superseding previously published figures are given herewith:

1961		1962	
Jan. 8	993	July 26	989
June 16	665	27	2,100
17	916	Sept. 7	1,720
18	1,180	8	2,320
July 11	834	9	1,870
		10	1,050

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
January 1961	1,870.2	993	0	60.3	3,710
June	4,118.3	1,180	0	137	8,170
July	3,143.5	834	2.2	101	6,240
Water year 1960-61	12,826.2	1,180	0	35.1	25,440
Calendar year 1961	13,175.9	1,180	0	36.1	26,140
July 1962	4,173.6	2,100	0	135	8,280
September	8,132.7	2,320	0	271	16,130
Water year 1961-62	13,767.1	2,320	0	37.7	27,300

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	1.4	0.6	19	4.7	3.2	3.0			0	0
2		0	1.0	.6	8.3	4.9	3.3	2.6			0	0
3		0	*.7	.6	6.6	4.5	3.3	2.1			0	0
4		0	.7	.5	351	4.5	3.2	1.9			0	0
5		0	.6	.6	134	6.8	8.3	1.8			0	0
6		0	.5	.7	71	4.7	4.9	1.7			0	0
7		0	.6	*.8	59	3.7	3.3	1.6			0	0
8		.1	.5	1.0	48	3.7	2.6	1.8		(*)	0	0
9		46	.5	1.0	40	197	2.4	1.7			0	0
10		19	.6	.9	35	40	2.4	5.3			0	0
11		3.6	.9	1.1	30	21	2.4	18			*0	0
12		.7	.9	1.1	*27	13	2.4	2.6			0	0
13		.1	.9	1.0	31	12	2.3	1.7			0	0
14		0	1.1	1.0	29	11	2.0	1.3			0	0
15		0	1.0	1.1	26	9.6	1.9	1.2			0	*0
16		0	.8	1.3	23	7.2	1.9	1.1			0	0
17		0	.9	1.5	17	*5.7	2.1	1.0			0	a5
18		0	.9	2.0	16	5.9	2.1	.9			0	a10
19		68	.8	2.0	16	22	2.1	.8			0	a5
20		112	.7	1.5	13	20	2.1	.7			0	1,320
21		17	.8	1.3	11	19	*36	.7			0	1,980
22		9.0	.8	1.2	9.6	7.7	14	.6			a15	991
23		4.2	.6	1.1	9.3	5.7	32	.6			a25	135
24		3.9	.7	1.0	8.0	5.7	*18	.5			a5	50
25		2.2	.8	1.0	7.7	5.4	6.4	.3			a1	33
26		1.5	.9	1.0	7.7	4.9	88	.1			.1	29
27		1.4	.7	1.0	7.2	4.3	29	*0			0	30
28		3.3	.7	.9	7.7	3.5	7.4	0			46	19
29		2.0	.6	1.4	6.6	3.3	4.7	0			15	14
30	(*)	1.3	.6	108	----------	3.2	3.3	0			1.4	10
31		----------	.6	90	----------	3.2	----------	0	----------		.1	----------
Total	0	295.3	23.8	228.8	1,074.7	467.8	297.0	55.6	0	0	108.6	4,631
Mean	0	9.84	0.77	7.38	37.1	15.1	9.90	1.79	0	0	3.50	154
Ac-ft	0	586	47	454	2,130	928	589	110	0	0	215	9,190

Calendar year 1963: Max 2,010 Min 0 Mean 43.9 Ac-ft 31,780
Water year 1963-64: Max 1,980 Min 0 Mean 19.6 Ac-ft 14,250

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.

8-993. Sabana River near De Leon, Tex.

Location.--Lat 32°06'48", long 98°36'18", on left bank at downstream side of bridge on Farm Road 587, 0.6 mile downstream from Spring Branch, 3.8 miles upstream from Turkey Creek, and 4 miles west of De Leon, Comanche County.
Drainage area.--263 sq mi.
Records available.--September 1960 to September 1964.
Gage.--Water-stage recorder. Prior to Nov. 22, 1960, wire-weight gage at same site and datum. Datum of gage is 1,209.59 ft above mean sea level, datum of 1929.
Extremes.--Maximum discharge during year, 8,420 cfs Sept. 20 (gage height, 21.9 ft); no flow at times.
1960-64: Maximum discharge, 9,770 cfs Sept. 7, 1962 (gage height, 21.8 ft); no flow at times.
Maximum stage since at least 1890, 24 ft in May 1908, from information by local resident. High water in 1959 reached a stage of 20.9 ft.
Revisions.--The maximum discharge for the water year 1962 has been revised to 9,770 cfs Sept. 7, 1962 (gage height, 21.8 ft), superseding figures published in Surface Water Records of Texas, 1962.
Remarks.--Records good except those for periods of no gage-height record, which are fair. Flow partly regulated by Nabors Lake (capacity unknown) on Spring Branch, used for recreation. Recording rain gage located at station.
Revisions.--Revised figures of discharge, in cubic feet per second, for the periods July and September 1962, superseding previously published figures, are given herewith:

1962	
July 26	1,620
27	1,010
Sept. 7	4,880
8	6,250

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
July 1962	3,504.0	1,620	0	113	6,950
September	12,026.1	6,250	.1	401	23,850
Water year 1961-62	16,888.2	6,250	0	46.3	33,500

Revised peak discharge.--1961-62: July 26 (2300 hrs.) 4,270 cfs (20.0 ft); Sept. 7 (2100 hrs.) 9,770 cfs (21.8 ft).

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.4	2.0	1.5	15	2.0	2.5	3.3	0.7	0.2	0.1	0.2
2	.2	.4	1.6	1.5	6.6	2.1	2.6	2.9	.7	.4	.1	.1
3	.2	.4	*1.5	1.5	4.7	2.1	2.6	2.2	.6	.1	.1	.1
4	.2	.6	1.5	1.5	a460	2.1	2.6	1.9	.7	.1	.1	.1
5	.2	.6	1.5	1.5	131	2.1	3.5	1.8	1.0	.1	.1	0
6	.2	.6	1.5	1.6	24	2.0	3.4	1.7	.7	0	.1	0
7	.2	.6	1.6	*1.6	11	2.0	2.7	1.6	.5	0	.2	0
8	.2	72	1.5	1.6	7.2	2.1	2.5	1.7	.4	*0	.3	0
9	.2	170	1.5	1.6	5.1	a120	2.3	1.6	.4	.1	.1	0
10	.2	7.4	1.7	1.6	4.2	25	2.2	1.4	.4	.3	.1	0
11	.2	3.3	1.9	1.6	3.4	9.0	2.2	1.4	.4	.1	**.1	0
12	.3	1.9	1.9	1.6	*3.1	5.8	2.3	2.6	.5	0	.1	0
13	.3	1.7	1.8	1.5	3.4	4.4	2.2	1.7	.3	0	.1	0
14	.3	1.6	2.0	1.4	3.3	3.7	2.1	1.3	.3	0	.1	0
15	.3	1.6	1.8	1.7	3.0	3.1	2.0	1.2	.2	0	.3	*0
16	.4	1.6	1.7	2.0	2.7	2.9	2.0	1.0	.4	0	.3	0
17	.3	1.6	1.7	2.2	2.5	*2.7	2.1	.9	.4	.3	.3	0
18	.3	1.7	1.6	2.6	2.5	2.6	2.2	.9	.4	0	.2	0
19	.3	37	1.5	2.6	2.3	5.0	2.3	.8	.4	0	.2	9.1
20	.3	34	1.6	2.3	2.2	5.1	2.2	.8	.2	0	0	4,760
21	.3	16	1.6	2.0	2.2	3.4	*109	.8	.2	0	0	2,630
22	.3	6.7	1.6	2.0	2.3	3.4	*65	.8	.1	0	34	1,390
23	.3	3.4	1.6	1.8	2.3	3.4	13	.8	.2	0	5.6	241
24	2.2	2.3	1.5	1.8	2.2	3.3	*6.8	.8	.2	0	1.0	354
25	.7	1.9	1.6	1.7	2.3	3.0	4.5	.8	.2	0	.5	62
26	.4	1.6	1.6	1.7	2.3	2.6	138	.8	.4	.1	.3	27
27	.4	1.8	1.6	1.8	2.2	2.5	60	1.0	.2	.1	.2	19
28	.4	3.7	1.6	1.8	2.1	2.5	14	*.9	.1	.3	33	14
29	.4	3.3	1.6	2.4	2.0	2.5	6.4	.7	.1	.1	3.9	11
30	*.4	2.3	1.6	a180	----------	2.5	4.2	.7	.1	.1	1.0	8.5
31	.4	----------	1.6	77	----------	2.5	----------	.7	----------	.1	.4	----------
Total	11.2	382.0	50.9	309.0	717.1	237.4	469.4	41.5	11.4	2.5	82.9	9,526.1
Mean	0.36	12.7	1.64	9.97	24.7	7.66	15.6	1.34	0.38	0.08	2.67	318
Ac-ft	22	758	101	613	1,420	471	931	82	23	5.0	164	18,890

Calendar year 1963: Max 4,570 Min 0.1 Mean 43.6 Ac-ft 31,540
Water year 1963-64: Max 4,760 Min 0 Mean 32.4 Ac-ft 23,480

Peak discharge (base, 1,500 cfs)

Date	Time	Gage height	Discharge
9-20	0600	21.9	8,420
9-21	2100	20.10	3,820

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
a No gage-height record.

8-994. Proctor Reservoir near Proctor, Tex.

Location.--Lat 31°58'07", long 98°29'09", in intake structure at Proctor Reservoir on Leon River, 2.0 miles upstream from U. S. Highways 67 and 377, and 3.5 miles west of Proctor, Comanche County.

Drainage area.--1,265 sq mi.

Records available.--January 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929. Prior to May 28, 1963, staff gage at same site and datum.

Extremes.--Maximum contents during year, 88,030 acre-ft Sept. 25 (elevation, 1,167.47 ft); minimum contents, 25,580 acre-ft Aug. 21 (elevation, 1,152.41 ft).
1963-64: Maximum contents, that of Sept. 25, 1964; minimum contents since first filling of reservoir, that of Aug. 21, 1964.

Remarks.--Reservoir is formed by reinforced concrete gated structure and rolled earth-fill section, total length 13,460 ft. Reservoir operated as a detention basin Jan. 30 to July 5, 1963. Gates closed July 6, 1963, and reservoir operated to elevation 1,156.0 ft for construction purposes. Deliberate impoundment began Sept. 30, 1963. Reservoir is operated for flood control and water conservation. Outlet works consist of two 36-inch diameter sluices. The spillway is a gated concrete gravity structure located on the left bank, with an ogee weir section and stilling basin, and is controlled by eleven 40- by 35-foot tainter gates. Spillway is designed to discharge 431,800 cfs at maximum design level (elevation, 1,201.0 ft). Capacity based on survey made in 1946, borrow is not included in capacities shown. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	1,206.0	-
Top of gates	1,197.0	374,200
Crest of spillway	1,162.0	59,400
Invert of two 36-inch diameter slide gate controlled outlets	1,128.0	68

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

Capacity table (elevation, in feet, and contents, in acre-feet)

1,150	20,150	1,165	74,250
1,155	32,710	1,170	103,600
1,160	50,620		

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30,420	29,020	35,710	34,750	36,860	33,320	32,920	34,400	32,050	29,930	27,000	27,740
2	30,360	28,960	35,650	34,720	36,960	33,290	32,920	34,000	31,960	29,910	26,930	27,660
3	30,300	28,880	35,620	34,720	37,200	33,320	32,920	33,560	31,870	29,820	26,820	27,580
4	30,220	28,850	35,620	34,690	39,310	33,320	33,290	33,100	31,960	29,740	26,750	27,500
5	30,190	28,820	35,580	34,660	40,580	33,220	33,350	32,920	31,930	29,650	26,670	27,420
6	30,160	28,800	35,550	34,590	40,620	33,290	33,380	32,890	31,840	29,510	26,570	27,340
7	30,130	28,710	35,520	34,500	40,260	33,320	33,320	32,860	31,750	29,400	26,440	27,270
8	30,080	31,960	35,420	34,470	39,940	33,810	33,200	33,100	31,640	29,350	26,310	27,190
9	30,020	34,560	35,330	34,440	39,660	34,090	33,100	33,130	31,600	29,240	26,230	27,110
10	29,930	34,750	35,390	34,400	39,350	34,440	32,980	33,100	31,520	29,100	26,130	27,030
11	29,880	34,780	35,360	34,370	38,860	34,530	32,920	33,130	31,460	29,040	26,060	26,980
12	29,820	34,750	35,260	34,310	38,830	34,500	32,860	33,130	31,370	28,900	25,900	26,900
13	29,740	34,720	35,330	34,250	38,410	34,500	32,710	33,100	31,280	28,820	25,800	26,820
14	29,680	34,620	35,200	34,220	38,070	34,470	32,620	33,040	31,200	28,680	25,700	26,770
15	29,600	34,560	35,170	34,440	37,700	34,370	32,560	32,980	31,170	28,600	25,780	26,690
16	29,540	34,560	35,130	34,470	37,300	34,250	32,530	32,920	31,250	28,500	25,750	26,850
17	29,510	34,590	35,100	34,440	37,000	34,060	32,530	32,860	31,170	28,410	25,850	26,800
18	29,460	34,560	35,070	34,440	36,600	34,180	32,530	32,770	31,080	28,300	25,850	26,800
19	29,400	35,580	35,040	34,400	36,170	34,120	32,500	32,710	30,990	28,220	25,750	27,420
20	29,350	36,270	35,070	34,400	35,910	33,940	32,560	32,650	30,880	28,140	25,630	43,800
21	29,320	36,330	35,070	34,400	35,460	33,750	38,410	32,590	30,790	28,040	25,650	73,400
22	29,260	36,400	35,010	34,400	35,040	33,500	39,280	32,560	30,700	27,960	27,110	85,130
23	29,460	36,170	34,940	34,400	34,660	33,380	38,660	32,500	30,650	27,850	27,770	87,270
24	29,460	35,940	34,940	34,370	34,250	33,320	38,350	32,440	30,530	27,740	27,820	87,970
25	29,490	35,780	34,910	34,310	33,900	33,260	37,900	32,380	30,420	27,640	27,770	87,680
26	29,460	35,620	34,910	34,250	33,560	33,130	37,600	32,320	30,330	27,560	27,720	86,750
27	29,430	35,780	34,880	34,250	33,380	33,070	37,260	32,320	30,270	27,480	27,610	85,130
28	29,350	35,840	34,880	34,180	33,260	33,070	36,600	32,290	30,190	27,370	27,820	82,900
29	29,260	35,780	34,850	34,340	33,260	33,040	35,780	32,260	30,100	27,320	27,900	79,770
30	29,240	35,750	34,780	35,680	----------	33,010	34,970	32,200	30,020	27,240	27,880	76,010
31	29,180	----------	34,750	36,660	----------	32,950	----------	32,140	----------	27,140	27,820	----------
(†)	1,153.78	1,155.97	1,155.66	1,156.25	1,155.18	1,155.08	1,155.73	1,154.81	1,154.08	1,153.02	1,153.28	1,165.33
(‡)	-1,320	+6,570	-1,000	+1,910	-3,400	-310	+2,020	-2,830	-2,120	-2,880	+680	+48,190

Water year 1963-64..... ‡ 45,510

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-995. Leon River near Hasse, Tex.

Location (revised).--Lat 31°57'28", long 98°27'32", on left bank at downstream side of bridge on U. S. Highways 67 and 377, 500 ft upstream from Gulf, Colorado and Santa Fe Railway Co. bridge, 0.3 mile upstream from Walnut Creek, 2.0 miles downstream from Proctor Reservoir Dam, and 2.1 miles northeast of Hasse, Comanche County.

Drainage area.--1,268 sq mi.

Records available.--January 1939 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,115.01 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942.

Average discharge.--25 years, 147 cfs (106,400 acre-ft per year).

Extremes.--Maximum discharge during year, 2,190 cfs Sept. 30; maximum gage height, 14.25 ft Sept. 21 (backwater from Walnut Creek); no flow Oct. 7, 9-10.

1939-64: Maximum discharge, 38,500 cfs May 24, 1952; maximum gage height, 21.72 ft Oct. 4, 1959; no flow at times.

Maximum stage since at least 1858, 27 ft in May 1908, from information by local resident. At location about 2½ miles upstream, flood of May 1908 was 9.1 ft higher than that of May 1952, from information by local resident.

Remarks.--Records good except those for periods of backwater, which are fair. Flow regulated by Proctor Reservoir (station 8-994) just upstream since Jan. 30, 1963. Diversions above station for municipal use, steam powerplant operation and other uses.

Rating table, except for periods of backwater from Walnut Creek (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 10, Nov. 8, 22, 26, Feb. 5, 27-28, Mar. 16-24, Apr. 22 to May 1, Sept. 23-30)

3.0	0	3.6	25	7.0	700
3.1	1.2	3.8	48	10.0	1,220
3.2	3.7	4.1	102	11.0	1,530
3.3	7.0	4.5	214	12.0	2,000
3.4	12	5.0	360	13.0	2,800

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.2	5.8	12	12	13	10	14	347	10	8.3	13	8.3
2	9.1	5.8	12	12	13	10	14	192	10	8.3	13	7.8
3	9.6	6.2	*12	12	14	10	14	192	11	8.7	13	8.7
4	9.6	6.2	12	13	21	10	14	189	12	9.1	13	7.8
5	9.0	6.2	12	13	90	10	15	117	12	9.1	13	7.8
6	.8	6.2	12	13	198	10	14	4.2	11	9.6	12	7.8
7	1.0	6.2	12	*13	202	10	19	3.4	10	10	12	7.4
8	3.1	16	12	13	202	10	31	6.6	10	*9.6	13	7.8
9	0	9.9	12	12	202	17	31	3.9	10	9.6	13	8.3
10	8.6	6.2	13	12	198	17	31	2.6	10	9.1	13	8.3
11	5.7	5.8	12	13	198	31	31	2.6	10	9.6	*12	9.1
12	5.1	5.5	12	13	198	31	31	2.3	10	8.7	10	9.1
13	5.5	5.5	12	12	198	31	30	2.3	9.6	8.7	10	9.1
14	5.5	5.5	12	12	198	31	31	4.9	10	9.1	9.6	9.1
15	5.1	5.5	12	12	195	31	21	12	10	9.1	8.7	*9.1
16	4.8	5.5	12	11	195	55	4.8	12	11	9.1	9.1	11
17	5.1	5.8	12	12	192	*86	4.8	11	10	9.1	9.1	10
18	5.5	6.2	12	13	192	88	4.8	11	10	9.6	9.1	9.6
19	5.5	7.4	12	13	192	92	4.5	11	10	9.1	9.1	9.1
20	5.5	6.2	12	12	195	86	4.5	11	10	8.7	9.1	25
21	5.8	6.2	12	12	195	84	15	10	10	8.7	9.1	36
22	5.8	43	12	12	195	84	166	11	10	14	10	19
23	6.2	88	12	13	195	84	486	12	9.6	13	8.3	99
24	8.1	88	12	13	195	66	486	12	9.6	14	8.3	239
25	5.8	88	12	13	195	33	486	10	10	14	8.7	151
26	5.8	56	12	12	148	33	494	10	9.6	14	8.7	687
27	5.8	14	12	12	86	26	477	12	9.6	13	8.7	1,000
28	5.8	14	12	12	52	14	468	*10	9.1	12	8.7	1,090
29	5.8	12	12	14	11	14	468	10	10	13	8.7	1,690
30	5.8	12	12	19	----------	14	458	10	9.1	12	8.3	*2,120
31	*5.8	----------	12	14	----------	14	----------	10	----------	12	8.7	----------
Total	176.8	554.8	373	394	4,378	1,142	4,368.4	1,254.8	303.2	321.9	320.0	7,321.2
Mean	5.70	18.5	12.0	12.7	151	36.8	146	40.5	10.1	10.4	10.3	244
Ac-ft	351	1,100	740	781	8,680	2,270	8,660	2,490	601	638	635	14,520

Calendar year 1963: Max 458 Min 0 Mean 55.3 Ac-ft 40,030
Water year 1963-64: Max 2,120 Min 0 Mean 57.1 Ac-ft 41,470

* Discharge measurement made on this day.
Note.--Backwater from Walnut Creek Nov. 8-9, Apr. 21, Aug. 22, Sept. 20-21.

8-1000. Leon River near Hamilton, Tex.

Location.--Lat 31°47'19", long 98°07'16", on downstream side of bridge on U. S. Highway 281, 2.2 miles upstream from Mesquite Creek, 3.6 miles downstream from Bear Creek, and 5.9 miles north of Hamilton, Hamilton County.

Drainage area.--1,914 sq mi.

Records available.--January 1925 to September 1931, September 1960 to September 1964.

Gage.--Water-stage recorder. Sept. 1, 1960, to Nov. 22, 1960, wire-weight gage at same site and datum. Datum of gage is 960.38 ft above mean sea level, datum of 1929. Jan. 7, 1925, to Sept. 30, 1931, chain gage 1.4 miles downstream at datum 3.13 ft lower.

Average discharge.--10 years (1925-31, 1960-64), 144 cfs (104,300 acre-ft per year).

Extremes.--Maximum discharge during year, 4,120 cfs Aug. 22 (gage height, 16.87 ft); no flow at times.
1925-31, 1960-64: Maximum discharge, 18,600 cfs Sept. 9, 1962 (gage height, 26.93 ft); no flow at times.
Maximum stage since at least 1858, 33.4 ft in May 1908 and December 1913; flood in September 1911 reached a stage of 32.0 ft, from information by local residents. The flood in October 1959 reached a stage of 29.1 ft.

Remarks.--Records good. Flow partly regulated by Leon Reservoir (see p. 300) and Proctor Reservoir (station 8-994). Diversions above station for irrigation, municipal supply, and industrial use. At end of year, flow from 4.09 sq mi above this station was partly controlled by 3 floodwater-retarding structures with a total combined capacity of 1,530 acre-ft below the flood spillway crests, of which 1,400 acre-ft is floodwater-retarding capacity and 130 acre-ft is sediment pool capacity. All of these structures were built during the current year. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Recording rain gage located at station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.5	1.6	17	13	82	70	28	462	13	2.1	0	2.5
2	4.2	1.3	14	13	43	35	28	428	13	2.3	0	2.2
3	3.6	1.1	13	13	32	26	28	250	*11	1.6	0	1.8
4	4.2	.5	12	13	51	24	27	229	12	1.1	0	1.6
5	3.9	.2	12	13	73	22	187	223	14	.4	0	1.3
6	3.3	.2	12	13	82	26	475	204	14	.3	0	.9
7	4.3	.2	12	13	171	20	89	80	13	*.2	0	.6
8	4.5	3.0	12	13	210	24	48	38	12	.1	0	.4
9	4.7	877	12	13	210	641	38	37	9.6	0	0	.2
10	3.9	301	*12	13	212	159	47	67	8.1	0	0	.2
11	2.0	46	12	13	214	70	48	40	6.7	0	*0	.2
12	1.0	22	12	13	*214	37	48	31	5.6	0	0	49
13	.4	13	13	*13	216	39	47	25	5.2	0	0	8.6
14	.2	9.3	13	13	216	43	46	20	5.2	0	0	3.3
15	.1	7.8	13	13	216	43	44	19	5.4	0	10	*1.8
16	0	7.0	14	15	216	42	43	17	78	0	6.2	78
17	0	6.5	14	16	216	40	41	18	56	0	41	182
18	0	6.5	14	16	*214	70	29	20	12	0	21	32
19	0	8.1	14	17	212	790	20	20	9.3	0	14	8.9
20	0	12	14	17	210	298	17	19	7.8	0	5.0	320
21	0	11	14	17	210	146	559	17	6.7	0	2.6	2,080
22	0	24	14	17	210	119	1,170	17	5.6	0	1,460	3,060
23	.1	13	14	16	210	113	626	17	4.7	0	814	912
24	1.3	24	14	15	210	108	491	17	3.4	0	98	229
25	1.4	75	13	14	210	*105	*1,840	17	2.6	0	24	314
26	1.8	76	13	14	210	76	*1,520	16	2.7	0	11	116
27	2.1	76	13	14	206	53	812	15	2.9	0	7.2	431
28	3.4	63	13	14	129	50	*566	14	3.6	0	5.4	775
29	2.7	28	13	14	105	45	485	14	3.6	0	4.0	900
30	*2.2	20	13	54	----------	33	462	14	2.9	0	3.4	1,060
31	2.1	----------	13	76	----------	29	----------	14	----------	0	3.0	----------
Total	61.9	1,734.3	408	541	5,010	3,396	9,909	2,419	349.6	8.1	2,529.8	10,572.5
Mean	2.00	57.8	13.2	17.5	173	110	330	78.0	11.7	0.26	81.6	352
Ac-ft	123	3,440	809	1,070	9,940	6,740	19,650	4,800	693	16	5,020	20,970

Calendar year 1963: Max 2,060 Min 0 Mean 78.8 Ac-ft 57,080
Water year 1963-64: Max 3,060 Min 0 Mean 101 Ac-ft 73,270

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

8-1005. Leon River at Gatesville, Tex.

Location.--Lat 31°26'05", long 97°45'35", on right bank just downstream from pier of bridge on U. S. Highway 84 in Gatesville, Coryell County, 0.1 mile downstream from Dodds Creek, and 5.3 miles upstream from Cottonwood Creek.

Drainage area.--2,365 sq mi.

Records available.--October 1950 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 723.85 ft above mean sea level, datum of 1929. Prior to Feb. 8, 1951, wire-weight gage at same site and datum.

Average discharge.--14 years, 258 cfs (186,800 acre-ft per year).

Extremes.--Maximum discharge during year, 6,680 cfs June 16 (gage height, 24.37 ft); minimum daily, 0.2 cfs July 15, Aug. 14-15.
1950-64: Maximum discharge, 51,200 cfs Oct. 4, 1959 (gage height, 34.14 ft); no flow at times.
Maximum stage since at least 1854, 35 ft in May 1908, from information by local residents.

Remarks.--Records good. Some regulation by Proctor Reservoir (station 8-994) since Jan. 30, 1963. Small diversions above station for irrigation, municipal supply, and oilfield operation. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see station 8-1000.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 1-2, 4, Feb. 9 to Mar. 3, Mar. 9-13, 19-28, Apr. 5-9, 16-17, Apr. 23 to May 10, May 12, May 31 to June 1, June 16-19, Aug. 16, 22-27, Sept. 16-30)

2.8	0.1	3.6	43	8.0	900
2.9	1.0	3.8	65	10.0	1,360
3.0	3.7	4.0	90	12.0	1,880
3.1	8.3	4.5	168	16.0	3,000
3.2	14	5.0	260	21.2	4,850
3.4	26	6.0	465		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.8	0.5	44	14	101	131	52	476	144	3.7	0.5	13
2	1.6	.6	29	15	87	138	44	465	39	3.0	.4	10
3	1.4	.7	22	15	75	89	39	454	*22	2.4	.4	8.8
4	1.4	.8	20	15	106	60	38	370	18	2.1	.5	7.8
5	1.2	1.0	17	15	57	44	109	260	21	1.8	.5	7.3
6	1.0	.7	15	15	37	37	82	250	18	1.6	.5	5.3
7	.7	1.0	14	15	65	33	337	240	21	*1.0	.6	4.1
8	.7	1.8	13	15	77	31	254	223	16	.6	.5	3.3
9	.6	2.7	13	14	164	128	102	302	16	.5	.5	2.7
10	.6	55	*15	14	213	462	67	83	15	.5	.4	2.7
11	.5	502	15	14	213	424	52	64	14	.5	*.5	2.7
12	.5	156	15	14	213	149	51	82	13	.5	.4	2.4
13	.3	61	16	14	213	90	57	69	12	.4	.3	1.6
14	.4	37	18	*14	213	61	55	52	9.8	.5	.2	1.2
15	.5	26	18	15	213	48	54	43	9.8	.2	.2	*1.2
16	.5	21	18	18	213	50	61	36	2,900	.3	417	152
17	.4	18	18	19	213	49	65	33	232	.6	17	970
18	.4	15	18	18	*213	49	54	29	61	.7	3.7	408
19	.4	14	18	19	213	194	54	28	91	.7	1.4	132
20	.3	13	17	19	213	469	47	25	38	.7	.7	289
21	.3	13	17	18	213	611	36	25	25	.7	.3	204
22	.4	12	16	18	213	240	29	25	18	.7	21	1,400
23	.5	11	16	19	213	149	816	25	14	.7	1,100	4,830
24	1.2	13	15	19	213	124	987	23	12	.7	2,390	4,200
25	1.0	19	15	18	213	*120	628	22	10	.7	788	756
26	.7	23	15	17	213	117	*1,180	22	8.8	.8	131	433
27	.6	43	15	16	204	112	*2,040	22	7.8	.8	62	465
28	.6	79	15	16	204	90	1,040	21	6.8	1.2	39	270
29	.5	79	15	16	193	67	658	19	5.3	1.0	28	614
30	.6	71	15	38	----------	61	507	21	4.5	.7	22	812
31	*.7	----------	15	27	----------	59	----------	50	----------	.6	16	----------
Total	22.3	1,290.8	542	533	4,991	4,486	9,595	3,859	3,822.8	30.9	5,043.5	16,009.1
Mean	0.72	43.0	17.5	17.2	172	145	320	124	127	1.00	163	534
Ac-ft	44	2,560	1,080	1,060	9,900	8,900	19,030	7,650	7,580	61	10,000	31,750

Calendar year 1963: Max 1,230 Min 0.3 Mean 85.2 Ac-ft 61,710
Water year 1963-64: Max 4,830 Min 0.2 Mean 137 Ac-ft 99,620

* Discharge measurement made on this day.

8-1010. Cowhouse Creek at Pidcoke, Tex.

Location.--Lat 31°17'05", long 97°53'05", on left bank 125 ft downstream from bridge on Farm Road 116, 0.1 mile downstream from Beehouse Creek, 0.6 mile northeast of Pidcoke, Coryell County, and 4.9 miles upstream from Table Rock Creek.

Drainage area.--455 sq mi.

Records available.--October 1950 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 736.7 ft above mean sea level, datum of 1929.

Average discharge.--14 years, 85.0 cfs (61,540 acre-ft per year).

Extremes.--Maximum discharge during year, 18,300 cfs Sept. 22 (gage height, 26.45 ft); no flow at times.
1950-64: Maximum discharge, 66,200 cfs Oct. 4, 1959 (gage height, 40.1 ft, from floodmark), from rating curve defined by current-meter measurements below 30,000 cfs and slope-area measurement at 55,800 cfs; no flow at times.
Maximum stage known since at least 1882, that of Oct. 4, 1959; a stage of about 37.5 ft occurred in 1900 and 1944, from information by local resident.

Remarks.--Records good. No diversion above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0		0	1.2	0.1	2.1	13	20	1.2	0	2.0
2		0		0	.8	3.1	2.0	9.9	9.1	1.0	0	1.6
3		0		0	.5	.9	1.6	7.1	*4.8	.8	0	1.3
4		0		0	154	.7	1.5	5.3	3.7	.6	0	.9
5		0		0	18	.4	133	4.5	15	.5	0	.7
6		0		0	5.9	.3	52	4.1	9.3	.4	0	.6
7		0		0	2.4	.3	20	3.6	3.5	*.3	0	.5
8		15		0	1.9	.3	16	3.4	1.9	.2	0	.4
9		27		0	1.2	298	9.9	557	1.3	.2	0	.4
10		1.5	(*)	0	1.4	97	6.2	62	1.1	.1	0	.3
11		.3		0	.9	28	4.5	34	.8	0	0	.3
12		.2		0	.7	13	3.4	21	.6	0	*0	.2
13		0		0	1.0	7.4	2.1	13	.5	0	0	.2
14		0		*0	.8	5.6	1.5	9.5	.4	0	0	*.2
15		0		0	.6	3.6	78	7.7	.4	0	446	.2
16		0		0	.4	2.6	571	6.5	1,060	0	101	2,480
17		0		0	.3	2.0	52	5.1	97	0	16	196
18		0		0	*.3	2.0	20	4.1	52	0	7.4	15
19		0		0	.2	815	14	3.4	28	0	4.3	5
20		0		0	.2	178	10	3.1	16	0	2.1	945
21		0		0	.3	58	8.4	2.7	9.5	0	1.4	625
22		0		0	.3	32	7.7	2.6	6.2	0	2,150	2,560
23		0		0	.2	22	6.8	2.6	4.8	0	1,590	674
24		0		0	.2	15	5.9	2.4	3.4	0	199	543
25		0		0	.2	*12	444	1.9	2.9	0	29	171
26		0		0	.2	8.8	183	1.8	2.4	0	13	159
27		0		0	.1	6.8	*58	1.5	2.0	0	9.1	107
28		0		0	.1	5.6	32	1.5	1.9	0	5.9	94
29		0		0	.1	4.3	22	1.4	1.8	0	4.3	66
30		0		3.1		3.2	16	71	1.4	0	3.2	49
31	(*)			4.4		2.7		245		0	2.6	
Total	0	44.0	0	7.5	194.4	1,628.7	1,784.6	1,111.7	1,361.7	5.3	4,584.3	8,699.3
Mean	0	1.47	0	0.24	6.70	52.5	59.5	35.9	45.4	0.17	148	290
Ac-ft	0	87	0	15	386	3,230	3,540	2,210	2,700	11	9,090	17,250

Calendar year 1963: Max 449 Min 0 Mean 8.18 Ac-ft 5,920
Water year 1963-64: Max 2,560 Min 0 Mean 53.1 Ac-ft 38,520

Peak discharge (base, 3,500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-16	1800	14.38	6,120	9-16	1730	24.85	16,400
5- 9	0330	11.99	4,300	9-20	0230	12.20	4,440
6-16	0830	14.65	6,280	9-22	1130	26.45	18,300
8-22	1900	16.49	7,900				

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

8-1020. Belton Reservoir near Belton, Tex.

Location.--Lat 31°07', long 97°28', in intake structure at Belton Dam on Leon River, 1.4 miles upstream from bridge on State Highway 317, 4.2 miles north of Belton, Bell County, 8.2 miles upstream from Nolan Creek, and 16.7 miles upstream from confluence with Lampasas River.
Drainage area.--3,560 sq mi.
Records available.--March 1954 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Feb. 20, 1955, staff gage at present site and datum.
Extremes.--Maximum contents during year, 289,300 acre-ft June 18 (elevation, 578.43 ft); minimum, 184,100 acre-ft Nov. 8 (elevation, 565.23 ft).
1954-64: Maximum contents, 870,300 acre-ft June 6, 1957 (elevation, 620.45 ft); minimum since initial filling, 113,400 acre-ft Dec. 16, 1956 (elevation, 553.06 ft).
Remarks.--Small diversions above the reservoir for irrigation, municipal supply and oilfield operation. Reservoir is formed by a rolled earth-fill dam 5,524 ft long including a 1,300-foot uncontrolled broad crested spillway in saddle on left bank and a 418-foot dike. Flood-control outlet works consist of a 22-foot diameter conduit controlled by three 7.0- by 22.0-foot electrically driven broome-type gates (elevation of invert, 483.0 ft). Low-flow outlet works consist of one 36- by 36-inch gated outlet discharging into flood-control conduit (elevation of invert at intake to wetwell, 540.0 ft). Deliberate impoundment of water began Mar. 8, 1954, and main dam was completed in December 1954. Reservoir built for flood control and conservation. Contents based on surveys dated 1936, 1937, and 1948. Fort Hood and adjacent military installations have been allocated 12,000 acre-ft of storage in the reservoir and during the 1964 water year diverted 9,740 acre-ft. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see station 8-1000. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Crest of spillway	631.0	1,097,600
Top of conservation storage	569.0	210,600
Invert of lowest intake	483.0	278

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

Capacity table (elevation, in feet, and capacity, in acre-feet)

564.0	176,000	572.0	233,700
567.0	196,200	575.0	258,600
568.0	203,300	578.0	285,280
570.0	218,100	580.0	304,085

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	189,600	185,200	188,700	188,100	192,200	203,900	211,000	226,400	210,800	223,800	205,600	211,400
2	189,400	184,900	188,800	188,100	192,400	204,800	210,800	227,400	210,800	225,000	205,300	211,300
3	189,200	184,800	188,700	188,100	192,700	205,300	210,600	228,300	210,800	222,600	205,100	211,000
4	189,100	184,800	188,700	188,100	194,800	205,600	211,000	227,900	211,200	220,100	205,100	210,800
5	188,900	184,600	188,600	188,000	195,400	205,700	211,500	225,500	211,300	217,600	204,700	210,200
6	188,700	184,400	188,600	187,900	195,800	205,800	211,800	222,400	211,100	215,200	204,500	209,900
7	188,700	184,200	188,600	187,900	195,700	205,900	212,000	218,900	210,700	212,800	204,300	209,800
8	188,500	185,600	188,500	187,800	195,700	206,200	212,100	216,700	210,500	211,700	204,200	209,700
9	188,300	185,900	188,300	187,700	195,800	206,700	212,700	219,100	210,600	211,300	204,000	209,500
10	188,100	185,800	188,500	187,700	196,000	207,000	212,500	220,600	210,500	210,800	203,600	209,300
11	187,900	185,700	188,700	187,700	196,400	207,500	212,200	220,200	210,200	210,500	203,400	209,100
12	187,800	186,000	188,400	187,500	196,800	208,600	212,000	218,700	209,900	210,400	203,200	208,800
13	187,500	186,400	189,000	187,400	197,200	209,100	211,700	215,800	209,900	210,100	202,900	208,600
14	187,400	186,600	188,700	187,200	197,500	209,400	211,400	213,400	209,900	209,700	202,500	208,300
15	187,200	186,400	188,600	187,700	198,000	209,500	210,900	212,000	210,500	209,500	203,200	208,000
16	187,100	186,400	188,500	188,000	198,300	209,700	219,900	211,900	266,700	209,300	204,900	211,200
17	186,900	188,300	188,400	187,900	198,700	209,700	231,700	211,800	284,100	209,100	204,100	218,000
18	186,800	188,300	188,500	187,900	199,000	210,800	233,100	211,700	289,200	208,800	204,300	219,400
19	186,600	188,700	188,400	188,000	199,200	212,800	233,500	211,600	287,500	208,600	205,000	220,300
20	186,400	188,700	188,700	188,000	199,800	214,600	232,300	211,400	284,500	208,400	204,600	221,900
21	186,300	188,500	188,700	188,000	200,300	215,100	230,100	211,300	281,400	208,000	204,600	223,400
22	186,200	188,800	188,700	188,100	200,600	216,400	228,500	211,000	277,700	207,800	206,700	226,600
23	186,400	188,500	188,500	188,100	201,000	217,200	226,300	210,900	273,300	207,700	211,400	232,600
24	186,500	188,300	188,400	188,100	201,500	216,900	223,700	210,800	268,100	207,500	212,500	244,700
25	186,400	188,300	188,300	188,100	201,900	215,500	223,200	210,700	262,200	207,200	214,800	252,800
26	186,200	188,300	188,300	188,100	202,300	213,700	226,000	210,400	255,500	207,100	215,100	256,500
27	186,200	188,600	188,300	188,100	202,600	212,500	228,300	210,300	251,000	206,800	213,400	258,600
28	186,100	188,900	188,300	188,100	202,900	212,500	230,000	210,300	245,400	206,600	212,400	259,800
29	185,800	188,500	188,300	188,200	203,200	212,200	228,900	210,200	240,000	206,400	212,200	259,400
30	185,600	188,600	188,200	191,000	----------	211,800	226,200	210,400	234,500	206,100	211,900	257,300
31	185,500	----------	188,100	191,900	----------	211,500	----------	210,800	----------	205,900	211,600	----------
(†)	565.44	565.90	565.83	566.38	567.98	569.12	571.05	569.03	572.10	568.36	569.14	574.85
(‡)	-4,300	+3,100	-500	+3,800	+11,300	+8,300	+14,700	-15,400	+23,700	-28,600	+5,700	+45,700
(††)	851	591	637	659	606	666	714	684	1,018	1,266	1,113	935

Calendar year 1963..... ‡ -22,900 †† 9,765
Water year 1963-64..... ‡ +67,500 †† 9,740

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.
†† Diversions, in acre-feet.

8-1025. Leon River near Belton, Tex.

Location.--Lat 31°04'15", long 97°26'30", on left bank 1,400 ft upstream from bridge on Farm Road 817, 2,000 ft upstream from concrete dam, 1 mile upstream from bridge on U. S. Highway 81, 2 miles northeast of Belton, Bell County, 3.2 miles downstream from Belton Dam, and 5.0 miles upstream from Nolan Creek.
Drainage area.--3,572 sq mi.
Records available.--October 1923 to September 1964.
Gage.--Water-stage recorder above concrete dam. Datum of gage is 476.68 ft above mean sea level, datum of 1929. Prior to May 21, 1931, staff gage at same site and datum.
Average discharge.--41 years, 631 cfs (456,800 acre-ft per year).
Extremes.--Maximum discharge during year, 5,290 cfs June 16 (gage height, 7.80 ft); minimum daily, 3.8 cfs Aug. 7.
1923-64: Maximum discharge, 56,500 cfs Apr. 22, 1945 (gage height, 24.41 ft); no flow at times.
Flood in December 1913 reached a stage of 25 ft and flood in September 1921 reached a stage of 21 ft, from information by local residents.
Remarks.--Records good. During year the city of Temple diverted 5,170 acre-ft from gage pool for municipal use. Flow regulated by Belton Reservoir since Mar. 8, 1954 (see preceding page).
Revisions.--Revised figures of discharge, in cubic feet per second, for the month of March 1938, superseding previously published figures, are given herewith:

Month	Cfs-days	Mean	Runoff
March 1938	29,851	956	58,810
Calendar year 1938	460,775	1,262	914,000
Water year 1937-38	499,854	1,369	991,500

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

3.2	2.6	4.0	115
3.3	5.0	4.2	205
3.4	9.1	4.5	430
3.5	16	5.0	960
3.6	26	6.0	2,280
3.8	60	6.5	3,040

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.2	6.8	7.2	5.6	7.6	7.2	235	1,490	15	3,040	6.4	115
2	*6.4	6.8	7.2	5.6	7.6	8.1	235	29	14	1,990	6.4	64
3	6.4	7.6	6.8	6.0	8.1	7.2	139	23	14	1,320	6.4	11
4	6.4	7.6	6.8	6.0	9.1	7.2	38	606	14	1,320	5.3	33
5	6.4	6.8	6.4	6.4	7.2	6.0	40	1,680	13	1,330	4.7	160
6	6.0	6.4	6.4	7.2	29	6.0	38	2,200	12	1,330	4.1	84
7	6.4	5.6	6.4	6.8	64	4.4	38	2,200	11	1,190	3.8	18
8	6.0	10	6.0	6.4	25	5.3	38	1,650	11	572	4.1	14
9	5.0	10	*6.0	6.0	20	6.4	48	448	10	175	4.7	7.6
10	5.6	8.1	6.8	5.6	20	4.1	125	34	8.6	116	5.0	7.2
11	6.0	8.6	7.2	6.0	20	5.6	217	493	6.8	32	4.7	7.6
12	5.6	8.1	6.8	6.0	20	10	217	1,260	6.4	34	4.7	11
13	6.0	7.2	6.8	*5.6	20	12	211	1,420	5.6	32	4.7	12
14	6.4	6.4	6.4	5.6	20	13	211	1,420	5.6	32	4.4	10
15	6.4	6.0	6.4	6.4	20	12	217	633	9.1	30	5.6	9.1
16	6.4	6.4	6.0	7.2	20	12	124	94	817	27	9.6	12
17	6.0	7.2	6.0	6.4	*20	11	26	94	25	26	10	14
18	6.0	8.1	5.6	6.0	20	8.6	25	94	341	19	9.1	9.6
19	5.6	7.2	5.6	6.0	20	23	27	94	1,330	9.6	7.6	9.6
20	6.0	7.6	6.4	6.0	20	9.6	801	91	1,920	12	6.8	12
21	7.2	6.8	6.4	6.0	20	8.1	1,430	91	1,920	12	6.0	16
22	7.2	7.2	6.8	5.0	20	8.6	984	91	2,130	9.1	9.1	29
23	6.4	6.4	6.4	5.0	20	60	1,320	91	2,580	7.6	10	26
24	7.2	6.8	6.0	5.6	20	428	1,700	94	2,800	6.4	247	391
25	7.6	6.4	5.6	5.3	22	984	1,700	94	2,800	6.0	736	155
26	7.6	6.4	6.0	5.3	18	1,120	779	94	2,960	6.8	1,010	421
27	7.6	6.8	6.0	5.6	12	703	42	59	3,040	8.1	996	237
28	7.6	7.2	6.4	6.4	7.6	241	652	14	3,040	6.4	618	36
29	7.6	7.2	6.8	6.4	7.2	241	1,860	12	3,040	5.3	115	548
30	7.2	7.2	7.2	12	----------	241	*2,280	13	3,040	5.0	112	1,670
31	7.2	----------	6.8	9.6	----------	235	----------	15	----------	5.6	112	----------
Total	202.6	216.9	199.6	195.0	544.4	4,448.4	15,797	16,721	31,939.1	12,714.9	4,089.2	4,149.7
Mean	6.54	7.23	6.44	6.29	18.8	144	527	539	1,065	410	132	138
Ac-ft	402	430	396	387	1,080	8,820	31,330	33,170	63,350	25,220	8,110	8,230

Calendar year 1963: Max 575 Min 2.3 Mean 85.1 Ac-ft 61,610
Water year 1963-64: Max 3,040 Min 3.8 Mean 249 Ac-ft 180,900

* Discharge measurement made on this day.

8-1038. Lampasas River near Kempner, Tex.

Location.--Lat 31°04'46", long 98°00'59", on right bank 26 ft upstream from centerline of U. S. Highway 190, 0.5 mile upstream from Mesquite Creek, 0.8 mile west of Kempner, Lampasas County, and 1 mile downstream from Sulphur Creek.
Drainage area.--817 sq mi.
Records available.--October 1962 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 828.38 ft above mean sea level, datum of 1929.
Extremes.--1962-63: Maximum discharge during year, 7,500 cfs Oct. 9 (gage height, 8.76 ft, from floodmark); minimum daily, 1.8 cfs July 23.
1963-64: Maximum discharge during year, 12,500 cfs Apr. 16 (gage height, 11.73 ft); minimum daily, 2.7 cfs Oct. 20.
Maximum stage since at least 1871 occurred in September 1873 (stage unknown). Flood of May 13, 1957, reached a stage of 37 ft and flood of Oct. 4, 1959, reached a stage of 34 ft, from information by local residents.
Remarks.--Records good except those for period of no gage-height record, which are fair. At end of year, flow from 74.8 sq mi above this station was partly controlled by 9 floodwater-retarding structures with a total combined capacity of 26,090 acre-ft below the flood spillway crests, of which 24,790 acre-ft is floodwater-retarding capacity and 1,300 acre-ft is sediment pool capacity. All of these structures were built during the period February 1959 to June 1961. Many small diversions above station for irrigation and municipal supply, amount unknown. Recording rain gage located at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Jan. 10 to Apr. 24, Apr. 29 to May 1, May 3, 1963, Feb. 19 to Mar. 3, 1964)

1.25	1.8	2.1	200
1.3	3.0	2.9	775
1.4	7.3	4.0	1,620
1.5	16	6.0	3,730
1.7	51	6.4	4,240
1.9	106		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	30	49	37	29	43	37	15	11	188	2.7	4
2	*10	24	55	36	27	47	36	13	10	28	2.4	4
3	10	22	105	37	27	37	30	15	*10	16	2.7	4
4	10	21	81	39	29	47	30	13	9.4	9.4	2.4	4
5	10	19	62	41	*30	47	55	13	7.3	7.3	2.7	4
6	10	21	58	49	34	45	49	78	7.9	7.9	3.9	3
7	10	19	51	53	36	47	39	76	7.3	5.6	2.7	3
8	17	18	51	49	36	47	37	34	6.7	4.7	3.0	3
9	*4,070	16	51	*49	36	47	30	24	5.6	4.3	6.2	3
10	2,600	15	51	47	39	43	29	18	5.6	3.3	5.2	3
11	190	15	53	47	45	98	27	13	6.2	4.3	3.6	3
12	30	14	53	43	43	45	25	11	3.6	3.0	2.4	210
13	25	14	53	37	43	36	24	10	3.3	2.7	3.0	100
14	25	14	55	41	43	34	22	*12	3.0	2.7	3.3	50
15	25	14	60	37	43	*29	19	12	4.3	3.0	6.2	30
16	25	14	62	34	41	36	21	12	5.2	3.6	6.7	15
17	25	15	67	36	43	37	19	13	203	2.7	4.7	15
18	21	15	75	36	53	37	19	*505	74	2.2	4.7	15
19	21	16	78	36	62	39	19	25	*37	2.4	4.7	15
20	22	22	568	37	78	41	18	16	36	2.4	4.7	15
21	25	36	58	39	62	41	18	15	30	2.7	9.4	10
22	*21	36	41	37	51	41	18	19	21	2.0	5.2	10
23	27	43	36	34	45	43	*18	29	15	1.8	4.7	10
24	22	37	39	30	47	39	15	*39	12	*2.2	4.7	9
25	21	34	41	32	45	41	14	30	10	2.4	3.9	9
26	18	32	43	29	45	43	14	27	10	2.2	3.9	8
27	18	*111	43	27	43	41	14	21	13	2.7	4.3	8
28	21	103	39	27	39	43	14	16	8.6	2.7	*3.6	8
29	111	65	37	27	----------	45	18	15	6.7	3.6	4	8
30	66	53	37	27	----------	41	18	14	6.2	3.9	4	8
31	39	----------	37	29	----------	41	----------	13	----------	2.7	4	----------
Total	7,558	908	2,189	1,159	1,194	1,341	746	1,166	588.9	332.4	129.6	591
Mean	244	30.3	70.6	37.4	42.6	43.3	24.9	37.6	19.6	10.7	4.18	19.7
Ac-ft	14,990	1,800	4,340	2,300	2,370	2,660	1,480	2,310	1,170	659	257	1,170

Calendar year		Max		Min	Mean	Ac-ft
Water year 1962-63:	Max	4,070	Min	1.8	Mean 49.0	Ac-ft 35,510

Peak discharge (base, 4,000 cfs)

Date	Time	Gage height	Discharge
10-9	0800	8.76	7,500

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 10-17, Aug. 29 to Sept. 30.

8-1038. Lampasas River near Kempner, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7	7.3	11	10	25	32	32	37	43	6.7	8.6	10
2	7	7.9	10	10	25	32	34	36	*27	6.7	7.3	9.4
3	7	7.9	9.4	10	20	27	36	32	21	6.2	6.7	9.4
4	*6.7	8.6	10	9.4	350	61	34	29	15	5.6	6.2	9.4
5	6.2	8.6	10	9.4	150	21	283	27	22	6.7	5.6	7.9
6	6.2	*7.9	9.4	9.4	70	16	103	29	27	5.6	5.6	7.9
7	5.6	7.9	9.4	10	40	16	47	27	24	*6.2	5.2	8.6
8	5.6	321	10	10	30	18	34	27	15	4.7	5.6	8.6
9	5.2	494	9.4	10	30	372	30	765	12	4.3	6.2	7.9
10	5.2	62	*12	10	25	153	27	108	10	4.3	*6.7	7.9
11	5.2	30	13	10	25	53	25	60	10	4.3	7.3	7.3
12	5.2	19	12	10	20	32	25	47	9.4	4.3	5.6	8.6
13	4.7	15	14	10	20	25	24	34	9.4	4.3	5.2	8.6
14	3.9	13	16	10	20	21	22	29	9.4	5.2	6.2	*8.6
15	4.7	12	14	*12	15	18	21	27	10	4.3	47	9.4
16	3.9	11	13	25	15	16	1,290	24	466	4.3	987	*171
17	3.3	10	13	22	15	16	238	22	404	4.3	293	651
18	3.6	10	12	14	15	18	70	21	96	4.3	147	51
19	3.6	13	12	13	*12	*1,300	40	19	49	5.6	90	24
20	2.7	13	12	11	13	*281	30	16	32	6.7	65	*2,470
21	3.6	10	13	10	16	90	*22	15	22	7.3	45	488
22	5.2	9.4	12	10	19	55	24	15	16	4.7	115	571
23	7.3	8.6	12	9.4	16	45	24	15	14	4.7	72	119
24	30	10	11	9.4	16	*39	24	16	11	5.2	51	206
25	15	9.4	12	8.6	18	39	203	14	10	4.7	43	206
26	8.6	9.4	11	8.6	19	36	264	13	9.4	5.2	29	75
27	7.9	11	10	9.4	27	34	108	12	7.9	6.7	22	136
28	7.3	19	11	9.4	27	32	*60	14	7.9	7.3	18	194
29	7.3	12	11	9.4	27	32	45	15	8.6	5.2	15	62
30	7.3	12	11	35	----------	32	39	26	8.6	5.6	12	41
31	6.7	----------	10	30	----------	32	----------	369	----------	18	11	----------
Total	208.7	1,189.9	355.6	384.4	1,120	2,994	3,258	1,940	1,426.6	179.2	2,150.0	5,594.5
Mean	6.73	39.7	11.5	12.4	38.6	96.6	109	62.6	47.6	5.78	69.4	186
Ac-ft	414	2,360	705	762	2,220	5,940	6,460	3,850	2,830	355	4,260	11,100

Calendar year 1963: Max 505 Min 1.8 Mean 24.7 Ac-ft 17,860
Water year 1963-64: Max 2,470 Min 2.7 Mean 57.0 Ac-ft 41,260

Peak discharge (base, 4,000 cfs)

Date	Time	Gage height	Discharge
4-16	1800	11.73	12,500
9-20	1000	8.10	6,490

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 1-3, Jan. 31 to Feb. 18, Apr. 18-20, Sept. 25.

8-1039. South Fork Rocky Creek near Briggs, Tex.

Location.--Lat 30°54'40", long 98°02'10", on downstream side of bridge on Ranch Road 963, 6 miles above confluence with North Fork Rocky Creek, and 7 miles west of Briggs, Burnet County.

Drainage area.--34.2 sq mi.

Records available.--April 1963 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 949.70 ft above mean sea level, datum of 1929.

Extremes.--1963: Maximum discharge during period April to September, 1,180 cfs May 18 (gage height, 5.62 ft), from rating curve defined by current-meter measurements below 1,000 cfs and slope-area measurement at 3,380 cfs; no flow for many days.
1963-64: Maximum discharge during water year, 2,260 cfs Oct. 24 (gage height, 7.38 ft); no flow for many days.
Maximum stage since at least 1904, 18 ft in September 1921, from information by local residents.

Remarks.--Records good. Three recording rain gages located in watershed. This is a hydrologic bench mark station.

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

1.0	0	2.0	28
1.1	.2	2.3	52
1.2	.8	2.4	63
1.3	1.8	2.6	88
1.4	3.4	3.0	151
1.6	8.3	3.3	220
1.8	16		

Discharge, in cubic feet per second, during period April to September 1963

May	5	19	
	6	*3.6	
	7	.8	
	8	.2	
	18	*74	
	19	1.6	
	20	.4	
	21	.2	
	22	.3	
	23	.2	
June	16	20	
	17	6.9	
	18	.4	
	19	*18	
	20	2.0	
	21	.8	
	22	.2	
Sept.	15	25	
	16	1.9	

Month	Cfs-days	Maximum	Minimum	Mean	Cfsm	In.	Runoff in acre-feet
May 1963	100.3	74	0	3.24	0.095	0.11	199
June	48.3	20	0	1.61	.047	.05	96
September	26.9	25	0	.90	.026	.03	53

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
5-18	0030	5.62	1,180

* Discharge measurement made on this day.
Note.--Flow occurred only on days listed above. Observation of no flow made Apr. 15-16, 23, May 14, July 24, Aug. 29.

8-1039. South Fork Rocky Creek near Briggs, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0	0.1	4.0	2.6	3.6	7.4	0.9			0
2	0	0	0	.2	3.6	6.1	3.8	5.0	.5			0
3	*0	0	0	.1	3.2	3.6	3.8	2.4	.4			0
4	0	0	0	0	17	8.7	3.4	1.8	.3			0
5	0	0	0	0	6.3	3.6	4.8	1.7	1.0			0
6	0	*0	0	0	4.8	3.0	3.8	1.6	.5			0
7	0	0	0	0	4.0	2.8	3.2	1.7	.2			0
8	0	24	0	0	3.6	3.0	2.8	1.7	.1	(*)		0
9	0	3.5	0	0	3.6	6.0	2.7	11	0			0
10	0	.8	0	0	3.2	3.6	2.7	4.4	0			0
11	0	.6	*0	0	2.8	2.8	2.5	2.5	0			0
12	0	.1	0	0	3.0	2.5	2.5	2.1	0			0
13	0	0	.2	0	3.0	2.7	2.2	1.6	0		(*)	0
14	0	0	.6	0	3.0	2.7	2.1	1.3	0			0
15	0	0	.5	0	2.8	2.4	1.8	1.1	0			0
16	0	0	.4	1.0	2.5	2.2	2.7	1.0	.2			*47
17	0	0	.3	1.0	2.5	2.2	4.6	.9	.1			11
18	0	0	.3	1.0	2.5	2.4	2.8	.7	0			.3
19	0	0	.3	1.5	2.2	62	2.4	.6	0			0
20	0	0	.3	1.0	*2.4	7.5	2.1	.6	0			0
21	0	0	.3	.8	3.2	6.1	1.8	.5	0			0
22	0	0	.4	.7	3.0	6.1	1.8	.4	0			0
23	7.3	0	.3	.6	2.7	5.8	1.7	.4	0			70
24	*198	0	.3	.6	2.8	5.5	1.5	.4	0			147
25	.8	0	.2	.4	3.4	5.3	3.3	.4	0			2.7
26	0	0	.2	.4	*2.7	*4.6	35	.3	0			1.2
27	0	0	.2	.4	2.5	4.6	5.4	.3	0			103
28	0	0	.2	.3	2.2	4.6	2.5	.2	0			3.9
29	0	0	.2	.4	2.2	4.2	*2.1	.5	0			1.3
30	0	0	0	15	----------	4.0	2.1	1.4	0			.8
31	0	----------	0	6.9	----------	3.8	----------	2.6	----------			----------
Total	206.1	29.0	5.2	32.4	104.7	187.0	117.5	58.5	4.2	0	0	388.2
Mean	6.65	0.97	0.17	1.05	3.61	6.03	3.92	1.89	0.14	0	0	12.9
Cfsm	0.194	0.028	0.0050	0.031	0.106	0.176	0.115	0.055	0.0041	0	0	0.377
In.	0.22	0.03	0.01	0.04	0.11	0.20	0.13	0.06	0.005	0	0	0.42
Ac-ft	409	58	10	64	208	371	233	116	8.3	0	0	770

Calendar year 1963: Max - Min - Mean - Cfsm - In. - Ac-ft -
Water year 1963-64: Max 198 Min 0 Mean 3.10 Cfsm 0.091 In. 1.23 Ac-ft 2,250

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-24	0200	7.38	2,260	9-24	0845	6.15	1,480
9-16	2100	5.80	1,270	9-27	0400	6.23	1,480
9-23	1515	6.77	1,840				

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

8-1040. Lampasas River at Youngsport, Tex.

Location.--Lat 30°57'21", long 97°42'42", on left bank 500 ft upstream from county road low-water crossing, 0.5 mile east of Youngsport, Bell County, and 4.4 miles downstream from Rocky Creek.

Drainage area.--1,244 sq mi.

Records available.--February 1924 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 633.46 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Mar. 14, 1931, staff gage at same site and datum.

Average discharge.--40 years, 276 cfs (199,800 acre-ft per year).

Extremes.--Maximum gage height during year, 14.09 ft Apr. 17 (discharge not determined, backwater from debris); no flow at times.

1924-64: Maximum discharge, 84,000 cfs May 13, 1957 (gage height, 36.4 ft, from floodmarks), from rating curve extended above 40,000 cfs on basis of maximum discharge of May 13, 1957, measured at highway bridge 22 miles downstream; no flow at times in 1925, 1934, 1950-52, 1954, 1956, 1963-64.

Maximum stage, 44.2 ft Sept. 8, 1873. Flood of Dec. 2, 1913, reached a stage of 33.6 ft, from information by local residents.

Remarks.--Records poor. Many small diversions above station for irrigation and municipal supply. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see station 8-1038. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4	8.8	11	15	80	39	67	410	160	6.3	0	8.8
2	4	7.9	7.1	15	54	79	67	500	*80	4.9	0	7.9
3	4	7.9	6.3	15	50	80	67	200	28	4.9	0	7.9
4	*3.6	7.9	7.1	15	460	54	64	100	26	4.2	0	7.1
5	3.2	7.9	7.1	15	540	85	70	80	24	4.2	0	5.6
6	3.6	*7.9	7.1	15	199	45	352	70	18	*4.9	0	5.6
7	3.2	8.8	7.9	15	98	39	134	60	20	4.2	0	5.6
8	3.6	15	7.9	15	70	37	91	90	21	3.6	0	4.9
9	3.2	600	7.9	10	59	52	75	450	18	2.8	0	4.9
10	3.2	300	9.7	10	52	400	70	460	18	2.4	0	4.9
11	3.6	100	*13	10	47	188	64	150	18	1.7	0	4.2
12	3.6	28	16	10	45	88	62	90	13	1.4	*0	4.2
13	4.2	9.7	20	10	45	67	59	80	12	.9	0	3.6
14	4.2	6.3	24	10	45	54	50	70	17	.6	0	*3.6
15	3.2	3.6	24	*11	45	47	37	60	24	.5	0	3.6
16	2.8	2.8	28	15	43	41	37	50	350	.5	400	100
17	3.6	12	23	21	41	39	1,100	50	790	.3	450	1,000
18	4.2	34	18	21	41	39	270	45	680	.2	250	150
19	3.2	3.2	13	22	*39	780	100	45	200	.1	100	30
20	2.4	4.2	21	22	37	950	72	40	100	.1	80	580
21	2.8	4.9	21	22	41	250	*59	40	55	.1	60	1,310
22	2.4	6.3	20	21	45	196	50	35	40	.1	50	720
23	2.4	4.9	20	21	47	145	50	35	30	.2	70	670
24	700	4.2	20	20	45	*122	45	30	25	.6	80	680
25	370	4.9	20	18	45	108	119	30	25	.4	60	570
26	70	4.9	20	17	45	95	730	30	20	.3	40	440
27	40	7.1	20	16	43	88	430	30	20	.2	30	620
28	25	16	15	15	39	84	220	30	15	.1	23	540
29	20	13	15	15	37	81	100	25	15	0	16	300
30	15	18	15	69	----------	75	90	30	10	0	12	100
31	11	----------	15	170	----------	67	----------	150	----------	0	11	----------
Total	1,329.2	1,260.1	480.1	696	2,477	4,514	4,801	3,565	2,872	50.7	1,732	7,892.4
Mean	42.9	42.0	15.5	22.5	85.4	146	160	115	95.7	1.64	55.9	263
Ac-ft	2,640	2,500	952	1,380	4,910	8,950	9,520	7,070	5,700	101	3,440	15,650

Calendar year 1963: Max 706 Min 0 Mean 29.6 Ac-ft 21,450
Water year 1963-64: Max 1,310 Min 0 Mean 86.5 Ac-ft 62,810

Peak discharge (base, 5,800 cfs)

Date	Time	Gage height	Discharge
4-17	0300	14.09	unknown

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

Note.--No gage-height record Oct. 1-3, Dec. 22 to Jan. 14. Stage-discharge relation indefinite, discharge estimated, Oct. 24-31, Nov. 9-11, Jan. 16 to Feb. 1, Feb. 4-5, Mar. 10, 19-21, Apr. 17-19, Apr. 26 to June 3, June 16-30, Aug. 16-27, Sept. 16-30.

8-1041. Lampasas River near Belton, Tex.

Location.--Lat 31°00'06", long 97°29'32", on left bank 22 ft upstream from upstream bridge of 3 bridges on U. S. Highway 81, 3.5 miles downstream from Stillhouse Hollow Dam (under construction), 4.1 miles southwest of Belton, Bell County, and 13 miles upstream from confluence with Leon River.

Drainage area.--1,325 sq mi.

Records available.--February 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 476.58 ft above mean sea level, adjustment unknown (Texas Highway Department bench mark).

Extremes.--Maximum discharge during year, 7,900 cfs June 16 (gage height, 20.74 ft); minimum daily, 0.2 cfs Oct. 14-16.
1963-64: Maximum discharge, that of June 16, 1964; minimum daily, that of Oct. 14-16, 1963.
Maximum stage since at least 1877, 47 ft September 1921, from information by local residents. Flood of May 1957 reached a stage of 46.1 ft, discharge 83,500 cfs.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Many small diversions above station for irrigation and municipal supply. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see station 8-1038.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 18, 20-26, Apr. 28 to May 1, May 3 to June 16)

4.87	0.2	5.7	84
4.9	.6	6.0	136
5.0	4.7	7.0	364
5.1	12	8.0	656
5.2	21	10.0	1,410
5.4	41	11.2	1,990

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*4.0	8.3	14	14	148	38	76	192	217	14	2	16
2	4.7	6.7	16	14	84	40	76	757	*114	13	1	13
3	4.7	6.0	16	14	63	78	76	207	67	12	1	12
4	3.4	*6.0	14	14	57	102	74	116	47	10	1	11
5	3.4	6.0	12	14	804	68	74	86	42	7.5	1	8.3
6	2.9	5.3	12	14	264	84	150	71	34	*6.7	1	6.7
7	2.4	5.3	11	13	136	68	207	68	30	6	1	6.7
8	2.0	14	10	12	97	59	114	67	28	6	1	6.0
9	1.6	328	*11	13	79	63	90	94	28	6	1	4.7
10	1.2	657	12	12	70	223	79	590	28	6	*1.2	*4.0
11	.6	172	14	12	66	279	76	247	26	5	.9	2.9
12	.4	72	14	12	57	132	73	134	24	5	.8	2.4
13	.3	43	15	*11	52	95	68	100	22	5	.8	2.0
14	.2	30	19	11	50	82	66	84	21	5	.8	1.6
15	.2	23	18	12	47	74	60	70	24	5	.8	1.2
16	.2	21	18	16	47	61	56	63	1,880	5	1.6	9.3
17	.3	19	16	22	*45	53	*1,080	56	247	4	644	1,460
18	.3	186	16	23	43	68	*358	50	416	4	364	579
19	.3	46	16	24	41	254	138	46	178	4	184	132
20	.3	24	16	24	40	*1,400	95	41	94	4	105	57
21	.3	16	16	24	40	458	*79	40	57	4	70	1,990
22	.3	14	16	23	40	240	68	38	40	3	66	570
23	.4	13	16	22	41	*174	61	38	32	3	57	743
24	742	12	15	21	43	144	59	36	27	3	96	747
25	397	13	15	19	45	129	67	34	24	3	79	488
26	75	12	15	18	42	118	458	33	22	3	45	322
27	46	12	15	17	42	107	620	31	19	3	34	503
28	25	15	15	16	42	98	258	30	17	2	29	653
29	16	14	15	16	39	92	140	30	16	2	24	309
30	12	14	14	28	----------	86	100	28	15	2	21	116
31	9.2	----------	14	160	----------	79	----------	27	----------	2	18	----------
Total	1,356.6	1,813.6	456	665	2,664	5,046	4,996	3,504	3,836	163.2	1,852.9	8,776.8
Mean	43.8	60.5	14.7	21.5	91.9	163	167	113	128	5.26	59.8	293
Ac-ft	2,690	3,600	904	1,320	5,280	10,010	9,910	6,950	7,610	324	3,680	17,410

		Max		Min		Mean		Ac-ft
Calendar year								
Water year 1963-64:	Max	1,990	Min	0.2	Mean	96.0	Ac-ft	69,690

* Discharge measurement made on this day.
Note.--No gage-height record July 7 to Aug. 9.

8-1045. Little River near Little River, Tex.

Location.--Lat 30°57'55", long 97°20'45", on right bank 25 ft downstream from State Highway 95, 2.4 miles southeast of Little River, Bell County, and 5 miles downstream from confluence of Leon and Lampasas Rivers.
Drainage area.--5,274 sq mi.
Records available.--October 1923 to May 1929, August 1962 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 400.11 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942. Oct. 5, 1923, to May 27, 1929, chain gage on railroad bridge ½ mile upstream at same datum.
Average discharge.--7 years (1923-28, 1962-64), 604 cfs (437,300 acre-ft per year).
Extremes.--1962: Maximum discharge during period August to September, 4,890 cfs Sept. 9 (gage height, 19.75 ft); minimum daily, 35 cfs Aug. 14 to Sept. 4.
1962-63: Maximum discharge during water year not determined, probably occurred Oct. 9 during period of no gage-height record; minimum daily, 8.2 cfs Aug. 6, 19.
1963-64: Maximum discharge during water year, 14,000 cfs June 16 (gage height, 35.36 ft); minimum daily, 15 cfs Oct. 12-13, Aug. 14-15.
1923-28, 1962-64: Maximum discharge, 28,400 cfs Oct. 2, 1927 (gage height, 43.3 ft); minimum daily, 8.2 cfs Aug. 6, 19, 1963.
Maximum stage since at least 1900, 46.8 ft in September 1921, from information by local residents.
Remarks.--Records good except those for periods of no gage-height record, which are fair. Many small diversions for irrigation and municipal supply affect very low flows. Some regulation by Belton Reservoir (station 8-1020) on Leon River beginning Mar. 8, 1954. At end of year, flow from 80.1 sq mi above this station was partly controlled by 10 floodwater-retarding structures with a total combined capacity of 28,160 acre-ft below the flood spillway crests of which 26,710 acre-ft is floodwater-retarding capacity and 1,450 acre-ft is sediment pool capacity. All of these structures were built during the period February 1959 to December 1961. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Recording rain gage at station.

Discharge, in cubic feet per second, 1962

Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	a50	55	7	47	49	13	a40	2,910	19	a35	a2,500	25	35	a180
2	a50	35	8	45	*732	14	a35	3,380	20	a35	548	26	35	a400
3	*51	35	9	a45	*2,120	15	a35	3,380	21	35	536	27	35	a550
4	49	35	10	a40	*472	16	*35	3,380	22	35	a300	38	35	a300
5	48	37	11	a40	262	17	35	*a3,300	23	35	a200	29	35	a200
6	48	68	12	a40	999	18	35	a3,300	24	35	a190	30	35	a180
												31	35	-
Total													1,223	30,613
Mean													39.5	1,020
Runoff in acre-feet													2,430	60,720

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

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	170	150	668	246	97	86	80	70	54	524	11	12
2	160	130	716	246	96	82	78	66	51	1,070	11	11
3	150	120	701	581	87	81	78	72	79	903	11	12
4	140	110	432	620	*84	81	82	74	454	560	10	14
5	130	110	476	620	87	91	177	82	465	524	9.4	17
6	130	109	465	620	89	81	218	181	465	512	8.2	17
7	120	118	432	620	87	78	136	719	*465	500	8.8	16
8	120	114	410	620	86	80	120	716	366	500	9.4	17
9	4,000	115	399	620	83	81	120	740	366	438	10	15
10	3,500	111	388	*573	83	75	107	692	366	85	11	18
11	1,500	104	377	366	87	83	101	692	366	53	17	18
12	900	100	377	355	87	101	154	668	366	50	13	19
13	500	96	366	355	92	86	156	644	366	49	8.8	24
14	300	93	355	355	91	*120	154	630	366	44	9.4	44
15	250	87	238	355	89	97	151	291	366	42	11	108
16	2,940	82	238	333	87	89	93	344	377	39	10	134
17	2,980	78	229	148	87	83	78	344	*410	32	11	492
18	2,870	70	238	121	115	104	74	353	399	22	9.4	149
19	1,000	82	246	114	164	560	80	1,020	443	18	8.2	97
20	450	105	254	108	116	572	91	549	548	17	18	72
21	400	101	374	105	108	572	76	432	572	28	17	60
22	360	300	524	105	105	572	72	178	560	*31	15	51
23	*344	300	311	102	112	572	94	*100	548	29	18	44
24	300	322	290	97	108	572	*82	87	548	26	16	41
25	200	322	344	102	101	560	75	77	548	27	16	38
26	150	344	263	104	96	144	72	72	524	25	*16	35
27	140	*1,090	254	101	93	88	72	77	524	23	15	34
28	500	204	254	96	88	84	70	72	512	19	11	32
29	400	202	254	97	----------	83	124	66	512	15	12	29
30	300	692	246	101	----------	82	91	60	536	16	11	26
31	200	----------	246	96	----------	80	----------	60	----------	11	11	----------
Total	25,604	5,961	11,365	9,082	2,705	6,120	3,156	10,228	12,522	6,232	373.6	1,696
Mean	826	199	367	293	96.6	197	105	330	417	201	12.1	56.5
Ac-ft	50,780	11,820	22,540	18,010	5,370	12,140	6,260	20,290	24,840	12,360	741	3,360

Calendar year		Max		Min		Mean		Ac-ft
Water year	1962-63:	Max	4,000	Min	8.2	Mean	260	Ac-ft 188,500

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 1-15, 19-22, Oct. 24 to Nov. 5; discharge computed from twice-daily wire-weight gage readings Oct. 16-18, 23, Nov. 6, Nov. 29 to Dec. 10, Dec. 18 to Jan. 10, Feb. 13-14, May 5-23.

8-1045. Little River near Little River, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*26	32	47	44	263	81	366	2,560	178	3,050	27	138
2	24	29	45	44	172	98	366	1,700	190	2,570	27	130
3	21	26	45	42	128	*151	344	411	122	1,390	26	64
4	21	*28	46	42	212	181	175	506	94	1,360	24	44
5	18	30	46	41	772	181	170	1,650	93	1,330	20	114
6	16	29	42	43	453	144	176	2,500	83	1,330	20	154
7	18	27	40	43	263	135	*310	2,300	75	1,290	21	62
8	16	54	37	43	183	128	212	1,750	66	600	19	44
9	16	237	36	41	146	127	180	550	59	300	18	37
10	17	819	37	41	128	169	178	650	56	150	19	32
11	17	276	45	40	121	434	322	750	52	100	19	*33
12	15	140	51	40	114	217	322	*1,400	48	80	18	31
13	15	89	48	39	111	157	322	1,690	46	69	17	30
14	16	74	68	39	108	133	311	1,660	42	65	15	30
15	17	62	*72	41	108	120	311	1,210	50	65	15	28
16	18	52	57	69	105	107	294	190	*7,290	64	34	32
17	19	48	50	78	98	93	*892	173	*2,060	57	393	2,480
18	20	511	48	93	100	92	*693	165	678	56	372	1,010
19	20	163	49	83	93	998	246	157	1,480	50	224	245
20	19	84	54	76	88	1,540	348	151	2,180	44	160	144
21	18	63	58	68	94	777	*1,830	146	2,140	45	121	1,670
22	18	51	53	63	116	366	1,100	141	2,180	43	138	945
23	20	45	48	63	98	272	1,290	141	2,600	39	143	965
24	361	42	46	63	97	485	1,880	149	2,870	37	149	2,890
25	967	40	47	58	105	1,160	1,880	144	*2,870	32	708	858
26	158	40	45	56	102	1,390	1,760	136	2,980	32	1,070	869
27	91	40	44	*52	93	1,200	896	133	3,120	*30	1,050	1,260
28	70	78	44	50	87	428	655	93	3,090	32	950	1,160
29	50	72	44	52	83	388	1,880	76	3,090	30	182	760
30	40	48	43	242	----------	388	2,530	72	3,090	30	148	1,710
31	36	----------	44	657	----------	377	----------	94	----------	31	143	----------
Total	2,198	3,329	1,479	2,446	4,641	12,517	22,239	23,448	42,972	14,401	6,290	17,969
Mean	70.9	111	47.7	78.9	160	404	741	756	1,432	465	203	599
Ac-ft	4,360	6,600	2,930	4,850	9,210	24,830	44,110	46,510	85,230	28,560	12,480	35,640

Calendar year 1963: Max 1,070 Min 8.2 Mean 162 Ac-ft 117,300
Water year 1963-64: Max 7,290 Min 15 Mean 421 Ac-ft 305,300

* Discharge measurement made on this day.
Note.--No gage-height record May 7-12, July 8-12.

8-1050. San Gabriel River at Georgetown, Tex.

Location.--Lat 30°39'10", long 97°39'20", on left bank 100 ft downstream from Missouri-Kansas-Texas Railroad Co. bridge, 1½ miles downstream from confluence of North and South Forks, and 1¾ miles northeast of Georgetown, Williamson County.

Drainage area.--399 sq mi.

Records available.--February 1924 to August 1925, July 1934 to September 1964.

Gage.--Water-stage recorder (digital beginning June 27) and concrete control. Datum of gage is 643.24 ft above mean sea level, datum of 1929. Feb. 27, 1924, to Aug. 31, 1925, staff gage at site 1 mile upstream at different datum.

Average discharge.--30 years (1934-64), 131 cfs (94,840 acre-ft per year).

Extremes.--Maximum discharge during year, 13,800 cfs Oct. 24 (gage height, 11.04 ft); minimum daily, 0.2 cfs Sept. 5.

1924-25, 1934-64: Maximum discharge, 155,000 cfs Apr. 24, 1957 (gage height, 31.89 ft in gage well, 34.10 ft, from floodmarks), from rating curve defined by current-meter measurements below 24,000 cfs and by contracted-opening measurement of 155,000 cfs; no flow at times in 1954-57.

Maximum stage since at least 1852, 36.1 ft Sept. 10, 1921, present site and datum (discharge, 160,000 cfs, by slope-area measurement of peak flow); flood of Apr. 24, 1957, second highest.

Remarks.--Records good. Small diversions have some effect on low flow which is also regulated at times by gates in recreation dam 3,000 ft upstream.

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

0.26	0.2	1.0	9.0	3.0	340
.3	.3	1.2	22	3.5	640
.7	1.3	1.5	48	4.0	1,080
.8	1.8	2.0	103	5.0	2,200
.9	4.0	2.5	188	6.0	3,640

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1963 TO SEPTEMBER 1964

DAY	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
1	1.8	6.8	9.0	9.6	65	31	46	70	51	11	5.8	3.7
2	1.9	6.2	8.4	9.6	47	55	47	102	40	28	5.8	2.9
3	1.9	6.2	8.4	9.0	42	63	47	50	29	6.2	5.1	a.8
4	2.4	6.2	8.4	9.0	131	52	46	42	25	1.3	4.4	a.3
5	2.8	5.7	8.4	9.6	137	42	46	37	28	7.5	4.2	a.2
6	3.7	5.7	8.4	9.0	69	*35	43	38	22	9.0	3.9	a.5
7	3.7	5.2	8.4	9.0	53	34	*41	38	18	7.8	3.9	*1.0
8	2.6	25	7.8	9.0	46	34	39	36	16	7.3	4.5	.9
9	*3.1	87	7.8	8.4	41	37	38	35	13	7.5	4.5	*1.2
10	3.1	40	8.4	8.4	41	45	37	48	13	7.0	4.1	1.9
11	3.1	23	9.6	8.4	38	41	37	*47	9.6	7.0	3.3	2.1
12	3.4	17	9.0	7.8	36	36	38	37	9.6	7.1	*2.9	3.0
13	4.0	14	13	7.8	37	33	37	32	9.6	6.5	2.7	3.1
14	4.0	13	13	7.8	35	33	35	28	11	6.1	2.7	2.8
15	4.4	11	*11	11	35	31	33	25	18	6.0	4.1	2.9
16	4.4	11	11	20	34	29	33	24	162	5.8	6.0	11
17	4.0	9.6	10	19	34	*28	37	23	74	5.8	4.2	65
18	3.7	9.6	11	19	34	31	38	21	40	5.8	4.4	8.5
19	4.0	10	11	19	32	760	38	20	28	6.0	4.6	8.1
20	4.4	11	16	18	31	186	35	20	14	5.4	4.6	7.0
21	4.4	*10	13	20	32	91	34	18	11	22	4.6	8.9
22	3.7	11	12	19	30	72	34	20	17	6.7	4.8	17
23	7.3	11	11	17	32	66	47	20	15	6.0	4.9	204
24	2,720	9.6	11	15	38	57	22	20	16	5.8	5.0	605
25	125	9.0	11	13	38	54	21	17	15	6.3	5.0	94
26	43	9.0	11	13	39	52	*420	18	*14	6.4	4.4	47
27	21	10	11	*13	37	36	212	17	13	*5.9	4.2	535
28	14	13	10	12	34	49	72	15	13	5.5	4.1	187
29	11	11	9.6	12	33	49	48	21	12	5.3	4.1	63
30	9.0	9.6	10	42	------	48	41	20	11	5.6	3.9	40
31	7.8	------	9.6	151	------	46	------	310	------	5.6	3.9	------
TOTAL	3,032.6	426.4	317.2	555.4	1,331	2,256	1,742	1,269	767.8	235.2	134.6	1,927.8
MEAN	97.8	14.2	10.2	17.9	45.9	72.8	58.1	40.9	25.6	7.59	4.34	64.3
AC-FT	6,020	846	629	1,100	2,640	4,470	3,460	2,520	1,520	467	267	3,820

CALENDAR YEAR 1963 MAX 2,720 MIN .5 MEAN 19.2 AC-FT 13,887
WATER YEAR 1963-64 MAX 2,720 MIN .2 MEAN 38.2 AC-FT 27,759

Peak discharge (base, 4,000 cfs)

Date	Time	Gage height	Discharge
10-24	1100	11.04	13,800

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

8-1065. Little River at Cameron, Tex.

Location.--Lat 30°49'53", long 96°57'01", on right bank at site of old McCowan Bridge, 2,020 ft upstream from bridge on U. S. Highway 77, 1.1 mile upstream from Gulf, Colorado and Santa Fe Railway Co. bridge, and 2 miles southeast of Cameron, Milam County.

Drainage area.--6,982 sq mi.

Records available.--November 1916 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 281.89 ft above mean sea level (levels by Corps of Engineers). Nov. 2, 1916, to Sept. 30, 1922, staff gage at site 1½ miles upstream at different datum. Oct. 1, 1922, to Apr. 8, 1926, chain gage at McCowan Bridge 30 ft downstream at same datum. Apr. 9, 1926, to Oct. 9, 1933, chain gage at bridge on U. S. Highway 77, 2,020 ft downstream at datum 1.58 ft lower.

Average discharge.--47 years (1917-64), 1,751 cfs (1,268,000 acre-ft per year).

Extremes.--Maximum discharge during year, 11,500 cfs June 17 (gage height, 25.18 ft); minimum, 17 cfs Aug. 15.
1916-64: Maximum discharge, 647,000 cfs Sept. 10, 1921 (gage height, 53.2 ft, present datum, from flood-mark), from rating curve extended above 110,000 cfs on basis of slope-area measurement at 647,000 cfs; no flow July 12-27, 1956.
Maximum stage since 1852, that of Sept. 10, 1921; flood in 1852 reached about the same stage. Flood in December 1913 reached a stage of 49.0 ft. Stages based on information by local resident.

Remarks.--Records good. Many small diversions for irrigation and municipal supply affect very low flows. Some regulation by Belton Reservoir (station 8-1020) on Leon River beginning Mar. 8, 1954. Records of the Aluminum Co. of America show they diverted 9,970 acre-ft of water from river above gage during the year for use at their Rockdale plant. At end of year, the flow from 167 sq mi above this station was partly controlled by 41 floodwater-retarding structures with a total combined capacity of 60,180 acre-ft below the flood spillway crests, of which 54,160 acre-ft is floodwater-retarding capacity and 6,020 acre-ft is sediment-pool capacity. Three structures were built during the current year and have a total combined capacity below flood spillway crests of 3,500 acre-ft, of which 506 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	61	80	54	1,120	192	555	2,330	600	3,010	52	156
2	*30	43	61	55	615	205	555	3,060	336	3,010	56	151
3	28	58	60	54	390	196	555	2,850	354	2,530	41	151
4	29	55	48	53	315	429	540	818	232	1,430	31	117
5	29	*53	46	50	570	405	390	585	178	1,360	26	65
6	28	51	46	50	1,010	366	321	1,500	147	1,360	26	51
7	27	51	49	50	870	303	318	*2,250	144	1,360	25	148
8	26	52	64	50	525	265	390	2,330	119	1,320	23	127
9	24	568	61	51	390	248	378	2,170	100	940	23	*53
10	23	630	62	48	321	235	288	1,220	89	412	23	47
11	22	781	66	a44	318	258	248	782	76	272	23	42
12	22	560	66	a38	290	450	345	730	74	202	22	36
13	20	290	76	a38	240	420	420	1,290	68	119	18	31
14	19	186	*91	a37	228	321	405	1,570	63	97	20	30
15	21	132	68	a37	220	272	390	1,540	70	89	18	28
16	20	82	91	59	215	245	384	1,360	114	81	28	92
17	20	73	94	79	208	225	378	435	*7,970	80	24	946
18	20	65	72	126	202	208	656	295	7,130	75	172	2,650
19	21	267	75	135	198	540	958	268	1,640	74	495	1,310
20	23	307	64	142	184	3,360	420	245	1,600	*73	318	480
21	23	124	71	*114	176	2,130	367	230	2,170	67	210	254
22	23	101	81	97	174	1,220	1,570	220	2,130	60	155	1,510
23	22	82	81	88	186	712	1,180	210	2,130	58	155	2,410
24	206	58	74	84	202	585	1,220	212	2,530	58	188	5,260
25	3,490	54	65	76	186	615	1,680	218	2,830	56	190	6,740
26	1,530	52	64	70	198	*1,150	1,780	225	2,830	49	*636	1,580
27	409	49	64	64	*196	1,400	2,740	196	2,920	44	1,040	1,740
28	186	54	61	63	198	1,320	1,740	180	3,060	39	1,080	6,130
29	122	56	59	62	208	712	888	160	3,100	35	1,010	*3,180
30	89	85	56	75	----------	585	1,680	129	3,060	37	379	1,080
31	63	----------	55	282	----------	570	----------	224	----------	35	180	----------
Total	6,648	5,080	2,071	2,325	10,153	20,142	23,739	29,832	47,864	18,432	6,687	36,595
Mean	214	169	66.8	75.0	350	650	791	962	1,600	595	216	1,220
Ac-ft	13,190	10,080	4,110	4,610	20,140	39,950	47,090	59,170	94,940	36,560	13,260	72,590

Calendar year 1963: Max 7,220 Min 9.2 Mean 278 Ac-ft 201,000
Water year 1963-64: Max 7,970 Min 18 Mean 573 Ac-ft 415,700

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

8-1082. North Elm Creek near Cameron, Tex.

Location.--Lat 30°55'50", long 97°01'10", on right bank 557 ft downstream from bridge on Farm Road 485, 2 miles upstream from mouth, 3 miles southwest of Ben Arnold, and 6 miles northwest of Cameron, Milam County.

Drainage area.--48.6 sq mi.

Records available.--October 1962 to September 1964.

Gage.--Water-stage recorder. Concrete low-water control beginning Apr. 23, 1964. Datum of gage is 325.1 ft above mean sea level (from Texas Highway Department bridge plans).

Extremes.--1962-63: Maximum discharge during water year, 897 cfs Nov. 27 (gage height, 6.21 ft); no flow for many days.
1963-64: Maximum discharge during water year, 198 cfs Sept. 24 (gage height, 4.00 ft); no flow for many days.
1962-64: Maximum discharge, that of Nov. 27, 1962; no flow for many days.
Maximum stage since at least 1913, 13.5 ft in October 1957, from information by local residents.

Remarks.--Records fair prior to Apr. 23, 1964 and good thereafter. No diversion above station. Four recording rain gages above station are distributed so that rainfall on the watershed can be determined.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1, 1963, to Apr. 22, 1964)

1.4	0.1	1.9	11
1.5	.6	2.0	17
1.6	1.7	2.5	58
1.7	3.7	3.0	101
1.8	6.7		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	1.2	0.2	0	0.1	0					
2	0	0	13	.2	0	.1	0					
3	0	0	20	.1	0	.1	0					
4	0	0	3.1	.1	0	.1	0					
5	0	0	1.3	.1	0	1.4	21					
6	0	0	.6	.1	0	.4	36					
7	0	0	.3	0	*0	.2	4.2					
8	0	0	.2	0	0	.1	1.3					
9	0	0	.1	0	0	0	.8					
10	*0	0	0	0	0	*0	.4					
11	0	0	0	0	0	0	.2					
12	0	0	0	0	0	0	.1					
13	0	0	0	0	0	0	0					
14	0	0	0	0	0	0	*0					
15	0	0	0	0	0	0	0					
16	0	0	0	0	0	0	0					
17	0	0	0	0	0	0	0		(*)			
18	0	0	0	0	200	0	0					
19	0	0	0	0	89	0	0					
20	0	0	.7	0	8.0	0	0	(*)				
21	0	0	**1.2	0	2.6	0	0					
22	0	0	2.4	0	1.1	0	0					
23	0	0	1.0	0	.8	0	2.3			(*)		
24	*0	0	.9	0	.5	0	2.2					
25	0	0	1.2	0	.4	0	.4					
26	0	.1	1.3	0	.3	0	.2					
27	0	423	1.0	0	.2	0	.1				(*)	
28	.1	62	.8	0	.2	0	0					
29	0	4.7	.6	0	----------	0	0					
30	0	*2.1	.4	0	----------	0	0					
31	0	----------	.3	0	----------	0	----------	----------	----------			----------
Total	0.1	496.9	51.6	0.8	303.1	2.5	69.2	0	0	0	0	0
Mean	0.003	16.6	1.66	0.03	10.8	0.08	2.31	0	0	0	0	0
Ac-ft	0.2	986	102	1.6	601	5.0	137	0	0	0	0	0

Calendar year		Max	Min	Mean	Ac-ft
Water year 1962-63:	Max	423	Min 0	Mean 2.53	Ac-ft 1,830

Peak discharge (base, 400 cfs)

Date	Time	Gage height	Discharge
11-27	1200	6.21	897
2-18	2000	5.72	610

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

8-1082. North Elm Creek near Cameron, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0		0			0	0
2	(*)					0		24			0	0
3						0		6.4			0	0
4						0		.9			0	0
5		(*)				0		.1			0	0
6						0	(*)	.1			0	0
7						0		*.1			0	0
8						0		0			0	0
9						0		0			0	0
10						0		0			0	0
11						0		0			0	0
12						0		0			0	0
13						0		0			0	0
14			(*)			0		0			0	0
15						0		0			0	0
16						0		0	(*)		0	0
17						0		0			0	12
18						0		0			0	14
19						4.3		0			0	1.8
20						.8		0		(*)	0	.5
21				(*)		0		0			0	.2
22						0		0			0	33
23						0		0			1.6	5.3
24						0	(*)	0			1.8	*62
25						0		0			.6	*84
26						*0		0			**.1	*6.2
27					(*)	0		0			0	*15
28						0		0			0	28
29						0		0			0	*5.9
30					----------	0		0			0	1.7
31		----------			----------	0	----------	0	----------		0	----------
Total	0	0	0	0	0	5.1	0	31.6	0	0	4.1	269.6
Mean	0	0	0	0	0	0.16	0	1.02	0	0	0.13	8.99
Ac-ft	0	0	0	0	0	10	0	63	0	0	8.1	535

Calendar year 1963: Max 200 Min 0 Mean 1.03 Ac-ft 745
Water year 1963-64: Max 84 Min 0 Mean 0.85 Ac-ft 616

Peak discharge (base, 400 cfs).--No peak above base.

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

8-1090. Brazos River near Bryan, Tex.

Location.--Lat 30°36'50", long 96°29'10", on left bank 2.4 miles downstream from Little Brazos River, 5 miles downstream from Texas and New Orleans Railroad Co. bridge, and 9 miles southwest of Bryan, Brazos County.

Drainage area.--38,400 sq mi, approximately, of which 9,240 sq mi is probably noncontributing.

Records available.--August 1899 to December 1902, February 1918 to January 1926, June 1926 to September 1964. Monthly figures only for some periods, published in WSP 1312. Prior to September 1925, published as "near College Station."

Gage.--Water-stage recorder. Datum of gage is 192.33 ft above mean sea level, datum of 1929. Aug. 1, 1899, to Dec. 31, 1902, and Feb. 23, 1918, to Sept. 17, 1925, staff or chain gage at site 7½ miles downstream at different datum. Sept. 11, 1925, to Oct. 24, 1932, chain gage at site 3,000 ft upstream at present datum.

Average discharge.--48 years (1899-1902, 1918-25, 1926-64), 5,359 cfs (3,880,000 acre-ft per year).

Extremes.--Maximum discharge during year, 26,100 cfs June 17 (gage height, 16.56 ft); minimum daily, 275 cfs Sept. 12.

1899-1902, 1918-64: Maximum gage height, 54 ft Sept. 12, 1921, present site and datum (discharge not determined); minimum daily discharge, 89 cfs Aug. 24, 1934.

Maximum stage since at least 1854, that of Sept. 12, 1921. Flood of Dec. 5, 1913, reached a stage of 51 ft, present site and datum, from information by Texas and New Orleans Railroad Co. at their bridge 5 miles upstream and from comparison of maximum stages reached by floods in 1913 and 1921 at gage near College Station. Flood in 1854 reached about the same stage as flood of Dec. 5, 1913.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Flow regulated by reservoirs above Brazos River at Waco (station 8-965) and by Belton Reservoir (station 8-1020) on Leon River. Many small diversions above station for irrigation, municipal and industrial use, and oilfield operation. At end of year, flow from 247 sq mi above this station and below the major reservoirs was partly controlled by 64 floodwater-retarding structures with a total combined capacity of 90,310 acre-ft below the flood spillway crests, of which 80,760 acre-ft is floodwater-retarding capacity and 9,550 acre-ft is sediment-pool capacity. Twelve of these structures were built during the year and have a total combined capacity below flood spillway crests of 17,380 acre-ft, of which 1,790 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,900	813	690	338	300	620	1,070	2,140	1,000	3,570	576	1,220
2	1,150	788	610	410	500	686	1,070	3,560	1,420	3,440	587	776
3	1,190	1,070	500	400	1,570	728	1,000	6,670	1,070	3,710	604	587
4	1,070	846	400	400	1,040	692	1,040	4,740	813	2,990	538	1,100
5	794	680	410	385	830	1,070	1,070	*2,290	728	2,200	445	1,000
6	839	548	420	360	1,140	1,070	930	1,520	820	2,000	360	1,220
7	1,140	490	420	360	1,040	1,000	930	2,360	898	1,950	380	1,100
8	*1,040	480	420	385	900	930	1,140	3,570	865	1,700	554	680
9	662	455	420	375	930	800	1,040	3,850	788	1,560	632	532
10	526	546	450	365	850	704	930	3,570	650	1,340	632	405
11	752	1,180	540	365	780	995	794	3,050	510	1,260	582	315
12	800	1,100	550	400	760	2,360	692	1,750	532	1,140	475	275
13	898	1,040	550	385	740	1,560	680	1,380	788	728	395	301
14	620	*698	550	360	680	1,100	794	1,750	1,070	516	328	886
15	526	538	550	346	640	865	800	2,360	1,180	405	604	758
16	650	620	530	450	620	776	794	2,150	1,180	320	576	865
17	538	674	480	538	610	764	782	1,750	10,300	283	614	2,580
18	390	686	*460	570	630	728	758	1,340	20,000	543	776	2,050
19	435	698	460	538	650	965	1,460	1,180	*9,130	638	598	3,990
20	526	686	485	587	650	1,450	1,950	898	3,710	638	692	3,240
21	395	852	475	576	630	5,840	1,220	728	3,240	674	764	1,650
22	370	746	485	538	630	4,870	850	800	3,710	*865	1,220	1,000
23	420	598	470	*475	620	2,690	1,900	1,000	3,310	898	1,180	2,240
24	455	638	470	450	590	*1,950	2,580	965	2,990	898	*1,300	5,350
25	509	710	445	435	*630	1,850	2,100	1,000	3,120	776	1,300	19,900
26	2,950	560	425	425	650	1,300	2,360	965	3,570	710	1,040	11,800
27	1,990	440	400	410	662	1,600	2,810	813	3,570	752	930	4,780
28	1,070	420	400	370	662	1,950	3,710	746	3,710	752	1,380	4,530
29	1,000	480	346	350	632	1,900	2,580	1,000	3,710	728	1,650	7,030
30	722	600	311	320	----------	1,340	1,520	965	3,850	722	1,650	3,910
31	604	----------	315	310	----------	1,140	----------	898	----------	716	1,260	----------
Total	26,931	20,680	14,437	12,976	21,566	46,293	41,354	61,758	92,232	39,422	24,622	86,070
Mean	869	689	466	419	744	1,493	1,378	1,992	3,074	1,272	794	2,869
Ac-ft	53,420	41,020	28,640	25,740	42,780	91,820	82,020	122,500	182,900	78,190	48,840	170,700

Calendar year 1963: Max 9,510 Min 299 Mean 1,336 Ac-ft 967,000
Water year 1963-64: Max 20,000 Min 275 Mean 1,334 Ac-ft 968,600

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 25 to Dec. 18, Jan. 29 to Feb. 25, Apr. 20 to May 18, June 21-22, 24-25.

8-1097. Middle Yegua Creek near Dime Box, Tex.

Location.--Lat 30°20'20", long 96°54'15", on right bank 25 ft upstream from centerline of State Highway 21, 4½ miles upstream from West Yegua Creek, and 5.0 miles southwest of Dime Box, Lee County.
Drainage area.--236 sq mi.
Records available.--August 1962 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 295.4 ft above mean sea level (from Texas Highway Department bridge plans).
Extremes.--1962: Maximum discharge during period August to September, 320 cfs Sept. 8 (gage height, 7.57 ft); no flow at times.
1962-63: Maximum discharge during water year, 1,290 cfs Feb. 21 (gage height, 10.58 ft); no flow at times.
1963-64: Maximum discharge during water year, 39 cfs Mar. 19 (gage height, 2.72 ft); no flow most of time.
1962-64: Maximum discharge, that of Feb. 21, 1963; no flow at times.
Maximum stage since at least 1851, 16 ft in December 1913, from information by local residents.
Remarks.--Records good. Recording rain gage located at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 21-25, 1962, June 7 to July 20, 1963, Dec. 12 to Mar. 18, 1964)

0.8	0	1.2	1.4	2.0	15	9.0	500
.9	.1	1.3	2.2	3.0	48	9.5	582
1.0	.4	1.4	3.2	6.0	180	10.0	795
1.1	.8	1.5	4.5	8.0	360	10.5	1,210

Discharge, in cubic feet per second, during period August to September 1962

Sept. 8.....	168	Sept. 14.....	25	Sept. 20.....	1.0	Sept. 26.....	6.4
9.....	56	15.....	12	21.....	.5	27.....	9.9
10.....	47	16.....	6.3	22.....	.3	28.....	4.2
11.....	61	17.....	*3.5	23.....	.2	29.....	22
12.....	68	18.....	2.1	24.....	.1	30.....	34
13.....	50	19.....	1.4	25.....	.1		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
September 1962.....	579.0	168	0	19.3	1,150

* Discharge measurement made on this day.
Note.--Flow occurred only on days listed above. Observations of no flow made Aug. 1, 13.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	56	322	64	13	29	5.9	5.3	1.3	(*)		
2	12	39	469	44	14	27	6.1	5.3	1.1			
3	6.7	22	302	33	13	25	5.9	5.0	1.0			
4	3.8	13	118	28	12	24	5.5	4.8	.7			(*)
5	2.6	7.6	105	26	11	22	128	4.7	.6			
6	1.9	5.1	139	23	11	19	194	4.5	.5			
7	1.4	3.5	180	20	*10	18	139	4.4	.4			
8	1.1	2.7	157	19	9.6	16	148	4.1	.3			
9	35	2.4	76	17	9.2	15	272	4.0	.2			
10	54	2.0	42	16	9.4	14	350	3.6	.1			
11	44	1.8	28	15	10	14	187	3.2	.1			
12	75	1.5	20	14	11	14	71	2.8	.1			
13	89	1.3	17	12	11	*14	34	2.7	0			
14	73	1.1	18	11	12	14	22	2.7	0			
15	41	1.1	16	12	12	13	16	2.5	0			
16	22	1.1	15	11	11	12	13	2.5	0			
17	12	1.1	14	11	10	12	11	2.4	.2			
18	7.2	1.1	14	12	210	12	9.8	2.3	*.9			
19	5.0	1.1	14	20	340	12	*9.2	2.2	.3			
20	3.5	1.2	16	39	318	11	8.8	*8.3	.3			
21	2.8	1.4	23	42	1,050	10	8.4	14	1.6			
22	2.4	1.7	50	32	655	9.6	8.0	16	.3			
23	2.0	1.9	160	25	516	8.4	7.8	23	.1	(*)		
24	1.6	2.7	474	20	300	7.8	7.0	16	.1			
25	*1.5	3.2	634	17	111	7.2	7.0	9.8	.1			
26	1.4	*3.2	500	16	59	7.0	6.7	6.1	.1			
27	1.3	68	*300	14	40	6.9	6.1	4.1	.1			
28	2.9	166	340	13	32	5.9	5.9	2.8	0			
29	26	109	372	13	---	5.3	5.8	2.2	0			
30	14	168	228	13	---	5.3	5.6	1.8	0			
31	30	---	104	13	---	5.9	---	1.5	---			---
Total	602.1	690.8	5,267	665	3,820.2	416.3	1,704.5	174.6	10.5	0	0	0
Mean	19.4	23.0	170	21.5	136	13.4	56.8	5.63	0.35	0	0	0
Ac-ft	1,190	1,370	10,450	1,320	7,580	826	3,380	346	21	0	0	0

Calendar year Max Min Mean Ac-ft
Water year 1962-63: Max 1,050 Min 0 Mean 36.6 Ac-ft 26,480

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
12-24	2400	9.79	676
2-21	0700	10.58	1,290

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

8-1097. Middle Yegua Creek near Dime Box, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0	0	0	0.7	2.1	0			0
2				0	0	2.0	.6	2.6	0			0
3				0	0	*3.0	.5	1.4	0			0
4				0	.2	2.4	.4	*1.0	0			0
5				0	0	2.1	1.7	1.0	0			0
6				0	0	2.0	1.3	2.8	.1			0
7				0	0	1.8	.8	2.9	.2			0
8				0	0	1.5	.7	1.8	.1			0
9	(*)			0	0	2.6	.6	1.5	0			0
10				0	0	1.5	.6	1.5	0			0
11				0	0	1.1	.5	1.1	0			0
12		(*)		0	0	1.0	.5	.8	0			0
13				0	0	.7	.5	.6	0			0
14				0	0	.6	.5	.4	0			0
15				0	0	.4	.4	.3	**.2			0
16				.1	0	.4	.3	.2	.2			.5
17			(*)	0	0	.4	.3	.1	1.0			6.7
18				0	0	.3	.3	.1	.4			.6
19				0	0	18	.3	.1	.1			.1
20				0	0	5.2	.3	0	0			.3
21				0	0	3.1	.2	0	.3	(*)		.1
22				0	0	2.8	.2	0	.7			0
23				0	0	*2.9	.4	0	.4			0
24				* 0	*0	2.9	.3	.1	.2		(*)	0
25				0	0	2.8	.3	.1	.2			0
26				0	0	2.5	4.3	0	.1			0
27				0	0	2.0	2.2	0	.1			5.8
28				0	0	1.7	.6	0	0			20
29				0	0	1.3	.5	0	0			20
30				.1	----------	1.1	1.5	0	0			26
31		----------		0	----------	.9	----------	0	----------			----------
Total	0	0	0	0.2	0.2	71.0	22.3	22.5	4.3	0	0	80.1
Mean	0	0	0	0.006	0.007	2.29	0.74	0.73	0.14	0	0	2.67
Ac-ft	0	0	0	0.4	0.4	141	44	45	8.5	0	0	159

Calendar year 1963: Max 1,050 Min 0 Mean 18.6 Ac-ft 13,470
Water year 1963-64: Max 26 Min 0 Mean 0.55 Ac-ft 398

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

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

8-1098. East Yegua Creek near Dime Box, Tex.

Location.--Lat 30°24'26", long 96°49'02", on left bank 25 ft upstream from bridge on State Highway 21, 0.8 mile downstream from mouth of Buffalo Creek, and 3.5 miles north of Dime Box, Lee County.
Drainage area.--243 sq mi.
Records available.--August 1962 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 284.00 ft above mean sea level (State Highway Department bench mark).
Extremes.--1962: Maximum discharge during period August to September, 412 cfs Sept. 8 (gage height, 8.43 ft); no flow Aug. 30 to Sept. 6.
1962-63: Maximum discharge during water year, 2,200 cfs Feb. 20 (gage height, 10.07 ft); no flow for many days.
1963-64: Maximum discharge during water year, 427 cfs Sept. 27 (gage height, 8.49 ft); no flow for many days.
1962-64: Maximum discharge, that of Feb. 20, 1963; no flow at times each year.
Maximum stage since at least 1886, 17 ft in 1899 and 1957, from information by local residents.
Remarks.--Records good except those for period of no gage-height record, which are fair. Diversions above station for irrigation. Recording rain gage located at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 4-22, 25-26, 1963)

0.7	0	1.5	5.8	6.0	170
.8	.3	2.0	14	7.0	250
.9	.6	3.0	39	9.0	600
1.0	1.1	4.0	71	9.5	1,160
1.2	2.6	5.0	115	10.0	2,030

Discharge, in cubic feet per second, during period August to September 1962

Sept. 7.....	6.3	Sept. 13.....	43	Sept. 19.....	3.9	Sept. 25.....	1.6
8.....	181	14.....	16	20.....	3.3	26.....	5.5
9.....	112	15.....	9.6	21.....	3.0	27.....	4.5
10.....	214	16.....	7.3	22.....	2.8	28.....	3.6
11.....	205	17.....	*5.9	23.....	2.2	29.....	3.4
12.....	138	18.....	4.5	24.....	1.8	30.....	4.2

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
September 1962.....	982.4	214	0	32.7	1,950

* Discharge measurement made on this day.
Note.--Flow occurred only on days listed above. Observation of no flow made Aug. 30.

8-1098. East Yegua Creek near Dime Box, Tex.--Continued

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57	37	225	40	21	30	9.6	7	2.7	0.4		
2	15	14	80	35	21	30	8.9	7	2.7	.5		
3	15	7.2	60	31	20	30	7.9	6.1	2.6	.5		
4	9.9	5.3	80	29	19	30	8.0	5.7	2.2	.4		
5	6.2	4.1	90	29	16	30	183	5.4	1.8	.1		
6	4.3	3.9	80	24	14	25	280	5.7	1.4	.2		
7	3.6	3.7	39	23	*16	25	811	5.4	1.0	.3		
8	2.9	3.2	27	22	17	25	536	4.5	1.2	.1		
9	*101	3.7	22	21	17	25	207	4.2	1.7	0		
10	37	4.2	19	21	17	25	64	4.8	1.6	0		
11	64	3.8	17	20	17	25	34	4.8	1.0	0		
12	50	3.2	14	18	18	25	25	4.5	.8	0		
13	20	2.6	13	16	18	*23	21	4.6	.6	0		
14	11	2.3	13	14	17	20	18	4.2	.5	0		
15	7.8	2.2	13	13	17	18	14	3.4	.3	0		
16	5.9	2.0	13	13	14	19	12	3.0	.1	0		
17	4.8	1.7	13	14	14	19	11	3.6	.3	0		
18	3.8	1.6	13	20	335	19	*10	3.6	*.4	0		
19	3.2	1.9	13	36	996	18	12	3.6	.4	0		
20	2.8	3.3	16	64	1,710	15	11	*5.4	.8	0		
21	2.8	4.6	50	66	694	12	9.9	10	3.8	0		
22	2.7	5.8	798	44	262	11	9	15	2.9	0		
23	2.6	8.2	851	30	77	11	9	20	1.8	*0		
24	2.8	6.8	449	23	47	11	9	20	1.6	0		
25	*2.9	5.7	270	21	40	11	8	15	1.8	0		
26	2.5	*5.0	398	20	35	10	8	10	1.6	0		
27	2.2	533	*385	19	30	9.9	8	7	1.2	0		
28	3.8	1,300	270	18	30	9.4	8	5	.7	0		
29	11	1,200	140	17	----------	9.6	8	3	.4	0		
30	26	576	80	17	----------	10	7	2.6	.2	0		
31	59	----------	60	18	----------	9.9	----------	2.5	----------	0		----------
Total	543.5	3,756.0	4,611	796	4,549	590.8	2,367.3	206.6	40.1	2.5	0	0
Mean	17.5	125	149	25.7	162	19.1	78.9	6.66	1.34	0.08	0	0
Ac-ft	1,080	7,450	9,150	1,580	9,020	1,170	4,700	410	80	5.0	0	0

Calendar year 1962: Max - Min - Mean - Ac-ft -
Water year 1962-63: Max 1,710 Min 0 Mean 47.8 Ac-ft 34,640

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
11-28	2200	9.64	1,370
12-22	1800	9.78	1,610
2-20	0500	10.07	2,200
4- 7	1700	9.43	1,060

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

Note.--No gage-height record Nov. 28-29, Dec. 2-6, Dec. 28 to Jan. 2, Feb. 25 to Mar. 13, Apr. 22 to May 2, May 22-29; discharge computed from twice-daily wire-weight gage readings Mar. 14 to Apr. 24.

8-1098. East Yegua Creek near Dime Box, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0	2.0	12	5.7	3.0	34	23	1.0		0
2		0	0	2.1	17	18	2.7	89	9.8	.8		0
3		0	.1	2.4	10	18	2.7	94	7.0	.6		0
4		0	.1	3.0	11	29	3.3	*87	4.7	.5		0
5		0	.1	3.1	8.2	19	4.5	28	3.8	.6		0
6		0	.1	2.5	7.8	11	4.2	13	3.3	.6		0
7		0	.1	2.2	9.1	7.8	3.8	11	2.8	.6		0
8		0	.1	2.1	7.2	7.6	3.0	9.9	2.3	.6		0
9	(*)	0	0	1.8	5.5	8.8	2.8	8.8	2.3	.4		0
10		0	.1	1.4	5.0	7.3	2.5	8.0	2.1	.2		0
11		0	.1	1.2	4.8	6.4	2.3	7.5	1.7	0		0
12		*0	.2	1.2	4.3	5.9	2.2	6.6	1.6	0		0
13		0	.6	1.4	4.2	6.2	1.9	5.5	1.8	0		a0
14		0	.6	1.6	4.3	5.5	1.9	5.9	1.9	0		a0
15		0	.2	1.6	4.4	4.4	2.5	5.5	*2.1	0		a0
16		0	.1	3.4	3.9	3.8	2.3	4.6	3.0	0		a9
17		0	*.1	4.6	4.0	3.7	2.2	4.2	3.6	0		a6
18		0	.1	4.4	4.0	3.7	2.1	4.5	6.1	0		a2
19		0	.2	8.5	3.8	23	1.7	5.0	8.5	0		32
20		.2	2.4	7.5	3.7	23	1.7	4.3	6.2	0		24
21		0	1.4	6.2	3.7	19	1.7	4.0	3.6	*0		9.0
22		0	1.4	5.2	3.9	13	1.6	4.6	2.5	0		7.2
23		0	2.1	3.8	3.9	*8.5	1.4	4.4	2.0	0		5.9
24		0	2.8	*2.7	*4.1	6.8	1.2	4.1	1.7	0	(*)	12
25		0	2.6	2.4	5.3	5.5	1.4	3.6	1.4	0		54
26		0	2.1	2.5	5.4	4.2	11	3.6	1.4	0		150
27		.1	1.6	2.3	7.5	4.0	14	3.4	1.6	0		*385
28		.3	1.2	2.1	8.0	4.0	46	3.4	1.4	0		236
29		.1	1.0	2.1	5.9	3.8	30	4.8	1.3	0		240
30		0	.9	8.2	----------	3.6	13	4.5	1.2	0		342
31		----------	1.4	12	----------	3.1	----------	31	----------	0		----------
Total	0	0.7	23.8	107.5	181.9	293.3	174.6	507.7	115.7	5.9	0	1,514.1
Mean	0	0.02	0.77	3.47	6.27	9.46	5.82	16.4	3.86	0.19	0	50.5
Ac-ft	0	1.4	47	213	361	582	346	1,010	229	12	0	3,000

Calendar year 1963: Max 1,710 Min 0 Mean 23.5 Ac-ft 17,010
Water year 1963-64: Max 385 Min 0 Mean 7.99 Ac-ft 5,800

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

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.

8-1100. Yegua Creek near Somerville, Tex.

Location.--Lat 30°19'18", long 96°30'27", near center of span at downstream side of bridge on State Highway 36, 760 ft downstream from Gulf, Colorado and Santa Fe Railway Co. bridge, 2 miles south of Somerville, Burleson County, and 5 miles upstream from Davidson Creek.

Drainage area.--1,008 sq mi.

Records available.--May 1924 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 199.21 ft above mean sea level, datum of 1929. Prior to Jan. 30, 1934, inverted chain gage at railway bridge 760 ft upstream, at datum 34.30 ft higher.

Average discharge.--40 years, 286 cfs (207,100 acre-ft per year).

Extremes.--Maximum discharge during year, 1,300 cfs Mar. 21 (gage height, 7.13 ft); no flow for many days.
1924-64: Maximum discharge, 56,800 cfs July 1, 1940 (gage height, 19.27 ft); no flow at times.
Maximum stage since at least 1875, 22 ft Dec. 5, 1913, present site and datum, from information by Gulf, Colorado and Santa Fe Railway Co.

Remarks.--Records good. Small diversions above station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 4, Feb. 7 to Mar. 2, Mar. 6, 7, 9, 12-14, 24, Apr. 30, May 1, 5-7, 31, June 2, 17, 20)

0.8	0	2.0	12	5.0	211
.9	.2	2.5	23	5.5	310
1.0	.5	3.0	38	6.0	490
1.1	.9	3.5	60	6.5	780
1.3	2.3	4.0	94	7.0	1,160
1.6	5.5	4.5	145	8.0	2,180

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	7.1	2.4	354	40	14	68	137	0.9		0
2		0	5.4	2.2	160	488	13	368	44	.6		0
3		0	5.0	1.9	47	843	12	336	38	.4		0
4		0	3.8	1.7	94	620	12	150	22	.2		0
5		1.8	2.6	1.4	319	258	12	*110	13	.1		0
6		31	1.8	1.2	276	88	12	97	9.3	0		0
7		18	.7	.9	108	51	11	50	6.4	0		0
8	(*)	7.4	.2	.8	44	37	11	27	4.2	0		0
9		3.9	0	.7	27	58	12	20	3.0	0		0
10		2.2	.1	.5	21	176	14	18	2.2	.1		0
11		1.2	.2	.5	16	237	13	15	1.7	.2		0
12		*1.0	.3	1.2	12	116	11	13	1.2	.2		0
13		.8	3.0	1.6	10	42	9.9	10	.8	.1		0
14		.6	92	1.7	9.1	30	8.9	8.5	.5	.1		0
15		.4	137	1.7	8.3	24	7.8	6.5	.6	0		0
16		.3	62	7.4	7.4	20	6.8	5.4	*5.0	0		0
17		.2	*22	112	7.0	17	7.6	4.4	172	0		.1
18		.2	11	64	7.0	15	9.1	4.1	331	0		39
19		.2	6.5	30	6.7	458	9.1	6.4	163	0		125
20		3.0	10	20	6.7	1,200	7.8	5.4	64	0		144
21		42	138	13	6.8	1,080	7.0	3.6	26	*0		42
22		24	117	9.3	6.8	466	6.0	3.1	18	0		34
23		10	44	*8.9	7.0	*190	5.3	3.1	12	0		55
24		6.2	19	8.2	10	64	5.1	3.2	7.8	0	(*)	32
25		4.2	11	6.3	*53	44	6.0	4.8	5.3	0		15
26		2.7	7.4	5.3	80	35	88	6.4	3.6	0		10
27		1.9	5.3	4.3	59	28	409	5.8	2.6	0		17
28		1.8	4.0	3.5	48	23	438	5.6	2.2	0		104
29		1.4	3.0	3.0	44	20	184	4.3	1.7	0		210
30		4.8	2.7	7.0	----------	17	76	4.1	1.3	0		288
31		----------	2.6	211	----------	15	----------	56	----------	0		----------
Total	0	171.2	724.7	533.6	1,854.8	6,800	1,438.4	1,422.7	1,099.4	2.9	0	1,115.1
Mean	0	5.71	23.4	17.2	64.0	219	47.9	45.9	36.6	0.09	0	37.2
Ac-ft	0	340	1,440	1,060	3,680	13,490	2,850	2,820	2,180	5.8	0	2,210

Calendar year 1963: Max 3,850 Min 0 Mean 102 Ac-ft 73,640
Water year 1963-64: Max 1,200 Min 0 Mean 41.4 Ac-ft 30,080

Peak discharge (base, 1,400 cfs).--No peak above base.

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

8-1101. Davidson Creek near Lyons, Tex.

Location.--Lat 30°25'10", long 96°32'24", on left bank 20 ft downstream from Farm Road 60, 1.2 miles downstream from Berry Creek, and 2.8 miles northeast of Lyons, Burleson County.

Drainage area.--195 sq mi.

Records available.--October 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 220.26 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 786 cfs May 2 (gage height, 12.88 ft); no flow at times.
1962-64: Maximum discharge, 4,220 cfs Nov. 28, 1962 (gage height, 16.08 ft), from rating curve defined by current-meter measurements below 1,900 cfs and above by conveyance study; no flow at times.
Maximum stage since at least 1902, 17 ft in 1947, from information by local resident.

Remarks.--Records good. Recording rain gage located at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Jan. 31 to Feb. 1)

2.0	0	4.0	49
2.1	.7	6.0	129
2.2	1.8	9.0	308
2.4	4.8	11.0	490
2.7	11	13.0	810
3.0	18		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.3	0.5	*45	2.4	2.1	120	25			0
2		0	.4	.6	14	98	2.1	*665	6.2			0
3		0	4.4	.6	7.1	71	1.9	145	2.6			0
4		.7	.9	.5	68	18	1.9	31	1.6			0
5		24	.1	.4	94	7.6	2.1	*17	1.0			0
6		3.8	0	.3	22	4.2	1.9	11	.7			0
7		.8	0	.3	8.1	3.2	2.2	8.3	.5			0
8	(*)	.2	0	.3	4.2	2.6	2.9	6.4	.3			0
9		.1	0	.2	2.8	28	2.5	5.0	.2			0
10		0	0	.1	2.1	50	2.5	4.5	.1			0
11		0	0	.1	1.5	23	2.9	4.0	0			0
12		*0	0	0	1.2	7.1	2.8	3.4	0			0
13		0	8.4	0	1.1	4.4	2.5	3.1	0			0
14		*0	50	0	1.0	3.2	2.2	2.6	0			0
15		0	15	0	1.0	2.6	1.8	2.2	0			0
16		0	3.8	3.2	.7	2.2	1.7	2.1	**3.1			0
17		0	1.2	61	.9	1.8	1.7	1.8	54			29
18		0	*.6	26	1.6	1.6	1.7	1.6	14			44
19		0	.2	8.3	1.4	*365	1.6	2.4	4.0			7.2
20		19	46	3.4	1.1	*171	1.5	1.9	1.6			3.1
21		6.7	104	1.7	1.0	28	1.4	1.5	.9	(*)		2.9
22		1.6	17	1.0	.5	14	1.2	1.2	.5			2.2
23		.3	5.0	*.8	.3	* 7.9	1.2	1.0	.2			1.1
24		0	2.5	.6	.6	5.6	1.1	.8	.1		(*)	.7
25		0	1.8	.4	*3.5	4.4	1.1	.8	0			.3
26		0	1.4	.2	3.2	3.4	116	.7	0			.1
27		0	1.1	.2	2.8	3.1	276	.6	0			3.0
28		.8	.9	.1	3.2	2.8	60	.5	0			20
29		1.2	.7	.2	2.6	2.5	18	.4	0			5.4
30		1.2	.7	28	----------	2.2	8.3	.5	0			7.5
31		----------	.6	*259	----------	2.1	----------	26	----------			----------
Total	0	60.4	267.0	398.0	296.5	942.9	526.8	1,072.3	116.6	0	0	126.5
Mean	0	2.01	8.61	12.8	10.2	30.4	17.6	34.6	3.89	0	0	4.22
Ac-ft	0	120	530	789	588	1,870	1,040	2,130	231	0	0	251

Calendar year 1963: Max 2,160 Min 0 Mean 29.2 Ac-ft 21,130
Water year 1963-64: Max 665 Min 0 Mean 10.4 Ac-ft 7,550

Peak discharge (base, 1,500 cfs).--No peak above base.

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

8-1103. Lake Mexia near Mexia, Tex.

Location.--Lat 31°38'45", long 96°34'39", 550 ft downstream from Cedar Creek, 610 ft upstream from spillway of dam on Navasota River, 1 mile upstream from Echo Dam, 1.6 miles upstream from Jacks Creek, and 6 miles southwest of Mexia, Limestone County.

Drainage area.--198 sq mi.

Records available.--July 1961 to September 1964 (gage heights only).

Gage.--Water-stage recorder. Datum of gage is 420.00 ft above mean sea level, datum of 1929.

Extremes.--Maximum gage height during year, 26.67 ft Mar. 20; minimum, 21.40 ft Jan. 15.
1961-64: Maximum gage height, 30.32 ft Apr. 28, 1962; minimum, that of Jan. 15, 1964.

Remarks.--Lake is formed by earth-fill and concrete structure 1,645 ft long. The service spillway is near left end of dam, uncontrolled and is 520 ft long. Lake used for municipal water supply by city of Mexia. The Bistone Municipal Water Supply District reported a diversion of 1,280 acre-ft for municipal use. Data regarding dam shown in following table:

	Gage height (feet)
Crest of dam	42.3
Crest of spillway	28.34
Invert of 24-inch outlet conduit	2.1

Gage height, in feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22.78	22.01	21.75	21.62	24.97	25.75	26.40	26.17	25.53	24.69	23.46	22.96
2	22.75	21.97	21.73	21.60	24.98	25.78	26.40	26.15	25.50	24.65	23.43	22.92
3	22.72	21.95	21.72	21.60	24.98	25.78	26.39	26.13	25.47	24.62	23.40	22.90
4	22.70	21.94	21.70	21.57	25.06	25.78	26.38	26.11	25.44	24.58	23.36	22.86
5	22.68	21.93	21.68	21.57	25.21	25.75	26.48	26.08	25.44	24.54	23.32	22.82
6	22.66	21.91	21.67	21.55	25.25	25.74	26.46	26.10	25.42	24.49	23.29	22.79
7	22.64	21.88	21.65	21.53	25.22	25.75	26.46	26.06	25.38	24.43	23.24	22.75
8	22.61	21.96	21.62	21.55	25.22	25.77	26.41	26.09	25.33	24.39	23.18	22.70
9	22.57	21.96	21.59	21.51	25.20	25.77	26.39	26.08	25.32	24.35	23.15	22.67
10	22.54	21.93	21.65	21.47	25.20	25.76	26.37	26.05	25.28	24.30	23.10	22.65
11	22.51	21.92	21.65	21.49	25.16	25.75	26.37	26.04	25.25	24.25	23.05	22.62
12	22.47	21.89	21.62	21.47	25.22	25.73	26.37	26.01	25.20	24.22	23.01	22.56
13	22.44	21.86	21.66	21.42	25.30	25.72	26.33	25.97	25.17	24.18	22.96	22.51
14	22.42	21.83	21.65	21.40	25.41	25.72	26.30	25.93	25.15	24.14	22.91	22.48
15	22.40	21.80	21.63	21.44	25.49	25.71	26.28	25.90	25.15	24.11	22.90	22.44
16	22.37	21.80	21.62	21.59	25.53	25.69	26.33	25.88	25.17	24.06	22.94	22.76
17	22.36	21.82	21.61	21.85	25.63	25.68	26.32	25.86	25.15	24.02	22.97	23.38
18	22.33	21.79	21.60	22.74	25.82	25.67	26.30	25.84	25.12	23.96	22.95	23.37
19	22.31	21.86	21.57	22.98	25.83	26.33	26.28	25.82	25.09	23.94	22.91	23.35
20	22.28	21.87	21.68	23.00	25.85	26.59	26.27	25.79	25.06	23.89	22.86	23.33
21	22.25	21.85	21.74	23.01	25.83	26.59	26.27	25.77	25.03	23.85	22.85	23.37
22	22.22	21.86	21.75	23.01	25.82	26.57	26.25	25.74	25.00	23.79	22.88	23.35
23	22.24	21.82	21.72	23.01	25.81	26.57	26.22	25.73	25.00	23.76	23.07	23.35
24	22.22	21.80	21.71	23.00	25.81	26.57	26.20	25.71	24.95	23.70	23.17	23.35
25	22.20	21.78	21.71	22.98	25.80	26.58	26.22	25.69	24.90	23.68	23.16	23.31
26	22.19	21.76	21.71	22.95	25.79	26.53	26.27	25.66	24.87	23.64	23.14	23.29
27	22.17	21.78	21.68	22.95	25.83	26.52	26.24	25.63	24.84	23.60	23.10	23.28
28	22.13	21.83	21.68	22.92	25.77	26.51	26.20	25.61	24.78	23.60	23.08	23.25
29	22.09	21.79	21.66	22.96	25.75	26.47	26.18	25.58	24.76	23.54	23.05	23.22
30	22.07	21.77	21.65	23.63	----------	26.45	26.16	25.58	24.72	23.53	23.01	23.20
31	22.07	----------	21.63	24.87	----------	26.43	----------	25.55	----------	23.49	22.98	----------

8-1105. Navasota River near Easterly, Tex.

Location.--Lat 31°10'10", long 96°17'55", near center of span at downstream side of bridge on U. S. Highway 79, 1 mile upstream from Missouri Pacific Railroad Co. bridge, and 7 miles northeast of Easterly, Robertson County.

Drainage area.--940 sq mi.

Records available.--March 1924 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 276.46 ft above mean sea level, datum of 1929. Prior to June 11, 1932, inverted staff gage at railroad bridge 1 mile downstream at datum 24.86 ft higher.

Average discharge.--40 years, 395 cfs (286,000 acre-ft per year).

Extremes.--Maximum discharge during year, 740 cfs Apr. 28 (gage height, 7.74 ft); minimum, 0.2 cfs July 23-25.
1924-64: Maximum discharge, 60,300 cfs May 2, 1944 (gage height, 22.13 ft); no flow at times.
Maximum stage since about 1845, 24 ft in June 1899, from information by local residents (discharge, 90,000 cfs from rating curve defined by current-meter measurements below 60,000 cfs and extended above.

Remarks.--Records good. Diversions for irrigation, municipal supply, and oilfield operation above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.8	0.9	2.4	4.6	21	7.7	6.9	50	3.7	0.7	0.4	a5
2	.7	.8	2.5	4.2	77	15	6.7	58	8.6	.7	.3	a4
3	.7	.8	2.5	4.1	50	18	6.6	168	8.6	.6	.3	a4
4	.7	.9	2.4	4.1	33	248	6.4	172	6.2	.6	.3	a3
5	.7	1.0	2.2	4.0	28	560	7.9	62	5.3	.5	.3	a9
6	.7	1.1	2.2	4.0	23	246	131	*32	3.6	.5	.3	a6
7	**.7	1.1	2.3	4.0	20	125	363	22	3.1	.4	.3	a4
8	.8	1.2	2.2	4.1	46	54	138	17	2.6	.4	.3	a3
9	.9	1.9	1.8	4.0	30	126	46	14	2.2	.4	.3	a2
10	.8	2.0	2.2	4.0	19	252	26	14	1.9	.3	.3	a1
11	.7	1.7	3.1	4.2	14	97	18	12	1.7	.3	.2	a1
12	.7	1.3	3.2	3.6	10	36	14	10	1.5	.3	.2	a1
13	.7	*1.2	4.1	3.2	9.6	23	13	8.8	1.3	.3	.3	a1
14	.7	1.2	6.6	3.2	8.8	21	10	7.4	1.3	.2	.3	a1
15	.6	1.2	5.0	3.2	9.2	17	8.1	6.4	2.0	.2	.3	a300
16	1.2	1.3	4.5	13	8.3	16	5.9	5.8	3.7	.3	.3	a250
17	1.6	1.4	5.2	20	7.4	80	5.3	5.5	4.0	.3	72	a180
18	1.2	1.8	4.5	20	9.6	41	6.2	4.8	*3.6	.2	189	a150
19	1.0	1.9	*3.7	13	11	41	5.9	4.6	3.6	.4	106	a100
20	1.0	2.9	8.3	15	12	45	5.6	4.2	4.0	.6	59	a150
21	1.1	2.8	12	34	34	187	5.0	3.7	3.4	.4	26	a80
22	1.1	2.5	10	*24	30	130	4.9	3.5	2.5	*.2	14	a40
23	1.8	2.0	8.1	16	19	49	5.6	4.0	1.9	.2	11	a30
24	6.7	1.9	5.9	12	16	30	5.9	5.0	1.4	.2	7.6	a30
25	2.6	2.2	5.2	8.6	17	*23	6.2	4.6	1.2	.3	*253	a20
26	1.8	2.0	4.8	7.0	*13	16	26	5.2	1.4	.4	161	a60
27	1.3	1.9	5.5	6.1	12	13	155	4.6	1.1	.3	62	a40
28	1.1	3.2	5.9	5.5	9.4	11	640	4.1	1.0	.3	19	a40
29	.9	3.2	5.2	5.5	8.3	9.4	509	3.8	1.3	.3	11	a30
30	.9	2.6	4.9	12	----------	8.5	126	3.6	.8	.4	a7	a30
31	.9	----------	4.9	25	----------	7.2	----------	4.1	----------	.4	a6	----------
Total	37.1	51.9	143.4	295.2	605.6	2,552.8	2,314.1	724.7	88.5	11.6	1,008.3	1,575
Mean	1.20	1.73	4.63	9.52	20.9	82.3	77.1	23.4	2.95	0.37	32.5	52.5
Ac-ft	74	103	284	586	1,200	5,060	4,590	1,440	176	23	2,000	3,120

Calendar year 1963: Max 323 Min 0.6 Mean 11.0 Ac-ft 7,970
Water year 1963-64: Max 640 Min 0.2 Mean 25.7 Ac-ft 18,660

Peak discharge (base, 2,500 cfs).--No peak above base.

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

8-1110. Navasota River near Bryan, Tex.

Location.--Lat 30°52'10", long 96°11'32", on right bank at upstream side of bridge on U. S. Highway 190, 2.5 miles upstream from Shepherd Creek, and 17 miles northeast of Bryan, Brazos County.

Drainage area.--1,429 sq mi.

Records available.--January 1951 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 224.64 ft above mean sea level, datum of 1929.

Average discharge.--13 years, 438 cfs (317,100 acre-ft per year).

Extremes.--Maximum discharge during year, 1,580 cfs Sept. 17 (gage height, 12.09 ft); no flow at times.
1951-64: Maximum discharge, 35,800 cfs Apr. 26, 1957 (gage height, 16.36 ft); no flow at times.
Maximum stage since about 1840, 19½ ft in June 1899, from information by local residents.

Remarks.--Records good. Diversion for irrigation and municipal supply above station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 23-25, Dec. 1-5, Dec. 12 to Feb. 1)

3.0	0	4.0	7.3	8.0	238
3.1	.1	4.5	16	9.0	368
3.2	.4	5.0	30	10.0	540
3.3	.8	5.5	49	11.0	830
3.4	1.4	6.0	76	12.0	1,470
3.8	4.9	7.0	144		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.2	3.4	10	16	44	35	30	560	12	1.2	0	15
2	1.0	2.8	12	16	69	35	28	382	11	1.1	0	11
3	1.0	2.5	12	16	61	48	27	256	9.7	1.0	0	8.1
4	.9	2.3	11	16	84	66	26	268	9.2	.9	.1	5.6
5	.9	1.9	10	16	100	65	26	305	9.3	.8	.1	5.3
6	.8	1.8	9.7	16	88	320	25	*220	12	.7	.1	9.5
7	*.7	1.9	9.3	16	79	572	26	110	13	.6	.1	7.0
8	.6	1.6	9.3	16	62	432	168	63	11	.5	.1	3.4
9	.5	2.1	9.3	16	49	238	354	46	9.0	.5	.1	2.2
10	.5	2.5	9.3	16	54	148	203	36	6.8	.4	0	1.7
11	.4	3.2	9.8	16	54	292	88	32	5.0	.4	0	1.4
12	.4	3.4	11	16	42	414	52	29	4.0	.3	0	1.5
13	.4	*4.3	12	16	35	240	39	27	3.4	.3	0	1.3
14	.4	5.2	14	16	30	110	32	23	2.8	.3	0	1.0
15	.4	5.2	15	16	28	74	28	20	2.8	.3	0	.9
16	.4	4.8	18	19	27	79	26	17	3.6	.4	0	258
17	.4	4.5	20	22	27	85	24	14	29	.4	0	1,390
18	.4	4.6	*19	49	28	68	21	13	*31	.4	0	702
19	.4	5.0	17	65	28	166	19	12	44	.3	0	237
20	.3	6.5	19	51	28	268	18	10	30	.3	70	104
21	.3	7.2	20	40	30	178	17	10	16	.3	114	161
22	.3	8.7	28	*32	30	160	17	9.5	13	* .2	94	86
23	.3	11	35	34	34	244	16	9.0	9.0	.2	251	41
24	.4	11	29	42	50	192	15	8.1	6.5	.2	519	28
25	.5	10	23	36	47	*95	15	8.1	5.2	.2	*114	23
26	.6	9.2	21	30	*46	72	69	9.2	4.1	.1	55	28
27	2.4	8.4	19	26	50	56	308	9.5	3.3	.1	198	63
28	5.9	9.0	18	23	47	46	446	10	2.6	.1	183	42
29	8.0	8.7	16	20	40	38	520	11	2.0	.1	71	29
30	6.0	8.4	15	22	----------	34	660	10	1.6	.1	32	34
31	4.4	----------	15	24	----------	31	----------	12	----------	0	21	----------
Total	41.1	161.1	495.7	775	1,391	4,901	3,343	2,549.4	321.9	12.7	1,722.6	3,300.9
Mean	1.33	5.37	16.0	25.0	48.0	158	111	82.2	10.7	0.41	55.6	110
Ac-ft	82	320	983	1,540	2,760	9,720	6,630	5,060	638	25	3,420	6,550

Calendar year 1963: Max 936 Min 0 Mean 39.6 Ac-ft 28,700
Water year 1963-64: Max 1,390 Min 0 Mean 52.0 Ac-ft 37,730

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

* Discharge measurement made on this day.
Note.--Discharge computed from once-daily wire-weight gage readings Nov. 9-11, Dec. 13-18.

8-1115. Brazos River near Hempstead, Tex.

Location.--Lat 30°07'34", long 96°11'05", near center of span of bridge on U. S. Highway 290, 4,500 ft upstream from Texas and New Orleans Railroad Co. bridge, 6.5 miles northwest of Hempstead, Waller County, and 8 miles upstream from Caney Creek.

Drainage area.--42,640 sq mi, approximately, of which 9,240 sq mi is probably noncontributing.

Records available.--October 1938 to September 1964. Gage-height records collected in this vicinity at intermittent periods since 1903 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 117.90 ft above mean sea level, datum of 1929. Prior to Nov. 1, 1940, chain gage at railroad bridge 4,500 ft downstream at datum 5.80 ft lower. Nov. 1, 1940, to Sept. 30, 1963, wire-weight gage at present site and datum.

Average discharge.--26 years, 6,562 cfs (4,751,000 acre-ft per year).

Extremes.--Maximum discharge during year, 18,700 cfs June 19 (gage height, 15.13 ft); minimum daily, 340 cfs Sept. 15.

1938-64: Maximum discharge, 143,000 cfs May 2, 1957 (gage height, 44.21 ft); minimum daily, 137 cfs Nov. 6, 1952.

Maximum stage since at least 1899, 56.1 ft Dec. 8, 1913, present site and datum, from information by Texas and New Orleans Railroad Co., obtained at bridge 4,500 ft downstream. Flood of July 4, 1899, reached a stage of 53.6 ft, present site and datum, from information by Texas and New Orleans Railroad Co.

Remarks.--Records good except for periods of no gage-height record, which are poor. Some regulation of flow by reservoirs above Bryan. Many small diversions above station for irrigation, municipal and industrial use, and oilfield operations. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Brazos River near Bryan (station 8-1090).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-2, 4-24, 26-27, Oct. 30 to Nov. 5, Nov. 7 to Dec. 14, Dec. 16-21, Dec. 26 to Jan. 17, Jan. 23-31, Feb. 13 to Mar. 2, May 14 to June 22)

0.9	325	2.0	750	8.0	5,500
1.0	350	3.0	1,310	12.0	10,600
1.5	520	5.0	2,660	16.0	18,000

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	485	850	600	468	2,000	925	1,860	5,500	1,730	3,500	725	1,610
2	547	675	625	450	2,000	2,960	1,400	5,000	1,460	3,500	700	1,340
3	1,490	775	650	450	2,210	5,060	1,340	5,000	1,670	3,500	625	1,190
4	1,250	850	725	450	2,980	3,680	1,280	5,500	1,670	3,500	580	850
5	1,130	1,620	650	485	3,060	*3,590	1,250	5,000	1,280	3,200	600	700
6	1,130	2,010	580	485	2,820	2,980	1,400	4,500	1,040	2,800	580	950
7	900	1,190	540	485	2,420	2,280	*1,430	3,500	950	2,500	520	1,010
8	950	925	502	468	2,660	1,790	1,160	3,000	1,010	2,200	443	1,130
9	1,220	775	468	450	2,500	1,460	1,100	2,500	1,010	1,900	415	1,010
10	1,070	675	450	450	2,000	1,490	1,200	3,000	980	1,700	520	725
11	800	600	450	468	1,550	1,670	1,200	3,200	900	1,500	580	560
12	650	649	468	443	1,340	1,730	1,100	*2,980	800	1,300	600	485
13	775	1,040	502	436	1,130	2,210	1,000	2,820	675	1,100	560	408
14	*875	1,070	1,130	443	1,040	2,580	950	2,210	725	1,000	520	359
15	900	1,010	1,930	468	1,010	2,000	950	1,790	1,040	900	468	340
16	725	800	1,670	502	950	1,550	950	1,930	*1,550	800	398	656
17	625	650	*1,550	1,030	900	1,340	950	2,280	1,790	700	485	1,160
18	675	625	1,280	1,860	875	1,130	950	2,280	7,610	600	580	2,510
19	650	725	925	2,070	850	2,800	950	2,070	*18,000	550	560	3,320
20	540	*800	725	1,790	825	6,050	1,200	1,670	12,000	*600	675	4,150
21	502	875	975	1,490	800	4,850	1,700	1,490	6,600	675	625	4,950
22	560	900	1,550	1,280	775	7,800	1,500	1,250	4,000	700	625	3,410
23	520	1,070	1,550	1,010	775	8,220	1,200	1,070	3,500	700	800	2,350
24	1,240	980	1,490	825	850	5,720	1,500	1,070	3,200	850	1,100	2,070
25	1,610	875	1,400	700	980	3,680	2,500	1,250	3,000	900	1,160	4,350
26	1,070	825	1,130	600	1,070	2,820	3,000	1,220	3,000	900	*1,250	14,400
27	1,090	800	825	580	1,010	2,280	2,500	1,160	3,000	825	1,280	13,600
28	2,500	700	650	*560	1,070	1,930	5,000	1,130	3,500	725	1,130	8,090
29	1,670	625	600	540	1,010	2,070	7,000	1,040	3,500	725	1,130	4,850
30	1,220	580	540	560	----------	2,140	6,000	1,070	3,500	750	1,460	6,380
31	1,010	----------	520	1,280	----------	1,930	----------	1,550	----------	750	1,610	----------
Total	30,379	26,544	27,650	23,576	43,460	92,715	55,520	79,030	94,690	45,850	23,304	88,913
Mean	980	885	892	761	1,499	2,991	1,851	2,549	3,156	1,479	752	2,964
Ac-ft	60,260	52,650	54,840	46,760	86,200	183,900	110,100	156,800	187,800	90,940	46,220	176,400

Calendar year 1963: Max 15,600 Min 398 Mean 1,899 Ac-ft 1,374,000
Water year 1963-64: Max 18,000 Min 340 Mean 1,726 Ac-ft 1,253,000

* Discharge measurement made on this day.
Note.--No gage-height record Apr. 9 to May 11, June 22 to July 20.

8-1117. Mill Creek near Bellville, Tex.

Location.--Lat 29°52'51", long 96°12'18", on left bank at upstream side of abandoned bridge pier about 5 ft downstream from State Highway 36, 5 miles southeast of Bellville, Austin County, and 6 miles upstream from Brazos River.
Drainage area.--377 sq mi.
Records available.--July 1963 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 122.82 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943.
Extremes.--1963: Maximum discharge during period July to September, 10.0 cfs Sept. 14 (gage height, 4.40 ft); minimum, 0.2 cfs Sept. 4, 22-24.
1963-64: Maximum discharge during water year, 1,320 cfs Mar. 3, 20; maximum gage height, 11.26 ft Mar. 3; minimum, 0.1 cfs Aug. 22.
Maximum stage since 1899, 22.8 ft in 1940, from information by local residents and Texas Highway Department.
Remarks.--Records good except those below 2.5 cfs, which are fair, and those for period of no gage-height record, which are poor. City of Bellville discharges about 0.15 cfs into a creek which enters Mill Creek above gage.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1, 1963, to Jan. 30, 1964)

3.45	0.1	3.9	5.0	6.0	187
3.5	.2	4.0	8.0	8.0	395
3.6	.6	4.2	18	9.0	530
3.7	1.4	4.5	43	10.0	750
3.8	2.8	5.0	88	11.0	1,170

Discharge, in cubic feet per second, July, August, and September 1963

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1	-	1.9	0.8	7	-	2.0	0.6	13	-	2.5	1.9	19	-	1.4	1.4	25	-	0.6	0.4
2	-	2.0	.5	8	-	2.0	.9	14	-	1.6	6.5	20	-	1.1	1.3	26	4.0	.6	.6
3	-	1.9	.4	9	-	2.5	*1.2	15	-	2.2	3.2	21	-	1.1	.6	27	3.6	.8	.8
4	-	2.0	.2	10	-	2.5	1.3	16	-	2.3	1.3	22	-	.9	.2	28	3.4	1.0	1.1
5	-	*2.2	.6	11	-	2.2	1.6	17	-	2.2	.8	23	-	.6	.2	29	*3.6	1.4	1.3
6	-	2.0	.7	12	-	2.3	1.4	18	-	2.0	.9	24	-	.5	.2	30	2.6	1.7	1.2
																31	2.0	1.6	
Total																	-	51.6	34.1
Mean																	-	1.66	1.14
Ac-ft																	-	102	68

* Discharge measurement made on this day.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.2	1.6	3.6	5.3	62	32	24	16	62	2.8	1.6	0.6
2	1.5	1.7	3.6	5.3	45	133	25	17	48	2.6	1.4	.6
3	1.4	1.9	3.8	5.3	35	*700	25	13	22	2.6	.9	.6
4	1.3	2.3	4.0	5.3	a32	*533	25	10	12	2.5	.5	.7
5	1.5	3.8	4.0	5.3	a30	*97	32	10	7.4	2.3	.5	.5
6	1.7	3.6	3.8	5.9	a28	61	32	12	5.0	2.2	.6	.3
7	1.6	2.6	4.0	6.8	a26	48	*28	11	4.0	2.0	.6	.4
8	1.5	2.6	3.8	7.1	a24	46	25	11	3.4	1.9	.6	.4
9	1.9	5.3	4.0	7.7	a22	55	24	9.6	2.8	1.7	.6	.5
10	1.9	5.3	4.5	8.0	a20	50	17	8.0	2.3	1.6	.7	.4
11	1.9	3.8	5.6	8.8	a55	48	16	7.1	2.2	1.5	.6	.3
12	1.6	2.6	5.3	9.2	a45	45	16	*7.4	2.0	1.4	.4	.4
13	1.9	2.3	7.7	9.2	a40	38	15	6.2	1.6	2.2	.3	.5
14	*1.6	2.3	17	8.8	a35	38	12	4.8	1.7	1.7	.4	.3
15	2.0	2.5	14	8.8	a30	36	10	4.0	20	1.2	.6	.2
16	4.0	2.8	*11	30	25	32	8.0	3.4	*167	.8	.6	.6
17	4.3	3.6	9.2	42	22	30	8.8	3.0	37	.7	.4	27
18	4.0	3.8	8.4	31	22	30	11	3.4	15	.6	.4	20
19	3.4	*3.8	8.0	26	20	377	8.8	5.0	8.8	1.5	.4	12
20	3.2	4.5	18	18	18	*1,120	8.0	4.8	5.9	3.6	.3	32
21	3.8	5.0	28	14	22	427	8.0	4.3	4.5	*2.8	.2	11
22	4.8	5.0	17	13	28	89	8.0	4.3	3.6	2.3	.1	7.1
23	4.8	7.1	12	13	25	56	7.7	4.3	3.0	1.9	1.7	7.1
24	4.3	4.5	9.6	12	33	49	7.4	14	2.5	1.5	32	5.6
25	3.6	3.4	8.0	10	174	46	13	38	2.8	1.2	9.6	3.6
26	3.4	3.2	7.4	9.6	74	38	59	20	27	.8	*11	3.6
27	26	3.2	6.8	10	52	29	110	11	9.6	.8	4.0	8.8
28	7.1	8.8	5.9	*11	40	26	38	7.7	4.3	.9	1.7	27
29	3.4	7.4	5.6	11	32	24	31	18	3.2	1.1	1.1	12
30	2.2	4.8	5.3	23	----------	23	21	14	3.0	2.2	.7	14
31	1.7	----------	5.3	103	----------	22	----------	67	----------	2.0	.7	----------
Total	108.5	115.1	254.2	483.4	1,116	4,378	673.7	369.3	493.6	54.9	75.2	198.1
Mean	3.50	3.84	8.20	15.6	38.5	141	22.5	11.9	16.5	1.77	2.43	6.60
Ac-ft	215	228	504	959	2,210	8,680	1,340	732	979	109	149	393

Calendar year 1963: Max - Min - Mean - Ac-ft -
Water year 1963-64: Max 1,120 Min 0.1 Mean 22.7 Ac-ft 16,500

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
3- 3	2200-2400	11.26	1,320
3-20	1800	11.25	1,320

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

8-1125. American Canal Co.'s canal near Fulshear, Tex.

Location.--Lat 29°38'32", long 95°53'06", near center of channel at downstream side of bridge, 1.2 miles downstream from point of diversion, and 3.4 miles south of Fulshear, Fort Bend County.

Records available.--October 1930 to September 1954, October 1957 to September 1964. Records for water year 1931 incomplete, yearly estimate only published in WSP 1312. Published as Brazos Valley Irrigation Co.'s canal prior to 1945.

Gage.--Water-stage recorder.

Average discharge.--31 years, 92.1 cfs (66,680 acre-ft per year).

Extremes.--Maximum daily discharge during year, 378 cfs June 16; no flow for several months.
1930-54, 1957-64: Maximum daily discharge, 466 cfs May 22, 23, Aug. 1, 1954; no flow for several months in each year.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Station above all diversions from canal. Flow controlled by pumping plant located on left bank of Brazos River 21.7 miles upstream from Richmond. Figures of discharge represent water pumped from river for irrigation in the vicinity of Sugarland.

Monthly discharge, in cubic feet per second, water year October 1963 to September 1964

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	225	0	84.0	5,170
November	0	0	0	0
December	0	0	0	0
Calendar year 1963	338	0	120	86,680
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	267	0	116	6,910
May	330	0	244	14,970
June	378	176	292	17,350
July	354	107	252	15,490
August	232	7.0	141	8,640
September	246	2.6	106	6,290
Water year 1963-64	378	0	103	74,820

Note.--No gage-height record Apr. 1-7, May 2-10, May 13 to June 1.

8-1135. Richmond Irrigation Co.'s canal near Richmond, Tex.

Location.--Lat 29°34', long 95°47', on left bank 600 ft downstream from crossing of U. S. Highway 59, 1½ miles downstream from point of diversion, and 1½ miles west of Richmond, Fort Bend County.

Records available.--October 1927 to September 1954, March 1956 to September 1964. Records for water years 1928-31 incomplete, yearly estimates only published in WSP 1312.

Gage.--Water-stage recorder.

Average discharge.--35 years, 40.3 cfs (29,180 acre-ft per year).

Extremes.--Maximum daily discharge during year, 162 cfs June 23; no flow for several months.
1927-54, 1956-64: Maximum daily discharge, 267 cfs Nov. 15, 28, 1957; no flow for several months each year.

Remarks.--Records good except April and May, which are fair. Water for irrigation is diverted by pumping from right bank of Brazos River 6 miles upstream from Richmond. Figures of discharge represent water pumped from river.

Monthly discharge, in cubic feet per second, water year October 1963 to September 1964

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October	82	0	29.0	1,780
November	0	0	0	0
December	0	0	0	0
Calendar year 1963	175	0	55.6	40,240
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	120	0	57.3	3,410
May	156	0	109	6,710
June	162	0	120	7,120
July	156	0	102	6,250
August	144	0	80.9	4,970
September	156	0	62.3	3,710
Water year 1963-64	162	0	46.8	33,950

8-1140. Brazos River at Richmond, Tex.

Location.--Lat 29°34'56", long 95°45'27", near right bank on downstream side of pier of bridge on U. S. Highway 59 in Richmond, Fort Bend County, and 925 ft downstream from Texas and New Orleans Railroad Co. bridge.
Drainage area.--44,020 sq mi, approximately, of which 9,240 sq mi is probably noncontributing.
Records available.--January 1903 to June 1906 and October 1922 to September 1964. Published as "at Rosenberg" October 1922 to September 1931 and equivalent except for diversion by Richmond Irrigation Co.'s canal. June to November 1901 and June to September 1902 in U. S. Department of Agriculture, Office of Experiment Stations, Bulletin Nos. 119 and 133. Gage-height records collected in this vicinity since 1914 are contained in reports of U. S. Weather Bureau.
Gage.--Water-stage recorder and wire-weight gage read once daily. Datum of gage is 40.94 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943. June to November 1901, June to September 1902, and January 1903 to June 1906, various types of nonrecording gages at railroad bridge 925 ft upstream at different datums. Oct. 1, 1922, to Sept. 30, 1931, chain gage at Rosenberg 7.6 miles upstream at datum about 4 ft higher.
Average discharge.--44 years (1903-5, 1922-64), 7,247 cfs (5,247,000 acre-ft per year).
Extremes.--Maximum discharge during year, 14,400 cfs June 20; maximum gage height, 10.45 ft Sept. 28; minimum daily discharge, 266 cfs Aug. 19.
1903-6, 1922-64: Maximum discharge, 123,000 cfs June 6, 1929 (gage height, 40.6 ft, from floodmarks), present site and datum; minimum daily, 35 cfs Aug. 23, 1934.
Maximum stage since at least 1852, 48.2 ft Dec. 10, 1913, present datum, from floodmarks on right bank 1,000 ft upstream from gage. From information by Southern Pacific Railroad, stages of other floods at railroad bridge, present datum, are as follows: May 1884, 43.7 ft; June 13, 1885, 44.7 ft; July 1899, 45.6 ft; May 2, 1915, 43.3 ft; May 9, 1922, 40.9 ft.
Remarks.--Records good. Some regulation of flow by reservoirs above Bryan. Considerable water diverted above station for irrigation and municipal supply. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Brazos River near Bryan (station 8-1090). Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 26 to Nov. 13, Nov. 15-31, Dec. 13-31, Jan. 20-28, Jan. 30 to Mar. 27, May 1 to June 7, June 17-21, Aug. 26 to Sept. 6, Sept. 18-27)

0	260	4.0	3,200
1.0	700	8.0	9,100
2.0	1,350	11.0	15,000

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	575	1,430	778	718	1,210	1,240	2,060	6,910	910	3,050	712	1,210
2	491	1,210	718	675	1,320	4,300	1,930	6,320	1,140	3,050	670	1,350
3	365	1,040	675	630	2,060	4,370	1,630	5,060	1,390	3,050	520	1,240
4	333	970	685	595	4,050	5,340	1,430	5,480	1,100	3,000	505	1,100
5	651	1,240	695	560	4,920	6,040	1,470	5,340	1,100	2,850	410	970
6	1,000	1,100	736	555	3,980	*4,500	1,350	5,620	1,280	2,950	410	712
7	940	1,340	772	550	3,590	3,980	1,240	5,340	1,100	2,700	446	482
8	970	2,020	690	575	3,050	3,200	1,240	3,720	820	2,110	535	482
9	880	1,590	625	560	2,700	2,600	1,240	2,700	650	1,670	505	600
10	820	1,280	595	550	2,750	2,110	*1,140	2,250	570	1,550	468	742
11	940	1,000	575	535	2,650	1,800	1,040	2,600	575	1,430	428	772
12	1,000	910	590	525	2,250	1,710	1,140	2,950	575	1,280	378	620
13	850	820	879	520	1,840	1,800	1,100	2,900	540	1,180	365	473
14	778	718	1,070	520	1,630	1,880	1,070	2,650	491	1,040	455	428
15	748	880	910	520	1,430	2,350	1,000	*2,450	491	970	396	419
16	778	1,100	877	575	1,280	2,600	940	1,880	685	880	414	374
17	*850	1,140	1,750	600	1,210	2,160	880	1,550	1,180	690	424	575
18	796	1,000	1,880	630	1,180	1,800	850	1,630	1,510	565	388	820
19	690	*880	*1,710	772	1,100	2,060	850	1,800	2,190	432	266	1,240
20	605	784	1,750	1,590	1,040	1,880	880	1,800	*13,200	388	287	2,300
21	560	790	1,550	2,020	1,040	5,020	940	1,550	11,400	505	297	3,460
22	525	880	1,180	1,930	1,040	6,180	802	1,240	*6,910	491	294	4,370
23	515	940	1,040	1,750	1,000	5,900	1,040	1,070	4,640	*437	325	4,780
24	510	970	1,470	1,550	1,150	7,910	1,320	940	3,250	500	396	3,590
25	510	1,040	1,710	1,390	2,500	7,070	1,140	910	3,100	496	525	2,600
26	728	1,100	1,710	1,070	2,350	5,200	1,070	880	3,000	550	754	2,350
27	1,470	1,000	1,590	940	1,840	3,720	2,410	970	2,700	695	1,070	9,980
28	1,350	1,000	1,350	850	1,550	2,800	4,370	910	2,650	850	*1,100	13,200
29	1,100	1,000	1,140	754	1,320	2,300	5,620	850	2,850	880	1,140	8,930
30	2,160	910	940	*799	----------	1,980	6,180	910	3,000	820	1,140	*6,040
31	1,930	----------	820	1,320	----------	2,020	----------	1,100	----------	736	1,040	----------
Total	26,418	32,082	33,460	27,128	59,030	107,820	49,372	82,280	74,997	41,795	17,063	76,209
Mean	852	1,069	1,079	875	2,036	3,478	1,646	2,654	2,500	1,348	550	2,540
Ac-ft	52,400	63,630	66,370	53,810	117,100	213,900	97,930	163,200	148,800	82,900	33,840	151,200

Calendar year 1963: Max 13,200 Min 229 Mean 1,869 Ac-ft 1,353,000
Water year 1963-64: Max 13,200 Min 266 Mean 1,715 Ac-ft 1,245,000

* Discharge measurement on this day.
Note.--Discharge computed from once-daily wire-weight gage readings Oct. 31, Dec. 18, May 4-13, Aug. 8-10, 12, 19-27.

8-1145. Brazos River near Juliff, Tex.

Location.--Lat 29°27'20", long 95°31'57", on left bank at South Texas Water Co.'s pumping plant, 3½ miles west of Juliff, Fort Bend County, and 3.8 miles downstream from Gulf, Colorado and Santa Fe Railway Co. bridge.

Drainage area.--44,100 sq mi, approximately, of which 9,240 sq mi is probably noncontributing.

Records available.--May 1949 to September 1964.

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Average discharge.--15 years, 5,443 cfs (3,941,000 acre-ft per year).

Extremes.--Maximum discharge during year, 14,400 cfs Sept. 28 (elevation, 29.52 ft); no flow at times due to pumping.

1949-64: Maximum elevation, 59.17 ft May 6, 7, 1957 (discharge not determined); no flow at times due to pumping.

Maximum elevation known since at least 1884, 64.0 ft about Dec. 11, 1913, from floodmark 4 miles to left of gage, from information by local resident. From same source and at same site, other floods as follows: about May 10, 1922, elevation 61.0 ft; about June 7, 1929, elevation 61.0 ft; about Nov. 29, 1940, elevation 61.5 ft. Flood in July 1899 was probably exceeded only by the flood of 1913.

Remarks.--Records good except those below 100 cfs and periods of no gage-height record, which are fair. Some regulation of flow by reservoirs above Bryan. Considerable water diverted above station for irrigation and industrial and municipal supply materially affect low flow. The Briscoe Irrigation Co. and the South Texas Water Co. have permits to divert a maximum of 600 and 400 cfs, respectively, between station at Richmond and this station for irrigation and industrial and municipal supply. For statement regarding regulation by Soil Conservation floodwater-retarding structures, see Brazos River near Bryan (station 8-1090).

Rating tables, except periods affected by rate of change of stage (elevation, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 22-26, Feb. 8-24, May 22 to June 17, July 13 to Aug. 26, Sept. 5-18)

15.2	0	16.4	120	20.0	1,920
15.4	10	16.8	220	23.0	4,900
15.6	23	17.5	450	27.0	10,400
16.0	60	18.5	857	30.0	15,200

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	390	1,640	832	784	1,060	1,340	2,250	6,540	230	2,340	418	884
2	246	1,270	762	741	972	2,570	2,200	6,540	169	2,380	473	1,000
3	117	1,060	700	680	1,520	4,790	1,880	5,260	128	2,430	348	*1,030
4	19	912	680	660	3,500	4,350	1,450	4,790	545	2,380	208	942
5	40	1,060	680	621	6,150	6,150	1,240	5,020	290	2,200	*110	807
6	424	1,130	700	621	4,350	4,900	1,200	4,900	407	2,290	13	621
7	583	972	741	*602	3,700	4,020	1,030	5,140	400	2,340	37	374
8	602	1,520	720	602	3,200	3,300	972	3,910	152	1,840	159	208
9	640	1,600	680	602	2,900	2,700	972	2,520	36	1,380	284	252
10	680	1,130	640	602	*2,800	* 2,160	912	1,800	25	1,100	190	374
11	680	884	621	602	2,700	1,800	832	1,760	46	1,030	220	564
12	741	720	602	583	2,430	1,600	857	2,120	46	a 900	187	545
13	680	640	720	583	2,080	1,600	884	2,200	41	a 650	167	458
14	602	564	1,240	583	1,720	1,720	857	1,920	*12	a 500	193	310
15	526	545	884	564	1,560	1,920	784	1,760	0	a 400	182	287
16	700	720	660	621	1,340	2,430	680	1,410	43	a 250	145	274
17	741	832	1,030	640	1,240	2,290	621	1,000	243	*a 80	136	326
18	784	807	1,520	660	1,170	2,040	564	912	*884	0	79	807
19	741	700	1,450	680	1,100	2,520	602	1,060	1,100	0	18	1,100
20	660	700	1,480	972	1,030	2,520	621	1,170	*9,820	1.7	1.1	1,600
21	621	720	1,800	1,760	1,000	3,790	621	1,060	10,900	60	2.5	3,000
22	602	762	1,410	1,960	1,000	6,280	*545	700	7,210	78	23	3,910
23	564	832	1,030	1,800	972	5,630	414	404	4,880	25	18	4,680
24	545	884	1,130	1,640	972	3,100	720	262	a3,700	31	140	4,020
25	*545	912	942	1,340	2,420	3,060	807	*193	a3,000	59	358	2,900
26	564	1,000	1,560	942	3,000	5,720	784	193	a2,600	31	640	2,250
27	884	*1,000	1,310	807	2,380	4,350	1,100	172	a2,300	89	942	3,460
28	1,380	1,030	1,310	640	1,840	3,300	3,290	182	a2,100	332	1,030	14,000
29	1,100	1,000	1,100	564	1,560	2,800	4,900	126	2,080	473	1,030	10,400
30	1,680	942	1,000	526	----------	2,340	5,630	91	2,340	602	1,060	7,580
31	2,040	----------	857	832	----------	2,160	----------	284	----------	425	942	----------
Total	21,121	28,488	30,791	25,814	61,666	109,250	40,219	65,399	55,727	26,696.7	9,753.6	73,963
Mean	681	950	993	833	2,126	3,524	1,341	2,110	1,858	861	315	2,465
Ac-ft	41,890	56,510	61,070	51,200	122,300	216,700	79,770	129,700	110,500	52,950	19,350	146,700

Calendar year 1963: Max 15,600 Min 15 Mean 1,731 Ac-ft 1,254,000
Water year 1963-64: Max 14,000 Min 0 Mean 1,500 Ac-ft 1,089,000

* Discharge measurement made on this day.
a No gage-height record.
Note.--Discharge computed from twice-daily staff gage readings June 29 to July 8. Discharge computed by using rate of change in stage as a factor Feb. 4, Mar. 2, 21, 24, 26, Apr. 28, June 20-23, Sept. 27, 29, 30.

8-1150. Big Creek near Needville, Tex.

Location.--Lat 29°28'35", long 95°48'45", near center of stream, at downstream side of bridge on State Highway 36, 1.5 miles downstream from Coon Creek, 5½ miles north of Needville, Fort Bend County, and 10½ miles upstream from Fairchild Creek.

Drainage area.--42.3 sq mi.

Records available.--May 1947 to June 1950, March 1952 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 69.39 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943. May 20, 1947, to June 30, 1950, and May 29, 1959, to Mar. 29, 1960, wire-weight gage at present site and datum.

Average discharge.--14 years (1947-49, 1952-64), 29.1 cfs (21,070 acre-ft per year).

Extremes.--Maximum discharge during year, 1,760 cfs Mar. 2 (gage height, 9.80 ft); minimum, 0.1 cfs for many days.

1947-50, 1952-64: Maximum discharge, 10,400 cfs June 26, 1960 (gage height, 13.81 ft); maximum gage height, 14.03 ft Oct. 31, 1959; no flow at times.

Maximum stage since about 1913, 14.4 ft in August 1945 before channel rectification, from information by local resident.

Remarks.--Records good. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 13-15, 20-21, Jan. 30 to Feb. 1, Feb. 4-6, 24-28, Mar. 2-4, 19-20, June 15-16, Sept. 11, 17-21, 30)

-0.54	0	1.0	68
-.5	.1	2.0	133
-.4	.9	3.0	225
-.3	3.0	4.0	340
-.2	6.5	6.0	670
0	21	7.0	880
.5	43	8.0	1,130

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.2	1.4	0.4	49	5.7	0.5	9.0	1.3	0.4	5.4	0.2
2	.2	.2	.9	.3	15	*1,050	.6	16	.8	.3	4.2	.1
3	.2	.2	.6	.2	7.9	174	.4	2.5	3.0	.2	2.2	1.7
4	.2	.2	.4	.3	*287	58	.4	1.1	2.0	.3	1.1	1.6
5	.3	.1	.4	.4	247	*27	.7	.8	1.1	.4	.7	1.2
6	.3	.2	.4	.4	52	11	1.2	.7	.5	.3	.5	1.2
7	.3	.7	.4	.4	21	4.6	2.5	.8	.7	.3	.5	.7
8	.3	.9	.4	.4	10	3.0	*.9	.8	.8	.7	1.6	.5
9	.3	1.6	.4	.4	4.2	2.0	.5	.7	.3	.5	1.4	.3
10	.3	2.2	.5	.3	2.7	1.6	.3	.5	.3	.4	.9	.4
11	.2	1.8	.5	.3	1.6	1.1	.3	.6	.3	.3	.8	23
12	.3	1.2	2.0	.3	1.1	.9	.4	.6	.3	.3	.7	4.6
13	.2	.7	189	.3	.9	.8	.3	.7	.3	2.0	.6	3.0
14	.2	.5	223	.3	.8	.7	.4	.4	.3	1.1	.6	2.5
15	.2	.4	36	.3	1.1	.6	.3	*.3	36	.9	1.4	1.8
16	.2	.4	*11	6.5	.7	.4	.3	.2	60	1.4	1.2	2.0
17	*.3	.4	4.6	5.0	.4	.4	.4	.3	20	3.0	1.2	41
18	.2	*.4	2.2	2.0	.5	.3	.6	.4	7.9	2.5	.8	138
19	.2	.4	1.4	1.1	.5	563	.4	.3	3.6	1.6	1.8	67
20	.2	.4	149	.6	.4	*63	.3	.3	1.4	1.2	1.6	115
21	.1	.4	89	.5	.6	15	.3	.3	1.4	.9	.8	33
22	.1	.5	20	.5	.7	5.7	.4	.4	.7	1.2	.3	8.6
23	.1	.6	6.1	.5	.6	3.0	.3	.4	*.4	*.9	.9	4.6
24	.2	.6	3.0	.5	229	1.8	.3	.5	.6	.8	.7	2.5
25	.2	.4	1.8	.4	348	1.6	5.6	.4	.8	.7	2.2	1.4
26	.2	.3	1.1	.4	69	.9	12	.4	2.7	1.2	1.6	.9
27	.3	.5	.7	*.3	36	.8	5.0	.4	3.3	4.2	3.6	.8
28	1.6	15	.6	.4	26	.7	2.5	.3	1.4	2.5	*4.2	1.1
29	1.1	7.2	.5	.4	11	.6	.9	.3	.7	3.6	2.5	*1.2
30	.6	2.7	.5	113	----------	.5	.4	.3	.5	5.7	1.1	101
31	.3	----------	.4	*229	----------	.4	----------	6.1	----------	6.5	.5	----------
Total	9.5	41.3	748.2	366.1	1,424.7	1,999.1	39.4	46.8	153.4	46.3	47.6	560.9
Mean	0.31	1.38	24.1	11.8	49.1	64.5	1.31	1.51	5.11	1.49	1.54	18.7
Ac-ft	19	82	1,480	726	2,830	3,970	78	93	304	92	94	1,110

Calendar year 1963: Max 792 Min 0 Mean 11.2 Ac-ft 8,110
Water year 1963-64: Max 1,050 Min 0.1 Mean 15.0 Ac-ft 10,880

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
1-30	2230	5.88	634	3- 2	0900	9.80	1,760
2- 4	2330	5.21	508	3-19	0700	8.87	1,400
2-24	2200	7.54	1,000				

* Discharge measurement made on this day.

8-1164. Dry Creek near Rosenberg, Tex.

Location.--Lat 29°30'42", long 95°44'45", on right bank 38 ft downstream from county road bridge, 5.0 miles southeast of Rosenberg, Fort Bend County, and 8.2 miles upstream from Smither's Lake (Lake George) spillway.

Drainage area.--8.53 sq mi. See Remarks.

Records available.--October 1958 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 71.90 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Average discharge.--6 years, 10.2 cfs (7,380 acre-ft per year).

Extremes.--Maximum discharge during year, 386 cfs Mar. 19 (gage height, 8.13 ft); no flow for many days.
1958-64: Maximum discharge, 2,410 cfs Oct. 31, 1959 (gage height, 12.66 ft); no flow for many days each year.
Highest flood since at least 1932, that of Oct. 31, 1959, from information by local residents.

Remarks.--Records good except those for period of no gage-height record, which are fair. Natural runoff is supplemented with water diverted from the Brazos River through the Richmond Irrigation Co.'s canal. Amount diverted not known.

Revisions.--Revised figures of discharge, in cubic feet per second, for the water years 1959-61, superseding previously published figures, are given herewith:

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
1959		1960-Con.		1960-Con.		1961-Con.		1961-Con.	
Apr. 8	30	Oct. 30	40	Aug. 31	32	Oct. 29	210	June 20	68
9	70	31	1,400			30	64	21	44
10	150	Dec. 15	160	1961		Nov. 18	48	July 10	260
11	190	16	120	Oct. 5	15	19	24	11	500
12	95	31	60	6	40	Dec. 8	55	12	260
May 23	65	Jan. 1	55	18	60	9	180	13	100
		Aug. 21	28	19	170	10	85	14	30
1960		22	65	20	28	11	36	Sept. 11	160
Oct. 4	11	23	45	26	110	31	170	12	700
5	50	29	155	27	40	June 18	355	13	110
14	30	30	110	28	46	19	570		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
April 1959	640.3	190	0	21.3	1,270
May	133.6	65	0	4.31	265
Water year 1958-59	2,290.6	190	0	6.28	4,540
October 1959	1,561.8	1,400	0	50.4	3,100
December	434.9	160	0	14.0	863
Calendar year 1959	5,131.5	1,400	0	14.1	10,170
January 1960	146.6	55	0	4.73	291
August	655.5	155	4.9	21.1	1,300
Water year 1959-60	8,447.8	1,400	0	23.1	16,750
October 1960	832.7	210	0	26.9	1,650
November	155.1	48	0	5.17	308
December	777.7	180	0	25.1	1,540
June	1,182.3	570	.2	39.4	2,350
July	1,236.9	500	.2	39.9	2,450
September	1,014.7	700	0	33.8	2,010
Water year 1960-61	6,288.5	700	0	17.2	12,470
Calendar year 1960	7,286.7	1,150	0	19.9	14,450

Revised peak discharge.--1958-59: Apr. 9 (2200 hrs.) 474 cfs (7.82 ft); Apr. 11 (1830 hrs.) 504 cfs (8.00 ft); May 23 (1000 hrs.) 165 cfs (4.93 ft).
1959-60: Dec. 15 (1800 hrs.) 474 cfs (8.17 ft); Dec. 31 (1900 hrs.) 222 cfs (5.74 ft); Aug. 22 (1930 hrs.) 152 cfs (5.43 ft); Aug. 29 (1630 hrs.) 432 cfs (8.40 ft).
1960-61: Oct. 18 (2330 hrs.) 432 cfs (8.41 ft); Oct. 26 (1300 hrs.) 286 cfs (7.00 ft); Oct. 29 (0930 hrs.) 460 cfs (8.54 ft); Dec. 9 (0200 hrs.) 334 cfs (6.60 ft); Dec. 31 (0500 hrs.) 334 cfs (6.60 ft); June 19 (0100 hrs.) 1,120 cfs (11.13 ft); July 11 (1200 hrs.) 870 cfs (10.20 ft); Sept. 12 (time unknown) 890 cfs (10.32 ft).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 13-14, 20-21, Jan. 30-31, Feb. 4-5, 24-25, Mar. 2, Apr. 25-26, May 19, 30-31, June 2, 9-10, July 27-29, Aug. 16-17, Sept. 21, 29-30)

2.05	0	2.6	10
2.1	.2	3.0	26
2.2	.8	3.5	46
2.3	2.3	4.0	73
2.4	4.4	4.5	106
2.5	6.9		

8-1164. Dry Creek near Rosenberg, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0.1	0	3.8	0.5	0	0.7	12	8.6	0.7	0.8
2	0	0	0	0	1.5	45	0	.1	15	7.2	.2	.6
3	0	0	0	0	1.1	6.2	0	0	7.0	7.2	.8	.8
4	.1	0	0	0	*60	2.9	0	.4	3.6	7.6	.4	2.7
5	.2	0	0	0	29	*a 1.0	0	1.2	1.2	7.6	.6	3.6
6	.2	0	0	0	5.6	a .5	0	1.5	1.0	7.6	1.0	4.0
7	.2	0	0	0	2.5	a .2	.2	.7	1.1	7.6	3.3	5.4
8	.1	.2	0	0	.8	a .1	.4	.7	3.6	7.6	4.9	6.2
9	.1	1.0	0	0	.3	a 0	*.4	.4	16	8.2	1.8	5.9
10	0	a1.0	0	0	.1	a 0	.6	.5	9.1	7.2	.8	5.9
11	0	a .8	0	0	0	a 0	.6	.6	2.5	6.9	.7	5.6
12	0	a .6	.2	0	0	a 0	4.2	1.0	1.1	6.6	.5	5.4
13	0	a .4	37	0	0	a 0	2.7	1.5	1.0	8.2	3.6	5.2
14	0	a .2	44	0	0	a 0	.7	*2.3	1.4	7.6	6.2	4.9
15	0	a0	5.6	0	.2	a 0	.8	1.6	9.2	7.6	6.9	4.0
16	0	a0	*3.6	3.2	.1	a 0	.8	2.7	5.6	8.6	16	3.6
17	*0	a0	2.3	2.7	0	a 0	.8	.7	1.1	6.6	9.7	8.2
18	0	*0	1.5	.8	0	a 0	.7	7.8	.2	8.6	5.9	7.9
19	0	0	.8	.3	0	a 100	2.9	17	.1	10	4.0	4.6
20	0	0	37	*.1	0	a 10	2.2	7.5	.1	a 8	2.9	3.8
21	0	0	16	.1	0	2.5	1.2	6.2	.8	a 6	3.1	6.5
22	0	0	3.8	0	0	.8	1.1	6.4	1.1	a 4	4.6	6.4
23	.1	0	1.8	0	0	.2	1.0	5.2	*.8	1.9	4.9	3.1
24	.1	0	1.3	0	53	.1	7.5	8.7	1.1	4.4	4.2	2.0
25	.1	0	1.1	0	47	0	16	9.0	3.4	6.9	4.2	1.3
26	0	0	.8	0	6.9	0	20	9.4	3.1	7.2	4.0	1.3
27	0	0	.6	*0	5.4	0	2.3	15	2.3	11	2.3	2.1
28	0	3.3	.4	0	3.6	0	.2	10	2.1	23	.8	6.0
29	0	.7	.2	0	1.1	0	.1	6.2	5.4	12	.4	*12
30	0	.2	.1	22	----------	0	.1	12	8.9	6.6	1.1	*12
31	0	----------	0	*32	----------	0	----------	17	----------	2.0	1.6	----------
Total	1.2	8.4	158.2	61.2	222.0	170.0	67.5	154.0	120.9	240.1	102.1	141.8
Mean	0.04	0.28	5.10	1.97	7.66	5.48	2.25	4.97	4.03	7.75	3.29	4.73
Ac-ft	2.4	17	314	121	440	337	134	305	240	476	203	281

Calendar year 1963: Max 232 Min 0 Mean 4.15 Ac-ft 3,010
Water year 1963-64: Max 100 Min 0 Mean 3.95 Ac-ft 2,870

Peak discharge (base, 250 cfs)

Date	Time	Gage height	Discharge
3-19	about 0500	8.13	386

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.

Reservoirs in Brazos River basin, Tex.

8-832. Lake Sweetwater.--Lat 32°26'20", long 100°18'20", on downstream side of intake structure to pump station, near left end of dam on Bitter Creek, 6.5 miles southeast of Sweetwater, Nolan County, and 8.5 miles upstream from mouth. Drainage area, 104 sq mi. Records available, January 1936 to September 1964. Staff gage read at irregular intervals. Datum of gage is 0.53 ft above mean sea level, datum of 1929, supplementary adjustment of 1957. Prior to Apr. 1, 1958, staff gage read once daily at same site and datum. Maximum contents observed during year, 4,960 acre-ft Oct. 3-5 (gage height, 2,101.4 ft); minimum observed, 3,470 acre-ft Sept. 18, 19 (gage height, 2,096.5 ft). Maximum contents observed during period 1936-64, 12,360 acre-ft June 1, 1957 (gage height, 2,116.70 ft); minimum observed, 780 acre-ft Aug. 17, 1953 (gage height, 2,082.54 ft).

Lake is formed by a rolled-fill earthen dam 2,600 ft long. Dam completed and storage began in 1930; lake first filled to spillway elevation in 1936. Lake is property of city of Sweetwater and was built to impound water for municipal use (see following page). Emergency spillway is located just to left of the dam and has a concrete ogee-type crest 607.5 ft long. Maximum controlled capacity, 11,900 acre-ft (gage height, 2,116.0 ft, crest of emergency spillway). No appreciable dead storage. Figures of contents not adjusted for sediment. Capacity curve based on survey made in 1929 furnished by Freese, Nichols and Endress, Consulting Engineers. Record of gage heights and diversions furnished by city of Sweetwater.

8-835. Fort Phantom Hill Reservoir.--Lat 32°36'58", long 99°40'05", at outlet gate tower near right bank, 120 ft upstream from dam on Elm Creek, 4 miles upstream from Clear Fork Brazos River, and 5 miles south of Nugent, Jones County. Drainage area, 478 sq mi. Records available, July 1940 to September 1964. Staff gage. Datum of gage is 1,580.78 ft above mean sea level. Maximum contents observed during year, 63,890 acre-ft Oct. 1 (gage height, 52.4 ft); minimum observed, 46,160 acre-ft Aug. 14-15 (gage height, 47.0 ft). Maximum contents observed during period 1940-64, 89,910 acre-ft May 25, 1957 (gage height, 58.7 ft); minimum observed, 19,040 acre-ft Apr. 23-25, 1953 (gage height, 34.5 ft).

Reservoir is formed by rock-faced earth-fill dam. Dam completed and storage began in October 1938. Capacity, 74,310 acre-ft (gage height, 55.1 ft, crest of spillway). Sill of lowest outlet gate is at gage height 1.6 ft. Dead storage is negligible. Water is used for municipal supply for city of Abilene (see following page). Figures given herein represent total contents. An undetermined amount of flood flow was diverted by gravity ditch from Deadman Creek into reservoir. During year 595 acre-ft was pumped into reservoir from Clear Fork Brazos River. Record of gage heights and diversions furnished by city of Abilene. Capacity table furnished by Soil Conservation Service from survey of Oct. 2, 1953.

8-845. Lake Stamford.--Lat 33°05', long 99°35', on left bank at intake structure of West Texas Utilities Co. stream powerplant at Lake Stamford on Paint Creek, 1 mile upstream from dam, 1.7 miles upstream from California Creek, and 10 miles southeast of Haskell, Haskell County. Drainage area, 360 sq mi. Records available, July 1953 to September 1964. Wire-weight gage read once daily. Datum of gage is 2.77 ft above mean sea level, datum of 1929 (levels by Freese, Nichols and Endress, Consulting Engineers). Maximum contents observed during year, 53,500 acre-ft June 17-20 (gage height, 1,412.7 ft); minimum observed, 42,300 acre-ft Sept. 13-14 (gage height, 1,410.2 ft). Maximum contents observed 1953-64, 74,100 acre-ft Sept. 9, 10, 1962 (gage height, 1,416.6 ft); minimum observed after first appreciable storage, 5,860 acre-ft July 15, 1953 (gage height, 1,393.7 ft).

Lake is formed by rock-faced earth-fill dam. Dam completed in March 1953. Storage began in June 1953. Capacity, 60,000 acre-ft (gage height, 1,414.0 ft, crest of spillway). Dead storage, 430 acre-ft (gage height, 1,380.0 ft, invert of 24-inch discharge conduit). Figures given herein represent total contents. Water is used for municipal supply for cities of Stamford and Hamlin (see following page); diversions totaled 1,505 acre-ft during water year. Gage-height record furnished by West Texas Utilities Co. from their powerplant 1 mile upstream from dam. Capacity table from curve dated August 1950 based on 1949 survey furnished by Freese, Nichols and Endress, Consulting Engineers. Diversions for municipal use furnished by city of Stamford.

8-864. Hubbard Creek Reservoir on Hubbard Creek.--See page 230.

8-884. Lake Graham.--Lat 33°08'05", long 98°36'55", on upstream side of dam on Salt Creek, 2.2 miles northwest of Graham, Young County, and 5 miles downstream from Oak Creek. Drainage area, 205 sq mi. Records available, March 1958 to October 1963 (unpublished records, staff and wire-weight gage read occasionally to once daily), October 1963 to September 1964. Water-stage recorder and wire-weight gage read once daily. Datum of gage is 1.30 ft above mean sea level, datum of 1929. Maximum contents during year, 52,160 acre-ft June 14 (gage height, 1,074.41 ft); minimum, 45,540 acre-ft Oct. 20 (gage height, 1,071.72 ft).

Lake on Salt Creek is formed by a rolled-fill earthen dam 5,000 ft long. It is connected with Lake Eddleman on Flint Creek by a short channel at 1,050.0 gage height. Storage began Apr. 28, 1958, and dam was completed in July 1958. Combined capacity of Lake Eddleman and Lake Graham, 53,680 acre-ft (gage height, 1,075.0 ft, crest of emergency spillway). Dead storage, 8,700 acre-ft (gage height, 1,050.0 ft, invert of 24-inch discharge conduit). Figures given herein represent total combined contents of Lake Eddleman and Lake Graham. Dam is property of city of Graham and was built to impound water for municipal and industrial use (see following page). Water is used by Texas Electric Service Company in their steam powerplant and by the city of Graham. Water pumped from Lake Graham for cooling purposes by Texas Electric Service Company is released into Lake Eddleman and returned to Lake Graham by the interconnecting channel. The uncontrolled emergency spillway is a cut channel at right end of dam, 1,050 ft wide with a concrete cutoff wall and will discharge 136,500 cfs. Capacity table from curve dated January 1957 furnished by Freese, Nichols and Endress, Consulting Engineers, based on original Lake Eddleman curve from survey made in 1928 by Hawley, Freese and Nichols and on Salt Creek curve from survey made in 1953 by W. G. Mobley, Engineer of Graham. Records of diversions furnished by city of Graham.

8-885. Possum Kingdom Reservoir on Brazos River.--See page 236.

8-903. Lake Palo Pinto.--Lat 32°38'44", long 98°16'16", near center of dam on Palo Pinto Creek, 4.0 miles upstream from bridge on Farm Road 4, 4.4 miles northwest of Santo, Palo Pinto County, and 7.5 miles upstream from Big Sunday Creek. Drainage area, 471 sq mi. Records available, April to September 1964. Water-stage recorder. Datum of gage is mean sea level, datum of 1929 (levels by Freese, Nichols, and Endress, Consulting Engineers). Maximum contents during period April to September, 2,820 acre-ft about Sept. 23 (elevation, about 837.7 ft); minimum, about 1,300 acre-ft about Aug. 14.

Lake is formed by rock-faced earth-fill dam with a 500-foot uncontrolled flat-crested concrete spillway at right end. Dam completed and storage began in April 1964. Capacity, 34,250 acre-ft (elevation, 863.0 ft, crest of spillway). Dead storage, 1,900 acre-ft (elevation, 835.0 ft, top of drop outlet to 30-inch discharge conduit). Figures given herein represent total contents. Lake is property of Palo Pinto County Municipal Water District No. 1 and was built to impound water for municipal use, principally by the city of Mineral Wells. Water will be released to flow about 15 miles downstream to a channel dam from where it will be pumped to the water plant of the city of Mineral Wells.

8-925. Whitney Reservoir on Brazos River.--See page 242.

Reservoirs in Brazos River basin, Tex.--Continued

8-990. Leon Reservoir.--Lat 32°21'30", long 98°41'00", at outlet works structure near center of dam on Leon River, 7 miles south of Ranger, Eastland County, and 9 miles southeast of Eastland. Drainage area, 252 sq mi. Records available, January 1955 to September 1964. Staff gage read once daily. Datum of gage is mean sea level, datum of 1929. Maximum contents observed during year, 27,620 acre-ft Feb. 5-9 (elevation, 1,375.2 ft); minimum observed, 22,850 acre-ft Aug. 14-15, Sept. 16 (elevation, 1,372.0 ft). Maximum contents observed during period 1955-64, 38,770 acre-ft Oct. 14, 1957 (elevation, 1,381.3 ft); minimum observed since first appreciable storage, 15,880 acre-ft Jan. 11-21, Feb. 5-7, Apr. 29-30, 1956 (elevation, 1,366.2 ft).

Reservoir is formed by rolled-fill earthen dam 3,700 ft long. Storage began April 1954; dam completed June 1954. Dam is property of Eastland County Water Supply District and was built to impound water for municipal use by cities of Ranger, Olden, and Eastland (see table below for diversions). Service spillway is uncontrolled circular drop outlet designed to discharge 5,000 cfs through 11-foot diameter concrete conduit. Emergency spillway 1,200 ft wide cut through natural ground near left end of dam. Reservoir capacity, 40,210 acre-ft (elevation, 1,382.0 ft, at emergency spillway) and 27,290 acre-ft (elevation, 1,375.0 ft, at service spillway). Dead storage, 869 acre-ft (elevation, 1,335.0 ft). Water can be withdrawn for municipal use down to elevation 1,335.0 ft. Capacity curve and table from survey made in 1952 furnished by Freese, Nichols and Endress, Consulting Engineers. Record of lake elevations and diversions for municipal use furnished by Eastland County Water Supply District.

8-994. Proctor Reservoir on Leon River.--See page 261.

8-1020. Belton Reservoir on Leon River.--See page 266.

8-1103. Lake Mexia on Navasota River.--See page 288.

Month-end gage height or elevation, contents, and monthly diversions, water year October 1963 to September 1964

Date	Elevation or gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)	Diversions for municipal use (acre-feet)	Elevation or gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)	Diversions for municipal use (acre-feet)
	Lake Sweetwater*				Fort Phantom Hill Reservoir*			
Sept. 30	2,101.4	4,960	-	-	52.4	63,890	-	-
Oct. 31	2,100.9	4,790	-170	0	51.6	61,000	-2,890	1,410
Nov. 30	2,100.6	4,690	-100	0	51.3	59,940	-1,060	851
Dec. 31	2,100.4	4,630	-60	0	50.9	58,540	-1,400	756
Calendar year 1963	-	-	-1,190	0	-	-	-12,180	15,440
Jan. 31	2,100.4	4,630	0	0	50.8	58,200	-340	846
Feb. 29	2,100.3	4,600	-30	0	51.1	59,230	+1,030	665
Mar. 31	2,100.0	4,500	-100	0	50.9	58,540	-690	844
Apr. 30	2,100.6	4,690	+190	0	50.7	57,860	-680	1,220
May 31	2,099.9	4,470	-220	0	49.9	55,160	-2,700	1,510
June 30	2,099.1	4,210	-260	0	48.9	51,920	-3,240	1,950
July 31	2,097.8	3,820	-390	131	47.8	48,530	-3,390	2,900
Aug. 31	2,097.1	3,630	-190	106	48.5	50,680	+2,150	1,600
Sept. 30	2,096.7	3,520	-110	56	48.0	49,120	-1,560	1,070
Water year 1963-64	-	-	-1,440	293	-	-	-14,770	15,620
	Lake Stamford*				Lake Graham†			
Sept. 30	1,412.2	51,000	-	-	1,072.12	46,510	-	-
Oct. 31	1,411.7	48,650	-2,350	124	1,072.15	46,580	+70	241
Nov. 30	1,411.6	48,200	-450	85.1	1,072.39	47,160	+580	196
Dec. 31	1,411.4	47,300	-900	87.9	1,072.18	46,660	-500	163
Calendar year 1963	-	-	-13,200	1,992	-	-	-	-
Jan. 31	1,411.3	46,850	-450	86.8	1,072.35	47,070	+410	173
Feb. 29	1,411.4	47,300	+450	64.9	1,073.10	48,900	+1,830	85.2
Mar. 31	1,411.1	45,950	-1,350	84.7	1,072.93	48,480	-420	141
Apr. 30	1,410.6	43,900	-2,050	129	1,072.64	47,770	-710	193
May 31	1,410.4	43,100	-800	139	1,074.40	52,140	+4,370	243
June 30	1,412.2	51,000	+7,900	146	1,073.95	51,010	-1,130	303
July 31	1,411.2	46,400	-4,600	261	1,072.94	48,510	-2,500	433
Aug. 31	1,410.6	43,900	-2,500	175	1,072.48	47,380	-1,130	315
Sept. 30	1,410.6	43,900	0	122	1,072.13	46,530	-850	245
Water year 1963-64	-	-	-7,100	1,505	-	-	+20	2,730
	Lake Palo Pinto‡				Leon Reservoir††			
Sept. 30					1,373.2	24,560	-	-
Oct. 31					1,372.8	23,980	-580	174
Nov. 30					1,374.4	26,360	+2,380	139
Dec. 31					1,374.2	26,050	-310	144
Calendar year 1963					-	-	-770	2,020
Jan. 31					1,374.2	26,050	0	143
Feb. 29					1,375.0	27,290	+1,240	132
Mar. 31					1,374.9	27,140	-150	152
Apr. 30	835.43	2,040	-	-	1,374.9	27,140	0	162
May 31	835.16	1,950	-90	0	1,374.2	26,050	-1,090	196
June 30	(a)	1,650	-300	0	1,373.6	25,150	-900	235
July 31	(a)	1,370	-280	0	1,372.4	23,410	-1,740	290
Aug. 31	(a)	2,010	+640	0	1,372.3	23,270	-140	237
Sept. 30	(a)	2,740	+730	0	1,375.0	27,290	+4,020	185
Water year 1963-64	-	-	-	-	-	-	+2,730	2,190

* Gage height at 0800 hours.
† Gage height at 2400 hours.
‡ Elevation at 2400 hours.
†† Elevation at about 1000 hours.
a No elevation record.

Note.--Diversions for Lake Graham for municipal and industrial uses.

8-1175. San Bernard River near Boling, Tex.

Location.--Lat 29°18'47", long 95°53'36", near left bank at downstream side of pile bent of bridge on Farm Road 442, 2½ miles downstream from Snake Creek, and 4½ miles northeast of Boling, Wharton County.

Drainage area (revised).--727 sq mi.

Records available.--May 1954 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 30.81 ft above mean sea level, datum of 1929.

Average discharge.--10 years, 430 cfs (311,300 acre-ft per year).

Extremes.--Maximum discharge during year, 3,170 cfs Mar. 3 (gage height, 19.63 ft); minimum daily, 8.6 cfs Apr. 24-25.

1954-64: Maximum discharge, 21,200 cfs June 28, 1960 (gage height, 42.41 ft); minimum daily, 2.4 cfs Nov. 27-30, 1956.

Maximum stage since at least 1900, 43.5 ft in 1913 (probably December). Flood in September 1938 reached a stage of 43.3 ft, from information by local resident.

Remarks.--Records good. Part of low flow is drainage from areas irrigated with diversions from Colorado River. Diversions above station for irrigation and other uses.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 5-12, 19-26, May 2-4, May 28 to June 5, June 16-17, 23-28, July 14 to Aug. 8, Aug. 10-21, Aug. 26 to Sept. 30)

2.64	8.6	6.0	188
2.8	12	8.0	414
3.0	18	10.0	710
3.5	36	14.0	1,570
4.0	56	18.0	2,680
5.0	112	20.0	3,310

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	28	203	31	890	646	24	63	140	82	176	106
2	62	33	140	26	1,060	1,540	21	161	130	82	193	94
3	67	36	106	26	782	3,060	19	119	122	70	180	94
4	70	30	88	23	750	2,660	18	74	103	62	152	88
5	66	28	70	21	1,420	2,400	17	49	85	61	126	71
6	62	42	53	20	1,340	1,690	16	36	74	59	103	94
7	58	237	40	19	1,420	878	17	31	65	61	91	126
8	57	300	31	18	1,440	488	17	26	54	66	82	119
9	55	228	26	18	1,030	*306	15	21	44	64	68	109
10	48	228	24	18	710	188	*14	17	37	60	97	109
11	48	414	21	17	494	122	13	16	27	56	119	103
12	46	426	23	17	330	91	13	19	20	61	126	97
13	46	294	290	15	213	70	13	*19	17	70	126	82
14	52	213	910	12	133	58	12	16	16	88	106	76
15	*57	168	970	12	91	49	12	20	18	106	109	79
16	52	130	1,080	19	66	41	11	20	73	116	148	79
17	49	91	1,080	32	52	36	11	15	397	126	130	136
18	57	*62	*800	27	45	31	12	14	800	122	112	550
19	56	45	494	24	38	664	11	24	1,010	136	97	710
20	56	32	390	27	33	615	11	25	1,190	140	88	1,100
21	57	25	426	25	30	402	10	21	970	*180	76	836
22	57	22	414	23	28	288	9.2	28	*746	*248	62	694
23	50	18	390	25	26	213	9.0	24	582	243	60	931
24	44	16	294	25	30	184	8.6	30	438	188	59	1,420
25	47	16	208	23	852	140	8.6	32	300	160	68	1,230
26	53	15	156	101	1,420	106	11	39	198	160	109	1,060
27	66	14	119	172	1,490	74	23	58	133	130	*122	800
28	153	47	88	126	1,370	55	39	113	97	109	109	614
29	68	48	66	85	930	43	61	133	76	91	112	* 522
30	46	167	50	*68	----------	34	66	140	74	91	122	694
31	35	----------	39	694	----------	28	----------	140	----------	119	116	----------
Total	1,802	3,453	9,089	1,789	18,513	17,200	542.4	1,543	8,036	3,407	3,444	12,823
Mean	58.1	115	293	57.7	638	555	18.1	49.8	268	110	111	427
Ac-ft	3,570	6,850	18,030	3,550	36,720	34,120	1,080	3,060	15,940	6,760	6,830	25,430

Calendar year 1963: Max 2,020 Min 8.5 Mean 155 Ac-ft 112,600
Water year 1963-64: Max 3,060 Min 8.6 Mean 223 Ac-ft 161,900

Peak discharge (base, 2,000 cfs)

Date	Time	Gage height	Discharge
3-3	0600	19.63	3,170

* Discharge measurement made on this day.

8-1180. Lake J. B. Thomas near Vincent, Tex.

Location.--Lat 32°35'09", long 101°12'18", at Big Spring pump station on south side of reservoir, 4.0 miles upstream from dam on Colorado River, 7.3 miles north of Vincent, Howard County, and 12.5 miles west of Ira.
Drainage area.--3,524 sq mi, of which 2,590 sq mi is probably noncontributing. Drainage area includes 426 sq mi of which 32 sq mi is probably noncontributing, above Bull Creek diversion dam.
Records available.--October 1953 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929. Nov. 4, 1953, to Feb. 7, 1955, Colorado River Municipal Water District staff gage located 4.0 miles downstream at same datum.
Extremes.--Maximum contents during year, 167,800 acre-ft Oct. 1 (elevation, 2,253.18 ft); minimum, 122,500 acre-ft Aug. 26 (elevation, 2,245.91 ft).
1953-64: Maximum contents, 218,600 acre-ft Sept. 8, 1962 (elevation, 2,259.85 ft); minimum since first appreciable storage, 72,340 acre-ft Apr. 29, May 2-4, 8, 9, 1955 (elevation, 2,235.1 ft).
Remarks.--Reservoir is formed by rolled-fill earthen dam, 14,500 ft long; storage began in July 1952; dam completed in September 1952. No appreciable storage prior to July 1953. The service spillway is a rectangular reinforced concrete 38- by 53-foot structure at top and decreasing to two 14- by 14-foot uncontrolled openings designed to discharge a total of 10,000 cfs at a head of 17 ft. Two emergency spillways, one 500 ft wide located at left end of dam and one 1,600 ft wide located at right end of dam, are designed to discharge 161,000 cfs at elevation 2,275.0 ft (maximum design level). Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	2,280.0	-
Crest of south emergency spillway	2,267.0	283,600
Crest of north emergency spillway	2,264.0	255,000
Crest of service spillway	2,258.0	203,600
Invert of intake to service outlet	2,200.0	1,300

Dam built by Colorado River Municipal Water District to impound water for municipal and industrial use for the cities of Big Spring, Odessa, and Snyder. All flow of Bull Creek is diverted into Lake J. B. Thomas by means of a diversion dam across the creek and a gravity canal through the intervening ridge except that which will flow through the spillway at one end of dam during extreme floods. Oilfields used 10,120 acre-ft of the total amount diverted to repressurize oil wells by injection process.
Cooperation.--Capacity curve, based on surveys made in 1948 and 1950 prepared and furnished by Freese, Nichols and Endress, Consulting Engineers. Record of diversion furnished by Colorado River Municipal Water District.

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	167,600	162,100	158,100	154,300	150,700	147,200	142,500	136,500	138,900	135,100	126,800	130,300
2	167,500	161,800	157,900	154,200	150,600	146,900	142,200	136,200	138,800	134,800	126,500	130,100
3	167,200	161,600	157,700	154,000	150,400	146,800	142,100	136,000	138,600	134,600	126,300	129,900
4	167,000	161,400	157,600	153,900	150,300	146,600	141,900	135,800	138,800	134,300	126,000	129,700
5	166,800	161,100	157,400	153,800	150,200	146,500	141,700	135,600	138,800	134,100	125,800	129,500
6	166,500	160,900	157,300	153,700	150,000	146,300	141,600	135,400	138,600	133,800	125,500	129,400
7	166,300	160,800	157,100	153,600	149,900	146,300	141,300	135,800	138,400	133,500	125,200	129,200
8	166,100	160,600	157,000	153,500	149,900	146,200	141,100	135,600	138,200	133,300	125,000	128,900
9	166,000	160,500	156,800	153,300	149,800	146,000	140,900	135,400	138,000	133,000	124,800	128,700
10	165,700	160,300	156,800	153,000	149,700	145,800	140,700	135,200	137,900	132,700	124,700	128,500
11	165,500	160,200	156,600	152,900	149,700	145,700	140,600	135,000	137,900	132,400	124,300	128,200
12	165,300	159,900	156,400	152,700	149,500	145,500	140,300	134,700	138,200	132,100	124,000	128,100
13	165,000	160,100	156,400	152,500	149,400	145,300	140,100	134,500	138,000	131,800	123,700	128,000
14	164,800	159,500	156,200	152,400	149,300	145,200	140,000	134,300	137,900	131,500	123,400	127,800
15	164,700	159,400	156,000	152,300	149,100	145,000	139,800	134,100	137,900	131,200	123,300	127,600
16	164,500	159,200	155,900	152,200	149,000	144,800	139,700	133,900	137,700	130,900	123,200	127,700
17	164,300	159,100	155,800	152,000	148,900	144,700	139,500	133,700	137,400	130,600	124,000	127,600
18	164,100	159,300	155,600	151,800	148,800	144,800	139,400	133,500	137,200	130,300	123,800	127,400
19	164,100	159,700	155,600	151,700	148,600	144,800	139,300	133,300	136,900	130,000	123,700	127,200
20	164,000	159,600	155,600	151,600	148,400	144,400	139,100	133,100	137,200	129,800	123,400	127,000
21	164,100	159,700	155,500	151,500	148,400	144,400	138,800	132,900	137,400	129,500	123,300	126,900
22	164,000	159,500	155,300	151,400	148,300	144,200	138,700	132,700	137,100	129,300	123,000	126,800
23	164,000	159,300	155,200	151,200	148,200	144,000	138,500	132,500	136,900	129,100	123,000	126,700
24	163,900	159,200	155,100	151,000	148,100	143,800	138,300	132,300	136,700	128,900	122,800	126,600
25	163,700	159,000	155,000	150,900	147,900	143,600	138,200	132,100	136,400	128,600	122,700	126,500
26	163,500	158,900	154,900	150,700	147,800	143,400	137,700	132,000	136,200	128,400	124,100	126,500
27	163,300	158,700	154,800	150,700	147,700	143,200	137,400	132,000	135,900	128,100	129,500	126,100
28	163,100	158,500	154,600	150,600	147,500	143,100	137,100	135,700	135,700	127,800	130,500	126,000
29	162,800	158,400	154,600	150,700	147,400	142,900	136,900	136,600	135,400	127,700	130,500	125,900
30	162,600	158,200	154,500	150,900	----------	142,800	136,800	138,800	135,200	127,500	130,600	125,800
31	162,500	----------	154,400	150,800	----------	142,700	----------	139,000	----------	127,200	130,600	----------
(†)	2,252.40	2,251.77	2,251.20	2,250.64	2,250.10	2,249.35	2,248.38	2,248.75	2,248.12	2,246.74	2,247.33	2,246.50
(‡)	-5,300	-4,300	-3,800	-3,600	-3,400	-4,700	-5,900	+2,200	-3,800	-8,000	+3,400	-4,800
(††)	2,830	2,270	2,240	2,250	2,070	2,520	2,810	2,930	3,040	3,740	3,390	2,570

Calendar year 1963..... ‡ -38,000 †† 29,810
Water year 1963-64..... ‡ -42,000 †† 32,660

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.
†† Diversions, in acre-feet, for municipal and industrial use.
Note.--Gage read by Colorado River Municipal Water District Jan. 31, Feb. 1-29, Mar. 1.

8-1190. Bluff Creek near Ira, Tex.

Location.--Lat 32°35'29", long 101°03'05", near left bank on downstream side of pier of abandoned county bridge 426 ft downstream from bridge on Farm Road 1606, 1.8 miles upstream from mouth, 2.8 miles west of Ira, Scurry County, and 11.6 miles southwest of Snyder.

Drainage area.--42.6 sq mi.

Records available.--October 1947 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 2,177.95 ft above mean sea level, datum of 1929. July 15 to Nov. 5, 1948, staff gage at present site and datum.

Average discharge.--17 years, 2.27 cfs (1,640 acre-ft per year).

Extremes.--Maximum discharge during year, 419 cfs Sept. 16 (gage height, 8.04 ft); no flow at times.
1947-64: Maximum discharge, 5,200 cfs July 5, 1948 (gage height, 16.22 ft, from floodmark), from rating curve defined by current-meter measurements below 1,600 cfs and by slope-area measurements at 2,380 and 5,200 cfs; no flow most of time each year.
Maximum stage since at least 1906 occurred in 1939, stage unknown. Flood in 1948 is the second highest since 1906.

Remarks.--Records fair. No diversion above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0.1	0	0.1	0.1	0.1	0	0.2		0	0.1
2	*0	0	.1	0	.1	.1	.1	0	**.1		0	0
3	0	0	.1	0	.1	.1	.1	0	.1		0	0
4	0	0	.1	0	.1	.1	.1	0	37		0	0
5	0	*0	.1	0	.1	.1	.1	0	19		0	0
6	0	0	.1	0	.1	.1	.1	0	.9		0	0
7	0	0	.1	0	.1	.1	.1	.1	.2	(*)	0	0
8	0	0	.1	0	.1	.1	.1	.1	.1		0	0
9	0	0	.1	0	.2	.1	.1	0	0		0	*0
10	0	0	**.1	0	.2	.1	.1	0	0		*0	0
11	0	0	.1	0	.1	.1	.1	0	.2		0	0
12	0	0	.1	0	.1	.1	.1	0	5.7		0	0
13	0	0	.1	0	.1	.1	.1	0	1.1		0	0
14	0	0	.1	**.1	.1	0	.1	0	.4		0	0
15	0	0	.1	.1	0	0	.1	0	.1		0	0
16	0	0	.1	.1	.1	0	.1	0	0		0	17
17	0	0	.1	.1	.1	0	.1	0	0		11	*0
18	0	.1	.1	.1	**.1	.1	.1	0	0		.1	0
19	0	2.5	.1	.1	.1	.1	.1	0	0		0	0
20	0	.1	.1	.1	.1	.1	0	0	0		0	0
21	3.5	.1	.1	.1	.1	.1	0	0	0		0	0
22	0	.1	.1	.1	.1	.1	0	0	0		0	0
23	0	0	0	.1	.1	.1	0	0	0		0	0
24	0	0	0	.1	.1	**.1	0	0	0		0	0
25	0	0	0	.1	.1	.1	0	0	0		0	0
26	0	0	0	.1	.1	.1	0	0	0		4.6	0
27	0	0	0	.1	.1	.1	*0	0	0		8.4	0
28	0	0	0	.1	.1	.1	0	12	0		.7	0
29	0	0	0	.2	.1	.1	0	.2	0		.2	0
30	0	.1	0	.2	----------	.1	0	*27	0		.2	0
31	0	----------	0	.1	----------	.1	----------	1.2	----------		.1	----------
Total	3.5	3.0	2.2	2.0	3.0	2.7	1.9	40.6	65.1	0	25.3	17.1
Mean	0.11	0.10	0.07	0.06	0.10	0.09	0.06	1.31	2.17	0	0.82	0.57
Ac-ft	6.9	6.0	4.4	4.0	6.0	5.4	3.8	81	129	0	50	34

Calendar year 1963: Max 430 Min 0 Mean 1.69 Ac-ft 1,220
Water year 1963-64: Max 37 Min 0 Mean 0.45 Ac-ft 330

Peak discharge (base, 250 cfs)

Date	Time	Gage height	Discharge
9-16	0700	8.04	419

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

8-1195. Colorado River near Ira, Tex.

Location.--Lat 32°32'18", long 101°03'12", on right bank 530 ft downstream from bridge on State Highway 350, 3¾ miles downstream from Bluff Creek, 4 miles upstream from Willow Creek, and 4.5 miles southwest of Ira, Scurry County.

Drainage area.--3,617 sq mi, of which 2,590 sq mi is probably noncontributing.

Records available.--October 1947 to September 1952 (monthly records only 1950-52), October 1958 to September 1964.

Gage.--Water-stage recorder. Concrete control since Feb. 18, 1961. Datum of gage is 2,134.15 ft above mean sea level, datum of 1929. Oct. 1-30, 1947, staff gage at site 75 ft upstream at same datum.

Average discharge.--5 years (1947-52), 50.5 cfs (36,560 acre-ft per year); 6 years (1958-64), 16.3 cfs, unadjusted (11,800 acre-ft per year).

Extremes.--Maximum discharge during year, 1,560 cfs Aug. 27 (gage height, 6.83 ft); no flow for many days.
1947-52, 1958-64: Maximum discharge, 20,500 cfs July 6, 1948 (gage height, 21.35 ft), from rating curve extended above 9,600 cfs by conveyance-slope method; no flow at times.
Flood of June 16, 1913 (gage height, 32 ft), was the greatest since at least that date, from information by local resident. Flood in May 1947 reached a stage of 25.1 ft, from floodmark at site of former bridge 269 ft upstream from gage.

Remarks.--Records good. Flow largely regulated by Lake J. B. Thomas since July 1952 (station 8-1180). Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 17, 26, 27, Sept. 16)

1.89	0	2.4	13
2.0	.1	2.6	38
2.1	.3	2.8	81
2.2	1.6	3.2	206
2.3	5.2	4.0	540

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.2	0.3	0.5	0.7	0.4	0.3	0.1	1.9		0	1.7
2	*0	.1	.3	.4	.5	.3	.3	.1	*.9		0	.4
3	0	.1	.2	.4	.7	.3	.3	0	.4		0	.3
4	0	.2	.2	.3	.9	.3	.3	0	8.8		0	.2
5	0	.2	.2	.3	.9	.3	.3	0	101		0	.2
6	0	.1	.3	.3	.6	.3	.3	0	8.8		0	.1
7	0	.1	.3	.3	.4	.3	.3	.6	2.0	(*)	0	.1
8	0	.1	.2	.4	.4	.3	.2	3.8	.6		0	0
9	0	.2	.2	.3	.4	.3	.2	1.9	.4		0	*0
10	0	.2	*.4	.3	.4	.3	.2	.7	.2		*0	0
11	0	.2	.4	.3	.3	.3	.3	.3	.1		0	0
12	0	.1	.3	.3	.4	.2	.3	.2	36		0	0
13	0	.1	.4	.2	.7	.3	.2	.1	6.7		0	.2
14	0	.1	.4	.3	.6	.3	.2	.1	2.2		0	.2
15	0	.2	.5	.3	.4	.2	.2	.1	.9		0	.2
16	0	.2	.5	.4	.3	.3	.2	.1	.5		0	137
17	0	.2	.5	.4	.4	.3	.2	0	.2		152	6.5
18	0	12	.4	.4	.3	3.7	.2	0	.2		14	1.6
19	0	63	.4	.3	.3	3.2	.2	0	.1		1.7	1.5
20	0	5.1	.5	.4	.4	.7	.3	0	.2		.5	3.3
21	70	3.4	.4	.3	.5	.4	.2	0	.3		.3	.7
22	4.6	17	.4	.3	.5	.3	.2	0	.1		.1	.4
23	1.3	2.1	.4	.3	.5	.3	.2	0	.1		.1	.4
24	.6	.9	.4	.3	.4	.3	.2	0	.1		.1	.4
25	.4	.5	.4	.3	.4	.3	.2	0	.1		0	.7
26	.3	.4	.4	.3	.4	.2	.1	0	0		135	.9
27	.3	.4	.3	.3	.3	.3	**.1	0	0		389	.3
28	.3	.4	.4	.3	.3	.3	0	111	0		15	.2
29	.2	.3	.4	.7	.3	.2	0	9.4	0		4.2	.2
30	.2	.3	.6	2.8	----------	.3	0	58	0		11	.2
31	.2	----------	.6	1.6	----------	.3	----------	6.9	----------		12	----------
Total	78.4	108.4	11.6	14.3	13.6	15.8	6.2	193.4	172.8	0	735.0	157.9
Mean	2.53	3.61	0.37	0.46	0.47	0.51	0.21	6.24	5.76	0	23.7	5.26
Ac-ft	156	215	23	28	27	31	12	384	343	0	1,460	313

Calendar year 1963: Max 540 Min 0 Mean 3.94 Ac-ft 2,850
Water year 1963-64: Max 389 Min 0 Mean 4.12 Ac-ft 2,990

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

8-1205. Deep Creek near Dunn, Tex.

Location.--Lat 32°33'50", long 100°53'55", at center of downstream side of bridge on Farm Road 1606, 2.0 miles northwest of Dunn, Scurry County, 3.0 miles upstream from Sulphur Draw, and 8.0 miles upstream from mouth.

Drainage area.--198 sq mi, of which 10 sq mi is probably noncontributing.

Records available.--April 1953 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 2,172.17 ft above mean sea level, datum of 1929. Prior to Apr. 21, 1955, staff or wire-weight gage at same site and datum.

Average discharge.--11 years, 12.0 cfs (8,690 acre-ft per year).

Extremes.--Maximum discharge during year, 598 cfs June 4 (gage height, 8.07 ft); no flow at times.
1953-64: Maximum discharge, 4,700 cfs May 23, 1955 (gage height, 22.90 ft); no flow at times in each year.
Maximum discharge since at least 1881, 36,400 cfs June 19, 1939, by slope-area measurement at site 8.0 miles upstream from gage. Flood in 1892 reached about same stage as that of June 19, 1939, from information by local residents.

Remarks.--Records good.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 21-22, Nov. 20 to Dec. 11, Dec. 14 to Feb. 7)
Feb. 10 to Mar. 14, May 8, 31, June 1)

2.1	0	2.8	14
2.2	.4	3.2	32
2.3	1.3	3.6	57
2.4	2.8	4.0	90
2.6	7.4	4.4	127

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0.4	0.5	0.5	0		0	1.6		0	0
2	*0	0	.4	.2	.3	0		0	*1.1		0	0
3	0	0	.4	.2	.3	.4		0	1.0		0	0
4	0	*0	.4	.2	.8	.1		0	67		0	0
5	0	0	.6	.1	.7	0		0	47		0	0
6	0	0	.7	.1	.3	0		0	3.5		0	0
7	0	0	.4	.3	.1	0		0	1.6	(*)	0	0
8	0	0	.4	.3	.1	0		.1	1.0		0	0
9	0	0	.1	.3	0	0		0	.6		0	*0
10	0	0	**.1	.3	.4	0		0	.2		*0	0
11	0	0	.1	.3	.1	0		0	.4		0	0
12	0	0	0	.4	.2	0		0	.6		0	0
13	0	0	0	.4	.5	0		0	2.8		0	0
14	0	0	.2	*.4	.4	0		0	3.2		1.0	0
15	0	0	.3	.4	.6	0		0	.7		.1	0
16	0	0	.2	.6	.2	0		0	.1		0	14
17	0	0	.2	.7	.6	0		0	0		1.3	*.2
18	0	7.2	.2	.7	**.1	0		0	0		0	0
19	0	63	.2	.7	0	0		0	0		0	0
20	0	3.7	.2	.9	0	0		0	0		0	0
21	4.2	1.1	.3	.9	.6	0		0	2.6		0	0
22	3.8	4.3	.4	.5	.5	0		0	1.1		0	0
23	.7	.6	.4	.2	.7	0		0	.1		0	65
24	.2	.1	.4	.1	1.1	*0		0	0		0	9.7
25	0	.1	.4	.1	.5	0		0	0		0	.5
26	0	.1	.4	.1	0	0		0	0		0	0
27	0	.1	1.1	.3	0	0		0	0		0	0
28	0	.1	.9	.8	0	0	(*)	22	0		0	0
29	0	.1	.2	1.0	0	0		46	0		0	0
30	0	.2	.2	11	----------	0		*96	0		3.4	0
31	0	----------	.9	2.6	----------	0	----------	4.6	----------		2.1	----------
Total	8.9	80.7	11.1	25.6	9.6	0.5	0	168.7	136.2	0	7.9	89.4
Mean	0.29	2.69	0.36	0.83	0.33	0.02	0	5.44	4.54	0	0.25	2.98
Ac-ft	18	160	22	51	19	1.0	0	335	270	0	16	177

Calendar year 1963: Max 1,780 Min 0 Mean 7.07 Ac-ft 5,120
Water year 1963-64: Max 96 Min 0 Mean 1.47 Ac-ft 1,070

Peak discharge (base, 850 cfs).--No peaks above base.

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

8-1210. Colorado River at Colorado City, Tex.

Location.--Lat 32°23'33", long 100°52'42", on right bank at Colorado City, Mitchell County, 3,517 ft upstream from bridge on U. S. Highway 80, 4,100 ft upstream from The Texas and Pacific Railway Co. bridge, and 1.6 miles upstream from Lone Wolf Creek.

Drainage area.--4,082 sq mi, approximately, of which 2,590 sq mi is probably noncontributing.

Records available.--November 1923 to August 1925 (published as "at Colorado"), May 1946 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 2,030.16 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942. Nov. 28, 1923, to Aug. 31, 1925, chain gage at site 1.4 miles downstream at different datum. May 9 to Aug. 5, 1946, staff gage at site 185 ft upstream at present datum.

Average discharge.--18 years (1946-64), 58.9 cfs (42,640 acre-ft per year).

Extremes.--Maximum discharge during year, 890 cfs Oct. 23 (gage height, 5.00 ft); no flow at times.
1923-25, 1946-64: Maximum discharge, 24,900 cfs July 6, 1948 (gage height, 22.37 ft, from floodmark); no flow at times.
Maximum stage since at least 1910, 35.9 ft June 20, 1939, present site and datum, based on floodmarks 1,000 ft upstream and 3,740 ft downstream from gage (discharge, 66,000 cfs by slope-area measurement of peak flow at site 2.5 miles upstream from gage).

Remarks.--Records good. Some regulation since 1952 by Lake J. B. Thomas (station 8-1180). Diversions from Lake J. B. Thomas for municipal use and oilfield operation. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

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

2.5	0	2.9	37
2.6	1.5	3.0	68
2.7	6.7	3.2	158
2.8	18	3.4	274

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*0	0.9	3	3.1	8.2	1.8	1.5	0	*26	0	0	17
2	0	.4	2.2	3.1	6.7	1.8	1.5	0	13	0	0	17
3	0	.3	1.8	3.5	5.3	1.8	.9	0	7.4	0	0	12
4	0	*.4	1.8	3.1	6.0	1.8	.9	0	22	0	0	7.4
5	0	.7	1.8	3.5	5.3	1.2	.9	0	105	0	0	5
6	0	.3	1.8	3.1	4.7	.9	.7	0	105	*0	0	3
7	0	.3	1.8	2.2	4.1	1.2	1.2	21	26	0	0	2
8	0	.3	1.2	2.6	3.5	4.2	.9	36	11	0	0	1
9	0	.4	1.2	1.8	2.6	3	.9	22	6.7	0	0	.5
10	0	.4	*1.8	1.8	2.2	2	.9	6.7	4.7	0	0	**.1
11	0	.3	2.2	2.2	2.2	2	.9	3.5	2.6	0	*0	.1
12	0	.3	1.8	2.2	2.2	2	.9	2.2	34	0	0	6.5
13	0	.3	2.2	*1.2	2.2	2	.7	1.5	56	0	0	1.8
14	0	.3	2.2	1.2	2.2	2	.3	.9	26	0	0	.9
15	0	.3	2.2	.9	1.8	1	.7	.7	11	0	0	.7
16	0	.3	2.6	.9	1.2	1	.4	.4	6.0	0	0	.7
17	0	.4	2.6	.9	2.2	1	.1	.2	3.1	0	0	169
18	0	1.1	2.6	1.2	2.6	10	.1	.1	2.2	0	150	36
19	0	83	2.6	1.2	1.8	5	0	.1	1.5	0	33	15
20	8.6	130	3.5	.9	2.2	3	0	.1	.9	0	11	10
21	4	44	3.1	.9	3.1	2	0	0	.7	0	4.7	7.4
22	13	51	3.1	1.2	2.6	2	.9	0	.3	0	2.2	6.0
23	129	30	3.5	1.2	2.2	2	1.5	0	0	0	1.5	8.2
24	182	22	3.1	1.2	2.2	2.6	.7	0	0	1.8	1.5	115
25	28	18	2.6	.9	2.6	2.6	.1	0	0	2.2	1.2	36
26	11	15	2.6	.9	2.2	1.5	0	0	0	1.2	.9	13
27	6.0	12	2.6	1.2	3.1	1.8	0	.7	0	.9	228	7.4
28	3.5	12	2.6	.9	2.2	1.5	*0	20	0	.1	164	4.1
29	2.6	10	2.6	1.8	1.8	1.2	0	151	0	0	40	3.1
30	2.2	5	3.1	3.5	----------	1.2	0	139	0	0	21	2.6
31	1.8	----------	3.1	3.5	----------	1.5	----------	108	----------	0	18	----------
Total	391.7	439.7	74.9	57.8	91.2	68.6	17.6	514.1	471.1	6.2	677.0	508.5
Mean	12.6	14.7	2.42	1.86	3.14	2.21	0.59	16.6	15.7	0.20	21.8	17.0
Ac-ft	777	872	149	115	181	136	35	1,020	934	12	1,340	1,010

Calendar year 1963: Max 1,650 Min 0 Mean 16.1 Ac-ft 11,660
Water year 1963-64: Max 228 Min 0 Mean 9.07 Ac-ft 6,580

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record Oct. 21, Nov. 30 to Dec. 1, Mar. 9-23, Sept. 5-9, 24.

8-1230. Lake Colorado City.--See page 362.

8-1236. Champion Creek Reservoir near Colorado City, Tex.

Location.--Lat 32°16'55", long 100°51'30", in service outlet structure at Champion Creek Dam on Champion Creek, 0.9 mile upstream from mouth, 4.8 miles downstream from State Highway 208, and 7.2 miles south of Colorado City, Mitchell County.
Drainage area.--203 sq mi.
Records available.--April 1959 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929. Prior to Sept. 29, 1959, staff gages at same site and datum.
Extremes.--Maximum contents during year, 13,870 acre-ft Oct. 25 (elevation, 2,056.44 ft); minimum, 11,130 acre-ft Sept. 12 (elevation, 2,052.40 ft).
1958-64: Maximum contents, 15,370 acre-ft May 23-27, 1963 (elevation, 2,058.48 ft); minimum, 1,600 acre-ft Oct. 1, 1959 (elevation, 2,025.90 ft).
Remarks.--Reservoir is formed by a rolled earth-fill dam about 6,800 ft long. Dam completed in Apr. 30, 1959; closure and storage began in February 1959. Reservoir is operated by Texas Electric Service Co. Water will be pumped from the reservoir to Lake Colorado City (see p.) for municipal use and cooling purposes in operation of steam powerplant. Service spillway is a cut channel 50 ft wide and about 1,800 ft long cut in the emergency spillway, which is 450 ft wide and about 1,800 ft long. The service spillway is cut 8 ft deeper than the emergency spillway. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	2,109.0	-
Maximum design flood stage	2,104.1	90,020
Emergency spillway crest	2,091.0	56,800
Service spillway crest	2,083.0	42,500
Invert of 1½- by 3-ft opening in inlet structure	2,020.0	880

Cooperation.--Capacity curve furnished by Freese, Nichols and Endress, Consulting Engineers, based on Geological Survey topographic map surveyed in 1950. Excavation for borrow, estimated not to exceed 1,000 acre-ft, is not included.

Capacity table (elevation, in feet, and contents, in acre-feet)

2,052	10,880
2,054	12,160
2,057	14,260

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13,650	13,780	13,760	13,640	13,540	13,440	13,270	13,010	12,720	12,280	11,680	11,280
2	13,650	13,760	13,740	13,630	13,540	13,440	13,260	12,990	12,710	12,260	11,660	11,260
3	13,640	13,760	13,740	13,630	13,570	13,430	13,240	12,980	12,680	12,240	11,650	11,250
4	13,620	13,750	13,740	13,630	13,570	13,430	13,230	12,960	12,710	12,230	11,630	11,230
5	13,610	13,740	13,730	13,630	13,560	13,420	13,220	12,950	12,730	12,210	11,610	11,220
6	13,600	13,740	13,720	13,620	13,570	13,420	13,210	12,940	12,710	12,180	11,590	11,200
7	13,600	13,730	13,710	13,620	13,550	13,410	13,200	12,940	12,700	12,150	11,580	11,190
8	13,580	13,720	13,710	13,620	13,550	13,430	13,180	12,940	12,680	12,130	11,570	11,170
9	13,560	13,710	13,700	13,610	13,540	13,420	13,160	12,920	12,660	12,110	11,550	11,160
10	13,550	13,710	13,710	13,600	13,540	13,410	13,150	12,910	12,640	12,090	11,540	11,150
11	13,540	13,700	13,680	13,590	13,530	13,410	13,150	12,890	12,630	12,070	11,530	11,140
12	13,520	13,690	13,680	13,570	13,550	13,400	13,130	12,870	12,640	12,050	11,490	11,180
13	13,500	13,690	13,680	13,570	13,540	13,390	13,120	12,850	12,630	12,030	11,470	11,180
14	13,490	13,680	13,660	13,560	13,530	13,380	13,100	12,830	12,610	12,010	11,450	11,180
15	13,480	13,670	13,660	13,550	13,520	13,370	13,090	12,810	12,590	11,980	11,450	11,170
16	13,470	13,660	13,660	13,550	13,510	13,380	13,080	12,800	12,580	11,960	11,440	11,170
17	13,460	13,660	13,660	13,550	13,510	13,360	13,070	12,780	12,560	11,940	11,460	11,150
18	13,450	13,670	13,650	13,540	13,500	13,390	13,060	12,760	12,540	11,920	11,470	11,140
19	13,460	13,710	13,650	13,530	13,490	13,400	13,060	12,750	12,520	11,900	11,450	11,140
20	13,460	13,710	13,650	13,530	13,500	13,360	13,040	12,730	12,500	11,880	11,430	11,140
21	13,450	13,780	13,650	13,530	13,490	13,360	13,030	12,720	12,470	11,860	11,420	11,160
22	13,430	13,800	13,630	13,520	13,480	13,340	13,080	12,710	12,440	11,840	11,400	11,160
23	13,540	13,800	13,630	13,530	13,490	13,340	13,080	12,690	12,420	11,850	11,390	11,230
24	13,860	13,790	13,630	13,520	13,480	13,340	13,070	12,670	12,400	11,830	11,370	11,250
25	13,870	13,780	13,640	13,520	13,490	13,320	13,060	12,660	12,380	11,820	11,360	11,250
26	13,860	13,770	13,640	13,510	13,470	13,310	13,100	12,640	12,360	11,800	11,340	11,250
27	13,850	13,780	13,640	13,510	13,460	13,290	13,080	12,650	12,350	11,780	11,320	11,230
28	13,840	13,780	13,630	13,500	13,460	13,290	13,060	12,670	12,330	11,760	11,300	11,220
29	13,830	13,760	13,640	13,520	13,440	13,280	13,050	12,770	12,310	11,750	11,290	11,210
30	13,820	13,760	13,630	13,540	----------	13,270	13,040	12,760	12,300	11,740	11,300	11,210
31	13,820	----------	13,630	13,540	----------	13,270	----------	12,730	----------	11,710	11,300	----------
(†)	2,056.37	2,056.28	2,056.10	2,055.97	2,055.83	2,055.58	2,055.25	2,054.82	2,054.20	2,053.32	2,052.67	2,052.54
(‡)	+160	-60	-130	-90	-100	-170	-230	-310	-430	-590	-410	-90

Calendar year 1963..... ‡ -200
Water year 1963-64..... ‡ -2,450

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-1236.5. Beals Creek above Big Spring, Tex.

Location.--Lat 32°15'01", long 101°29'26", on left bank at end of Channing Street in Big Spring, Howard County, just downstream from One Mile Lake, 2.9 miles upstream from Little Sandy Creek, and 7.5 miles downstream from confluence of Sulphur Springs Creek and Mustang Draw.

Drainage area.--9,409 sq mi, of which 8,915 sq mi is probably noncontributing.

Records available.--January 1959 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 2,400.02 ft above mean sea level, datum of 1929.

Average discharge.--5 years, 0.71 cfs (514 acre-ft per year).

Extremes.--No flow during year.
1959-64: Maximum discharge, 255 cfs Sept. 6, 1962 (gage height, 5.95 ft); no flow most of time.
Flood of May 10, 1957, was highest known since 1932, from comparison of floods at a point 4 miles downstream, from information by City Engineering Department. Flood of June 12, 1938, reached a stage of about 7.6 ft at present site and datum, from information by Texas and Pacific Railway Co.
Revisions.--Figures of maximum discharge for the water years 1959 and 1961 have been revised to 75 cfs July 12, 1959 (gage height, 3.42 ft) and 87 cfs July 22, 1961 (gage height, 4.01 ft), superseding figures published in WSP 1632 and Surface Water Records of Texas, 1961, respectively.

Remarks.--Records excellent. No diversion above station. Runoff from contributing drainage area is largely regulated by several natural salt lakes. Observations of no flow made Oct. 1, Nov. 5, Dec. 9, 1963, Jan. 13, Feb. 17, Mar. 23, Apr. 27, June 2, July 6, Aug. 10, Sept. 9, 1964.

Revisions.--Revised figures of discharge, in cubic feet per second, for the period July 22-23, 1961, superseding previously published figures, are given herewith:

July 22, 1961..... 72
July 23, 1961..... 67

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
July 1961	202.8	72	0	6.54	402
Water year 1960-61	226.1	72	0	.62	448

8-1238. Beals Creek near Westbrook, Tex.

Location.--Lat 32°11'57", long 101°00'49", near left bank on downstream side of pier of bridge on State Highway 163, 1.5 miles downstream from Crystal Creek, 11 miles south of Westbrook, Mitchell County, 12 miles upstream from Colorado River, and 16 miles southwest of Colorado City.

Drainage area.--9,903 sq mi, of which 8,930 sq mi is probably noncontributing.

Records available.--October 1958 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 2,048.74 ft above mean sea level, datum of 1929.

Average discharge.--6 years, 24.0 cfs (17,380 acre-ft per year).

Extremes.--Maximum discharge during year, 1,080 cfs Sept. 24 (gage height, 8.26 ft); no flow at times.
1958-64: Maximum discharge, 8,780 cfs May 19, 1961 (gage height, 21.65 ft); no flow at times.
Maximum stage known since 1908, about 24.5 ft in 1922, from information by local resident.

Remarks.--Records good. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	(*)	0	1.4	2.2	3.6	2.2	1.7	0.5	9.4		0	0
2		0	1.2	2.1	3.2	2.2	1.5	.5	3.6		0	0
3		0	1.3	2.2	2.7	1.9	1.7	.4	*1.9		0	0
4		*0	1.4	2.2	3.4	1.8	1.8	.4	144		0	0
5		0	1.2	2.1	2.5	1.5	1.5	.3	124		0	0
6		0	1.4	2.1	1.9	1.5	1.4	.2	33	(*)	0	0
7		0	1.5	2.1	2.2	1.5	1.2	.3	11		0	0
8		0	1.5	1.9	2.1	1.8	1.1	37	*3.5		0	0
9		0	*1.4	1.8	1.9	3.6	1.1	92	1.7		0	0
10		0	1.5	2.1	1.8	2.3	1.1	16	1.1		*0	*0
11		0	1.7	1.9	1.8	1.4	1.2	4.0	.6		0	0
12		0	1.4	1.9	1.9	1.3	1.2	1.5	1.0		0	73
13		0	2.1	*1.8	2.2	1.4	1.2	1.2	13		0	10
14		0	2.4	1.8	2.5	1.3	1.1	.9	17		0	3.0
15		0	2.4	1.8	2.4	1.3	1.0	.8	4.8		0	.6
16		0	2.5	1.8	2.4	1.3	.9	.8	1.9		0	.1
17		0	2.5	1.8	*2.4	1.3	.8	.7	1.2		31	0
18		1.4	2.2	2.1	2.2	5.0	.7	.6	.5		.7	0
19		87	2.4	2.1	2.1	106	.7	.5	.2		.2	0
20		47	2.7	2.2	2.1	18	.7	.5	.1		0	0
21		15	2.2	1.9	3.6	9.8	.7	.4	.1		0	0
22		74	2.4	1.8	3.4	4.7	.7	.3	0		0	0
23		25	2.4	1.5	3.6	*3.2	2.3	.2	0		0	149
24		11	2.2	1.7	3.8	2.5	1.2	.2	0		0	311
25		4.4	1.8	1.7	3.4	2.2	.9	.1	0		0	8.7
26		2.2	1.9	1.7	2.7	1.9	2.5	0	0		0	8.4
27		1.9	1.9	1.7	2.4	1.8	.6	0	0		0	4.8
28		1.5	1.9	1.5	2.5	1.8	*.5	186	0		0	4.0
29		1.4	1.5	2.1	2.4	1.8	.5	117	0		0	1.8
30		1.5	2.1	4.0	----------	1.9	.5	135	0		0	.9
31		----------	2.2	3.6	----------	2.1	----------	35	----------		0	----------
Total	0	273.3	58.6	63.2	75.1	192.3	34.0	633.3	373.6	0	31.9	575.3
Mean	0	9.11	1.89	2.04	2.60	6.20	1.13	20.4	12.5	0	1.03	19.2
Ac-ft	0	542	116	125	149	381	67	1,260	741	0	63	1,140

Calendar year 1963: Max 762 Min 0 Mean 10.8 Ac-ft 7,790
Water year 1963-64: Max 311 Min 0 Mean 6.31 Ac-ft 4,580

Peak discharge (base, 680 cfs)

Date	Time	Gage height	Discharge
6- 4	2130	7.62	890
9-24	0300	8.26	1,080

* Discharge measurement or observation of no flow made on this day.
Note.--Discharge computed from once-daily readings of outside gage Apr. 1-22, 24-25, 27, June 2, Aug. 17-20, Sept. 29-30.

8-1239. Colorado River near Silver, Tex.

Location.--Lat 32°01'10", long 100°44'08", on downstream side of left pier of bridge on Farm Road 2059, 4.7 miles southwest of Silver, Coke County, 11 miles upstream from Pecan Creek, and 18.1 miles downstream from Big Silver Creek.

Drainage area.--15,480 sq mi, approximately, of which 11,600 sq mi is probably noncontributing.

Records available.--October 1956 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,875.15 ft above mean sea level, datum of 1929. Prior to Feb. 7, 1957, wire-weight gage at same site and datum.

Average discharge.--8 years, 132 cfs (95,560 acre-ft per year).

Extremes.--Maximum discharge during year, 5,370 cfs Sept. 23 (gage height, 13.28 ft); no flow at times.
1956-64: Maximum discharge, 23,200 cfs May 12, 1957 (gage height, 24.19 ft, from floodmark in gage well); no flow at times each year.
Maximum stage since at least 1891, about 32 ft in April 1922, from information by local resident.

Remarks.--Records good. Some regulation by Lake J. B. Thomas, Champion Creek Reservoir, and Lake Colorado City (see stations 8-1180, 8-1236, and p. 362, respectively). Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 27-31)

3.43	0	4.3	81
3.5	.2	4.6	144
3.6	1.5	5.0	252
3.7	5.0	6.0	582
3.8	12	7.0	1,000
4.0	34	9.0	2,070

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*0	0.9	2.9	0.7	1.7	1.5	0.7	0	*169	0	0	57
2	0	.3	1.7	.9	2.0	1.0	.6	0	78	0	0	38
3	0	.1	1.2	.9	4.5	.9	.6	0	*95	0	0	30
4	0	*0	.9	.5	7.3	.5	.5	0	161	0	0	14
5	0	0	.7	.7	12	.4	.4	0	*499	0	0	8.7
6	0	0	.6	.6	12	.3	.3	0	161	*0	0	4.1
7	0	0	.4	.6	9.4	.2	.3	0	152	0	0	2.0
8	0	0	.3	.6	7.3	.2	.3	0	72	0	0	.7
9	0	0	**.3	.6	5.0	.1	.2	0	38	0	0	.1
10	0	0	.3	.9	3.7	.1	.2	44	20	0	0	*0
11	0	0	.2	.6	3.3	.1	.2	62	10	0	*0	0
12	0	0	.2	.5	3.3	1.4	.2	29	23	0	0	168
13	0	0	.2	*.4	2.9	2.9	.1	11	42	0	0	324
14	0	0	.2	.5	2.9	1.5	.1	4.1	29	0	0	58
15	0	0	.4	.5	2.0	.7	.1	2.0	53	0	0	26
16	0	0	.5	.5	2.0	.6	.1	.2	38	0	16	45
17	0	0	.7	.5	1.7	.5	.1	0	21	0	*1,120	34
18	0	0	.6	.4	1.5	.5	.1	0	10	0	*114	29
19	0	16	.7	.4	*1.2	.6	.1	0	5.6	0	21	81
20	0	0	.7	.4	1.2	53	.1	0	2.9	0	31	41
21	0	133	.7	.4	1.7	47	0	0	.6	0	22	127
22	0	83	.7	.4	2.0	23	17	0	*.1	0	14	87
23	0	111	.7	.4	2.3	16	39	0	0	0	19	1,310
24	0	61	.7	.3	2.9	11	1.8	0	0	0	7.2	1,860
25	269	43	.7	.2	3.7	*6.1	.1	0	0	0	2.3	325
26	54	28	.7	.1	2.9	3.7	0	0	0	0	.6	137
27	34	18	.7	.1	2.6	2.3	*0	3.4	0	0	.1	57
28	15	13	.7	.1	2.3	1.5	0	154	0	0	0	32
29	6.7	7.3	.6	.1	1.7	.9	0	253	0	7.9	200	21
30	2.9	4.5	.6	.5	----------	.7	0	*542	0	4.6	247	14
31	1.2	----------	.6	1.7	----------	.7	----------	222	----------	0	78	----------
Total	382.8	519.1	21.1	16.0	109.0	179.9	63.2	1,326.7	1,680.2	12.5	1,892.2	4,930.6
Mean	12.3	17.3	0.68	0.52	3.76	5.80	2.11	42.8	56.0	0.40	61.0	164
Ac-ft	759	1,030	42	32	216	357	125	2,630	3,330	25	3,750	9,780

Calendar year 1963: Max 1,880 Min 0 Mean 27.6 Ac-ft 20,010
Water year 1963-64: Max 1,860 Min 0 Mean 30.4 Ac-ft 22,080

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record Nov. 1-3, 20, Mar. 4-11, Apr. 25-26, June 21.

8-1255. Oak Creek Reservoir.--See page 362.

8-1265. Colorado River at Ballinger, Tex.

Location.--Lat 31°43'50", long 99°56'25", near left bank on downstream side of pier of bridge on U. S. Highway 83, in Ballinger, Runnels County, and 2,000 ft upstream from Elm Creek.
Drainage area.--16,840 sq mi, approximately, of which 11,600 sq mi is probably noncontributing.
Records available.--June 1907 to September 1964. Monthly discharge only for some periods published in WSP 1312. Gage-height records collected in this vicinity from 1903-29 are contained in reports of U. S. Weather Bureau.
Gage.--Water-stage recorder. Datum of gage is 1,593.74 ft above mean sea level, datum of 1929. Prior to Nov. 29, 1930, staff, chain, or Mott gages at several sites upstream within 1 mile of present site at various datums.
Average discharge.--57 years, 349 cfs (252,700 acre-ft per year).
Extremes.--Maximum discharge during year, 6,680 cfs May 29 (gage height, 8.55 ft); no flow at times.
1907-64. Maximum discharge, 75,400 cfs Sept. 18, 1936 (gage height, 28.6 ft); no flow at times.
Maximum stage since at least 1882, about 36 ft sometime in 1884, present site and datum, from information by local residents. Flood of Aug. 6, 1906, reached a stage of about 32.0 ft, present site and datum, from floodmarks (backwater from Elm Creek).
Remarks.--Records good. Diversions above station for irrigation, municipal supplies, and oilfield operation. Flow slightly regulated by Lake Colorado City since 1949, Lake J. B. Thomas since 1952, Oak Creek Reservoir since 1953, and by Champion Creek Reservoir since August 1958. At end of year, flow from 45.1 sq mi above this station was partly controlled by 10 floodwater-retarding structures with a total combined capacity of 11,560 acre-ft below the flood spillway crests, of which 10,270 acre-ft is floodwater-retarding capacity and 1,290 acre-ft is sediment-pool capacity. Six structures were built during the current year and have a total combined capacity below flood spillway crests of 7,790 acre-ft, of which 653 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used May 29, June 12-13, Aug. 30, Sept. 24-25)

0.9	0	1.8	115
1.0	.3	2.0	186
1.1	1.3	2.5	407
1.2	4.0	3.0	720
1.3	9.5	4.0	1,690
1.4	20	5.0	2,830
1.5	37	6.0	4,050
1.6	60		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	7.2	18	3.6	58	2.4	1.5	0.9	378	0.1	0	*205
2	0	5.8	15	*3.6	27	1.9	1.0	.9	175	0	0	100
3	0	3.6	13	3.3	25	1.5	.6	.7	145	0	0	53
4	0	1.3	11	3.3	73	1.2	.4	.7	138	0	0	39
5	0	.9	9.5	2.9	44	1.2	.2	.6	174	0	0	22
6	0	.7	8.0	2.9	27	1.2	.1	1.2	482	0	0	13
7	0	.7	7.4	2.9	16	1.0	.1	1.0	360	0	0	12
8	0	1.5	5.8	2.9	13	1.3	.1	.8	159	0	0	8.0
9	0	2.6	5.2	2.9	11	1.3	.1	.8	135	0	0	4.8
10	0	1.5	5.2	2.6	*9.5	1.3	.1	.8	98	0	0	1.7
11	0	1.5	4.8	2.4	7.4	*1.2	.1	.8	70	0	0	.9
12	0	1.2	4.8	2.4	6.8	3.0	.1	.8	616	0	0	.5
13	0	.8	4.4	2.6	7.4	5.3	0	.7	761	0	0	.4
14	0	.6	4.0	2.6	8.8	2.8	0	.7	122	0	0	24
15	0	.5	4.0	2.6	7.4	1.7	*.3	.7	60	0	.6	167
16	0	.6	4.0	2.9	6.8	1.3	.6	.6	39	0	23	89
17	0	1.2	3.6	2.9	6.2	.9	.6	.6	*35	0	27	157
18	0	1.2	3.6	2.9	5.2	2.5	.2	.6	27	0	931	100
19	0	892	3.3	2.9	4.8	6.6	.1	.6	27	0	644	58
20	.4	497	3.6	2.6	4.4	11	.1	*.5	26	0	162	305
21	1.2	110	3.6	2.9	5.2	10	58	.4	16	0	68	401
22	1.3	53	3.6	2.9	4.8	5.8	29	.5	12	0	44	228
23	1.1	31	3.6	2.9	4.4	3.6	515	.4	4.8	0	26	285
24	*1.0	74	3.3	2.9	6.2	2.6	48	.4	2.6	0	14	1,020
25	.4	73	2.9	2.6	6.2	1.9	14	.3	1.9	0	*7.7	1,830
26	.6	76	2.6	2.4	5.2	1.3	20	.3	2.4	0	3.7	539
27	.8	53	2.9	2.4	4.8	1.2	6.8	.8	1.3	0	1.3	224
28	63	42	2.6	2.4	4.4	5.3	2.4	60	.9	0	1.0	*135
29	63	*31	2.6	2.6	3.3	5.2	1.2	2,940	.2	*0	c2.5	92
30	37	22	3.3	18	----------	3.3	.9	351	.2	0	2,040	68
31	20	----------	3.6	24	----------	2.1	----------	353	----------	0	338	----------
Total	189.8	1,987.4	172.8	123.7	413.2	92.9	701.6	3,722.1	4,069.3	0.1	4,333.8	6,182.3
Mean	6.12	66.2	5.57	3.99	14.2	3.00	23.4	120	136	0.003	140	206
Ac-ft	376	3,940	343	245	820	184	1,390	7,380	8,070	0.2	8,600	12,260

Calendar year 1963: Max 3,650 Min 0 Mean 55.2 Ac-ft 39,920
Water year 1963-64: Max 2,940 Min 0 Mean 60.1 Ac-ft 43,610

* Discharge measurement or observation of no flow made on this day.
c Backwater from Elm Creek.

8-1270. Elm Creek at Ballinger, Tex.

Location.--Lat 31°45'00", long 99°56'50", on right bank 1,000 ft upstream from storage dam at Ballinger, Runnels County, and 1¼ miles upstream from mouth.

Drainage area.--471 sq mi.

Records available.--April 1932 to September 1964.

Gage.--Water-stage recorder and masonry dam control. Datum of gage is 1,617.72 ft above mean sea level, datum of 1929.

Average discharge.--32 years, 46.4 cfs (33,590 acre-ft per year).

Extremes.--Maximum discharge during year, 10,800 cfs Aug. 29 (gage height, 7.77 ft); no flow at times.
1932-64: Maximum discharge, 50,000 cfs Oct. 13, 1957 (gage height, 14.20 ft, from floodmark); no flow at times.
Flood in August 1906 reached a stage of 14.5 ft, affected by backwater from Colorado River; highest stage not affected by backwater from Colorado River since at least 1904 was that of Oct. 13, 1957, from information by local residents.

Remarks.--Records good except those below 100 cfs and those for periods of no gage-height record, which are fair. Stage-discharge relation during period of low flow affected by wind action and occasional accumulation of drift on dam. Low flow affected by diversion of Ballinger city pumping plant which diverts water for a part of the municipal supply. Only flow over dam is recorded. An unknown amount of low flow is stored in reservoir at gage. City of Winters has permit to divert a total of 1,160 acre-ft from Lake Winters (capacity, 3,060 acre-ft, revised).

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

3.8	0	4.4	500
3.9	11	4.7	950
4.0	67	5.0	1,450
4.1	144	5.9	3,430
4.2	244		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0	1.0	2.5	2.5	1.0	4.5	0.2		0	*15
2		0	0	.6	1.0	1.5	.6	2.5	.4		0	11
3		0	0	.2	6.4	.6	.4	1.5	.2		0	7.0
4		0	0	.2	92	0	.2	1.0	2.8		0	4.5
5		0	0	.2	69	.1	0	.2	2.5		0	2.5
6		0	0	.2	11	.4	0	2.5	7.0		0	1.5
7		0	0	.2	4.5	1.5	0	2.5	2.5		0	.4
8		0	0	.1	4.5	1.5	0	.2	1.0		0	.1
9		0	0	.1	2.5	.3	0	0	.4		0	0
10		0	0	.1	*2.5	0	0	0	.1		0	0
11		0	0	.1	1.5	.4	0	0	0		0	0
12		0	0	.1	1.5	1.0	0	0	0		0	0
13		0	.2	0	1.5	1.0	0	0	0		0	0
14		0	.2	.1	1.5	.6	0	0	0		5.3	0
15		0	.2	.2	.2	.6	*0	0	0		203	0
16		0	.4	.4	.4	1.0	0	0	0		4.5	0
17		0	.4	.4	.6	1.0	0	0	*0		2.5	0
18		0	.4	.4	.4	1.5	0	0	0		272	1.0
19		0	.4	.1	.4	1.2	0	0	0		25	.4
20		39	.6	0	1.5	.3	0	*0	0		7.0	5.6
21		15	.4	0	1.5	.4	32	0	0		4.5	195
22		1.0	.4	.2	2.5	1.0	93	0	0		117	49
23		.4	.2	.4	2.5	1.5	88	0	0		25	a20
24	(*)	.2	.4	.1	4.5	1.5	38	0	0		11	a500
25		.1	.4	0	2.5	1.0	7.7	0	0		*4.5	a250
26		0	.2	0	2.5	1.0	311	0	0		4.5	a 40
27		0	.2	.1	1.6	1.0	50	0	0		1.0	a 10
28		0	.2	.2	.4	1.0	15	2.4	0		.2	a 2
29		*0	.4	.4	.6	1.0	7.0	4.5	0		3,240	a .6
30		0	1.0	2.5	----------	1.0	4.5	1.5	0		264	a .4
31		----------	1.0	2.5	----------	1.0	----------	0	----------	(*)	43	----------
Total	0	55.7	7.6	11.1	224.0	28.4	648.4	23.3	17.1	0	4,234.0	1,116.0
Mean	0	1.86	0.25	0.36	7.72	0.92	21.6	0.75	0.57	0	137	37.2
Ac-ft	0	110	15	22	444	56	1,290	46	3.4	0	8,400	2,210

Calendar year 1963: Max 1,180 Min 0 Mean 12.4 Ac-ft 8,950
Water year 1963-64: Max 3,240 Min 0 Mean 17.4 Ac-ft 12,630

Peak discharge (base, 2,100 cfs)

Date	Time	Gage height	Discharge
8-29	0430	7.77	10,800

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.

8-1275. South Concho Irrigation Co.'s canal at Christoval, Tex.

Location.--Lat 31°11'20", long 100°30'00", on right bank at Christoval, Tom Green County, 85 ft downstream from point of diversion and 100 ft downstream from bridge on U. S. Highway 277.

Records available.--November 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 2,017.02 ft above mean sea level, datum of 1929.

Average discharge.--24 years (1940-64), 7.31 cfs (5,290 acre-ft per year).

Extremes.--Maximum daily diversion for irrigation during year (excluding floodflow), 8.4 cfs Sept. 29; minimum daily, 0.2 cfs Aug. 7-8, Sept. 4-6, 9.
1939-64: Maximum daily diversion for irrigation (excluding floodflow), 21 cfs June 27, 28, 1941, Sept. 18, 21, 1942; no flow Apr. 26 to July 9, 1957, Mar. 18 to Apr. 10, 1958.

Remarks.--Records fair. Canal diverts water for irrigation from right bank of South Concho River 600 ft upstream from station at Christoval.

Monthly discharge, in cubic feet per second, water year October 1963 to September 1964

Month	Maximum	Minimum	Mean	Runoff in (acre-feet)
October	4.3	2.4	3.10	190
November	6.2	3.4	4.36	259
December	6.0	4.5	5.59	344
Calendar year 1963	7.0	1.6	4.00	2,900
January	8.1	4.5	5.36	330
February	7.2	5.0	5.89	339
March	6.6	5.1	5.40	332
April	5.0	2.8	3.95	235
May	2.8	1.3	1.87	115
June	1.8	1.0	1.27	75
July	1.5	.5	1.00	62
August	1.1	.2	.64	39
September	8.4	.2	2.42	144
Water year 1963-64	8.4	0.2	3.39	2,460

8-1280. South Concho River at Christoval, Tex.

Location.--Lat 31°13', long 100°30', near center of stream on downstream side of center pier of Panhandle and Santa Fe Railway Co. bridge at Christoval, Tom Green County, 12 miles upstream from Lake Nasworthy.

Drainage area.--409 sq mi, of which 65 sq mi is probably noncontributing.

Records available.--February 1930 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 2,010.22 ft above mean sea level, datum of 1929. Prior to July 17, 1930, staff gage at same site and datum.

Average discharge.--34 years, 36.1 cfs (26,140 acre-ft per year).

Extremes.--Maximum discharge during year, 9,450 cfs Sept. 24 (gage height, 10.20 ft); minimum, 1.0 cfs Sept. 14.
1930-64: Maximum discharge, 100,000 cfs July 23, 1938 (gage height, 21.95 ft, from floodmarks), from rating curve defined by current-meter measurements below 15,100 cfs and slope-area measurement at 80,100 cfs; no flow Feb. 28, Mar. 1, 1955.
Maximum stage since 1882, about 23 ft Aug. 6, 1906 (discharge, 115,000 cfs, from rating curve as noted above), from information by local residents.

Remarks.--Records good. Low flow materially affected by diversion 600 ft above station to South Concho Irrigation Co.'s canal (see preceding page).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 23-24, 26-27)

1.7	1.2	2.4	135
1.8	5.1	2.7	292
1.9	13	3.0	480
2.0	25	3.5	850
2.1	42	4.0	1,260
2.2	67	5.0	2,240

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.6	6.3	7.6	7.6	6.9	7.6	9.1	9.1	6.9	3.6	6.3	6.3
2	6.9	6.3	7.6	7.6	6.9	7.6	9.1	9.1	6.9	3.6	6.3	6.3
3	6.9	6.3	7.6	7.6	6.9	7.6	9.1	9.1	6.3	4.0	5.7	6.3
4	6.9	6.3	7.6	7.6	7.6	7.6	8.3	8.3	6.3	3.6	5.7	5.7
5	6.9	6.3	7.6	7.6	6.9	7.6	8.3	7.6	6.9	3.6	5.1	4.6
6	6.9	6.3	7.6	7.6	*6.9	8.3	8.3	7.6	6.9	4.0	4.6	4.0
7	6.9	6.3	7.6	7.6	6.9	8.3	8.3	8.3	6.3	3.6	4.6	3.6
8	6.9	6.3	7.6	6.9	6.9	8.3	8.3	7.6	6.3	3.1	4.6	3.6
9	6.9	6.3	8.3	6.9	6.9	8.3	8.3	7.6	6.3	3.1	4.6	3.6
10	6.3	6.3	8.3	6.9	6.3	*8.3	8.3	7.6	6.9	2.7	6.3	3.6
11	6.3	6.3	8.3	6.9	6.3	8.3	8.3	7.6	6.9	2.4	6.9	3.1
12	6.9	6.3	8.3	6.9	6.3	8.3	8.3	6.9	6.9	2.4	6.9	2.0
13	6.9	5.7	7.6	6.9	6.3	8.3	9.1	6.9	6.9	2.7	6.3	2.4
14	6.9	5.7	7.6	6.9	6.3	8.3	*9.1	6.9	6.9	3.1	6.3	1.7
15	6.9	5.7	7.6	6.9	6.3	8.3	9.1	6.9	6.9	3.6	6.9	1.4
16	6.9	5.1	7.6	6.9	6.3	7.6	9.1	6.9	*6.9	3.6	8.3	1.4
17	6.9	5.7	7.6	6.9	6.3	7.6	9.1	6.9	7.6	4.0	7.6	1.4
18	6.3	6.3	7.6	6.9	6.9	7.6	9.1	6.9	6.9	4.6	6.3	1.4
19	6.3	7.6	7.6	7.6	7.6	8.3	9.9	*6.9	6.9	4.6	5.7	1.7
20	6.9	10	7.6	7.6	7.6	7.6	9.1	6.9	6.9	4.6	5.1	2.4
21	6.9	9	7.6	7.6	7.6	7.6	9.1	6.9	5.7	5.1	4.6	2.7
22	* 6.9	8.3	7.6	6.9	7.6	7.6	9.1	6.9	5.7	*5.1	6.3	2.4
23	6.9	7.6	7.6	6.9	7.6	7.6	9.1	6.9	5.7	5.7	7.6	965
24	6.9	7.6	7.6	6.9	7.6	7.6	9.1	6.9	5.1	5.1	6.9	2,010
25	6.9	7.6	7.6	6.9	7.6	8.3	9.1	6.9	4.6	4.6	6.9	221
26	6.3	*7.6	7.6	6.9	7.6	8.3	9.1	6.9	4.6	4.0	6.3	100
27	6.3	8.3	7.6	6.9	7.6	8.3	9.1	6.9	4.0	4.6	*6.3	932
28	6.3	8.3	7.6	7.6	7.6	8.3	9.1	6.9	4.0	4.6	6.3	43
29	6.3	8.3	7.6	7.6	7.6	8.3	9.1	6.9	4.6	4.6	6.9	17
30	6.3	7.6	6.9	8.3	----------	8.3	9.1	7.6	4.6	4.6	6.9	16
31	6.3	----------	*7.6	6.9	----------	8.3	----------	6.9	----------	5.1	6.9	----------
Total	208.6	207.6	237.7	223.7	203.7	248.2	266.6	228.2	184.3	123.6	192.0	4,375.6
Mean	6.73	6.92	7.67	7.22	7.02	8.01	8.89	7.36	6.14	3.99	6.19	146
Ac-ft	414	412	471	444	404	492	529	453	366	245	381	8,680

Calendar year 1963: Max 44 Min 5.1 Mean 10.6 Ac-ft 7,690
Water year 1963-64: Max 2,010 Min 1.4 Mean 18.3 Ac-ft 13,290

Peak discharge (base, 160 cfs)

Date	Time	Gage height	Discharge
9-24	0330	10.20	9,450
9-27	0030	6.30	3,350

* Discharge measurement made on this day.
Note.--No gage-height record Nov. 2-25, Nov. 28 to Dec. 2.

8-1284. Middle Concho River above Tankersley, Tex.

Location.--Lat 31°25'40", long 100°42'30", on left bank 0.3 mile upstream from East Rocky Creek, 0.5 mile southwest of Tullos Ranch headquarters in Irion County, and 6.7 miles northwest of Tankersley, Tom Green County.
Drainage area.--2,436 sq mi, of which 1,055 sq mi is probably noncontributing.
Records available.--March 1961 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 1,986.47 ft above mean sea level, datum of 1929.
Extremes.--Maximum discharge during year, 8,820 cfs Sept. 21 (gage height, 19.20 ft); no flow most of time.
1961-64: Maximum discharge, that of Sept. 21, 1964; no flow at times.
Flood information begins with a flood in 1900 which reached the same stage, 29½ ft, as the flood of Sept. 26, 1936, from information by local resident.
Remarks.--Records good.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 22-30)

6.4	0	6.9	13	8.0	231
6.5	.1	7.0	21	9.0	555
6.6	.9	7.2	45	10.0	980
6.7	3.3	7.4	81	12.0	1,970
6.8	7.1				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Aug. 15	0.3	Sept. 12	12	Sept. 23	*131
16	*144	13	68	24	953
17	*194	14	25	25	*419
18	40	15	5.5	26	78
19	*5.2	16	1.3	27	45
20	.2	17	.1	28	24
22	3.9	21	1,710	29	9.2
23	36	22	*1,470	30	4.6
24	2.3				
25	.1				

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
August 1964	426.0	194	0	13.7	845
September	4,955.7	1,710	0	165	9,830
Calendar year 1963	-	74	0	.33	238
Water year 1963-64	-	1,710	0	14.7	10,680

Peak discharge (base, 1,700 cfs)

Date	Time	Gage height	Discharge
9-21	1830	19.20	8,820
9-24	1330	14.20	3,330

* Discharge measurement made on this day.
Note.--Flow occurred only on days listed above. Observation of no flow made Oct. 23, Nov. 27, Dec. 26, Feb. 3, Mar. 9, Apr. 13, May 18, June 15, July 20, Aug. 26.

8-1293. Spring Creek above Tankersley, Tex.

Location.--Lat 31°19'48", long 100°38'24", on right bank at downstream side of bridge on Farm Road 2335, 1.4 miles south of Tankersley, Tom Green County, and 2.5 miles upstream from Dove Creek.

Drainage area.--424 sq mi, of which 28 sq mi is probably noncontributing.

Records available.--October 1960 to September 1964.

Gage.--Water-stage recorder and concrete control. Prior to Nov. 10, 1960, wire-weight gage at same site and datum. Datum of gage is 1,964.72 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 4,830 cfs Sept. 22 (gage height, 8.08 ft); no flow most of time.
1960-64: Maximum discharge, 5,210 cfs June 18, 1961 (gage height, 8.34 ft); no flow at times.
Maximum stages since at least 1853 occurred in 1882 and 1884 (stages unknown) and on Oct. 3, 1959 (18.4 ft). At former gage (Spring Creek near Tankersley) 8 miles downstream, the flood of Oct. 3, 1959, was found to be about 3 ft lower than the 1882 flood, the greatest at that location since at least 1853.

Remarks.--Records good. Many small diversions above station for irrigation.

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

3.4	0	4.1	12
3.5	.1	4.3	35
3.6	.3	4.5	71
3.7	.8	4.7	125
3.8	1.5	5.0	248
3.9	3.0	5.3	440
4.0	5.9	5.7	810

Discharge, in cubic feet per second, water year October 1963to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	0.2	0.2	0.1		0	0
2						0	.2	.2	.1		0	0
3					(*)	0	.2	.2	.1		0	0
4						0	.2	.2	.1		0	0
5						0	.2	.2	.1		0	0
6						0	.2	.2	.1		0	0
7						0	.2	.2	.1		0	0
8						0	.2	.2	0		0	0
9						*0	.2	.2	0		0	0
10						0	.2	.2	0		0	0
11						0	.3	.2	0		0	0
12						0	.3	.2	0		0	0
13						0	.2	.2	0		0	0
14						0	.2	.2	0		0	0
15						0	.2	.2	*0		0	0
16						0	.2	.2	0		2.9	0
17						.1	.2	.2	0		3.8	0
18						.2	.2	.2	0		.3	0
19		(*)				.2	.2	.2	0		.1	0
20						.2	.3	.2	0	(*)	0	0
21	(*)					.2	2.0	.2	0		0	0
22						.2	.4	.2	0		0	*765
23						.2	.3	.2	0		0	*24
24						.2	.2	.2	0		0	*6.7
25						.2	.2	.1	0		0	1.3
26		(*)	(*)			.2	.2	.1	0		*0	.4
27						.2	.2	.1	0		0	.2
28						.2	.2	.1	0		0	18
29						.2	.2	.2	0		0	4.8
30					----------	.2	.2	.2	0	(*)	0	1.6
31		----------			----------	.2	----------	.1	----------		0	----------
Total	0	0	0	0	0	2.9	8.4	5.7	0.7	0	7.1	822.0
Mean	0	0	0	0	0	0.09	0.28	0.18	0.02	0	0.23	27.4
Ac-ft	0	0	0	0	0	5.8	17	11	1.4	0	14	1,630

Calendar year 1963: Max 1.3 Min 0 Mean 0.09 Ac-ft 64
Water year 1963-64: Max 765 Min 0 Mean 2.31 Ac-ft 1,680

Peak discharge (base, 400 cfs)

Date	Time	Gage height	Discharge
9-22	0445	8.08	4,830

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record June 1-4, 14-25, July 18-19, 24-29.

8-1305. Dove Creek at Knickerbocker, Tex.

Location.--Lat 31°16'24", long 100°37'45", on right bank at right end of bridge on Farm Road 2335, 0.4 mile west of Knickerbocker, Tom Green County, and 5.4 miles upstream from mouth.

Drainage area.--229 sq mi, of which 31 sq mi is probably noncontributing.

Records available.--October 1960 to September 1964.

Gage.--Water-stage recorder. Prior to Nov. 10, 1960, wire-weight gage at same site and datum. Datum of gage is 2,001.45 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 43 cfs Nov. 19 (gage height, 4.98 ft); no flow July 1 to Sept. 27.
1960-64: Maximum discharge, 8,400 cfs June 18, 1961 (gage height, 13.36 ft); no flow July 1 to Sept. 27, 1964.
Maximum stage since at least 1882, 30.4 ft in 1906 and Oct. 3, 1959. Floods in 1882 and 1884 reached about the same stage, from information by local resident.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Flow is partly regulated by storage and diversion from two small channel dams upstream and by many small diversions upstream for irrigation.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.2	1.1	2.7	3.5	3.9	3.2	2.4	1.4	0.7			0
2	2.3	1.2	2.3	3.6	3.8	3.2	2.1	1.4	.7			0
3	2.1	1.2	2.4	3.5	*3.9	3.0	2.1	1.2	.6			0
4	2.1	1.2	2.4	3.4	4.5	2.8	1.8	1.0	.7			0
5	2.1	1.2	2.4	3.6	4.0	2.8	1.5	1.0	.7			0
6	2.1	1.1	2.4	3.6	3.4	3.0	1.5	1.0	.6			0
7	1.9	1.6	2.4	3.6	3.2	2.8	1.5	1.1	.6			0
8	1.9	1.4	2.3	3.6	3.2	2.2	1.5	1.0	.6			0
9	1.7	1.5	2.3	3.4	3.1	*1.6	1	1.0	.6			0
10	1.7	1.6	2.4	3.4	3.0	1.4	1	1.0	.6			0
11	1.4	1.6	2.8	3.4	3.0	1.3	1	1.0	.6			0
12	1.4	1.4	2.9	3.2	2.9	1.2	1	.9	.6			0
13	1.4	1.5	2.9	3.4	3.0	1.2	*.9	.9	.6			0
14	1.2	1.2	2.8	3.6	3.1	1.6	.8	.8	.6			0
15	1.2	1.1	2.8	3.7	2.7	2.0	1.0	.8	*.6			0
16	1.1	1.4	2.8	3.8	2.7	2.8	.9	.8	.6			0
17	1.0	1.6	2.9	3.7	2.6	2.9	.7	.7	.6			0
18	.9	1.6	3.7	3.6	2.5	3.1	.8	*.7	.6			0
19	.9	*11	4.0	3.5	2.4	3.9	.7	.7	.6			0
20	1.0	3.1	4.1	3.2	2.4	3.1	.7	.7	.6			0
21	*1.1	1.9	4.1	3.2	2.7	3.0	2.9	.7	.6	(*)		0
22	1.0	2.0	4.2	3.2	2.9	3.5	2.2	.7	.6			0
23	.9	1.9	4.5	3.5	3.0	3.2	1.5	.6	.6			0
24	1.2	1.9	4.1	3.6	3.1	2.8	1.3	.6	.6			0
25	.9	1.9	3.9	3.5	3.4	3.1	1.3	.4	.6			0
26	1.0	*1.9	*3.7	3.2	3.2	3.1	1.6	.4	.7		(*)	0
27	1.1	2.0	3.7	3.2	3.1	3.1	1.9	.5	.7			0
28	1.0	3.1	3.7	3.1	3.0	3.1	1.7	.5	.7			.3
29	.9	2.9	3.2	3.0	3.0	3.1	1.4	.5	.7			1.4
30	.9	2.7	3.2	3.2	----------	3.0	1.4	.6	.3			1.7
31	.9	----------	3.2	4.0	----------	2.7	----------	.5	----------			----------
Total	42.5	60.8	97.2	107.0	90.7	82.8	42.1	25.1	18.5	0	0	3.4
Mean	1.37	2.03	3.14	3.45	3.13	2.67	1.40	0.81	0.62	0	0	0.11
Ac-ft	84	121	193	212	180	164	84	50	37	0	0	6.7

Calendar year 1963: Max 41 Min 0.3 Mean 3.84 Ac-ft 2,780
Water year 1963-64: Max 11 Min 0 Mean 1.56 Ac-ft 1,130

Peak discharge (base, 100 cfs).--No peak above base.
* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record Mar. 11-12, 30-31, Apr. 5-12.

8-1312. Twin Buttes Reservoir near San Angelo, Tex.

Location.--Lat 31°22'59", long 100°32'11", in outlet control tower at Twin Buttes Dam on Middle Concho River, Spring Creek, and South Concho River, 3.8 miles upstream from Lake Nasworthy Dam, and 8.1 miles southwest of San Angelo, Tom Green County.
Drainage area.--3,724 sq mi, of which 1,178 sq mi is probably noncontributing.
Records available.--October 1962 to September 1964.
Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929.
Extremes.--Maximum contents observed during year, 18,360 acre-ft Sept. 30 (elevation, 1,926.9 ft in South Concho pool, and 1,895.3 ft in Middle Concho-Spring Creek pool); minimum contents observed, 2,660 acre-ft Aug. 12 (elevation, 1,918.2 ft in South Concho pool, and 1,878.6 ft in Middle Concho-Spring Creek pool).
Remarks.--Reservoir is formed by a rolled earth-fill dam, 8.1 miles long including a 200-foot uncontrolled off-channel concrete gravity spillway with ogee weir section. Outlet works consist of three 15.5-foot concrete conduits, each is controlled by a 12- by 15-foot fixed wheel gate and 12- by 15-foot radial gate. Low-flow releases will be made through 2- by 2-foot regulating gates located in the center of each of three fixed wheel gates. The South Concho and Middle Concho-Spring Creek pools are connected by a 3.22 mile equalizing channel, at a lake elevation of 1,925 ft. The two pools join to form one lake. Deliberate impoundment of water began on Dec. 1, 1962; dam was completed Feb. 13, 1963. The U. S. Bureau of Reclamation furnished the capacity curve, which is based on a survey made in 1958. Reservoir built for flood control, irrigation and municipal use. Data regarding dam and reservoir are shown in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	1,991.0	-
Crest of spillway	1,969.1	640,600
Top of conservation storage	1,940.2	186,200
Bottom of equalizing channel	1,925.0	84,760
Dead storage in South Concho pool	1,925.0	4,600
Invert to outlet works	1,885.0	3,750

Cooperation.--Record of gage heights furnished by city of San Angelo.

Capacity tables (elevations, in feet, and contents, in acre-feet)

South Concho Pool

1,918.0	1,860	1,924.0	4,110
1,920.0	2,490	1,926.0	5,150
1,922.0	3,230	1,928.0	6,380

Middle Concho-Spring Creek Pool

1,878.0	586	1,885.0	3,750
1,879.0	843	1,890.0	7,600
1,880.0	1,160	1,896.0	13,430
1,882.0	2,010		

Contents, in acre-feet, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,600	3,370	-	-	-	-	4,920	-	4,510	-	-	3,020
2	3,570	-	3,570	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	4,430	-	-	-
4	-	-	3,640	-	-	4,800	-	-	-	-	-	-
5	-	-	-	-	4,590	-	-	-	-	-	2,830	-
6	-	3,330	-	-	-	-	-	5,080	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	4,080	-	-	4,920	-	-	3,530	-	-
9	3,570	-	-	-	-	-	-	-	-	-	-	2,840
10	-	-	-	-	-	-	-	-	4,360	-	-	-
11	-	-	3,610	-	-	4,840	-	-	-	-	-	-
12	-	-	-	-	4,550	-	-	-	-	-	2,660	-
13	-	3,370	-	-	-	-	-	4,910	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	4,200	-	-	4,800	-	-	3,330	-	-
16	3,460	-	-	-	-	-	-	-	-	-	-	2,750
17	-	-	-	-	-	-	-	-	4,120	-	-	-
18	-	-	3,680	-	-	4,800	-	-	-	-	-	-
19	-	3,430	-	-	4,640	-	-	-	-	-	3,100	-
20	-	3,470	-	-	-	-	-	4,750	-	-	-	-
21	-	-	-	-	-	-	5,340	-	-	-	-	-
22	-	-	-	4,280	-	-	5,340	-	-	3,200	-	-
23	3,400	-	-	-	-	-	-	-	-	-	-	10,210
24	-	-	3,810	-	-	-	-	-	3,900	-	-	13,490
25	-	-	-	-	-	4,920	-	-	-	-	-	-
26	-	-	-	-	4,760	-	-	-	-	-	3,150	-
27	-	3,540	-	-	-	-	-	4,590	-	-	-	-
28	-	-	-	-	4,800	-	-	-	-	-	-	18,180
29	-	-	-	4,320	a4,800	-	5,160	-	-	3,000	-	18,330
30	3,400	a3,550	-	-	----------	-	a5,150	-	3,770	-	-	18,360
31	a3,380	----------	3,940	4,470	----------	a4,920	----------	a4,520	----------	3,000	a 3,040	----------
(†)	-	-	1,921.0	1,921.9	-	-	-	-	1,920.5	1,919.0	-	1,926.9
	-	-	1,879.8	1,880.3	-	-	-	-	1,879.8	1,879.0	-	1,895.3
(‡)	-220	+170	+390	+530	+330	+120	+230	-630	-750	-770	+40	+15,320

Calendar year 1963..... ‡ +2,240
Water year 1963-64..... ‡ +14,760

† Elevation, in feet, at end of month, in South Concho and Middle Concho-Spring Creek pools, respectively.
‡ Change in contents, in acre-feet.
a No gage-height record. Contents interpolated.

8-1314. Pecan Creek near San Angelo, Tex.

Location.--Lat 31°19'03", long 100°27'30", on left bank 210 ft upstream from county road, 0.9 mile west of U. S. Highway 277, 2.4 miles upstream from mouth, and 10.1 miles south of San Angelo, Tom Green County.
Drainage area.--84.9 sq mi.
Records available.--June 1961 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 1,910.51 ft above mean sea level, datum of 1929.
Extremes.--Maximum discharge during year, 6,780 cfs Sept. 24 (gage height, 11.15 ft), from rating curve defined by current-meter measurements below 2,100 cfs and slope-area measurement at 30,500 cfs; no flow most of time.
1961-64: Maximum discharge, that of Sept. 24, 1964; no flow most of time.
Maximum stage since at least 1908, 14.36 ft Sept. 15, 1936 (discharge, 30,500 cfs, by slope-area measurement of peak stage).
Revisions.--The maximum discharge for the water year 1963 has been revised to 477 cfs Aug. 17, 1963 (gage height, 8.21 ft), superseding previously published figure.
Remarks.--Records fair. No known diversions above station.
Revisions.--Revised figure of discharge, in cubic feet per second, for the period Aug. 17, 1963, superseding previously published figure is given herewith:

Aug. 17, 1963..... 42

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
August 1963	43.1	42	0	1.39	85
Water year 1962-63	89.3	42	0	.24	177

Discharge, in cubic feet per second, water year October 1963 to September 1964

Aug. 22	450	Sept. 26	*35
23	*50	27	381
24	*.5	28	4.2
Sept. 24	*602	29	.6
25	*15		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
August 1964	500.5	450	0	16.1	993
September	1,037.8	602	0	34.6	2,060
Calendar year 1963	-	42	0	.24	177
Water year 1963-64	-	602	0	4.20	3,050

Peak discharge (base, 100 cfs)

Date	Time	Gage height	Discharge
8-22	1500	9.88	2,730
9-24	0145	11.15	6,780
9-24	1700	8.08	375
9-26	2400	9.68	2,300

* Discharge measurement made on this day.
Note.--Flow occurred only on days listed above. Observations of no flow made Oct. 23, Nov. 19, Dec. 31, Feb. 4, Mar. 10, Apr. 14, May 19, June 16, July 30.

8-1316. Tom Green County Water Control and Improvement District No. 1 canal near San Angelo, Tex.

Location.--Lat 31°24'58", long 100°23'23", on left bank at Parshall flume, 1,900 ft downstream from U. S. Highway 87, 4.3 miles south of San Angelo, Tom Green County, and 7.0 miles downstream from Lake Nasworthy.
Records available.--March 1963 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 1,855.33 ft above mean sea level, datum of 1929 (Bureau of Reclamation reference mark).
Extremes.--No water released during period of record.
Remarks.--Record represents water released from Lake Nasworthy for irrigation. Local flood runoff eliminated.

8-1320. Lake Nasworthy.--See page 362.

8-1335. North Concho River at Sterling City, Tex.

Location.--Lat 31°50', long 100°59', on right bank 100 ft upstream from bridge on Farm Road 379, 0.3 mile south of Sterling City, Sterling County, 3.5 miles downstream from Lacy Creek, and 4 miles upstream from Sterling Creek.

Drainage area.--605 sq mi, of which 66 sq mi is probably noncontributing.

Records available.--September 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 2,242.36 ft above mean sea level, datum of 1929. Prior to Dec. 6, 1939, chain gage at same site and datum.

Average discharge.--25 years, 11.5 cfs (8,330 acre-ft per year).

Extremes.--Maximum discharge during year, 4,850 cfs Sept. 23 (gage height, 18.52 ft); no flow most of time. 1939-64: Maximum discharge, 16,300 cfs July 6, 1948 (gage height, 23.70 ft); no flow at times each year. Maximum stage since at least 1891, that of July 6, 1948.

Remarks.--Records good. Small diversions above station for irrigation.

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

2.3	0	4.0	36
2.4	.2	4.5	60
2.5	.5	5.0	90
2.6	1.0	6.0	157
2.7	1.9	7.0	251
2.8	3.1	8.0	371
3.0	6.4	10.0	684
3.2	10	12.0	1,060
3.5	18	14.0	1,640

Discharge, in cubic feet per second, water year October 1963 to September 1964

July	30	49	Sept.	23	*1,540
	31	.7		24	1,230
Aug.	17	*182		25	*126
	18	*11		26	20
Sept.	17	53		27	6.6
	20	34		28	*2.6
	21	28		29	1.3
	22	14		30	.6

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
July 1964	49.7	49	0	1.60	99
August	193	182	0	6.23	383
September	3,056.1	1,540	0	102	6,060
Calendar year 1963	-	108	0	.80	581
Water year 1963-64	-	1,540	0	.90	6,540

Peak discharge (base, 300 cfs)

Date	Time	Gage height	Discharge
9-17	0100	8.40	427
9-23	1700	18.52	4,850
9-24	1600	17.06	3,500

* Discharge measurement made on this day.

Note.--Flow occurred only on days listed above. Observation of no flow made Oct. 1, Nov. 6, Dec. 9, Jan. 13, Feb. 17, Mar. 23, Apr. 27, June 1, July 6, Aug. 10, 19, Sept. 9.

8-1340. North Concho River near Carlsbad, Tex.

Location.--Lat 31°35'33", long 100°38'12", near left bank on downstream side of pier of county road bridge, 0.6 mile southwest of Carlsbad, Tom Green County, 1.5 miles upstream from Mule Creek, and 16.2 miles upstream from San Angelo Dam.

Drainage area.--1,249 sq mi, of which 105 sq mi is probably noncontributing.

Records available.--March 1924 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,968.02 ft above mean sea level, datum of 1929. Prior to Feb. 4, 1925, and Sept. 27, 1936, to Feb. 7, 1937, staff gage, Feb. 4, 1925, to Sept. 26, 1936, and Feb. 8, 1937, to Nov. 6, 1955, water-stage recorder, at site 2½ miles upstream at datum 32.76 ft higher.

Average discharge.--40 years, 44.9 cfs (32,510 acre-ft per year).

Extremes.--Maximum discharge during year, 3,320 cfs Sept. 24 (gage height, 10.59 ft); no flow at times.
1924-64: Maximum discharge, 94,600 cfs Sept. 26, 1936 (gage height, 16.0 ft at former site, 29.1 ft at present site, from floodmarks), from rating curve extended above 11,000 cfs on basis of slope-area measurements of 35,200 cfs and 94,600 cfs at former site; no flow at times.
Maximum stage since 1853, that of Sept. 26, 1936. Stage not known for major flood in June 1853.

Remarks.--Records good. Diversions by pumping above station affect low flow (combined capacity of pumps 40 cfs).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 19, May 28, 29, Sept. 21-25)

3.0	0	3.6	12	5.5	479
3.1	.2	3.8	28	6.0	704
3.2	.7	4.0	51	7.0	1,220
3.3	1.9	4.3	94	8.0	1,850
3.4	4.0	4.6	157	9.0	2,600
3.5	7.3	5.0	272		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0						0	*0.7		0	0
2	0	0						0	.1		0	0
3	0	0						0	.1		0	0
4	0	0						0	0		0	0
5	0	0						0	*0		0	0
6	0	0						0	0		0	0
7	0	0						0	0		0	0
8	0	0						0	0		0	0
9	0	0						0	0		0	0
10	0	0						0	0		0	0
11	0	0						0	0		0	0
12	0	0						0	0		0	0
13	0	0						0	0		0	0
14	0	0						0	0		0	0
15	0	0						0	0		0	0
16	0	0						0	0		0	0
17	0	0						0	0		0	0
18	0	0						0	0		*66	0
19	0	*132						0	0		*11	0
20	0	*2.7						0	0		1.0	0
21	0	.1						0	0		0	180
22	0	0						0	0		0	328
23	0	0						0	0		0	68
24	0	0						0	0		0	*2,130
25	.8	0						0	0		0	*1190
26	.5	0			(*)			0	0		0	96
27	0	*0						0	0		0	30
28	0	0						*178	0		*0	*13
29	0	0		(*)			(*)	187	*0		0	6.2
30	0	0	(*)		----------	(*)		*26	0	(*)	0	2.6
31	*0	----------			----------		----------	4.2	----------		0	----------
Total	1.3	134.8	0	0	0	0	0	395.2	0.9	0	78.0	4,043.8
Mean	0.04	4.49	0	0	0	0	0	12.7	0.03	0	2.52	135
Ac-ft	2.6	267	0	0	0	0	0	784	1.8	0	155	8,020

Calendar year 1963: Max 430 Min 0 Mean 4.66 Ac-ft 3,370
Water year 1963-64: Max 2,130 Min 0 Mean 12.7 Ac-ft 9,230

Peak discharge (base, 1,500 cfs)

Date	Time	Gage height	Discharge
5-28	2100	8.30	1,780
9-24	0900	10.59	3,320
9-25	0430	10.43	3,160

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

8-1345. San Angelo Reservoir at San Angelo, Tex.

Location.--Lat 31°29'04", long 100°28'53", in intake structure of San Angelo Dam on North Concho River, 3.1 miles northwest of San Angelo, Tom Green County, 6.2 miles downstream from Dry Creek, and 10.1 miles downstream from Grape Creek.

Drainage area.--1,488 sq mi, of which 105 sq mi is probably noncontributing.

Records available.--February 1952 to September 1964.

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929. Prior to May 12, 1953, staff gage at same site and datum.

Extremes.--Maximum contents during year, 41,220 acre-ft Oct. 1 (elevation, 1,886.95 ft); minimum, 21,870 acre-ft Sept. 20-21 (elevation, 1,877.85 ft).

1952-64: Maximum contents, 174,100 acre-ft Oct. 14, 1957 (elevation, 1,916.47 ft); minimum contents since first appreciable storage, that of Sept. 20-21, 1964.

Remarks.--Reservoir is formed by a rolled earth-fill dam 40,885 ft long including spillway. Closure was completed Mar. 7, 1951. Deliberate impoundment of water began Feb. 1, 1952. Reservoir is operated for flood control and part of municipal supply for city of San Angelo. Outlet works consist of 6 gate-controlled outlets (7.5 by 14.5 ft) opening into two 18-foot diameter concrete conduits, and two 30-inch gate-controlled outlets for water supply outlet. The emergency spillway to the right of the dam is an uncontrolled off-channel concrete gravity dam with ogee weir section 1,150 ft long designed to discharge 356,000 cfs at maximum design level (elevation, 1,958.0 ft). Capacity based on survey made in 1944. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	1,964.0	-
Crest of emergency spillway	1,938.5	396,400
Top of conservation storage	1,908.0	119,200
Inverts to wet well for 30-inch outlets	1,878.5	22,970
Inverts of 6 gate-controlled outlets	1,840.0	5

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

Capacity table (elevation, in feet, and contents, in acre-feet)

1,877	20,490	1,883	31,850
1,879	23,850	1,885	36,420
1,881	27,650	1,887	41,350

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	41,070	38,940	38,760	37,910	37,060	36,440	35,220	33,820	33,110	29,720	25,830	23,370
2	40,970	38,820	38,690	37,880	37,060	36,420	35,150	33,720	33,090	29,610	25,730	23,230
3	40,860	38,710	38,660	37,810	37,080	36,350	35,080	33,630	33,020	29,510	25,640	23,110
4	40,790	38,640	38,620	37,780	37,110	36,280	35,010	33,540	32,910	29,360	25,510	23,000
5	40,690	38,590	38,570	37,780	37,130	36,230	34,960	33,470	32,840	29,220	25,370	22,940
6	40,610	38,540	38,490	37,740	37,110	36,200	34,890	33,410	32,870	29,070	25,240	22,850
7	40,510	38,520	38,470	37,690	37,060	36,180	34,730	33,320	32,800	28,910	25,090	22,710
8	40,440	38,470	38,440	37,660	37,010	36,130	34,620	33,230	32,660	28,760	24,980	22,640
9	40,360	38,470	38,420	37,660	36,990	36,090	34,590	33,140	32,510	28,620	24,890	22,570
10	40,260	38,420	38,470	37,640	36,960	36,040	34,590	33,020	32,350	28,480	24,760	22,450
11	40,180	38,370	38,390	37,590	36,920	35,990	34,520	32,910	32,240	28,370	24,670	22,340
12	40,080	38,320	38,370	37,540	36,940	35,940	34,430	32,800	32,150	28,250	24,560	22,280
13	39,980	38,200	38,340	37,490	36,920	35,870	34,340	32,690	32,040	28,150	24,450	22,230
14	39,910	38,120	38,300	37,420	36,890	35,800	34,270	32,580	31,910	28,030	24,340	22,180
15	39,830	38,100	38,270	37,420	36,840	35,760	34,180	32,460	31,780	27,890	24,430	22,130
16	39,830	38,100	38,250	37,400	36,800	35,800	34,090	32,350	31,670	27,650	24,690	22,070
17	39,760	38,050	38,220	37,370	36,770	35,730	34,020	32,240	31,520	27,520	24,670	22,000
18	39,630	37,980	38,200	37,320	36,700	35,870	33,970	32,130	31,370	27,380	24,610	21,920
19	39,580	39,010	38,200	37,250	36,660	35,850	33,910	32,040	31,240	27,250	24,560	21,880
20	39,580	39,040	38,150	37,200	36,660	35,760	33,930	31,960	31,110	27,130	24,450	21,870
21	39,530	39,040	38,120	37,160	36,630	35,730	33,950	31,850	31,000	27,030	24,340	21,980
22	39,480	39,040	38,100	37,130	36,580	35,710	33,930	31,740	30,850	26,930	24,280	22,500
23	39,430	38,980	38,030	37,110	36,560	35,660	33,880	31,630	30,720	26,850	24,210	22,760
24	39,360	38,940	38,000	37,060	36,630	35,590	33,860	31,520	30,590	26,730	24,120	26,750
25	39,380	38,910	37,980	37,040	36,610	35,520	33,820	31,430	30,460	26,580	24,030	29,380
26	39,360	38,860	37,950	37,010	36,560	35,480	34,200	31,320	30,330	26,400	23,900	29,590
27	39,330	38,910	37,930	36,960	36,510	35,430	34,160	31,240	30,200	26,270	23,800	29,610
28	39,260	38,860	37,930	36,920	36,490	35,360	34,040	32,240	30,100	26,150	23,690	29,590
29	39,210	38,820	37,930	36,920	36,440	35,290	33,950	33,140	29,970	26,080	23,580	29,570
30	39,130	38,760	37,950	37,080	----------	35,240	33,880	33,230	29,850	25,980	23,530	29,550
31	39,040	----------	37,930	37,060	----------	35,240	----------	33,110	----------	25,880	23,480	----------
(†)	1,886.08	1,885.97	1,885.63	1,885.27	1,885.01	1,884.50	1,883.91	1,883.57	1,882.07	1,880.10	1,878.79	1,881.93
(‡)	-2,180	-280	-830	-870	-620	-1,200	-1,360	-770	-3,260	-3,970	-2,400	+6,070

Calendar year 1963..... ‡ -19,570
Water year 1963-64..... ‡ -11,670

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-1350. North Concho River at San Angelo, Tex.

Location.--Lat 31°27'56", long 100°26'51", near left bank on downstream side of pier of Sixth Street Bridge in San Angelo, Tom Green County, 3.2 miles upstream from confluence with South Concho River, and 3.4 miles downstream from San Angelo Dam.

Drainage area.--1,507 sq mi, of which 105 sq mi is probably noncontributing.

Records available.--October 1915 to June 1928, February 1929 to September 1931, July 1947 to September 1964.

Gage.--Water-stage recorder. Concrete control since July 1947. Datum of gage is 1,813.42 ft above mean sea level, datum of 1929, Prior to Sept. 1, 1920, staff gage and Sept. 1, 1920, to Feb. 11, 1929, water-stage recorder, at site 1.6 miles downstream at datum 11.02 ft lower. Feb. 12, 1929, to Sept. 30, 1931, water-stage recorder at site 1.6 miles downstream at datum 13.02 ft lower.

Average discharge.--30 years (1916-27, 1929-31, 1947-64), 37.0 cfs (26,790 acre-ft per year).

Extremes.--Maximum discharge during year, 1,360 cfs May 28 (gage height, 3.60 ft); minimum daily, 0.6 cfs July 22, Aug. 2.

1915-31, 1947-64: Maximum discharge, about 47,000 cfs June 13, 1930 (gage height, 22.52 ft, site and datum then in use); no flow at times.

Flood of Sept. 17, 1936, reached a stage of 34.6 ft, from floodmarks (discharge, 184,000 cfs by slope-area measurement). The flood in 1936 was the greatest since flood in June 1853 (stage unknown).

Remarks.--Records good. Since 1952, flow largely regulated by San Angelo Reservoir (see preceding page).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 18, Apr. 21, May 28-29, June 17-19, July 5-11, 15-17, Aug. 3, 10-12, 16, 20-21, 24, Sept. 2-8, 10-11, 17, 19-20)

0.96	0.6	1.3	5.1	2.0	45
1.0	1.0	1.4	7.7	2.2	85
1.1	1.8	1.6	15	2.5	190
1.2	3.4	1.8	25		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	14	3.5	2.8	3.2	3.4	18	24	1.4	24	1.4	26
2	14	11	3.2	4.3	3.2	7.3	17	14	1.2	28	.6	27
3	15	1.6	3.7	13	8.1	17	8.3	14	8.2	29	*4.0	37
4	17	4.2	5.6	3.5	9.4	11	8.0	16	27	29	18	36
5	19	14	16	1.8	3.7	3.8	8.0	20	25	36	18	26
6	15	15	14	2.4	3.4	3.8	11	26	2.9	38	18	17
7	17	15	3.5	14	3.2	7.4	14	26	7.5	43	17	37
8	20	12	3.2	11	3.2	17	15	27	26	42	16	32
9	20	1.8	3.2	1.9	3.0	13	10	27	26	42	17	6.0
10	18	1.1	3.5	1.7	3.0	3.8	2.9	28	29	42	33	29
11	15	1.0	3.5	1.7	5.9	3.8	17	29	36	26	20	43
12	15	3.3	3.5	1.6	13	7.7	21	29	32	1.3	36	12
13	14	18	3.5	4.6	3.5	16	17	28	26	.9	35	4.9
14	14	22	3.4	15	3.0	16	16	29	26	19	33	3.9
15	15	11	3.4	12	2.8	12	*22	26	27	26	44	3.4
16	15	1.6	6.9	2.4	2.8	3.3	24	21	31	35	55	4.8
17	15	3.2	16	2.0	5.7	12	22	21	*35	28	4.0	36
18	15	11	4.5	5.7	15	25	19	23	35	20	2.2	23
19	14	31	3.4	16	12	14	19	*28	32	20	4.6	20
20	3.6	4.5	3.4	16	3.4	2.0	20	28	29	18	30	37
21	2.6	3.8	3.2	17	3.4	1.6	24	28	29	2.3	39	13
22	15	4.5	3.2	17	3.4	1.6	2.6	28	29	.6	4.2	5.5
23	15	3.4	6.7	12	3.2	4.2	1.8	26	29	5.6	2.2	5.7
24	15	3.4	16	1.8	3.9	14	1.8	25	28	20	16	14
25	17	3.4	12	1.5	3.5	14	1.5	28	30	20	34	4.5
26	3.2	4.3	3.2	1.4	3.2	14	5.0	32	29	20	30	2.6
27	1.3	10	2.8	4.7	3.4	14	1.5	26	34	20	*30	2.8
28	1.2	4.0	2.8	16	3.4	10	4.2	164	29	17	29	3.5
29	3.9	3.5	2.8	17	3.4	1.9	14	13	29	9.2	28	4.5
30	14	3.5	3.2	22	----------	5.7	19	1.8	26	9.5	21	4.5
31	14	----------	2.8	3.9	----------	18	----------	1.4	----------	7.3	14	----------
Total	406.8	240.1	169.6	247.7	141.3	298.3	384.6	857.2	755.2	678.7	654.2	521.6
Mean	13.1	8.00	5.47	7.99	4.87	9.62	12.8	27.7	25.2	21.9	21.1	17.4
Ac-ft	807	476	336	491	280	592	763	1,700	1,500	1,350	1,300	1,030

Calendar year 1963: Max 211 Min 0 Mean 16.3 Ac-ft 11,840
Water year 1963-64: Max 164 Min 0.6 Mean 14.6 Ac-ft 10,620

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

8-1360. Concho River near San Angelo, Tex.

Location.--Lat 31°27'10", long 100°23'30", on left bank 0.5 mile downstream from confluence of North Concho and South Concho Rivers, and 1.8 miles southeast of San Angelo, Tom Green County.

Drainage area.--5,380 sq mi, of which 1,283 sq mi is probably noncontributing.

Records available.--September 1915 to September 1964.

Gage.--Water-stage recorder and concrete control since December 1960. Datum of gage is 1,776.79 ft above mean sea level, datum of 1929. Prior to Aug. 11, 1917, staff gage at same site and datum. Prior to May 16, 1963, at same site on right bank.

Average discharge.--49 years, 152 cfs (110,000 acre-ft per year).

Extremes.--Maximum discharge during year, 2,060 cfs May 28 (gage height, 5.60 ft); minimum daily, 0.1 cfs at times.

1915-64: Maximum discharge, 230,000 cfs Sept. 17, 1936 (gage height, 46.6 ft, from floodmarks), from rating curve defined by current-meter measurements below 105,000 cfs and slope-area measurements of 67,000 and 230,000 cfs; no flow at times in 1921, 1952-53.

Maximum stage known since 1853, 47.5 ft Aug. 6, 1906 (discharge, about 246,000 cfs), from information by local resident. Other large floods are known to have occurred in June 1853, August 1882 and April 1900.

Remarks.--Records good. Many diversions above station for irrigation and municipal supply. The city of San Angelo diverted 11,280 acre-ft for municipal use during the 1964 water year. Prior to July 1957, part of the sewage effluent was returned to the stream about 1,000 ft downstream from gage, and part of it was used to irrigate about 100 acres of land on left bank opposite gage. Since July 1957, all of the sewage effluent has been used for irrigation about 6 miles downstream from gage and none is returned directly to the stream. Flow regulated by Twin Buttes Reservoir (station 8-1312), Lake Nasworthy (see p. 362) on South Concho River, and San Angelo Reservoir (station 8-1345) on North Concho River.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Dec. 17-Jan. 29)

1.3	0.2	1.7	10	2.4	108
1.4	.7	1.8	17	2.7	192
1.5	2.2	2.0	37	3.0	300
1.6	5.1	2.2	67		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.1	0.5	0.1	1.6	0.1	0.1	0.1	0.1	0.1	0.1	0.2
2	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.2
3	.2	.1	.1	.1	1.7	.1	.1	.1	.1	.1	.1	.1
4	.1	.1	.1	.1	24	.1	.1	.1	.1	.1	.1	.2
5	.1	.1	.1	.1	4.9	.1	.1	.1	.2	.1	.1	.2
6	.1	.1	.1	.1	.1	.1	.1	.1	.2	.1	.1	.1
7	.1	.1	.1	.1	.3	.1	.1	.1	.1	.1	.1	.1
8	.1	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
9	.1	.2	.1	.1	.1	.2	.1	.1	.1	.1	.1	.1
10	.2	.1	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1
11	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.2
12	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	a1.0
13	.1	.1	.1	.1	.3	.1	.1	.1	.1	.1	.1	.2
14	.1	.1	.1	.1	.1	.1	**.1	.1	.1	.1	.1	.1
15	.2	.1	.1	.1	.1	.1	.1	.1	**.1	.1	.5	.1
16	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	102	.1
17	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	10	.1
18	.1	.1	.1	.1	.1	17	.1	.1	.1	.1	.2	.1
19	.1	62	.1	.1	.1	47	.1	.1	.1	.1	.1	.1
20	.1	17	.1	.1	.1	5.9	.3	.1	.1	.1	.1	a10
21	.1	6.5	.1	.1	.2	.1	44	.1	.1	.1	.1	8.0
22	.1	9.9	.1	.1	.1	.1	10	.1	.1	.1	.1	2.9
23	.1	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	a.2
24	.1	.1	.1	.1	.6	.1	.1	.1	.1	.1	.1	a10
25	.4	.1	.1	.1	.4	.1	.1	.1	.1	.1	**.1	a.5
26	2.6	.1	.1	.1	.1	.1	.3	.1	.1	.1	.1	a.2
27	.6	*.7	*.1	.1	.1	.1	.2	.1	.1	.1	.1	a.1
28	.1	.2	.1	.1	.1	.1	.1	234	.1	.1	.1	a.1
29	.1	.7	.1	.1	.1	.1	.1	47	.1	.2	.1	a.1
30	.1	.2	.3	29	----------	.1	.1	8.4	.1	.2	.2	a.1
31	.1	----------	.1	9.0	----------	.1	----------	.1	----------	.1	.2	----------
Total	6.8	99.7	3.8	40.9	36.0	72.8	57.3	292.2	3.2	3.3	115.6	35.6
Mean	0.22	3.32	0.12	1.32	1.24	2.35	1.91	9.43	0.11	0.11	3.73	1.19
Ac-ft	13	198	7.5	81	71	144	114	580	6.3	6.5	229	71

Calendar year 1963: Max 171 Min 0.1 Mean 5.81 Ac-ft 4,200
Water year 1963-64: Max 234 Min 0.1 Mean 2.10 Ac-ft 1,520

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

8-1365. Concho River near Paint Rock, Tex.

Location.--Lat 31°31', long 99°55', near left bank on downstream side of pier of bridge on U. S. Highway 83, 0.2 mile north of Paint Rock, Concho County, and 2 miles downstream from Kickapoo Creek.

Drainage area.--6,415 sq mi, of which 1,283 sq mi is probably noncontributing.

Records available.--September 1915 to September 1964.

Gage.--Water-stage recorder with masonry dam control. Datum of gage is 1,574.43 ft above mean sea level, datum of 1929. Prior to Sept. 16, 1920, staff gage and Sept. 17, 1920, to Sept. 17, 1936, water-stage recorder, at site 1.4 miles upstream at datum 13.16 ft higher. Oct. 2, 1936, to May 18, 1938, staff gage at site 1,000 ft downstream at present datum. May 19, 1938, to Jan. 14, 1940, wire-weight gage at present site and datum.

Average discharge.--49 years, 204 cfs (147,700 acre-ft per year).

Extremes.--Maximum discharge during year, 6,430 cfs Aug. 30 (gage height, 16.58 ft); no flow at times.
1915-64: Maximum discharge, 301,000 cfs Sept. 17, 1936 (gage height, 43.4 ft, from floodmarks), from rating curve defined by current-meter measurements below 85,000 cfs and slope-area measurements at 144,000 and 301,000 cfs; no flow at times.
Maximum stage since at least 1853, that of Sept. 17, 1936. Flood in August 1882 reached a stage of about 39.9 ft and flood in August 1906 reached a stage of 39.5 ft, from information by local resident.

Remarks.--Records good above 10 cfs and fair below. Many diversions above station for irrigation and municipal supply. Regulation same as that for Concho River near San Angelo (see preceding page).

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.7	0.1	11	9.2	7.6	9.2	1.5	3.0	28	0.1	0	*42
2	.6	.1	9.2	*9.2	5.2	8.4	1.5	3.0	18	.1	0	15
3	.5	.1	9.2	7.6	6.0	6.8	1.5	2.4	12	.1	0	*6.0
4	.5	.1	9.2	7.6	15	4.4	1.1	3.0	9.2	.1	0	4.4
5	.5	0	8.4	7.6	10	4.4	1.1	2.4	265	.1	0	3.0
6	.4	0	8.4	7.6	8.4	3.6	.7	1.9	40	.1	0	2.4
7	.4	0	7.6	7.6	7.6	3.6	.3	1.9	15	.1	0	1.5
8	.4	0	7.6	6.8	8.4	3.0	.3	1.1	10	.1	0	1.1
9	.4	0	7.6	6.0	8.4	1.6	.7	.7	7.6	.1	0	.7
10	.4	0	7.6	6.0	*7.6	2.8	.7	.7	4.4	.1	0	.3
11	.3	0	8.4	6.8	6.8	*6.0	.7	.3	3.0	.1	0	.3
12	.3	0	8.4	6.8	9.2	5.2	.7	.2	2.4	.1	0	.3
13	.3	0	8.4	7.6	8.4	4.4	.3	.2	1.9	.1	0	.3
14	.3	0	8.4	6.8	7.6	3.6	0	.2	1.5	.1	0	.3
15	.3	0	8.4	6.8	6.0	3.6	*.3	.2	1.1	.1	0	.2
16	.2	0	8.4	6.8	6.0	3.6	.3	.2	.7	.1	0	.2
17	.2	0	8.4	6.8	5.2	4.4	.3	.2	**.3	.1	0	.2
18	.2	0	8.4	6.0	3.6	5.2	.3	.1	.3	.1	0	.2
19	.2	0	8.4	3.0	3.6	5.2	.3	.1	.2	.1	0	.2
20	.2	0	8.4	3.6	3.6	5.2	.3	**.1	.2	.1	0	.2
21	.1	11	8.4	4.4	5.2	5.2	16	.1	.2	.1	0	6.3
22	.1	29	8.4	4.4	5.2	4.4	9.2	.1	.2	.1	1.8	127
23	.1	21	8.4	3.6	5.2	3.6	4.4	.1	.2	**.1	23	137
24	**.1	17	8.4	1.9	5.2	3.6	6.8	.1	.2	.1	8.4	517
25	.1	13	8.4	1.5	4.4	3.0	4.4	.1	.2	.1	*3.6	156
26	.1	12	8.4	1.9	7.6	2.4	26	.1	.2	.1	2.4	52
27	.1	12	8.4	1.5	8.4	1.9	16	.1	.2	.1	4.4	310
28	.1	12	8.4	1.5	9.2	1.9	6.8	.2	.2	.1	9.2	51
29	.1	*12	8.4	2.4	9.2	1.9	4.4	216	.2	.1	3.0	26
30	.1	11	8.4	5.2	----------	1.5	3.6	144	.2	.1	*1,560	14
31	.1	----------	8.4	9.2	----------	1.5	----------	46	----------	.1	*144	----------
Total	8.4	150.4	262.2	173.7	203.8	125.1	110.5	428.8	422.8	3.1	1,759.8	1,475.1
Mean	0.27	5.01	8.46	5.60	7.03	4.04	3.68	13.8	14.1	0.10	56.8	49.2
Ac-ft	17	298	520	345	404	248	219	851	839	6	3,490	2,930

Calendar year 1963: Max 1,170 Min 0 Mean 16.9 Ac-ft 12,270
Water year 1963-64: Max 1,560 Min 0 Mean 14.0 Ac-ft 10,170

* Discharge measurement made on this day.

** Field estimate made on this day.

8-1370. Mukewater Creek subwatershed No. 9 near Trickham, Tex.

Location.--Lat 31°41'40", long 99°12'18", near center of dam on tributary to Sand Creek, 1.5 miles upstream from mouth, 4.5 miles southwest of Bangs, Brown County, and 7.1 miles north of Trickham, Coleman County.

Drainage area.--4.02 sq mi.

Records available.--January 1961 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,500.01 ft above mean sea level, datum of 1929.

Extremes.--Maximum outflow during year, 37.6 cfs Apr. 23 (gage height, 22.79 ft); no outflow for many days. Maximum inflow, 1,170 cfs (average for 5-minute interval) Apr. 23, adjusted for rainfall on pool surface during time of peak inflow.

1961-64: Maximum outflow, that of Apr. 23, 1964; no outflow for many days. Maximum inflow, 1,440 cfs (average for 15-minute interval) June 3, 1961, adjusted for rainfall on pool surface during time of peak inflow.

Remarks.--Records good. Dam completed November 1960 and gage established Jan. 19, 1961. Storage began prior to establishment of gage. Rolled-fill earthen dam is 2,070 ft long, with 150 ft wide earthen spillway at right end of dam with crest at gage height 27.1 ft. Outlet structure is 2 x 4 ft. Uncontrolled concrete drop inlet structure connected to a 19-inch outlet pipe. The openings in top of drop inlet are 1 x 2 ft on upstream and downstream sides, and 1 x 4 ft on right and left sides. All openings are at gage height 18.2 ft. There is a sluice gate at end of an 8-inch pipe which connects to lower end of drop inlet box at gage height 10.7 ft. Pool capacity, 725 acre-ft at spillway crest, 114 acre-ft at top of drop outlet, and 16 acre-ft at sluice gate. Capacity based on survey made Dec. 1, 1961.

Pool water budget, in acre-feet, water year October 1963 to September 1964

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Inflow[1/]	8.2	61.7	0.8	32.5	19.6	8.4	350	0.4	0.8	0.2	0.5	113
Outflow	0	7.1	0	16.9	21.2	0	344	.2	0	0	0	48.2
(††)	.98	4.03	.37	2.28	1.14	1.53	5.22	.73	.64	0	1.31	5.53

Calendar year 1963: Inflow 303 Outflow 176 †† 20.31
Water year 1963-64: Inflow 596 Outflow 438 †† 23.76

1/ Inflow adjusted for rainfall on pool and for pool losses.
†† Weighted mean rainfall, in inches.

8-1375. Mukewater Creek at Trickham, Tex.

Location.--Lat 31°36', long 99°13', on left bank at Trickham, Coleman County, 750 ft upstream from bridge on Farm Road 1176, 2.9 miles upstream from Hay Creek, 6.9 miles upstream from mouth, and 11.8 miles southwest of Santa Anna.

Drainage area.--70.0 sq mi.

Records available.--August 1951 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,394.54 ft above mean sea level (State Highway Department bench mark).

Average discharge.--13 years, 10.3 cfs (7,460 acre-ft per year).

Extremes.--Maximum discharge during year, 2,450 cfs Apr. 24 (gage height, 7.89 ft); no flow most of time.
1951-64: Maximum discharge, 15,000 cfs May 1, 1956 (gage height, 15.83 ft), from rating curve defined by current-meter measurements below 5,600 cfs and contracted-opening measurement of peak flow; no flow at times.
Maximum stage since at least 1919, 18 ft in 1927, from information by local resident.

Remarks.--Records good. Station maintained to establish rainfall-runoff relationships and to assist the Soil Conservation Service in evaluating the effect of floodwater-retarding structures to be constructed in the basin. Twenty rain gages (15 standard and 5 recording) are operating in the basin above this station. No diversion above station. At end of year, flow from 15.3 sq mi above this station was partly controlled by 5 floodwater-retarding structures with a total combined capacity of 2,960 acre-ft below the flood spillway crests, of which 2,590 acre-ft is floodwater-retarding capacity and 375 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation capacity until eliminated by sedimentation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 8-9, 19, Jan. 30, Feb. 4, Apr. 4-5, 21, 23-27, Sept. 21-22, 24)

1.68	0	2.4	50
1.7	.1	2.7	107
1.8	.9	3.5	350
1.9	2.9	5.0	900
2.0	6.8	6.0	1,350
2.1	14		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0		0	3.5	0	0	18	0			0
2		0		0	1.3	0	0	11	0			0
3		0		0	.7	0	0	4.6	0			0
4		0	(*)	0	51	0	19	*4.2	0			0
5		0		0	11	0	69	1.5	12			0
6		0		0	3.2	0	3.8	.6	1.7			0
7		0		0	.9	0	1.9	.3	.2	(*)		0
8		26		*0	.3	0	3.2	.1	0			0
9		120		0	.2	0	2.6	.1	0			0
10		15		0	.1	2.4	1.5	0	0			0
11		4.6		0	*0	1.0	.1	0	0			0
12		1.5		0	0	.2	0	0	0		(*)	0
13		.5		0	0	0	0	0	0			0
14		.2		0	0	0	0	0	0			0
15		0		0	0	0	0	0	0			0
16		0		0	0	0	0	0	0			*0
17		0		0	0	0	0	0	0			0
18		0		0	0	*0	0	0	0			0
19		45		0	0	.6	0	0	0			0
20		34		0	0	1.6	0	0	0			0
21		7.3		0	0	1.5	*31	0	0			192
22		3.2		0	0	.3	22	0	0			90
23		1.9		0	0	.1	*286	0	0			8.5
24		1.3		0	0	0	*976	0	0			93
25		.8		0	0	0	176	0	0			24
26		.3		0	0	0	273	*0	0			8.5
27		.2		0	0	0	*102	0	0			29
28		.2		0	0	0	*52	0	0			14
29	(*)	.1		0	0	0	32	0	0			8.5
30		0		68	----------	0	21	0	0			7.3
31		----------		24	----------	0	----------	0	----------			----------
Total	0	262.1	0	92.0	72.2	7.7	2,072.1	40.4	13.9	0	0	474.8
Mean	0	8.74	0	2.97	2.49	0.25	69.1	1.30	0.46	0	0	15.8
Ac-ft	0	520	0	182	143	15	4,110	80	28	0	0	942
(†)	163	239	221	280	254	256	411	290	200	125	98.0	316
(††)	0.81	3.69	0.36	2.22	1.22	1.37	5.45	0.64	0.73	0.09	1.27	5.99

Calendar year 1963: Max 643 Min 0 Mean 6.55 Ac-ft 4,750 †† 21.26
Water year 1963-64: Max 976 Min 0 Mean 8.29 Ac-ft 6,020 †† 23.84

Peak discharge (base, 600 cfs)

Date	Time	Gage height	Discharge
4-24	0600	7.89	2,450

* Discharge measurement or observation of no flow made on this day.
† Contents, in acre-feet, at end of month, in Soil Conservation Service reservoirs upstream from station.
†† Weighted mean rainfall, in inches, during month, in study area.

8-1380. Colorado River at Winchell, Tex.

Location.--Lat 31°28'05", long 99°09'45", near left bank on downstream side of pier of bridge on U. S. Highway 377, 0.3 mile south of Winchell, Brown County, and 6.2 miles downstream from Home Creek.
Drainage area.--24,580 sq mi, approximately, of which 11,900 sq mi is probably noncontributing.
Records available.--November 1923 to September 1934 (published as "near Milburn"), January 1939 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 1,264.86 ft above mean sea level, datum of 1929. November 1923 to September 1934 combination staff and chain gage at site 4.2 miles downstream at datum 10.14 ft lower. Jan. 13, 1939, to Mar. 24, 1940, wire-weight gage at present site and datum.
Average discharge.--35 years (1924-34, 1939-64), 658 cfs (476,400 acre-ft per year).
Extremes.--Maximum discharge during year, 13,700 cfs Apr. 24 (gage height, 20.02 ft); no flow Oct. 7 to Nov. 7, July 10 to Aug. 15.
1923-34, 1939-64: Maximum discharge, 76,100 cfs Oct. 15, 1930 (gage height, 51.8 ft, present site and datum); no flow at times.
Highest stages since 1882 were 62.2 ft Sept. 19, 1936, and 56.2 ft Aug. 8, 1906, at bridge 1,000 ft upstream and converted to present site and datum, from information by Gulf, Colorado and Santa Fe Railway Co.
Remarks.--Records good. Diversions above station for irrigation, municipal supply, and oilfield operation. Some regulation by the following: Since July 1952 by Lake J. B. Thomas (station 8-1180), since April 1949 by Lake Colorado City (see p. 362), since May 1953 by Oak Creek Reservoir (see p. 362), by Lake Nasworthy (see p. 362), since February 1952 by San Angelo Reservoir (station 8-1345), since August 1958 by Champion Creek Reservoir (station 8-1236), and since October 1962 by Twin Buttes Reservoir (station 8-1312).
At end of year, flow from 177 sq mi above this station was partly controlled by 43 floodwater-retarding structures with a total combined capacity of 42,180 acre-ft below the flood spillway crests, of which 38,320 acre-ft is floodwater-retarding capacity and 3,860 acre-ft is sediment-pool capacity. Sixteen of these structures were built during the current year and have a total combined capacity below flood spillway crests of 14,830 acre-ft, of which 1,250 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

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

2.2	0	2.8	32	6.0	882
2.3	.7	3.0	52	8.0	2,240
2.4	3.7	3.4	104	10.0	3,720
2.5	8.8	4.2	230	14.0	7,300
2.6	16	5.0	424	14.3	7,600

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.7	*0	78	11	56	11	3.7	143	424	4.6	0	1,020
2	.6	0	*67	11	48	10	3.7	114	410	3.7	0	411
3	.4	0	58	11	50	9.4	3.3	73	360	3.0	0	286
4	.3	0	49	11	373	8.8	3.7	51	234	2.6	0	187
5	.2	0	43	11	240	8.8	160	38	340	2.4	0	132
6	.1	0	37	*11	125	9.4	68	26	214	1.5	0	89
7	0	0	33	11	140	8.8	39	20	388	1.2	0	65
8	0	1.4	29	12	148	14	22	14	440	.6	0	52
9	0	157	25	11	100	268	14	12	332	.3	0	42
10	0	69	24	11	70	118	8.8	10	205	0	*0	36
11	0	22	24	11	*54	56	8.0	7.7	138	0	0	29
12	0	16	22	11	42	39	6.1	6.6	120	0	0	22
13	0	13	22	10	37	26	3.7	5.6	100	0	0	16
14	0	13	21	9.4	31	19	3.3	4.6	671	0	0	*13
15	0	11	20	11	26	14	2.4	4.1	349	0	0	10
16	0	8.2	16	11	24	*12	2.0	3.3	186	0	278	7.7
17	0	7.2	16	11	22	13	1.7	3.0	116	0	68	6.1
18	0	6.1	15	10	20	22	1.7	2.4	75	0	23	5.1
19	0	8.2	14	9.4	16	88	1.5	1.7	51	0	11	16
20	0	43	14	8.8	16	35	*1.2	1.2	37	0	600	361
21	0	557	14	8.2	16	21	478	1.2	26	0	379	2,110
22	0	382	13	8.2	16	16	523	1.2	20	0	213	6,660
23	0	218	12	8.8	15	13	*5,490	1.5	15	0	161	863
24	0	144	11	8.8	15	10	7,570	1.2	13	0	106	3,860
25	0	96	11	7.7	16	8.8	1,100	*1.0	10	0	65	2,870
26	0	73	11	8.2	13	7.7	1,260	.7	8.8	0	78	2,570
27	0	65	11	7.7	13	5.6	1,150	25	7.7	0	50	5,900
28	0	112	10	7.2	11	4.6	523	28	6.1	0	33	1,620
29	0	120	10	7.7	11	4.1	310	91	5.6	0	23	551
30	0	98	10	40	----------	4.1	202	1,380	5.1	0	2,360	317
31	0	----------	11	134	----------	3.7	----------	868	----------	0	2,870	----------
Total	2.3	2,240.1	751	460.1	1,764	888.8	18,963.8	2,940.0	5,307.3	19.9	7,318	30,126.9
Mean	0.07	74.7	24.2	14.8	60.8	28.7	632	94.8	177	0.64	236	1,004
Ac-ft	4.6	4,440	1,490	913	3,500	1,760	37,610	5,830	10,530	39	14,520	59,760

Calendar year 1963: Max 6,750 Min 0 Mean 162 Ac-ft 117,100
Water year 1963-64: Max 7,570 Min 0 Mean 193 Ac-ft 140,400

Peak discharge (base, 12,000 cfs)

Date	Time	Gage height	Discharge
4-24	0800	20.02	13,700

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

8-1390. Deep Creek subwatershed No. 3 near Placid, Tex.

Location.--Lat 31°17'10", long 99°09'25", near right end of dam on tributary to Deep Creek, 2.8 miles southeast of Placid, McCulloch County.

Drainage area.--3.42 sq mi.

Records available.--October 1953 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,500.00 ft above mean sea level, datum of 1929. Prior to Dec. 1, 1953, staff gage at same site and datum.

Average outflow.--11 years, 293 acre-ft per year.

Extremes.--Maximum outflow during year, 26.7 cfs (gage height, 15.21 ft) Sept. 27. Maximum inflow, 681 cfs (average for 5-minute interval) Sept. 27, adjusted for rainfall on pool surface during time of peak inflow. No inflow for many days.

1953-64: Maximum outflow, 30 cfs May 19, 1955 (gage height, 20.79 ft). Maximum inflow, 1,800 cfs May 18, 1955 (average for 15-minute interval), adjusted for rainfall on pool surface during time of peak inflow, computed from outflow and change in pool contents. No inflow or outflow for many days.

Remarks.--Records good. Records given herein represent daily outflow from pool, determined from stage-discharge relation for outlet structure. Pool is formed by earth-fill dam; dam completed and storage began in October 1953. Outlet is a 2.5-foot square concrete drop inlet structure (gage height of crest, 13.0 ft) connected to a 17-inch concrete outlet pipe at gage height 5.5 ft. There is also an 8-inch controlled water-supply outlet pipe connected to the drop outlet at gage height 5.5 ft. Spillway crest is at gage height 22.0 ft. Pool capacity, 886 acre-ft at spillway crest, 125 acre-ft at concrete drop outlet, and 7.1 acre-ft at controlled outlet pipe, from Soil Conservation Service survey dated Aug. 27, 1960.

Pool water budget, in acre-feet, water year October 1963 to September 1964

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Inflow1/	0	18.1	0.4	11.6	11.0	48.0	17.6	76.9	23.8	0.1	10.8	251
Outflow	0	0	0	0	0	0	0	29.6	18.3	0	0	185
(††)	.20	3.09	.58	2.37	1.49	2.89	2.70	2.85	.96	.35	2.38	8.85

Calendar year 1963: Inflow 114 Outflow 0 †† 19.25
Water year 1963-64: Inflow 469 Outflow 233 †† 28.71

Peak inflow (base, 100 cfs)

Date	Time	Discharge	Date	Time	Discharge
3- 8	2100	140 (15-min)	9-21	1445	203 (15-min)
5-28	2220	424 (5-min)	9-21	2215	221 (15-min)
9-20	0630	103 (15-min)	9-27	0620	681 (5-min)
9-21	0130	179 (15-min)			

1/ Inflow adjusted for rainfall on pool and for pool losses.
†† Weighted mean rainfall, in inches.

8-1395. Deep Creek near Mercury, Tex.

Location.--Lat 31°24'10", long 99°07'15", near left bank on downstream side of bridge on Farm Road 502, 1.5 miles upstream from Dry Prong Deep Creek, and 2.3 miles southeast of Mercury, McCulloch County.

Drainage area.--43.9 sq mi.

Records available.--October 1953 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,325.64 ft above mean sea level, datum of 1929. Prior to Nov. 25, 1953, reference point at same site and datum.

Average discharge.--11 years, 7.09 cfs (5,130 acre-ft per year).

Extremes.--Maximum discharge during year, 3,230 cfs Sept. 21 (gage height, 16.36 ft); no flow most of time. 1953-64: Maximum discharge, 5,500 cfs Oct. 4, 1953 (gage height, 18.27 ft, from floodmarks); no flow most of time.
Maximum stage since at least 1890, 21.3 ft July 23, 1938 (discharge, 33,600 cfs), by slope-area measurement of peak flow. Flood in 1906 reached a stage of 21 ft, from information by local resident.

Remarks.--Records good below 400 cfs and fair above. Flow from 19.9 sq mi above this station is partly controlled by five floodwater-retarding structures with a total combined capacity of 5,730 acre-ft below the flood spillway crests, of which 5,140 acre-ft is floodwater-retarding capacity and 587 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Station operated as part of the Deep Creek basin hydrologic cooperative program of the Geological Survey and Soil Conservation Service to evaluate rainfall-runoff relation, soil conservation practices, and the effects of floodwater-retarding structures.

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

4.4	0	5.2	47
4.5	.8	5.4	76
4.6	2.6	5.6	117
4.7	5.7	6.0	187
4.8	10	7.0	322
4.9	16	8.0	488
5.0	25	11.0	1,110

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		*0		0	0	0	0	0	3.1		0	0
2		0	(*)	0	0	0	0	0	2.4		0	0
3		0		0	6.4	0	0	0	.4		0	0
4		0		0	50	0	0	0	12		0	0
5		0		0	.7	0	57	0	95		0	0
6		0		*0	0	0	3.0	0	7.4	(*)	0	0
7		0		0	0	0	.6	0	1.9		0	0
8		61		0	0	26	0	0	.2		0	0
9		7.9		0	0	80	0	0	0		0	0
10		.1		0	*0	4.5	0	0	0		*0	0
11		0		0	0	1.8	0	0	0		0	0
12		0		0	0	.2	0	0	0		0	0
13		0		0	0	0	0	0	0		0	0
14		0		0	0	0	0	0	0		0	*0
15		0		0	0	0	0	0	0		0	0
16		0		0	0	*0	0	0	0		0	0
17		0		0	0	0	0	0	0		0	0
18		0		0	0	22	0	0	0		0	0
19		7.9		0	0	76	0	0	0		0	0
20		1.2		0	0	4.1	*0	0	0		0	*191
21		0		0	0	4.1	0	0	0		4.2	899
22		0		0	0	1.6	9.2	0	0		10	328
23		0		0	0	.2	18	0	0		1.2	68
24		0		0	0	0	*16	0	0		0	63
25		0		0	0	0	2.2	*0	0		0	26
26		0		0	0	0	17	0	0		0	9.8
27		0		0	0	0	1.5	215	0		0	376
28		0		0	0	0	.1	53	0		0	80
29		0		0	0	0	0	202	0		0	37
30		0		35	----------	0	0	21	0		0	14
31		----------		1.4	----------	0	----------	7.3	----------		0	----------
Total	0	78.1	0	36.4	57.1	220.5	124.6	498.3	122.4	0	15.4	2,091.8
Mean	0	2.60	0	1.17	1.97	7.11	4.15	16.1	4.08	0	0.50	69.7
Ac-ft	0	155	0	72	113	437	247	988	243	0	31	4,150
(†)	272	336	308	353	380	539	561	708	544	404	340	717
(††)	0.18	3.40	0.55	2.26	1.41	2.76	2.80	3.58	1.23	0.41	2.30	8.60

Calendar year 1963: Max 300 Min 0 Mean 2.59 Ac-ft 1,870 †† 19.50
Water year 1963-64: Max 899 Min 0 Mean 8.87 Ac-ft 6,440 †† 29.48

* Discharge measurement or observation of no flow made on this day.
† Contents, in acre-feet, at end of month, in Soil Conservation Service reservoirs upstream from station.
†† Weighted mean rainfall, in inches, during month.

8-1400. Deep Creek subwatershed No. 8 (Dry Prong Deep Creek) near Mercury, Tex.

Location.--Lat 31°23'05", long 99°08'30", near center of dam on Dry Prong Deep Creek, 1.9 miles southeast of Mercury, McCulloch County, and 3.5 miles upstream from mouth.

Drainage area.--4.32 sq mi.

Records available.--February 1952 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,377.13 ft above mean sea level, datum of 1929 (levels by Soil Conservation Service).

Average outflow.--12 years, 572 acre-ft per year.

Extremes.--Maximum outflow during year, 54.5 cfs Sept. 22 (gage height, 20.60 ft). Maximum inflow, 5,660 cfs (average for 5-minute interval) Sept. 21, adjusted for rainfall on pool surface during time of peak inflow. No outflow or inflow for many days.

1952-64: Maximum outflow, 56 cfs May 19, 1955 (gage height, 22.13 ft); no outflow for many days in each year. Maximum inflow, that of Sept. 21, 1964, computed from outflow and change in pool contents, adjusted for rainfall on pool surface during time of peak inflow.

Remarks.--Records good. Records of daily discharge are outflow from pool determined from stage-discharge relation for outlet structure. Dam completed December 1951, but no appreciable storage before Apr. 18, 1952. Outflow began May 24, 1952. Pool is formed by earth-fill dam 4,300 ft long, with grass sodded emergency spillway section at gage height 24.0 ft. Outlet structure is a 3-foot square concrete drop outlet (gage height of crest, 9.0 ft) connected to a 21-inch concrete outlet pipe at gage height -1.0 ft. There is an 8-inch controlled water-supply outlet pipe connected to drop outlet at gage height -1.0 ft. Pool capacity, 1,410 acre-ft at spillway crest, 215 acre-ft at concrete drop outlet, and 16 acre-ft at controlled outlet pipe, based on Soil Conservation Service map prepared in July 1952. Dam built by Soil Conservation Service for flood control. Small amounts of water are released for irrigation or for use of livestock. Recording rain gage located at station.

Pool water budget, in acre-feet, water year October 1963 to September 1964

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Inflow1/	0	21.6	2.5	15.4	29.6	66.2	165	133	22.1	1.8	10.9	995
Outflow	0	0	0	0	0	41.3	154	116	21.4	0	0	919
(††)	.08	3.32	.44	2.18	1.36	2.34	3.45	3.99	1.27	.69	2.38	10.63

Calendar year 1963: Inflow 270 Outflow 116 †† 19.15
Water year 1963-64: Inflow 1,460 Outflow 1,250 †† 32.13

Peak inflow (base, 100 cfs)

Date	Time	Discharge	Date	Time	Discharge
2- 3	2215	131 (15-min)	9-20	0615	186 (15-min)
4-22	2245	274 (15-min)	9-21	1515	316 (15-min)
5-27	1300	397 (15-min)	9-21	2110	5,660 (5-min)
5-28	2200	112 (15-min)	9-27	0730	220 (15-min)

1/ Inflow adjusted for rainfall on pool and for pool losses.
†† Weighted mean rainfall, in inches.

8-1405. Dry Prong Deep Creek near Mercury, Tex.

Location.--Lat 31°24'10", long 99°08'10", near center of span on downstream side of bridge on Farm Road 502, 1.3 miles southeast of Mercury, McCulloch County, 1.7 miles downstream from floodwater-retarding reservoir, and 1.8 miles upstream from mouth.

Drainage area.--8.31 sq mi.

Records available.--June 1951 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,339.02 ft above mean sea level, datum of 1929.

Average discharge.--13 years, 1.23 cfs (890 acre-ft per year).

Extremes.--Maximum discharge during year, 1,970 cfs Sept. 21 (gage height, 9.00 ft); no flow most of time. 1951-64: Maximum discharge, 2,000 cfs May 17, 1955, from rating curve defined by current-meter measurements below 1,000 cfs and extended above by logarithmic plotting; maximum gage height, 9.00 ft May 17, 1955, and Sept. 21, 1964; no flow most of time.

Maximum stage since at least 1924, that of May 17, 1955, and Sept. 21, 1964. Flood of July 23, 1938, reached a stage of 8.7 ft, from information by local resident.

Remarks.--Records good. Flow from 4.32 sq mi above this station is partly controlled by one floodwater-retarding structure with a total capacity of 1,410 acre-ft below the flood spillway crest, of which 1,200 acre-ft is floodwater-retarding capacity and 215 acre-ft is sediment-pool capacity. The capacity allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. A permit to use 104 acre-ft per year from the pool has been issued, however, no diversion was reported for the year. Station operated as part of the Deep Creek basin hydrologic cooperative program of the Geological Survey and Soil Conservation Service to evaluate rainfall-runoff relation, soil conservation practices, and the effects of floodwater-retarding structures.

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

2.55	0	2.9	5.3	3.3	55
2.6	.1	3.0	11	3.5	82
2.7	.8	3.1	22	4.0	140
2.8	2.2	3.2	38	4.5	205

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		*0		0	0	0	0	0.1	0.9		0	0
2		0	(*)	0	0	0	0	0	.4		0	0
3		0		0	7.3	0	0	0	.1		0	0
4		0		0	4.3	0	0	0	.7		0	0
5		0		0	.1	0	0	0	15		0	0
6		0		*0	0	0	0	0	3.8	(*)	0	0
7		0		0	0	0	0	0	1.7		0	0
8		7.0		0	0	1.0	0	0	.9		0	0
9		1.2		0	0	3.5	0	0	.5		0	0
10		0		0	*0	.1	0	0	.1		*0	0
11		0		0	0	0	0	0	0		0	0
12		0		0	0	0	0	0	0		0	0
13		0		0	0	0	0	0	0		0	0
14		0		0	0	0	0	0	0		0	*0
15		0		0	0	0	0	0	0		0	0
16		0		0	0	*0	0	0	0		0	0
17		0		0	0	0	0	0	0		0	0
18		0		0	0	7.5	0	0	0		0	0
19		1.1		0	0	9.8	0	0	0		0	0
20		.1		0	0	3.5	*0	0	0		0	*18
21		0		0	0	1.6	0	0	0		3.2	177
22		0		0	0	1.0	8.5	0	0		1.0	69
23		0		0	0	.6	24	0	0		0	63
24		0		0	0	.3	*19	0	0		0	62
25		0		0	0	.1	11	*0	0		0	61
26		0		0	0	0	9.5	0	0		0	59
27		0		0	0	0	3.1	26	0		0	71
28		0		0	0	0	1.2	17	0		0	61
29		0		0	0	0	.5	23	0		0	59
30		0		4.2	----------	0	.2	6.1	0		0	56
31		----------		.2	----------	0	----------	2.2	----------		0	----------
Total	0	9.4	0	4.4	11.7	29.0	77.0	74.4	24.1	0	4.2	756
Mean	0	0.31	0	0.14	0.40	0.94	2.57	2.40	0.80	0	0.14	25.2
Ac-ft	0	19	0	8.7	23	58	153	148	48	0	8.3	1,500
(†)	151	170	165	175	196	212	216	219	197	172	163	250
(††)	0.04	3.42	0.47	2.17	1.41	2.35	3.26	3.85	1.40	0.75	2.42	10.21

Calendar year 1963: Max 38 Min 0 Mean 0.40 Ac-ft 293 †† 19.53
Water year 1963-64: Max 177 Min 0 Mean 2.71 Ac-ft 1,970 †† 31.75

* Discharge measurement or observation of no flow made on this day.
† Contents, in acre-feet, at end of month, in Soil Conservation Service reservoirs above station.
†† Weighted mean rainfall, in inches, during month.

8-1410. Hords Creek Reservoir near Valera, Tex.

Location.--Lat 31°50'00", long 99°33'35", at outlet-works structure near right end of dam on Hords Creek, 5.3 miles northwest of Valera, Coleman County, and 8.8 miles west of Coleman.
Drainage area.--48 sq mi, approximately.
Records available.--April 1948 to September 1964.
Gage.--Water-stage recorder and wire-weight gage. Datum of gage is mean sea level, datum of 1929.
Extremes.--Maximum contents during year, 4,070 acre-ft Apr. 26 (elevation, 1,888.07 ft); minimum, 2,910 acre-ft Sept. 19 (elevation, 1,883.26 ft).
1948-64: Maximum contents, 12,790 acre-ft May 1, 1956 (elevation, 1,906.86 ft); minimum since first appreciable storage in June 1951, that of Sept. 19, 1964.
Remarks.--Reservoir is formed by a rolled earth-fill dam 6,800 ft long, including spillway. Deliberate impoundment of water began Apr. 7, 1948, and dam was completed in June 1948. Reservoir is operated for flood control and part of municipal water supply for city of Coleman (see table below for diversions). Outlet works consist of 3 concrete conduits, 2 of which are controlled by slide gates. The third conduit (service spillway) is uncontrolled. In addition, there is a 500-foot uncontrolled broad-crested emergency spillway located in a saddle on the right bank. Capacity based on survey made in 1946. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	1,939.0	-
Crest of emergency spillway	1,920.0	25,310
Crest of service spillway (top of conservation storage)	1,900.0	8,640
Invert of lowest outlet for water supply	1,876.5	1,690
Invert of slide gates	1,856.0	-

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey. Diversions from reservoir for municipal use furnished by city of Coleman.

Capacity table (elevation, in feet, and contents, in acre-feet)

1,883.0	2,850	1,887.0	3,790
1,884.0	3,070	1,888.0	4,050
1,885.0	3,290	1,889.0	4,340
1,886.0	3,530		

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,870	3,660	3,600	3,480	3,430	3,380	3,370	4,040	3,840	3,590	3,260	3,020
2	3,860	3,640	3,600	3,480	3,430	3,370	3,360	4,030	3,830	3,570	3,250	3,010
3	3,860	3,640	3,590	3,470	3,450	3,370	3,350	4,030	3,820	3,560	3,240	3,000
4	3,850	3,630	3,590	3,470	3,460	3,360	3,360	4,020	3,870	3,550	3,230	2,990
5	3,840	3,630	3,580	3,470	3,460	3,350	3,350	4,020	3,870	3,540	3,220	2,990
6	3,830	3,620	3,580	3,470	3,450	3,350	3,340	4,030	3,860	3,530	3,210	2,980
7	3,820	3,610	3,580	3,460	3,450	3,350	3,330	4,020	3,850	3,510	3,200	2,970
8	3,810	3,640	3,570	3,460	3,440	3,450	3,320	4,010	3,840	3,500	3,190	2,960
9	3,810	3,640	3,570	3,450	3,440	3,460	3,320	4,000	3,830	3,490	3,180	2,950
10	3,800	3,630	3,560	3,450	3,440	3,460	3,310	4,000	3,820	3,470	3,170	2,940
11	3,790	3,630	3,560	3,440	3,440	3,450	3,300	3,990	3,810	3,460	3,160	2,940
12	3,780	3,630	3,560	3,440	3,440	3,450	3,290	3,980	3,800	3,450	3,140	2,940
13	3,770	3,620	3,550	3,440	3,440	3,450	3,290	3,970	3,790	3,440	3,130	2,940
14	3,760	3,610	3,550	3,430	3,430	3,440	3,280	3,960	3,780	3,420	3,120	2,930
15	3,750	3,610	3,540	3,430	3,430	3,440	3,280	3,950	3,770	3,410	3,120	2,930
16	3,740	3,610	3,540	3,430	3,420	3,440	3,270	3,940	3,760	3,400	3,110	2,930
17	3,740	3,600	3,540	3,420	3,420	3,430	3,270	3,930	3,750	3,390	3,100	2,920
18	3,730	3,600	3,540	3,420	3,420	3,440	3,260	3,930	3,740	3,380	3,100	2,920
19	3,720	3,640	3,530	3,420	3,410	3,440	3,260	3,920	3,730	3,370	3,090	2,920
20	3,720	3,640	3,530	3,410	3,410	3,430	3,260	3,910	3,720	3,360	3,080	2,940
21	3,720	3,640	3,530	3,410	3,410	3,420	3,540	3,900	3,700	3,340	3,080	3,540
22	3,710	3,630	3,520	3,410	3,400	3,420	3,540	3,900	3,690	3,340	3,080	3,540
23	3,710	3,630	3,520	3,400	3,400	3,410	3,980	3,890	3,680	3,320	3,070	3,910
24	3,710	3,630	3,510	3,400	3,400	3,410	4,040	3,880	3,660	3,320	3,060	4,030
25	3,700	3,620	3,510	3,390	3,400	3,400	4,050	3,870	3,650	3,300	3,060	4,030
26	3,700	3,620	3,500	3,390	3,400	3,400	4,060	3,860	3,640	3,290	3,050	4,030
27	3,690	3,620	3,500	3,380	3,390	3,390	4,060	3,870	3,630	3,280	3,040	4,020
28	3,680	3,620	3,500	3,380	3,380	3,380	4,060	3,870	3,620	3,270	3,030	4,020
29	3,680	3,610	3,500	3,400	3,380	3,380	4,050	3,860	3,610	3,290	3,040	4,010
30	3,670	3,600	3,490	3,440	----------	3,370	4,050	3,860	3,600	3,280	3,030	4,010
31	3,660	----------	3,490	3,430	----------	3,370	----------	3,850	----------	3,270	3,020	----------
(†)	1,886.50	1,886.28	1,885.82	1,885.58	1,885.36	1,885.31	1,887.99	1,887.24	1,886.25	1,884.90	1,883.80	1,887.83
(‡)	-220	-60	-110	-60	-50	-10	+680	-200	-250	-330	-250	+990
(††)	82	56	56	61	54	58	61	76	101	118	95	68

Calendar year 1963..... ‡ -310 †† 874
Water year 1963-64..... ‡ +130 †† 886

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.
†† Diversions for municipal use, in acre-feet.

8-1415. Hords Creek near Valera, Tex.

Location.--Lat 31°50'10", long 99°32'20", on left bank 7,500 ft downstream from Hords Creek Reservoir, 5.5 miles north of Valera, Coleman County, and 7.0 miles west of Coleman.

Drainage area.--53 sq mi, approximately, of which 48 sq mi is above Hords Creek Reservoir.

Records available.--April 1947 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,819.88 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Average discharge.--17 years, 1.39 cfs (1,010 acre-ft per year).

Extremes.--Maximum discharge during year, 962 cfs Sept. 23 (gage height, 6.87 ft); no flow for many days.
1947-64: Maximum discharge, 3,860 cfs Apr. 30, 1956 (gage height, 14.73 ft), from rating curve defined by current-meter measurements below 1,900 cfs and extended by logarithmic plotting; no flow at times in each year.
Maximum stage since 1900, 23.0 ft July 3, 1932, from information by local residents (discharge not determined), Flood in July or September 1900 reached a stage 3.7 ft higher than that of July 1932, 12 miles downstream from station, from information by local residents.

Remarks.--Records good. Flow regulated by Hords Creek Reservoir (station 8-1410).

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

1.6	0	2.2	6.1
1.7	.2	2.4	12
1.8	.6	2.6	20
1.9	1.4	2.8	32
2.0	2.5	3.0	48
2.1	4.0	3.3	86

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0.2	0.1	0.2	0.6	0.1			0
2					.2	**.1	.2	.6	.1			0
3					.3	.1	.2	.5	0			0
4			(*)		1.4	.1	.2	.4	.2			0
5					.5	0	.2	.4	.4			0
6					* .2	0	.2	.4	.1			0
7				(*)	.2	.1	.2	.4	.1			0
8					.2	5.0	.2	.4	0			0
9					.2	2.7	.2	.2	0			0
10					.2	.6	.1	.2	0			0
11					.2	.5	.1	.2	0			0
12					.2	.4	.1	.2	0			0
13					.2	.4	**.1	.2	0			0
14					.2	.3	.1	.2	0			0
15					.2	.3	0	.2	*0			0
16					.2	.3	0	.1	0			0
17					.2	.3	0	.1	0			0
18					.1	.3	0	**.1	0			0
19					.1	.3	0	.1	0			0
20					.1	.2	0	.1	0			0
21					.1	.2	5.2	.1	0			35
22					.1	.2	1.0	.1	0	(*)		1.3
23	(*)				.1	.2	11	0	0			80
24					.1	.2	16	0	0		(*)	6.6
25					.2	.2	5.2	0	0			1.7
26					.1	.2	5.7	0	0			.7
27					.1	.2	1.8	0	0			.5
28					.1	.2	1.0	.1	0			.3
29					.1	.2	.8	.1	0			.3
30					----------	.2	.7	.1	0			.2
31		----------			----------	.2	----------	.1	----------			----------
Total	0	0	0	0	6.3	14.3	50.7	6.2	1.0	0	0	126.6
Mean	0	0	0	0	0.22	0.46	1.69	0.20	0.03	0	0	4.22
Ac-ft	0	0	0	0	12	28	101	12	2.0	0	0	251

Calendar year 1963: Max 38 Min 0 Mean 0.31 Ac-ft 222
Water year 1963-64: Max 80 Min 0 Mean 0.56 Ac-ft 406

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

8-1420. Hords Creek at Coleman, Tex.

Location.--Lat 31°50'55", long 99°25'30", near right bank at downstream side of pier of bridge on U. S. Highways 84 and 283 and State Highway 206, 1 mile north of Coleman, Coleman County, 2.5 miles downstream from Bachelor Creek, and 12 miles downstream from Hords Creek Dam.
Drainage area.--107 sq mi, of which 48 sq mi is above Hords Creek Dam.
Records available.--October 1940 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 1,676.83 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942. Prior to May 23, 1946, staff gage at site 3,700 ft downstream at datum 6.38 ft lower.
Average discharge.--24 years, 8.20 cfs (5,940 acre-ft per year).
Extremes.--Maximum discharge during year, 5,020 cfs Sept. 23 (gage height, 12.40 ft); no flow at times.
1940-64: Maximum discharge, 25,100 cfs Apr. 30, 1956 (gage height, 21.50 ft), from rating curve defined by current-meter measurements below 4,800 cfs and by slope-area measurement at 8,640 cfs, and contracted-opening measurement at 25,100 cfs; no flow at times.
Maximum stage since at least 1876 occurred in July or September 1900 and reached a stage about 6.3 ft higher than that of Apr. 30, 1956, at a point near municipal light and powerplant about 6,000 ft downstream from present gage. Flood of July 3, 1932, reached a stage about 2.6 ft higher than that of Apr. 30, 1956, at the same downstream point. Data pertaining to stage of floods in 1900 and 1932 from information by local residents.
Remarks.--Records fair. Since 1948 flow largely regulated by Hords Creek Reservoir (station 8-1410) from which city of Coleman obtains part of its municipal water supply.
Additions.--The peaks above the base for the water years 1961-63 not previously published are given herewith:

Peak discharge (base, 600 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
1- 7-61	1900	4.56	614	10- 9-61	1400	8.48	2,820	5- 5-63	2400	5.79	1,170
5-19-61	1000	5.74	1,170	5-28-62	2100	4.77	698	5-22-63	0900	6.72	1,740
6- 5-61	0500	8.45	2,770	6-30-62	1800	4.90	764	5-30-63	1400	5.77	1,150

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

0.8	0	1.3	1.6	1.8	9.6	3.0	78
.9	.1	1.4	2.5	2.0	15	3.5	162
1.0	.2	1.5	3.8	2.2	21	4.0	320
1.1	.5	1.6	5.4	2.4	30	5.0	700
1.2	.9	1.7	7.4	2.7	48	6.0	1,120

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0		0	0	0	0	2.0	0.1		0	0
2		0		0	0	*0	0	1.5	.1		0	0
3		0		0	.4	0	0	1.0	.1		0	0
4		0	(*)	0	.7	0	.1	*.7	.6		0	.2
5		0		0	0	0	.1	.5	.3		0	0
6		0		0	*0	0	0	.5	.1		0	0
7		0		*0	0	0	*0	.4	0		0	0
8		0		0	0	2.4	0	.4	0		0	0
9		.1		0	0	.4	0	.3	0		0	0
10		0		0	0	0	0	.2	0		0	0
11		0		0	0	0	0	.2	0		0	0
12		*0		0	0	0	0	.2	0		0	0
13		0		0	0	0	*0	.2	0		0	0
14		0		0	0	0	0	.2	0		0	0
15		0		0	0	0	0	.2	*0		0	0
16		0		0	0	0	0	.2	0		0	0
17		0		0	0	0	0	.2	0		0	0
18		0		0	0	0	0	**.2	0		0	0
19		.8		0	0	0	0	.2	0		0	0
20		0		0	0	0	0	.2	0		0	5.2
21		0		0	0	0	*335	.2	0		.3	581
22		0		0	0	0	*15	.2	0	(*)	0	24
23	(*)	0		0	0	0	*632	.2	0		0	834
24		0		0	0	0	170	.1	0		*0	89
25		0		0	0	0	42	.1	0		0	*20
26		0		0	0	0	32	.1	0		0	8.8
27		0		0	0	0	15	.1	0		0	3.9
28		0		0	0	0	6.4	.1	0		0	2.0
29		0		0	0	0	3.8	.1	0		.5	1.0
30		0		2.6	---	0	2.7	.1	0		.1	.5
31		---		0	---	0	---	.1	---		0	---
Total	0	0.9	0	2.6	1.1	2.8	1,254.1	10.9	1.3	0	0.9	1,569.6
Mean	0	0.03	0	0.08	0.04	0.09	41.8	0.35	0.04	0	0.03	52.3
Ac-ft	0	1.8	0	5.2	2.2	5.6	2,490	22	2.6	0	1.8	3,110

Calendar year 1963: Max 357 Min 0 Mean 3.01 Ac-ft 2,180
Water year 1963-64: Max 834 Min 0 Mean 7.77 Ac-ft 5,640

Peak discharge (base, 600 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-21	1000	6.52	1,340	9-21	0900	9.30	2,920
4-23	1800	10.32	3,520	9-23	1600	12.40	5,020
4-24	1800	4.82	624				

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

8-1425. Brown County Water Improvement District No. 1 canal near Brownwood, Tex.

Location.--Lat 31°50', long 99°00', on right bank 100 ft upstream from bridge on county road from Brownwood to Brownwood Dam, 6,000 ft downstream from Brownwood Dam, and 7 miles north of Brownwood, Brown County.

Records available.--March 1950 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,403.96 ft above mean sea level, datum of 1929.

Average discharge.--14 years, 28.1 cfs (20,340 acre-ft per year).

Extremes.--Maximum daily discharge during year, 68 cfs July 6-7; minimum daily, 1.1 cfs Nov. 13.
1950-64: Maximum daily discharge, 77 cfs July 17, 1957; minimum daily, 0.4 cfs Feb. 10, 1955.

Remarks.--Records good. Canal diverts from Brownwood Reservoir (station 8-1430) on right bank of Pecan Bayou. Small amount of water pumped from canal upstream from gage for domestic use. Of the total flow of the canal passing gage during year, 5,550 acre-ft was used for municipal and industrial supply, from records furnished by Brown County Water Improvement District No. 1. According to records furnished the Texas Water Commission by the district, 3,680 acres were irrigated during 1964.

Monthly discharge, in cubic feet per second, water year October 1963 to September 1964

Month	Maximum	Minimum	Mean	Runoff in (acre-feet)
October	58	21	39.1	2,400
November	43	1.1	17.9	1,060
December	13	11	11.9	730
Calendar year 1963	65	1.1	30.8	22,330
January	28	11	19.1	1,180
February	19	13	16.0	918
March	22	3.3	12.9	790
April	52	15	27.3	1,630
May	61	15	29.8	1,830
June	66	22	47.2	2,810
July	68	64	65.9	4,050
August	64	37	54.8	3,370
September	53	13	40.6	2,420
Water year 1963-64	68	1.1	31.9	23,190

8-1430. Brownwood Reservoir near Brownwood, Tex.

Location.--Lat 31°50', long 99°00', at outlet structure for irrigation canal just upstream from right end of dam on Pecan Bayou a quarter of a mile downstream from Jim Ned Creek, and 8 miles north of Brownwood, Brown County.
Drainage area.--1,535 sq mi.
Records available.--July 1933 to May 1941, November 1944 to September 1964.
Gage.--Staff gage read once daily. Datum of gage is 0.50 ft below mean sea level, datum of 1929. July 1933 to May 31, 1941, and Nov. 21, 1944, to Sept. 30, 1949, staff gages or water-stage recorder at various sites at dam at same datum.
Extremes.--Maximum contents observed during year, 148,600 acre-ft Apr. 25 (gage height, 1,425.8 ft); minimum observed, 101,900 acre-ft Jan. 26-29, Apr. 19-20 (gage height, 1,418.7 ft).
1933-41, 1944-64: Maximum contents observed, 192,300 acre-ft May 2, 1956 (gage height, 1,431.4 ft); minimum observed, 11,900 acre-ft July 15, 1934 (gage height, 1,389.5 ft).
Remarks.--Reservoir first filled during flood of July 3, 4, 1932. Dam completed in 1933 and operation began July 1933. Reservoir is formed by earth-fill dam, 1,580 ft long. The uncontrolled emergency spillway is a broad-crested weir 479 ft long, which is 800 ft to left of dam. Reservoir can be drained by two 12-foot (horseshoe-shaped) reinforced concrete conduits. Water is withdrawn for irrigation through a 5-foot circular concrete conduit. Figures given herein represent total contents. Water used for irrigation, municipal and industrial supply for city of Brownwood (see station 8-1425). At end of year, flow from 266 sq mi above this station was partly controlled by 41 floodwater-retarding structures with a total combined capacity of 64,330 acre-ft below the flood spillway crests, of which 60,120 acre-ft is floodwater-retarding capacity and 4,210 acre-ft is sediment-pool capacity. Three structures were built during the current year and have a total combined capacity below flood spillway crests of 2,770 acre-ft, of which 306 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Data regarding dam is shown in the following table:

	Gage height (feet)	Capacity (acre-feet)
Crest of dam	1,450.0	-
Crest of spillway	1,425.1	143,400
Invert to irrigation canal	1,406.0	46,510
Invert to 12-foot outlet conduits	1,330.0	-

Cooperation.--Record of daily gage height furnished by Brown County Water Improvement District No. 1. Capacity table, from survey made in 1959, furnished by Corps of Engineers and Soil Conservation Service.

Capacity table (gage height, in feet, and contents, in acre-feet)

1,418.0	97,850
1,422.0	121,700
1,426.0	150,200

Contents, in acre-feet, at 1800 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	109,700	104,900	106,100	103,700	103,700	104,300	103,100	143,400	132,200	125,900	116,900	110,900
2	109,700	104,900	106,100	103,700	103,700	104,300	103,100	142,700	132,200	125,200	116,300	110,900
3	109,700	104,900	105,300	103,700	103,700	104,300	103,100	142,000	131,500	125,200	116,300	110,900
4	109,100	104,300	105,300	103,700	104,900	104,300	103,100	141,300	131,500	125,200	116,300	110,300
5	109,100	104,300	105,300	103,700	105,500	103,700	103,700	140,600	132,200	124,500	115,700	110,300
6	109,100	104,300	105,300	103,700	105,500	103,700	104,300	140,600	132,200	124,500	115,700	109,700
7	108,500	104,300	105,300	103,700	105,500	103,700	104,300	139,900	132,200	123,800	115,100	109,700
8	108,500	104,900	105,300	103,100	105,500	104,300	104,300	139,200	132,200	123,800	115,100	109,700
9	108,500	104,900	104,900	103,100	105,500	104,300	103,700	138,500	131,500	123,100	114,500	109,100
10	107,900	104,900	104,900	103,100	105,500	104,300	103,700	137,800	131,500	123,100	114,500	109,100
11	107,900	104,900	104,900	103,100	105,500	104,300	103,700	137,100	131,500	122,400	114,500	109,100
12	107,900	104,900	104,900	103,100	105,500	104,300	103,100	136,400	130,800	122,400	113,900	108,500
13	107,300	104,900	104,900	102,500	105,500	104,300	103,100	135,700	130,800	121,700	113,900	108,500
14	107,300	104,900	104,900	102,500	105,500	104,300	103,100	135,700	130,100	121,700	113,300	108,500
15	107,300	104,900	104,900	102,500	105,500	104,300	103,100	135,700	130,100	121,100	113,300	108,500
16	107,300	104,900	104,900	102,500	105,500	104,300	102,500	135,000	130,100	121,100	112,700	108,500
17	106,700	104,900	104,900	102,500	104,900	104,300	102,500	135,000	130,100	120,500	112,700	108,500
18	106,700	104,300	104,900	102,500	104,900	104,300	102,500	135,000	129,400	119,900	112,100	107,900
19	106,700	105,500	104,900	102,500	104,900	104,300	101,900	134,300	129,400	119,300	112,100	107,900
20	106,700	106,100	104,900	102,500	104,900	104,300	101,900	134,300	129,400	118,700	111,500	113,900
21	106,100	106,100	104,300	102,500	104,900	104,300	115,700	133,600	128,700	118,700	111,500	125,900
22	106,100	106,100	104,300	102,500	104,900	104,300	118,700	133,600	128,700	118,100	112,100	137,800
23	106,100	106,100	104,300	102,500	104,900	104,300	122,400	133,600	128,000	118,100	112,100	137,800
24	106,100	106,100	104,300	102,500	104,300	104,300	147,000	132,900	128,000	118,100	111,500	139,900
25	106,100	106,100	104,300	102,500	104,300	104,300	148,600	132,900	127,300	118,100	111,500	139,200
26	106,100	106,100	104,300	101,900	104,300	103,700	147,800	132,900	127,300	117,500	111,500	138,500
27	106,100	106,100	104,300	101,900	104,300	103,700	147,000	132,900	126,600	117,500	111,500	138,500
28	106,100	106,100	104,300	101,900	104,300	103,700	145,500	132,900	126,600	117,500	111,500	137,800
29	105,500	106,100	103,700	101,900	104,300	103,700	144,800	132,200	126,600	117,500	111,500	137,100
30	105,500	106,100	103,700	103,700	----------	103,700	144,100	132,200	125,900	116,900	111,500	137,100
31	105,500	----------	103,700	103,700	----------	103,100	----------	132,200	----------	116,900	111,500	----------
(†)	1,419.3	1,419.4	1,419.0	1,419.0	1,419.1	1,418.9	1,425.2	1,423.5	1,422.6	1,421.2	1,420.3	1,424.2
(‡)	-4,200	+600	-2,400	0	+600	-1,200	+41,000	-11,900	-6,300	-9,000	-5,400	+25,600

Calendar year 1963..... ‡ -25,700
Water year 1963-64..... ‡ +27,400

† Gage height, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-1435. Pecan Bayou at Brownwood, Tex.

Location.--Lat 31°43'54", long 98°58'25", on right bank at Brownwood, Brown County, 502 ft upstream from city dam, 6.3 miles downstream from Salt Creek, and 10 miles downstream from Brownwood Reservoir.

Drainage area.--1,614 sq mi.

Records available.--May 1917 to June 1918, October 1923 to September 1964.

Gage.--Water-stage recorder above spillway of city dam. Datum of gage is 1,318.58 ft above mean sea level, datum of 1929. May 25 to June 4, 1917, staff gage at dam 502 ft downstream at datum 2.45 ft lower. June 8, 1917 to June 30, 1918, staff gage at site 200 ft upstream at datum 3.49 ft lower. Oct. 16, 1923 to July 10, 1929, staff gage at site about 200 ft upstream at datum 0.10 ft lower. July 11, 1929 to Apr. 2, 1962, at site 1,500 ft upstream at present datum.

Average discharge.--39 years (1924-28, 1929-64), 154 cfs (111,500 acre-ft per year).

Extremes.--Maximum discharge during year, 4,700 cfs Apr. 24 (gage heignt, 4.96 ft); minimum daily, 0.1 cfs at times.
1917-18, 1923-64: Maximum discharge, 31,600 cfs Oct. 14, 1930 (gage height, 16.92 ft); no flow at times. Maximum stage known, 21.7 ft in September 1900, from information by Gulf, Colorado and Santa Fe Railway Co. Flood of July 3, 1932, probably the greatest known, reached a discharge of about 235,000 cfs as it entered Brownwood Reservoir (computed from rate of change of contents in reservoir; data furnished by engineers of Brown County Water Improvement District No. 1).

Remarks.--Records good. Flow regulated by Brownwood Reservoir (station 8-1430). There was uncontrolled flow over spillway at Brownwood Reservoir Apr. 24-May 1. Diversion from Brownwood Reservoir, 10 miles upstream by Brown County Water Improvement District No. 1 canal (station 8-1425).

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

0.3	0	0.8	7.3	2.0	570
.4	.3	.9	12	2.5	1,030
.5	1.2	1.0	26	3.0	1,590
.6	2.8	1.3	130	3.5	2,260
.7	4.8	1.6	270		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3	0.1	0.7	0.6	6.6	0.5	0.5	308	0.3	0.1	0.2	0.1
2	.3	.1	.6	.8	3.8	.6	.6	296	.4	.2	.3	.1
3	.2	.1	.5	.8	3.0	.9	.6	289	.9	.2	.6	.1
4	.2	.1	.4	.8	72	1.6	.9	296	1.0	.2	.8	.1
5	.2	.1	.4	.7	14	1.8	33	289	35	.2	.4	.1
6	.2	.2	.4	.6	6.6	1.4	12	296	11	.2	.3	.1
7	.1	.3	.5	1.2	3.6	1.0	3.8	296	3.8	.3	.3	.2
8	.1	109	.5	1.2	1.8	1.2	1.7	296	1.4	.3	.3	.3
9	.1	77	.5	1.0	1.2	7.6	.8	296	.7	.3	.2	.3
10	.1	8.0	.6	.8	1.0	7.2	.4	296	.4	.3	.2	.3
11	.1	3.0	1.6	.9	.7	3.6	.4	302	.3	.2	**.2	.3
12	.1	1.8	1.6	.7	.6	1.8	.4	302	.3	.2	.1	.3
13	.1	.9	1.6	.5	*1.7	1.1	.2	177	.3	.1	.1	.3
14	.1	.7	1.4	.4	1.1	1.2	.2	11	.2	.1	.1	.2
15	.1	.4	1.4	.5	1.1	1.1	.3	5.3	.2	.1	.1	.2
16	.1	.4	1.4	.9	1.2	1.0	.5	3.0	.2	.1	.1	.3
17	.1	.3	1.4	1.0	1.0	*.8	1.1	2.0	.2	.1	.1	.9
18	.1	.3	1.6	1.1	.9	.9	1.0	1.7	.2	.1	.1	.4
19	.1	84	1.6	2.2	.7	16	.7	1.7	.2	.1	.1	.3
20	.1	24	1.7	1.2	.5	8.4	.6	2.3	.2	.1	.1	425
21	.1	5.7	1.4	.9	.6	4.2	391	2.2	.2	.1	.1	741
22	.1	3.2	1.6	.6	.5	2.3	42	1.7	.3	.1	.1	262
23	.1	2.2	1.6	.6	.5	1.6	*111	1.4	.3	.2	.1	296
24	.2	1.0	1.2	.6	1.0	1.4	1,160	1.0	.4	.2	.1	378
25	.2	.5	1.0	.7	1.2	1.2	1,640	.7	.3	.2	.1	308
26	.2	.4	.9	.6	1.6	1.1	1,200	.4	.3	.2	.2	302
27	.2	.4	.9	.4	1.2	.9	1,070	.3	.2	.2	.2	302
28	.2	.8	.7	.4	1.0	.8	726	.4	.2	.2	.2	308
29	**.1	1.2	.7	.4	.6	.7	503	.4	.1	.2	.1	308
30	.1	.9	.6	65	----------	.6	371	.5	.1	.2	.1	308
31	.1	----------	.5	19	----------	.5	----------	.3	----------	.2	.1	----------
Total	4.4	327.1	31.5	107.1	131.3	75.0	7,273.7	3,775.3	59.6	5.5	6.1	3,942.9
Mean	0.14	10.9	1.02	3.45	4.53	2.42	242	122	1.99	0.18	0.20	131
Ac-ft	8.7	649	62	212	260	149	14,430	7,490	118	11	12	7,820

Calendar year 1963: Max 3,640 Min 0.1 Mean 72.5 Ac-ft 52,530
Water year 1963-64: Max 1,640 Min 0.1 Mean 43.0 Ac-ft 31,220

* Discharge measurement made on this day.
** Field estimate made on this day.

8-1440. Noyes Canal at Menard, Tex.

Location.--Lat 30°55', long 99°47', on right bank at intersection of Canal and Gay Streets in Menard, Menard County, and 4½ miles downstream from headgates.

Records available.--March 1924 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,878.06 ft above mean sea level, datum of 1929. Prior to July 23, 1940, staff gage at site 2,000 ft upstream at datum 4.99 ft higher.

Average discharge.--40 years, 14.1 cfs (10,210 acre-ft per year).

Extremes.--Maximum daily discharge during year, 30 cfs Feb. 20-21; no flow at times.
1924-64: Maximum daily discharge (exclusive of times canal submerged by waters of San Saba River), 50 cfs Apr. 15, 1925 (probably affected by local runoff between point of diversion and station); no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Discharge represents only flow diverted from San Saba River as local runoff between point of diversion and gage is excluded from the computations. Canal diverts water from right bank of San Saba River 4 miles upstream from Menard for irrigation near Menard. Ten acres are irrigated from canal above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	22	0	25	27		0	15	14	10	10	19
2	13	20	0	25	24		0	19	14	10	9.3	16
3	15	15	0	25	24		0	17	14	10	8.9	14
4	16	20	0	25	28		0	17	13	10	8.3	13
5	16	21	0	25	29		9.0	*15	13	10	8.0	13
6	16	21	0	25	25		16	14	13	10	8.5	12
7	16	19	0	25	22		15	14	13	10	9.3	12
8	17	17	0	25	23		14	12	*13	10	8.7	11
9	17	10	*0	25	23		15	13	11	10	8.0	11
10	16	1.6	13	24	24		18	13	10	10	8.0	11
11	16	.1	23	23	24		19	16	10	10	8.5	13
12	16	0	20	23	24		18	14	10	10	8.0	18
13	12	0	20	23	25		18	13	10	*9.9	7.2	17
14	17	0	15	*24	24		20	13	10	9.3	4.1	17
15	17	0	20	24	24		18	13	10	8.0	8.3	17
16	18	0	20	25	23		17	14	10	8.3	12	16
17	18	0	20	25	23		19	14	10	8.3	*17	11
18	18	0	20	25	24		19	14	10	8.3	12	14
19	18	0	20	25	*27		19	13	10	6.7	11	14
20	18	0	20	25	30		19	9.3	10	7.4	11	22
21	18	0	20	24	30		20	10	10	8.0	10	7.0
22	17	0	20	24	28		18	13	10	8.0	10	7.0
23	17	0	20	25	27		18	14	10	8.9	19	7.4
24	18	0	20	21	23		17	14	10	10	23	9.9
25	21	0	20	24	16		17	14	10	10	25	7.3
26	21	0	20	22	5.1		17	12	10	9.9	24	6.7
27	19	0	20	23	.5		18	12	10	9.6	19	6.2
28	19	0	20	23	0		18	13	10	**3.5	17	*5.1
29	*20	0	25	24	0		18	15	10	8.3	23	.5
30	19	0	25	27	----------	(*)	14	15	10	8.9	26	0
31	20	----------	25	28	----------		----------	15	----------	9.7	17	----------
Total	532	166.7	446	756	626.6	0	448.0	429.3	328	281.0	399.1	348.1
Mean	17.2	5.56	14.4	24.4	21.6	0	14.9	13.8	10.9	9.06	12.9	11.6
Ac-ft	1,060	331	885	1,500	1,240	0	889	852	651	557	792	690

Calendar year 1963: Max 27 Min 0 Mean 13.9 Ac-ft 10,030
Water year 1963-64: Max 30 Min 0 Mean 13.0 Ac-ft 9,450

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record Dec. 12 to Jan. 8, May 29 to June 7, June 10 to July 12. Local and flood runoff eliminated on Nov. 8, 19, 22, 27, Jan. 30, Mar. 8-9, 18, Apr. 4, 26, May 28, July 28-30, Aug. 15, Sept. 16-17, 19-20, 22-27.

8-1445. San Saba River at Menard, Tex.

Location.--Lat 30°55'05", long 99°47'05", on downstream side of bridge on U. S. Highway 83 in Menard, Menard County, and 0.7 mile downstream from Las Moras Creek.

Drainage area.--1,151 sq mi.

Records available.--September 1915 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,863.05 ft above mean sea level, datum of 1929. Sept. 14, 1915, to Mar. 12, 1924, chain gage at site 635 ft downstream at datum 2.20 ft lower. Mar. 13, 1924, to Feb. 21, 1939, staff gage at site 1,000 ft upstream at datum 2.00 ft higher. Feb. 22, 1939, to Jan. 25, 1940, chain gage at present site and datum. Jan. 26, 1940, to Sept. 19, 1957, water-stage recorder at site 240 ft to right at present datum.

Average discharge.--49 years, 67.9 cfs (49,160 acre-ft per year).

Extremes.--Maximum discharge during year, 3,600 cfs Aug. 23 (gage height, 9.03 ft); no flow at times.
1915-64: Maximum discharge, 130,000 cfs July 23, 1938 (gage height, 22.2 ft, present site and datum from floodmark), from rating curve defined by current-meter measurements below 60,000 cfs and slope-area measurements at 68,600 and 130,000 cfs; no flow at times caused by diversions to Noyes Canal.
Maximum stage since at least 1880, 23.3 ft June 6, 1899, present site and datum, from information by local resident.

Remarks.--Records fair. Low flow during irrigation season regulated by diversions to Noyes Canal 4 miles upstream and diversions by pumping at several locations upstream. Records of the Texas Water Commission show permits have been granted to irrigate 3,338 acres above station. See record of Noyes Canal on preceding page.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.7	0.7	30	3.1	11	23	33	1.5	3.4	0.5	0	0.1
2	1.5	.4	30	3.1	6.3	23	34	1.3	2.1	.5	0	.2
3	1.7	.8	30	2.9	5.0	23	33	1.5	1.9	.5	0	.2
4	1.3	1.5	30	1.9	7.8	22	34	1.4	1.7	.4	0	.2
5	2.1	2.1	30	1.7	8.7	22	33	*.8	1.7	.3	0	.2
6	2.9	4.3	30	2.4	6.9	20	7.2	.8	1.7	.3	0	.2
7	3.1	3.8	30	2.7	5.0	21	3.8	.8	1.5	.3	0	.2
8	2.4	12	28	1.7	4.5	37	3.3	.8	*1.3	.2	0	.2
9	1.3	12	*26	1.9	4.3	78	3.1	.8	1.0	.2	0	.2
10	1.3	20	22	2.9	4.3	50	3.1	.8	.8	.1	0	.2
11	1.5	23	7.9	2.4	4.3	37	3.1	.8	.8	.1	0	.1
12	2.7	23	3.8	2.1	4.5	33	3.1	.8	.8	.1	0	.1
13	2.9	23	3.5	2.1	4.5	32	2.9	.8	.8	*0	0	.1
14	2.9	23	4.4	*1.7	4.8	32	1.6	.8	.8	0	0	.2
15	2.4	23	4.5	1.5	5.0	36	.5	.8	.8	0	0	.2
16	2.1	22	3.5	1.7	3.8	33	.7	.8	.8	0	0	.2
17	7.3	23	2.9	1.7	3.5	29	.7	.8	.8	0	*0	.2
18	7.4	23	2.1	1.3	2.9	30	*.7	.8	.8	0	0	.2
19	5.3	23	2.1	1.1	*3.5	40	.8	.8	.8	0	0	.2
20	5.0	34	2.7	1.1	*3.5	35	1.0	.8	.8	0	0	*13
21	4.5	34	2.4	1.9	5.8	31	1.3	.8	.7	0	0	*47
22	3.1	30	2.9	2.4	5.6	30	1.0	.8	.8	0	0	68
23	.3	28	2.7	2.7	5.3	30	1.3	.8	.7	0	*644	111
24	.2	27	2.1	4.0	5.6	31	1.7	.8	.7	0	*134	951
25	.2	28	1.9	3.5	4.8	34	2.1	.8	.7	0	32	*782
26	.2	27	1.9	3.5	4.9	32	2.4	.8	.7	0	13	242
27	.3	30	2.4	4.3	19	31	2.4	.8	.7	0	7.8	141
28	1.1	40	2.7	4.8	22	31	*1.8	.8	.7	0	5.3	*63
29	*1.3	36	3.9	5.8	22	30	1.7	5.2	.5	0	33	62
30	1.1	31	5.3	16	----------	*30	1.7	3.0	.5	0	29	50
31	1.0	----------	4.0	20	----------	32	----------	4.8	----------	0	8.8	----------
Total	71.1	608.6	355.6	109.9	199.1	998.0	220.0	37.9	31.8	3.5	906.9	2,533.4
Mean	2.29	20.3	11.5	3.55	6.87	32.2	7.33	1.22	1.06	0.11	29.3	84.4
Ac-ft	141	1,210	705	218	395	1,980	436	75	63	6.9	1,800	5,020

Calendar year 1963: Max 77 Min 0 Mean 9.70 Ac-ft 7,030
Water year 1963-64: Max 951 Min 0 Mean 16.6 Ac-ft 12,050

Peak discharge (base, 670 cfs)

Date	Time	Gage height	Discharge
8-23	0600	9.03	3,600
9-24	1700	8.35	2,660

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

8-1448. Brady Creek near Eden, Tex.

Location.--Lat 31°11'00", long 99°50'30", on right bank at upstream side of bridge on U. S. Highway 83, 2.2 miles south of Eden, Concho County, and 2.6 miles upstream from Hardin Creek.
Drainage area.--97 sq mi.
Records available.--April 1962 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 2,002.37 ft above mean sea level, datum of 1929 (State Highway Department bench mark).
Extremes.--No flow during year.
1962-64: Maximum discharge, 278 cfs Oct. 9, 1961 (gage height 3.18 ft, from floodmark); no flow at times. Maximum stage since at least 1884, 15.8 ft in July 1938, from information by local resident.
Remarks.--Records excellent. At end of year, flow from 65.0 sq mi above this station was partly controlled by 5 floodwater-retarding structures with a total combined capacity of 22,900 acre-ft below the flood spillway crests, of which 22,190 acre-ft is floodwater-retarding capacity and 715 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Observations of no flow made Oct. 29, Dec. 9, 1963, Jan. 14, Feb. 19, Mar. 30, Apr. 28, May 5, June 8, July 13, Aug. 17, Sept. 28, 1964.

8-1449. Brady Creek Reservoir near Brady, Tex.

Location.--Lat 31°08'17", long 99°23'07", 280 ft upstream from Brady Creek Dam on Brady Creek, at mouth of Bear Creek, and 3.0 miles west of Brady, McCulloch County.
Drainage area.--513 sq mi.
Records Available.--May 1963 to September 1964.
Gage.--Water-stage recorder in metal shelter on deck of service outlet structure. Datum of gage is mean sea level, datum of 1929.
Extremes.--Maximum contents observed during year, 5,820 acre-ft Sept. 30 (elevation, 1,723.7 ft); minimum observed, 1,030 acre-ft Sept. 18 (elevation, 1,710.4 ft).
1963-64: Maximum contents observed, that of Sept. 30, 1964; minimum observed since first appreciable storage, that of Sept. 18, 1964.
Remarks.--Reservoir is formed by a compacted earth-fill dam 8,400 ft long. Dam was completed and storage began in May 1963. Dam was built by the city of Brady in cooperation with the Soil Conservation Service and Farmers Home Administration for flood control and municipal and industrial water supply. The service spillway is an uncontrolled concrete drop inlet structure which discharges through a 7- by 7-foot concrete box conduit through the dam. Service spillway is designed to discharge 4,000 cfs with a 19.4-foot head. Emergency spillway is a cut channel 1,000 ft wide located at right end of dam. Service outlet is a 36-inch cast-iron pipe extending through the embankment, equipped with three sluice gates with 3- by 3-foot openings at elevations 1,712.0 ft, 1,727.0 ft, and 1,733.0 ft. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	1,783.0	-
Crest of emergency spillway	1,762.4	90,310
Crest of service spillway	1,743.0	30,430
Invert of lowest intake to service outlet	1,712.0	1,320

At end of year, flow from 263 sq mi above this station was partly controlled by 35 floodwater-retarding structures with a total combined capacity of 82,180 acre-ft below the flood spillway crests, of which 77,890 acre-ft is floodwater-retarding capacity and 4,290 acre-ft is sediment-pool capacity. These structures were built during the period February 1955 to July 1962. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Freese, Nichols and Endress, Consulting Engineers, furnished the capacity curve which was based on Geological Survey topographic map, edition of 1960. Capacity curve was not adjusted for borrow; borrow pits were below 1,743-foot elevation.
Cooperation.--Record of diversions furnished by city of Brady.

Month-end elevations and contents, May to September 1963

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
May 31	e8	680	-
June 30	e13	1,450	+770
July 31	e11	1,130	-320
Aug. 31	e13	1,540	+410
Sept. 30	e13	1,540	0

e Estimated.

Month-end elevations and contents, water year October 1963 to September 1964

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	(a)	1,540	-
Oct. 31	(a)	1,500	-40
Nov. 30	(a)	1,450	-50
Dec. 31	(a)	1,390	-60
Calendar year 1963	-		-
Jan. 31	12.4	1,410	+20
Feb. 29	12.6	1,450	+40
Mar. 31	14.4	1,900	+450
Apr. 30	(a)	1,820	-80
May 31	13.5	1,660	-160
June 30	12.6	1,450	-210
July 31	11.6	1,240	-210
Aug. 31	(a)	1,100	-140
Sept. 30	23.7	5,820	+4,720
Water year 1963-64	-	-	+4,280

a No elevation record. Contents estimated.

8-1450. Brady Creek at Brady, Tex.

Location.--Lat 31°08'15", long 99°19'55", on left bank just upstream from bridge on U. S. Highway 377 on North Bridge Street in Brady, McCulloch County, and 0.4 mile downstream from Live Oak Creek.
Drainage area.--575 sq mi.
Records available.--May 1939 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 1,646.50 ft above mean sea level, datum of 1929. Prior to July 9, 1940, staff gage at site 3,600 ft upstream at datum 8.24 ft higher.
Average discharge.--25 years, 23.3 cfs (16,870 acre-ft per year).
Extremes.--Maximum discharge during year, 1,960 cfs Mar. 9 (gage height, 9.70 ft, from floodmark); no flow most of time.
1939-64: Maximum discharge, 39,100 cfs Sept. 10, 1952 (gage height, 24.80 ft); no flow at times.
Maximum stage since at least 1882, 29.1 ft July 23, 1938, present site and datum (discharge at site 5 miles downstream, 86,000 cfs by slope-area measurement). Flood of Oct. 6, 1930 (second highest since 1882), reached a stage of 25.9 ft (discharge, 50,300 cfs), present site and datum, from information by local residents.
Remarks.--Records fair. The city of Brady has a permit to divert 730 acre-ft per year for municipal use. Since May 22, 1963, when deliberate impoundment began, flow largely controlled by Brady Creek Reservoir. At end of year, flow from 24.2 sq mi above this station and below Brady Creek Reservoir was partly controlled by 6 floodwater-retarding structures with a total combined capacity of 7,160 acre-ft below flood spillway crests, of which 6,440 acre-ft is floodwater-retarding capacity and 720 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 25 to Nov. 8, Jan. 20-30, Feb. 20-25, Apr. 26 to May 28)

Oct. 1 to Feb. 25

3.8	0	4.6	1.4
4.1	.1	4.8	2.8
4.2	.2	5.0	5.0
4.3	.4	5.1	6.6
4.4	.6	5.3	11
4.5	.9		

Feb. 26 to Sept. 30

3.3	0	5.0	16
3.5	.1	5.5	29
3.6	.3	6.0	46
3.7	.6	6.5	73
3.8	1.0	7.0	111
4.0	2.4	7.5	184
4.2	4.2	8.0	350
4.5	7.7	8.5	695

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0	0	0	0.1	0.1	0.1	0.1		0	0
2	0	0	0	0	0	.1	.1	.1	.1		0	0
3	0	0	0	0	.1	.1	*.2	.1	0		0	0
4	0	0	0	0	.1	.1	.2	.2	.2		0	0
5	0	0	0	0	0	.2	.9	.3	.4		0	0
6	0	0	0	0	0	.2	.3	**.3	.1		0	0
7	0	0	0	0	0	.2	.2	.2	.1		0	0
8	0	10	0	0	0	30	.3	.2	.1		0	0
9	0	4.6	0	0	0	366	.3	.4	*0		0	0
10	0	.1	*0	0	0	2.6	.3	.2	0		0	0
11	0	0	0	0	0	1.4	.2	.1	0		0	0
12	0	0	0	0	0	.6	.2	.1	0		0	0
13	0	0	.1	0	.1	.4	.2	.1	0		*0	0
14	0	0	.1	0	.1	.3	.2	.1	0		0	0
15	0	0	0	0	.1	.2	.2	0	0	(*)	0	0
16	0	0	0	**.1	.1	.2	.2	0	0		0	0
17	0	0	0	.1	.1	.2	.2	0	0		0	0
18	0	0	0	.1	.1	2.7	.3	0	0		0	0
19	0	0	0	0	.1	9.3	.3	0	0		0	0
20	0	0	0	.1	**.1	2.4	.2	0	0		0	12
21	0	0	0	.1	.1	.8	1.4	0	0		0	6.0
22	0	0	0	0	.1	.6	.5	0	0		.1	20
23	0	0	0	0	.1	.6	.3	0	0		.1	21
24	0	0	0	0	.2	.5	.3	0	0		0	69
25	.1	0	0	0	.2	.3	.3	0	0		0	8.3
26	.1	0	0	0	*.2	.1	.8	0	0		0	1.5
27	.1	.1	0	0	.1	.1	.3	0	0		0	381
28	0	.1	0	0	.1	.4	.2	.6	0		0	24
29	0	0	0	.1	.1	.4	.1	1.0	0		0	4.6
30	0	0	0	1.8	----------	.2	.1	.2	0		0	* 2.5
31	*0	----------	0	0	----------	.1	----------	.1	----------		0	----------
Total	0.3	14.9	0.2	2.4	2.2	421.4	9.4	4.4	1.1	0	0.2	549.9
Mean	0.01	0.50	0.01	0.08	0.08	13.6	0.31	0.14	0.04	0	0.01	18.3
Ac-ft	0.6	30	0.4	4.8	4.4	836	19	8.7	2.2	0	0.4	1,090

Calendar year 1963: Max 10 Min 0 Mean 0.07 Ac-ft 50
Water year 1963-64: Max 381 Min 0 Mean 2.75 Ac-ft 2,000

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

8-1460. San Saba River at San Saba, Tex.

Location.--Lat 31°12'50", long 98°42'40", on right bank at downstream side of pier of bridge on State Highway 16, 1.2 miles north of San Saba, San Saba County, 4.8 miles downstream from China Creek, 5.0 miles upstream from Simpson Creek, and 15.5 miles upstream from mouth.
Drainage area.--3,042 sq mi.
Records available.--December 1904 to December 1906 (gage heights only), September 1915 to September 1964. Published as "near San Saba" December 1904 to December 1906, September 1915 to August 1930.
Gage.--Water-stage recorder. Datum of gage is 1,162.16 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942. December 1904 to December 1906, reference point on bridge at site 2.7 miles upstream at different datum. September 1915 to Aug. 27, 1930, staff gage at site 2.4 miles upstream at datum 5.99 ft higher. Aug. 28, 1930, to Sept. 30, 1952, recording gage at site 1.8 miles downstream at datum 8.80 ft lower. Oct. 1, 1952, to July 8, 1953, wire-weight gage at present site and datum. Since Oct. 1, 1956, supplementary water-stage recorder used for flood flows, 2,780 ft to right of main-channel gage.
Average discharge.--49 years (1915-64), 243 cfs (175,900 acre-ft per year).
Extremes.--Maximum discharge during year, 20,200 cfs Sept. 24 (gage height, 27.67 ft); no flow July 11-Aug. 2, Aug. 7-16.
1915-64: Maximum discharge, 203,000 cfs July 23, 1938 (gage height, 45.18 ft, from floodmarks, at site and datum then in use), from rating curve defined by current-meter measurements below 41,000 cfs and by slope-area measurement at 203,000 cfs; no flow at times in 1918, 1930, 1954-56, 1963-64.
Maximum stage since at least 1899, that of July 23, 1938. Flood of June 6, 1899, reached a stage of 42.6 ft at site and datum of gage in use 1930-52, from information by local resident.
Remarks.--Records good. Diversions above station for irrigation and municipal use affect low flow. Beginning May 22, 1963, flow was partly regulated by Brady Creek Reservoir, capacity 90,300 acre-ft, At end of year, flow from 68.2 sq mi above this station and below Brady Creek Reservoir was partly controlled by 15 floodwater-retarding structures with a total combined capacity of 16,650 acre-ft below flood spillway crests, of which 15,090 acre-ft is floodwater-retarding capacity and 1,560 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used, main gage: Mar. 9-10, 19, Sept. 20, 23, 25-27, 29, 30; supplementary gage: Sept. 22-25, 27, 28)

2.6	0	3.2	11	5.0	398
2.7	.1	3.3	18	6.0	744
2.8	.5	3.5	40	10.0	2,260
2.9	1.4	3.7	69	15.0	4,180
3.0	3.1	4.0	125	20.0	6,800
3.1	6.1	4.5	247	25.0	10,700

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	22	19	48	44	184	56	62	38	41	3.2	0	26
2	20	16	46	44	123	51	*58	41	29	1.4	8.7	21
3	15	17	44	44	88	47	62	35	27	.9	8.8	17
4	15	21	46	43	120	50	58	35	24	.4	2.1	14
5	15	19	46	44	329	53	72	36	143	.2	.5	13
6	18	18	46	46	204	51	81	*34	181	2.5	.1	15
7	16	19	46	47	129	53	92	28	51	.8	0	18
8	13	37	44	46	92	53	69	29	41	.2	0	13
9	16	51	46	43	76	635	68	30	*35	.1	0	10
10	16	64	*47	40	69	651	68	273	33	.1	0	8.1
11	13	53	50	40	63	294	58	138	30	0	0	7.7
12	11	57	50	43	58	172	51	78	26	0	0	12
13	13	53	53	41	58	127	44	54	23	0	0	11
14	16	44	56	43	57	107	38	44	21	*0	0	16
15	14	39	56	44	57	90	35	36	22	0	0	13
16	9.6	34	58	51	54	79	36	32	23	0	8.1	12
17	9.6	34	54	54	51	76	41	29	28	0	26	13
18	9.6	39	48	56	50	81	43	27	67	0	*20	14
19	9.1	40	47	53	50	539	41	21	53	0	11	12
20	15	43	46	48	50	270	36	18	33	0	6.5	1,810
21	16	40	50	47	53	197	26	16	26	0	7.1	*4,020
22	12	43	48	44	56	136	25	13	22	0	30	*9,960
23	11	41	47	46	58	113	84	13	11	0	29	*2,140
24	11	40	46	44	63	99	62	21	9.1	0	29	9,840
25	11	39	46	46	*64	92	136	13	10	0	26	4,850
26	14	41	46	44	68	79	96	7.3	11	0	25	1,660
27	43	44	44	40	66	76	66	6.9	9.6	0	105	6,720
28	46	48	44	36	62	71	48	16	11	0	88	5,730
29	44	50	46	35	58	68	48	196	14	0	60	*1,360
30	*30	51	44	51	----------	68	43	93	12	0	44	*757
31	22	----------	43	83	----------	64	----------	58	----------	0	33	----------
Total	545.9	1,154	1,481	1,430	2,510	4,598	1,747	1,509.2	1,066.7	9.8	567.9	49,112.8
Mean	17.6	38.5	47.8	46.1	86.6	148	58.2	48.7	35.6	0.32	18.3	1,637
Ac-ft	1,080	2,290	2,940	2,840	4,980	9,120	3,470	2,990	2,120	19	1,130	97,410

Calendar year 1963: Max 341 Min 0 Mean 45.2 Ac-ft 32,730
Water year 1963-64: Max 9,960 Min 0 Mean 180 Ac-ft 130,400

Peak discharge (base, 3,000 cfs)

Date	Time	Gage height	Discharge
9-22	1030	27.12	16,400
9-24	1830	27.67	20,200
9-27	1700	26.86	15,400

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

8-1470. Colorado River near San Saba, Tex.

Location.--Lat 31°13'05", long 98°33'50", on left bank at downstream side of pier of bridge on U. S. Highway 190, 5.2 miles downstream from San Saba River, and 9.2 miles east of San Saba, San Saba County.
Drainage area.--30,600 sq mi, approximately, of which 11,900 sq mi is probably noncontributing.
Records available.--October 1915 to October 1922 (published as "near Chadwick"), October 1923 to December 1934 (published as "near Tow"), August 1930 to September 1964. Monthly discharge only for some periods published in WSP 1312.
Gage.--Water-stage recorder. Datum of gage is 1,096.22 ft above mean sea level, datum of 1929. October 1915 to October 1922 staff gage at site 1.2 miles upstream at datum 1.92 ft higher. October 1923 to Apr. 16, 1925, chain gage, and Apr. 17, 1925, to December 1934, water-stage recorder, at site 44 miles downstream at different datum. Aug. 30, 1930, to Mar. 18, 1940, water-stage recorder and Mar. 19 to May 23, 1940, staff gage, at site 2,230 ft downstream at present datum.
Average discharge.--46 years (1916-19, 1920-22, 1923-64), 1,380 cfs (999,100 acre-ft per year).
Extremes.--Maximum discharge during year, 29,900 cfs Sept. 22 (gage height, 23.82 ft); no flow July 20, Aug. 8, Aug. 11-14.
1915-22, 1923-64: Maximum discharge, 224,000 cfs July 23, 1938 (gage height, 63.2 ft, present site, based on floodmarks at site then in use); no flow Aug. 27-31, 1954; Aug. 3-13, 1963; July 20-Aug. 8, Aug. 11-14, 1964.
Maximum stage known during period 1878 to July 22, 1938, 58.4 ft Sept. 25, 1900 (discharge, 184,000 cfs), present site, from floodmarks at former site.
Remarks.--Records good. Diversions above station for irrigation, municipal use, and oilfield operation. Flow slightly regulated by 7 reservoirs in the Colorado and Concho Rivers and Oak Creek basins above Winchell, and by 3 reservoirs in the San Saba River and Pecan Bayou basins; combined capacity, 1,508,100 acre-ft. At end of year, flow from 340 sq mi above this station was partly controlled by 75 floodwater-retarding structures with a total combined capacity of 88,340 acre-ft below the flood spillway crests, of which 80,450 acre-ft is floodwater-retarding capacity and 7,890 acre-ft is sediment-pool capacity. Sixteen structures were built during the current year and have a total combined capacity below flood spillway crests of 14,830 acre-ft, of which 1,250 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 24-25, Sept. 20-30)

1.4	0	1.9	9.9	2.6	152	6.0	3,230
1.5	.1	2.0	16	2.8	265	10.0	8,530
1.6	1.4	2.2	39	3.4	720	14.0	14,900
1.7	3.0	2.4	81	4.0	1,230	20.0	25,700
1.8	5.6						

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	41	152	79	524	103	93	816	1,150	15	0	2,830
2	34	37	157	79	368	100	90	664	617	13	0	1,270
3	34	34	140	76	240	96	*81	532	449	10	0	578
4	34	35	128	76	375	100	79	479	471	7.9	0	375
5	30	37	124	76	950	96	93	427	382	5.6	0	323
6	30	35	120	76	848	103	361	*390	1,500	3.9	0	234
7	30	35	109	76	464	109	316	368	639	2.6	0	152
8	34	984	103	79	302	112	234	345	323	1.8	0	112
9	31	1,290	100	76	227	896	152	427	*539	1.2	.1	87
10	29	471	*100	74	240	1,560	124	471	471	.8	.1	72
11	27	316	100	74	202	894	109	539	316	.4	0	55
12	27	197	100	74	172	479	96	397	197	.3	0	46
13	26	157	100	72	162	302	81	338	140	.2	0	41
14	25	116	100	74	144	215	72	309	103	**.2	0	34
15	27	100	96	74	132	177	57	230	189	.2	.4	27
16	30	87	96	84	124	148	50	109	624	.3	16	25
17	29	81	96	84	124	132	48	76	358	.3	10	22
18	25	81	93	87	120	223	46	62	192	.2	*a10	142
19	24	81	90	93	112	1,860	46	54	148	.1	a15	77
20	24	81	87	93	106	1,150	46	46	109	0	18	3,820
21	24	81	84	93	106	554	46	38	74	0	136	*14,000
22	30	99	84	90	106	294	94	a35	60	0	986	*24,000
23	31	633	81	87	106	227	1,170	a30	52	0	482	19,600
24	29	382	81	84	103	187	6,520	a30	37	0	234	9,860
25	27	259	81	81	*112	162	9,700	a25	26	0	162	16,500
26	26	a190	81	79	109	136	4,440	a25	19	0	112	5,690
27	25	a160	81	79	109	124	3,010	a25	15	0	84	7,800
28	48	a140	81	76	106	106	2,560	a25	13	0	109	16,400
29	60	128	81	74	103	100	1,610	172	13	0	100	5,500
30	*64	124	81	144	----------	96	1,100	675	14	0	76	*2,080
31	52	----------	81	193	----------	93	----------	992	----------	0	1,420	----------
Total	999	6,492	3,088	2,656	6,896	10,934	32,524	9,151	9,240	64.0	3,970.6	131,752
Mean	32.2	216	99.6	85.7	238	353	1,084	295	308	2.06	128	4,392
Ac-ft	1,980	12,880	6,120	5,270	13,680	21,690	64,510	18,150	18,330	127	7,880	261,300

Calendar year 1963: Max 10,500 Min 0 Mean 327 Ac-ft 236,600
Water year 1963-64: Max 24,000 Min 0 Mean 595 Ac-ft 431,900

Peak discharge (base, 13,000 cfs)

Date	Time	Gage height	Discharge
9-22	2200	23.82	29,900
9-25	0500	19.08	22,200
9-28	0600	16.29	18,000

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

8-1480. Buchanan Reservoir near Burnet, Tex.

Location.--Lat 30°45'05", long 98°25'00", in powerhouse at Buchanan Dam on Colorado River, 1 mile upstream from bridge on State Highway 29, and 11 miles west of Burnet, Burnet County.
Drainage area.--31,250 sq mi, approximately, of which 11,900 sq mi is probably noncontributing.
Records available.--May 1937 to September 1964.
Gage.--Selsyn indicating gage. Datum of gage is 0.48 ft above mean sea level, datum of 1929 (levels by Lower Colorado River Authority). Prior to July 1938, temporary staff and float gages at same site and datum.
Extremes.--Maximum contents observed during year, 678,000 acre-ft Apr. 29 to May 2 (gage height, 1,005.0 ft); minimum observed, 377,900 acre-ft Sept. 19 (gage height, 986.3 ft).
1937-64: Maximum contents observed, 1,006,000 acre-ft May 15, 1954, May 21, 1955, and June 21, 1961 (gage height, 1,020.6 ft); minimum after filling of reservoir in July 1938, 340,800 acre-ft Sept. 8-10, 1952 (gage height, 983.4 ft).
Remarks.--Reservoir is formed by 2 reinforced concrete multiple-arch sections, 3 banks of tainter gates, and a 1,100-foot reinforced concrete spillway section. Dam completed and storage began May 20, 1937. Figures given herein represent total contents. Water used for power development and irrigation of rice in several districts below Columbus. Power unit consists of three 11,250 kilowatts generators. There is also a 14,500 horsepower pumpback unit designed to pump back 840 cfs at a head of 120 ft. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Colorado River near San Saba (station 8-1470). Data regarding dam and reservoir are shown in the following table:

	Gage height (feet)	Capacity (acre-feet)
Crest of 1,100-foot gravity overflow spillway	1,020.0	992,000
Bottom of 30-33 ft wide by 15 ft high tainter gates	1,005.0	678,000
Bottom of 7-40 ft wide by 25 ft high tainter gates	995.0	505,000
Invert to penstocks	937.0	36,800

Cooperation.--Gage-height records and capacity table based on 1925 survey furnished by Lower Colorado River Authority.

Capacity table (gage height, in feet, and contents, in acre-feet)

986,	374,000	997	537,000
988	401,000	1,000	587,000
991	444,000	1,003	641,000
994	489,000	1,005	678,000

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	610,400	608,600	623,000	610,400	617,600	626,600	639,200	678,000	617,600	545,000	441,000	402,400
2	610,400	606,800	623,000	610,400	617,600	626,600	637,400	678,000	617,600	541,800	441,000	406,600
3	610,400	606,800	623,000	610,400	619,400	624,800	637,400	676,100	614,000	540,200	438,000	406,600
4	610,400	606,800	623,000	610,400	619,400	624,800	637,400	674,200	612,200	537,000	435,000	406,600
5	608,600	605,000	623,000	612,200	621,200	624,800	639,200	670,400	610,400	535,400	430,500	406,600
6	608,600	606,800	623,000	612,200	623,000	624,800	639,200	670,400	606,800	532,200	426,200	403,800
7	608,600	605,000	624,800	610,400	626,600	624,800	639,200	666,600	606,800	527,400	426,200	403,800
8	606,800	610,400	624,800	612,200	626,600	626,600	637,400	664,700	603,200	524,200	419,200	402,400
9	606,800	614,000	624,800	610,400	628,400	624,800	637,400	662,800	601,400	521,000	417,800	398,200
10	606,800	615,800	626,600	610,400	628,400	626,600	637,400	662,800	599,600	517,800	413,600	395,400
11	606,800	617,600	624,800	610,400	628,400	628,400	637,400	662,800	597,800	514,600	409,400	392,600
12	606,800	617,600	623,000	610,400	630,200	630,200	637,400	660,900	594,200	513,000	408,000	389,800
13	606,800	617,600	623,000	606,800	630,200	628,400	637,400	659,000	592,400	509,800	405,200	388,400
14	606,800	617,600	621,200	606,800	630,200	630,200	635,600	655,400	590,600	505,000	403,800	385,700
15	606,800	617,600	623,000	606,800	630,200	630,200	633,800	655,400	590,600	501,800	406,600	383,100
16	605,000	615,800	621,200	608,600	632,000	630,200	633,800	651,800	590,600	497,000	408,000	383,100
17	605,000	617,600	621,200	608,600	632,000	630,200	632,000	651,800	587,000	493,800	405,200	385,700
18	606,800	617,600	619,400	608,600	632,000	632,000	632,000	650,000	583,600	490,600	405,200	380,500
19	606,800	617,600	617,600	610,400	630,200	633,800	630,200	648,200	580,200	489,000	402,400	377,900
20	606,800	617,600	617,600	610,400	630,200	637,400	630,200	642,800	578,500	486,000	401,000	381,800
21	608,600	617,600	615,800	610,400	630,200	639,200	628,400	642,800	576,800	483,000	399,600	403,800
22	608,600	619,400	615,800	608,600	630,200	639,200	626,200	639,200	575,100	478,500	401,000	439,500
23	608,600	617,600	612,200	610,400	632,000	641,000	624,800	635,600	571,700	475,500	401,000	498,600
24	610,400	619,400	612,200	610,400	630,200	641,000	628,400	635,600	568,300	471,000	403,800	533,800
25	610,400	619,400	612,200	610,400	630,200	641,000	648,200	632,000	564,900	468,000	403,800	568,300
26	610,400	619,400	610,400	612,200	628,400	639,200	662,800	628,400	561,500	465,000	403,800	583,600
27	610,400	621,200	610,400	612,200	626,600	639,200	670,400	624,800	558,100	459,000	403,800	601,400
28	608,600	623,000	610,400	612,200	626,600	639,200	674,200	621,200	556,400	456,000	403,800	630,200
29	608,600	621,200	610,400	612,200	626,600	639,200	678,000	617,600	553,000	453,000	402,400	650,000
30	608,600	623,000	608,600	615,800	----------	639,200	678,000	615,800	549,800	450,000	403,800	655,400
31	608,600	----------	608,600	615,800	----------	639,200	----------	615,800	----------	444,000	402,400	----------
(†)	1,001.2	1,002.0	1,001.2	1,001.6	1,002.2	1,002.9	1,005.0	1,001.6	997.8	991.0	988.1	1,003.8
(‡)	-1,800	+14,400	-14,400	+7,200	+10,800	+12,600	+38,800	-62,200	-66,000	-105,800	-41,600	+253,000

Calendar year 1963..... ‡ +102,000
Water year 1963-64..... ‡ +45,000

† Gage height, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-1485. North Llano River near Junction, Tex.

Location.--Lat 30°31'00", long 99°48'45", on left bank 1,000 ft upstream from remains of old Wilson Dam, 3 miles northwest of Junction, Kimble County, and 4 miles upstream from confluence with South Llano River.

Drainage area.--914 sq mi.

Records available.--September 1915 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,699.92 ft above mean sea level, datum of 1929. Prior to Aug. 1, 1925, chain gage at site 550 ft downstream at same datum. Aug. 1, 1925, to Sept. 16, 1936, water-stage recorder 520 ft downstream at same datum. Sept. 16, 1936, to June 22, 1940, staff gages at various sites at same datum.

Average discharge.--49 years, 67.7 cfs (49,010 acre-ft per year).

Extremes.--Maximum discharge during year, 26,100 cfs Sept. 24 (gage height, 13.30 ft); no flow Aug. 3-14 (regulation).

1915-64: Maximum discharge, 94,800 cfs Sept. 16, 1936 (gage height, 29.2 ft, present site, based on gage-height relation curve), from rating curve defined by current-meter measurements below 68,000 cfs and by slope-area measurement at 94,800 cfs; no flow at times.

Maximum stage since at least 1875, that of Sept. 16, 1936; maximum stage during period 1875 to Sept. 15, 1936, 27 ft in 1889, from information by local resident.

Remarks.--Records good. Diversions for irrigation materially affect low flow.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 22-23, Sept. 23-24)

0.5	0	1.2	11	3.5	968
.6	.1	1.3	16	4.0	1,430
.7	.4	1.5	34	5.0	2,640
.8	.9	1.7	60	6.0	4,300
.9	1.9	2.0	125	7.0	6,360
1.0	3.6	2.5	323	8.0	8,700
1.1	6.6	3.0	608		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	0.6	7.0	8.2	45	15	12	13	12	1.5	0.3	25
2	.6	.6	7.0	8.2	37	15	12	12	9.6	1.5	.1	22
3	.6	.6	7.0	7.8	31	14	11	11	8.2	1.6	0	21
4	.6	.8	7.0	7.8	39	13	11	9.6	7.4	1.2	0	19
5	.5	.8	7.0	8.2	30	13	11	9.1	16	1.3	0	18
6	.5	.6	7.4	8.2	27	13	11	8.6	9.6	1.4	0	17
7	.5	.6	7.4	8.2	24	13	11	7.8	7.8	1.3	0	17
8	.5	3.6	7.4	8.2	24	13	11	7.4	*6.6	1.2	0	16
9	.5	2.2	*7.4	7.8	22	12	11	59	6.0	1.1	0	15
10	.5	1.6	7.4	7.8	22	12	10	38	5.6	1.0	0	15
11	.5	1.4	8.2	7.4	21	12	9.1	29	5.3	.8	0	14
12	.4	1.4	8.2	7.4	21	12	9.6	22	5.0	.4	0	14
13	.3	1.3	8.2	7.4	21	12	9.1	19	4.5	*.4	0	14
14	.4	1.3	8.2	7.4	20	12	8.6	16	4.2	.2	0	16
15	.6	1.4	8.2	7.0	19	12	8.2	15	3.9	.6	.1	17
16	.7	1.8	8.2	7.4	19	12	8.9	13	3.6	.7	24	16
17	.6	2.3	8.2	7.4	19	11	27	12	3.2	.7	*3.4	15
18	.6	2.6	8.2	7.4	18	12	28	12	2.8	.5	54	15
19	.6	3.2	8.2	8.6	*17	15	24	11	2.6	.3	28	13
20	.6	3.6	8.2	9.6	17	13	22	9.6	2.5	.7	16	356
21	.6	3.9	8.2	9.6	19	13	19	8.6	2.8	.7	12	498
22	.6	4.2	8.2	9.6	19	13	19	7.4	2.5	.6	450	810
23	.7	4.2	8.2	9.6	17	13	17	7.0	1.6	.6	1,990	537
24	1.3	4.2	8.2	9.1	18	12	16	7.0	1.3	.5	281	*8,230
25	1.3	4.2	8.2	9.1	18	12	15	7.4	2.0	.5	110	821
26	1.2	4.5	7.8	9.1	17	11	19	7.0	2.3	.5	75	374
27	.9	5.3	7.8	8.6	16	11	15	6.6	2.3	.7	58	292
28	.8	6.3	8.2	8.6	16	11	15	6.3	2.3	.6	46	*239
29	.7	6.6	8.2	9.1	15	10	14	6.3	2.3	.5	40	186
30	.7	6.6	8.2	35	----------	11	13	8.2	2.3	.6	34	162
31	.7	----------	8.2	49	----------	*12	----------	15	----------	.5	29	----------
Total	20.2	82.3	243.4	323.8	648	385	427.5	420.9	148.1	24.7	3,250.9	12,824
Mean	0.65	2.74	7.85	10.4	22.3	12.4	14.2	13.6	4.94	0.80	105	427
Ac-ft	40	163	483	642	1,290	764	848	835	294	49	6,450	25,440

Calendar year 1963: Max 86 Min 0 Mean 7.02 Ac-ft 5,080
Water year 1963-64: Max 8,230 Min 0 Mean 51.4 Ac-ft 37,300

Peak discharge (base, 1,200 cfs)

Date	Time	Gage height	Discharge
9-22	2200	6.47	5,700
9-24	0200	13.30	26,100

* Discharge measurement made on this day.

8-1500. Llano River near Junction, Tex.

Location.--Lat 30°29'50", long 99°43'20", on right bank 600 ft north of Farm Road 2169, half a mile downstream from point where slough diverts floodwater from main channel, 3 miles east of Junction, Kimble County, 3.8 miles downstream from confluence of North Llano and South Llano Rivers, and 4.3 miles upstream from Johnson Fork.

Drainage area.--1,874 sq mi.

Records available.--September 1915 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,630.32 ft above mean sea level, datum of 1929. Prior to Aug. 14, 1925, staff gage and Aug. 14, 1925, to May 17, 1940, water-stage recorder at present site and datum. May 18, 1940, to Aug. 17, 1944, water-stage recorder at site 5,330 ft upstream at datum 6.0 ft higher. Since Aug. 18, 1944, gage at site 5,330 ft upstream has been used as a supplementary gage for stages above 5 ft.

Average discharge.--49 years, 189 cfs (136,800 acre-ft per year).

Extremes.--Maximum discharge during year, 26,400 cfs Sept. 24 (gage height, 17.50 ft); minimum, 25 cfs Aug. 13-15.

1915-64: Maximum discharge, 319,000 cfs June 14, 1935 (gage height, 41.4 ft at supplementary gage, from floodmarks), from rating curve defined by current-meter measurements below 54,000 cfs and by slope-area measurements at 154,000 and 319,000 cfs; minimum, 3.1 cfs Aug. 16, 17, 1956.

Maximum stage since at least 1875, that of June 14, 1935. There was a major flood in 1889 which was the highest known until 1935.

Remarks.--Records good except those for period of no gage-height record, which are fair. Small diversions above station for irrigation.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 24-25)

Oct. 1 to Sept. 23, Sept. 26-30						Sept. 24-25	
0.9	20	1.6	153	3.0	1,180	8.0	5,280
1.0	27	1.8	245	4.0	2,550	9.0	7,400
1.1	37	2.0	358	5.0	4,430	10.0	9,700
1.2	49	2.2	500	6.0	6,620	11.0	12,100
1.4	87	2.5	730				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	59	60	60	72	96	83	76	81	64	39	37	85
2	57	60	60	70	96	83	76	78	60	34	36	81
3	57	60	70	70	99	81	74	76	57	31	34	68
4	54	60	70	68	110	78	74	74	57	36	32	68
5	54	60	70	68	102	78	102	72	72	37	29	68
6	54	60	70	68	96	78	96	70	66	38	28	66
7	54	60	70	68	93	78	90	66	62	34	28	64
8	52	150	70	68	90	78	87	64	*59	30	28	64
9	52	90	*74	68	90	78	85	85	56	27	28	64
10	51	70	74	68	90	76	83	93	54	29	29	60
11	51	70	74	68	87	76	83	90	54	28	27	59
12	52	70	74	68	87	76	83	85	52	28	26	56
13	54	70	74	68	87	76	83	83	49	29	25	57
14	54	70	74	68	87	74	78	78	46	*30	25	60
15	52	70	74	70	85	74	76	74	45	29	38	64
16	56	70	74	70	85	72	74	72	45	31	93	64
17	56	70	74	70	83	70	90	70	45	31	74	60
18	56	70	74	68	83	74	87	68	45	31	62	60
19	56	60	74	68	*83	85	87	66	46	32	54	59
20	56	60	74	62	83	83	87	66	48	34	49	303
21	57	60	74	62	85	81	85	66	46	34	48	2,540
22	56	60	74	64	87	78	85	66	45	34	376	1,190
23	57	60	74	57	87	78	85	64	44	31	2,010	1,100
24	57	60	74	60	87	78	78	62	38	30	432	*10,900
25	78	60	74	64	87	76	78	62	37	30	226	4,160
26	87	60	74	64	87	76	90	60	38	31	171	1,010
27	83	60	72	66	87	74	90	57	39	32	138	682
28	72	60	72	66	85	74	85	56	40	36	110	*568
29	66	60	72	68	85	74	83	54	42	37	104	478
30	60	60	72	92	----------	74	81	56	40	38	99	433
31	60	----------	72	96	----------	*74	----------	64	----------	38	90	----------
Total	1,820	2,010	2,232	2,127	2,589	2,388	2,511	2,178	1,491	1,009	4,586	24,591
Mean	58.7	67.0	72.0	68.6	89.3	77.0	83.7	70.3	49.7	32.5	148	820
Ac-ft	3,610	3,990	4,430	4,220	5,140	4,740	4,980	4,320	2,960	2,000	9,100	48,780

Calendar year 1963: Max 665 Min 37 Mean 76.3 Ac-ft 55,230
Water year 1963-64: Max 10,900 Min 25 Mean 135 Ac-ft 98,270

Peak discharge (base, 1,500 cfs)

Date	Time	Gage height	Discharge
8-23	0730	4.76	3,930
9-21	0500	5.70	5,930
9-24	0400	17.50	26,400

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 30 to Dec. 8.

8-1508. Beaver Creek near Mason, Tex.

Location.--Lat 30°38'35", long 99°05'40", on left bank at upstream side of bridge on U. S. Highway 87, 1.4 miles upstream from Llano River, 6.4 miles downstream from Spring Creek, and 11.1 miles southeast of Mason, Mason County.
Drainage area.--218 sq mi.
Records available.--July 1963 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 1,253.24 ft above mean sea level, datum of 1929.
Extremes.--1963: Maximum discharge during period July to September, 194 cfs Sept. 13 (gage height, 3.21 ft); no flow Aug. 3 to Sept. 11.
1963-64: Maximum discharge during water year, 24,600 cfs Sept. 24 (gage height, 10.8 ft); no flow at times.
Remarks.--Records fair except those for periods of missing record, which are poor. No known regulation or diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 1 to Aug. 5, Sept. 25-26, 30, 1963, Oct. 1-19, 1963, July 11-14, July 29 to Aug. 25, Sept. 20-23, 1964)

1.2	0	1.9	6.8	3.6	370
1.3	.1	2.0	10	4.0	620
1.4	.3	2.2	20	4.5	1,040
1.5	.8	2.4	36	5.0	1,540
1.6	1.5	2.7	73	6.0	3,060
1.7	2.6	3.0	135	7.0	5,300
1.8	4.4	3.3	230		

Discharge, in cubic feet per second, July, August, and September 1963

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1	-	0.1	0	7	-	0	0	13	0.1	0	81	19	0.1	a0	a4	25	0.1	0	*1.1
2	-	.1	0	8	-	0	0	14	.1	0	30	20	.1	*0	a3	26	.1	0	6.7
3	-	0	0	9	-	0	0	15	.1	a0	53	21	.1	0	a2	27	.1	0	14
4	-	0	0	10	-	0	0	16	.1	a0	30	22	.1	0	a2	28	.1	0	5.5
5	-	0	0	11	*0.1	0	0	17	.1	a0	16	23	.1	0	a2	29	.1	0	3.4
6	-	0	0	12	.1	0	.1	18	.1	a0	7.7	24	.1	0	a1	30	.1	0	2.5
																31	.1	0	
Total																	-	0.2	265.0
Mean																	-	0.01	8.83
Ac-ft																	-	0.4	526

* Discharge measurement or observation of no flow made on this day.
a No gage-height record.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.4	1.3	3.4	1.3	15	2.6	2	1.6	0.1	0.1	0	1.2
2	1.2	1.1	2.8	1.2	9.4	2.6	*2.1	1.1	.1	0	0	.9
3	1.2	1.0	2.1	1.2	9.4	2.6	2.0	.8	.1	0	0	1.0
4	1.2	1.0	2.0	1.2	63	2.4	1.8	.5	.1	0	0	1.1
5	1.2	.9	1.8	1.1	31	1.8	7.1	*.4	2	0	0	.8
6	1.2	.9	1.6	1.1	15	1.8	8.0	.3	4	0	0	.6
7	1.2	.9	1.6	1.2	9.7	1.8	5.4	.3	3	0	0	.5
8	1.2	20	1.6	1.2	7.4	1.8	3.0	.3	*1.8	0	0	.5
9	1.2	73	*1.5	1.3	5.9	2.1	2.4	23	1.0	0	0	.5
10	1.2	20	1.5	1.3	5.2	2.1	2.0	4.4	.4	0	0	.5
11	1.2	8.5	1.5	1.3	4.8	2.4	1.8	4.0	.3	0	0	.5
12	1.2	4.8	1.5	1.2	4.4	2.4	1.8	2.5	.2	0	0	.5
13	1.2	3.0	2.1	1.3	4.0	2	1.5	1.3	.1	0	0	.5
14	1.2	2.4	4.2	1.4	3.8	2	1.3	1	.1	*0	0	.5
15	1.2	1.8	5.0	*1.4	3.4	2	1.0	.8	.1	0	0	.5
16	1.2	1.6	4.4	2.0	2.8	2	.8	.8	.4	0	0	.5
17	1.2	1.6	3.0	2.6	2.8	2	1.2	.6	** .3	0	*0	.4
18	1.2	1.8	2.5	2.8	2.6	2	4.0	.6	.2	0	0	.5
19	1.2	2.0	2.4	2.1	*2.5	200	6.2	.5	.2	0	0	.4
20	1.2	1.8	2.4	1.5	2.5	50	3.6	.5	.1	0	0	*6.2
21	1.2	1.8	2.4	1.4	4.2	10	2.5	.4	.1	0	0	7.7
22	1.2	1.8	2.4	1.3	5.2	5	2.2	.4	.1	0	0	6.4
23	1.2	1.6	2.0	1.3	5.2	4	2.1	.4	.1	0	0	*1,250
24	1.2	1.6	1.8	1.3	4.2	3	2.0	.3	.1	0	.2	*3,890
25	1.2	1.6	1.8	1.3	4.2	2	1.8	.3	.1	0	760	*118
26	250	1.5	1.6	1.2	4.2	2	2.8	.3	.1	0	42	40
27	50	2.2	1.6	1.2	3.8	2	2.8	.2	.1	0	15	225
28	10	8.0	1.5	1.1	2.9	2	3.4	.2	.1	0	6.4	69
29	4.0	9.4	1.4	1.3	2.8	2	2.4	.2	.1	0	4.0	*35
30	*2.6	4.8	1.3	21	----------	2	1.6	.2	.1	0	2.5	26
31	1.8	----------	1.3	40	----------	2	----------	.2	----------	0	1.8	----------
Total	348.6	183.7	68.0	102.1	241.3	324.4	82.6	48.4	15.6	0.1	831.9	5,685.2
Mean	11.2	6.12	2.19	3.29	8.32	10.5	2.75	1.56	0.52	0.003	26.8	190
Ac-ft	691	364	135	203	479	643	164	96	31	0.2	1,650	11,280

Calendar year 1963: Max - Min - Mean - Ac-ft -
Water year 1963-64: Max 3,890 Min 0 Mean 21.7 Ac-ft 15,740

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-26	unknown	5.5	2,200	8-25	0300	7.30	6,200
3-19	unknown	4.8	1,340	9-24	0900	10.8	24,600

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record Oct. 20-28, Jan. 13-14, Mar. 13 to Apr. 1, May 14 to June 7.

8-1515. Llano River at Llano, Tex.

Location.--Lat 30°45', long 98°40', on right bank in Llano, Llano County, 0.4 mile downstream from bridge on State Highway 16, and 7 miles upstream from Little Llano River.

Drainage area.--4,233 sq mi.

Records available.--September 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 970.01 ft above mean sea level, datum of 1929.

Average discharge.--25 years, 312 cfs (225,900 acre-ft per year).

Extremes.--Maximum discharge during year, 67,200 cfs Sept. 24 (gage height, 20.10 ft); no flow July 18-Aug. 5.
1939-64: Maximum discharge, 232,000 cfs Sept. 10, 1952 (gage height, 32.6 ft), from rating curve defined by current-meter measurements below 129,000 cfs and by slope-area measurement at 232,000 cfs; no flow at times in 1952-56, 1964.
Maximum stage since at least 1879, 41.5 ft June 14, 1935 (discharge, 380,000 cfs), from information by local resident.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Many small diversions above station. Part of low flow of Llano River disappears into the formations between station near Junction and Llano.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	92	120	84	290	116	94	102	54	7.2	0	138
2	51	82	110	84	210	116	*94	108	47	6.8	0	116
3	47	76	100	84	171	120	92	97	38	6.2	0	108
4	48	75	94	82	649	115	88	78	33	5.6	0	98
5	47	73	92	80	348	112	132	72	42	5.9	0	90
6	47	68	90	82	259	114	160	*67	44	6.5	11	80
7	46	68	91	82	192	114	148	64	45	6.5	10	75
8	44	700	88	84	158	120	155	62	*60	6.2	10	70
9	43	568	88	78	140	120	129	99	40	5.3	10	65
10	43	225	*92	80	125	120	112	780	38	5.0	9.0	60
11	42	226	94	80	116	131	106	414	36	4.7	6.8	55
12	41	219	92	78	116	127	102	226	33	4.4	5.9	50
13	40	172	98	78	114	125	94	150	32	4.4	4.7	50
14	41	140	106	76	110	122	92	118	31	*3.6	4.0	45
15	41	125	104	82	108	120	86	100	32	1.4	36	45
16	38	116	100	98	100	118	84	88	36	1	648	45
17	37	110	98	98	100	114	90	75	44	.5	*250	40
18	41	108	98	92	98	137	88	68	35	0	322	40
19	42	108	96	89	96	1,240	92	61	28	0	176	40
20	43	102	96	84	96	520	104	56	25	0	120	279
21	46	100	94	84	112	312	114	52	30	0	90	635
22	47	102	94	82	116	222	108	54	23	0	70	*5,660
23	47	96	92	84	118	178	104	56	20	0	60	7,600
24	51	94	92	83	125	158	98	52	16	0	435	37,700
25	55	90	90	78	*129	142	103	51	5.9	0	2,650	12,300
26	65	88	88	78	127	129	205	49	10	0	1,040	4,430
27	205	106	88	76	127	118	156	47	10	0	507	13,000
28	168	127	86	75	118	110	109	43	9.0	0	334	3,510
29	148	125	84	76	116	104	133	46	9.0	0	253	*1,690
30	*125	129	84	276	----------	98	114	75	7.6	0	207	1,160
31	110	----------	84	385	----------	96	----------	100	----------	0	170	----------
Total	1,941	4,510	2,923	3,052	4,684	5,588	3,386	3,510	913.5	81.2	7,439.4	89,274
Mean	62.6	150	94.3	98.5	162	180	113	113	30.4	2.62	240	2,976
Ac-ft	3,850	8,950	5,800	6,050	9,290	11,080	6,720	6,960	1,810	161	14,760	177,100

Calendar year 1963: Max 700 Min 9.5 Mean 94.1 Ac-ft 68,110
Water year 1963-64: Max 37,700 Min 0 Mean 348 Ac-ft 252,500

Peak discharge (base, 7,500 cfs)

Date	Time	Gage height	Discharge
9-22	0600	9.32	11,300
9-24	1000	20.10	67,200
9-27	0630	12.46	23,800

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record July 16 to Aug. 5, Sept. 5-19.

8-1535. Pedernales River near Johnson City, Tex.

Location.--Lat 30°17'27", long 98°24'01", near center of span at downstream side of bridge on U. S. Highway 281, 0.2 mile downstream from Towhead Creek, 1.1 miles northeast of Johnson City, Blanco County, and 3.4 miles downstream from Buffalo Creek.

Drainage area.--947 sq mi.

Records available.--May 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,096.70 ft above mean sea level, datum of 1929, supplementary adjustment of 1942. May 4 to Sept. 13, 1939, wire-weight gage and Sept. 14, 1939 to Sept. 10, 1952, water-stage recorder at upstream side of bridge at same datum. Sept. 11, 1952 to June 29, 1953, staff gage and June 30, 1953 to Oct. 7, 1954, water-stage recorder at site 360 ft downstream at same datum.

Average discharge.--25 years, 158 cfs (114,400 acre-ft per year).

Extremes.--Maximum discharge during year, 10,600 cfs Mar. 19 (gage height, 9.58 ft); no flow at times.
1939-64: Maximum discharge, 441,000 cfs Sept. 11, 1952 (gage height, 42.5 ft, from floodmark), from rating curve defined by current-meter measurements below 116,000 cfs and slope-area measurement of 441,000 cfs; no flow at times in 1951-52, 1954, 1956, 1963-64.
Maximum stage since at least 1859, that of Sept. 11, 1952; flood of July 1869 reached a stage of 33 ft, from information by local residents.

Remarks.--Records good except those below 0.5 cfs, which are fair. Some diversions above station for irrigation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 24 to Aug. 16, Sept. 23, 24, 26-28)

1.91	0	2.4	4.0	3.2	162
2.0	.1	2.5	7.0	3.5	285
2.1	.4	2.6	12	4.0	585
2.2	1.0	2.7	24	4.5	1,040
2.3	2.1	2.9	73	6.5	4,080

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.1	8.0	36	18	184	34	43	34	11	0.4	0.1	0.1
2	1.8	6.1	29	17	117	60	*46	26	9.0	.4	0	.1
3	2.0	5.2	23	16	92	58	43	23	7.5	.4	0	.1
4	2.0	5.2	20	14	243	76	43	22	8.5	.3	0	.1
5	2.0	5.8	18	14	173	53	38	20	9.5	.3	0	0
6	2.1	5.5	17	14	106	38	41	20	8.5	.2	0	.1
7	2.0	5.2	17	14	81	36	43	20	7.5	.2	0	.1
8	1.8	1,520	14	13	70	36	38	20	6.4	.1	0	.1
9	1.7	1,290	14	12	66	50	38	*24	5.8	.1	0	.1
10	*1.5	198	14	12	58	46	36	24	5.5	.1	0	.1
11	1.5	103	14	12	56	36	36	24	5.5	0	0	.1
12	1.5	68	16	12	56	34	34	29	*5.2	0	0	.2
13	1.5	46	25	11	48	31	31	23	4.9	0	0	.2
14	1.5	31	48	12	43	29	29	22	4.3	0	0	.2
15	1.4	23	43	17	43	29	26	18	4.6	0	0	.2
16	1.3	*18	34	36	43	26	29	14	4.3	0	.1	6.3
17	1.2	14	29	36	41	24	38	12	4.0	0	.3	14
18	1.1	12	26	29	38	51	41	11	3.4	0	.2	4.1
19	1.0	13	24	23	36	3,380	38	10	3.4	0	.2	12
20	.9	14	23	20	34	447	36	9.0	4.3	*0	**.1	34
21	.8	13	*24	19	43	173	36	9.0	3.0	.5	.1	61
22	.8	12	23	18	46	123	34	10	2.1	.3	.1	922
23	.9	10	28	18	38	106	34	10	1.8	.2	.1	281
24	4.0	10	23	16	38	89	31	10	1.5	.1	.2	1,190
25	32	10	20	*16	48	76	29	8.5	1.4	0	.2	395
26	108	11	20	17	46	68	233	9.0	1.0	0	.2	132
27	119	33	19	16	41	60	114	10	.8	.1	.1	310
28	53	155	18	16	34	56	58	9.0	.7	.4	.1	222
29	26	70	19	18	*31	50	41	8.5	.6	.2	.2	120
30	17	48	18	463	----------	48	36	8.5	.5	.1	.1	53
31	12	----------	18	534	----------	46	----------	9.0	----------	.1	.1	----------
Total	405.4	3,763.0	714	1,503	1,993	5,469	1,393	506.5	136.5	4.5	2.5	3,758.2
Mean	13.1	125	23.0	48.5	68.7	176	46.4	16.3	4.55	0.15	0.08	125
Ac-ft	804	7,460	1,420	2,980	3,950	10,850	2,760	1,000	271	8.9	5.0	7,450

Calendar year 1963: Max 1,520 Min 0 Mean 27.2 Ac-ft 19,710
Water year 1963-64: Max 3,380 Min 0 Mean 53.7 Ac-ft 38,960

Peak discharge (base, 4,100 cfs)

Date	Time	Gage height	Discharge
11- 8	2030	8.26	7,350
3-19	1100	9.58	10,600
9-22	1600	7.37	5,630

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

8-1545. Lake Travis near Austin, Tex.

Location.--Lat 30°23'20", long 97°54'35", in powerhouse at Mansfield Dam on Colorado River, 7.3 miles downstream from Sandy Creek and 12 miles northwest of Austin, Travis County.
Drainage area.--38,130 sq mi, approximately, of which 11,900 sq mi is probably noncontributing.
Records available.--September 1940 to September 1964. Prior to October 1948, published as Marshall Ford Reservoir near Austin.
Gage.--Indicating gage. Datum of gage is 0.12 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation). Prior to Dec. 26, 1940, staff gages on left bank near dam, datum at mean sea level, unadjusted. Dec. 26, 1940, to February 1942, mercury manometer in powerhouse, datum at mean sea level, unadjusted.
Extremes.--Maximum contents during year, 542,200 acre-ft Sept. 30 (gage height, 637.1 ft); minimum, 339,000 acre-ft Oct. 20-23, Nov. 7 (gage height, 615.0 ft).
1940-64: Maximum contents, 1,770,000 acre-ft May 18, 1957 (gage height, 707.4 ft); minimum, 332,600 acre-ft Aug. 13, 14, 1951 (gage height, 614.2 ft).
Remarks.--Reservoir is formed by concrete gravity-type dam. Storage began Sept. 9, 1940; dam completed early in 1942. Capacity between gage heights 681.0 and 714.0 ft is 778,000 acre-ft and is reserved for flood control. Figures given herein represent total contents. Contents based on survey dated October 1939. Water used for power development and for irrigation of rice in several districts below Columbus. Data regarding dam and reservoir are shown in following table:

	Gage height (feet)	Capacity (acre-feet)
Crest of spillway	714.0	1,950,000
Top of designated power storage	681.0	1,172,000
Invert of penstocks	552.0	54,800
Invert of twenty-four 8½-foot diameter paradox gates	535.8	27,900

Cooperation.--Records of daily gage heights and capacity curve furnished by Lower Colorado River Authority.

Capacity table (gage height, in feet, and contents, in acre-feet)

615	339,000
620	379,600
625	423,000
630	469,100
635	520,600
640	572,700

Contents, in acre-feet, at 2400 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	347,800	340,600	365,400	386,500	402,000	433,800	479,400	453,600	445,500	421,200	398,500	368,600
2	346,200	340,600	365,200	386,500	402,000	433,800	479,400	455,400	444,600	420,300	397,700	367,800
3	345,400	340,600	366,200	386,500	403,700	434,700	478,400	456,300	441,900	416,700	396,800	365,400
4	343,800	339,800	366,200	386,500	407,100	434,700	477,300	454,500	441,000	412,300	398,500	363,800
5	342,200	339,800	366,200	386,500	409,700	436,500	477,300	454,500	441,000	409,700	400,200	361,400
6	342,200	339,800	366,200	387,300	412,300	437,400	476,300	454,500	441,000	407,100	402,000	359,800
7	342,200	339,000	365,400	386,500	414,000	437,400	476,300	455,400	441,900	407,100	403,700	356,600
8	340,600	340,600	365,400	386,500	414,900	437,400	474,200	455,400	440,100	407,100	403,700	354,200
9	340,600	354,200	365,400	386,500	414,900	438,300	472,200	457,200	438,300	405,400	402,800	353,400
10	340,600	358,200	365,400	387,300	415,800	440,100	470,100	457,200	436,500	399,400	402,000	355,800
11	340,600	359,000	365,400	387,300	415,800	440,100	468,100	456,300	433,800	402,000	402,800	358,200
12	340,600	359,800	367,000	388,200	415,800	441,000	467,100	457,200	432,900	402,000	402,800	357,400
13	339,800	359,800	370,200	388,200	417,600	441,900	465,100	457,200	430,200	398,500	402,800	355,000
14	339,800	359,800	370,200	389,100	420,300	442,800	465,100	456,300	428,400	397,700	400,200	352,600
15	339,800	359,800	371,000	389,900	421,200	442,800	463,000	453,600	427,500	396,800	401,100	350,200
16	339,800	359,800	371,000	390,800	422,100	444,600	464,000	451,800	431,100	396,800	401,100	353,400
17	339,800	359,800	372,700	391,600	423,000	444,600	464,000	450,000	433,800	395,900	398,500	359,800
18	339,800	359,800	372,700	391,600	423,000	447,300	464,000	446,400	437,400	394,200	397,700	361,400
19	339,800	361,400	374,400	391,600	423,000	456,300	464,000	446,400	438,300	394,200	398,800	363,000
20	339,000	361,400	377,000	391,600	423,000	465,100	463,000	444,600	437,400	394,200	395,100	364,600
21	339,000	361,400	378,700	391,600	423,900	468,100	463,000	444,600	436,500	394,200	392,500	367,800
22	339,000	363,000	379,600	391,600	424,800	469,100	461,000	444,600	434,700	395,100	390,800	368,600
23	339,000	363,000	380,500	394,200	424,800	470,100	460,000	444,600	431,100	396,800	388,200	375,300
24	340,600	363,000	383,900	394,200	425,700	473,200	457,200	443,700	428,400	397,700	384,800	434,700
25	341,400	363,000	383,900	394,200	426,600	476,300	457,200	445,500	426,600	398,500	381,300	472,200
26	341,400	363,000	384,800	394,200	428,400	476,300	457,200	447,300	423,900	397,700	378,700	488,700
27	342,200	363,000	385,600	394,200	430,200	476,300	461,000	448,200	423,000	396,800	377,900	512,400
28	342,200	364,600	385,600	394,200	430,200	477,300	458,100	449,100	423,000	397,700	377,000	533,000
29	342,200	364,600	385,600	394,200	432,000	477,300	459,000	450,000	423,000	398,500	373,600	541,200
30	340,600	365,400	385,600	395,900	----------	477,300	456,300	449,100	422,100	398,500	371,900	542,200
31	340,600	----------	386,500	399,400	----------	479,400	----------	448,200	----------	398,500	369,400	----------
(†)	615.2	618.3	620.8	622.3	626.0	631.0	628.7	627.8	624.9	622.2	618.8	637.1
(‡)	-9,600	+24,800	+21,100	+12,900	+32,600	+47,400	-23,100	-8,100	-26,100	-23,600	-29,100	+172,800

Calendar year 1963..... ‡ -523,800
Water year 1963-64..... ‡ +192,000

† Gage height, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-1570. Waller Creek at 38th Street, Austin, Tex.

Location.--Lat 30°17'49", long 97°43'36", on right bank 200 ft upstream from bridge at East 38th Street at Austin, Travis County, 1.1 miles upstream from West Branch of Waller Creek, and 3.3 miles upstream from Colorado River.

Drainage area.--2.31 sq mi.

Records available.--April 1955 to September 1964.

Gage.--Water-stage recorder (digital beginning May 29) and concrete control. Datum of gage is 555.44 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942.

Average discharge.--9 years, 1.67 cfs (1,210 acre-ft per year).

Extremes.--Maximum discharge during year, 1,340 cfs Sept. 27 (gage height, 7.01 ft); no flow Sept. 10, 13-14.
1955-64: Maximum discharge, 1,970 cfs Oct. 29, 1960 (gage height, 7.77 ft); no flow for many days in 1955-57, 1964.

Remarks.--Records excellent except those above 200 cfs and those for period of no gage-height record, which are fair. Flow slightly regulated at times by a small reservoir at St. Mary's Academy on East 41st Street, and a small swimming pool at the academy which is drained into the creek every week or two during the summer. Water from other swimming pools also drain into the creek. Station is part of hydrologic research project to study rainfall-runoff relation for small urban areas.

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

1.8	0	2.6	4.3
1.9	.2	2.8	8.7
2.0	.3	3.0	16
2.1	.6	3.2	27
2.2	1.0	3.4	42
2.4	2.1	3.8	88

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1963 TO SEPTEMBER 1964

DAY	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
1	0.1	0.2	0.2	0.2	0.3	0.5	0.3	5.4	0.1	0.4	0.6	0.4
2	.1	.1	.1	.1	.3	.7	.4	.3	.5	.5	.3	.1
3	.1	.1	.2	.1	.3	.3	.2	.2	.4	.4	.1	.5
4	.1	.2	.2	.2	6.6	1.7	.3	.2	.8	.4	.3	.4
5	.1	.2	.2	.2	.4	.4	.7	.3	3.5	.4	.3	.3
6	.1	.1	.1	.2	.5	.4	.3	.6	.4	.1	1.0	.6
7	.1	.1	.1	.2	.4	.4	.2	.4	.5	.4	.4	.8
8	.1	2.7	.1	.4	.5	.3	.2	.3	.1	.4	.4	.4
9	.1	.3	.1	.2	.4	2.2	.3	.2	.3	.4	.2	.1
10	.1	.2	.2	.2	.4	.4	.3	.3	.4	.4	.1	0
11	.1	.2	.3	.2	.4	.2	.2	.4	.4	.3	.5	.3
12	.1	.1	.7	.2	.4	.2	.2	.2	.4	.4	.3	.1
13	.1	.1	4.2	.2	.5	.3	.3	.3	.4	.1	.4	0
14	.1	.1	.9	a .2	.4	.3	.2	.2	1.0	.3	.2	0
15	.1	.1	.2	a .2	1.3	.3	.2	.1	16	.3	.4	.1
16	.1	.2	.2	a 5.0	.4	.3	.4	.1	63	.4	5.3	25
17	.1	.2	.2	a 2.5	.4	.3	.8	.1	1.5	.4	.2	4.1
18	.1	.2	.2	a .5	.2	9.8	.2	.1	.7	.3	.4	.1
19	.1	.6	.2	a .4	.3	9.4	.2	.9	.6	2.5	.5	.1
20	.1	.3	* 2.7	a .3	.3	.5	.2	.1	.6	3.6	.6	.4
21	.1	.2	.2	.3	3.3	.4	.2	.2	.5	.4	.5	.8
22	.1	* .7	.2	.3	.6	.4	.2	1.1	.2	.4	.6	.1
23	.1	.1	.2	.4	.5	.3	.2	.2	.4	.4	2.2	.1
24	3.0	.1	.2	.2	2.3	.3	.2	1.7	.5	.4	.9	.1
25	* .1	.1	.2	.2	.6	.3	.6	.9	.5	.3	.5	.4
26	.8	.1	.2	.2	.5	.3	9.3	.2	.4	.4	.4	.5
27	.2	1.6	.2	* .2	.6	.2	.2	.1	.4	.1	.3	88
28	.1	.7	.2	.1	.4	.3	.2	.2	.4	.3	.4	.7
29	.1	.1	.2	* .8	.4	.3	.2	.2	.2	1.2	.5	2.0
30	.1	.1	.2	16	------	.2	.2	3.4	.4	.4	.4	.3
31	.1	------	.2	.5	------	.2	------	.8	------	.4	.1	------
TOTAL	6.8	10.1	13.5	30.9	23.9	32.1	17.6	19.7	95.5	17.1	19.3	126.8
MEAN	.22	.34	.44	1.00	.82	1.04	.59	.64	3.18	.55	.62	4.23
CFSM	.095	.146	.188	.432	.357	.450	.254	.275	1.38	.239	.270	1.83
IN	.11	.16	.22	.50	.38	.52	.28	.32	1.54	.28	.31	2.04
AC-FT	13	20	27	61	47	64	35	39	189	34	38	252

CALENDAR YEAR 1963 MAX 33 MIN .1 MEAN .844 CFSM .365 INCHES 4.96 AC-FT 610
WATER YEAR 1963-64 MAX 88 MIN 0 MEAN 1.13 CFSM .489 INCHES 6.65 AC-FT 819

Peak discharge (base, 200 cfs)

Date	Time	Gage height	Discharge
3-18	2330	4.65	246
6-16	0830	5.66	579
9-16	2135	4.83	292
9-27	0600	7.01	1,340

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

8-1575. Waller Creek at 23d Street, Austin, Tex.

Location.--Lat 30°17'08", long 97°44'01", on San Jacinto Boulevard, 50 ft upstream from bridge on East 23d Street at Austin, Travis County, and 2.1 miles upstream from Colorado River.

Drainage area.--4.13 sq mi.

Records available.--December 1954 to September 1964.

Gage.--Water-stage recorder (digital beginning May 29). Datum of gage is 509.95 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942.

Average discharge.--9 years (1955-64), 3.80 cfs (2,750 acre-ft per year).

Extremes.--Maximum discharge during year, 2,280 cfs Sept. 27 (gage height, 7.08 ft); minimum daily, 0.4 cfs for several days.
1954-64: Maximum discharge, 3,710 cfs Oct. 29, 1960 (gage height, 7.96 ft); minimum daily, 0.2 cfs at times.
Maximum flood since 1885 occurred Apr. 22, 1915, stage unknown.

Remarks.--Records excellent except those above 100 cfs, which are fair. Some regulation by small dam upstream. Diversion of city water into channel during the summer months from municipal and private swimming pools. Probability of diversions into and out of drainage area by storm sewers. Station is part of hydrologic research project to study rainfall-runoff relation for small urban areas. Three recording and three non-recording rain gages located in watershed.

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

0.8	0.3	1.5	5.6
.9	.5	1.6	8.3
1.0	.8	1.8	16
1.1	1.3	2.0	30
1.2	1.9	2.4	72
1.3	2.8	2.8	133
1.4	4.0	3.1	193

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1963 TO SEPTEMBER 1964

DAY	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
1	0.6	0.6	0.4	0.5	0.9	1.3	0.8	9.7	0.9	1.3	1.2	1.1
2	.6	.5	.5	.5	.9	1.5	1.1	1.0	.8	1.3	1.0	1.2
3	.7	.5	.5	.5	6.8	.8	.9	.8	1.0	1.3	1.0	1.1
4	.9	1.4	.5	.5	8.2	3.1	.8	1.1	2.6	1.4	.9	1.2
5	.6	.8	.5	.5	1.0	.9	1.7	1.0	6.3	1.0	1.4	1.0
6	.6	.6	.4	.5	1.4	1.1	.9	1.6	1.0	1.1	2.5	1.6
7	.7	.7	.4	1.2	1.1	1.0	.8	1.3	1.0	1.0	1.5	1.4
8	1.0	9.0	.4	.7	1.0	1.3	.7	1.4	.8	1.1	1.6	1.2
9	.9	1.2	.4	1.4	.9	5.0	.7	1.0	1.1	1.2	.8	.9
10	.7	.6	.6	.6	1.0	.8	.9	1.0	1.1	1.4	1.2	1.0
11	.8	.7	.8	.7	1.0	.7	.7	1.3	1.2	.9	1.1	2.9
12	.5	.6	2.5	.5	1.0	.7	.7	.9	1.1	1.0	1.1	.8
13	.6	.5	9.1	.5	1.2	.8	1.0	.9	1.2	1.0	1.1	.7
14	.9	.5	2.3	.5	.8	.8	.7	1.1	1.7	1.0	1.1	.8
15	1.0	.6	.5	.6	3.3	.7	.7	.9	25	1.5	1.1	.8
16	.9	.6	.5	11	.8	.7	1.1	.9	*133	1.1	12	60
17	.8	.5	.6	7.2	.9	.8	2.4	.9	3.4	1.2	1.1	8.6
18	1.2	.6	.6	.9	.7	17	.7	.8	1.7	1.1	1.1	1.0
19	.9	2.0	.6	.7	.8	23	.7	1.7	1.6	3.8	1.2	.9
20	.8	.9	6.6	.7	.8	1.4	.7	.7	1.3	7.3	1.3	1.9
21	1.0	.6	.7	.7	7.0	1.0	.8	.8	1.2	1.4	1.5	2.5
22	1.1	2.1	.6	.5	1.2	.9	1.0	3.8	1.3	1.1	1.8	1.0
23	.9	.6	.6	*1.2	.9	1.0	.9	.9	1.1	1.2	6.6	.9
24	8.7	.8	.6	.8	5.0	.9	.9	2.4	1.3	1.4	2.3	1.0
25	1.1	.9	.5	.6	1.2	1.1	1.9	1.7	1.3	1.1	1.4	1.2
26	2.2	1.0	.6	.6	1.0	.8	20	.9	1.4	1.1	1.2	1.9
27	.7	4.9	.6	.7	1.2	.8	.9	.8	1.1	.9	1.0	179
28	.7	1.5	.6	.6	.9	.8	.9	.9	1.1	1.1	1.3	2.2
29	.7	.4	.5	2.0	1.0	.7	.9	1.1	1.2	3.0	1.1	5.2
30	.6	.5	.6	32	------	.9	1.1	7.2	1.0	1.1	1.0	1.2
31	.8	------	.6	1.3	------	.8	------	1.6	------	1.4	1.0	------
TOTAL	34.2	36.7	35.2	71.2	53.9	73.1	48.0	52.1	199.8	46.8	55.5	286.2
MEAN	1.10	1.22	1.14	2.30	1.86	2.36	1.60	1.68	6.66	1.51	1.79	9.54
CFSM	.266	.295	.276	.557	.450	.571	.387	.407	1.61	.366	.433	2.31
IN	.31	.33	.32	.64	.49	.66	.43	.47	1.80	.42	.50	2.58
AC-FT	68	73	70	141	107	145	95	103	396	93	110	568

CALENDAR YEAR 1963 MAX 78 MIN .4 MEAN 2.09 CFSM .506 INCHES 6.85 AC-FT 1,510
WATER YEAR 1963-64 MAX 179 MIN .4 MEAN 2.71 CFSM .656 INCHES 8.94 AC-FT 1,969

Peak discharge (base, 600 cfs)

Date	Time	Gage height	Discharge
3-18	2315	4.65	745
6-16	0800	5.55	1,230
9-16	2145	4.93	885
9-27	0615	7.08	2,280

* Discharge measurement made on this day.

8-1580. Colorado River at Austin, Tex.

Location (revised).--Lat 30°14'40", long 97°41'39", on right bank 1,000 ft upstream from upstream bridge on U. S. Highway 183 in Austin, Travis County, and 1.4 miles downstream from Town Lake Dam. Prior to Oct. 17, 1963, at site 1,000 ft downstream.

Drainage area.--38,400 sq mi, approximately, of which 11,900 sq mi is probably noncontributing.

Records available.--February 1898 to September 1964. Records of daily discharge for Dec. 13-26, 1914, and Feb. 9-17, 1915, published in WSP 408, have been found unreliable and should not be used.

Gage (revised).--Water-stage recorder. Datum of gage is 402.27 ft above mean sea level, datum of 1929. Prior to June 18, 1915, combination staff and chain gages in vicinity of Congress Avenue Bridge 3.9 miles upstream at datum 19.6 ft higher. June 18, 1915 to Apr. 21, 1918, water-stage recorder (pressure type) in basement near left end of Congress Avenue Bridge at datum 19.6 ft higher. Apr. 26, 1918 to June 19, 1939, water-stage recorder at Congress Avenue Bridge at datum 19.6 ft higher. June 20, 1939 to Oct. 16, 1963, at site 1,000 ft downstream at datum 5.0 ft higher.

Average discharge.--66 years, 2,458 cfs (1,780,000 acre-ft per year).

Extremes.--Maximum discharge during year, 10,300 cfs June 16 (gage height, 11.25 ft); minimum daily, 3.0 cfs Mar. 28, 29.

1898-1964: Maximum discharge, 481,000 cfs June 15, 1935 (gage height, 50 ft, present site and datum, from floodmark); minimum unregulated, 13 cfs Aug. 18, 1918.

Maximum stage since at least 1833, 51 ft (revised) July 7, 1869, present site and datum (adjusted to present site on basis of record for flood of June 15, 1935), determined from information concerning stage at former site furnished by Dean T. U. Taylor.

Remarks.--Records good. Flow largely regulated by Lake Travis (station 8-1545). There are 16 major reservoirs above the station with a combined total capacity of 4,642,000 acre-ft. Records furnished by city of Austin show 42,810 acre-ft diverted for municipal use above station and 18,880 acre-ft of treated sewage returned below station. Many other diversions above Buchanan Reservoir for irrigation, municipal supplies, and oil-field operations. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	546	30	39	35	46	47	654	1,170	1,750	2,070	950	1,490
2	510	26	41	38	39	170	618	1,110	1,500	1,890	854	1,510
3	506	26	39	41	39	6.6	576	1,210	1,700	2,120	1,010	1,830
4	513	32	30	41	139	21	502	1,940	1,700	1,870	960	1,710
5	401	36	30	36	57	26	508	1,990	1,930	1,670	960	1,560
6	406	35	30	315	50	33	631	*1,590	1,400	2,330	950	1,520
7	548	35	32	82	60	39	798	1,350	1,360	1,860	960	1,570
8	484	52	30	50	46	42	1,530	1,820	2,100	1,730	754	1,540
9	104	92	30	42	44	59	*858	1,220	2,320	2,160	540	1,470
10	a 50	62	36	33	44	38	1,330	1,240	2,430	2,150	820	1,490
11	a 40	54	41	35	41	39	1,160	1,800	*2,520	1,730	844	1,530
12	a 40	47	44	38	41	33	1,160	1,780	2,410	1,590	838	1,210
13	a 40	42	56	35	44	33	1,220	1,800	2,420	1,990	1,160	1,150
14	a 40	39	66	35	42	38	1,200	1,600	2,260	1,930	1,180	1,260
15	* 38	39	47	45	52	36	1,240	2,110	1,780	2,010	868	1,170
16	a 30	*35	41	125	41	35	1,080	1,910	2,070	1,800	752	612
17	29	38	36	59	44	32	930	1,940	172	1,600	1,050	462
18	32	39	32	49	44	35	766	2,280	147	1,470	1,060	542
19	29	41	33	44	46	371	784	2,260	808	801	1,570	556
20	32	44	62	41	41	44	1,120	2,200	1,400	865	*1,490	614
21	35	46	*57	36	47	41	1,140	1,800	1,440	1,360	1,700	745
22	32	40	52	45	57	46	1,340	1,180	2,200	1,330	1,620	560
23	33	33	113	a36	46	52	1,320	1,230	2,200	1,430	1,540	*732
24	52	32	52	a36	54	52	1,770	1,200	2,260	*1,350	1,660	*748
25	* 49	36	44	*a35	59	56	1,050	1,210	2,240	1,150	1,520	609
26	49	38	44	a36	52	46	1,150	1,150	2,340	930	1,480	592
27	47	41	42	39	46	177	1,660	1,470	2,320	1,270	1,490	1,460
28	47	56	41	38	* 41	3.0	1,620	1,470	1,760	1,310	1,470	85
29	46	42	41	42	39	3.0	1,920	1,470	2,270	900	1,290	92
30	35	38	42	283	----------	22	1,680	1,550	2,290	895	1,130	685
31	32	----------	38	70	----------	30	----------	1,510	----------	1,060	1,870	----------
Total	4,875	1,246	1,361	1,915	1,441	1,705.6	33,315	49,560	55,497	48,621	36,340	31,104
Mean	157	41.5	43.9	61.8	49.7	55.0	1,110	1,599	1,850	1,568	1,172	1,037
Ac-ft	9,670	2,470	2,700	3,800	2,860	3,380	66,080	98,300	110,100	96,440	72,080	61,690

Calendar year 1963: Max 2,350 Min 26 Mean 965 Ac-ft 698,700
Water year 1963-64: Max 2,520 Min 3.0 Mean 729 Ac-ft 529,600

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

8-1591.5. Wilbarger Creek near Pflugerville, Tex.

Location.--Lat 30°27'16", long 97°36'02", on left bank 131 ft downstream from county road (Pfluger Lane), 800 ft downstream from Farm Road 685, 1.6 miles northeast of Pflugerville, Travis County, and 1.9 miles downstream from Missouri-Kansas-Texas Railroad.

Drainage area.--4.61 sq mi.

Records available.--August 1963 to September 1964.

Gage.--Water-stage recorder (digital beginning June 4, 1964). Datum of gage is 670.61 ft above mean sea level, datum of 1929.

Extremes.--1963: No flow during period August to September.
1963-64: Maximum discharge during water year, 1,760 cfs June 16 (gage height, 6.92 ft); no flow for many days.
Maximum stage since at least 1894, occurred in September 1921, stage unknown. This information from local residents.

Remarks.--Records good. Three recording rain gages located in watershed.

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

0.77	0	1.3	6.1	1.8	38
.9	.1	1.4	9.4	2.2	91
1.0	.4	1.5	13	2.6	158
1.1	1.3	1.6	19	3.0	240
1.2	3.3				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	0	1.5	0.2	0.2		0
2						0	0	.2	.1	.2		0
3						0	0	0	.1	.2		0
4						0	0	0	.1	.1		0
5						0	0	0	.1	.1	(*)	0
6						0	0	0	.1	.1		0
7						0	0	0	.1	.1		0
8						0	0	*0	0	.1		0
9						0	0	0	0	.1		0
10						0	0	0	0	.1		0
11						0	0	0	0	.1		0
12						0	0	0	0	.1		0
13						0	0	0	0	.1		0
14						*0	*0	0	0	.1		0
15					(*)	0	0	0	*59	.1		0
16						0	0	0	*237	.1		0
17						0	0	0	6.6	0		0
18						0	0	0	2.9	0		0
19						.6	0	0	1.6	0		0
20						0	0	0	1.1	.1		0
21				(*)		0	0	0	.8	0		0
22		(*)				0	0	0	.7	0		0
23			(*)			0	0	0	.6	0		0
24						0	0	0	.4	0		0
25	(*)					0	0	0	.4	0		0
26						0	*50	0	.3	0		*0
27						0	*.2	0	.3	0	(*)	*60
28						0	0	0	.2	0		.3
29						0	0	0	.3	0		.1
30					----------	0	0	*125	.2	0		.1
31		----------			----------	0	----------	4.5	----------	0		----------
Total	0	0	0	0	0	0.9	50.2	131.2	313.2	2.0	0	60.5
Mean	0	0	0	0	0	0.03	1.67	4.23	10.4	0.07	0	2.02
Cfsm	0	0	0	0	0	0.0063	0.362	0.918	2.26	0.014	0	0.438
In.	0	0	0	0	0	0.01	0.40	1.06	2.53	0.02	0	0.49
Ac-ft	0	0	0	0	0	1.8	100	260	621	4.0	0	120

Calendar year	Max	Min	Mean	Cfsm	In.	Ac-ft
Water year 1963-64:	Max 237	Min 0	Mean 1.53	Cfsm 0.332	In. 4.50	Ac-ft 1,106

Peak discharge (base, 400 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-26	0700	4.30	569	6-16	0900	6.92	1,760
5-30	2000	6.79	1,700	9-27	0700	4.52	648
6-15	1830	5.23	938				

* Discharge measurement or observation of no flow made on this day.
Note.--Observation of no flow made Aug. 9, Sept. 12, 16, 27, 1963.

8-1592. Colorado River at Bastrop, Tex.

Location.--Lat 30°06'20", long 97°19'08", on left bank in City Park in Bastrop, Bastrop County, 400 ft upstream from bridge on State Highway 71, 0.3 mile upstream from Gills Creek, and 1.1 miles downstream from Piney Creek.

Drainage area.--39,400 sq mi, approximately, of which 11,900 sq mi is probably noncontributing.

Records available.--March 1960 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 307.38 ft above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942. Prior to May 10, 1960, staff gage at same site and datum.

Extremes.--Maximum discharge during year, 15,100 cfs June 17 (gage height, 13.57 ft); minimum, 50 cfs Apr. 2.
1960-64: Maximum discharge, 79,600 cfs Oct. 29, 1960 (gage height, 34.34 ft); minimum, that of Apr. 2, 1964.
Maximum stage since at least 1845, 60.3 ft July 7 or 8, 1869. Flood of June 16, 1935, reached a stage of 57.0 ft and flood of Dec. 4, 1913, reached a stage of 53.3 ft, from information by local residents.

Remarks.--Records good. Many diversions above station for irrigation and municipal supply. Regulation same as that for Colorado River at Austin (see preceding page). Records of the Lower Colorado River Authority indicate that during the 1964 water year 11,320 acre-ft were diverted above this station by pumping into Lake Bastrop.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	755	97	103	108	325	115	75	1,790	1,880	2,240	1,070	1,330
2	725	92	95	105	194	152	111	1,490	1,780	2,090	1,040	1,500
3	675	90	88	105	152	122	350	1,230	1,630	1,820	940	1,560
4	675	90	84	101	149	191	330	1,300	1,730	2,120	1,100	1,700
5	675	86	84	101	147	127	310	1,880	1,760	1,930	963	1,740
6	640	84	86	103	197	99	278	2,000	1,940	1,780	1,030	1,650
7	555	84	86	101	152	92	318	1,740	1,630	2,130	1,020	1,610
8	610	90	82	210	130	97	710	1,550	1,440	1,930	1,120	1,640
9	645	99	84	182	130	105	1,290	1,860	1,950	*1,850	800	1,630
10	557	103	86	122	127	99	1,030	1,470	2,310	2,000	700	1,540
11	286	115	88	105	115	101	1,160	1,380	2,430	2,090	825	1,560
12	209	110	90	97	113	103	1,280	1,840	2,400	1,780	880	1,570
13	185	99	113	88	113	101	1,170	1,850	2,400	1,620	880	1,300
14	*155	92	130	84	113	101	1,240	1,890	2,400	1,930	1,090	1,260
15	144	*90	125	84	117	97	1,240	1,660	2,350	1,910	1,220	1,310
16	135	92	141	103	115	95	1,300	2,070	4,570	1,940	1,020	1,310
17	127	90	*135	113	117	92	1,120	1,990	3,970	1,830	865	2,770
18	117	88	122	*164	117	90	1,160	1,980	1,270	1,660	1,020	*1,100
19	115	95	115	138	110	168	880	2,240	630	1,500	*1,110	506
20	110	110	117	115	105	351	825	2,260	606	1,240	1,140	635
21	105	97	120	101	115	*266	1,010	2,250	1,480	950	1,370	700
22	99	95	125	99	*125	170	1,210	1,930	1,460	1,140	1,640	702
23	97	92	141	97	125	138	1,370	1,490	2,080	1,420	1,700	725
24	*97	90	130	92	141	127	1,380	1,280	2,190	1,360	1,570	610
25	101	88	135	88	147	117	*1,730	1,460	2,250	1,390	1,640	766
26	99	88	155	88	133	115	1,380	1,390	2,140	1,280	1,630	712
27	108	92	127	88	141	117	1,420	*1,200	2,290	1,030	1,520	1,110
28	117	101	117	84	130	115	1,740	1,500	2,280	1,290	1,530	3,370
29	113	99	115	80	120	168	1,610	1,560	1,840	1,270	1,530	688
30	108	101	113	102	----------	130	1,920	1,540	2,200	1,160	1,420	370
31	108	----------	110	128	----------	92	----------	1,780	----------	880	1,250	----------
Total	9,247	2,839	3,442	3,376	4,015	4,053	30,947	52,850	66,286	50,560	36,633	38,974
Mean	298	94.6	111	109	138	131	1,032	1,705	2,210	1,631	1,182	1,299
Ac-ft	18,340	5,630	6,830	6,700	7,960	8,040	61,380	104,800	131,500	100,300	72,660	77,300

Calendar year 1963: Max 8,940 Min 82 Mean 1,117 Ac-ft 808,700
Water year 1963-64: Max 8,970 Min 75 Mean 828 Ac-ft 601,400

* Discharge measurement made on this day.

8-1595. Colorado River at Smithville, Tex.

Location.--Lat 30°01', long 97°10', on right bank 360 ft downstream from bridge on State Highway 71 in Smithville, Bastrop County, 850 ft downstream from Gazley Creek, and 4 miles downstream from Alum Creek.

Drainage area.--39,880 sq mi, approximately, of which 11,900 sq mi is probably noncontributing.

Records available.--July 1930 to September 1964. Gage-height records collected in this vicinity since 1920 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 270.14 ft above mean sea level, datum of 1929. Prior to Apr. 9, 1931, staff gage at same site and datum.

Average discharge.--34 years, 2,768 cfs (2,004,000 acre-ft per year).

Extremes.--Maximum discharge during year, 14,300 cfs June 17 (gage height, 10.65 ft); minimum, 95 cfs Apr. 3.
1930-64: Maximum discharge, 305,000 cfs June 16, 1935 (gage height, 42.5 ft, from floodmarks), from rating curve defined by current-meter measurements below 209,000 cfs and slope-area measurement at 305,000 cfs; minimum, 76 cfs Nov. 2, 1934.
Maximum stage since at least 1860 occurred July 8, 1869, and was several feet higher than flood of Dec. 4, 1913, which reached a stage of 47.4 ft, and was the highest since 1869, from information by local residents.

Remarks.--Records good. Many diversions above station for irrigation and municipal supply. Regulation same as that for Colorado River at Austin (station 8-1580).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 21 to Feb. 1, Feb. 3 to Mar. 2, Mar. 4-19, Mar. 23 to Apr. 3, Sept. 17-18, 21, 28-29)

0.8	102	3.0	1,200
1.2	200	4.0	2,450
1.6	330	6.0	5,400
2.3	640	9.0	11,000
2.5	750		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	898	136	125	118	174	130	116	1,860	1,930	2,640	899	1,360
2	696	132	127	118	266	301	102	1,480	1,680	2,520	1,080	1,620
3	675	127	123	118	192	272	160	1,120	1,680	2,000	972	1,800
4	645	123	120	118	187	164	490	1,070	1,620	2,380	877	1,860
5	635	120	120	116	171	171	540	1,400	1,740	2,190	1,030	2,120
6	640	127	120	116	158	136	486	1,860	1,800	2,060	984	2,000
7	565	130	120	116	184	118	458	1,800	1,860	2,260	1,000	2,000
8	540	141	120	116	153	111	510	1,560	1,400	2,320	1,030	1,930
9	620	153	123	192	136	127	701	1,550	1,560	2,060	1,050	2,000
10	590	146	120	184	136	123	1,180	1,520	2,380	2,120	762	1,860
11	430	143	*118	148	132	118	806	1,220	2,520	2,380	610	1,860
12	269	146	118	136	127	118	1,180	1,460	2,580	2,190	774	1,860
13	209	143	130	127	125	120	1,060	1,740	2,580	1,860	798	1,740
14	187	136	143	120	123	120	1,050	1,740	2,580	2,060	824	1,520
15	*174	*127	136	120	125	118	1,120	1,550	2,640	2,190	1,140	1,490
16	169	127	136	139	118	114	1,110	1,800	4,870	2,190	1,220	1,680
17	164	127	139	139	120	111	1,080	2,000	11,000	2,190	941	*4,390
18	158	127	136	*143	123	111	1,010	1,800	3,470	1,860	762	*2,820
19	151	132	130	174	120	492	856	2,190	930	1,740	1,040	949
20	143	161	132	158	116	440	702	2,260	600	1,620	*1,060	675
21	141	156	132	143	123	*386	702	2,260	972	1,020	1,140	943
22	139	132	127	136	*125	266	956	2,120	1,400	929	1,740	1,080
23	134	123	130	132	127	177	1,070	1,680	1,860	1,460	1,930	964
24	*136	123	141	125	132	151	1,210	1,170	2,380	1,420	1,740	1,030
25	136	123	136	118	146	141	*1,510	1,520	2,450	1,510	1,740	838
26	136	123	139	116	146	132	1,740	1,340	2,450	1,510	1,930	927
27	134	127	148	118	139	130	1,480	*1,120	2,450	1,200	1,620	930
28	136	136	134	118	136	130	1,550	1,200	2,640	1,010	1,680	4,120
29	141	127	125	114	132	127	1,540	1,440	2,120	1,270	1,680	1,600
30	141	123	123	130	----------	158	1,680	1,450	2,260	1,400	1,620	716
31	139	----------	120	156	----------	141	----------	1,620	----------	1,010	1,430	----------
Total	10,071	3,997	3,991	4,122	4,192	5,454	23,155	49,900	72,402	56,569	37,103	50,682
Mean	325	133	129	133	145	176	938	1,610	2,413	1,825	1,197	1,689
Ac-ft	19,980	7,930	7,920	8,180	8,310	10,820	55,840	98,980	143,600	112,200	73,590	100,500

Calendar year 1963: Max 11,400 Min 118 Mean 1,132 Ac-ft 820,000
Water year 1963-64: Max 11,000 Min 102 Mean 892 Ac-ft 647,800

* Discharge measurement made on this day.

8-1600. Dry Creek at Buescher Lake, near Smithville, Tex.

Location.--Lat 30°02'35", long 97°09'20", on left bank 225 ft upstream from dam in Bastrop-Buescher State Park, 1.9 miles upstream from mouth, and 2.2 miles north of Smithville, Bastrop County.

Drainage area.--1.48 sq mi (area above dam).

Records available.--October 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 327.86 ft above mean sea level, datum of 1929.

Average discharge.--25 years, 0.42 cfs (304 acre-ft per year).

Extremes.--Maximum inflow during year, not determined, probably occurred during period when water surface in reservoir was below limits of gage; maximum gage height, 10.55 ft Sept. 28-29; no inflow most of time.
1939-64: Maximum inflow, 1,870 cfs (average for 30-minute interval) June 30, 1940; maximum gage height, 24.96 ft June 30, 1940 (outflow, 1,670 cfs); no inflow most of time.

Remarks.--Records poor. Records given herein represent flow into Buescher Lake. No runoff except during and immediately following precipitation. Discharge below gage height 22.27 ft (spillway crest), determined from change in contents of lake; that above gage height 22.27 ft determined by algebraic summation of flow over spillway and change in contents of lake (reduced to equivalent cubic feet per second). There was no flow over spillway during the year. No adjustments made for evaporation or seepage losses. Capacity of lake, 248 acre-ft. No diversions above station or from lake. Recording rain gage located at station since Jan. 31, 1961.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0	0	0	0.3	0	0.1	0			0
2		0	0	0	0	0	0	0	0			0
3		0	0	0	0	0	0	0	0			0
4		0	0	0	.1	0	0	0	0			0
5		0	0	0	0	0	0	0	0			0
6		0	0	0	0	0	0	0	0			0
7		0	0	0	0	0	0	0	0			0
8		0	0	0	0	0	0	0	0			0
9		0	0	0	0	0	0	0	0	(*)		0
10		0	0	0	0	0	0	0	0			0
11		0	*0	0	0	0	0	0	0			0
12		0	0	0	0	0	0	0	0			0
13		0	.3	0	0	0	0	0	0			0
14		0	0	0	0	0	0	0	0			0
15		*0	0	0	0	0	0	0	0			0
16	(*)	0	0	0	0	0	0	0	.1			1.3
17		0	0	0	0	0	0	0	0			13
18		0	0	*0	0	.2	0	0	0			**.4
19		.1	0	0	0	0	0	0	0			0
20		0	0	0	0	0	0	0	0		(*)	0
21		0	0	0	0	*0	0	0	0			.4
22		0	0	0	*0	0	0	0	0			0
23		0	0	0	0	0	0	0	0			0
24		0	0	0	0	0	0	0	0			0
25		0	0	0	0	0	*0	0	0			0
26		0	0	0	0	0	.1	0	0			0
27		.1	0	0	0	0	0	*0	0			3.8
28		0	0	0	0	0	0	0	0			1.1
29		0	0	0	0	0	0	0	0			0
30		0	0	.2	----------	0	0	0	0			0
31		----------	0	0	----------	0	----------	0	----------			----------
Total	0	0.2	0.3	0.2	0.1	0.5	0.1	0.1	0.1	0	0	20.3
Mean	0	0.007	0.01	0.006	0.003	0.02	0.003	0.003	0.003	0	0	0.68
Ac-ft	0	0.4	0.6	0.4	0.2	1.0	0.2	0.2	0.2	0	0	40

Calendar year 1963: Max 1.0 Min 0 Mean 0.02 Ac-ft 12
Water year 1963-64: Max 13.3 Min 0 Mean 0.06 Ac-ft 43

* Observation of no outflow or inflow made on this day.
** Field estimate of inflow and observation of no outflow made on this day.
Note.--No gage-height record Oct. 1 to Sept. 15 except when gage height was from staff gage on Oct. 16, Nov. 15, Dec. 11, Jan. 18, Feb. 22, 25, Mar. 7, 21, Apr. 25, May 14, 27, July 9, Aug. 20.

8-1610. Colorado River at Columbus, Tex.

Location.--Lat 29°42'20", long 96°32'05", near right bank at downstream side of pier of bridge on U. S. Highway 90 at eastern edge of Columbus, Colorado County, 340 ft downstream from Texas and New Orleans Railroad Co. bridge, and 2.6 miles downstream from Cummins Creek.

Drainage area.--41,070 sq mi, approximately, of which 11,900 sq mi is probably noncontributing; 41,170 sq mi, approximately, at site "near Eagle Lake."

Records available.--January 1903 to December 1911 (gage heights only), May 1916 to September 1964. Discharge records for 1902-11, published in WSP 84, 99, 132, 174, 210, 288, and 308, have been found to be unreliable and should not be used. Records collected at site 23 miles downstream October 1930 to May 1939, published as "near Eagle Lake." Gage-height records collected in this vicinity since 1903 are contained in reports of U. S. Weather Bureau.

Gage.-- Water-stage recorder. Datum of gage is 155.52 ft above mean sea level, datum of 1929. Prior to May 1, 1919, various nonrecording gages at sites in the immediate vicinity at datum 3.00 ft lower. May 1, 1919, to Nov. 23, 1930, water-stage recorder at site about 300 ft downstream at datum 3.00 ft lower. Sept. 17, 1930, to June 12, 1939 (Oct. 1, 1930, to May 31, 1939, used herein), water-stage recorder at site 23 miles downstream at different datum. May 17 to Nov. 14, 1939, wire-weight gage at present site and datum.

Average discharge.--48 years (1916-64), 3,320 cfs (2,404,000 acre-ft per year).

Extremes.--Maximum discharge during year, 9,340 cfs June 18 (gage height, 9.30 ft); minimum, 100 cfs Mar. 18. 1916-64: Maximum discharge, 190,000 cfs June 18, 1935 (gage height, 38.5 ft), computed on basis of records for station near Eagle Lake; minimum, 93 cfs Sept. 1, 1918.

Maximum stage since at least 1852, 41.6 ft, present datum, in July 1869 and on Dec. 6, 1913, from information by local resident. River divided each time and left Columbus on an island.

Remarks.--Records good. Many diversions above station for irrigation and municipal supply. At end of year, flow from 60.7 sq mi above this station was partly controlled by 18 floodwater-retarding structures with a total combined capacity of 23,360 acre-ft below the flood spillway crests, of which 21,030 acre-ft is floodwater-retarding capacity and 2,330 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Upstream regulation same as that for Colorado River at Austin (station 8-1580). Records of suspended sediment loads and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 6-28, Jan. 25-30)

1.4	100	3.0	1,560
1.7	310	4.0	2,560
2.0	570	7.0	5,830
2.5	1,060	10.0	10,500

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	960	*188	167	136	399	230	142	1,410	1,660	1,760	1,120	1,360
2	840	188	160	130	480	1,940	160	1,660	1,610	2,110	920	1,210
3	830	188	148	130	366	2,960	174	1,610	1,660	2,110	960	1,260
4	720	202	142	124	435	1,410	142	1,310	1,610	1,960	980	1,410
5	700	209	142	124	453	670	124	1,090	1,460	1,810	900	1,460
6	660	195	142	124	507	*444	278	1,110	1,510	1,960	950	1,610
7	660	181	136	118	462	342	525	1,560	1,560	1,810	930	1,660
8	651	181	118	118	350	310	*489	1,760	1,660	1,710	960	1,610
9	588	230	112	112	294	270	462	1,560	1,460	1,960	990	1,560
10	561	254	124	118	302	326	507	1,360	1,260	1,810	1,020	1,560
11	579	399	130	118	254	435	810	1,560	1,660	1,710	870	1,560
12	570	286	124	174	230	334	860	1,260	2,060	1,860	790	1,510
13	489	223	154	230	216	246	860	1,170	2,160	1,960	680	1,510
14	408	195	202	188	195	202	1,010	1,460	2,160	1,710	790	1,510
15	*358	195	202	174	209	167	940	1,560	2,310	1,560	830	1,360
16	326	195	216	230	181	142	960	1,560	2,460	1,760	930	1,310
17	302	195	*209	238	174	130	1,000	1,410	*3,120	1,760	1,080	3,140
18	286	195	195	223	174	118	1,050	1,760	*7,700	1,810	990	3,190
19	286	*188	181	209	160	1,550	960	*1,760	5,130	1,710	900	4,640
20	278	195	209	209	148	3,220	940	1,710	1,920	1,610	880	2,110
21	270	188	209	209	181	1,610	810	1,960	1,150	*1,460	980	1,310
22	254	223	195	246	181	740	740	2,010	880	1,250	1,030	1,410
23	246	202	181	254	167	570	780	2,010	1,260	1,000	1,540	1,760
24	230	181	160	230	202	471	960	1,760	1,510	1,060	1,610	1,230
25	230	160	154	209	382	390	1,100	1,410	1,910	1,260	*1,560	1,160
26	223	148	148	188	278	310	1,220	1,240	2,060	1,260	1,460	1,120
27	223	154	154	181	286	254	1,610	1,410	2,160	1,360	1,510	1,040
28	216	209	154	*167	278	223	1,610	1,230	2,060	1,210	1,510	1,400
29	209	188	148	154	254	195	1,360	1,080	2,210	1,020	1,410	3,060
30	202	174	160	202	----------	160	1,510	1,230	2,110	1,150	1,410	3,080
31	188	----------	154	374	----------	148	----------	1,560	----------	1,210	1,410	----------
Total	13,543	6,109	5,030	5,641	8,198	20,517	24,093	46,540	63,440	49,690	33,900	58,110
Mean	437	204	162	182	283	662	803	1,501	2,115	1,603	1,094	1,937
Ac-ft	26,860	12,120	9,980	11,190	16,260	40,690	47,790	92,310	125,800	98,560	67,240	115,300

Calendar year 1963: Max 9,270 Min 112 Mean 1,107 Ac-ft 801,100
Water year 1963-64: Max 8,190 Min 112 Mean 915 Ac-ft 664,100

* Discharge measurement made on this day.

8-1620. Colorado River at Wharton, Tex.

Location.--Lat 29°18'30", long 96°06'15", near center of span at downstream side of bridge on U. S. Highway 59, in Wharton, Wharton County, 1,000 ft downstream from Texas and New Orleans Railroad Co. bridge, and 12 miles upstream from Jones Creek.

Drainage area.--41,380 sq mi, approximately, of which 11,900 sq mi is probably noncontributing.

Records available.--July 1916 to September 1925, July and August 1938 (flood discharge measurements only), October 1938 to September 1964. June to November 1901 and May to September 1902, daily records published in U. S. Department of Agriculture, Office of Experiment Stations, Bulletin Nos. 119 and 133. Gage-height records collected in this vicinity since 1935 are contained in reports of U. S. Weather Bureau.

Gage.--Wire-weight gage read twice daily. Datum of gage is 65.42 ft above mean sea level, datum of 1929. Prior to Mar. 19, 1919, staff gage, Mar. 19, 1919, to July 17, 1921, water-stage recorder, July 18 to Dec. 12, 1921, chain gage, and Dec. 31, 1921, to Sept. 30, 1925, water-stage recorder, at site about 700 ft upstream at different datum.

Average discharge.--31 years (1919-21, 1922-25, 1938-64), 2,865 cfs (2,074,000 acre-ft per year).

Extremes.--Maximum discharge during year, 7,990 cfs Sept. 19 (gage height, 7.30 ft); minimum daily, 42 cfs Aug. 22 (result of pumping).

1916-25, 1938-64: Maximum discharge observed, 100,000 cfs July 3, 1940 (gage height, 35.99 ft); no flow Aug. 6, 1925 (result of pumping).

Maximum stage since at least 1869, 38.9 ft Dec. 8, 1913, present datum, from information by local residents; below Wharton floodwater combined with floodwater of Brazos River. Flood of about July 12, 1869, reached about same height. Flood of June 20, 1935, reached a stage of 38.2 ft, present datum, furnished by U. S. Weather Bureau (discharge, 159,000 cfs, from rating curve defined by current-meter measurements below 145,000 cfs). Flood of July 30, 1938, reached a stage of 37.4 ft, present datum, observed by Geological Survey engineers (discharge, 145,000 cfs).

Remarks.--Records good. Many diversions above station for irrigation, municipal supply, and oilfield operation. For statement regarding regulation see Colorado River at Columbus (station 8-1610). Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Cooperation.--Gage-height record collected in cooperation with U. S. Weather Bureau.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	575	214	249	207	525	346	294	980	1,010	890	780	590
2	675	214	242	214	435	1,030	286	980	1,100	650	890	550
3	675	210	242	210	444	939	270	1,100	835	700	700	512
4	620	221	221	204	650	3,060	270	1,100	808	808	550	417
5	575	252	221	204	625	2,080	282	780	585	780	412	346
6	484	306	218	191	675	1,020	214	560	458	615	366	458
7	476	263	218	191	540	700	173	435	382	675	270	512
8	422	252	214	185	530	545	*263	527	390	650	322	625
9	408	417	214	185	453	*444	435	950	426	615	448	625
10	404	362	210	185	374	422	426	920	435	752	338	610
11	346	278	207	182	310	350	408	675	322	835	322	585
12	282	286	210	173	302	412	498	625	302	752	274	650
13	224	370	327	182	286	471	835	*700	585	780	204	650
14	246	294	471	188	278	386	808	440	780	835	235	615
15	*249	263	440	228	263	342	950	378	1,010	700	182	615
16	246	238	334	263	249	302	980	525	1,970	585	238	610
17	232	228	*294	256	246	263	950	502	*2,270	725	310	945
18	191	*235	274	249	238	256	752	435	2,410	862	260	2,510
19	246	235	235	246	232	346	752	584	*6,460	862	314	7,100
20	310	224	270	235	214	725	862	835	5,180	1,010	179	5,170
21	298	235	282	232	228	3,110	780	835	1,950	1,100	102	2,720
22	286	235	278	230	235	2,130	752	1,190	887	*1,010	42	1,780
23	480	242	270	240	224	1,100	550	1,380	428	862	115	1,480
24	270	249	252	242	266	808	471	1,640	242	615	188	1,640
25	263	235	228	249	512	675	498	1,640	458	426	*605	1,260
26	256	238	228	224	498	570	795	1,350	535	422	675	950
27	249	246	214	214	507	480	1,040	1,070	808	575	620	980
28	246	294	204	207	390	417	1,290	1,010	835	575	650	950
29	235	318	207	*210	346	386	1,260	862	780	502	725	958
30	235	278	210	232	----------	322	980	650	835	502	650	*2,350
31	224	----------	210	476	----------	302	----------	625	----------	650	610	----------
Total	10,928	7,932	7,894	6,934	11,075	24,739	19,124	26,283	35,476	22,320	12,576	39,763
Mean	353	264	255	224	382	798	637	848	1,183	720	406	1,325
Ac-ft	21,680	15,730	15,660	13,750	21,970	49,070	37,930	52,130	70,370	44,270	24,940	78,870

Calendar year 1963: Max 8,640 Min 191 Mean 819 Ac-ft 592,900
Water year 1963-64: Max 7,100 Min 42 Mean 615 Ac-ft 446,400

* Discharge measurement made on this day.

8-1625. Colorado River near Bay City, Tex.

Location.--Lat 28°58'26", long 96°00'44", on right bank 6,300 ft downstream from bridge on State Highway 35, 7,100 ft downstream from Texas and New Orleans Railroad Co. bridge, and 2.8 miles west of Bay City, Matagorda County.

Drainage area.--41,650 sq mi, approximately, of which 11,900 sq mi is probably noncontributing.

Records available.--July 1940 (in WSP 1046), April 1948 to September 1964. Records of elevation collected in this vicinity since 1946 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929, Houston supplementary adjustment of 1943. July 2-6, 1940, reference point at highway bridge, 6,300 ft upstream at datum 30.60 ft lower.

Average discharge.--16 years (1948-64), 2,291 cfs (1,659,000 acre-ft per year).

Extremes.--Maximum discharge during year, 7,800 cfs Sept. 19 (elevation, 21.96 ft); minimum, 1.3 cfs Sept. 15. 1940, 1948-64: Maximum discharge, 84,100 cfs June 26, 1960; maximum elevation, 48.2 ft, present datum, July 4, 1940, at site 6,300 ft upstream at bridge on State Highway 35, observed by Corps of Engineers (elevation, 46.6 ft, adjusted to present site); no flow at times in 1951-53, 1956.
Maximum elevation known since 1869, 56.1 ft Dec. 10, 1913. Flood in July 1869 probably reached about same elevation. Elevation of other floods are as follows: May 8, 1922, 55.4 ft; June 1929, 55.0 ft; June 22, 1935, 54.6 ft; Oct. 5, 1936, 52.2 ft; Aug. 2, 1938, 53.4 ft; Nov. 27, 1940, 47.6 ft. All above flood data from information by Texas and New Orleans Railroad Co. and adjusted to present site.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Diversions above station for irrigation and municipal supply. Upstream regulation same as that for Colorado River at Austin. For statement regarding regulation by Soil Conservation Service reservoirs below Austin, see Colorado River at Columbus (station 8-1610).

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 16, Sept. 23-30)

Oct. 1-16		Oct. 17 to Sept. 30					
12.1	42	11.0	1.0	11.7	38	14.0	770
12.3	94	11.1	2.3	12.0	80	16.0	1,970
12.6	208	11.2	4.0	12.5	192	18.0	3,550
13.0	390	11.3	7.0	13.0	350	21.0	6,600
14.0	900	11.4	12				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	380	292	329	276	770	389	10	286	10	3.5	442	1.6
2	304	282	305	279	568	668	9	327	426	3.2	571	1.6
3	400	282	292	179	477	2,250	8	403	256	3.3	484	1.6
4	380	282	282	75	661	2,230	7	458	145	3.3	305	1.6
5	360	285	272	100	1,300	2,620	6	362	75	3.2	120	1.6
6	365	302	266	10	970	1,500	5	127	6.3	3.2	20	1.9
7	326	336	266	5	702	895	4	16	3.0	3.0	3.3	1.6
8	375	343	260	5	545	680	*3.3	5.2	3.0	3.0	267	1.6
9	425	371	253	5	525	568	5.5	4.3	2.8	3.0	429	1.8
10	375	465	253	30	461	*485	5.8	294	2.6	3.2	382	1.8
11	253	405	253	15	389	461	6.1	268	2.5	3.5	166	1.8
12	82	354	247	131	354	421	8.0	88	2.3	3.8	185	1.6
13	52	329	312	1,450	332	461	9.0	65	2.3	3.2	106	1.4
14	144	382	604	333	331	485	10	17	2.2	3.2	3.0	1.4
15	366	343	870	155	315	421	10	2.2	3.0	3.2	5.7	1.3
16	*742	318	612	330	292	181	157	1.9	2.6	3.2	22	1.6
17	354	302	457	405	282	82	316	1.9	1,430	3.5	4.6	2.6
18	605	269	*368	524	282	53	272	1.8	*1,300	7.0	1.6	2,860
19	340	256	336	315	272	10	142	1.8	*3,250	161	1.6	5,890
20	340	253	322	298	263	600	249	*1.6	5,740	463	1.5	6,600
21	409	*263	340	289	256	1,600	200	1.6	2,240	612	1.5	3,770
22	397	282	350	279	256	2,100	253	1.6	199	541	1.4	1,200
23	389	282	343	266	260	1,400	126	407	14	508	1.4	914
24	425	279	340	263	276	1,700	13	630	3.5	288	*1.4	872
25	371	295	326	266	436	1,600	4.9	958	3.3	137	1.4	1,080
26	336	289	312	279	870	500	4.9	866	3.2	13	1.4	508
27	329	289	298	266	590	250	270	593	2.8	6.4	1.4	593
28	332	368	285	253	525	100	521	324	2.8	*139	1.5	*533
29	326	368	302	*235	425	50	617	287	2.8	170	1.6	590
30	312	368	285	260	----------	25	496	188	3.0	174	1.6	904
31	308	----------	279	408	----------	15	----------	43	----------	298	1.6	----------
Total	10,902	9,534	10,619	7,984	13,985	24,800	3,748.5	7,030.9	15,139.0	3,572.9	3,536.5	26,342.4
Mean	352	318	343	258	482	800	125	227	505	115	114	878
Ac-ft	21,620	18,910	21,060	15,840	27,740	49,190	7,440	13,950	30,030	7,090	7,010	52,250

Calendar year 1963: Max 7,100 Min 12 Mean 549 Ac-ft 397,700
Water year 1963-64: Max 6,600 Min 1.3 Mean 375 Ac-ft 272,100

* Discharge measurement made on this day.
Note.--No gage-height record Jan. 4-11, Mar. 17 to Apr. 8, June 18, 19.

Reservoirs in Colorado River basin, Tex.

8-1180. Lake J. B. Thomas on Colorado River.--See page 302.

8-1230. Lake Colorado City.--Lat 32°20'40", long 100°55'10", on left bank at municipal water-intake structure, 1.7 miles upstream from Lake Colorado City Dam on Morgan Creek, 2.2 miles downstream from The Texas and Pacific Railway Co. bridge, 2.5 miles upstream from mouth, and 4.0 miles southwest of Colorado City, Mitchell County. Drainage area, 322 sq mi of which 32 sq mi is probably noncontributing. Records available, April 1949 to September 1964. Water-stage recorder. Datum of gage is mean sea level, datum of 1929. Prior to Aug. 23, 1950, staff gages at or near powerplant about 0.7 mile downstream at same datum. Maximum contents during year, 23,250 acre-ft Oct. 1 (elevation, 2,064.88 ft); minimum, 16,450 acre-ft Aug. 27 (elevation, 2,059.15 ft). Maximum contents during period 1949-64, 40,280 acre-ft Sept. 7, 1962 (elevation, 2,075.10 ft); minimum since first appreciable storage, 5,800 acre-ft Apr. 11-13, 1950 (elevation, 2,045.72 ft).

Lake is formed by a rolled-fill earthen dam 4,800 ft long. Storage began in April 1949 and dam completed in September 1949. Lake is operated by Texas Electric Service Co. for cooling purposes in operation of steam powerplant. Colorado City diverts water for municipal supply (see following page). Service spillway is a double-rectangular drop inlet, located 100 ft upstream from dam, having two uncontrolled openings 10 by 12 ft designed to discharge a total of 5,000 cfs. An emergency spillway 1,200 ft wide and designed to discharge 150,000 cfs directly into the Colorado River is located 600 ft upstream and to left of dam. Capacity of lake, 37,460 acre-ft (elevation, 2,073.7 ft, crest of emergency spillway), 31,000 acre-ft (elevation, 2,070.1 ft, crest of service spillway); dead storage, 198 acre-ft (elevation, 2,024.3 ft, bottom of service outlet conduit). Water for municipal supply can be withdrawn down to elevation 2,045 ft. Capacity curve furnished by Texas Electric Service Co. based on 1946 survey, aerial photographs, and Geological Survey topographic maps. Records of diversions for municipal use furnished by Colorado City.

8-1236. Champion Creek Reservoir on Champion Creek.--See page 307.

8-1255. Oak Creek Reservoir.--Lat 32°04', long 100°17', on left bank at municipal pump station 2 miles upstream from dam on Oak Creek, 3 miles southeast of Blackwell, Nolan County, 14 miles north of Bronte, Coke County, and 20 miles upstream from mouth. Drainage area, 244 sq mi. Records available, May 1953 to September 1964. Staff gage read once daily. Datum of gage is mean sea level, datum of 1929. Maximum contents observed during year, 14,380 acre-ft Sept. 25-27 (elevation, 1,985.0 ft); minimum observed, 9,020 acre-ft Aug. 14 (elevation, 1,979.0 ft). Maximum contents observed during period 1953-64, 49,100 acre-ft Oct. 13, 1957 (elevation, 2,003.80 ft); minimum observed, 7,060 acre-ft Aug. 1, 1953 (elevation, 1,976.2 ft).

Reservoir is formed by a rolled-fill earthen dam 3,800 ft long. Dam completed in May 1952; no appreciable storage prior to May 12, 1953. Reservoir is property of city of Sweetwater and was built to impound water for municipal use by cities of Sweetwater, Blackwell, and Bronte (see following page). Uncontrolled service spillway is channel 300 ft wide located to right of dam. Emergency spillway is channel 800 ft wide located between dam and service spillway. Capacity of reservoir, 52,940 acre-ft (elevation, 2,005.0 ft, crest of emergency spillway), 39,360 acre-ft (elevation, 2,000 ft, crest of uncontrolled service spillway); dead storage, 100 acre-ft. Service outlet (elevation, 1,951.0 ft) can release water to Oak Creek through 24-inch pipeline. Capacity curve based on survey in 1950 furnished by Freese, Nichols and Endress, Consulting Engineers. Record of lake elevations and diversions furnished by city of Sweetwater.

8-1312. Twin Buttes Reservoir on South Concho River.--See page 318.

8-1320. Lake Nasworthy.--Lat 31°23'15", long 100°28'40", on left bank 250 ft upstream from Nasworthy Dam on South Concho River, 3.8 miles downstream from Twin Buttes Dam, and 6 miles southwest of San Angelo, Tom Green County. Drainage area, 3,833 sq mi, of which 3,724 sq mi is above Twin Buttes Reservoir and of which 1,178 sq mi is probably noncontributing. Records available, March 1930 to September 1964. Water-stage recorder. Datum of gage is 1,840.00 ft above mean sea level, datum of 1929. Maximum contents during year, 2,680 acre-ft Sept. 27 (gage height, 22.60 ft); minimum, 209 acre-ft Aug. 22 (gage height, 13.21 ft). Maximum contents during period 1930-64, 26,900 acre-ft Sept. 15, 1936 (gage height, 38.36 ft); minimum, that of Aug. 22, 1964.

Lake is formed by 5,480-foot dam having a 3,780-foot earthen section, two emergency spillways 300 and 600 ft long, and a concrete service spillway with a bank of fifteen 18- by 25-foot tainter gates, and one collapsible floodgate. Dam completed and storage began Mar. 28, 1930. Capacity of lake, 27,470 acre-ft (gage height, 39.1 ft, crest of 300-foot emergency spillway), 13,990 acre-ft (gage height, 33.2 ft, top of tainter gates), and 12,390 acre-ft (gage height, 32.2 ft, top of collapsible floodgates). Capacity at top of 600-foot emergency spillway (gage height, 40.1 ft) not determined. There is no dead storage. Contents since September 1962 controlled by releases from Twin Buttes Reservoir (station 8-1312). Beginning in 1955 figures of contents and capacities shown herein have been adjusted for sedimentation. Siltation surveys made by Soil Conservation Service in December 1938 and May 1953 show that 1,191 acre-ft of silt was deposited from March 1930 to December 1938 and an additional 1,023 acre-ft was deposited from December 1938 to May 1953, making a total siltation of 2,214 acre-ft (gage height, 32.2 ft). Water is used for part of San Angelo municipal supply and irrigation. Capacity curve based on survey by Soil Conservation Service in 1953.

8-1345. San Angelo Reservoir on North Concho River.--See page 322.

8-1410. Hords Creek Reservoir on Hords Creek.--See page 333.

8-1430. Brownwood Reservoir on Pecan Bayou.--See page 337.

8-1449. Brady Creek Reservoir on Brady Creek.--See page 341.

8-1480. Buchanan Reservoir on Colorado River.--See page 345.

8-1545. Lake Travis on Colorado River.--See page 351.

Reservoirs in Colorado River basin, Tex.--Continued

Month-end elevation or gage height, contents, and monthly diversions, water year October 1963 to September 1964

Date	Elevation or gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)	Diversions in (acre-feet)
Lake Colorado City*				
Sept. 30	2,064.88	23,250	-	-
Oct. 31	2,064.40	22,620	-630	131
Nov. 30	2,064.12	22,250	-370	92
Dec. 31	2,063.81	21,860	-390	82
Calendar year 1963	-	-	-7,790	1,650
Jan. 31	2,063.52	21,490	-370	94
Feb. 29	2,063.23	21,120	-370	85
Mar. 31	2,062.82	20,620	-500	114
Apr. 30	2,062.08	19,730	-890	149
May 31	2,062.29	19,980	+250	163
June 30	2,061.43	18,960	-1,020	186
July 31	2,060.13	17,500	-1,460	258
Aug. 31	2,060.02	17,380	-120	223
Sept. 30	2,059.53	16,850	-530	135
Water year 1963-64	-	-	-6,400	1,710
Oak Creek Reservoir†				
Sept. 30	1,982.6	12,060	-	-
Oct. 31	1,981.8	11,340	-720	316
Nov. 30	1,981.6	11,170	-170	185
Dec. 31	1,981.2	10,820	-350	184
Calendar year 1963	-	-	-3,770	4,790
Jan. 31	1,981.0	10,640	-180	186
Feb. 29	1,980.7	10,400	-240	176
Mar. 31	1,980.1	9,900	-500	205
Apr. 30	1,981.1	10,730	+830	203
May 31	1,980.7	10,400	-300	231
June 30	1,981.2	10,820	+420	261
July 31	1,979.8	9,660	-1,160	381
Aug. 31	1,983.1	12,520	+2,860	306
Sept. 30	1,984.9	14,280	+1,760	287
Water year 1963-64	-	-	+2,220	2,920
Lake Nasworthy‡				
Sept. 30	16.18	574	-	
Oct. 31	15.47	460	-114	
Nov. 30	15.91	526	+66	
Dec. 31	16.47	629	+103	
Calendar year 1963	-	-	-3,010	
Jan. 31	16.99	728	+99	
Feb. 29	17.30	799	+71	
Mar. 31	17.23	783	-16	
Apr. 30	17.50	845	+62	
May 31	16.20	578	-267	
June 30	14.97	387	-191	
July 31	13.78	260	-127	
Aug. 31	16.09	557	+297	
Sept. 30	22.10	2,430	+1,870	
Water year 1963-64	-	-	+1,860	

* Elevation at 2400 hours.
† Elevation at 0800 hours.
‡ Gage height at 2400 hours.
Note.--Diversions for Lake Colorado City for municipal use; diversions for Oak Creek Reservoir for municipal and industrial use.

8-1635. Lavaca River at Hallettsville, Tex.

Location.--Lat 29°26', long 96°57', on left bank 75 ft downstream from downstream end of bridge on U. S. Highway 77 in Hallettsville, Lavaca County, and 0.4 mile upstream from Texas and New Orleans Railroad Co. bridge.
Drainage area.--101 sq mi.
Records available.--July 1939 to September 1964.
Gage.--Water-stage recorder and movable wire-weight gage read twice daily. Datum of gage is 186.72 ft above mean sea level, datum of 1929. Prior to Apr. 19, 1960, water-stage recorder for high stages and movable wire-weight gage read twice daily for stages below about 6.2 ft. Apr. 20, 1960, to June 2, 1961, movable wire-weight gage or tape down from reference point read twice daily. All gages at same site and datum.
Average discharge.--25 years, 40.6 cfs (29,390 acre-ft per year).
Extremes.--Maximum discharge during year, 2,220 cfs Sept. 17 (gage height, 14.24 ft); minimum, 0.1 cfs Nov. 15-16, Dec. 23.
1939-64: Maximum discharge, 93,100 cfs June 30, 1940 (gage height, 40.60 ft, from floodmarks), from rating curve defined by current-meter measurements below 23,000 cfs and slope-area measurement of peak flow; no flow at times in 1953, 1956.
Maximum stage since at least 1840, that of June 30, 1940; maximum stage from about 1870 to 1940, 32.8 ft July 16, 1936, from information by local resident.
Remarks.--Records fair. No diversion above station. Most of extreme low-water flow is from poultry-dressing plant 1,000 ft above station. Corps of Engineers started channel rectification 1½ miles downstream from gage in April 1959, reached gage Sept. 21, 1959, and completed work in February 1960.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 27, Mar. 2 to June 17)

Oct. 1 to Mar. 1		Mar. 2 to Sept. 30			
7.0	0	5.6	0.2	7.5	44
7.1	.3	5.7	.6	8.0	74
7.2	2.2	5.8	1.1	8.5	120
7.3	7.5	6.0	2.7	9.0	200
7.5	27	6.2	5.1	10.0	440
7.7	48	6.5	10	11.0	740
8.0	96	7.0	23	12.0	1,140
8.5	206				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	1.1	2.5	0.8	25	3.0	*2.3	3.8	0.9	0.5	0.7	0.8
2	.2	.6	1.0	1.0	8.2	195	2.3	3.1	.7	.5	.5	.7
3	.2	1.1	.3	1.6	6.8	46	2.3	2.6	.7	.4	.4	.7
4	.2	2.2	.3	1.6	68	26	2.5	*2.2	.6	.4	.4	.7
5	.2	3.8	.3	1.6	47	20	2.4	2.2	.6	.4	.4	.7
6	.3	2.5	.3	1.6	18	16	2.2	2.1	.5	.4	.4	.6
7	*.5	3.0	.3	1.9	8.2	15	2.2	2.0	.6	.3	.4	.6
8	.6	14	.2	2.2	3.4	14	1.9	1.8	*.5	.3	8.6	2.6
9	.6	21	.2	1.9	2.2	30	1.7	1.6	.5	.3	1.2	1.9
10	.5	22	.4	1.3	1.9	42	1.6	1.5	.5	.3	.7	1.2
11	.7	7.5	.8	1.6	1.6	20	1.9	1.6	.5	.3	.4	1.4
12	.6	*2.2	1.6	1.6	1.3	12	2.0	1.5	.5	.3	.4	1.1
13	.6	1.1	9.0	1.3	1.3	9.2	1.8	1.2	.4	*.4	.4	.6
14	.6	.3	12	1.1	1.1	9.0	1.7	1.0	.4	.4	.4	.5
15	.6	.2	6.8	2.4	1.9	7.5	1.6	1.0	122	.3	.4	.4
16	.8	.2	*4.4	7.5	1.1	7.0	1.8	.9	*107	.3	.4	1.2
17	.8	.2	1.6	4.4	1.0	5.8	3.2	.6	*179	.3	*.4	861
18	3.4	3.2	.8	5.0	1.0	5.9	2.0	.8	*43	.3	.4	82
19	1.6	3.2	.5	3.9	1.0	203	1.9	.9	9.3	1.1	.3	17
20	1.1	2.3	4.8	*2.5	.8	42	1.8	.8	4.0	.9	.3	19
21	.8	1.1	2.2	1.6	6.1	15	1.8	.8	2.3	.6	.2	10
22	1.0	1.1	2.2	1.3	5.0	7.0	1.7	.9	1.8	.4	.3	*7.1
23	1.1	.4	1.2	1.3	4.4	5.4	1.6	2.0	1.3	.4	193	6.1
24	4.4	.3	.5	1.3	*17	4.9	1.7	3.5	1.0	.4	29	4.8
25	2.5	.3	.5	.6	46	4.0	74	1.8	1.4	.4	6.8	3.4
26	17	.3	.8	.8	22	2.9	200	1.2	1.2	.5	3.2	3.1
27	3.9	21	.6	1.1	9.0	2.7	104	.9	.9	.4	1.9	2.7
28	2.5	22	.6	1.1	5.0	2.6	22	1.2	.6	.4	1.5	2.4
29	1.6	25	.6	1.1	3.0	2.3	7.7	1.1	.6	.5	1.2	482
30	1.3	6.1	.6	42	----------	2.2	4.9	2.4	.6	.7	1.0	272
31	1.6	----------	.8	140	----------	2.2	----------	3.0	----------	.7	.8	----------
Total	52.0	169.3	58.7	239.0	318.3	779.6	460.5	52.2	483.9	13.8	256.4	1,788.3
Mean	1.68	5.64	1.89	7.71	11.0	25.1	15.4	1.68	16.1	0.45	8.27	59.6
Ac-ft	103	336	116	474	631	1,550	913	104	960	27	509	3,550

Calendar year 1963: Max 805 Min 0.2 Mean 6.58 Ac-ft 4,770
Water year 1963-64: Max 861 Min 0.2 Mean 12.8 Ac-ft 9,270

Peak discharge (base, 2,300 cfs).--No peak above base.

* Discharge measurement made on this day.
Note.--Discharge computed from twice-daily wire-weight gage readings Oct. 1-6, Dec. 24-26, Sept. 23-30.

8-1640. Lavaca River near Edna, Tex.

Location.--Lat 28°57'35", long 96°41'10", at downstream side near center of upstream bridge of two bridges on U. S. Highway 59, 660 ft upstream from Texas and New Orleans Railroad Co. bridge, and 2.8 miles southwest of Edna, Jackson County.

Drainage area.--887 sq mi.

Records available.--August 1938 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 13.88 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to June 6, 1939, chain gage (property of Corps of Engineers); June 6, 1939, to Apr. 3, 1957, wire-weight or staff gage, at site 110 ft downstream; Apr. 4, 1957, to Mar. 21, 1961, wire-weight or staff gage at present site; all at same datum.

Average discharge.--26 years, 267 cfs (193,300 acre-ft per year).

Extremes.--Maximum discharge during year, 3,120 cfs June 17 (gage height, 16.85 ft); minimum, 2.5 cfs Oct. 1.
1938-64: Maximum discharge, 73,000 cfs July 1, 1940 (gage height, 32.51 ft); no flow at times.
Maximum stage since at least 1880, 33.8 ft May 25, 1936 (discharge, 83,400 cfs), from information by local resident.

Remarks.--Records good. Small diversions above station for irrigation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 10 to Mar. 20, June 15-18, Sept. 23-26, 30)

2.2	3.1	3.5	89
2.3	5.4	4.0	145
2.4	8.7	6.0	420
2.5	13	10.0	1,120
2.7	24	13.0	2,020
3.0	44	15.0	2,850

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.9	6.4	26	10	407	20	*26	55	14	31	18	9.4
2	5.2	5.4	24	10	168	79	*22	77	14	28	18	8.0
3	3.7	5.4	16	11	70	195	21	175	14	25	16	7.0
4	3.3	6.0	11	11	286	279	21	76	12	22	13	7.3
5	3.3	6.4	9.0	11	317	85	21	*46	10	22	11	6.4
6	3.1	6.0	8.0	11	194	43	21	40	9.4	24	11	6.0
7	3.3	6.0	7.6	12	98	30	20	33	9.8	19	11	7.0
8	*3.5	17	7.0	12	47	24	18	28	9.0	18	28	6.6
9	3.3	124	6.6	10	31	20	16	25	8.0	18	30	6.0
10	3.3	98	6.6	9.8	23	17	16	24	7.3	16	24	6.0
11	3.3	19	7.6	9.8	18	16	16	26	*7.0	15	33	4.4
12	3.5	13	8.4	10	16	38	18	25	6.6	15	21	5.4
13	3.3	*18	213	9.4	14	26	18	20	6.0	14	15	4.2
14	3.5	12	289	8.7	12	18	18	18	5.8	*26	10	3.7
15	3.5	8.7	207	9.4	12	16	17	15	529	22	7.0	3.9
16	3.5	7.6	87	14	11	14	16	14	*2,410	16	5.4	4.6
17	3.5	6.4	*41	16	10	12	17	12	*2,770	16	4.4	252
18	3.7	5.8	31	12	11	12	18	12	*1,510	13	*4.2	2,270
19	4.2	5.2	25	16	9.4	125	22	14	567	13	3.9	1,240
20	4.2	5.2	21	17	8.7	811	21	13	236	19	3.9	268
21	4.2	6.0	21	16	8.7	410	18	12	149	18	3.5	188
22	4.4	7.6	18	*16	9.0	128	16	16	104	16	3.1	147
23	5.2	8.0	16	14	8.4	74	16	16	77	17	3.1	*115
24	4.9	6.6	15	13	46	54	14	22	60	12	6.4	60
25	5.2	5.8	14	11	*93	44	14	23	51	11	314	41
26	5.2	5.4	14	10	42	37	362	22	54	12	94	371
27	7.4	8.9	13	11	82	31	938	22	76	11	41	188
28	8.4	104	12	11	44	29	259	20	65	12	24	299
29	8.7	36	11	9.8	27	27	134	16	40	14	18	146
30	20	24	11	25	----------	24	76	13	35	15	14	107
31	9.8	----------	10	763	----------	23	----------	15	----------	16	11	----------
Total	157.5	593.8	1,206.8	1,129.9	2,123.2	2,761	2,230	945	8,865.9	546	819.9	5,787.9
Mean	5.08	19.8	38.9	36.4	73.2	89.1	74.3	30.5	296	17.6	26.4	193
Ac-ft	312	1,180	2,390	2,240	4,210	5,480	4,420	1,870	17,590	1,080	1,630	11,480

Calendar year 1963: Max 3,640 Min 2.7 Mean 55.7 Ac-ft 40,320
Water year 1963-64: Max 2,770 Min 3.1 Mean 74.2 Ac-ft 53,880

Peak discharge (base, 4,100 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Discharge computed from twice-daily wire-weight gage readings Dec. 18 to Jan. 22.

8-1643. Navidad River near Hallettsville, Tex.

Location.--Lat 29°28'00", long 96°48'45", on right bank 28 ft downstream from bridge on U. S. Highway 90-A, 1.2 miles southwest of Sublime, 3.2 miles downstream from Honey Creek, and 8 miles northeast of Hallettsville, Lavaca County.

Drainage area.--333 sq mi.

Records available.--October 1961 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 159.28 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Extremes.--Maximum discharge during year, 908 cfs Mar. 19 (gage height, 14.86 ft); no flow Aug. 5-7, 22, Sept. 2-16.
1961-64: Maximum discharge, 3,230 cfs Feb. 18, 1963 (gage height, 20.90 ft); no flow Aug. 5-7, 22, Sept. 2-16, 1964.
Maximum stage since at least 1860, 40 ft in June 1940; flood in July 1936 reached a stage of 39 ft, from information by local residents and Southern Pacific Railroad Co.

Remarks.--Records good except those between 250 and 1,500 cfs and those based on wire-weight gage readings, which are fair, and those for periods of no gage-height record, which are poor.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	1.7	5.1	6.4	59	18	16	14	27	1.1	0.5	0.1
2	.2	1.3	4.8	6.7	30	230	16	13	9.0	1.1	.3	0
3	.2	1.4	4.1	6.9	24	154	16	12	5.9	.6	.2	0
4	.3	1.6	4.1	7.7	82	57	17	*11	4.4	.5	.1	0
5	.3	2.0	3.8	7.2	101	35	17	11	3.9	.4	0	0
6	.3	2.8	3.8	8.2	38	28	16	11	3.4	.3	0	0
7	*.4	3.3	4.4	8.7	24	24	*16	11	3.1	.3	0	0
8	.4	3.3	4.2	9.3	17	24	15	10	*2.8	.3	1.4	0
9	.4	3.3	3.8	9.3	15	24	14	9.3	2.7	.3	2.6	0
10	.4	3.2	4.4	8.7	14	59	13	8.5	2.6	.2	.6	0
11	.4	3.2	5.3	9.0	14	44	13	7.7	2.3	.2	.2	0
12	.4	*3.0	5.3	9.9	13	26	14	7.4	2.0	.2	.1	0
13	.4	2.0	7.2	9.3	13	22	14	6.9	1.7	*.3	.4	0
14	.6	1.4	13	8.7	13	20	13	5.5	1.2	.2	.4	0
15	.7	1.4	20	9.3	14	18	11	5.3	7.9	.2	.2	0
16	.6	1.7	*13	17	14	16	11	5.3	*61	.2	.2	0
17	.6	2.1	8.7	32	12	15	12	5.1	18	.1	**.2	246
18	.9	3.2	6.9	24	12	100	13	6.7	8.5	.1	.4	322
19	1.3	4.1	6.7	15	12	730	11	8.5	5.5	.3	.2	45
20	1.4	6.4	7.2	11	11	129	10	21	4.2	.3	.1	44
21	1.2	5.1	9.0	*10	13	60	10	8.5	3.4	.3	.1	17
22	1.3	4.8	11	10	17	46	10	6.2	3.0	.3	0	*135
23	1.4	4.1	8.7	11	17	36	9.6	5.5	2.3	.2	2.5	48
24	1.6	3.2	6.7	11	*34	31	9.0	5.3	2.0	.1	1.1	13
25	1.7	3.0	6.4	10	138	28	10	20	1.7	.1	1.2	8.2
26	1.7	3.0	6.4	9.6	56	24	157	14	1.5	.1	.4	6.7
27	1.8	4.5	6.7	9.6	32	21	153	7.2	3.2	.1	.3	14
28	2.3	16	6.4	10	24	20	36	5.1	2.6	.1	.2	17
29	2.4	24	6.4	11	18	19	20	3.9	1.2	.1	.1	99
30	2.0	8.7	6.2	46	----------	17	15	3.4	.9	.2	.1	171
31	2.0	----------	6.2	187	----------	16	----------	33	----------	.6	.1	----------
Total	29.8	128.8	215.9	549.5	881	2,091	707.6	302.3	198.9	9.4	14.2	1,186.0
Mean	0.96	4.29	6.96	17.7	30.4	67.5	23.6	9.75	6.63	0.30	0.46	39.5
Ac-ft	59	255	428	1,090	1,750	4,150	1,400	600	395	19	28	2,350

Calendar year 1963: Max 1,450 Min 0.2 Mean 22.8 Ac-ft 16,480
Water year 1963-64: Max 730 Min 0 Mean 17.3 Ac-ft 12,520

Peak discharge (base, 1,500 cfs).--No peak above base.

* Discharge measurement made on this day.
** Field estimate made on this day.
Note.--No gage-height record Nov. 6-12, May 2-3, 17-19, 24, 31, June 7; discharge computed from once-daily wire-weight gage readings Dec. 17-20, Mar. 2-3, 5-7, Mar. 9 to Apr. 7, May 4-16, 20-23, 25-30, June 1-6.

8-1645. Navidad River near Ganado, Tex.

Location.--Lat 29°02', long 96°33', at downstream side near center of upstream bridge on U. S. Highway 59, 170 ft upstream from Texas and New Orleans Railroad Co. bridge, a quarter of a mile downstream from Sandy Creek, and 2¼ miles southwest of Ganado, Jackson County.

Drainage area.--1,116 sq mi.

Records available.--May 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 13.62 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Mar. 7, 1958, wire-weight gage at site 70 ft downstream at same datum. Mar. 7, 1958, to Mar. 22, 1961, staff and wire-weight gages at same site and datum.

Average discharge.--25 years, 477 cfs (345,300 acre-ft per year).

Extremes.--Maximum discharge during year, 4,970 cfs June 16 (gage height, 22.79 ft); minimum, 4.3 cfs June 14.
1939-64: Maximum discharge, 64,500 cfs July 2, Nov. 26, 1940; maximum gage height, 36.54 ft July 2, 1940, from floodmark; no flow for many days in 1955-56.
Maximum stage since at least 1876, 39.8 ft May 27, 1936, from information by local resident and Texas and New Orleans Railroad Co. (discharge, 94,000 cfs, from rating curve extended above 60,000 cfs).

Remarks.--Records good. Diversions for irrigation above station. Much of low flow during the April to September irrigation season comes from Sandy Creek and is drainage from rice fields irrigated by water diverted from the Colorado River. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office. Listed below are discharge measurements, in cubic feet per second, of Sandy Creek near mouth, a quarter of a mile upstream from gaging station, during water year 1964:

Oct. 8	29.1	Apr. 2	0.55	July 14	166
Nov. 13	94.7	May 5	16.2	Aug. 18	25.2
Jan. 21	.33	June 11	4.32		

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 8, Jan. 31 to Mar. 20, Mar. 24 to Apr. 26)

4.3	5.5	6.0	127
4.5	11	8.0	440
4.8	23	14.0	1,670
5.2	47	19.0	3,140
5.6	84	22.5	4,790

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	13	133	13	910	164	19	47	63	18	237	33
2	45	10	68	13	696	146	*20	35	84	16	198	24
3	36	12	43	12	380	670	19	35	91	15	140	20
4	34	14	29	12	887	614	21	24	46	10	95	28
5	34	15	20	12	910	270	19	*26	28	36	89	44
6	29	15	16	12	602	138	18	24	21	44	80	59
7	34	24	13	11	364	87	18	23	19	33	60	60
8	*29	52	11	11	191	61	18	25	14	41	191	70
9	22	793	10	11	122	49	16	21	12	42	312	71
10	20	530	9.8	11	89	41	16	18	10	41	278	79
11	23	389	9.2	10	66	36	16	24	*7.5	49	184	63
12	21	198	10	10	54	62	17	26	9.5	83	128	59
13	17	*100	529	10	46	56	19	19	11	132	85	58
14	13	53	1,420	10	44	39	16	16	6.0	*155	64	44
15	9.8	36	1,290	9.8	41	33	17	14	1,470	141	45	34
16	7.8	25	890	12	34	30	15	19	*4,790	134	35	41
17	6.8	21	*512	12	32	29	18	19	3,740	161	29	706
18	7.8	18	262	12	32	27	31	12	*2,100	177	*26	2,720
19	8.0	14	155	12	32	266	37	28	1,040	170	25	2,960
20	12	9.8	113	14	30	758	28	86	531	270	18	1,860
21	11	7.8	156	*16	30	774	22	88	284	304	14	1,180
22	15	6.8	163	14	30	198	21	91	156	262	9.5	791
23	11	6.8	123	13	29	95	21	83	90	184	11	*602
24	12	8.0	78	12	85	58	23	78	53	139	131	548
25	15	8.3	53	12	*658	41	15	103	36	106	287	355
26	20	7.5	39	12	512	33	38	170	26	135	229	432
27	18	9.9	30	11	476	28	108	164	23	137	184	548
28	15	209	23	12	321	27	253	115	23	118	145	639
29	13	253	19	12	177	22	158	81	17	112	98	566
30	14	237	16	30	----------	20	70	60	24	154	85	530
31	17	----------	14	977	----------	21	----------	60	----------	214	61	----------
Total	632.2	3,095.9	6,257.0	1,350.8	7,880	4,893	1,127	1,634	14,825.0	3,633	3,573.5	15,224
Mean	20.4	103	202	43.6	272	158	37.6	52.7	494	117	115	507
Ac-ft	1,250	6,140	12,410	2,680	15,630	9,710	2,240	3,240	29,400	7,210	7,090	30,200

Calendar year 1963: Max 3,150 Min 0.5 Mean 130 Ac-ft 93,760
Water year 1963-64: Max 4,790 Min 6.0 Mean 175 Ac-ft 127,200

Peak discharge (base, 5,500 cfs).--No peak above base.

* Discharge measurement made on this day.
Note.--Discharge computed from once-daily wire-weight gage readings Feb. 16-24, Mar. 1-10, Apr. 2-8, May 14 to June 10, July 14 to Aug. 17.

8-1660. Johnson Creek near Ingram, Tex.

Location.--Lat 30°06'00", long 99°17'00", on right bank 1.3 miles upstream from Henderson Branch, 3.4 miles northwest of Ingram, Kerr County, 3.8 miles upstream from mouth, and 9.2 miles northwest of Kerrville.

Drainage area.--115 sq mi.

Records available.--September 1941 to November 1959, October 1961 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,721.30 ft above mean sea level, datum of 1929.

Average discharge.--21 years, 12.8 cfs (9,270 acre-ft per year).

Extremes.--Maximum discharge during year, 9,750 cfs Sept. 24 (gage height, 9.89 ft), from rating curve extended above 4,400 cfs as explained below; minimum, 1.9 cfs July 6.

1941-59, 1961-64: Maximum discharge, 95,900 cfs Oct. 4, 1959 (gage height, 24.25 ft), from rating curve defined by current-meter measurements below 4,400 cfs and extended to 95,900 cfs by slope-area measurements at 9,100 and 16,000 cfs and conveyance study; minimum daily, 0.4 cfs July 26, 27, 1956.

Maximum stage since at least 1852, 35 ft July 2, 1932, from information by local resident; discharge, 138,000 cfs by slope-area measurement at point half a mile downstream from State fish hatchery and 6 or 7 miles upstream from gage. Flood of June 14, 1935, reached a stage of 31 or 32 ft, from information by local resident.

Remarks.--Records good. Small diversions above station for irrigation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 30)

1.45	1.8	2.2	61
1.5	2.5	2.4	100
1.6	5.5	2.7	180
1.7	10	3.0	300
1.8	16	4.0	870
2.0	34	5.0	1,620

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.8	7.3	11	8.6	14	10	11	9.1	7.3	4.0	4.9	4.9
2	6.4	7.8	*11	8.6	13	9.6	11	8.6	6.8	4.3	4.3	4.6
3	6.0	7.3	11	8.6	13	9.1	11	8.6	6.4	4.6	4.0	4.6
4	6.0	7.8	10	9.6	15	10	11	8.2	5.2	4.3	3.4	4.3
5	6.0	8.2	11	8.6	13	9.1	13	7.8	8.2	3.4	3.4	4.0
6	6.0	7.8	10	*8.6	12	10	12	8.2	9.1	2.4	3.7	4.0
7	6.8	7.3	11	8.2	13	11	10	8.2	8.2	2.8	4.0	4.0
8	7.3	105	10	8.2	12	11	9.6	7.8	7.3	2.8	4.0	4.0
9	6.4	27	9.6	8.2	11	11	9.1	10	6.4	2.4	4.6	4.6
10	5.5	19	10	7.8	*11	11	9.1	11	6.4	2.2	4.6	6.0
11	5.2	16	11	9.1	10	9.6	9.1	9.1	6.0	2.2	4.6	5.2
12	5.5	14	11	8.6	9.1	9.1	9.1	8.6	6.0	2.4	4.9	4.9
13	5.2	14	11	8.2	6.8	8.6	8.6	7.8	6.0	3.1	4.6	4.9
14	4.9	13	13	8.6	6.8	8.6	8.6	7.8	5.2	3.1	4.6	4.9
15	4.9	11	11	8.6	9.1	9.6	9.6	7.8	5.2	3.4	4.0	5.2
16	4.9	11	11	9.1	11	*9.6	8.6	7.3	5.5	3.7	3.7	7.2
17	4.9	11	11	8.6	11	9.1	14	7.3	5.5	3.4	4.0	5.5
18	4.6	11	11	8.6	10	147	13	6.8	5.5	3.1	4.0	5.2
19	5.2	11	10	8.6	10	86	11	6.8	5.2	3.1	4.0	5.5
20	6.0	11	10	8.6	10	24	*11	6.8	5.2	3.1	3.7	6.0
21	6.4	11	10	9.1	11	19	11	7.3	5.2	2.4	*2.8	9.1
22	6.0	11	10	9.1	11	16	11	7.3	4.9	2.2	3.4	44
23	6.0	11	9.6	9.1	10	15	10	8.6	4.6	2.2	5.2	*44
24	7.3	10	11	8.6	11	15	10	8.2	4.0	2.4	12	*1,430
25	7.8	10	9.6	9.1	11	14	11	*6.8	3.1	3.4	11	*93
26	9.1	11	9.6	8.6	11	13	13	6.0	3.1	3.1	8.2	49
27	8.2	13	9.6	9.1	10	13	11	6.4	2.8	*4.0	6.0	191
28	7.3	16	9.1	8.6	9.6	13	9.1	6.4	2.8	4.3	5.5	63
29	*7.3	11	9.6	9.1	9.1	12	8.6	6.0	*3.1	4.0	5.5	46
30	7.8	10	9.1	24	----------	11	9.1	6.4	3.4	4.3	4.9	39
31	7.3	----------	9.6	20	----------	11	----------	7.8	----------	4.6	*4.6	----------
Total	195.0	441.5	321.4	296.0	314.5	575.0	313.2	240.8	163.6	100.7	152.1	2,107.6
Mean	6.29	14.7	10.4	9.55	10.8	18.5	10.4	7.77	5.45	3.25	4.91	70.3
Ac-ft	387	876	637	587	624	1,140	621	478	324	200	302	4,180

Calendar year 1963: Max 105 Min 2.7 Mean 8.44 Ac-ft 6,110
Water year 1963-64: Max 1,430 Min 2.2 Mean 14.3 Ac-ft 10,360

Peak discharge (base, 50 cfs)

Date	Time	Gage height	Discharge
11- 8	1300	4.12	940
3-18	2200	5.09	1,710
9-24	1200	9.89	9,750

* Discharge measurement made on this day.

8-1670. Guadalupe River at Comfort, Tex.

Location.--Lat 29°58', long 98°54', on left bank at downstream side of pier of bridge on U. S. Highway 87, a quarter of a mile downstream from Cypress Creek, and half a mile east of Comfort, Kendall County.

Drainage area.--836 sq mi.

Records available (revised).--May 1939 to September 1964. All figures of discharge above 39,000 cfs have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 1,372.05 ft above mean sea level, datum of 1929. Prior to Nov. 28, 1939, wire-weight gage at same site and datum.

Average discharge.--25 years, 140 cfs (101,400 acre-ft per year).

Extremes.--Maximum discharge during year, 12,800 cfs Sept. 22 (gage height, 17.50 ft); no flow July 11 to Aug. 3, Aug. 7-9.

1939-64: Maximum discharge not determined, occurred Oct. 4, 1959 (gage height, 33.15 ft); no flow at times in 1952-57, 1963-64.

Maximum stage since at least 1848, 40.3 ft in July 1869, from report by Corps of Engineers. Flood of July 1, 1932, reached a stage of 38.4 ft (from floodmark), from information by State Highway Department, and flood of July 16, 1900, reached about the same stage as that of July 1, 1932, from information by local residents.

Revisions.--The figures of maximum discharge for the water years 1944 and 1960, published in WSP 1008, 1712 and 1750-B, are considered to be in error because the slope-area measurement of flood of July 1, 1932, was made above the mouth of Cypress Creek which enters between the gage and the slope-area site.

Remarks.--Records good except those for periods of once- or twice-daily staff gage readings, which are fair. Small diversions above station for irrigation.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	27	*62	40	140	65	84	63	*22	3.4	0	55
2	21	28	56	40	110	66	86	62	21	2.8	0	52
3	19	18	56	39	99	63	80	59	21	1.1	*0	50
4	16	23	52	39	128	60	77	57	*18	1.1	.1	47
5	12	26	50	38	99	54	81	61	27	.7	*.3	44
6	11	26	48	*38	93	52	81	63	17	1.1	.2	43
7	13	26	47	38	88	52	77	60	17	.7	0	42
8	8.5	162	45	38	86	53	72	56	17	.7	0	41
9	8.5	334	43	37	83	59	70	61	17	.7	0	85
10	7.1	141	43	37	*80	59	68	76	14	.2	.4	57
11	9.8	104	43	37	79	52	68	71	12	0	.5	50
12	8.5	93	49	37	77	52	67	63	14	0	.4	45
13	8.0	83	48	37	77	50	67	55	9.1	0	.3	43
14	8.5	76	50	36	75	51	65	47	7.6	0	.5	40
15	8.0	66	52	37	72	49	63	45	14	0	.9	40
16	6.2	63	51	40	71	*47	61	42	17	0	75	40
17	30	63	50	40	70	47	*82	40	17	0	6.2	89
18	11	61	47	38	70	87	100	40	17	0	5.3	46
19	8.0	59	45	37	67	1,570	94	35	14	0	4.4	40
20	8.0	56	45	37	67	339	84	29	14	0	2.5	39
21	9.8	51	45	36	63	197	75	30	12	0	*1.1	58
22	8.0	62	42	35	71	155	71	30	17	0	4.5	5,610
23	22	55	43	35	70	130	70	28	7.6	*0	493	2,120
24	28	50	41	35	75	115	68	28	7.6	0	471	2,660
25	584	47	41	36	81	110	91	*28	5.8	0	760	2,010
26	83	48	40	33	74	99	116	25	5.3	0	220	488
27	51	53	40	33	71	91	102	24	4.0	*0	119	1,500
28	35	59	40	33	68	87	84	23	3.4	0	91	861
29	*35	66	40	34	62	86	71	23	*3.4	0	77	*534
30	28	66	40	109		91	65	22	5.3	0	68	405
31	28		40	227		90		22		0	*61	
Total	1,161.9	2,092	1,434	1,406	2,366	4,178	2,340	1,368	398.1	12.5	2,462.6	17,234
Mean	37.5	69.7	46.3	45.4	81.6	135	78.0	44.1	13.3	0.40	79.4	574
Ac-ft	2,300	4,150	2,840	2,790	4,690	8,290	4,640	2,710	790	25	4,880	34,180

Calendar year 1963: Max 584 Min 0 Mean 35.9 Ac-ft 25,960
Water year 1963-64: Max 5,610 Min 0 Mean 99.6 Ac-ft 72,280

Peak discharge (base, 2,600 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-25	2000	11.84	3,800	9-22	0500	17.50	12,800
3-19	0830	11.71	3,700	9-24	2130	16.03	9,750

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

Note.--Discharge computed from once- or twice-daily staff gage readings Oct. 1-24, Oct. 26 to Nov. 8, June 6 to July 11, Aug. 4-6, 10-22.

8-1675. Guadalupe River near Spring Branch, Tex.

Location.--Lat 29°51'40", long 98°23'00", on right bank at downstream side of bridge on county road, 82 ft downstream from bridge on Ranch Road 311, 2.0 miles southeast of Spring Branch, Comal County, and 7.2 miles downstream from Curry Creek.

Drainage area.--1,282 sq mi.

Records available.--June 1922 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 948.13 ft above mean sea level, datum of 1929.

Average discharge.--42 years, 258 cfs (186,800 acre-ft per year).

Extremes.--Maximum discharge during year, 9,120 cfs Sept. 25 (gage height, 13.10 ft); no flow Aug. 3-22.
1922-64: Maximum discharge, 121,000 cfs July 3, 1932 (gage height, 42.10 ft), from rating curve defined by current-meter measurements below 70,000 cfs; no flow at times in 1951-52, 1954-56, 1963-64.
Maximum stage since at least 1859, about 53 ft in 1869; flood in July 1900 reached a stage of about 49 ft, from information by local resident.

Remarks.--Records good. Small diversions above station for irrigation.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Apr. 26-28, July 20 to Aug. 3)

Oct. 1 to Dec. 31		Jan. 1 to Sept. 30			
1.8	9.8	1.1	0	2.0	23
1.9	15	1.2	.1	2.1	34
2.0	23	1.3	.4	2.2	49
2.2	50	1.4	1.0	2.4	94
2.4	88	1.5	2.0	2.7	174
2.6	140	1.6	3.0	3.0	275
3.0	275	1.7	6.1	4.0	720
4.0	720	1.8	9.8	6.0	2,000
5.0	1,320	1.9	15	11.0	6,800

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	40	76	55	391	102	150	96	52	12	0.2	72
2	23	37	80	55	264	126	147	89	48	12	.1	61
3	23	39	76	55	219	262	142	84	36	11	*0	51
4	21	40	72	53	264	119	134	82	33	12	0	46
5	19	44	70	51	311	116	122	76	55	9.4	0	40
6	18	42	68	51	230	114	119	76	78	8.1	0	36
7	17	42	64	51	186	104	126	79	78	7.4	0	34
8	15	50	61	48	159	99	119	84	49	5.8	0	32
9	15	195	59	48	139	99	116	76	42	4.2	0	33
10	14	453	59	46	129	96	109	74	38	4.8	0	31
11	13	279	59	44	126	96	104	76	36	4.5	0	61
12	13	188	59	46	124	99	106	89	32	3.8	0	57
13	13	143	61	43	119	94	104	84	27	3.6	0	48
14	12	117	63	42	112	94	102	69	26	2.9	0	40
15	12	104	68	44	112	89	99	63	26	2.4	0	37
16	12	95	66	51	106	86	94	61	312	2.2	0	38
17	11	84	66	49	104	84	102	55	185	1.8	0	58
18	12	80	68	49	102	86	102	53	94	1.6	0	76
19	12	80	70	49	94	2,200	126	49	42	1.4	0	80
20	15	74	70	49	92	*1,550	132	48	31	1.4	0	46
21	22	72	66	48	96	556	124	48	23	2.0	0	42
22	18	68	64	48	94	379	114	46	21	1.6	0	200
23	17	59	61	48	89	307	104	49	20	1.2	230	6,180
24	20	64	59	44	102	254	99	46	20	.8	223	1,470
25	36	64	59	43	106	233	106	43	21	.6	524	4,280
26	786	*61	59	43	*112	208	124	43	19	.4	710	1,360
27	238	61	*59	43	119	196	174	40	23	.1	303	2,490
28	86	72	59	43	109	180	*150	*37	20	.1	183	2,050
29	64	74	59	*43	102	162	122	36	*16	.1	134	*1,050
30	*52	70	59	93	----------	*147	109	34	14	*.2	106	600
31	45	----------	57	378	----------	142	----------	34	----------	.2	*86	----------
Total	1,698	2,891	1,996	1,853	4,312	8,479	3,581	1,919	1,517	119.6	2,499.3	20,699
Mean	54.8	96.4	64.4	59.8	149	274	119	61.9	50.6	3.86	80.6	690
Ac-ft	3,370	5,730	3,960	3,680	8,550	16,820	7,100	3,810	3,010	237	4,960	41,060

Calendar year 1963: Max 1,020 Min 0 Mean 50.9 Ac-ft 36,870
Water year 1963-64: Max 6,180 Min 0 Mean 141 Ac-ft 102,300

Peak discharge (base, 4,000 cfs)

Date	Time	Gage height	Discharge
9-25	1700	13.10	9,120

* Discharge measurement or observation of no flow made on this day.
Note.--Discharge computed from once-daily wire-weight gage readings Oct. 20-21, Mar. 3-4, 15-20.

8-1676. Rebecca Creek near Spring Branch, Tex.

Location.--Lat 29°55'08", long 98°22'09", on right bank 72 ft upstream from private road crossing, 2.8 miles upstream from mouth, 4.0 miles northeast of Spring Branch, Comal County, and 5.3 miles south of Twin Sisters.

Drainage area.--11.0 sq mi.

Records available.--January 1960 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 985.55 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Extremes.--Maximum discharge during year, 191 cfs Mar. 18 (gage height, 2.99 ft), from rating curve explained below; no flow Oct. 1-25, July 8, Aug. 22.

1960-64: Maximum discharge, 4,340 cfs Oct. 29, 1960, and Apr. 5, 1963; maximum gage height, 6.20 ft Apr. 5, 1963, from rating curve defined by current-meter measurements below 20 cfs and critical-depth measurement at 4,340 cfs; no flow in 1963-64.

Maximum stage since at least 1885, 25½ ft in September 1952. Flood in 1947 or 1948 reached a stage of 4 or 5 ft lower than flood in 1952, from information by local residents.

Remarks.--Records good except those for periods when flow was seepage under and through control, which are fair. No diversion above station. Recording rain gage located at station.

Rating table, except periods when all flow is through and under control
(gage height, in feet, and discharge, in cubic feet per second)

1.98	0	2.20	6.8
2.00	.1	2.25	10
2.05	.7	2.3	15
2.10	2.1	2.4	27
2.15	4.2		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*0	0.6	0.4	0.4	2.5	2.9	3.3	2.1	*0.6	*1.2	0.4	0.2
2	0	.6	.4	.4	2.5	3.3	3.3	1.8	.6	1.2	.4	*.2
3	0	.6	.4	.3	3.3	3.3	3.3	1.5	.6	1.2	*.3	.2
4	0	.6	.4	.3	9.2	2.9	3.3	1.5	.6	1.2	.3	.2
5	0	.6	.4	.3	6.2	2.5	3.8	1.2	.6	1.2	.4	.2
6	0	.6	.4	.3	5.2	2.9	3.3	1.0	.6	1.2	.4	.2
7	0	.5	.4	.3	4.7	2.9	3.3	.7	.6	.9	.4	.2
8	0	.5	.4	.4	4.2	2.9	2.5	.6	.6	0	.6	.3
9	0	.5	.4	.3	4.2	2.5	2.5	.6	.6	1.2	.6	.3
10	0	.5	.4	.3	4.2	2.1	2.5	.6	.6	1.0	.4	.3
11	0	.5	.4	.3	4.2	2.1	2.5	.6	.6	.7	.4	.3
12	0	.5	.4	.3	4.2	2.1	2.5	.6	.6	.7	.3	.3
13	0	.5	.4	.3	4.2	1.8	2.5	.6	.6	.7	.2	.3
14	0	.5	.4	.3	3.8	1.8	2.5	.6	.6	.7	.3	.3
15	0	.5	.4	.3	3.3	1.8	2.5	.6	.6	.7	.2	.3
16	0	.5	.4	.3	3.3	1.5	2.5	.6	5.4	.7	.4	.4
17	0	.4	.4	.3	3.3	1.5	3.3	.6	15	.6	.3	.3
18	0	.4	.4	.3	2.5	1.5	2.9	.6	5.2	.6	.2	.3
19	0	.4	.4	.3	2.5	22	2.9	.6	4.2	1.2	.1	.2
20	0	.4	.4	.6	2.5	5.2	2.5	.6	3.8	1.0	.1	.4
21	0	.4	.4	.6	2.5	4.7	2.5	.6	3.3	1.0	.1	.3
22	0	.4	.4	.6	2.5	4.7	2.1	.6	2.9	.7	0	.3
23	0	.4	.4	.6	2.5	4.2	2.1	.6	2.9	.6	.2	.3
24	0	.4	.4	.6	2.5	3.8	2.1	.6	2.5	.7	.2	.3
25	0	.4	.4	.4	2.5	3.8	2.9	.6	2.5	.6	.2	.3
26	2.5	*.4	.4	.4	*2.5	3.8	2.9	.6	2.1	.4	.1	.3
27	1.2	.4	*.4	.6	2.5	3.8	2.1	.6	2.1	.4	.1	2.0
28	.8	.4	.4	.6	2.5	3.3	*1.8	.6	1.8	.4	.1	1.0
29	.6	.4	.4	*.4	2.5	3.3	1.8	.6	1.4	.4	.2	.7
30	*.6	.4	.4	2.3	----------	*3.3	1.8	.6	1.2	.4	.1	.7
31	.6	----------	.4	2.5	----------	3.3	----------	.6	----------	.4	.1	----------
Total	6.3	14.2	12.4	16.2	102.5	111.5	79.8	24.2	65.3	23.9	8.1	11.6
Mean	0.20	0.47	0.40	0.52	3.53	3.60	2.66	0.78	2.18	0.77	0.26	0.39
Ac-ft	12	28	25	32	203	221	158	48	130	47	16	23

Calendar year 1963: Max 253 Min 0 Mean 1.54 Ac-ft 1,110
Water year 1963-64: Max 22 Min 0 Mean 1.30 Ac-ft 943

Peak discharge (base, 50 cfs)

Date	Time	Gage height	Discharge
3-18	2400	2.99	191
6-17	1100	2.68	87

* Discharge measurement or observation of no flow made on this day.
Note.--All flow under or through control Oct. 1-25, Oct. 29 to Jan. 5, May 9 to June 15, July 1-8.

8-1677. Canyon Reservoir near New Braunfels, Tex.

Location.--Lat 29°52'07", long 98°11'55", in intake structure of Canyon Dam on Guadalupe River, 12 miles northwest of New Braunfels, Comal County, and 16 miles west of San Marcos. Prior to Sept. 24, 1964, staff gage at same site and datum.

Drainage area.--1,425 sq mi.

Records available.--July 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to Sept. 24, 1964, staff gage at present site and datum.

Extremes.--1962: Maximum contents during period July to September, 1,130 acre-ft Sept. 9 (elevation, 780.2 ft); none prior to July 16.

1962-63: Maximum contents during water year, 2,470 acre-ft Apr. 5 (elevation, 789.5 ft); minimum, 705 acre-ft Sept. 2 (elevation, 775.8 ft).

1963-64: Maximum contents during water year, 23,460 acre-ft Sept. 30 (elevation, 826.52 ft); minimum, 722 acre-ft Oct. 17 (elevation, 776.0 ft).

Remarks.--Small diversions above the reservoir for irrigation. Reservoir is formed by a rolled earth-fill dam 6,830 ft long, consisting of the main dam 4,410 ft long, earthen dike 210 ft long, and a 1,260-foot long uncontrolled broadcrested type spillway with a 950-foot concrete and earthen non-overflow section. Flood-control outlet works consist of a 10-foot diameter conduit controlled by two 5-foot 8-inches by 10-foot hydraulically-operated slide gates (elevation of invert, 775.0 ft). Deliberate impoundment of water began June 16, 1964, and main dam was completed in August 1964. Reservoir built for flood-control and water conservation. Contents based on maps prepared in 1947. Data regarding dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	974.0	-
Crest of emergency spillway	943.0	740,900
Top of conservation pool	909.0	386,200
Invert of lowest intake at floatwell	801.88	5,410
Invert of gate sill, flood-control outlet works	775.0	640

Cooperation.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

Capacity table (elevation, in feet, and contents, in acre-feet)

750	0	758	30	789	2,380
751	1	761	63	800	4,840
752	3	764	118	809	8,360
753	5	773	496	819	15,400
754	8	780	1,110	827	24,060
756	17				

Contents, in acre-feet, at 0800 hours, during July to September 1962

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1	-	-	739	8	-	688	765	14	-	714	801	20	-	705	774	26	-	722	828
2	-	-	739	9	-	697	1,130	15	-	714	792	21	-	705	774	27	-	731	819
3	-	-	739	10	-	705	994	16	-	714	792	22	-	705	774	28	-	731	810
4	-	-	739	11	-	705	894	17	-	705	783	23	-	705	765	29	-	739	792
5	-	648	739	12	-	705	847	18	-	705	774	24	302	705	765	30	-	739	810
6	-	656	739	13	-	714	819	19	-	705	774	25	-	722	765	31	530	739	
7	-	672	748																
(†)																	773.5	776.2	777.0
(‡)																	-	+209	+71

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.
Note.--No elevation record July 21-23, 25-30, Aug. 1-4, 1962.

8-1677. Canyon Reservoir near New Braunfels, Tex.--Continued

Contents, in acre-feet, at 0800 hours, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	801	1,010	894	904	875	904	856	885	856	838	731	714
2	801	953	914	904	885	904	856	875	847	838	722	705
3	810	904	1,010	904	885	894	847	875	838	828	722	714
4	810	885	1,000	904	875	894	847	866	828	819	722	722
5	810	875	984	904	875	894	1,200	866	828	792	722	714
6	810	875	953	894	866	875	1,980	866	819	792	714	714
7	810	875	943	894	866	866	1,280	866	819	792	714	714
8	838	866	924	885	866	875	1,110	866	810	783	714	714
9	856	856	914	885	866	875	1,070	856	801	765	731	714
10	866	856	904	885	866	875	1,050	856	792	765	722	714
11	866	856	904	894	875	875	1,000	866	774	756	714	714
12	847	847	894	894	856	885	984	875	774	756	714	714
13	828	838	885	885	847	885	963	866	765	756	714	714
14	810	838	875	885	838	875	943	866	765	756	714	714
15	810	838	866	885	828	875	933	856	765	756	714	714
16	810	819	866	885	828	885	924	856	765	756	714	714
17	810	838	866	875	828	885	924	847	774	756	748	714
18	810	856	866	875	875	885	914	838	774	748	739	714
19	904	856	866	885	924	885	904	828	783	748	739	714
20	914	856	875	885	953	875	904	828	774	739	739	714
21	875	856	973	885	943	866	904	828	774	739	748	722
22	847	856	943	885	943	866	904	828	765	731	739	748
23	875	856	904	875	933	866	904	828	765	731	739	748
24	856	856	924	875	933	866	885	856	774	731	739	756
25	847	856	914	875	924	866	885	866	792	731	731	756
26	838	856	924	875	914	856	875	866	765	731	722	748
27	828	866	914	875	904	856	866	875	774	731	722	748
28	828	1,100	904	866	904	856	866	1,200	783	731	722	748
29	847	984	914	866	---	866	866	1,010	783	739	722	748
30	1,250	924	904	875	---	856	914	924	810	731	722	748
31	1,150	---	904	875	---	856	---	885	---	731	722	---
(†)	780.4	778.2	778.0	777.7	778.0	777.5	778.1	777.8	777.0	776.1	776.0	776.3
(‡)	+340	-226	-20	-29	+29	-48	+58	-29	-75	-79	-9	+26

Water year 1962-63..... ‡ -62

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-1677. Canyon Reservoir near New Braunfels, Tex.--Continued

Contents, in acre-feet, at 0800 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	739	847	875	856	1,170	933	1,010	984	810	2,630	2,300	3,580
2	748	838	875	847	1,230	924	1,010	984	810	2,610	2,280	3,380
3	756	819	885	847	1,150	924	1,010	953	810	2,610	2,240	3,210
4	765	819	885	847	1,100	1,000	1,010	943	819	2,600	2,230	3,000
5	765	810	875	847	1,130	973	1,000	933	819	2,580	2,210	2,820
6	765	810	875	847	1,180	943	994	924	810	2,560	2,200	2,650
7	765	810	875	847	1,060	933	973	924	828	2,560	2,180	2,450
8	756	810	875	847	1,060	924	973	924	875	2,540	2,170	2,260
9	748	828	856	847	1,060	924	973	914	866	2,530	2,180	2,270
10	748	819	856	838	994	914	973	914	856	2,520	2,150	2,290
11	748	1,180	856	838	984	914	973	904	828	2,520	2,140	2,290
12	739	1,130	856	838	963	914	963	904	819	2,500	2,120	2,290
13	739	1,060	856	847	963	914	953	904	810	2,480	2,100	2,300
14	748	1,000	856	847	953	914	953	904	801	2,450	2,090	2,330
15	739	963	856	838	953	914	953	904	810	2,450	2,090	2,350
16	739	943	856	838	943	904	943	894	933	2,440	2,080	2,380
17	722	924	856	856	943	894	953	875	2,190	2,420	2,040	2,390
18	731	904	856	856	933	894	953	856	2,900	2,410	2,040	2,400
19	731	885	866	847	924	924	953	856	2,940	2,400	2,030	2,440
20	731	875	866	847	914	1,860	963	847	2,860	2,440	2,000	2,510
21	739	875	875	847	914	2,230	994	838	2,760	2,440	1,980	2,560
22	731	875	875	847	914	1,490	994	838	2,650	2,440	1,980	2,590
23	748	875	866	847	914	1,330	984	838	2,670	2,430	1,980	3,820
24	765	866	856	847	914	1,230	973	838	2,690	2,400	1,950	10,960
25	774	856	856	847	924	1,180	953	847	2,690	2,380	2,080	10,980
26	765	856	856	838	933	1,130	984	847	2,690	2,380	2,880	15,440
27	1,260	856	856	838	933	1,110	984	838	2,670	2,360	3,820	16,880
28	1,130	856	856	838	943	1,090	1,020	819	2,670	2,350	3,950	20,960
29	973	866	856	838	943	1,070	1,050	819	2,650	2,330	3,920	22,910
30	904	875	856	847	----------	1,050	1,000	810	2,650	2,310	3,800	23,370
31	866	----------	856	973	----------	1,020	----------	810	----------	2,300	3,690	----------
(†)	777.6	777.7	777.5	778.7	778.4	779.2	779.0	777.0	790.5	778.6	795.5	826.4
(‡)	+118	+9	-19	+117	-30	+77	-20	-190	+1,840	-350	+1,390	+19,680

Calendar year 1963..... ‡ -48
Water year 1963-64..... ‡ +22,620

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.

8-1678. Guadalupe River at Sattler, Tex.

Location.--Lat 29°51'32", long 98°10'47", on right bank 200 ft upstream from Horseshoe Falls, 0.8 mile north of Sattler, Comal County, 1.8 miles downstream from Canyon Dam, 2.3 miles upstream from Heiser Hollow, and 11.5 miles north of New Braunfels.

Drainage area.--1,422 sq mi.

Records available.--March 1960 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 742.24 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Extremes.--Maximum discharge during year, 1,520 cfs Mar. 20 (gage height, 5.55 ft); minimum, 1.5 cfs Sept. 28 (gage height, 2.06 ft).
1960-64: Maximum discharge, 20,800 cfs Oct. 29, 1960 (gage height, 12.20 ft); no flow July 31 to Aug. 6, 1962 (result of closure of Canyon Dam).
Flood in July 1869 (stage unknown) has not been exceeded since that date; flood in July 1900 (stage unknown) exceeded 39 ft; maximum stage since at least 1904, 39 ft in July 1932 and in June 1935, from information by local residents.

Remarks.--Records good. Flow regulated by Canyon Reservoir (station 8-1677) since July 21, 1962. Small diversions above station for irrigation.

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

2.4	8.8	3.6	165
2.5	12	4.0	301
2.7	24	4.5	550
3.0	51	5.0	910
3.3	98	5.5	1,460

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*13	*61	74	61	306	106	162	*133	*37	*36	17	179
2	18	55	*74	*60	340	*106	*162	120	36	36	17	*179
3	21	50	77	60	*273	112	162	110	39	36	*17	173
4	21	47	78	60	247	150	158	104	46	35	17	165
5	21	44	77	59	277	131	152	98	43	34	17	160
6	21	42	72	58	293	118	142	94	39	31	16	152
7	19	41	70	56	232	114	136	93	48	25	16	148
8	18	48	66	55	190	112	131	91	66	24	17	89
9	16	51	63	54	162	104	129	91	63	24	16	42
10	15	82	63	51	148	98	127	91	54	24	16	39
11	14	293	61	50	136	96	125	87	47	24	16	40
12	12	269	61	50	127	98	122	85	42	22	16	40
13	12	196	63	49	120	100	118	87	37	22	15	37
14	12	150	63	49	116	100	112	89	37	22	15	38
15	11	125	63	50	114	98	110	89	42	21	15	38
16	11	106	64	55	110	94	108	84	162	21	16	38
17	10	94	67	59	110	91	112	74	110	21	15	38
18	10	87	69	61	110	93	114	67	114	20	15	38
19	10	78	70	61	104	158	114	63	108	25	14	38
20	11	75	75	61	100	1,090	122	60	114	20	14	27
21	10	72	75	61	100	1,160	133	56	108	19	14	36
22	10	70	75	63	100	630	133	55	63	19	14	42
23	14	67	72	61	100	445	129	55	30	19	15	230
24	26	64	70	61	100	362	120	54	36	18	14	390
25	27	60	70	60	102	305	118	58	36	18	14	381
26	27	61	69	58	106	261	125	55	38	18	17	395
27	319	64	69	56	110	236	129	50	37	18	92	224
28	281	67	67	55	112	219	158	46	36	17	173	174
29	152	69	66	55	110	193	168	43	36	17	179	385
30	100	72	64	78	----------	179	152	41	36	18	171	390
31	74	----------	64	144	----------	171	----------	40	----------	18	173	----------
Total	1,336	2,660	2,131	1,871	4,555	7,330	3,983	2,363	1,740	722	1,193	4,345
Mean	43.1	88.7	68.7	60.4	157	236	133	76.2	58.0	23.3	38.5	145
Ac-ft	2,650	5,280	4,230	3,710	9,030	14,540	7,900	4,690	3,450	1,430	2,370	8,620

Calendar year 1963: Max 902 Min 5.9 Mean 63.7 Ac-ft 46,130
Water year 1963-64: Max 1,160 Min 10 Mean 93.5 Ac-ft 67,900

* Discharge measurement made on this day.
Note.--Discharge computed from once-daily staff gage readings Oct. 31, Sept. 14-21.

8-1685. Guadalupe River above Comal River, at New Braunfels, Tex.

Location.--Lat 29°42'55", long 98°06'40", on right bank at New Braunfels, Comal County, 1.1 miles upstream from Comal River, and about 22 miles downstream from Canyon Reservoir.

Drainage area.--1,516 sq mi.

Records available.--December 1927 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 586.65 ft above mean sea level, datum of 1929.

Average discharge.--36 years (1928-64), 356 cfs (257,700 acre-ft per year).

Extremes.--Maximum discharge during year, 3,270 cfs June 16 (gage height, 4.65 ft); minimum, 12 cfs Oct. 18-24.
1927-64: Maximum discharge, 101,000 cfs June 15, 1935 (gage height, 32.95 ft); no flow July 8, 9, July 17 to Aug. 20, 1956.
Maximum stage since at least 1845, 38 ft July 8, 1869, and in December 1913, from information by local residents.

Remarks.--Records excellent. Small diversions above station for irrigation. Flow largely regulated since June 16, 1964, by Canyon Reservoir (station 8-1677) about 22 miles upstream from gage. Reservoir operated as a temporary detention basin during period August 1962 to June 1964.

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

1.2	12	2.2	217
1.4	28	2.5	426
1.6	49	3.0	940
1.8	77	3.5	1,600
2.0	124		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	66	66	62	266	117	169	142	42	*71	28	175
2	15	57	66	66	356	114	169	128	40	66	22	169
3	14	50	68	65	320	114	169	110	38	62	23	169
4	16	47	72	65	292	142	164	104	39	59	*29	164
5	20	45	75	65	299	151	160	99	69	56	27	155
6	20	42	*72	65	334	131	151	97	48	53	20	151
7	20	41	71	63	292	124	138	94	42	50	21	146
8	19	44	68	63	235	117	131	92	47	45	30	142
9	18	53	65	62	190	110	131	92	66	40	30	74
10	18	50	65	61	169	107	135	90	62	38	22	49
11	16	179	63	61	155	104	135	89	53	37	22	44
12	16	285	63	61	*142	104	131	89	47	36	27	46
13	15	212	68	59	135	104	128	85	42	34	25	44
14	14	160	66	59	131	104	121	87	39	33	25	41
15	13	128	63	63	128	99	117	87	41	32	25	41
16	13	110	63	77	124	97	117	87	742	31	25	62
17	13	97	66	74	121	94	128	80	316	32	25	68
18	12	89	69	74	117	92	121	72	235	30	24	52
19	12	87	71	74	114	128	121	65	212	28	16	49
20	12	79	75	71	104	707	121	62	206	36	16	50
21	12	72	75	69	110	1,240	*131	58	201	46	15	50
22	12	69	75	69	104	722	138	57	185	39	15	56
23	12	65	72	69	102	468	135	57	131	37	20	68
24	14	62	71	68	110	379	128	54	104	36	38	379
25	24	59	69	65	110	320	128	61	104	35	52	371
26	31	61	68	65	117	272	128	62	99	34	52	395
27	99	62	66	63	121	248	128	54	97	33	46	611
28	313	68	65	63	121	229	135	50	90	31	114	154
29	185	61	65	65	121	206	164	47	85	27	180	424
30	114	62	63	116	----------	190	155	46	80	32	175	468
31	82	----------	62	185	----------	175	----------	46	----------	33	164	----------
Total	1,209	2,562	2,106	2,207	5,040	7,309	4,127	2,443	3,602	1,252	1,353	4,867
Mean	39.0	85.4	67.9	71.2	174	236	138	78.8	120	40.4	43.6	162
Ac-ft	2,400	5,080	4,180	4,380	10,000	14,500	8,190	4,850	7,140	2,480	2,680	9,650

Calendar year 1963: Max 1,180 Min 6.8 Mean 73.9 Ac-ft 53,530
Water year 1963-64: Max 1,240 Min 12 Mean 104 Ac-ft 75,530

* Discharge measurement made on this day.

8-1690. Comal River at New Braunfels, Tex.

Location.--Lat 29°42'21", long 98°07'20", on right bank 200 ft upstream from San Antonio Street viaduct in New Braunfels, Comal County, and 1.1 miles upstream from mouth.

Drainage area.--117 sq mi. Normal flow of river comes from springs; drainage area not applicable.

Records available.--1882 to September 1964 (1882 to November 1927, discharge measurements only).

Gage.--Water-stage recorder. Concrete control since Oct. 1, 1955. Datum of gage is 582.80 ft above mean sea level, datum of 1929.

Average discharge.--32 years (1932-64), 284 cfs (205,600 acre-ft per year).

Extremes.--Maximum discharge during year, 1,300 cfs June 16 (gage height, 5.70 ft); minimum daily, 115 cfs Aug. 19-22.

1927-64: Maximum discharge, 35,000 cfs Sept. 11, 1952 (gage height, 36.14 ft, from floodmarks), from rating curve defined by current-meter measurements below 1,600 cfs and slope-area measurements at 6,700 and 35,000 cfs; minimum daily, 5.5 cfs June 7, 1956.

Maximum stages known, 36.91 ft July 8, 1869, and 37.65 ft Oct. 17, 1870, at site half a mile downstream, from painted and dated marks in old Remmert Brewery (probably some backwater from Guadalupe River).

Remarks.--Records excellent. Diurnal fluctuations from steam powerplant half a mile upstream. Flow of river is primarily from Comal Springs about 1 mile upstream except during periods of local rain. Comal powerplant well pump was not operated during the year. Comal Springs emerge from the Edwards limestone in the Balcones fault zone.

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

3.65	107	4.3	335
3.7	120	4.5	440
3.8	147	5.0	770
3.9	177	5.2	930
4.0	211	5.5	1,160
4.1	250	6.0	1,480
4.2	290		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	165	180	201	208	226	230	222	211	184	*187	128	141
2	165	184	201	211	226	226	222	208	184	187	128	139
3	165	187	201	211	226	226	219	204	184	184	128	136
4	165	187	*201	211	238	230	219	204	184	184	*123	136
5	165	187	201	211	226	230	219	197	197	184	117	133
6	165	187	201	211	226	230	219	201	184	184	117	133
7	165	187	201	211	226	230	215	204	184	174	120	133
8	165	197	201	211	226	230	215	201	184	171	125	133
9	165	191	201	211	230	230	215	194	180	171	133	133
10	162	191	201	211	230	230	215	191	177	168	139	133
11	162	191	201	211	230	230	215	194	177	168	133	133
12	162	194	201	211	230	226	215	197	177	168	133	133
13	162	194	204	211	230	226	215	197	177	168	130	133
14	165	194	204	211	230	226	211	197	177	165	128	136
15	165	194	204	211	230	226	208	194	177	162	128	130
16	162	194	204	211	230	226	208	191	283	159	128	144
17	162	197	204	211	230	226	211	191	417	156	125	139
18	162	197	208	211	230	230	208	191	204	156	120	139
19	162	204	208	211	230	238	208	180	201	156	115	141
20	165	208	208	211	230	230	211	180	201	165	115	141
21	165	201	208	211	234	226	211	180	201	156	115	147
22	165	187	208	211	230	222	215	180	201	150	115	144
23	165	194	208	211	230	*222	211	184	201	147	123	147
24	171	197	208	211	238	222	215	187	201	144	130	150
25	177	197	208	211	234	222	215	187	201	139	133	150
26	180	197	208	211	234	222	215	184	201	136	139	153
27	180	201	208	211	234	222	215	187	197	136	141	180
28	180	201	208	211	230	222	211	187	194	130	141	168
29	180	197	208	211	230	222	211	187	194	128	141	165
30	180	197	208	246	----------	222	211	187	191	128	141	165
31	180	----------	208	226	----------	222	----------	187	----------	128	141	----------
Total	5,199	5,814	6,344	6,588	6,674	7,022	6,420	5,964	6,015	4,939	3,973	4,288
Mean	168	194	205	213	230	227	214	192	200	159	128	143
Ac-ft	10,310	11,530	12,580	13,070	13,240	13,930	12,730	11,830	11,930	9,800	7,880	8,510

Calendar year 1963: Max 308 Min 125 Mean 208 Ac-ft 150,800
Water year 1963-64: Max 417 Min 115 Mean 189 Ac-ft 137,300

Peak discharge (base, 1,100 cfs)

Date	Time	Gage height	Discharge
6-16	2400	5.70	1,300

* Discharge measurement made on this day.

8-1700. San Marcos River spring flow at San Marcos, Tex.

Location.--Lat 29°52', long 97°55', on left bank 500 ft downstream from the Cape Ginning Co.'s mill, half a mile downstream from bridge on U. S. Highway 81, 1 mile southeast of San Marcos, Hays County, and 1.2 miles upstream from Blanco River.

Drainage area.--83.7 sq mi. Normal flow of river comes from springs, drainage area of stream not applicable.

Records available.--May 1956 to September 1964. June 1915 to January 1916, March 1916 to September 1921, and May to September 1956, published as San Marcos River at San Marcos; records include some surface runoff. Periodic measurements of spring flow were made at this location outside periods of record since Nov. 14, 1894, and are published as miscellaneous measurements.

Gage.--Water-stage recorder. Datum of gage is 536.82 ft above mean sea level, datum of 1929. June 10, 1915, to Jan. 19, 1916, staff gage at site 1.2 miles upstream and Mar. 13, 1916, to Sept. 7, 1921, recording gage near present site, datum relations unknown.

Average discharge.--8 years (1956-64), 155 cfs (112,200 acre-ft per year).

Extremes.--Maximum daily spring discharge during year, 127 cfs June 18-21; maximum gage height, 7.04 ft June 16 (flood runoff); minimum daily spring discharge, 76 cfs Oct. 22.
1956-64: Maximum daily spring discharge, 292 cfs May 9, 1958; maximum gage height (backwater from Blanco River), 28.5 ft May 3, 1958; minimum daily spring discharge, 46 cfs Aug. 15, 16, 1956.
Maximum stage since at least 1913, 38.6 ft Sept. 10, 1921 (from floodmark) present datum (backwater from Blanco River).

Remarks.--Records good except those for days affected by local runoff, which are fair. Flow slightly regulated by millpond just above gage and by utilities dam about 1½ miles upstream. Entire flow of river is from San Marcos Springs, about 1¾ miles upstream, except during periods of local runoff. Springs emerge from the Edwards limestone in the Balcones fault zone. Small diversion for operation of State fish hatchery, some of which is returned above gage.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	85	86	85	86	84	88	93	104	94	112	93	91
2	84	86	84	86	85	88	94	104	94	*112	92	90
3	84	86	84	86	81	88	94	104	94	111	91	90
4	83	87	85	85	84	86	94	104	93	112	90	89
5	82	86	*85	85	86	86	95	104	91	111	*89	91
6	82	86	85	85	85	86	95	105	91	106	89	92
7	82	85	85	*84	84	89	94	105	92	104	88	92
8	81	87	85	84	83	91	92	104	92	104	90	90
9	81	88	86	83	83	90	89	104	91	104	92	90
10	80	87	86	84	84	86	93	104	90	103	94	*90
11	80	87	87	85	84	87	96	103	91	104	95	89
12	80	87	88	84	*85	86	98	101	91	103	94	88
13	81	86	89	82	85	87	97	99	89	99	94	87
14	80	86	89	83	86	87	94	101	89	98	92	88
15	79	86	87	84	82	87	94	100	91	97	94	87
16	79	86	86	85	83	86	98	101	92	95	96	90
17	80	86	88	83	86	86	98	101	122	95	94	94
18	80	83	86	83	84	86	101	102	127	94	90	95
19	80	87	86	82	86	88	103	99	127	101	89	95
20	80	88	87	82	87	*90	103	99	127	109	92	96
21	78	87	87	85	88	93	102	99	127	107	90	96
22	76	87	86	86	87	93	102	101	122	104	90	94
23	81	86	86	86	86	91	102	103	118	103	94	96
24	81	86	86	84	87	90	*102	100	117	103	95	97
25	80	86	86	84	86	93	103	98	116	103	95	96
26	86	86	89	84	85	94	105	96	116	102	94	98
27	86	87	88	85	84	94	104	*95	115	100	94	98
28	85	86	88	84	84	94	102	96	116	94	93	101
29	85	84	87	85	86	94	102	94	115	93	92	105
30	*87	85	86	84	----------	93	103	95	114	97	93	105
31	87	----------	86	83	----------	92	----------	95	----------	96	94	----------
Total	2,535	2,586	2,678	2,611	2,460	2,769	2,942	3,120	3,144	3,176	2,862	2,800
Mean	81.8	86.2	86.4	84.2	84.8	89.3	98.1	101	105	102	92.3	93.3
Ac-ft	5,030	5,130	5,310	5,180	4,880	5,490	5,840	6,190	6,240	6,300	5,680	5,550

Calendar year 1963: Max 162 Min 76 Mean 109 Ac-ft 78,710
Water year 1963-64: Max 127 Min 76 Mean 92.0 Ac-ft 66,810

* Discharge measurement made on this day.

Note.--Gage-height record not representative of springflow on Oct. 22-23, 25-26, Nov. 8, Dec. 13, Jan. 16, 30-31, Feb. 1, 4, 12-13, 16, 21, 24, Mar. 3-4, 18-19, Apr. 17, 25-26, May 25-26, 30-31, June 15-17, July 19, Aug. 8-10, 23, Sept. 16-17, 22-23, 27-28.

8-1710. Blanco River at Wimberley, Tex.

Location.--Lat 29°59', long 98°04', on left bank 800 ft downstream from Cypress Creek, 1,200 ft upstream from bridge on State Highway 12, and a quarter of a mile south of Wimberley, Hays County.

Drainage area.--364 sq mi.

Records available.--August 1924 to September 1926, June 1928 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 802.23 ft above mean sea level, datum of 1929. Aug. 6, 1924, to Sept. 30, 1926, inclined and vertical staff gage at site 30 ft upstream at same datum.

Average discharge.--38 years, 108 cfs (78,190 acre-ft per year).

Extremes.--Maximum discharge during year, 4,260 cfs Sept. 27 (gage height, 5.3 ft, from floodmark); minimum, 6.0 cfs Aug. 14.

1924-26, 1928-64: Maximum discharge, 113,000 cfs May 28, 1929 (gage height, 31.10 ft, from floodmarks), from rating curve defined by current-meter measurements below 30,000 cfs and slope-area measurements of 95,000 and 113,000 cfs; minimum, 0.6 cfs Aug. 16, 1956.

Maximum stage since at least 1869, that of May 28, 1929; flood in July 1869 reached a stage of 23 ft, from information by local residents.

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

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

0.17	6.7
.2	9.1
.3	21
.4	38
1.0	225
1.5	465
2.0	770

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	11	11	12	23	14	40	26	21	12	9.1	9.1
2	10	9.1	11	12	21	16	40	24	20	11	8.2	9.1
3	10	10	*11	12	21	20	40	23	20	10	8.2	9.1
4	10	11	11	12	28	18	35	23	21	10	*8.2	8.2
5	10	12	12	12	24	14	35	23	20	9.1	7.4	8.2
6	10	12	12	11	24	16	35	23	20	9.1	7.4	8.2
7	10	12	13	*11	24	18	33	23	18	9.1	7.4	8.2
8	10	16	14	11	23	22	33	21	17	9.1	10	8.2
9	10	16	16	11	21	20	31	21	17	9.1	11	*10
10	10	13	14	10	20	18	31	21	17	9.1	10	10
11	10	12	14	10	*18	16	31	21	17	9.1	8.2	9.5
12	10	12	13	10	18	14	30	21	16	9.1	8.2	9
13	9.1	12	16	10	18	18	30	20	16	9.1	7.4	9
14	9.1	11	17	10	16	24	28	18	16	9.1	7.4	8.5
15	10	11	16	13	20	22	26	18	20	9.1	6.7	8
16	11	10	16	17	18	20	26	17	46	9.1	13	50
17	12	11	14	12	16	*16	30	14	38	9.1	10	60
18	12	11	14	12	14	14	28	14	30	9.1	9.1	30
19	12	16	14	11	14	100	24	14	30	10	8.2	20
20	13	13	14	10	14	250	24	14	30	10	8.2	14
21	13	13	16	9.1	26	150	*24	14	28	10	7.4	10
22	12	14	14	10	22	70	24	16	23	10	7.4	25
23	12	11	13	10	18	70	26	17	18	9.1	10	30
24	20	10	13	10	16	60	26	20	16	9.1	10	20
25	18	11	13	9.1	26	50	26	24	14	9.1	10	15
26	18	13	12	9.1	22	45	33	20	14	7.4	9.1	12
27	16	14	12	9.1	18	45	26	*17	13	8.2	8.2	600
28	14	16	13	9.1	16	45	26	17	13	8.2	8.2	80
29	12	12	13	11	14	45	26	16	12	8.2	8.2	50
30	12	11	12	27	----------	40	26	24	*12	9.1	8.2	30
31	*12	----------	12	30	----------	40	----------	34	----------	9.1	9.1	----------
Total	367.2	366.1	416	372.5	573	1,330	893	618	613	287.9	269.1	1,178.3
Mean	11.8	12.2	13.4	12.0	19.8	42.9	29.8	19.9	20.4	9.29	8.68	39.3
Ac-ft	728	726	825	739	1,140	2,640	1,770	1,230	1,220	571	534	2,340

Calendar year 1963: Max 1,270 Min 9.1 Mean 28.7 Ac-ft 20,750
Water year 1963-64: Max 600 Min 6.7 Mean 19.9 Ac-ft 14,460

Peak discharge (base, 1,800 cfs)

Date	Time	Gage height	Discharge
9-27	unknown	5.3	4,260

* Discharge measurement made on this day.
Note.--No gage-height record Feb. 12 to Apr. 6, Sept. 10-30.

8-1713. Blanco River near Kyle, Tex.

Location.--Lat 29°58'42", long 97°54'30", on left bank 800 ft downstream from Tarbutton Ranch House (Hatchett Ranch), 2.3 miles west of Kyle, Hays County, 3.6 miles upstream from Kushla, 3.9 miles downstream from mouth of Halifax Creek, and 5 miles upstream from bridge on U. S. Highway 81.
Drainage area.--424 sq mi.
Records available.--May 1956 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 620.12 ft above mean sea level, Corps of Engineers bench mark.
Average discharge.--8 years, 146 cfs (105,700 acre-ft per year).
Extremes.--Maximum discharge during year, 1,180 cfs June 17 (gage height, 8.61 ft); no flow most of time.
1956-64: Maximum discharge, 98,000 cfs May 2, 1958 (gage height, 36.3 ft, from floodmark), from rating curve defined by current-meter measurements below 26,000 cfs and slope-area measurement at 139,000 cfs and slope conveyance study; no flow at times in 1956-57, 1963-64.
Maximum stage since at least 1882, about 40 ft in May 1929, from information by local residents (discharge, 139,000 cfs). Flood of Sept. 11, 1952, reached a stage of 38.0 ft (discharge, 115,000 cfs).
Revisions.--The annual peaks for the water years 1957-58, 1960, have been revised to 75,400 cfs Apr. 24, 1957 (gage height, 34.0 ft), 98,000 cfs May 2, 1958 (gage height, 36.30 ft), 40,900 cfs Oct, 4, 1959 (gage height, 28.70 ft), superseding previously published figures in WSP 1512, 1562, and 1712.
Remarks.--Records good. Small diversions above station for irrigation.
Revisions.--Revised figures of discharge, in cubic feet per second, for the periods Apr. 24, 1957, and May 2, 1958, superseding previously published figures, are given herewith:

Apr. 24, 1957..... 9,490
May 2, 1958..... 11,700

Month	Cfs-days	Maximum	Mean	Runoff in acre-feet
April 1957.....	23,812.3	9,490	794	47,230
Water year 1956-57.....	60,311.2	9,490	165	119,600
Calendar year 1957.....	94,420.9	9,490	259	190,300
May 1958.....	35,592	11,700	1,148	70,600
Water year 1957-58.....	132,240	11,700	362	262,200
Calendar year 1958.....	113,761	11,700	312	225,600

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 20-21, June 16-18)

3.4	0	3.9	5.8	4.7	59
3.5	.2	4.0	9.1	5.0	99
3.6	.8	4.2	18	5.5	189
3.7	1.8	4.4	31	6.0	297
3.8	3.4				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0	8.1	0.8	15	6.6	2.6	0.1		
2				0	3.8	2.1	15	6.6	1.2	0		
3			(*)	0	2.4	2.7	15	4.5	.6	0		
4				0	8.2	2.1	13	3.3	.4	0	(*)	
5				0	11	1.3	13	2.4	.3	0		
6				0	7.0	1.6	12	3.1	.2	0		
7				*0	6.0	4.5	12	5.5	.1	0		
8				0	5.8	5.2	9.5	4.8	0	0		
9				0	5.0	5.0	8.7	3.4	0	0		(*)
10				0	3.8	3.3	8.0	2.6	0	0		
11				0	*2.9	2.2	7.6	1.6	0	0		
12				0	2.4	1.4	8.4	1.3	0	0		
13				0	2.6	3.5	7.6	.8	0	0		
14				0	1.7	6.4	6.6	.6	0	0		
15				0	3.2	4.0	6.4	.4	0	0		
16				0	2.6	2.6	5.8	.3	109	0		
17				0	1.3	1.4	10	.1	297	0		
18				0	.8	1.1	9.5	0	70	0		
19				0	.8	126	6.6	0	20	0		
20				0	.7	*227	5.8	0	11	0		
21				0	4.2	76	6.0	0	7.3	0		
22				0	7.6	42	*5.8	0	5.0	0		
23				0	4.2	30	6.4	0	3.3	0		
24				0	2.9	26	6.4	0	1.8	0		
25				0	4.8	24	7.0	4.9	.8	0		
26				0	4.5	21	15	5.0	.6	0		
27				0	2.6	20	16	*1.2	.5	0		
28				0	1.6	20	6.6	.6	.4	0		
29				0	.9	18	4.2	.4	.3	0		
30	(*)			0	----------	16	5.8	.4	**.2	0		
31		----------		7.7	----------	15	----------	.3	----------	0		----------
Total	0	0	0	7.7	113.4	712.2	274.7	60.7	532.6	0.1	0	0
Mean	0	0	0	0.25	3.91	23.0	9.16	1.96	17.8	0.003	0	0
Ac-ft	0	0	0	15	225	1,410	545	120	1,060	0.2	0	0

Calendar year 1963: Max 530 Min 0 Mean 16.7 Ac-ft 12,060
Water year 1963-64: Max 297 Min 0 Mean 4.65 Ac-ft 3,380

Peak discharge (base, 1,500 cfs).--No peak above base.

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

8-1720. San Marcos River at Luling, Tex.

Location.--Lat 29°39'55", long 97°39'05", on left bank 390 ft downstream from bridge on State Highway 80, 1 mile south of Luling, Caldwell County, and 8 miles upstream from Plum Creek.

Drainage area.--833 sq mi.

Records available.--April 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 322.05 ft above mean sea level, datum of 1929.

Average discharge.--25 years, 322 cfs (233,100 acre-ft per year).

Extremes.--Maximum discharge during year, 1,710 cfs Nov. 8 (gage height, 13.79 ft); minimum daily, 70 cfs Sept. 15.

1939-64: Maximum discharge, 57,000 cfs Sept. 12, 1952 (gage height, 34.95 ft); minimum daily, 43 cfs Aug. 12, 1951.

Maximum stage since at least 1859, 40.4 ft in 1869 or 1870, from information by State Highway Department. Flood of May 29, 1929, reached a stage of 37.1 ft and is the second highest known.

Remarks.--Records good. Regulation by powerplant 800 ft upstream. At end of year, flow from 36.3 sq mi above this station was partly controlled by 11 floodwater-retarding structures with a total combined capacity of 10,890 acre-ft below the flood spillway crests, of which 9,100 acre-ft is floodwater-retarding capacity and 1,790 acre-ft is sediment-pool capacity. Three structures were built during the current year and have a total combined capacity below flood spillway crests of 3,520 acre-ft, of which 410 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Base flow is mostly from large springs near San Marcos. Diversions above station for irrigation and fish hatchery.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	85	80	96	100	113	106	116	108	154	*114	82	77
2	85	79	96	100	104	327	116	107	103	109	83	74
3	84	81	96	100	107	119	118	107	98	108	84	71
4	84	84	96	101	217	111	118	106	96	108	82	72
5	84	84	*96	99	138	108	119	107	94	111	*81	71
6	84	82	98	99	110	105	118	108	92	110	79	73
7	84	81	100	100	106	106	116	109	89	108	80	78
8	84	556	99	*100	103	107	111	109	90	104	295	77
9	81	203	98	99	102	110	109	106	89	101	104	*78
10	82	103	100	97	103	107	106	104	87	99	89	76
11	82	96	101	99	103	105	106	101	85	97	88	77
12	83	96	100	99	104	103	111	99	84	97	85	75
13	84	95	110	98	*104	103	112	95	83	99	84	71
14	85	95	110	97	103	104	119	104	82	95	83	71
15	85	95	99	99	103	104	108	92	88	91	79	70
16	83	94	96	112	101	104	103	92	198	91	78	96
17	83	96	96	107	99	104	110	91	682	91	78	646
18	83	96	96	100	101	*109	112	93	577	90	79	119
19	84	97	96	100	99	780	107	91	260	93	78	91
20	84	132	99	100	99	147	113	89	182	99	74	88
21	84	99	100	99	110	201	113	87	154	99	73	87
22	84	96	97	103	110	197	*112	92	143	97	74	96
23	95	92	96	104	103	160	109	97	135	95	185	223
24	106	92	96	103	112	143	108	105	129	92	96	225
25	81	94	96	101	120	132	133	97	125	90	83	98
26	83	99	97	101	106	127	125	110	123	91	81	93
27	88	103	97	102	99	126	116	103	119	91	78	255
28	84	104	100	103	96	125	111	*96	118	93	76	722
29	80	98	99	103	97	125	108	84	120	89	76	463
30	*77	95	97	189	----------	122	105	84	117	83	74	230
31	80	----------	96	170	----------	119	----------	217	----------	83	75	----------
Total	2,615	3,397	3,049	3,284	3,172	4,646	3,388	3,190	4,596	3,018	2,836	4,643
Mean	84.4	113	98.4	106	109	150	113	103	153	97.4	91.5	155
Ac-ft	5,190	6,740	6,050	6,510	6,290	9,220	6,720	6,330	9,120	5,990	5,630	9,210

Calendar year 1963: Max 902 Min 74 Mean 128 Ac-ft 92,420
Water year 1963-64: Max 780 Min 70 Mean 114 Ac-ft 82,980

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

* Discharge measurement made on this day.

8-1724. Plum Creek at Lockhart, Tex.

Location.--Lat 29°55'24", long 97°40'37", on left bank at downstream side of bridge on U. S. Highway 183, 2.8 miles north of Lockhart, Caldwell County, 3.5 miles upstream from Town Branch, and 6.5 miles downstream from Brushy Creek.

Drainage area.--113 sq mi.

Records available.--April 1959 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 431.19 ft above mean sea level, datum of 1929.

Average discharge.--5 years, 39.7 cfs (28,740 acre-ft per year).

Extremes.--Maximum discharge during year, 1,610 cfs Sept. 23, 27; maximum gage height, 14.01 ft Sept. 27; no flow most of year.

1959-64: Maximum discharge, 26,600 cfs Oct. 29, 1960 (gage height, 20.62 ft); no flow for several days in each year.

Maximum stage since at least 1905, 22 ft in June 1936 at old highway bridge 548 ft upstream; flood in 1951 reached a stage of 20 ft at same site, from information by local resident.

Remarks.--Records good. No known diversion above station. At end of year, flow from 20.9 sq mi above this station was partly controlled by 8 floodwater-retarding structures with a total combined capacity of 8,270 acre-ft below the flood spillway crests, of which 6,990 acre-ft is floodwater-retarding capacity and 1,280 acre-ft is sediment-pool capacity. One structure was built during the current year and has a capacity below flood spillway crest of 1,020 acre-ft, of which 230 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0		0	0.1	0	*1.7		0
2					0		0	0	0	1.3		0
3					0		0	0	0	.8		0
4					.1		0	0	0	.3		0
5			(*)		0		0	0	0	.1	(*)	0
6					0		0	0	0	0		0
7					0		0	0	0	0		0
8				(*)	0		0	0	0	0		0
9					0		0	0	0	0		*0
10					0		0	0	0	0		0
11					0		0	0	0	0		0
12					0		0	0	0	0		0
13					*0		0	0	0	0		0
14					0		0	0	0	0		0
15					0		0	0	0	0		0
16					0		0	0	186	0		.4
17					0		0	0	126	0		*143
18					0	(*)	0	0	27	0		*2.4
19					0		0	0	10	0		.3
20					0		0	0	6.3	0		.1
21					0		0	0	5.1	0		0
22					0		*0	0	4.6	0		.1
23					0		0	0	4.1	0		532
24					.1		0	0	3.9	0		12
25					0		0	0	3.5	0		2.0
26					0		35	0	3.2	0		.8
27					0		24	4.6	3.0	0		681
28					0		4.8	*1.1	2.7	0		65
29					0		1.5	.2	2.5	0		15
30	(*)				----------		.4	0	2.2	0		8.0
31		----------			----------		----------	0	----------	0		----------
Total	0	0	0	0	0.2	0	65.7	6.0	390.1	4.2	0	1,462.1
Mean	0	0	0	0	0.007	0	2.19	0.19	13.0	0.14	0	48.7
Ac-ft	0	0	0	0	0.4	0	130	12	774	8.3	0	2,900

Calendar year 1963: Max 929 Min 0 Mean 5.75 Ac-ft 4,160
Water year 1963-64: Max 681 Min 0 Mean 5.27 Ac-ft 3,820

Peak discharge (base, 2,000 cfs).--No peak above base.

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

8-1730. Plum Creek near Luling, Tex.

Location.--Lat 29°42', long 97°37', near left bank on downstream side of pier of bridge on county road, 1 mile downstream from West Fork Plum Creek, 2 miles upstream from Texas and New Orleans Railroad Co. bridge, and 3 miles northeast of Luling, Caldwell County.

Drainage area.--356 sq mi.

Records available.--March 1930 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 326.57 ft above mean sea level, datum of 1929.

Average discharge.--34 years, 88.5 cfs (64,070 acre-ft per year).

Extremes.--Maximum discharge during year, 3,450 cfs Sept. 17 (gage height, 15.90 ft); no flow at times.
1930-64: Maximum discharge, 78,500 cfs July 1, 1936 (gage height, 25.7 ft, from floodmarks), from rating curve extended above 37,500 cfs; no flow at times.
Maximum stage since at least 1868, that of July 1, 1936; flood in December 1913 reached about same stage, from information by local residents.

Remarks.--Records good except those for period of no gage-height record, which are fair. Slight regulation at low flow by oilfield operation above station. At end of year, flow from 36.9 sq mi above this station was partly controlled by 10 floodwater-retarding structures with a total combined capacity of 14,840 acre-ft below the flood spillway crests, of which 13,170 acre-ft is floodwater-retarding capacity and 1,670 acre-ft is sediment-pool capacity. One structure was built during the current year and has a capacity below flood spillway crest of 1,020 acre-ft, of which 230 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. No diversion above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.1	0.1	3	2.9	11	7.5	4.2	3.9	5.1	*3.4	0.2	0
2	1.0	.2	3	2.9	5.1	316	4.2	3.2	2.5	3.4	.1	0
3	.9	.4	3	2.9	4.5	46	4.5	2.7	1.1	2.3	0	0
4	1.2	.5	3	2.7	33	12	5.4	2.5	.7	1.9	0	0
5	1.2	.2	*2.5	2.3	35	7.5	5.1	2.5	.7	1.7	*0	0
6	1.1	.4	2.7	2.3	9.0	6.4	5.1	2.5	.6	1.6	0	0
7	1.1	.4	2.7	2.3	4.8	6.4	4.8	2.5	.2	.8	0	0
8	1.0	127	2.5	*2.3	3.4	6.4	3.6	2.9	.1	.5	.3	0
9	.9	27	2.5	2.1	3.2	6.8	3.6	2.9	.2	.2	.2	*0
10	.6	5.6	2.5	2.1	3.2	6.1	3.4	2.7	.2	.1	2.0	0
11	.4	2.7	2.5	2.3	3.2	6.1	3.2	2.3	.7	.1	1.4	0
12	.2	2.1	2.9	2.3	3.4	5.8	3.4	2.1	.9	.1	1.0	0
13	.4	1.9	4.6	2.1	*3.4	5.8	3.6	1.6	.8	.1	1.1	0
14	.6	1.7	9.5	2.1	3.6	5.8	2.9	1.6	1.1	.2	1.0	0
15	.6	1.6	8.3	2.3	3.6	5.4	2.3	1.4	1.2	.2	.9	0
16	.6	1.7	4.2	3.6	3.6	4.2	2.5	.6	566	.1	.6	.5
17	.5	2.1	3.2	7.6	3.6	3.4	3.6	.6	928	.1	.4	1,480
18	.7	1.9	2.7	5.1	3.4	*4.3	4.8	.5	183	.1	.3	*1,200
19	.6	33	2.5	2.9	3.4	574	4.8	.4	46	0	.2	68
20	.6	84	2.5	2.5	3.4	83	3.6	.4	17	2.3	.2	*48
21	.8	9.1	2.7	2.7	4.2	12	3.4	.4	10	1.4	.1	41
22	.7	2.9	3.6	2.7	7.8	7.2	3.2	.7	7.9	.6	0	38
23	.7	2.3	3.2	2.5	8.7	5.8	3.2	1.2	6.4	.5	9.5	645
24	1.0	2	2.7	2.3	7.9	5.8	*3.4	1.4	5.8	.5	4.1	830
25	1.0	2	2.5	2.3	18	5.1	6.4	1.9	5.1	.4	.8	51
26	2.5	2	2.7	2.3	14	4.5	9.4	2.5	4.5	.4	.4	32
27	2.1	4	2.7	2.3	8.3	4.5	*5.1	2.3	3.6	.4	.3	389
28	1.4	8	2.7	2.3	6.8	4.2	26	*1.4	3.6	.4	.2	1,480
29	1.0	5	2.9	2.5	6.4	4.2	9.2	2.4	3.4	.4	.1	128
30	*.9	4	2.9	14	----------	4.2	5.1	2.5	3.2	.6	.1	48
31	.5	----------	2.9	55	----------	4.2	----------	12	----------	.4	0	----------
Total	27.9	335.8	101.8	148.5	228.9	1,180.6	198.9	68.5	1,809.6	25.2	25.5	6,478.5
Mean	0.90	11.2	3.28	4.79	7.89	38.1	6.63	2.21	60.3	0.81	0.82	216
Ac-ft	55	666	202	295	454	2,340	395	136	3,590	50	51	12,850

Calendar year 1963: Max 1,430 Min 0 Mean 14.5 Ac-ft 10,480
Water year 1963-64: Max 1,480 Min 0 Mean 29.0 Ac-ft 21,080

Peak discharge (base, 2,300 cfs)

Date	Time	Gage height	Discharge
9-17	2200	15.90	3,450

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record Nov. 24 to Dec. 4, Dec. 31 to Jan. 2.

8-1746. Peach Creek below Dilworth, Tex.

Location.--Lat 29°28'26", long 97°18'59", on right bank at downstream side of bridge on U. S. Highway 90-A, 1.3 miles downstream from Mitchell Creek, 3.1 miles southwest of Dilworth, Gonzales County, 6.4 miles upstream from mouth, and 8.5 miles southeast of Gonzales.

Drainage area.--462 sq mi, approximately.

Records available.--August 1959 to September 1964.

Gage.--Water-stage recorder. Prior to Feb. 11, 1960, wire-weight gage at same site and datum. Datum of gage is 213.53 ft above mean sea level, datum of 1929.

Average discharge.--5 years, 130 cfs (94,120 acre-ft per year).

Extremes.--Maximum discharge during year, 2,320 cfs Mar. 3 (gage height, 23.38 ft); no flow at times.
1959-64: Maximum discharge, 23,800 cfs Oct. 19, 1960 (gage height, 31.28 ft); no flow at times each year.
Maximum stage since at least 1840, 35.3 ft in June 1940. A stage of 32.8 ft was reached June 30, 1936, but may have been affected by backwater from Guadalupe River, from information by local residents.

Remarks.--Records good. Recording rain gage located at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 16-18, Mar. 28 to Apr. 24, Aug. 23-24, Sept. 20-22, 29-30)

3.2	0	6.5	57
3.3	.1	7.0	78
3.4	.2	9.0	200
3.5	.7	12.0	440
3.6	1.5	18.0	1,150
3.7	2.5	22.0	1,950
4.0	6.7	23.0	2,200
6.0	44		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	17	0.3	254	6.6	4.2	4.5	0.2	0.1	0	0
2		0	9.7	.2	40	1,380	4.1	3.2	.1	.1	0	0
3		0	4.9	.2	19	*2,100	4.1	2.3	0	.1	0	0
4		0	2.9	.2	56	*1,060	4.1	* 1.6	.1	0	0	0
5		0	1.8	.2	172	73	4.1	1.3	.4	0	0	0
6		0	1.3	.2	77	30	3.5	1.2	.2	0	0	0
7	(*)	0	.9	.2	26	19	*3.4	1.1	.1	0	0	0
8		25	.5	.3	15	14	3.7	1.0	* .7	0	0	0
9		891	.4	.2	8.5	421	3.4	.9	.3	0	0	0
10		1,520	.3	.2	5.6	364	2.8	.9	.1	0	0	0
11		362	.2	.2	4.2	87	2.4	.9	0	0	0	0
12		*31	.2	.1	3.8	31	2.4	.8	0	0	0	0
13		16	.2	.1	3.0	19	2.3	.6	0	* 0	0	0
14		8.0	5.5	.1	2.4	13	2.0	.5	0	0	0	0
15		*5.2	23	.1	2.3	9.2	2.1	.4	140	0	0	0
16		3.4	*40	.2	2.4	7.4	2.1	.3	480	0	0	0
17		2.5	23	.2	2.2	6.2	2.6	.2	227	0	*0	43
18		1.9	12	.3	2.0	5.4	2.3	.2	169	0	0	270
19		1.6	7.3	.3	1.4	775	2.1	.1	48	0	0	259
20		1.4	4.9	* .3	1.3	1,110	1.9	.1	20	0	0	52
21		1.1	3.4	.3	1.9	609	1.9	.1	10	0	0	24
22		1.0	2.9	.2	1.6	69	1.6	.1	5.5	0	0	*12
23		.7	2.1	.3	1.6	30	1.3	.1	3.7	0	58	4.9
24		1.0	1.4	.5	*7.8	20	.8	.1	2.3	0	16	5.6
25		1.7	1.1	.4	102	16	93	.1	1.3	0	2.5	3.4
26		1.6	1.1	.3	119	12	155	.1	1.7	0	.5	12
27		2.3	1.0	.3	31	9.3	58	.1	1.0	0	.2	234
28		7.8	.8	.3	14	7.7	24	0	.4	0	.1	270
29		23	.6	.3	8.0	6.2	11	0	.2	.1	0	50
30		24	.5	26	----------	5.4	6.4	.3	.2	.3	0	33
31		----------	.3	303	----------	4.6	----------	.9	----------	0	0	----------
Total	0	2,933.2	171.2	336.0	985.0	8,320.0	412.6	24.0	1,112.5	0.7	77.3	1,272.9
Mean	0	97.8	5.52	10.8	34.0	268	13.8	0.77	37.1	0.02	2.49	42.4
Ac-ft	0	5,820	340	666	1,950	16,500	818	48	2,210	1.4	153	2,520

Calendar year 1963: Max 1,520 Min 0 Mean 14.0 Ac-ft 10,120
Water year 1963-64: Max 2,100 Min 0 Mean 42.7 Ac-ft 31,030

Peak discharge (base, 870 cfs)

Date	Time	Gage height	Discharge
11-10	1400	20.92	1,680
3- 3	1700	23.38	2,320
3-20	1800	18.38	1,210

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

8-1750. Sandies Creek near Westhoff, Tex.

Location.--Lat 29°12'54", long 97°26'57", on left bank 100 ft downstream from bridge on county highway, 1.9 miles upstream from Birds Creek, and 2.0 miles northeast of Westhoff, De Witt County.

Drainage area.--560 sq mi.

Records available.--March 1930 to November 1934, August 1959 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 178.27 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943. Prior to Nov. 9, 1934, recording gage at site 150 ft upstream at datum 0.86 ft. higher. Aug. 10, 1959, to Feb. 2, 1960, staff gage at same site and datum.

Average discharge.--9 years, 76.9 cfs (55,670 acre-ft per year).

Extremes.--Maximum discharge during year, 1,260 cfs Apr. 27 (gage height, 14.94 ft); minimum, 0.1 cfs for many days during October, July, and August.
1930-34, 1959-64: Maximum discharge, 20,700 cfs June 19, 1961 (gage height, 26.64 ft); no flow at times. Maximum stage since at least 1864, 33.1 ft July 2, 1936, from floodmarks, at present site and datum (discharge, 92,700 cfs by slope-area measurement). Flood in October 1913 reached a stage of 26.0 ft, present site and datum, from information by local residents.

Remarks.--Records good except those for period when staff gage was used and those for period of no gage-height record, which are fair. No diversion above station. Recording rain gage located at station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 8, June 4-17, June 23 to Aug. 22, Aug. 28 to Sept. 16, Sept. 23-25)

0.9	0.1	3.0	38
1.0	.4	4.0	77
1.2	1.4	6.0	185
1.4	3.0	9.0	405
1.7	6.5	13.0	905
2.0	12	15.0	1,290
2.5	22		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	0.2	18	3.9	474	12	5.5	26	12	0.6	0.2	1.0
2	.6	.2	11	3.9	254	280	5.2	61	21	.4	4.4	.8
3	.5	.2	7.7	3.9	70	651	*5.1	100	11	.4	4.2	.6
4	.4	.2	6	4.1	81	*470	4.8	42	7.6	.3	1.7	.5
5	.4	.2	5.1	4.1	167	138	4.8	17	6.0	.2	.6	.8
											.3	
6	.3	.3	4.4	4.0	173	46	4.7	9.7	5.1	.2	.3	4.7
7	.2	.4	4.1	4.0	72	24	4.7	*7.4	4.1	.2	.2	1.2
8	.2	.8	3.7	4.0	24	16	4.4	6.4	4.2	.2	4.3	.7
9	.2	2.8	3.5	4.0	14	13	4.1	5.7	*4.0	.2	5.0	.8
10	**.2	333	3.3	3.9	10	165	3.9	5.3	3.6	.2	3.3	.6
11	.2	219	3.3	3.7	7.8	78	3.9	4.8	3.0	.2	3.0	.6
12	.2	60	3.3	3.5	6.8	24	3.8	4.4	2.4	.2	2.8	1.2
13	.2	23	6.4	3.4	5.8	13	3.7	4.0	1.9	.2	2.6	4.8
14	.2	12	15	3.4	5.5	9.9	3.3	3.6	1.7	.2	2.1	3.5
15	.1	*8.2	24	3.4	5.2	8.4	2.8	3.4	1.7	**.2	1.3	1.8
16	.1	6.4	34	4.7	5.1	7.6	2.7	3.1	1.7	.2	.8	1.7
17	.1	5.1	22	5.2	5.1	7.0	3.8	2.8	1.6	.2	.6	6.8
18	.1	4.2	14	5.8	5.1	6.4	3.9	2.6	92	.2	.4	34
19	.1	4	*9.7	7.1	5.0	172	4.5	2.2	179	.2	.2	13
20	.1	4	7.8	7.0	4.6	396	5.6	1.9	55	.2	**.2	8.1
21	.1	4.2	7.1	6.5	5.8	320	5.5	1.9	26	.2	.1	50
22	.1	5.8	6.1	6.0	6.1	153	5	2.2	11	.2	.1	90
23	.1	6	5.6	*5.7	7.8	51	4.6	2.9	6.0	.2	25	*27
24	.3	5.3	5.3	5.2	14	25	4.2	2.9	3.7	.2	49	16
25	.8	4.6	5.2	4.8	120	15	6.3	5.4	2.6	.2	71	5.0
26	.4	4.2	5	4.6	104	11	248	9.4	1.8	.2	73	76
27	.4	10	4.6	4.4	*76	9.0	1,100	8.3	1.8	.1	29	106
28	.2	23	4.5	4.4	34	7.8	623	5.3	1.3	.1	11	152
29	.2	46	4.2	4.4	15	6.8	139	4.4	1.0	.2	4.8	297
30	.2	26	4.1	36	----------	6.1	48	3.8	.8	.3	2.6	565
31	.2	----------	3.9	305	----------	5.6	----------	4.1	----------	.2	1.6	----------
Total	8.0	819.3	261.9	474.0	1,777.7	3,147.6	2,268.8	363.9	474.6	7.0	305.4	1,471.2
Mean	0.26	27.3	8.45	15.3	61.3	102	75.6	11.7	15.8	0.23	9.85	49.0
Ac-ft	16	1,630	519	940	3,530	6,240	4,500	722	941	14	606	2,920

Calendar year 1963: Max 746 Min 0.1 Mean 12.1 Ac-ft 8,790
Water year 1963-64: Max 1,100 Min 0.1 Mean 31.1 Ac-ft 22,580

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
4-27	1600	14.94	1,260

* Discharge measurement made on this day
** Field estimate made on this day.
Note.--Discharge computed from twice-daily staff-gage readings Aug. 8-20.

8-1758. Guadalupe River at Cuero, Tex.

Location.--Lat 29°03'57", long 97°19'16", on left bank at downstream side of bridge on U. S. Highways 77-A, 87, and 183, 2.1 miles upstream from Gohlke Creek, 2.4 miles southwest of Cuero, De Witt County, 4.2 miles downstream from Sandies Creek, and 7.1 miles downstream from Central Power and Light Co. powerplant dam.

Drainage area.--4,877 sq mi.

Records available.--December 1902 to December 1906, August 1916 to December 1935, January to September 1964. Published as "near Cuero" 1902-6, and as "below Cuero" 1916-35. Gage-height records collected at site 7.1 miles upstream above Sandies Creek since 1941 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 128.64 ft above mean sea level, datum of 1929. Dec. 26, 1902, to June 1903, staff gage at site 7.1 miles upstream at different datum (gage heights moved to the site 3.3 miles upstream from present site before computation); July 1903 to 1904 reference point 3.3 miles upstream at different datum; August 19, 1916, to Dec. 16, 1935, recording gage at site 5.0 miles downstream at datum 3.19 ft lower.

Average discharge.--20 years (1903-6, 1916-18, 1920-35), 1,303 cfs (943,300 acre-ft per year).

Extremes.--Maximum discharge during period January to September, 4,890 cfs Mar. 21 (gage height, 12.04 ft); minimum daily, 138 cfs Aug. 22.

1902-6, 1916-35, 1964: Maximum discharge, 101,000 cfs May 30, 1929 (gage height, 35.2 ft, site and datum then in use); minimum daily, 138 cfs Aug. 22, 1964.

Maximum stage since at least 1900, 43.0 ft Mar. 1, 1903 (former site and datum used in 1915-35). Other floods at this station occurred July 2, 1936 (44.33 ft, present site and datum), from information furnished by Texas Highway Department; Oct. 4, 1913 (37.57 ft, at different site and datum); May 30, 1929 (35.2 ft, site and datum then in use); Dec. 6, 1913 (34.57 ft, at different site and datum); June 21, 1961 (37.0 ft, present site and datum); Oct. 20, 1919 (32.2 ft, site and datum then in use), from information by local residents.

Remarks.--Records good. Flow is partly regulated by a series of small power dams between New Braunfels and this station. One of these, Central Power and Light Co.'s dam, is located 7.1 miles upstream from gage. At end of year, flow from 73.2 sq mi above this station was partly controlled by 21 floodwater-retarding structures with a total combined capacity of 25,720 acre-ft below the flood spillway crests, of which 22,270 acre-ft is floodwater-retarding capacity and 3,450 acre-ft is sediment-pool capacity. Four structures were built during the current year and have a combined capacity below flood spillway crests of 4,550 acre-ft, of which 636 acre acre-ft is sediment-pool capacity. Capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Many small diversions above station.

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

2.8	27	6.0	1,100
3.0	54	7.0	1,620
3.4	134	8.0	2,210
4.0	298	10.0	3,460
5.0	650	12.0	4,890

Discharge, in cubic feet per second, during period January to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				450	2,030	444	630	512	264	356	154	273
2				400	1,880	888	550	610	407	388	184	309
3				400	955	3,810	*590	630	424	388	149	218
4				350	1,400	*4,300	550	570	417	308	146	229
5				400	1,170	2,810	512	530	280	209	147	295
6				370	1,680	775	550	478	309	293	147	285
7				350	1,150	478	650	*512	230	232	142	228
8				700	803	550	752	460	401	275	169	267
9				450	710	530	414	460	*264	292	142	233
10				350	610	1,170	414	414	297	196	339	217
11				300	710	1,120	495	375	265	263	245	260
12				400	530	680	414	401	220	252	212	233
13				350	500	460	530	404	244	250	172	208
14				450	550	495	495	401	272	224	159	189
15				400	570	427	775	343	265	*212	152	166
16				380	610	478	490	336	301	205	154	156
17				450	550	460	460	362	910	193	154	160
18				500	444	530	543	365	1,250	171	152	574
19				450	478	910	530	286	2,880	171	151	2,330
20				400	512	2,510	478	295	1,970	172	*154	2,390
21				380	460	4,590	530	286	774	177	157	596
22				380	530	2,690	460	401	690	174	138	366
23				*427	570	1,300	460	293	570	173	166	403
24				384	512	1,510	460	335	495	177	195	865
25				460	550	1,120	420	401	444	171	517	2,140
26				424	865	1,080	2,110	229	444	179	283	2,090
27				388	*932	754	1,790	230	397	168	237	1,120
28				368	628	570	1,790	272	320	164	218	1,220
29				460	580	606	1,020	275	317	177	171	2,630
30				463	----------	630	610	335	415	181	244	3,600
31		----------		1,000	----------	758	----------	338	----------	163	350	----------
Total				13,434	23,469	39,433	20,472	12,139	16,736	6,954	6,100	24,250
Mean				433	809	1,272	682	392	558	224	197	808
Ac-ft				26,650	46,550	78,210	40,610	24,080	33,200	13,790	12,100	48,100

Peak discharge (base, 7,500 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 1-22.

8-1765. Guadalupe River at Victoria, Tex.

Location.--Lat 28°47'40", long 97°00'40", on left bank just upstream from pier of upstream bridge of two bridges on U. S. Highway 59 in Victoria, Victoria County, 1,300 ft upstream from Southern Pacific Railroad Co. bridge, and 10 miles upstream from Coleto Creek.

Drainage area.--5,161 sq mi.

Records available.--November 1934 to September 1964. Gage-height records collected in this vicinity since 1904 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 29.15 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Average discharge.--29 years (1935-64), 1,553 cfs (1,124,000 acre-ft per year).

Extremes.--Maximum discharge during year, 5,720 cfs Nov. 11 (gage height, 16.19 ft); minimum daily, 148 cfs Oct. 13.

1934-64: Maximum discharge, 179,000 cfs July 3, 1936 (gage height, 31.22 ft); minimum daily, 14 cfs Aug. 20, 1956.

Maximum stage since at least 1833, that of July 3, 1936. Flood of June 1, 1929, reached a stage of 30.2 ft, present site and datum.

Remarks.--Records good. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see preceding page. Many small diversions above station. Some regulation by powerplants above station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

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

2.6	136	4.0	445	12.0	3,500
3.0	192	6.0	1,040	15.0	5,000
3.5	300	10.0	2,540	16.0	5,600

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	178	408	580	445	1,140	595	730	655	385	351	217	302
2	197	475	490	475	1,820	565	*670	565	278	385	183	344
3	203	248	460	430	1,340	1,470	565	685	430	415	196	308
4	190	250	400	430	1,140	3,700	655	700	445	430	184	272
5	186	262	376	385	1,300	3,330	565	*625	445	355	170	250
6	184	308	385	415	1,140	1,500	580	610	318	242	170	305
7	169	201	385	400	1,400	715	595	535	352	308	177	305
8	*172	362	475	385	985	550	685	520	240	265	1,530	262
9	192	306	415	655	775	670	700	520	400	295	564	280
10	189	2,280	352	415	745	653	445	505	*288	305	199	270
11	189	5,480	430	364	625	1,140	445	475	333	274	322	244
12	182	2,990	445	315	730	925	520	430	270	292	335	236
13	148	*805	550	400	580	730	460	445	254	303	246	268
14	168	550	715	379	505	535	535	445	260	*276	241	234
15	207	745	640	460	580	550	580	445	376	253	200	208
16	172	565	565	445	625	490	760	385	334	247	178	201
17	204	550	*580	415	625	535	528	379	360	228	176	491
18	175	490	550	430	565	520	520	400	955	228	178	1,170
19	187	505	490	520	475	805	535	400	1,770	216	173	824
20	179	460	490	475	505	1,160	550	364	2,220	202	*172	2,220
21	166	445	460	430	550	3,100	520	352	1,230	198	172	1,550
22	181	490	445	*430	490	3,680	550	334	760	203	173	580
23	192	640	490	430	580	1,850	475	430	730	194	173	415
24	205	520	475	475	595	1,200	475	337	610	202	176	565
25	278	445	490	400	*580	1,300	475	379	580	202	187	*925
26	196	400	415	460	625	1,020	518	445	490	194	441	2,060
27	237	445	415	430	925	1,040	1,860	275	475	194	342	1,540
28	318	550	430	385	835	730	1,510	250	445	205	287	985
29	280	520	430	385	640	640	1,440	292	370	192	236	1,340
30	535	565	430	510	----------	745	895	290	361	191	224	2,540
31	358	----------	430	985	----------	700	----------	376	----------	205	192	----------
Total	6,617	23,260	14,683	13,958	23,420	37,143	20,341	13,848	16,764	8,050	8,414	21,494
Mean	213	775	474	450	808	1,198	678	447	559	260	271	716
Ac-ft	13,120	46,140	29,120	27,690	46,450	73,670	40,350	27,470	33,250	15,970	16,690	42,630

Calendar year 1963: Max 5,480 Min 100 Mean 507 Ac-ft 367,100
Water year 1963-64: Max 5,480 Min 148 Mean 568 Ac-ft 412,600

Peak discharge (base, 7,800 cfs).--No peak above base.

* Discharge measurement made on this day.

8-1770. Coleto Creek near Schroeder, Tex.

Location.--Lat 28°50', long 97°11', on downstream side of left abutment of bridge on Farm Road 622, 2½ miles northeast of Schroeder, Goliad County, 4.8 miles downstream from Cottonwood Creek, 8.0 miles upstream from Perdido Creek, and 11.5 miles west of Victoria.

Drainage area.--365 sq mi.

Records available.--January 1930 to December 1933, October 1952 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 87.59 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943. Prior to Dec. 31, 1933, staff gage at site 0.7 mile downstream at same datum; Oct. 20, 1952, to Jan. 17, 1955, staff gage at site 0.6 mile downstream at same datum.

Average discharge.--15 years, 60.3 cfs (43,660 acre-ft per year).

Extremes.--Maximum discharge during year, 6,500 cfs Aug. 8 (gage height, 11.46 ft); no flow Nov. 6-7.
1930-33, 1952-64: Maximum discharge, 39,000 cfs Apr. 28, 1957 (gage height, 21.00 ft); no flow for many days in 1956, 1963-64.
Maximum stages since at least 1872, at site 0.7 mile downstream, 22.90 ft Oct. 16, 1946, and 20.0 ft in October 1925, from information by local resident.

Remarks.--Records good. No diversion above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.1	4.3	1.6	89	5.1	5.1	2.1	1.8	0.2	0.4	0.3
2	.1	.1	2.9	1.6	33	11	5.6	1.8	1.1	.2	.4	.3
3	.1	.1	1.8	1.6	18	39	* 5.6	1.3	.6	.2	.4	.3
4	.1	.1	1.4	1.6	688	26	5.1	1.4	.5	.2	.3	.3
5	.1	.1	1.1	1.6	296	14	5.1	*1.8	1.0	.2	.3	.4
6	.1	.1	.8	1.6	92	10	3.5	2.6	.5	.2	.3	.4
7	** .1	0	.8	1.6	47	7.6	3.5	2.6	.3	.2	.8	.4
8	.1	20	.7	1.6	32	7.6	1.8	2.1	.2	.2	*2,410	.5
9	.1	6.2	.6	1.4	24	5.1	2.1	1.6	.2	.2	*178	.4
10	.1	4.2	.5	1.3	21	3.9	1.6	1.3	** .2	.2	49	.4
11	.1	.5	.6	1.3	18	3.5	2.6	3.9	.2	.2	20	.4
12	.1	** .2	30	1.1	14	3.5	3.2	4.2	.2	.2	8.7	.4
13	.1	** .2	92	1.0	13	3.9	2.6	1.4	.1	.2	5.1	.3
14	.1	.1	141	.8	10	4.3	1.6	.7	.2	.2	3.5	.3
15	.1	.1	117	3.6	11	3.5	1.4	.5	.7	.2	2.1	.4
16	.1	.1	39	6.6	7.6	2.9	1.6	.5	.7	** .2	1.3	.5
17	.1	.1	*16	3.2	7.0	3.2	8.1	.4	.4	2	** .8	* 801
18	.1	.1	8.8	1.6	7.0	3.2	4.3	.4	.3	.3	.6	* 278
19	.1	.3	5.6	3.9	6.1	167	3.2	.4	.3	1.3	.4	44
20	.1	.2	5.6	2.9	5.1	226	2.6	.4	.2	.7	.2	17
21	.1	.1	4.7	2.6	17	70	2.9	.5	.2	.5	.2	15
22	1.2	.2	4.3	* 2.4	13	36	2.6	1.6	.2	.4	.1	33
23	.4	.1	3.5	2.4	5.6	24	2.4	9.1	.1	.4	2.8	4.8
24	.2	.1	2.6	2.1	18	20	2.1	5.8	.1	.4	1.8	2.8
25	.2	.1	2.6	1.6	*8.8	16	2.4	10	.1	.4	1.1	4.7
26	.1	.1	2.6	1.4	5.1	10	2.4	7.5	.2	.3	.5	93
27	3.6	3.9	2.4	1.6	6.1	8.8	2.1	18	.2	.3	.4	161
28	.3	63	2.1	1.4	5.6	8.8	1.6	26	.2	.4	.4	75
29	.2	20	1.8	1.4	3.9	6.6	1.0	9.3	.2	.4	.3	30
30	.2	6.1	1.6	119	----------	5.1	1.3	6.1	.2	.4	.3	15
31	.1	----------	1.4	433	----------	4.7	----------	5.8	----------	.4	.3	----------
Total	8.6	126.6	500.1	610.4	1,521.9	760.3	91.0	131.1	11.4	10.0	2,690.8	1,580.3
Mean	0.28	4.22	16.1	19.7	52.5	24.5	3.03	4.23	0.38	0.32	86.8	52.7
Ac-ft	17	251	992	1,210	3,020	1,510	180	260	23	20	5,340	3,130

Calendar year 1963: Max 276 Min 0 Mean 7.44 Ac-ft 5,380
Water year 1963-64: Max 2,410 Min 0 Mean 22.0 Ac-ft 15,950

Peak discharge (base, 2,500 cfs)

Date	Time	Gage height	Discharge
8- 8	0800	11.46	6,500
9-17	1630	9.66	3,920

* Discharge measurement made on this day.
** Field estimate made on this day.
Note.--Discharge computed from once-daily wire-weight gage readings Oct. 22-24, Oct. 28 to Nov. 1, Nov. 9-13, Jan. 17-21, Feb. 24-25.

8-1780. San Antonio River at San Antonio, Tex.

Location.--Lat 29°24'35", long 98°29'40", on right bank at downstream side of South Alamo Street Bridge, in San Antonio, Bexar County, and 2.1 miles upstream from San Pedro Creek.
Drainage area.--41.8 sq mi. Normal flow of river formerly came from springs but now comes largely from artesian wells; drainage area of stream not applicable.
Records available.--January 1915 to November 1929, February 1939 to September 1964. Ground-water discharge into river is discussed by Petit and George, Texas Board of Water Engineers Bulletin 5608, vol. 1 (1956, p. 45). December 1895 to June 1906, periodic discharge measurements only.
Gage.--Water-stage recorder. Datum of gage is 612.26 ft above mean sea level, datum of 1929. Jan. 26, 1915, to Feb. 27, 1916, staff gage at site 2.2 miles upstream at different datum. Feb. 28, 1916, to Apr. 7, 1920, staff gage at site 1.9 miles upstream at different datum. Apr. 8, 1920, to Nov. 16, 1929, water-stage recorder at same site and datum.
Average discharge.--39 years, 53.4 cfs (38,660 acre-ft per year).
Extremes.--Maximum discharge during year, 1,870 cfs Mar. 18 (gage height, 7.76 ft); minimum daily, 6 cfs Aug. 26
1915-29, 1939-64: Maximum discharge, 15,300 cfs Sept. 10, 1921 (gage height, 20.14 ft, from floodmark), from rating curve defined by current-meter measurements below 2,000 cfs and by slope-area measurement at 15,300 cfs; no flow at times due to regulation.
Maximum stage since 1819, that of Sept. 10, 1921; flood of July 5, 1819, equaled or exceeded that of Sept. 10, 1921.
Remarks.--Records fair except those for period of no gage-height record, which are poor. Floodflow regulated by Olmos flood-control reservoir (capacity, 15,500 acre-ft) about 8½ miles upstream. Dam completed in 1926. Springs emerged from Edwards limestone in Balcones fault zone. Diurnal fluctuation caused by industrial pumping from wells (depleting the underground reservoir) above station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Dec. 29, Jan. 18 to Mar. 19, June 16-17, Aug. 22-23, Sept. 23-27)

Oct. 1 to Dec. 31		Jan. 1 to Sept. 30	
0.7	4.1	0.8	5.9
.8	7.6	.9	9.4
1.0	18	1.0	14
1.5	54	1.2	26
2.0	102	1.5	50
3.0	227	2.0	104
4.0	388	3.0	265
		4.0	487

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	13	8.8	16	31	14	18	22	15	12	12	12
2	13	16	11	19	16	15	19	13	13	19	11	12
3	13	13	12	19	21	14	18	12	14	23	12	13
4	13	16	11	19	81	14	19	13	14	20	12	12
5	13	15	11	22	19	*14	16	12	30	23	12	12
6	11	16	11	16	16	15	18	12	16	27	30	11
7	13	15	12	16	8.7	15	17	13	13	13	59	9.4
8	13	53	8.4	16	13	16	17	13	15	16	22	17
9	13	44	11	16	14	15	*16	13	15	16	12	23
10	14	13	14	16	14 14	15	15	11	16	15	9.4	14
11	13	7.2	12	15	14	14	16	16	16	15	9.0	13
12	13	6.8	14	14	15	14	15	13	16	13	10	15
13	12	11	44	15	15	16	16	13	15	15	12	13
14	15	12	20	14	15	14	16	*13	18	14	12	13
15	10	11	10	40	17	12	16	14	16	15	12	13
16	10	11	12	27	15	12	19	15	*242	15	9.8	22
17	*11	8.8	12	19	15	12	61	16	146	14	11	19
18	11	12	12	13	15	161	18	15	30	14	9.8	15
19	15	13	14	12	15	178	16	12	16	15	10	15
20	12	*11	16	13	15	20	16	15	15	13	11	14
21	15	12	15	15	40	16	16	18	14	13	9.8	23
22	15	14	11	11	21	16	16	12	15	13	*124	23
23	15	11	13	11	16	16	17	21	15	*13	*303	178
24	328	8.8	12	12	42	16	16	18	31	13	*a20	22
25	109	9.7	12	11	21	16	31	12	18	13	a12	17
26	76	29	14	10	15	17	21	13	16	17	a6	17
27	97	66	*16	10	14	16	19	12	16	12	11	59
28	25	22	17	9.8	13	18	16	12	15	12	13	35
29	21	17	14	*11	14	18	16	19	18	12	13	18
30	13	11	17	*231	----------	16	15	100	12	14	11	11
31	13	----------	16	178	----------	17	----------	44	----------	12	13	----------
Total	976	518.3	433.2	866.8	580.7	782	565	557	861	471	833.8	690.4
Mean	31.5	17.3	14.0	28.0	20.0	25.2	18.8	18.0	28.7	15.2	26.9	23.0
Ac-ft	1,940	1,030	859	1,720	1,150	1,550	1,120	1,100	1,710	934	1,650	1,370

Calendar year 1963: Max 383 Min 5.6 Mean 17.8 Ac-ft 12,870
Water year 1963-64: Max 328 Min 6 Mean 22.2 Ac-ft 16,140

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

8-1787. Salado Creek (upper station) at San Antonio, Tex.

Location.--Lat 29°30'57", long 98°25'51", on upstream side of upstream bridge of two bridges on Interstate Highway 410 at San Antonio, Bexar County, 1.0 mile west of Northeast School, 1.2 miles upstream from Perrin-Beitel Creek, and 2.7 miles east of San Antonio International Airport.

Drainage area.--137 sq mi.

Records available.--September 1960 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 684.60 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 9,000 cfs June 16 (gage height, 10.35 ft), from rating curve defined by current-meter measurements below 3,900 cfs and extended above on basis of area-velocity study; no flow for many days.
1960-64: Maximum discharge, that of June 16, 1964; no flow for many days each year.
Maximum stage since at least 1853, 23 to 24 ft in October 1913. Flood in September 1921 reached a stage of 18 ft and flood of Sept. 27, 1946, reached a stage of 18.2 ft and are highest since 1899.

Remarks.--Records good except those above 4,000 cfs, which are fair, and those for periods of no gage-height record, which are poor. No diversion above station. Recording rain gage located at station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	0.3	0.6	0.2	0.2	0	0.1	0.7	1.8	1	1.3	1.3
2	.5	.5	.6	.2	.1	0	.1	.5	.7	.8	1.5	1.3
3	.3	.7	.6	.1	.1	0	.1	.3	.4	.8	1.5	1.1
4	.4	.8	.4	.1	1.4	0	.1	.4	.3	.8	1.5	1.5
5	.5	.7	.5	.1	1.3	0	0	1.3	.4	.8	1.3	1.5
6	.5	.6	.5	.1	.1	*0	0	2.2	.3	.8	1.8	1.5
7	.4	.6	.5	.1	**.1	0	0	.6	.3	.8	2.4	1.8
8	.6	2.7	.4	.1	0	0	*0	.5	.2	.8	1.8	4.4
9	.6	1.4	.4	.1	0	.1	0	.5	.2	.8	1.5	1.3
10	.4	1.1	.4	.1	.1	0	0	.5	.3	.8	1.1	1.3
11	.5	1.1	.3	.1	.1	0	0	.5	.4	.8	.6	1.3
12	.8	1.2	.2	.1	.1	0	0	.5	.6	.8	.9	1.3
13	.9	.9	.4	.1	0	0	0	.4	.6	.8	1.1	1.3
14	.9	.8	.4	.1	*0	0	0	*.6	.6	.8	1.3	1.3
15	.8	.7	.3	7	0	0	0	.7	.6	.8	1.3	1.3
16	*.6	.7	.2	1	0	0	0	.7	*1,790	.6	.8	1.3
17	.8	.7	.3	.5	0	0	.1	.6	*346	.6	.8	3.2
18	.7	.7	.6	.4	0	1.2	.3	.6	81	.6	1.3	1.8
19	.6	.7	.5	.3	0	9.3	.3	.6	9.2	.6	1.8	1.3
20	.6	.9	.4	.2	0	.4	.3	1.1	*4.1	.6	1.5	1.3
21	.6	*1.0	.3	.2	.1	.3	.3	1.1	1.8	.6	1.3	2.3
22	.7	1.0	.2	.2	.1	.1	.3	.6	1.3	.6	27	10
23	.7	.9	.2	.2	0	.1	.3	.5	1.1	*.6	33	5.7
24	3.3	1.0	.3	.2	.4	.2	.4	.4	.8	.8	3.2	2.3
25	1.2	1.0	.4	.1	.9	.2	.5	.3	.8	1.1	1.3	2.3
26	6.7	1.3	*.6	.1	.5	.2	.4	.5	.6	.9	*.9	1.8
27	.9	1.7	.5	.1	.2	.2	.3	1.0	.8	1.3	.9	3.4
28	.7	1.5	.4	.1	.1	.2	.4	1.3	.6	1.5	1.3	1.8
29	.6	.7	.3	.1	0	.2	.6	.8	.6	1.3	1.1	1.8
30	.6	.6	.2	*11	----------	.1	.7	1.4	1.1	1.3	1.1	1.3
31	.4	----------	.2	*6.4	----------	.1	----------	2.5	----------	1.3	1.3	----------
Total	28.4	28.5	12.1	29.7	5.9	12.9	5.6	24.2	2,247.5	26.5	99.5	65.1
Mean	0.92	0.95	0.96	0.96	0.20	0.42	0.19	0.78	74.9	0.85	3.21	2.17
Ac-ft	56	57	24	59	12	26	11	48	4,460	53	197	129

Calendar year 1963: Max 8.9 Min 0 Mean 0.39 Ac-ft 282
Water year 1963-64: Max 1,790 Min 0 Mean 7.07 Ac-ft 5,130

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
6-16	1300	10.35	9,000

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record Jan. 2-29, July 1-23.

8-1788. Salado Creek (lower station) at San Antonio, Tex.

Location.--Lat 29°21'25", long 98°24'45", on right bank at upstream side of bridge on Loop 13 at San Antonio, Bexar County, 2.0 miles east of Brooks Air Force Base, and 3.7 miles upstream from Rosillo Creek.

Drainage area.--189 sq mi.

Records available.--September 1960 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 526.95 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 2,620 cfs June 17 (gage height, 17.51 ft); no flow part of July 28, Aug. 2, 5-7.
1960-64: Maximum discharge, that of June 17, 1964; no flow part of July 28, Aug. 2, 5-7, 1964. Floods of Sept. 27, 1946, and Aug. 15, 1960, were of about equal magnitude and are the highest since at least 1941. Flood of Aug. 15, 1960, reached a stage of 26.8 ft, from floodmarks.
Revisions.--The maximum discharge for the water year 1963, has been revised to 1,660 cfs Nov. 27, 1962 (gage height, 15.20 ft), superseding figures published in Surface Water Records of Texas, 1963.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Small diversions above station. Most of low flow comes from artesian wells and springs in city of San Antonio.

Rating table (gage Height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 17 to Dec. 4, Jan. 29, Apr. 20 to May 30, June 2-16, June 21 to Sept. 9)

6.6	0.5	8.0	48
6.7	1.1	9.0	125
6.9	3.0	10.0	240
7.1	6.2	11.0	410
7.3	11	13.0	905
7.5	19	14.0	1,230

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	8.3	6.7	9	36	13	11	10	24	4.9	2.2	6.4
2	4.8	7.6	6.2	8	24	14	12	12	12	4.9	1.3	6.2
3	4.4	7.6	6.2	7	30	14	12	10	8.3	4.3	1.6	5.8
4	4.4	8.3	6.2	7	91	12	13	8.8	7.4	3.8	1.8	5.8
5	4.3	8.0	6	6	44	11	12	9.1	15	3.8	.8	5.3
6	4.4	7.8	6	6	25	*11	*12	9.1	15	4.4	.5	6.7
7	4.6	7.8	6	6	19	11	11	10	7.6	3.7	4.3	5.8
8	4.4	13	6	6	16	11	11	10	6.2	4.0	20	4.9
9	4.3	31	5	6	15	12	11	10	6.2	4.3	7.4	18
10	4.1	27	5	6	15	12	11	9.1	5.1	4.0	3.7	18
11	4.3	14	5	6	14	11	12	9.3	4.8	3.8	2.9	10
12	4.3	9.9	5	6	15	11	13	10	4.6	3.7	6	7.6
13	4.4	8.8	50	6	15	12	12	8.3	4.6	2.8	6	5.9
14	4.4	8.3	20	6	14	12	9.6	*7.8	4.6	3.1	6	5.3
15	4.4	8.3	10	30	15	13	10	7.6	6.0	3.6	6	6
16	*4.4	9.0	7	15	14	11	11	6.9	149	2.9	6	8
17	4.4	9.6	7	10	14	9.9	39	6.4	*930	2.7	6	10
18	4.8	9.9	7	9	13	27	27	6.9	327	2.9	6	13
19	5.5	9.9	10	8	13	395	14	6.9	58	2.5	6	9
20	5.5	9.9	8	7	12	54	11	6.0	*22	5.9	6	6
21	4.9	*9.6	7	7	30	22	9.6	7.9	14	3.8	10	8
22	4.6	9.9	6	7	27	16	9.6	18	7.7	*2.9	100	20
23	4.6	9.9	6	7	18	15	10	14	8.7	2.5	300	60
24	*279	8.8	8	7	20	14	9.6	35	14	1.9	90	20
25	*52	9.6	10	6	39	14	11	16	16	1.5	27	10
26	212	19	*12	6	22	13	17	10	9.1	2.3	*15	8
27	36	27	12	6	17	12	15	8.0	6.2	3.4	9.9	30
28	72	41	13	6	15	12	11	7.4	6.0	1.9	7.8	20
29	13	14	12	6.0	13	11	9.3	6.4	4.8	2.3	7.1	15
30	9.3	7.8	11	*191	----------	10	9.6	12	5.5	2.9	7.1	10
31	8.5	----------	10	198	----------	11	----------	79	----------	2.0	6.4	----------
Total	786.4	380.6	295.3	617.0	655	826.9	386.3	387.9	1,709.4	103.4	680.8	364.7
Mean	25.4	12.7	9.53	19.9	22.6	26.7	12.9	12.5	57.0	3.34	22.0	12.2
Ac-ft	1,560	755	586	1,220	1,300	1,640	766	769	3,390	205	1,350	723

Calendar year 1963: Max 339 Min 0.6 Mean 13.2 Ac-ft 9,580
Water year 1963-64: Max 930 Min 0.5 Mean 19.7 Ac-ft 14,260

Peak discharge (base, 600 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
1-30	2300	11.99	630	6-17	0130	17.51	2,620
3-19	0800	12.35	730	8-23	unknown	13.05	905

* Discharge measurement made on this day.
Note.--No gage-height record Dec. 5-25, Dec. 29 to Jan. 28, Aug. 12-24, Sept. 15-16, 19-30.

8-1790. Medina River near Pipe Creek, Tex.

Location.--Lat 29°40'40", long 98°58'41", on left bank 600 ft upstream from Bandera Falls, 0.8 mile upstream from Red Bluff Creek, and 4 miles southwest of town of Pipe Creek, Bandera County.

Drainage area.--474 sq mi.

Records available.--October 1922 to June 1935, December 1952 to September 1964. Monthly discharge only for some periods, published in WSP 1312 and 1732.

Gage.--Water-stage recorder. Datum of gage is 1,067.37 ft above mean sea level, unadjusted. December 1922 to June 1935 water-stage recorder at site 2 miles upstream at different datum.

Average discharge.--23 years (1922-34, 1953-64), 107 cfs (77,460 acre-ft per year).

Extremes.--Maximum discharge during year, 39,800 cfs Sept. 27 (gage height, 28.2 ft); minimum, 0.9 cfs Oct. 13-17.

1922-35, 1952-64: Maximum discharge, 64,000 cfs July 1, 1932 (gage height, 33.8 ft, from floodmarks, datum then in use), from rating curve defined by current-meter measurements below 32,000 cfs and slope-area measurement at 64,000 cfs; minimum, 0.2 cfs July 14-16, 1956.

Maximum stage since at least 1880, about 43 ft in 1919, present site and datum, from information by local resident.

Remarks.--Records good. Small diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 11 to Jan. 18, Mar. 20 to May 10, Aug. 25-30)

3.73	1.1	5.5	320
3.76	1.7	6.0	555
3.80	2.8	7.0	1,140
3.9	6.5	8.0	1,820
4.0	12	10.0	3,620
4.3	38	12.0	5,850
4.6	80	14.0	8,500
5.0	164	16.0	11,600

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.5	2.5	9.0	20	127	103	59	43	15	6.0	1.7	16
2	1.5	2.5	9.6	19	87	192	59	40	14	6.0	1.7	14
3	1.5	2.8	*10	19	72	45	56	36	13	6.0	*1.7	13
4	1.3	2.8	11	18	77	39	53	35	13	5.6	1.7	12
5	1.3	2.8	11	18	72	36	50	34	19	5.2	1.7	11
6	1.3	2.8	16	*18	71	35	48	33	25	5.2	1.7	10
7	1.3	2.8	14	18	65	34	49	33	19	4.8	2.0	9.6
8	1.3	6.1	11	17	64	33	48	34	17	4.4	2.0	*9.6
9	1.3	8.7	11	17	60	38	48	34	16	4.4	2.0	51
10	1.3	17	15	17	58	35	48	35	14	4.1	1.7	11
11	1.3	9.0	16	18	*54	34	46	33	13	3.8	1.7	9.0
12	1.1	7.4	17	17	53	33	46	32	12	3.8	1.5	8.4
13	1.1	6.0	17	16	52	32	50	30	12	3.8	1.5	8.0
14	1.1	5.2	20	16	52	32	45	28	11	3.8	1.5	8.0
15	1.1	4.4	22	17	52	31	43	27	12	3.4	1.5	8.0
16	1.1	4.4	20	20	50	30	44	24	12	3.4	167	8.0
17	1.1	4.1	20	18	49	*30	86	24	12	3.1	30	26
18	1.1	4.1	23	17	49	35	66	23	13	3.1	10	14
19	1.1	4.1	22	17	46	336	59	22	11	3.1	7.0	11
20	1.1	4.1	23	17	45	262	*54	21	10	2.8	6.0	9.0
21	1.1	4.4	21	16	48	146	50	21	8.4	2.5	5.2	9.0
22	1.1	4.8	20	16	46	111	49	22	8.0	2.2	4.8	*2,860
23	1.1	4.8	19	16	45	96	48	23	7.4	2.2	9.5	924
24	2.8	4.8	19	16	46	85	38	21	7.4	2.2	469	495
25	2.5	4.8	19	16	48	78	62	20	7.0	2.2	*406	327
26	3.8	5.6	20	16	45	71	64	*19	7.0	2.2	104	235
27	3.4	7.0	19	16	43	68	54	19	6.5	2.2	52	11,900
28	2.8	7.4	19	16	40	66	48	18	6.5	2.0	35	1,470
29	* 2.8	7.4	19	17	39	64	44	18	*6.5	2.0	28	731
30	2.8	8.4	19	92	----------	60	43	16	6.5	2.0	23	533
31	2.8	----------	19	145	----------	59	----------	16	----------	2.0	18	----------
Total	51.8	163.0	530.6	736	1,655	2,349	1,557	834	354.2	109.5	1,400.1	19,750.6
Mean	1.67	5.43	17.1	23.7	57.1	75.8	51.9	26.9	11.8	3.53	45.2	658
Ac-ft	103	323	1,050	1,460	3,280	4,660	3,090	1,650	703	217	2,780	39,170

Calendar year 1963: Max 99 Min 1.1 Mean 15.6 Ac-ft 11,300
Water year 1963-64: Max 11,900 Min 1.1 Mean 80.6 Ac-ft 58,490

Peak discharge (base, 1,600 cfs)

Date	Time	Gage height	Discharge
8-24	2100	9.53	3,120
9-22	1900	14.22	8,800
9-27	0400	28.2	39,800

* Discharge measurement made on this day.

8-1791. Red Bluff Creek near Pipe Creek, Tex.

Location.--Lat 29°40'48", long 98°57'20", on left bank 0.8 mile upstream from bridge on county road, 1.7 miles downstream from Pipe Creek, 1.9 miles upstream from mouth, and 3.2 miles south of town of Pipe Creek, Bandera County.
Drainage area.--56.3 sq mi.
Records available.--April 1956 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 1,107.2 ft above mean sea level, unadjusted.
Average discharge.--8 years, 9.76 cfs (7,070 acre-ft per year).
Extremes.--Maximum discharge during year, 46,900 cfs Sept. 27 (gage height, 22.64 ft); no flow most of time.
1956-64: Maximum discharge, that of Sept. 27, 1964, from rating curve defined by current-meter measurements below 2,000 cfs and by slope-area measurement at 46,900 cfs; no flow for many days in each year.
Maximum stage known since at least 1905, that of Sept. 27, 1964. A stage of about 17 ft was reached in July 1937. Flood in October 1953 reached a stage of 13.8 ft.
Remarks.--Records good. Small dams on tributaries affect flow during time of storm runoff. No known diversion.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Jan. 30	9.9	Sept. 27	*4,090
31	.4	28	*51
Mar. 19	27	29	25
Apr. 17	.6	30	15
Aug. 23	14		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
January 1964	10.3	9.9	0	0.33	20
March	27	27	0	.87	54
April	.6	.6	0	.02	1.2
August	14	14	0	.45	28
September	4,181	4,090	0	139	8,290
Calendar year 1963	-	106	0	.30	219
Water year 1963-64	-	4,090	0	11.6	8,390

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
9-27	0400	22.64	46,900

* Discharge measurement made on this day.
Note.--Flow occurred only on days listed above. Observations of no flow made Oct. 29, Dec. 3, Jan. 6, Feb. 11, Mar. 17, Apr. 20, May 26, June 29, Aug. 3, Sept. 8.

8-1795. Medina Lake near San Antonio, Tex.

Location.--Lat 29°32'17", long 98°56'00", at gate operating platform, 576 ft from left end of Medina Dam on Medina River, 4 miles upstream from Medina diversion dam, 13 miles north of Castroville, and 28 miles west of San Antonio, Bexar County.
Drainage area.--634 sq mi.
Records available.--May 1913 to September 1964.
Gage.--Wire-weight gage read once daily if stage changing materially, otherwise intermittently. Datum of gage is 7.5 ft below mean sea level (levels by Corps of Engineers). Prior to Sept. 30, 1948, staff gages at same site and datum.
Extremes.--Maximum contents observed during year, 65,610 acre-ft Oct. 2 (gage height, 1,021.3 ft); minimum observed, 16,020 acre-ft Sept. 21 (gage height, 985.5 ft).
1913-64: Maximum contents observed, 288,800 acre-ft Sept. 16, 1919 (gage height, 1,078.0 ft); minimum observed since lake first filled, 780 acre-ft about Apr. 11, 1948 (gage height, 944.0 ft).
Remarks.--Lake is formed by gravity-type concrete dam. Dam completed and storage began May 7, 1913. Spillway section is located near right end of dam and is of natural rock, 880 ft long with a 3-foot wide cut-off wall. Water used for irrigation of lands in the Bexar-Medina-Atascosa Counties Water Improvement District No. 1, which has Certified Filing No. 18 from the Texas Water Commission to irrigate 150,000 acres. Maximum acres irrigated, 35,200 in 1946; 20,294 acres irrigated in 1964. No power developed. Data regarding dam are shown in the following table:

	Gage height (feet)	Capacity (acre-feet)
Crest of spillway	1,072.0	254,000
Invert of 60-inch water-supply outlet pipes	966.5	4,780
Invert of 30-inch sluice pipes	920.0	0

Cooperation.--Capacity table, based on survey made prior to June 1912, and gage-height records furnished by Bexar-Medina-Atascosa Counties Water Improvement District No. 1.

Month-end gage heights and contents, water year October 1963 to September 1964

Date	Gage height (feet)†	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	1,021.8	66,770	-
Oct. 31	(a)	58,930	-7,840
Nov. 30	1,015.6	54,550	-4,380
Dec. 31	(a)	51,450	-3,100
Calendar year 1963	-	-	-82,550
Jan. 31	1,012.2	48,340	-3,110
Feb. 29	1,012.7	49,260	+920
Mar. 31	1,013.3	50,350	+1,090
Apr. 30	(a)	48,530	-1,820
May 31	(a)	41,780	-6,750
June 30	1,005.5	37,940	-3,840
July 31	996.3	26,060	-11,880
Aug. 31	990.0	19,120	-6,940
Sept. 30	1,018.2	59,300	+40,180
Water year 1963-64	-	-	-7,470

† Gage read at irregular intervals.
a No gage-height record.

8-1800. Medina Canal near Riomedina, Tex.

Location.--Lat 29°30', long 98°54', in center of canal, 54 ft upstream from center pier of double-barrel flume, 350 ft downstream from county highway bridge, a third of a mile downstream from head of canal and diversion dam, 4 miles downstream from Medina Dam, 6 miles north of Riomedina, Medina County, and 32 miles northwest of San Antonio.

Records available.--March 1922 to May 1934, July 1957 to September 1964.

Gage.--Water-stage recorder.

Average discharge.--18 years (1922-33, 1957-64), 38.2 cfs (27,660 acre-ft per year).

Extremes.--Maximum discharge during year, 166 cfs July 16 (gage height, 2.21 ft); no flow for many days.
1922-34, 1957-64: Maximum discharge, 173 cfs June 17, 1963 (gage height, 2.33 ft); no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor. Station is above all diversions from canal. Canal diverts from right bank of Medina River for irrigation near Lacoste and Natalia.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	10	7.5	5.4	0	11	0	33	0	119	79	62
2	86	10	7.5	5.4	0	9.5	35	32	13	123	57	64
3	84	10	7.5	5.4	.1	9.3	51	33	20	127	69	82
4	83	30	7.5	28	0	30	52	52	20	130	102	90
5	83	30	7.5	71	0	39	54	88	20	131	129	89
6	83	30	7.2	72	0	*39	54	89	20	130	144	89
7	83	50	7.2	72	0	40	55	91	19	130	149	91
8	83	50	7.0	72	0	40	*55	69	28	131	108	92
9	83	50	7.0	55	0	42	55	62	54	133	45	95
10	83	50	7.0	47	0	42	55	58	52	140	62	98
11	84	15	7.0	48	0	43	56	54	60	143	95	100
12	83	15	7.0	48	0	43	56	51	74	154	113	102
13	83	15	7.0	48	0	44	56	62	96	162	123	102
14	83	15	7.0	48	0	44	56	95	115	163	126	91
15	88	15	7.0	31	21	44	56	*119	118	165	127	*66
16	*91	15	7.0	9.5	74	59	57	124	51	163	130	16
17	92	15	7.0	7.5	42	85	16	126	7.6	160	137	0
18	92	45	6.5	4.5	28	85	.1	130	7.6	129	157	0
19	91	45	6.3	4.2	28	27	.1	118	20	90	160	0
20	92	45	6.3	4.2	28	.1	.1	108	38	89	158	0
21	94	*45	6.3	4.0	9.0	0	9.2	137	38	94	157	33
22	95	50	6.3	17	.1	0	34	146	*54	121	157	55
23	96	71	6.3	24	.1	0	35	92	92	*152	86	8.1
24	40	72	6.3	24	.1	0	37	65	92	157	26	0
25	10	73	6.3	24	.1	0	12	64	91	162	36	0
26	10	41	*6.3	24	.1	0	.1	62	90	160	73	0
27	10	8.0	6.1	24	.1	0	0	62	90	160	*54	.1
28	10	7.8	5.9	12	.1	0	0	87	89	158	0	0
29	10	7.8	5.9	.1	7.6	0	25	102	89	157	0	0
30	10	7.5	5.9	.2	----------	0	28	55	100	157	0	0
31	10	----------	5.9	*0	----------	0	----------	0	----------	141	33	----------
Total	2,098	943.1	208.5	839.4	238.4	775.9	999.6	2,466	1,658.2	4,331	2,892	1,425.2
Mean	67.7	31.4	6.73	27.1	8.22	25.0	33.3	79.5	55.3	140	93.3	47.5
Ac-ft	4,160	1,870	414	1,660	473	1,540	1,980	4,890	3,290	8,590	5,740	2,830

Calendar year 1963: Max 171 Min 0 Mean 64.8 Ac-ft 46,900
Water year 1963-64: Max 165 Min 0 Mean 51.6 Ac-ft 37,440

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record Oct. 24 to Nov. 20.

8-1805. Medina River near Riomedina, Tex.

Location.--Lat 29°30'01", long 98°54'18", on left bank 233 ft upstream from bridge at Haby's Crossing, 0.8 mile downstream from Bexar, Medina, and Atascosa Counties Water Control and Improvement District No. 1 diversion dam, 4.3 miles northwest of Riomedina, Medina County, 9 miles upstream from San Geronimo Creek, and 10 miles north of Castroville.

Drainage area.--650 sq mi.

Records available.--January 1922 to September 1934 (daily record of flow over dam and monthly or annual record of seepage under or around dam), January 1953 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 857.6 ft above mean sea level, datum of 1929 (river-profile survey). Jan. 21, 1922, to Sept. 30, 1934, water-stage recorder on upstream side of diversion dam 0.8 mile upstream at different datum.

Average discharge.--23 years, 33.9 cfs (24,540 acre-ft per year).

Extremes.--Maximum discharge during year, 56 cfs Oct. 25; maximum gage height, 2.48 ft Aug. 22; minimum discharge, 12 cfs July 21.
1922-34, 1953-64: Maximum discharge, about 11,800 cfs Apr. 21, 1926; no flow at times.

Remarks.--Records good. Flow regulated by Medina Lake (station 8-1795), 5 miles upstream, and diversion reservoir, 0.8 mile upstream. All flow is seepage under and around dam except for occasional flow over spillway of dam. Diversion for irrigation above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 30 to Apr. 16, June 16 to Sept. 30)

2.0	14
2.1	23
2.3	44

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	32	30	26	27	25	22	23	30	22	18	16
2	25	32	30	26	27	25	23	22	30	23	18	17
3	25	31	30	26	28	25	23	20	31	24	18	18
4	25	31	30	25	30	24	23	20	30	23	17	18
5	24	30	30	26	28	24	23	21	30	23	18	18
6	24	29	30	26	27	*24	23	21	29	24	20	18
7	24	29	30	27	26	24	23	21	28	23	21	18
8	24	31	29	27	26	24	*23	21	27	23	22	18
9	24	31	29	27	26	25	23	21	27	23	19	18
10	24	31	29	27	26	26	23	19	26	23	18	18
11	24	31	29	28	25	26	23	18	27	23	17	18
12	24	31	29	28	25	27	23	16	26	22	17	18
13	24	31	29	28	25	27	23	15	26	22	18	18
14	24	31	29	28	25	28	23	17	27	22	18	18
15	24	31	29	28	25	28	24	*19	27	23	18	*18
16	*24	30	29	28	25	29	25	20	32	24	20	19
17	23	30	29	28	25	29	29	25	26	24	19	19
18	23	30	29	27	25	30	27	25	26	24	19	18
19	23	29	28	27	24	31	26	26	26	22	19	18
20	24	29	28	26	25	28	25	26	25	18	19	18
21	24	*29	28	27	25	28	25	30	24	14	19	17
22	24	29	28	27	25	27	24	32	*23	15	24	17
23	24	29	28	26	25	26	24	32	23	*19	21	18
24	26	29	27	26	25	25	25	30	23	20	19	16
25	29	29	27	25	25	24	28	28	23	20	18	14
26	35	30	*27	25	25	23	27	28	22	20	18	14
27	34	31	26	25	25	22	26	27	22	20	*18	22
28	34	32	26	25	25	21	25	27	22	20	18	21
29	33	31	26	25	25	20	24	27	21	19	16	22
30	34	30	26	30	----------	20	24	30	21	19	14	22
31	33	----------	26	*26	----------	21	----------	30	----------	19	14	----------
Total	812	909	880	826	745	786	729	737	780	660	572	542
Mean	26.2	30.3	28.4	26.6	25.7	25.4	24.3	23.8	26.0	21.3	18.5	18.1
Ac-ft	1,610	1,800	1,750	1,640	1,480	1,560	1,450	1,460	1,550	1,310	1,130	1,080

Calendar year 1963: Max 35 Min 19 Mean 27.3 Ac-ft 19,750
Water year 1963-64: Max 35 Min 14 Mean 24.5 Ac-ft 17,820

* Discharge measurement made on this day.

8-1815. Medina River near San Antonio, Tex.

Location.--Lat 29°15'15", long 98°28'20", near left bank on downstream side of pier of bridge on U. S. Highway 281, 6.8 miles upstream from mouth, and 7 miles south of San Antonio, Bexar County.

Drainage area.--1,317 sq mi (634 sq mi is above dam forming Medina Lake).

Records available.--October 1929 to December 1930, July 1939 to September 1964. October 1929 to December 1930 records below about 50 cfs in connection with seepage investigation (published as "at Losoya").

Gage.--Water-stage recorder. Datum of gage is 439.0 ft above mean sea level (levels by Corps of Engineers). October 1929 to December 1930 staff gage at Losoya 1.5 miles downstream at different datum.

Average discharge.--25 years (1939-64), 102 cfs (73,840 acre-ft per year).

Extremes.--Maximum discharge during year, 2,140 cfs Oct. 25 (gage height, 15.84 ft); minimum daily, 7.6 cfs July 29.

1929-30, 1939-64: Maximum discharge, 31,800 cfs Aug. 29, 1946; maximum gage height, 41.57 ft Sept. 27, 1946 (backwater from San Antonio River); minimum daily discharge, 3.3 cfs Apr. 18, Nov. 1, 1956, Jan.24, 1957.

Maximum stage known 55 ft sometime prior to construction of Medina Dam in 1913, from information by State Highway Department.

Remarks.--Records good Oct. 1 to Feb. 5 and poor thereafter. Flow slightly regulated by Medina Lake (station 8-1795), 60 miles upstream and diversion dam reservoir (capacity, 4,500 acre-ft). The Bexar-Medina-Atascosa Counties Water Improvement District No. 1 has Certified Filing No. 18 from the Texas Water Commission to irrigate 150,000 acres of land (station 8-1800 for diversion canal records). Several small diversions below diversion dam reservoir. The city of San Antonio reported that there were no releases from Mitchell Lake during the water year. A considerable part of the low flow is waste water from Kelly Field which enters via Leon Creek.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	35	54	50	51	206	46	48	48	204	30	12	25
2	30	48	50	50	103	49	48	56	132	28	11	22
3	28	45	50	51	88	48	48	43	93	26	9.9	22
4	29	44	50	52	113	47	48	42	83	24	12	20
5	30	46	50	51	83	*46	46	42	106	21	12	22
6	27	44	50	50	70	44	46	42	110	24	8.2	19
7	26	44	50	51	64	44	44	45	83	23	*13	19
8	31	48	50	53	58	42	41	48	79	19	28	21
9	31	58	49	54	54	46	*38	45	69	*20	28	20
10	25	52	51	52	52	48	38	37	62	20	23	20
11	24	50	52	58	52	48	39	38	59	19	17	21
12	25	46	52	54	52	48	40	40	60	15	14	22
13	25	46	64	52	52	47	41	40	60	30	18	24
14	24	46	67	58	52	49	42	*38	56	25	14	22
15	25	44	54	61	52	47	42	31	69	22	13	23
16	25	46	52	90	50	44	42	32	76	18	10	36
17	*24	42	53	78	50	46	62	31	*1,100	21	11	46
18	27	42	52	67	54	54	73	28	302	19	17	29
19	26	44	54	58	56	1,130	66	28	200	17	13	25
20	26	*45	57	54	56	445	61	29	*144	19	9.3	22
21	26	44	58	52	68	204	59	36	83	19	11	18
22	29	44	54	52	64	144	58	44	62	*13	13	24
23	30	42	53	53	56	108	56	38	44	11	182	223
24	*1,140	40	54	51	54	77	54	46	43	9.4	*84	192
25	*1,150	39	54	52	70	60	58	44	56	8.4	49	93
26	914	50	52	50	56	57	60	45	44	13	34	75
27	414	62	*53	49	51	51	58	42	43	10	29	107
28	*141	97	52	50	48	50	55	39	36	8.7	28	*301
29	86	60	52	*49	48	53	51	40	34	7.6	26	224
30	65	54	50	74	----------	53	42	63	34	9.0	25	100
31	57	----------	51	269	----------	50	----------	196	----------	12	24	----------
Total	4,595	1,466	1,640	1,946	1,932	3,325	1,504	1,416	3,626	561.1	798.4	1,837
Mean	148	48.9	52.9	62.8	66.6	107	50.1	45.7	121	18.1	25.8	61.2
Ac-ft	9,110	2,910	3,250	3,860	3,830	6,600	2,980	2,810	7,190	1,110	1,580	3,640

Calendar year 1963: Max 1,150 Min 10 Mean 50.2 Ac-ft 36,330
Water year 1963-64: Max 1,150 Min 7.6 Mean 67.3 Ac-ft 48,880

Peak discharge (base, 1,500 cfs)

Date	Time	Gage height	Discharge
10-25	0300	15.84	2,140
3-19	1400	13.80	1,570
6-17	0830	15.74	1,960

* Discharge measurement made on this day.
Note.--Stage-discharge relation indefinite Feb. 6-26.

8-1818. San Antonio River near Elmendorf, Tex.

Location.--Lat 29°14'15", long 98°21'43", on left bank 270 ft to left of low-water edge, 2,000 ft downstream from Braunig Plant Lake, and 2.2 miles southwest of Elmendorf, Bexar County.

Drainage area.--1,743 sq mi.

Records available.--September 1962 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 392.50 ft above mean sea level, datum of 1929, San Antonio supplementary adjustment of 1953.

Extremes.--Maximum discharge during year, 5,320 cfs Oct. 24 (gage height, 24.30 ft); minimum, 24 cfs July 31.
1962-64: Maximum discharge, that of Oct. 24, 1963; minimum, 12 cfs Aug. 24, 26, 1963.
Maximum stage since at least 1900, 61 ft in 1946. Second highest was 53 ft in 1913, from information by local residents.

Remarks.--Records good. Flow slightly regulated by Medina Lake (station 8-1795) and Olmos flood-control reservoir (combined capacity, 269,500 acre-ft). Storage began in Medina Reservoir in 1913 and Olmos Dam was completed in 1926. Water diverted above station from Medina River for irrigation in vicinity of Devine and Lytle and some water diverted for irrigation near San Antonio. Records furnished by city of San Antonio show the city discharged an average of 100 cfs of sewage effluent into the San Antonio River about 8 miles below San Antonio River at San Antonio (station 8-1780); records furnished by the San Antonio City Public Service Board show that an average of 24 cfs was diverted into Braunig Plant Lake. See Medina River near San Antonio (station 8-1815) for additional information relative to sewage effluent.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 24-27)

2.9	32
3.2	56
3.6	104
4.0	181
5.0	384
10.0	1,240
18.0	3,120

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	118	197	163	148	656	156	170	154	360	114	70	109
2	118	181	165	148	322	190	186	148	211	112	54	104
3	94	167	174	*160	296	197	188	118	154	114	52	103
4	74	176	172	148	789	190	170	120	146	101	64	100
5	84	197	170	138	408	*165	152	136	204	77	69	100
6	84	197	163	148	290	172	148	131	209	90	69	88
7	75	170	163	156	250	174	167	133	150	104	136	79
8	114	336	152	142	218	165	156	140	136	85	283	96
9	97	348	152	148	222	172	150	136	133	82	165	101
10	108	283	172	148	213	179	163	131	106	81	122	113
11	108	192	176	154	211	176	156	127	93	89	106	90
12	86	170	176	152	199	160	154	160	89	75	81	78
13	80	163	293	152	202	154	179	136	89	91	82	72
14	82	163	321	172	197	163	195	*125	84	91	93	68
15	88	154	192	195	195	156	167	115	96	81	87	43
16	86	163	167	440	174	163	152	112	409	76	69	84
17	86	146	165	277	186	165	353	103	*2,310	86	74	122
18	101	146	165	225	195	174	260	100	1,120	84	74	128
19	92	160	160	190	192	*2,980	176	109	389	72	37	112
20	83	170	202	192	192	1,090	158	114	213	80	40	96
21	87	163	174	199	351	331	156	109	138	94	78	90
22	97	167	150	192	286	305	152	163	124	*82	81	150
23	78	152	158	176	211	216	156	123	114	74	1,670	866
24	*3,040	134	170	183	250	211	148	167	172	70	580	435
25	*1,900	131	150	176	329	209	174	243	378	62	272	244
26	*2,210	234	152	160	236	199	181	181	196	52	170	179
27	911	323	165	165	216	190	167	176	150	60	124	355
28	*532	539	154	181	190	179	154	163	120	67	122	*412
29	286	242	144	172	172	167	144	156	120	64	116	457
30	236	195	156	903	----------	163	144	345	124	66	101	260
31	213	----------	160	1,370	----------	174	----------	569	----------	62	101	----------
Total	11,448	6,159	5,396	7,510	7,848	9,485	5,176	4,943	8,337	2,538	5,242	5,334
Mean	369	205	174	242	271	306	173	159	278	81.9	169	178
Ac-ft	22,710	12,220	10,700	14,900	15,570	18,810	10,270	9,800	16,540	5,030	10,400	10,580

Calendar year 1963: Max 3,040 Min 25 Mean 179 Ac-ft 129,800
Water year 1963-64: Max 3,040 Min 37 Mean 217 Ac-ft 157,500

Peak discharge (base, 2,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-24	1300	24.30	5,320	6-17	1600	18.85	3,350
1-30	2200	18.83	3,350	8-23	0800	14.99	2,360
3-19	0800	22.02	4,420				

* Discharge measurement made on this day.

8-1824. Calaveras Creek subwatershed No. 6 near Elmendorf, Tex.

Location.--Lat 29°22'53", long 98°17'34", near center of dam on Chupaderas Creek, tributary to Calaveras Creek, 0.4 mile north of Sayer, 9.1 miles north of Elmendorf, Bexar County, and 9.2 miles upstream from mouth.

Drainage area.--7.01 sq mi.

Records available.--December 1956 to September 1964.

Gage.--Water-stage recorder and concrete drop outlet. Datum of gage is 516.06 ft above mean sea level, datum of 1929 (levels by Soil Conservation Service).

Average outflow.--7 years (1957-64), 695 acre-ft per year.

Extremes.--Maximum outflow during year, 39.2 cfs Feb. 4 (gage height, 23.78 ft); no outflow for many days. Maximum inflow, 1,810 cfs (average for 5-minute interval) Feb. 3, adjusted for rainfall on pool surface during time of peak inflow.

1956-64: Maximum outflow, 46.4 cfs Sept. 25, 1957 (gage height, 30.57 ft); no outflow for many days. Maximum inflow, 3,750 cfs (average for 15-minute interval) Sept. 25, 1957. Maximum inflow computed from outflow and change in reservoir contents, adjusted for rainfall on pool surface during time of peak inflow.

Remarks.--Records fair. Records given herein represent daily outflow from pool determined from stage-discharge relation for outlet structure. Pool is formed by earth-fill dam; dam completed Dec. 15, 1956. Outlet structure is a 36-inch square concrete drop inlet connected to a 17-inch concrete outlet pipe. Top of drop inlet is at gage height 18.0 ft; bottom of four 8- by 8-inch uncontrolled openings at 14.80 ft; right emergency spillway at 34.3 ft, left emergency spillway at 34.5 ft. There is a sluice gate at end of an 8-inch pipe which connects to lower end of drop inlet box at gage height 8.52 ft. Pool capacity, 1,650 acre-ft at spillway crest, 98 acre-ft at top of drop inlet, and 8.0 acre-ft at sluice gate. Capacity based on survey made June 26, 1960. There are 2 recording rain gages; 1 at the gaging station and 1 in basin.

Pool water budget, in acre-feet, water year October 1963 to September 1964

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Inflow1/	251	38.5	0.83	82.4	345	167	0.50	0.79	0.01	0.04	0.11	0.33
Outflow	200	33.7	0	24.7	183	81.5	0	0	0	0	0	0
(††)	4.66	3.20	1.06	2.79	3.27	2.43	1.21	1.51	1.00	.43	2.67	1.92

Calendar year 1963: Inflow - Outflow 234 †† 18.54

Water year 1963-64: Inflow 886 Outflow 523 †† 26.15

1/ Inflow adjusted for rainfall on pool and for pool losses.

†† Weighted mean rainfall, in inches.

8-1825. Calaveras Creek near Elmendorf, Tex.

Location (revised).--Lat 29°15'38", long 98°17'34", near center of span at downstream side of upstream bridge of two bridges on U. S. Highway 181, 2.5 miles east of Elmendorf, Bexar County, 5 miles upstream from mouth, and 9 miles southeast from city limits of San Antonio.

Drainage area.--77.2 sq mi.

Records available.--August 1954 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 406.45 ft above mean sea level, datum of 1929, supplementary adjustment of 1943.

Average discharge.--10 years, 10.6 cfs (7,670 acre-ft per year).

Extremes.--Maximum discharge during year, 2,170 cfs Nov. 8 (gage height, 16.32 ft); no flow most of time.
1954-64: Maximum discharge, 5,310 cfs Sept. 25, 1957 (gage height, 21.83 ft); no flow at times.
Maximum stage since at least 1860, 35 ft Sept. 29, 1946, from information by local residents.

Remarks.--Records fair. Station operated as part of the Calaveras Creek hydrologic program to evaluate rainfall-runoff relation, and the effects of floodwater-retarding structures. At end of year, flow from 37.1 sq mi above station was partly controlled by 9 floodwater-retarding structures with a total combined capacity of 12,040 acre-ft below the flood spillway crests, of which 10,670 acre-ft is floodwater-retarding capacity and 1,370 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. There are 2 recording and 9 nonrecording rain gages in the basin above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	1.8	0.2	0	24	7.1	0.4	0	0.3		0	0
2	0	0	0	0	12	a74	.3	0	0		0	0
3	0	0	0	0	11	a.6	.1	0	0		0	0
4	0	0	0	0	203	**a.1	.1	0	0		0	0
5	0	0	*0	0	*77	.1	0	0	0		0	0
6	0	0	0	0	63	0	0	0	0		0	0
7	0	0	0	0	*38	0	0	0	0		0	0
8	0	381	0	0	20	0	0	0	0		0	0
9	0	102	0	0	11	0	*0	0	0		0	0
10	0	17	*0	0	*6.1	0	0	0	0		0	0
11	0	4.7	0	0	*3.6	0	0	0	0		0	0
12	0	2.2	0	0	2.7	0	0	0	0		0	0
13	0	*0	0	0	2.4	0	0	0	0		0	0
14	0	0	0	0	1.9	0	0	*0	0		0	0
15	*0	0	0	0	1.9	0	0	0	0		0	0
16	0	0	0	0	1.4	0	0	0	*0		0	0
17	0	0	0	0	1.2	0	0	0	17		0	0
18	0	0	0	0	.6	27	0	0	5.4		0	0
19	0	0	0	0	**.1	*354	0	0	1.3		0	0
20	0	*0	0	0	0	76	0	0	0		0	0
21	0	0	0	0	4.2	74	0	0	0	(*)	0	0
22	0	0	0	0	2.8	60	0	0	0		12	0
23	0	0	0	0	0	a6	0	0	0		*213	0
24	*289	0	*0	0	5.4	*a3.5	0	0	0		*25	0
25	*4.9	0	0	0	2.7	2.5	0	0	0		6.7	0
26	*54	0	0	0	1.2	1.9	0	0	0		0	0
27	36	13	0	0	0	1.7	0	0	0		0	.3
28	20	22	0	0	0	1.6	0	0	0		0	*0
29	7.7	5.8	0	*0	0	1.2	0	0	0		0	0
30	5.8	2.0	0	*179	----------	.9	0	0	0		0	0
31	4.0	----------	0	*91	----------	.6	----------	12	----------		0	----------
Total	421.4	551.5	0.2	270	497.2	692.8	0.9	12	24.0	0	256.7	0.3
Mean	13.6	18.4	0.01	8.71	17.1	22.3	0.03	0.4	0.80	0	8.28	0.01
Ac-ft	836	1,090	0.4	536	986	1,370	1.8	24	48	0	509	0.6
(†)	908	1,130	951	1,440	1,140	1,420	1,220	1,070	858	612	529	489
(††)	3.81	4.16	1.30	3.03	2.34	2.43	1.23	2.37	1.04	0.70	3.56	2.20

Calendar year 1963: Max 381 Min 0 Mean 3.18 Ac-ft 2,300 †† 20.72
Water year 1963-64: Max 381 Min 0 Mean 7.45 Ac-ft 5,400 †† 28.17

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
† Contents, in acre-feet, at end of month, in Soil Conservation Service pools above station.
†† Weighted mean rainfall, in inches, during month.
a No gage-height record.
Note.--Stage-discharge relation indefinite Oct. 29 to Nov. 4, Nov. 8-12, Nov. 27 to Dec. 1, Jan. 30-31.

8-1835. San Antonio River near Falls City, Tex.

Location.--Lat 28°57'05", long 98°03'50", on left bank 23 ft downstream from bridge on Farm Road 791, 0.9 mile upstream from Scared Dog Creek, and 3.6 miles southwest of Falls City, Karnes County.

Drainage area.--2,113 sq mi.

Records available.--April 1925 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 285.49 ft above mean sea level, datum of 1929.

Average discharge.--39 years, 305 cfs (220,800 acre-ft per year).

Extremes.--Maximum discharge during year, 2,650 cfs Mar. 21 (gage height, 4.57 ft); minimum, 34 cfs Aug. 22.
1925-64: Maximum discharge, 47,400 cfs Sept. 29, 1946 (gage height, 33.80 ft, from floodmark); minimum, 15 cfs June 27, 28, 1956.
Maximum stage since at least 1875, that of Sept. 29, 1946. Flood in October 1913 reached a stage of 28.4 ft, from floodmark, from information by local residents.

Remarks.--Records good. Diversion and regulation above station (see Remarks for San Antonio River near Elmendorf, station 8-1818, and Calaveras Creek near Elmendorf, station 8-1825).

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 8, 24-26, Sept. 24-25, 30)

0.7	34
.8	58
1.2	176
1.6	350
2.0	570
3.0	1,280
5.0	2,980

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	101	227	218	162	1,650	199	191	152	585	124	61	104
2	101	199	176	176	1,030	191	191	152	433	118	68	106
3	109	187	156	166	466	195	191	162	274	109	68	109
4	112	176	159	162	331	*222	203	156	173	118	58	109
5	90	156	166	180	810	214	199	136	149	112	48	109
6	76	166	162	173	740	199	187	139	152	101	68	112
7	81	184	162	156	416	187	173	149	218	81	68	142
8	76	180	152	162	312	187	169	145	191	87	311	92
9	76	804	156	173	256	184	176	145	145	98	182	87
10	101	733	149	159	222	176	173	152	139	90	227	98
11	90	395	152	159	222	187	166	149	130	87	149	106
12	101	256	173	162	206	191	176	*142	106	87	124	109
13	104	191	203	166	199	191	*173	139	98	90	112	90
14	87	162	195	162	195	180	159	156	104	76	90	76
15	*79	162	380	173	195	176	180	142	101	81	87	71
16	76	162	279	191	187	180	191	124	95	79	98	71
17	76	162	191	350	187	176	187	121	161	66	90	56
18	79	162	173	395	173	187	215	118	1,140	66	74	79
19	81	*145	166	265	184	224	385	104	*1,710	74	71	124
20	92	152	173	218	191	1,690	227	98	747	79	74	127
21	87	162	173	191	195	2,230	176	133	306	*68	51	115
22	90	162	199	199	222	687	169	136	187	68	39	101
23	87	156	176	203	390	342	162	142	142	81	131	154
24	104	156	*159	191	252	261	162	159	130	81	*736	417
25	865	149	166	180	206	248	162	136	124	71	961	656
26	*2,400	136	176	184	340	239	187	203	304	66	448	360
27	2,200	139	162	180	284	231	187	206	274	63	227	218
28	1,860	265	159	*166	227	214	173	169	173	51	152	207
29	805	570	176	169	210	206	166	169	145	48	133	460
30	434	331	166	195	----------	199	152	159	121	63	130	*516
31	270	----------	159	495	----------	187	----------	176	----------	----------	58	118	----------
Total	10,990	7,187	5,612	6,263	10,498	10,380	5,608	4,569	8,757	2,541	5,254	5,181
Mean	355	240	181	202	362	335	187	147	292	82.0	169	173
Ac-ft	21,800	14,260	11,130	12,420	20,820	20,590	11,120	9,060	17,370	5,040	10,420	10,280

Calendar year 1963: Max 2,400 Min 26 Mean 190 Ac-ft 137,300
Water year 1963-64: Max 2,400 Min 39 Mean 226 Ac-ft 164,300

Peak discharge (base, 1,800 cfs)

Date	Time	Gage height	Discharge
10-26	1600	4.52	2,560
3-21	0500	4.57	2,650
6-19	0800	3.74	1,900

* Discharge measurement made on this day.

8-1839. Cibolo Creek near Boerne, Tex.

Location.--Lat 29°46'25", long 98°41'52", on left bank, 0.6 mile upstream from Southern Pacific Lines bridge, and 2.3 miles southeast of Boerne, Kendall County.

Drainage area.--68.4 sq mi.

Records available.--March 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,339.61 ft above mean sea level, datum of 1929.

Extremes.--1962: Maximum discharge during period March to September, 73 cfs Apr. 27 (gage height, 2.70 ft); no flow for many days.
1962-63: Maximum discharge during water year, 412 cfs Apr. 28 (gage height, 3.60 ft); no flow for many days.
1963-64: Maximum discharge during water year, 36,400 cfs Sept. 27 (gage height, 19.15 ft, from flood-mark), from rating curve extended above 466 cfs on basis of contracted-opening measurement at 36,400 cfs; no flow for many days.
1962-64: Maximum discharge, that of Sept. 27, 1964; no flow for many days each year.
Maximum stage since at least 1892, that of Sept. 27, 1964. Second highest flood reached a stage of 16.3 ft (discharge, 25,600 cfs) in 1952, from information by local residents.

Remarks.--Records good. No known diversion above station.

Discharge, in cubic feet per second, during period March to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						2	1.4	8.8	3.6	0.5		0
2						2	1.4	6.9	7.4	*.4		0
3						*1.8	1.5	6.4	9.4	.4	(*)	0
4						1.6	2.0	6.0	7.4	.3		0
5						1.5	6.9	5.2	10	.3		0
6						1.4	6.9	4.8	6.0	.2		*0
7						1.4	10	4.5	4.2	.2		2.3
8						1.5	7.4	4.2	2.8	.1		**1.5
9						1.5	5.2	3.8	2.2	.1		0
10						3.7	4.2	3.6	1.8	0		0
11						5.6	3.8	3.3	1.5	0		0
12						5.2	3.6	3.0	1.1	0		0
13						3.0	3.0	2.8	1.0	0		0
14						2.6	2.8	2.6	.9	0		0
15						3.0	2.8	2.4	.9	0		0
16						*3.0	2.6	2.2	.8	0		0
17						2.6	2.4	2.2	.8	0		0
18						2.2	2.6	2.2	.8	0		0
19						2.6	2.6	2.2	.8	0		0
20						2.8	2.4	2.2	.7	0		0
21						2.8	2.2	2.0	.6	0		0
22						2.4	2.0	1.8	.6	0		0
23						2.2	*6.6	1.6	.5	0		0
24						2.0	8.3	*1.5	.4	0		0
25						1.6	5.2	1.2	.4	0		0
26						1.4	2.6	1.1	.4	0		0
27						1.4	39	.9	.6	0		0
28						1.4	26	.7	.7	0		0
29						1.4	16	7.8	.6	0		0
30					----------	1.4	12	9.4	.4	0		0
31		----------			----------	1.4	----------	4.8	----------	0		----------
Total						70.4	195.4	112.1	69.3	2.5	0	3.8
Mean						2.27	6.51	3.62	2.31	0.08	0	0.12
Ac-ft						140	388	222	137	5.0	0	7.5

Peak discharge (base, 300 cfs).--No peak above base.

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

8-1839. Cibolo Creek near Boerne, Tex.--Continued

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0.3	1.2	1.8	1.0	0.9	1.6	0.5			
2	0	0	.4	1.2	1.8	1.0	*.9	1.4	.5			
3	0	0	.5	1.2	1.8	1.0	.9	1.4	.4			
4	0	0	.6	1.2	1.8	1.1	1.0	1.4	.4			
5	0	0	.6	1.2	1.6	1.1	92	1.2	.4			
6	0	0	.6	1.4	1.6	1.1	13	*1.6	.4			
7	0	0	.6	1.5	1.5	1.1	3.8	1.4	.3			
8	0	0	.6	1.4	1.4	1.1	2.4	1.4	.3			
9	*0	0	.7	1.4	1.5	1.1	1.8	1.4	.3			
10	0	0	.7	1.2	1.5	1.1	1.5	1.5	.1			
11	0	0	.7	1.2	1.8	1.0	1.4	1.6	0			
12	0	0	.8	1.4	2.2	1.0	1.1	1.8	0			
13	0	0	.8	1.4	2.0	1.0	.9	1.8	*0			
14	0	*0	.8	1.6	2.2	1.0	.8	1.8	0			
15	0	0	.8	1.6	2.4	1.0	.8	1.8	0	(*)		
16	0	0	.9	1.6	2.0	1.0	.8	1.6	0			
17	9.0	.1	.9	1.6	2.0	1.0	.8	1.5	0			
18	2.6	.1	.9	1.6	3.9	1.0	.8	1.2	0			
19	.7	.1	1.0	1.8	5.2	.9	.8	1.6	0			
20	.3	.2	1.4	1.8	3.6	.9	.8	1.8	0			
21	.9	.2	*1.1	1.8	2.2	1.0	.8	1.4	0			
22	.5	.1	1.0	2.0	1.6	1.0	.8	1.4	0			
23	.3	.1	1.1	**1.8	1.6	1.0	.8	1.2	0			
24	.1	.2	1.6	1.8	1.5	1.0	.8	1.1	0			
25	0	.2	1.4	2.0	1.5	1.0	.9	1.0	0			
26	0	.2	1.2	2.0	1.4	1.0	.9	1.0	0			(*)
27	0	.5	1.2	2.0	1.1	1.0	.9	.9	0		(*)	
28	81	.4	1.2	2.2	*1.0	.9	61	1.0	0			
29	12	.3	1.2	2.2	---	.9	24	.8	0			
30	.3	.3	1.2	2.2	---	.9	5.2	.6	0			
31	.1	---	1.2	2.0	---	.9	---	.6	---			---
Total	107.8	3.0	28.0	50.5	55.5	31.1	223.3	41.8	3.6	0	0	0
Mean	3.48	0.10	0.90	1.63	2.00	1.00	7.44	1.35	0.12	0	0	0
Ac-ft	214	6.0	56	100	110	62	443	83	7.1	0	0	0

Calendar year 1962: Max - Min - Mean - Ac-ft -
Water year 1962-63: Max 92 Min 0 Mean 1.49 Ac-ft 1,080

Peak discharge (base, 300 cfs)

Date	Time	Gage height	Discharge
10-28	1700	3.46	338
4-28	1500	3.60	412

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

8-1839. Cibolo Creek near Boerne, Tex.--Continued

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0		0	30	4.8	5.6	5.6	1.1	0.4		0
2		0	(*)	0	11	16	6.0	4.5	1.1	.4		0
3		0		0	11	10	6.4	3.3	1.0	.3	(*)	0
4		0		0	77	7.4	6.4	2.8	.9	.3		0
5		0		0	37	4.2	6.9	2.8	3.9	.1		0
6		0		*0	22	4.2	6.9	3.6	9.2	0		0
7		0		0	13	4.5	7.4	4.8	3.3	0		0
8		0		0	10	4.8	6.0	5.2	2.0	0		*0
9		0		0	8.8	11	6.9	3.8	1.8	0		0
10		0		0	*6.4	10	8.3	3.3	1.6	0		0
11		0		0	6.0	6.4	8.8	2.4	1.6	0		0
12		0		0	6.0	6.0	9.4	2.2	1.6	0		0
13		0		0	6.0	5.6	9.4	1.4	1.6	0		0
14		0		0	5.6	6.0	8.8	1.1	1.5	0		0
15		0		0	5.6	5.2	9.4	1.0	1.6	0		0
16		0		0	5.2	*4.5	9.9	1.1	5.5	0		0
17		0		0	5.2	4.5	*15	1.1	3.8	0		0
18		0		0	5.2	18	8.8	.7	2.8	0		0
19		0		0	4.2	131	3.8	.8	1.8	0		0
20		0		0	4.5	9.4	2.8	.9	1.8	0		0
21		0		0	8.3	6.9	2.4	1.1	1.5	0		0
22		0		0	9.9	6.9	2.4	1.6	1.5	0		0
23		0		0	6.9	6.9	2.8	4.2	1.4	0		0
24		0		0	8.3	6.4	3.0	3.8	1.2	0		0
25		0		0	10	6.4	6.0	*2.4	1.1	0		0
26		0		0	7.4	6.0	7.8	1.5	1.0	0		*0
27		0		0	6.0	5.6	6.0	1.1	.9	0		*1,800
28		2.0		0	4.8	6.4	4.8	.9	.8	0		*58
29	(*)	1.0		0	4.5	5.6	4.2	.8	*.6	0		12
30		.2		153	----------	5.6	4.2	.9	.5	0		12
31		----------		90	----------	5.2	----------	1.4	----------	0		----------
Total	0	3.2	0	243	345.8	341.4	196.5	72.1	60.0	1.5	0	1,882
Mean	0	0.11	0	7.84	11.9	11.0	6.55	2.33	2.00	0.05	0	62.7
Ac-ft	0	6.3	0	482	686	677	390	143	119	3.0	0	3,730

Calendar year 1963: Max 92 Min 0 Mean 1.12 Ac-ft 811
Water year 1963-64: Max 1,800 Min 0 Mean 8.59 Ac-ft 6,240

Peak discharge (base, 300 cfs)

Date	Time	Gage height	Discharge
1-30	1430	3.51	377
3-19	0130	3.75	470
9-27	0500	19.15	36,400

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

8-1840. Cibolo Creek near Bulverde, Tex.

Location.--Lat 29°43'33", long 98°25'37", on left bank at Col. C. P. Wiley ranchhouse, 1.8 miles downstream from bridge on U. S. Highway 281, 2.0 miles southeast of Bulverde, Comal County, and 4.7 miles upstream from Dripping Springs Creek.
Drainage area.--198 sq mi.
Records available.--April 1946 to September 1964.
Gage.--Water-stage recorder. Altitude of gage is 1,013 ft (by barometer).
Average discharge.--18 years, 8.25 cfs (5,970 acre-ft per year).
Extremes.--Maximum discharge during year, 19,000 cfs Sept. 27 (gage height, 20.93 ft); no flow most of year.
1946-64: Maximum discharge, 21,100 cfs May 2, 1958 (gage height, 22.5 ft, from floodmark), from rating curve defined by current-meter measurements below 4,400 cfs and slope-area measurement at 11,700 cfs; no flow most of time.
Maximum stage since at least 1868 occurred about 1889 (stage unknown); the second and third highest stage occurred in 1913 and 1937 or 1938, respectively (stages unknown); the fourth highest stage, 25 ft, occurred in 1943; from information by local residents.
Remarks.--Records fair. The purpose of the station is to determine streamflow losses during periods of medium and low flow. Small diversions above station. Much of flow enters sinkholes and caverns in the Glen Rose limestone above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

June 16	871	Sept. 27	3,290
17	494	28	125
18	16	29	9.9
19	.8	30	.3
20	.1		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1964	1,381.9	871	0	46.1	2,740
September	3,425.2	3,290	0	114	6,790
Calendar year 1963	-	0	0	0	0
Water year 1963-64	-	3,290	0	13.1	9,530

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
6-16	1030	8.65	4,600
9-27	1100	20.93	19,000

Note.--Flow occurred only on days listed above. Discharge measurement or observation of no flow made Oct. 31, Dec. 3, Jan. 7, Feb. 12, Mar. 20, Apr. 20, May 26, June 16, 18-19, 30, Aug. 5, Sept. 8, 28.

8-1850. Cibolo Creek at Selma, Tex.

Location.--Lat 29°35'35", long 98°18'40", on right bank 0.6 mile downstream from Missouri-Kansas-Texas Railroad Co. bridge, and 0.8 mile upstream from bridge on U. S. Highway 81 at Selma, Bexar County.
Drainage area.--274 sq mi.
Records available.--March 1946 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 728.34 ft above mean sea level, datum of 1929.
Average discharge.--18 years, 8.99 cfs (6,510 acre-ft per year).
Extremes.--Maximum discharge during year, 26,500 cfs Sept. 27 (gage height, 17.12 ft); no flow most of time.
1946-64: Maximum discharge, 49,200 cfs May 3, 1958 (gage height, 21.7 ft, from floodmark), from rating curve defined by current-meter measurements below 16,000 cfs and slope-area measurement at 36,400 cfs; no flow most of time.
Maximum stage known since at least 1869, 26 ft in 1889; stage of flood in 1913 unknown, from information by local residents.
Remarks.--Records good. Small diversion above station. Much of flow enters the Edwards limestone in the Balcones fault zone which crosses basin between this station and station near Bulverde.

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

2.52	0	3.5	45	7.0	2,200
2.7	.3	4.0	126	8.0	3,430
2.8	1.5	5.0	501	9.0	4,800
3.0	7.0	6.0	1,200		

Discharge, in cubic feet per second, water year October 1963 to September 1964

June 16	709	June 21	0.4	Sept. 27	3,610
17	544	22	.2	28	461
18	240	23	.1	29	66
19	21	24	.1	30	15
20	2.6				

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1964	1,517.4	709	0	50.6	3,010
September	4,152	3,610	0	138	8,240
Calendar year 1963	-	0	0	0	0
Water year 1963-64	-	3,610	0	15.5	11,250

Peak discharge (base, 200 cfs)

Date	Time	Gage height	Discharge
6-16	1700	7.33	2,620
9-27	1600	17.12	26,500

Note.--Flow occurred only on days listed above. Discharge or observation of no flow made Oct. 30, Dec. 4, Jan. 7, Feb. 12, Mar. 17, Apr. 21, May 26, June 16, 18-19, 30, Aug. 3, Sept. 8, 27.

8-1860. Cibolo Creek near Falls City, Tex.

Location.--Lat 29°00'50", long 97°55'48", on right bank at downstream side of pier of bridge on State Highway 123, 5.5 miles northeast of Falls City, Karnes County, and 9 miles upstream from mouth.
Drainage area.--827 sq mi.
Records available.--October 1930 to September 1964. Monthly discharge only for some periods, published in WSP 1312.
Gage.--Water-stage recorder. Datum of gage is 264.28 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943. Nov. 4, 1930, to Aug. 4, 1940, water-stage recorder at site 1,600 ft upstream at datum 0.56 ft higher. Aug. 5 to Sept. 13, 1940, wire-weight gage at present site and datum.
Average discharge.--34 years, 106 cfs (76,740 acre-ft per year).
Extremes.--Maximum discharge during year, 4,900 cfs Nov. 9 (gage height, 16.48 ft); minimum, 1.6 cfs Aug. 22.
1930-64: Maximum discharge, 33,600 cfs July 6, 1942 (gage height, 34.45 ft); no flow July 30, 31, Aug. 4-22, 1956.
Maximum stage since at least 1890, 35 ft in October 1913 (discharge, about 35,000 cfs).
Remarks.--Records good except those below 3 cfs, which are fair. Diversions for irrigation above station. Much of flow of creek enters sinkholes and caverns in the Glen Rose limestone and in the Edwards limestone in the Balcones fault zone which crosses basin above station at Selma. At end of year, flow from 17.8 sq mi above this station was partly controlled by 5 floodwater-retarding structures with a total combined capacity of 5,906 acre-ft below the flood spillway crests, of which 5,000 acre-ft is floodwater-retarding capacity and 960 acre-ft is sediment-pool capacity. All of these structures were built during the current year. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 9-10, Jan. 31, Feb. 1, 4-5, Mar. 19-20, June 18-19, Sept. 24, 29-30)

0.53	2.0	2.0	103
.6	3.2	3.0	218
.7	6.2	5.0	540
.8	11	9.0	1,470
1.0	22	13.0	2,650
1.5	59		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.6	11	16	14	297	22	19	11	15	12	4.0	5.2
2	6.6	8.7	15	14	63	39	19	11	36	10	4.0	4.9
3	5.5	7.4	12	14	48	28	19	11	18	9.6	4.3	4.3
4	5.5	7.4	10	14	529	*22	19	11	11	8.7	5.5	4.3
5	5.8	7.8	9.6	14	1,230	21	19	11	9.6	8.2	5.5	4.6
6	5.8	7.4	9.2	14	120	21	18	11	9.2	8.7	4.6	4.9
7	6.6	7.0	9.2	14	57	20	18	12	9.6	7.4	3.5	4.9
8	6.6	7.8	8.7	14	39	20	16	12	8.2	6.2	119	6.2
9	5.5	2,550	8.7	15	31	22	15	11	8.7	6.2	4.9	6.2
10	4.6	*800	8.7	14	27	21	15	10	9.2	6.2	3.8	5.5
11	4.9	74	9.6	13	24	21	14	10	7.8	4.6	4	5.2
12	4.9	40	9.6	14	22	21	14	*12	7.8	4.0	4.3	5.2
13	5.8	24	40	13	22	21	15	11	7.4	3.8	3.5	4.9
14	5.8	16	28	13	21	22	*14	9.6	7.0	4.6	4.6	4.6
15	*6.6	13	16	15	21	22	13	8.7	7.0	5.2	4.0	4.6
16	6.6	11	15	17	19	22	13	8.7	6.2	4.6	3.1	4.6
17	6.6	11	22	16	19	21	16	7.8	12	3.8	2.5	4.6
18	6.6	10	21	16	19	24	16	7.8	515	3.3	2.5	4.9
19	5.8	*9.6	17	16	19	553	17	6.6	*542	3.3	2.5	5.2
20	6.6	9.6	16	16	19	1,460	18	6.6	174	4.3	2.5	5.2
21	6.2	10	15	16	22	126	18	8.7	80	*4.9	2.3	6.6
22	5.5	28	15	16	22	65	16	11	50	5.2	2.0	6.2
23	5.8	17	14	15	20	46	15	10	37	4.6	56	5.5
24	11	12	*14	15	21	37	15	11	30	4.6	80	254
25	13	10	14	14	22	30	15	11	23	4.6	*33	63
26	13	9.6	15	14	22	27	35	10	19	3.8	16	49
27	106	20	14	14	26	23	17	9.6	15	3.5	10	184
28	78	13	14	*14	26	22	13	8.7	13	4.6	7.0	205
29	32	10	14	14	22	21	12	7.4	12	4.9	5.8	*1,860
30	18	9.6	14	141	----------	19	11	7.8	13	5.5	4.9	*291
31	12	----------	14	988	----------	19	----------	11	----------	4.9	5.8	----------
Total	419.8	3,771.9	458.3	1,551	2,849	2,858	494	306.0	1,712.7	175.8	415.4	3,024.3
Mean	13.5	126	14.8	50.0	98.2	92.2	16.5	9.87	57.1	5.67	13.4	101
Ac-ft	833	7,480	909	3,080	5,650	5,670	980	607	3,400	349	824	6,000

Calendar year 1963: Max 2,550 Min 2.3 Mean 25.4 Ac-ft 18,420
Water year 1963-64: Max 2,550 Min 2.0 Mean 49.3 Ac-ft 35,780

Peak discharge (base, 3,600 cfs)

Date	Time	Gage height	Discharge
11-9	1930	16.48	4,900

* Discharge measurement made on this day.

8-1865. Ecleto Creek near Runge, Tex.

Location.--Lat 28°55'12", long 97°46'19", on left bank 55 ft downstream from Farm Road 81, 215 ft left of left end of bridge, 2.6 miles upstream from Salt Branch, 4.5 miles northwest of Runge, Karnes County, and 5.2 miles upstream from mouth.

Drainage area.--239 sq mi.

Records available.--March 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 215.03 ft above mean sea level, Texas Highway Department bridge plans.

Extremes.--Maximum discharge during year, 980 cfs Feb. 4 (gage height, 9.44 ft); no flow most of time.
1962-64: Maximum discharge, 1,060 cfs June 2, 1962 (gage height, 9.79 ft, from floodmark); no flow for many days each year.
Maximum stage since at least 1903, 34 ft in June 1903, second highest, 32 ft in September 1952, from information by local residents.

Remarks.--Records fair.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 28, Dec. 14-15, Feb. 1-2, 5-6, 25-26, Mar. 3-4, 20-22, Apr. 27-28, Aug. 8-9, 25-26, Sept. 29-30)

1.1	0	2.0	23
1.2	.1	2.5	60
1.3	.8	3.0	108
1.4	1.9	4.0	178
1.5	3.6	6.0	390
1.6	6.1	7.0	528
1.8	13		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0.2	0	65	1.0	0.3	0.6			0	0
2	0	0	0	0	14	214	.3	.4			0	0
3	0	0	0	0	34	*67	**.2	.2			0	0
4	0	0	0	0	405	14	.2	.1			0	0
5	0	0	0	0	58	4.7	.2	0			0	0
6	0	0	0	0	9.7	2.4	.2	0			0	0
7	0	0	0	0	4.1	1.2	.2	*0			0	0
8	0	0	0	0	2.2	.8	.1	0			*134	0
9	0	0	0	0	1.3	.7	.1	0	(*)		8.6	0
10	*0	*0	0	0	.8	1.4	.1	0			.3	0
11	0	0	0	0	.7	.7	.1	0			0	0
12	0	0	0	0	.6	.5	.1	0			0	0
13	0	0	11	0	.5	.4	.1	0			0	0
14	0	0	49	0	.5	.3	0	0			0	0
15	0	0	15	0	.5	.3	0	0		(*)	0	0
16	0	0	4.1	0	.5	.2	0	0			0	0
17	0	0	1.8	0	.4	.2	.1	0			0	0
18	0	0	*1.0	0	.4	.3	.1	0			0	0
19	0	0	.8	0	.3	265	0	*0			0	0
20	0	0	.7	0	.3	88	0	0			*0	0
21	0	0	.6	0	.6	23	0	0			0	0
22	0	0	.5	0	.5	7.3	0	2.3			0	0
23	0	0	.3	*0	.8	3.6	0	.1			0	0
24	0	0	.2	0	21	2.4	0	0			0	0
25	0	0	.2	0	61	1.4	0	0			21	*0
26	0	0	.2	0	13	.9	0	0			6.2	0
27	0	38	.2	0	*3.6	.7	12	0			.9	0
28	.4	42	.1	0	1.9	.5	16	0			.2	0
29	.5	3.8	.1	0	1.4	.5	2.8	0			0	25
30	0	.6	.1	3.6	----------	.4	1.2	0			0	8.1
31	0	----------	.1	123	----------	.3	----------	0	----------		0	----------
Total	0.9	84.4	86.2	126.6	702.6	704.1	34.4	3.7	0	0	171.2	33.1
Mean	0.03	2.81	2.78	4.08	24.2	22.7	1.15	0.12	0	0	5.52	1.10
Ac-ft	1.8	167	171	251	1,390	1,400	68	7.3	0	0	340	66

Calendar year 1963: Max 243 Min 0 Mean 1.75 Ac-ft 1,260
Water year 1963-64: Max 405 Min 0 Mean 5.32 Ac-ft 3,860

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
2- 4	0300	9.44	980
3-19	0830	7.51	610

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

8-1870. Escondido Creek subwatershed No. 1 near Kenedy, Tex.

Location.--Lat 28°46'42", long 97°53'42", near center of dam on an unnamed fork of Panther Creek, 500 ft upstream from State Highway 72, and 3 miles southwest of Kenedy, Karnes County.

Drainage area.--3.29 sq mi.

Records available.--October 1954 to September 1964.

Gage.--Water-stage recorder and concrete drop outlet. Datum of gage is 350.00 ft above mean sea level, datum of 1929 (levels by Soil Conservation Service).

Average outflow.--10 years, 181 acre-ft per year.

Extremes.--No outflow during year. Maximum inflow, 809 cfs (average for 15-minute interval) Aug. 8, computed from change in pool contents and adjusted for rainfall on pool surface during time of peak inflow.
1954-64: Maximum outflow, 183 cfs Oct. 26, 1960 (gage height, 29.08 ft); no outflow for many days each year. Maximum inflow, 4,990 cfs Oct. 25, 1960 (average for 15-minute interval), computed from outflow and change in pool contents.

Remarks.--Records good. Dam completed Sept. 21, 1954, but no appreciable storage before July 1955. First outflow began Apr. 27, 1957. Rolled-fill earthen dam is about 2,000 ft long, with earthen spillway at gage height 27.7 ft. Outlet structure is 2½-foot square concrete drop inlet, gage height of crest 18.0 ft, with a 10-inch pipe auxiliary opening in the upstream face of the drop inlet, invert gage height 16.0 ft. Outlet structure is connected to a 12-inch concrete outlet pipe at gage height 9.2 ft. There is an 8-inch controlled emergency outlet to drop inlet at gage height 9.2 ft. Pool capacity, 905 acre-ft at spillway crest, 220 acre-ft at drop inlet crest, 150 acre-ft at 10-inch uncontrolled pipe, and 23.2 acre-ft at 8-inch controlled outlet. Dam built by Soil Conservation Service for flood control. Capacity based on survey made June 21, 1964. Rainfall record from 2 recording gages, 1 at station and 1 in basin above.

Pool water budget, in acre-feet, water year October 1963 to September 1964

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Inflow1/	0.5	30.9	7.7	1.6	0.4	15.3	0.2	0.3	0.3	0.4	107	0
Outflow	0	0	0	0	0	0	0	0	0	0	0	0
(††)	1.55	5.50	2.37	2.36	1.87	2.36	.81	2.18	1.41	1.35	7.06	.86

Calendar year 1963: Inflow 117 Outflow 0 †† 22.86
Water year 1963-64: Inflow 165 Outflow 0 †† 29.68

Peak inflow (base, 100 cfs)

Date	Time	Discharge
11-27	1700	109 (15-min)
3-19	0025	148 (5-min)
8- 8	0530	809 (15-min)

1/ Inflow adjusted for rainfall on pool and for pool losses.
†† Weighted mean rainfall, in inches.

8-1875. Escondido Creek at Kenedy, Tex.

Location.--Lat 28°49'11", long 97°51'32", near center of channel at downstream side of bridge on U. S. Highway 181 in northwest edge of Kenedy, Karnes County, 4.6 miles upstream from Dry Escondido Creek, and 9.6 miles upstream from mouth.

Drainage area.--72.4 sq mi.

Records available.--July 1954 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 246.40 ft above mean sea level, datum of 1929.

Average discharge.--10 years, 9.55 cfs (6,910 acre-ft per year).

Extremes.--Maximum discharge during year, 1,290 cfs Aug. 8 (gage height, 17.83 ft); no flow most of time.
1954-64: Maximum discharge, 10,700 cfs Oct. 25, 1960 (gage height, 23.55 ft), from rating curve defined by current-meter measurements below 4,400 cfs and extended above; no flow for many days each year.
Maximum stage since at least 1887, 24.2 ft Aug. 29, 1946, from information by local residents.

Remarks.--Records good. At end of year, flow from 36.5 sq mi above this station was partly controlled by 10 floodwater-retarding structures with a total combined capacity of 13,300 acre-ft below flood spillway crests, of which 11,050 acre-ft is floodwater-retarding capacity and 2,250 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Eleven rain gages (8 standard and 3 recording) are in operation in the basin above the station. Station operated as part of the Escondido Creek basin hydrologic cooperative program of the Geological Survey and Soil Conservation Service to evaluate rainfall-runoff relation, soil conservation practices, and to assist the Soil Conservation Service in evaluating the effect of floodwater-retarding structures.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	7.9	0	1.0	0					0	
2	0	0	5.3	0	.2	9.3					0	
3	0	0	3.0	0	22	*2.6					0	
4	0	0	1.1	0	236	1.2					0	
5	0	0	.3	0	14	.6					0	
6	0	0	.1	0	*8.8	.3					0	
7	0	0	0	0	7.2	.1					0	
8	0	0	0	0	5.8	0					*433	
9	0	120	0	0	5.2	0					57	
10	0	23	0	0	4.2	0					*27	
11	0	.1	0	0	2.5	0					15	
12	0	0	0	0	1.1	0		(*)			11	
13	0	0	101	0	.6	0	(*)				8.8	
14	*0	0	88	0	.3	0					6.0	
15	0	0	15	0	.1	0					3.8	
16	0	0	8.8	0	0	0					2.4	
17	0	0	5.4	0	0	0	(*)				1.2	
18	0	*0	2.0	0	0	0					.4	
19	0	0	.7	0	0	255					.1	
20	0	0	*.4	0	0	18				(*)	0	
21	0	0	.2	0	0	10					0	
22	0	0	.1	0	0	9.0					0	
23	0	0	0	0	0	6.4			(*)		1.7	
24	0	0	0	0	0	4.9					0	
25	0	0	0	0	4.1	4.1					*0	(*)
26	16	0	0	0	2.9	2.6					0	
27	9.6	158	0	0	.1	1.6					0	
28	.3	158	0	*0	0	.9					0	
29	0	18	0	0	0	.5					0	
30	0	10	0	5.3	----------	.2					0	
31	0	----------	0	9.9	----------	.1	----------		----------		0	----------
Total	25.9	487.1	239.3	15.2	316.1	327.4	0	0	0	0	567.4	0
Mean	0.84	16.2	7.72	0.49	10.9	10.6	0	0	0	0	18.3	0
Ac-ft	51	966	475	30	627	649	0	0	0	0	1,130	0
(†)	1,130	2,120	2,180	2,330	2,260	2,370	2,160	1,940	1,730	1,470	2,440	2,140
(††)	1.54	5.36	2.64	2.40	2.46	2.46	0.93	2.15	1.41	1.07	5.55	0.87

Calendar year 1963: Max 158 Min 0 Mean 2.50 Ac-ft 1,810 †† 22.43
Water year 1963-64: Max 433 Min 0 Mean 5.41 Ac-ft 3,930 †† 28.84

* Discharge measurement or observation of no flow made on this day.
† Contents, in acre-feet, at end of month, in Soil Conservation Service pools above station.
†† Weighted mean rainfall, in inches, during month.

8-1879. Escondido Creek subwatershed No. 11 (Dry Escondido Creek) near Kenedy, Tex.

Location.--Lat 28°52', long 97°51', near center of dam on Dry Escondido Creek, 0.35 mile upstream from bridge on Farm Road 792, 3 miles north of Kenedy, Karnes County, and 4.5 miles upstream from Escondido Creek.

Drainage area.--8.43 sq mi.

Records available.--January to August 1958 (annual maximum only), September 1958 to September 1964.

Gage.--Water-stage recorder with concrete drop inlet control. Datum of gage is 285.12 ft above mean sea level, datum of 1929.

Average outflow.--6 years, 152 acre-ft per year.

Extremes.--Maximum outflow during year, 6.3 cfs Feb. 3 (gage height, 16.25 ft); no outflow for many days.
Maximum inflow, 435 cfs (average for 15-minute interval) Feb. 3, computed from outflow and change in pool contents, adjusted for rainfall on pool surface during time of peak inflow.
1958-64: Maximum outflow, 82.6 cfs Feb. 22, 1958; no outflow for many days each year. Maximum inflow, 1,560 cfs (average for 15-minute interval) Sept. 22, 1958, computed and adjusted as above.

Remarks.--Records good. Records of daily discharge are outflow from pool, determined from stage-discharge relation for outlet structure. Pool is formed by earthen dam, completed in 1958; however, the lower drain valve in outlet structure remained open until Sept. 15, 1958, when all finishing work was completed. The first outflow since the lower drain valve was closed began Sept. 22, 1958. Outlet structure is a 3-foot square concrete drop inlet connected to a 28-inch concrete outlet pipe. Four 10-inch square portholes are set in the sides of the drop inlet, two on the upstream side and two on the downstream side, at bottom gage height 15.67 ft. Top of drop inlet is at gage height 18.00 ft, two emergency spillways at gage height 32.8 ft. The lower drain valve is an 8-inch diameter cleanout gate at bottom of drop inlet at gage height 9.4 ft. Pool capacity, 2,700 acre-ft at spillway crest, 266 acre-ft at drop inlet crest, 161 acre-ft at bottom of portholes and 35 acre-ft at 8-inch controlled outlet. Structure built by Soil Conservation Service for flood control. Capacity based on survey made July 11, 1960. Rainfall record from two recording gages, one at the station and one in basin above.

Pool water budget, in acre-feet, water year October 1963 to September 1964

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Inflow 1/	0.1	32.5	14.5	17.0	90.9	47.0	1.3	0.4	0.5	18.4	44.5	0.2
Outflow	0	0	0	0	25.6	16.9	0	0	0	0	0	0
(††)	.39	4.62	2.61	2.75	2.69	2.49	.91	2.05	3.17	2.72	4.54	.84

Calendar year 1963: Inflow 454 Outflow 261 †† 21.58
Water year 1963-64: Inflow 267 Outflow 42.5 †† 29.78

Peak inflow (base, 100 cfs)

Date	Time	Discharge
11-27	1745	109 (5-min)
2- 3	2115	435 (15-min)
3-19	0045	165 (15-min)
8- 8	0645	180 (15-min)

1/ Inflow adjusted for rainfall on pool and for pool losses.
†† Weighted mean rainfall, in inches.

8-1885. San Antonio River at Goliad, Tex.

Location.--Lat 28°38'58", long 97°23'04", on right bank at upstream side of bridge on U. S. Highway 183, 1.2 miles southeast of courthouse in Goliad, Goliad County, and 11.7 miles upstream from Manahuilla Creek.

Drainage area.--3,921 sq mi.

Records available.--June 1924 to March 1929, February 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 91.08 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943. Prior to Mar. 31, 1929, chain gage at Texas and New Orleans Railroad Co. bridge 0.9 mile upstream at same datum.

Average discharge.--29 years (1924-28, 1939-64), 514 cfs (372,100 acre-ft per year).

Extremes.--Maximum discharge during year, 4,360 cfs Aug. 10 (gage height, 20.03 ft); minimum, 50 cfs Aug. 7-8.
1924-29, 1939-64: Maximum discharge, 33,800 cfs July 9, 1942 (gage height, 44.9 ft); minimum observed, 1.2 cfs June 16, 1956.
Maximum stage since 1869, that of July 9, 1942. Floods in October 1913 and June 15, 1935, reached about the same stage. Maximum stage since about 1800 occurred in 1869 and was several feet higher than flood of July 9, 1942.

Remarks.--Records good. Diversions and regulation above station (see Remarks for San Antonio River near Elmendorf, station 8-1818, and Escondido Creek at Kenedy, station 8-1875). At end of year, flow from 99.8 sq mi above this station was partly controlled by 25 floodwater-retarding structures with a total combined capacity of 34,020 acre-ft below the flood spillway crests, of which 29,300 acre-ft is floodwater-retarding capacity and 4,720 acre-ft is sediment-pool capacity. Five structures were built during the current year and have a total combined capacity below flood spillway crests of 5,960 acre-ft, of which 960 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Nov. 30 to Jan. 30)

2.3	50	7.0	910
2.5	80	16.0	3,140
3.0	160	19.0	4,020

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	114	365	490	197	795	240	*216	162	157	142	56	144
2	112	272	320	190	1,560	248	208	154	188	126	64	138
3	104	240	248	189	1,410	550	206	150	460	120	63	123
4	98	216	216	195	955	347	200	152	356	115	58	117
5	104	200	197	192	1,840	248	200	154	248	112	64	126
6	106	182	197	186	1,560	240	216	*155	181	114	61	125
7	102	166	198	194	1,190	232	208	141	154	109	54	120
8	86	178	195	189	630	216	198	134	146	102	731	122
9	*86	197	192	179	430	205	181	141	184	90	*3,800	144
10	83	556	189	179	347	203	174	141	*173	82	3,970	125
11	78	2,260	187	186	296	198	184	139	133	90	896	107
12	86	969	192	181	272	192	181	146	122	90	329	106
13	93	403	202	179	256	195	174	141	120	90	240	112
14	94	*280	392	182	240	202	179	133	110	86	187	120
15	94	224	480	195	232	202	171	122	99	*85	168	110
16	98	198	329	202	224	189	160	125	98	80	136	107
17	86	190	365	202	224	186	173	122	102	72	118	138
18	80	186	*296	208	216	186	200	110	99	83	114	254
19	80	182	240	312	208	315	192	101	220	82	*115	98
20	83	184	216	356	198	1,260	232	107	1,460	83	99	80
21	85	171	216	272	216	1,530	312	118	1,560	78	86	115
22	91	168	208	232	224	2,190	216	117	610	83	88	134
23	94	178	208	*216	216	1,690	181	167	304	78	94	130
24	93	189	224	208	264	592	170	206	203	69	104	118
25	93	179	216	216	356	395	165	242	170	74	138	179
26	98	176	197	208	*347	320	165	284	184	82	910	630
27	971	208	197	198	256	288	166	158	157	78	870	610
28	1,820	440	206	198	329	264	190	181	280	74	428	392
29	1,940	610	198	197	280	248	202	189	240	64	256	383
30	1,390	356	194	232	----------	232	176	162	171	60	182	997
31	590	----------	200	356	----------	224	----------	171	----------	60	154	----------
Total	9,132	10,323	7,605	6,626	15,571	13,827	5,796	4,725	8,689	2,753	14,633	6,204
Mean	295	344	245	214	537	446	193	152	290	88.8	472	207
Ac-ft	18,110	20,480	15,080	13,140	30,880	27,430	11,500	9,370	17,230	5,460	29,020	12,310

Calendar year 1963: Max 2,260 Min 20 Mean 205 Ac-ft 148,700
Water year 1963-64: Max 3,970 Min 54 Mean 289 Ac-ft 210,000

Peak discharge (base, 2,200 cfs)

Date	Time	Gage height	Discharge
11-11	1600	13.73	2,500
3-22	2200	12.57	2,220
8-10	0700	20.03	4,360

* Discharge measurement made on this day.
Note.--Discharge computed from once-daily wire-weight gage readings Mar. 27-31, Apr. 4-7.

8-1893. Medio Creek near Beeville, Tex.

Location.--Lat 28°28'58", long 97°39'23", on left bank at downstream side of bridge on U. S. Highway 59, 8 miles northeast of Beeville, Bee County, and 9 miles upstream from Parker Hollow Creek.

Drainage area.--204 sq mi.

Records available.--October 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 163.00 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 2,430 cfs Aug. 9 (gage height, 13.40 ft, from floodmark); no flow most of time.
1962-64: Maximum discharge, 2,830 cfs June 2, 1962 (gage height, 13.87 ft); no flow most of time.
Maximum stage since at least 1914, 31 ft about September 1919, from information by local resident.

Remarks.--Records good except those for Aug. 9 to Sept. 30, which are fair.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 30, Nov. 13, Dec. 3, Feb. 3-4, Mar. 24)

5.5	0	7.0	90
5.6	.8	7.5	160
5.7	3.8	8.0	250
6.0	12	9.0	480
6.3	26	11.0	1,100
6.6	47		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	3.2	0	9.6	0					0	
2	0	0	1.2	0	2.5	0					0	
3	0	0	.2	0	.6	0					0	
4	0	0	0	0	.1	0					0	
5	0	0	0	0	0	0					0	
6	0	0	0	0	0	0		(*)			0	
7	0	0	0	0	0	0					0	
8	0	0	0	0	0	0					*0	
9	*0	0	0	0	0	0			(*)		1,000	
10	0	145	0	0	0	0					25	
11	0	11	0	0	0	0					7	
12	0	2.6	0	0	0	0					3	
13	0	.4	0	0	0	0					1	
14	0	*0	0	0	0	0					.4	
15	0	0	0	0	0	0				(*)	0	
16	0	0	0	0	0	0					0	
17	0	0	0	0	0	0					0	
18	0	0	*0	0	0	0					0	
19	0	0	0	0	0	31					*0	
20	0	0	0	0	0	50					0	
21	0	0	0	0	0	8.5		(*)			0	
22	0	0	0	0	0	3.2					0	
23	0	0	0	*0	0	1.2					0	
24	0	0	0	0	0	.1					110	(*)
25	0	0	0	0	0	0					10	
26	0	0	0	0	*0	0					4	
27	0	114	0	0	0	0					1	
28	28	409	0	0	0	0					0	
29	3.9	42	0	0	0	0					0	
30	.1	7.8	0	0	----------	0					0	
31	0	----------	0	17	----------	*0	----------		----------		0	----------
Total	32.0	731.8	4.6	17	12.8	94.0	0	0	0	0	1,161.4	0
Mean	1.03	24.4	0.15	0.5	0.44	3.03	0	0	0	0	37.5	0
Ac-ft	63	1,450	9.1	34	25	186	0	0	0	0	2,300	0

Calendar year 1963: Max 415 Min 0 Mean 4.22 Ac-ft 3,050
Water year 1963-64: Max 1,000 Min 0 Mean 5.61 Ac-ft 4,070

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
11-28	0100	10.22	830
8- 9	unknown	13.40	2,430

* Observation of no flow made on this day.
Note.--No gage-height record June 10 to July 14, Aug. 9 to Sept. 30.

8-1895. Mission River at Refugio, Tex.

Location.--Lat 28°17'30", long 97°16'44", on left bank at upstream side of upstream bridge of two bridges on U. S. Highway 77, 560 ft upstream from Missouri-Pacific Railroad Co. bridge, and a quarter of a mile southwest of Refugio, Refugio County.

Drainage area.--690 sq mi.

Records available.--July 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1.00 ft above mean sea level, datum of 1929. Prior to Nov. 25, 1958, wire-weight or staff gage at site 59 ft downstream at same datum. Nov. 26, 1958, to Apr. 18, 1963, wire-weight gage at present site and datum.

Average discharge.--25 years, 72.9 cfs (52,780 acre-ft per year).

Extremes.--Maximum discharge during year, 1,340 cfs July 19; maximum gage height, 12.8 ft July 20; minimum discharge, 0.8 cfs July 6-7, 9-13.

1939-64: Maximum discharge, 41,700 cfs July 7, 1942 (gage height, 33.3 ft); minimum observed, 0.7 cfs Oct. 7, 9, 1940, Aug. 18-20, Sept. 5, 1945, Dec. 29, 31, 1949, Jan. 1, 1950, July 13, Aug. 28, 1963.

Maximum stage since about 1899, that of July 7, 1942. Floods in August 1914 and May 17, 1938, reached a stage of 32.3 ft, from information by local residents.

Remarks.--Records good. Small diversion above station. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 19-23)

1.85	0.6	2.5	25
1.9	1.0	3.0	60
2.0	2.2	4.0	145
2.1	4.5	6.0	375
2.3	12	9.0	860

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.4	2.4	24	3.0	33	7.3	3.4	1.9	3.4	1.4	3.0	1.6
2	1.8	2.8	10	3.0	28	6.2	3.7	1.9	2.8	1.3	3.0	1.6
3	1.8	3.2	7.0	3.0	19	6.6	3.4	1.9	2.2	1.0	3.0	1.6
4	1.4	3.4	5.2	3.0	14	5.6	3.4	1.8	1.9	.9	3.0	1.6
5	1.4	3.7	4.5	2.8	25	5.6	3.4	1.8	1.8	.9	3.0	1.8
6	1.4	3.7	4.0	3.0	27	5.6	3.7	*1.8	1.6	.8	3.0	1.9
7	1.4	4.0	3.7	3.0	13	4.5	3.4	1.8	1.6	.8	3.0	1.9
8	1.5	6.2	3.4	3.0	7.6	3.4	3.4	1.6	1.5	.9	3.0	2.0
9	*1.4	52	3.2	2.8	6.2	2.8	3.2	1.6	1.5	.9	3.0	1.9
10	1.5	203	3.2	2.8	5.6	3.0	3.2	1.4	*1.5	.8	690	1.9
11	1.4	71	3.2	3.0	4.8	2.8	3.2	1.8	1.4	.8	101	2.0
12	1.5	48	3.2	3.0	4.8	2.6	3.4	1.4	1.4	.9	28	2.0
13	1.5	5.4	7.1	3.0	4.5	2.8	3.4	1.3	1.3	.9	12	1.9
14	1.5	*4.7	6.2	3.0	4.5	3.7	3.2	1.3	1.5	.9	10	1.8
15	1.5	5.2	7.6	6.1	4.2	3.4	3.0	1.2	1.8	*.9	8.0	1.8
16	1.8	4.5	5.2	9.2	4.0	3.7	3.0	1.3	1.6	1.0	4.2	1.9
17	2.2	4.0	4.2	14	4.0	4.0	2.8	1.2	1.6	1.2	3.2	2.0
18	2.4	3.7	*4.0	17	4.0	3.7	2.6	1.1	1.5	1.8	3.0	1.8
19	2.0	3.4	4.2	17	4.0	15	2.6	1.2	1.5	718	*2.6	1.6
20	2.0	3.4	4.5	12	4.0	62	2.4	1.3	1.4	*769	2.4	1.6
21	2.0	3.4	4.2	8.4	6.5	30	2.2	2.1	1.4	*177	2.4	1.5
22	2.6	3.7	4.2	6.6	4.8	13	2.2	4.2	1.5	42	2.2	1.4
23	2.4	3.4	4.2	*5.6	4.2	8.8	2.0	3.7	1.5	14	2.0	1.3
24	3.8	3.4	4.2	4.5	33	6.6	2.0	26	1.6	6.2	2.0	*1.3
25	2.0	3.4	4.2	4.0	104	5.9	2.2	35	2.0	6.2	2.2	4.2
26	2.6	3.4	4.2	3.4	*68	5.2	2.0	129	2.0	4.5	2.0	3.4
27	2.8	9.2	4.0	3.4	31	4.5	1.8	47	10	3.7	2.0	2.9
28	2.6	34	3.4	3.4	14	4.2	1.8	29	2.6	4.2	2.0	1.9
29	2.2	175	3.0	3.2	8.8	3.7	1.6	11	1.6	3.2	1.9	1.8
30	2.2	56	3.2	7.5	----------	3.2	1.6	6.2	1.6	3.8	1.8	2.2
31	2.2	----------	3.4	14	----------	*3.2	----------	4.5	----------	3.0	1.6	----------
Total	61.2	732.6	159.8	180.7	495.5	242.6	83.2	328.3	60.6	1,772.9	913.5	58.1
Mean	1.97	24.4	5.15	5.83	17.1	7.83	2.77	10.6	2.02	57.2	29.5	1.94
Ac-ft	121	1,450	317	358	983	481	165	651	120	3,520	1,810	115

Calendar year 1963: Max 203 Min 0.8 Mean 6.38 Ac-ft 4,610
Water year 1963-64: Max 769 Min 0.8 Mean 13.9 Ac-ft 10,090

Peak discharge (base, 2,500 cfs).--No peak above base.

* Discharge measurement made on this day.

Note.--Discharge computed from once-daily wire-weight gage readings Oct. 1-9, Nov. 10-14, 29, Feb. 1-3, 5-7, 24-26, Mar. 1-16, Aug. 10-19.

8-1897. Aransas River near Skidmore, Tex.

Location.--Lat 28°16'56", long 97°37'14", on right bank 195 ft downstream from centerline of abandoned county road bridge, 3.8 miles downstream from confluence of West Aransas Creek and Poesta Creek, and 4.4 miles northeast of Skidmore, Bee County.

Drainage area.--247 sq mi.

Records available.--March to September 1964.

Gage.--Water-stage recorder. Datum of gage is 72.37 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during period March to September, 1,350 cfs July 19 (gage height, 12.32 ft); no flow for many days.
Maximum stage since at least 1914, 33 ft in September 1954, from information by local resident.

Remarks.--Records fair.

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

0.7	0	1.3	6.2	4.0	104
.8	.1	1.5	11	5.0	187
.9	.3	2.0	21	6.0	288
1.0	1.0	2.5	34	8.0	550
1.1	2.2	3.0	50	9.0	710
1.2	3.9	3.5	72		

Discharge, in cubic feet per second, during period March to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						-	0.7	0.3	21	0.3	0.5	0
2						-	.6	.2	*9.7	.6	.5	0
3						-	.7	.3	4.0	.5	.4	0
4						-	.8	.4	1.6	1.2	.3	0
5						-	.8	.4	.9	*4.3	.2	0
6						-	.8	.5	.7	5.1	.1	0
7						-	.8	.6	.6	7.8	.1	0
8						-	.5	.5	.5	3.2	.1	0
9	(**)					-	.4	.5	.4	1.0	.1	0
10						-	.4	.5	.4	.4	.1	0
11						-	.4	.5	.3	.2	**.2	0
12						-	.4	1.0	.2	.1	.2	0
13						-	.4	3.5	.2	0	.2	0
14						-	.6	3.4	.2	0	.1	0
15						-	.6	1.8	.2	0	.1	*0
16						-	.5	1.0	.2	0	0	0
17						-	.5	.6	.2	0	0	40
18			(*)			-	.5	.4	.2	0	0	18
19						-	.4	.3	1.2	*635	*0	8.6
20						-	.4	.2	1.6	*172	0	3.3
21						-	.4	.8	.5	*24	0	1.5
22						-	.5	11	.2	11	0	.8
23						-	.4	12	.1	6.5	0	.5
24						-	.4	181	0	2.6	0	.4
25						-	.4	72	0	1.8	0	.3
26					(*)	-	.5	143	14	1.3	0	.3
27						1.0	.4	20	10	1.1	0	.3
28						.9	.4	15	5.3	.8	0	.4
29						.8	**.3	10	1.8	.7	0	.7
30					----------	.7	.3	4.4	.7	.6	0	.7
31		----------			----------	*.7	----------	37	----------	.5	0	----------
Total						-	15.2	523.1	76.9	882.6	3.2	75.8
Mean						-	0.51	16.9	2.56	28.5	0.10	2.53
Ac-ft						-	30	1,040	153	1,750	6.3	150

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

8-1900. Nueces River at Laguna, Tex.

Location.--Lat 29°25'45", long 99°59'50", on right bank 0.5 mile downstream from Sycamore Creek, and 1 mile northeast of Laguna, Uvalde County.

Drainage area.--764 sq mi.

Records available.--October 1923 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,119.72 ft above mean sea level, datum of 1929. Prior to Jan. 26, 1925, staff gage at site 2 miles downstream at different datum.

Average discharge.--41 years, 137 cfs (99,180 acre-ft per year).

Extremes.--Maximum discharge during year, 108,000 cfs Sept. 20 (gage height, 22.17 ft in gage well, 23.4 ft from floodmarks); minimum, 12 cfs Sept. 12-20.

1923-64: Maximum discharge, 307,000 cfs Sept. 24, 1955 (gage height, 29.95 ft in gage well, 32.7 ft from floodmarks), from rating curve defined by current-meter measurements below 40,000 cfs, float measurement at 110,000 cfs, and slope-area measurements at 213,000 and 307,000 cfs; minimum, 2.6 cfs Mar. 14-16, 1957.

Maximum stage since at least 1866, that of Sept. 24, 1955. Flood in June 1913 reached a stage of about 29 ft (discharge, 210,000 cfs); flood of Sept. 21, 1923, reached a stage of about 26.5 ft (discharge, 160,000 cfs); from information by local residents. Discharge based on rating curve mentioned above.

Remarks.--Records good. Many small diversions above station for irrigation.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	18	29	41	61	56	77	68	50	26	18	14
2	20	18	29	*39	62	56	75	64	49	26	17	*14
3	21	18	29	41	63	54	75	62	48	26	17	14
4	21	18	31	39	*70	54	a75	61	48	25	17	14
5	21	20	31	39	68	52	a70	60	47	25	17	14
6	21	20	31	39	68	52	a70	60	45	24	17	14
7	21	20	32	39	66	52	a70	60	45	23	18	14
8	21	24	31	39	62	52	a70	58	44	23	18	13
9	21	24	32	39	61	*52	a70	91	43	23	18	13
10	21	23	34	39	60	49	a65	75	42	22	17	13
11	21	24	35	39	56	49	a65	75	42	22	16	13
12	21	23	36	39	55	49	a65	72	41	23	16	13
13	21	22	41	39	56	49	a65	66	39	23	15	12
14	21	23	41	39	56	69	*62	62	38	22	15	12
15	22	23	39	41	55	75	61	61	37	22	15	12
16	23	23	38	41	55	64	62	60	37	21	15	12
17	23	24	38	41	55	61	74	56	37	21	15	12
18	22	24	38	39	55	83	83	55	36	21	15	12
19	22	24	38	39	54	114	77	*54	35	22	14	12
20	22	25	39	39	55	117	74	52	34	25	14	*16,800
21	*22	24	41	38	60	94	70	54	33	22	14	*6,230
22	24	25	41	38	56	83	68	52	32	21	14	3,680
23	24	25	41	38	55	81	66	50	32	21	18	2,510
24	25	25	39	37	55	83	64	49	*33	20	22	*1,620
25	21	26	39	36	56	83	66	48	32	20	18	2,290
26	19	*29	39	36	56	81	88	49	30	19	17	1,170
27	18	35	39	35	56	81	85	49	30	19	16	2,050
28	18	32	41	35	54	79	77	48	29	19	16	2,010
29	17	30	41	36	54	77	74	52	28	*19	15	1,080
30	17	29	41	70	----------	77	72	60	27	19	15	*828
31	17	---------	41	60	----------	77	----------	54	----------	18	15	----------
Total	648	718	1,135	1,249	1,695	2,155	2,135	1,837	1,143	682	504	40,515
Mean	20.9	23.9	36.6	40.3	58.4	69.5	71.2	59.3	38.1	22.0	16.3	1,350
Ac-ft	1,290	1,420	2,250	2,480	3,360	4,270	4,230	3,640	2,270	1,350	1,000	80,360

Calendar year 1963: Max 6,610 Min 15 Mean 73.7 Ac-ft 53,370
Water year 1963-64: Max 16,800 Min 12 Mean 149 Ac-ft 107,900

Peak discharge (base, 700 cfs)

Date	Time	Gage height	Discharge
9-20	1430	23.4	108,000
9-22	2200	6.74	5,220
9-25	0230	5.33	3,170
9-27	2300	5.72	3,680

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

8-1905. West Nueces River near Brackettville, Tex.

Location.--Lat 29°28'55", long 100°14'20", at Wilson Ranch, 9 miles downstream from Loss Creek, 11 miles upstream from Liveoak Creek, and 15.8 miles northeast of Brackettville, Kinney County.

Drainage area.--700 sq mi.

Records available.--September 1939 to September 1950, April 1956 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,326.79 ft above mean sea level, datum of 1929. Prior to Mar. 14, 1940, staff gage at same site and datum.

Average discharge.--19 years, 36.8 cfs (26,640 acre-ft per year).

Extremes.--Maximum discharge during year, 246,000 cfs Sept. 20 (gage height, 31.3 ft, from floodmark), from rating curve defined by current-meter measurements below 4,500 cfs and slope-area measurements at 10,000, 51,000, 150,000 and 246,000 cfs; no flow most of time.
1939-50, 1956-64: Maximum discharge, that of Sept. 20, 1964; no flow most of time.
Maximum stage since at least 1879, about 40 ft June 14, 1935 (discharge, 550,000 cfs, based on slope-area measurements of 580,000 cfs at site 33 miles upstream from gage and 536,000 cfs at site 24 miles downstream from gage), present site and datum, from gage-height relation of 1935 and 1955 flood peaks at site 0.6 mile upstream. Flood in 1900 reached a stage of about 34 ft, and flood of Sept. 24, 1955, reached a stage of 27.7 ft; from floodmark at present site (discharge, 150,000 cfs, by slope-area measurement).

Remarks.--Records good. In ordinary years most of runoff from basin is lost by seepage into Edwards limestone above station. No known diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 23-26)

2.4	0	3.2	21	6.0	1,200
2.5	.1	3.4	39	7.0	2,090
2.6	.8	3.7	87	9.0	4,700
2.7	2.3	4.0	165	12.0	11,200
2.8	4.6	4.5	335	17.0	27,500
2.9	7.0	5.0	560	20.0	44,000
3.0	10				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Sept. 20	*42,500	Sept. 26	607
21	4,300	27	8,730
22	1,940	28	3,330
23	*659	29	713
24	1,190	30	*403
25	1,040		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
September 1964	65,412	42,500	0	2,180	129,700
Calendar year 1963	-	0	0	0	0
Water year 1963-64	-	42,500	0	179	129,700

Peak discharge (base, 1,000 cfs)

Date	Time	Gage height	Discharge
9-20	1200	31.3	246,000
9-24	2000	7.50	2,660
9-27	1800	17.6	30,200

* Discharge measurement made on this day.

Note.--Flow occurred only on days listed above. Observation of no flow made Oct. 22, Nov. 26, Jan. 2, Feb. 4, Mar. 9, Apr. 14, May 19, June 24, July 29, Sept. 2.

8-1920. Nueces River below Uvalde, Tex.

Location.--Lat 29°07'25", long 99°53'40", on right bank at McDaniel Ranch, 5.7 miles upstream from bridge on U. S. Highway 83, 8.8 miles southwest of Uvalde, Uvalde County, and 18.2 miles downstream from West Nueces River.

Drainage area.--1,947 sq mi.

Records available.--April 1939 to September 1964. October 1927 to April 1939 published as "near Uvalde"; records equivalent except during periods of low flow when seepage inflow between sites is a material factor.

Gage.--Water-stage recorder. Datum of gage is 796.12 ft above mean sea level, datum of 1929. Oct. 4, 1927, to Apr. 30, 1939, at site 6.2 miles upstream at different datum.

Average discharge.--25 years, 90.1 cfs (65,230 acre-ft per year).

Extremes.--Maximum discharge during year, 188,000 cfs Sept. 20 (gage height, 23.41 ft in gage well, 24.4 ft from floodmarks), from rating curve extended as explained below; minimum, 0.8 cfs Sept. 3-5.

1939-64: Maximum discharge, 189,000 cfs Sept. 24, 1955 (gage height, 24.61 ft, from floodmark), from rating curve defined by current-meter measurements below 34,000 cfs and slope-area measurement at 189,000 cfs; no flow at times in 1951-57.

Maximum stage since at least 1836, 40.4 ft June 14, 1935, from floodmarks (discharge at former site, 616,000 cfs, by slope-area measurement). Large floods occurred in 1901 and 1913, stages unknown.

Remarks --Records good. Part of flow of Nueces River enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde. At low stages most of headwater flow enters this formation. Many small diversions above station for irrigation.

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

1.1	0.5	2.0	40	5.0	1,700
1.2	1.1	2.3	80	6.0	3,200
1.3	2.4	2.6	135	7.0	5,500
1.4	4.3	3.0	250	9.0	12,500
1.5	7.1	3.5	460	11.0	23,200
1.6	11	4.0	770	13.0	37,500
1.8	22				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.4	7.1	6.2	6.8	7.1	6.2	4.5	2.7	5.0	2.1	2.2	1.1
2	7.4	6.8	6.5	*6.8	6.8	6.2	4.5	2.5	4.5	2.1	2.1	*1.0
3	7.4	7.1	6.5	6.8	7.1	6.2	4.5	2.5	4.3	2.1	1.9	.9
4	7.4	7.1	6.5	6.8	*7.1	5.0	4.3	2.5	4.1	1.9	1.8	.8
5	7.4	7.1	6.5	6.8	6.5	5.6	3.9	2.7	3.9	1.9	1.7	.9
6	7.4	6.8	6.8	6.5	6.5	5.9	3.7	2.7	3.9	1.9	1.5	.9
7	7.4	6.8	6.8	6.5	6.2	6.2	3.9	2.7	3.9	1.8	1.4	.9
8	7.4	7.1	6.8	6.5	6.2	6.2	3.7	2.7	3.9	1.8	1.9	.9
9	7.4	7.1	6.8	6.2	6.2	5.0	3.7	9.3	3.9	1.7	2.5	1.0
10	7.4	7.1	7.1	6.2	6.2	*5.3	3.7	7.5	3.9	1.7	2.1	1.0
11	7.1	6.8	7.1	6.2	6.5	5.6	3.7	5.0	3.9	1.5	1.8	1.0
12	6.8	6.8	7.1	6.2	6.5	5.9	3.7	4.5	3.9	1.5	1.5	1.0
13	6.8	6.8	7.7	6.2	6.2	5.9	*3.7	4.1	3.7	1.5	1.3	1.0
14	6.8	6.8	7.4	6.5	6.2	5.6	3.5	3.7	3.5	1.5	1.2	1.0
15	7.1	6.8	7.4	6.8	5.9	5.3	3.5	3.5	3.5	1.5	1.2	1.0
16	7.1	6.8	7.1	6.8	5.9	5.3	3.5	3.5	3.5	1.5	1.2	1.0
17	7.1	6.8	7.1	6.5	6.2	5.3	5.6	3.3	3.3	1.4	1.2	1.0
18	7.1	6.8	7.1	6.5	5.9	6.5	4.5	3.3	3.1	1.4	1.2	1.0
19	6.8	6.8	7.4	5.9	5.9	7.1	3.9	3.3	2.9	2.5	1.1	1.0
20	6.8	6.8	7.4	5.9	6.2	5.3	3.7	3.3	2.9	3.3	1.1	19.000
21	*7.1	6.8	7.1	6.2	6.5	4.7	3.5	*3.5	2.7	2.2	1.0	*33,800
22	8.0	6.2	7.1	6.5	6.5	4.7	3.5	3.5	2.7	1.7	1.0	6,780
23	7.7	5.6	6.8	6.5	6.5	5.0	3.5	3.5	2.5	1.4	1.8	4,590
24	7.4	5.9	7.1	5.9	6.5	5.0	3.3	3.3	*2.5	1.3	3.1	*1,760
25	7.4	6.2	7.1	5.9	6.5	4.7	3.3	3.3	2.4	1.2	2.4	2,680
26	7.4	*6.5	7.1	5.9	6.5	4.7	3.1	3.3	2.4	1.2	1.8	1,770
27	7.4	7.1	6.8	6.2	6.5	4.7	2.7	3.3	2.4	1.2	1.4	5,290
28	7.4	6.8	6.8	6.2	6.2	4.7	2.7	3.1	2.4	*1.2	1.3	12,400
29	7.1	6.2	6.8	6.8	6.2	4.5	2.5	3.5	2.2	1.6	1.3	2,970
30	7.1	6.2	6.8	9.2	----------	4.5	2.7	23	2.2	5.0	1.2	1,380
31	7.1	----------	6.8	7.7	----------	4.5	----------	7.8	----------	3.1	1.2	----------
Total	224.6	201.6	215.6	202.4	185.2	167.3	110.5	136.4	99.9	57.7	49.4	92,438.4
Mean	7.25	6.72	6.95	6.53	6.39	5.40	3.68	4.40	3.33	1.86	1.59	3,081
Ac-ft	445	400	428	401	367	332	219	271	198	114	98	183,300

Calendar year 1963: Max 6,850 Min 5.6 Mean 38.4 Ac-ft 27,800
Water year 1963-64: Max 33,800 Min 0.8 Mean 257 Ac-ft 186,600

Peak discharge (base, 250 cfs)

Date	Time	Gage height	Discharge
9-20	2200	24.4	188,000
9-28	0630	11.24	24,500

* Discharge measurement made on this day.

8-1930. Nueces River near Asherton, Tex.

Location.--Lat 28°29'55", long 99°40'55", on right bank 28 ft downstream from bridge on Farm Road 190 between Asherton and Brundage, 1.2 miles downstream from El Moro Creek, and 5.5 miles northeast of Asherton, Dimmit County.

Drainage area.--4,082 sq mi.

Records available.--October 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 470.92 ft above mean sea level, datum of 1929. Prior to Feb. 2, 1940, chain gage at same site and datum.

Average discharge.--25 years, 169 cfs (122,400 acre-ft per year).

Extremes.--Maximum discharge during year, 20,800 cfs Sept. 16 (gage height, 30.25 ft); no flow most of time. 1939-64: Maximum discharge, 28,500 cfs Oct. 6, 1959 (gage height, 30.88 ft); no flow for many days. Maximum stage since at least 1900, 33 ft June 17, 1935; flood of June 30, 1913, reached about same stage, from information by local residents.

Remarks.--Records good. Part of flow of Nueces River and its headwater tributaries enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde; at low stages most of headwater flow enters this formation. Considerable losses of floodflows into various permeable formations occur downstream from the Balcones fault zone. Flow slightly regulated by several small reservoirs above station. Many diversions above station for irrigation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 24-27, May 16-26, Aug. 23-27, Sept. 14-16, 18-21)

1.5	0	2.5	32	24.0	4,600
1.6	.4	3.0	54	27.0	6,500
1.7	1.2	4.0	117	28.0	7,500
1.8	2.6	6.0	307	29.0	9,300
1.9	5.1	9.0	720	29.5	13,000
2.0	9.2	17.0	2,380	30.0	18,100
2.2	19				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.5				0		0	*11		0	0.9
2	0	.2				0		.2	6.7		0	.4
3	0	.1				0		5.9	3.8		0	.2
4	0	*0				0		2.4	1.7		0	.8
5	0	0				0		.6	.6		0	.5
6	0	0				0		.1	.2		0	.1
7	0	0				0		0	0	(*)	0	0
8	0	0				0		0	0		0	0
9	0	0	(*)			0		0	0		0	0
10	0	0				0		0	0		*0	0
11	0	0				0		.3	0		0	0
12	0	0				0		**2.0	0		0	.2
13	0	0		(*)		0		9.2	0		0	13
14	0	0				0	(*)	2.8	0		0	*29
15	0	0				0		17	0		0	39
16	0	0				0		46	0		0	*14,300
17	0	0				0		80	0		0	*8,330
18	0	0			(*)	0		74	0		0	*2,140
19	0	0				0		45	0		0	*232
20	0	0				0		35	0		0	*88
21	0	0				0		54	0		0	301
22	1.6	0				.1		78	0		0	5,960
23	3.0	0				2.6		280	0		1,540	12,300
24	250	0				*1.4		173	0		*3,270	12,900
25	237	0				.4		66	0		750	10,000
26	166	0				1.0		34	0		168	9,220
27	60	0				1.4		20	0		49	8,200
28	25	0				.6	(*)	16	0		20	7,450
29	9.2	0				.3		24	0		8.4	8,610
30	3.6	0				.1		24	0		3.5	10,100
31	1.6					0		16			1.8	
Total	757.0	0.8	0	0	0	7.9	0	1,105.5	24.0	0	5,810.7	110,215.1
Mean	24.4	0.03	0	0	0	0.25	0	35.7	0.80	0	187	3,674
Ac-ft	1,500	1.6	0	0	0	16	0	2,190	48	0	11,530	218,600

Calendar year 1963: Max 1,930 Min 0 Mean 21.0 Ac-ft 15,230
Water year 1963-64: Max 14,300 Min 0 Mean 322 Ac-ft 233,900

Peak discharge (base, 2,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-24	0500	22.68	4,100	9-23	2100	29.65	14,500
9-16	1500	30.25	20,800	9-30	1600	29.20	10,300

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

8-1940. Nueces River at Cotulla, Tex.

Location.--Lat 28°25'32", long 99°14'26", on left bank at downstream side of bridge on U. S. Highway 81, a third of a mile upstream from Missouri Pacific Railroad Co. bridge, three-quarters of a mile south of Cotulla, La Salle County, and 1.2 miles upstream from Lind Dam.

Drainage area.--5,260 sq mi.

Records available.--November 1923 to September 1964. November 1923 to September 1926 monthly discharge only, published in WSP 1312; figures of daily discharge for Oct. 31, 1923, to Sept. 30, 1926, published in WSP 588, 608 and 628, have been found to be unreliable and should not be used. Gage-height records collected in this vicinity 1914-17 and since 1922 are contained in reports of U. S. Weather Bureau.

Gage.--Water-stage recorder. Datum of gage is 368.08 ft above mean sea level, datum of 1929. Oct. 31, 1923, to Aug. 3, 1924, staff gage at approximate site of present gage at datum 7.28 ft higher. Aug. 4, 1924, to Nov. 19, 1934, staff gage at site 5,000 ft downstream at datum 8.42 ft higher. Nov. 20, 1934, to July 14, 1938, water-stage recorder and July 15, 1938, to Apr. 30, 1963, wire-weight gage at present site and datum.

Average discharge.--40 years (1924-64), 275 cfs (199,100 acre-ft per year).

Extremes.--Maximum discharge during year, 46,000 cfs Sept. 17 (gage height, 27.75 ft); no flow most of year.

1923-64: Maximum discharge, 82,600 cfs June 18, 1935 (gage height, 32.4 ft, from floodmarks), from rating curve defined by current-meter measurements below 43,000 cfs and extended above on basis of slope-area measurement of peak flow; no flow at times.

Maximum stage since at least 1879, that of June 18, 1935. Flood of June 19, 1899, reached a stage of 29.7 ft; from information by local residents.

Revisions.--Figures of maximum discharge for the water years 1951 and 1957 have been revised to 2,720 cfs May 30, 1951 (gage height, 12.60 ft) and 10,700 cfs Apr. 22, 1957 (gage height, 18.30 ft), superseding figures published in WSP 1212 and 1512, respectively.

Remarks.--Records good. Part of flow of Nueces River and its headwater tributaries enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde; at low stages most of the headwater flow enters this formation. Considerable losses of floodflows into various permeable formations occur downstream from the Balcones fault zone. Low flow slightly regulated by small storage reservoirs above station, most of which is diverted above station by pumping.

Cooperation.--Once-daily wire-weight gage readings furnished by U. S. Weather Bureau.

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

7.4	0	7.9	20	9.0	290	16.0	6,700
7.5	.3	8.0	33	10.0	710	22.0	18,400
7.6	1.4	8.2	73	11.0	1,280	24.0	24,900
7.7	4.4	8.5	151	13.0	2,920	27.0	40,900
7.8	10						

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	26						0	*21		0	62
2	0	16						0	18		0	33
3	0	11						0	17		0	21
4	0	*8.0						0	14		0	16
5	0	5.2						0	9.4		0	23
6	0	2.3						0	6.2		0	13
7	0	1.1						0	4.4	(*)	0	8.0
8	0	.7						0	2.6		0	4.0
9	0	1.0	(*)					0	1.4		0	10
10	0	.8						0	.7		*0	1.4
11	0	.6						0	.4		0	.6
12	0	.4						*0	.2		0	.4
13	0	.4		(*)				0	0		0	.2
14	0	.2						0	0		0	**.1
15	0	.2						0	0		0	14
16	0	.2						0	0		0	664
17	0	0						0	0		0	29,000
18	0	0			(*)			0	0		0	*37,400
19	0	0						0	0		0	*18,900
20	0	0						0	0		0	*8,100
21	0	0						0	0		0	2,770
22	0	0						0	0		0	1,320
23	0	0						0	0		0	642
24	0	0				(*)		56	0		249	2,270
25	0	0						173	0		*5,480	7,620
26	34	0						181	0		5,420	11,900
27	336	0						81	0		3,510	11,600
28	339	0					(*)	49	0		1,920	10,700
29	164	0						32	0		828	10,300
30	76	0			----------			221	0		248	9,120
31	38	----------			----------		----------	74	----------		112	----------
Total	987	74.1	0	0	0	0	0	867	95.3	0	17,767	162,512.7
Mean	31.8	2.47	0	0	0	0	0	28.0	3.18	0	573	5,417
Ac-ft	1,960	147	0	0	0	0	0	1,720	189	0	35,240	322,300

Calendar year 1963: Max 1,340 Min 0 Mean 25.1 Ac-ft 18,200
Water year 1963-64: Max 37,400 Min 0 Mean 498 Ac-ft 361,600

Peak discharge (base, 2,500 cfs)

Date	Time	Gage height	Discharge
8-25	1800	15.74	6,250
9-17	2200	27.75	46,000
9-26	1800	19.15	12,500

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

8-1942. San Casimiro Creek near Freer, Tex.

Location.--Lat 27°57'47", long 98°58'05", at downstream side of bridge on State Highway 44, 11 miles upstream from Nueces River and 22 miles northwest of Freer, Duval County.

Drainage area.--469 sq mi.

Records available.--January 1962 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 298 ft above mean sea level, State Highway Department bridge plans.

Extremes.--Maximum discharge during year, 1,600 cfs Sept. 18 (gage height, 16.79 ft); no flow most of time.
1962-64: Maximum discharge, 13,400 cfs June 17, 1963 (gage height, 22.35 ft); no flow most of time.
Maximum stage since at least 1946, 26 ft in 1954, from information by State Highway Department.

Remarks.--Records good above 5 cfs and fair below.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used June 2-3)

3.5	0	4.3	3.9	8.0	112
3.6	.1	4.6	7.2	10.0	230
3.7	.3	5.0	14	13.0	500
3.8	.6	5.5	24	14.0	640
3.9	1.0	6.0	39	15.0	860
4.0	1.5	7.0	72	16.0	1,210

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	1.6				0	0	*0.3	0	0	0
2		0	.6				0	0	0	0	0	0
3		0	.2				0	0	0	0	0	0
4		*0	0				0	0	0	0	0	0
5		0	0				0	0	0	0	0	0
6		0	0				0	0	0	0	0	0
7		0	0				0	0	0	*0	0	5.4
8		0	0				0	0	0	0	0	42
9		.5	*0				0	0	0	0	1.0	12
10		4.1	0				0	0	0	0	*3.6	3.9
11		4.1	0				0	3.7	0	0	4.2	.4
12		.4	0				0	*28	0	0	.6	127
13		0	0	(*)			0	11	0	0	0	*1,010
14		0	0				0	2.2	0	0	0	558
15		0	0				0	.4	0	0	0	446
16		0	0				0	0	0	0	0	*216
17		0	0				0	0	0	0	0	898
18		0	0		(*)		0	0	0	0	0	1,110
19		0	0				0	0	0	0	0	163
20		0	0				0	0	0	0	0	47
21		0	0				0	77	0	0	0	21
22		0	0				0	*1,080	0	1.9	0	4.8
23		0	0				0	*466	0	.8	62	2.2
24		0	0			(*)	0	66	0	0	48	1.5
25		0	0				.5	*11	0	0	252	1.9
26		0	0				274	9.4	0	0	38	49
27		16	0				119	4.8	0	0	3.9	21
28		98	0				*4.7	6.1	15	0	1.2	3.8
29		11	0				.9	1.8	1.0	0	.3	28
30		4.0	0		----------		.2	2.8	.1	0	0	174
31		----------	0		----------		----------	3.4	----------	0	0	----------
Total	0	138.1	2.4	0	0	0	399.3	1,773.6	16.4	2.7	414.8	4,945.9
Mean	0	4.60	0.08	0	0	0	13.3	57.2	0.55	0.09	13.4	165
Ac-ft	0	274	4.8	0	0	0	792	3,520	33	5.4	823	9,810

Calendar year 1963: Max 8,750 Min 0 Mean 54.4 Ac-ft 39,360
Water year 1963-64: Max 1,110 Min 0 Mean 21.0 Ac-ft 15,260

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
5-22	1000	16.25	1,300
9-13	0200	16.37	1,400
9-18	0930	16.79	1,600

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

8-1945. Nueces River near Tilden, Tex.

Location.--Lat 28°18', long 98°34', on right bank at downstream side of pier of bridge on State Highway 173, 2 miles upstream from Cow Creek, and 10.5 miles south of Tilden, McMullen County.

Drainage area.--8,192 sq mi.

Records available.--November 1942 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 183.5 ft above mean sea level, datum of 1929 (levels ty Topographic Division).

Average discharge.--21 years (1943-64), 379 cfs (274,400 acre-ft per year).

Extremes.--Maximum discharge during year, 31,800 cfs Sept. 21 (gage height, 23.26 ft); no flow most of time.
1942-64: Maximum discharge, 70,000 cfs Oct. 11, 1946 (gage height, 26.46 ft), from rating curve defined by current-meter measurements below 45,000 cfs; no flow at times.
Maximum stage since about 1902, that of Oct. 11, 1946. Floods in June 1935 reached a stage of 23.7 ft and in July 1942 about 22 ft, from information by local residents.

Remarks.--Records good. Part of flow of Nueces River and its headwater tributaries enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde. At low stage most of headwater flow enters this formation. Considerable losses of floodflows into various permeable formations occur downstream from the Balcones fault zone. Diversions for irrigation above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	165	54	0		0	0	27	91	0	0	1,120
2	*0	106	18	0		0	0	13	*76	0	0	1,380
3	0	60	7.5	0		0	0	2.8	129	0	0	1,600
4	0	37	2.7	0		0	0	.1	80	0	0	746
5	0	*23	1.4	0		0	0	0	40	0	0	98
6	0	16	1.1	0		0	0	0	18	0	0	48
7	0	10	1.0	0		0	0	0	10	*0	0	28
8	0	6.1	.6	0		0	0	0	4.9	0	205	22
9	0	44	.3	0		0	0	0	1.7	0	1,070	30
10	0	120	** .2	0		0	0	0	.4	0	492	97
11	0	21	.1	0		0	0	0	.1	0	78	59
12	0	5.2	.1	0		0	0	0	0	0	*132	25
13	0	2.1	5.1	0		0	0	1.3	0	0	52	56
14	0	1.4	9.1	*0		0	0	.7	0	0	20	*653
15	0	1.3	4.2	0		0	0	0	0	0	8.4	970
16	0	.8	.6	.1		0	0	0	1.2	0	1.9	1,160
17	0	.6	.2	.1		0	0	0	15	0	.3	1,340
18	0	.3	.1	.1		0	0	0	0	0	.1	*1,370
19	0	.2	0	.1		161	0	0	0	0	0	1,360
20	0	.1	0	0	(*)	49	0	0	0	0	0	1,640
21	0	0	0	0		4.6	0	17	0	11	0	*21,800
22	0	0	0	0		15	0	48	0	6.2	0	26,500
23	0	0	0	0		100	0	35	0	.2	0	18,900
24	0	0	0	0		38	0	467	0	0	426	12,300
25	0	0	0	0		*11	0	622	0	0	227	7,200
26	0	0	0	0		3.0	0	302	0	0	342	4,160
27	0	2.5	0	0		.4	0	140	0	0	372	2,920
28	0	20	0	0		.1	*.8	64	0	0	524	2,200
29	0	4.7	0	0		0	132	40	0	0	650	1,710
30	0	67	0	0	----------	0	43	50	0	0	769	4,270
31	7.5	----------	0	0	----------	0	----------	94	----------	0	908	----------
Total	7.7	714.3	106.3	0.4	0	382.1	175.8	1,923.9	467.3	17.4	6,277.7	115,762
Mean	0.25	23.8	3.43	0.01	0	12.3	5.86	62.1	15.6	0.56	203	3,859
Ac-ft	15	1,420	211	0.8	0	758	349	3,820	927	35	12,450	229,600

Calendar year 1963: Max 18,800 Min 0 Mean 152 Ac-ft 109,800
Water year 1963-64: Max 26,500 Min 0 Mean 344 Ac-ft 249,600

Peak discharge (base, 1,800 cfs)

Date	Time	Gage height	Discharge
9-21	1900	23.26	31,800

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

8-1950. Frio River at Concan, Tex.

Location.--Lat 29°29'18", long 99°42'16", on left bank 0.7 mile southeast of Concan Post Office, Uvalde County, and 15 miles upstream from Dry Frio River.

Drainage area.--405 sq mi.

Records available.--October 1923 to September 1929, October 1930 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,203.71 ft above mean sea level, datum of 1929. Oct. 26, 1923, to July 28, 1924, staff gage at site 86 ft upstream at datum 5.08 ft lower. July 29, 1924, to Oct. 3, 1930, combination staff and chain gage and Oct. 4, 1930, to May 18, 1939, water-stage recorder, at site 130 ft downstream at present datum.

Average discharge.--39 years (1924-29, 1930-64), 96.8 cfs (70,080 acre-ft per year).

Extremes.--Maximum discharge during year, 2,580 cfs Sept. 22 (gage height, 6.54 ft), from rating curve extended above 1,300 cfs as explained below; minimum, 5.9 cfs Sept. 1-4.
1923-64: Maximum discharge, 162,000 cfs July 1, 1932 (gage height, 34.44 ft, from floodmarks), from rating curve defined by current-meter measurements below 7,400 cfs and slope-area measurements at 29,400 and 162,000 cfs; no flow Aug. 5, 1956, to Jan. 6, 1957.
Maximum stage since at least 1869, that of July 1, 1932.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Part of flow of Frio River enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde and below station. Most of low flow enters this formation. Many small diversions for irrigation above station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 20 to Apr. 16)

Oct. 1 to Dec. 31				Jan. 1 to Sept. 30			
3.4	8.2	3.8	48	3.4	6.7	4.0	115
3.5	11	4.0	98	3.5	11	4.5	340
3.6	18	4.2	170	3.6	21	5.0	660
3.7	30			3.8	58	5.5	1,140

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	12	42	38	83	56	66	60	38	18	9.2	7.0
2	11	12	42	38	76	54	66	55	34	18	9.2	*6.7
3	11	12	41	38	*70	52	66	55	34	18	9.2	6.7
4	11	13	41	34	66	50	66	55	34	18	9.2	6.7
5	10	13	42	34	58	52	60	50	38	17	8.7	7.8
6	10	12	42	34	56	54	60	50	34	16	8.7	8.2
7	11	12	41	36	54	54	60	50	32	14	8.7	8.2
8	11	22	39	36	54	54	60	80	30	13	9.6	8.2
9	11	101	39	34	56	46	60	75	30	13	13	7.8
10	11	75	42	36	56	48	60	70	30	13	11	7.4
11	11	50	42	38	58	48	60	65	30	13	9.6	7.8
12	11	42	42	38	60	50	60	60	30	13	8.2	7.8
13	11	41	44	38	58	52	58	60	30	13	7.4	8.2
14	11	39	48	40	60	50	*56	55	29	13	7.8	8.2
15	12	39	46	42	60	48	56	55	29	13	8.2	8.2
16	12	39	44	42	60	50	*56	50	34	12	8.2	10
17	12	39	42	42	63	50	100	50	30	12	8.2	10
18	12	39	42	40	60	71	90	48	29	13	8.2	11
19	12	39	42	40	60	163	80	46	29	15	7.8	10
20	13	39	44	40	63	83	70	*44	25	16	7.4	10
21	13	39	44	42	68	73	65	46	23	14	7.0	12
22	*13	37	42	42	66	70	60	48	23	13	7.0	751
23	14	36	41	42	63	70	60	48	22	13	7.8	649
24	20	37	39	36	63	70	56	46	*25	11	13	273
25	16	39	37	36	66	68	90	44	27	11	13	378
26	14	41	37	36	63	66	80	44	23	11	11	236
27	14	*50	37	36	58	66	75	44	22	11	9.6	236
28	14	50	39	34	54	66	70	42	21	*10	9.2	295
29	13	42	41	38	56	63	65	40	20	9.2	8.7	265
30	13	41	41	109	----------	63	60	44	18	9.6	8.7	222
31	13	----------	41	112	----------	66	----------	40	----------	9.6	8.2	----------
Total	382	1,102	1,286	1,321	1,788	1,926	1,991	1,619	853	413.4	280.7	3,482.9
Mean	12.3	36.7	41.5	42.6	61.7	62.1	66.4	52.2	28.4	13.3	9.05	116
Ac-ft	758	2,190	2,550	2,620	3,550	3,820	3,950	3,210	1,690	820	557	6,910

Calendar year 1963: Max 104 Min 2.0 Mean 30.8 Ac-ft 22,290
Water year 1963-64: Max 751 Min 6.7 Mean 44.9 Ac-ft 32,620

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
9-22	1530	6.54	2,580
9-25	0300	4.82	524

* Discharge measurement made on this day.
Note.--No gage-height record Apr. 17 to May 19.

8-1960. Dry Frio River near Reagan Wells, Tex.

Location.--Lat 29°30', long 99°47', on right bank 1,000 ft upstream from Aldine School, 2 miles upstream from Rock Creek, and 4 miles southeast of Reagan Wells, Uvalde County.

Drainage area.--117 sq mi.

Records available.--September 1952 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,335.2 ft above mean sea level, adjustment unknown (levels by Ground Water Branch).

Average discharge.--12 years, 27.3 cfs (19,760 acre-ft per year).

Extremes.--Maximum discharge during year, 324 cfs Sept. 23 (gage height, 3.61 ft); minimum, 0.1 cfs Aug. 4-23.
1952-64: Maximum discharge, 23,200 cfs Sept. 24, 1955 (gage height, 18.68 ft, from floodmarks), from rating curve defined by current-meter measurements below 700 cfs and slope-area measurements at 11,400 and 64,700 cfs; no flow at times.
Flood of June 14, 1935, reached a stage of 26.0 ft, from information by local resident (discharge at site 2.6 miles upstream, 64,700 cfs).

Remarks.--Records good except those for Oct. 22 to Nov. 27, and those for period of no gage-height record, which are fair. Part of flow of Dry Frio River enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde and below station. Most of low flow enters this formation. Small diversions above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-30, May 19 to Sept. 21)

1.7	0.1	2.4	9.8
1.8	.2	2.5	16
1.9	.4	2.6	27
2.0	.8	2.7	42
2.1	1.7	2.8	62
2.2	3.5	3.0	118
2.3	6.0		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	1.1	8.1	6.0	45	12	25	14	4.8	1.5	0.2	0.6
2	.5	1.1	8.1	6.0	40	12	24	13	4.5	1.4	.2	** .6
3	.6	1.4	7.3	*6.0	35	11	24	12	4.3	1.4	.2	.6
4	.6	1.6	6.9	6.0	*42	10	23	12	4.1	1.4	.2	.6
5	.6	1.7	6.9	6.0	44	10	21	11	4.3	1.2	.1	.6
6	.6	1.7	6.9	5.7	37	10	21	11	4.3	1.1	.1	.5
7	.6	1.8	7.3	5.7	32	10	20	11	4.5	1.0	.1	.5
8	.6	1.9	7.3	5.7	29	10	19	10	4.3	.9	.1	.5
9	.6	2.4	7.3	5.7	27	9.8	19	11	4.1	.8	.2	.5
10	.6	2.6	7.3	5.7	25	*9.8	18	12	3.9	.8	.1	.5
11	.6	2.4	7.3	5.4	24	9.8	18	11	3.9	.7	.1	.5
12	.6	2.6	6.9	5.4	23	9.8	18	11	3.5	.6	.1	.5
13	.6	2.6	6.9	5.1	21	9.8	16	9.8	3.2	.6	.1	.4
14	.6	2.8	7.3	5.1	20	9.8	*15	8.9	3.2	.6	.1	.4
15	.6	3.0	7.3	4.8	19	9.3	15	8.9	3.0	.5	.1	.4
16	.6	3.5	7.7	4.8	18	8.9	15	8.5	3.0	.5	.1	.4
17	.6	3.5	7.7	4.8	16	8.9	41	7.3	3.0	.5	.1	.4
18	.6	4.1	8.1	4.5	15	20	25	7.3	2.8	.4	.1	.4
19	.6	4.5	7.7	4.3	15	88	21	6.6	2.8	.4	.1	.3
20	.6	4.8	7.7	4.3	14	85	18	*6.3	2.4	.5	.1	.3
21	.7	5.7	7.3	4.5	19	62	16	6.3	2.2	.4	.1	.4
22	*.7	6.0	7.3	4.5	16	54	15	6.3	2.1	.4	.1	2.1
23	.8	6.3	6.9	4.5	15	48	15	6.6	2.1	.3	.1	88
24	.7	6.0	6.9	4.8	15	40	15	6.3	*2.1	.3	.6	76
25	.8	6.3	6.6	4.5	15	37	21	5.7	1.9	.3	.5	44
26	.7	6.6	6.6	4.5	14	34	18	5.7	1.8	.3	.5	37
27	.8	*6.9	6.6	4.5	13	32	18	5.7	1.8	.2	.5	65
28	.8	8.1	6.6	4.3	12	29	15	5.4	1.7	** .2	.5	91
29	.9	8.1	6.6	4.5	12	27	15	5.1	1.6	.2	.6	80
30	1.0	8.1	6.3	50	----------	26	15	5.4	1.5	.2	.6	65
31	1.1	----------	6.0	50	----------	25	----------	5.1	----------	.2	.6	----------
Total	20.7	119.2	221.7	247.6	672	777.9	579	266.2	92.7	19.8	7.2	558.0
Mean	0.67	3.97	7.15	7.99	23.2	25.1	19.3	8.59	3.09	0.64	0.23	18.6
Ac-ft	41	236	440	491	1,330	1,540	1,150	528	184	39	14	1,110

Calendar year 1963: Max 77 Min 0.1 Mean 5.67 Ac-ft 4,100
Water year 1963-64: Max 91 Min 0.1 Mean 9.79 Ac-ft 7,100

Peak discharge (base, 200 cfs)

Date	Time	Gage height	Discharge
9-23	1900	3.61	324

* Discharge measurement made on this day.
** Field estimate made on this day.
Note.--No gage-height record Jan. 30 to Feb. 3.

8-1975. Frio River below Dry Frio River, near Uvalde, Tex.

Location.--Lat 29°14'55", long 99°40'24", on right bank 1 mile upstream from crossing of old Uvalde-Sabinal road, 4.3 miles downstream from Dry Frio River, 5 miles downstream from bridge on U. S. Highway 90, and 7.4 miles northeast of Uvalde, Uvalde County.

Drainage area.--661 sq mi.

Records available.--September 1952 to September 1964. Sum of records published as Frio River at Knippa and Dry Frio River at Knippa for period September 1952 to September 1953 is equivalent to record for this station.

Gage.--Water-stage recorder. Datum of gage is 882.47 ft above mean sea level, datum of 1929.

Average discharge.--12 years, 16.4 cfs (11,870 acre-ft per year).

Extremes.--Maximum discharge during year, 378 cfs Sept. 23 (gage height, 4.67 ft); no flow most of time.
1952-64: Maximum discharge, 53,000 cfs June 17, 1958 (gage height, 19.7 ft, from floodmark), from rating curve defined by current-meter measurements below 13,000 cfs and slope-area measurement of 53,000 cfs; no flow most of time.
Maximum stage since at least 1887, about 35 ft in 1894. Flood of July 1, 1932, reached a stage of about 30 ft. A higher flood than that of 1894 occurred prior to 1887. Above information by local residents.

Remarks.--Records good. Part of flow of Frio River enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde and above station. Most of low flow enters this formation. Many diversions for irrigation above station.

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

2.0	0	2.6	9.1
2.1	.2	2.8	17
2.2	.8	3.0	30
2.3	1.9	3.2	50
2.4	3.6	3.5	92

Discharge, in cubic feet per second, water year October 1963 to September 1964

Sept. 23	81
24	69
25	*1.1
27	9.8
28	8.8
29	.6

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
September 1964	170.3	81	0	5.68	338
Calendar year 1963	-	0	0	0	0
Water year 1963-64	-	81	0	.47	338

Peak discharge (base, 1,000 cfs).--No peak above base.
* Discharge measurement made on this day.
Note.--Flow occurred only on days listed above. Observations of no flow made on Oct. 7, 21, Dec. 2, Jan. 2, Feb. 5, Mar. 9, Apr. 13, May 18, June 23, July 28, Sept. 1.

8-1980. Sabinal River near Sabinal, Tex.

Location.--Lat 29°29'25", long 99°29'40", on right bank 470 ft upstream from low-water crossing on old Sabinal-Utopia road, 2.5 miles downstream from Onion Creek, and 12 miles north of Sabinal, Uvalde County.

Drainage area.--206 sq mi.

Records available.--October 1942 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,131.20 ft above mean sea level, datum of 1929.

Average discharge.--22 years, 35.0 cfs (25,340 acre-ft per year).

Extremes.--Maximum discharge during year, 4,690 cfs Sept. 27 (gage height, 6.76 ft); no flow most of time.
1942-64: Maximum discharge, 55,200 cfs June 17, 1958 (gage height, 24.6 ft, from floodmark), from rating curve defined by current-meter measurements below 1,200 cfs and slope-area measurements at 8,490, 10,600 and 55,200 cfs; no flow at times.
Maximum stage since at least 1892, about 29 ft July 2, 1932, from information by local residents.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Small diversions above station for irrigation.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0	20	10	23	18	4.8		0	0
2				0	18	11	23	18	4.2		0	*0
3				*0	*17	11	23	15	4.2		0	0
4				0	23	9.4	21	13	4.2		0	0
5				0	17	9.4	20	12	4.5		0	0
6				0	14	10	20	15	3.5		0	0
7				0	11	10	20	15	3.5		0	0
8				0	10	10	18	14	3.5		0	0
9				0	9.4	9.4	20	13	3.5		0	0
10				0	9.4	*8.6	20	12	2.7		0	0
11				0	9.4	8.6	18	12	2.7		0	0
12				0	9.4	8.6	18	11	1.9		0	0
13				0	9.4	8.6	17	10	1.1		0	0
14				0	8.6	8.6	*14	10	.5		0	0
15				0	9.4	7.0	14	10	.5		0	0
16				0	9.4	7.0	14	9.4	8.0		0	0
17				0	9.4	7.0	*37	8.6	5.5		0	0
18				0	9.4	10	24	8.6	4.8		0	0
19				0	8.6	413	21	8.6	4.2		0	0
20				0	9.4	145	20	*8.6	3.5		0	0
21	(*)			0	11	73	18	9.4	1.9		0	0
22				0	10	50	18	10	1.1		0	758
23				.1	9.4	43	18	9.4	*.5		0	494
24				.1	11	38	18	8.6	3.0		0	117
25				.1	11	34	27	9.4	4.2		89	*90
26				.1	11	28	24	11	2.7		3.8	42
27		(*)		.1	10	28	20	8.6	.5	(*)	0	920
28				.1	10	28	20	7.0	0		0	*326
29				.2	10	26	18	5.0	0		0	176
30				50	----------	23	18	5.5	0		0	111
31		----------		45	----------	23	----------	5.5	----------		0	----------
Total	0	0	0	95.8	334.6	1,116.2	604	331.2	85.2	0	92.8	3,034
Mean	0	0	0	3.09	11.5	36.0	20.1	10.7	2.84	0	2.99	101
Ac-ft	0	0	0	190	664	2,210	1,200	657	169	0	184	6,020

Calendar year 1963: Max 406 Min 0 Mean 5.79 Ac-ft 4,200
Water year 1963-64: Max 920 Min 0 Mean 15.6 Ac-ft 11,290

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
3-19	0630	3.51	1,220
9-22	1200	4.77	2,400
9-27	1030	6.76	4,690

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record Jan. 22 to Feb. 2.

8-1985. Sabinal River at Sabinal, Tex.

Location (revised).--Lat 29°18'45", long 99°28'45", on left bank 80 ft downstream from bridge on U. S. Highway 90, 1,100 ft downstream from Southern Pacific Lines railroad bridge, 0.8 mile west of Sabinal, Uvalde County, and 5.8 miles upstream from Ranchero Creek. Prior to Mar. 20, 1964, at site 80 ft upstream.

Drainage area.--247 sq mi.

Records available.--September 1952 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 882.17 ft above mean sea level, datum of 1929. Prior to July 29, 1958, wire-weight gage and July 29, 1958, to Mar. 19, 1964, water-stage recorder at site 80 ft upstream at same datum.

Average discharge.--12 years, 22.9 cfs (16,580 acre-ft per year).

Extremes.--Maximum discharge during year, 4,440 cfs Sept. 27 (gage height, 12.38 ft, from floodmark); no flow most of time.

1952-64: Maximum discharge, 73,300 cfs June 17, 1958 (gage height, 33.3 ft); no flow at times.

Maximum stage since at least 1890, 40 ft Aug. 24, 1919, from information by local residents. Flood of July 2, 1932, reached a stage of 31 ft (discharge, 60,000 cfs), from information by Southern Pacific Lines. There is a substantial legend that a flood in 1858 covered the townsite of Sabinal. This would call for a stage of 70 to 80 ft which seems unlikely. However, it is possible that a flood occurred in 1858 that covered part of the townsite and was higher than any flood since that date.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Small diversions for irrigation above station. Most of low flow of the Sabinal River enters formations in the Balcones fault zone which crosses basin upstream from this station and below the next upstream station. Part of flow enters the Edwards and associated limestones which lie upstream from other formations that receive water.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Feb. 26 to Mar. 28, July 2 to Aug. 20, Sept. 27-30)

3.2	0	3.7	4.2	5.0	115
3.3	.1	3.9	9.5	5.5	200
3.4	.6	4.1	18	6.0	310
3.5	1.4	4.4	40	7.0	613
3.6	2.5	4.7	73	9.0	1,590

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0	0.1	0.1	0.1	0.1	0.1	0.2	0.6	0.1	0
2			0	**.1	.1	.1	.1	0	.2	.5	.1	0
3			0	.1	**.1	.1	.1	0	.2	.5	.1	*0
4			0	.1	.2	.1	.1	0	.1	.5	.1	0
5			0	.1	.2	0	.1	0	.1	.5	.1	0
6			0	.1	.2	0	.1	0	.1	.5	.1	0
7			0	.1	.1	0	.1	0	.1	.5	0	0
8			0	.1	.1	0	.1	0	.1	.5	0	0
9			0	.1	.2	*0	0	.1	.1	.5	0	0
10			0	.1	.2	0	0	0	0	.5	0	0
11			0	.1	.1	0	0	0	0	.5	0	0
12			0	.1	.2	0	0	0	0	.5	0	0
13			0	.1	.2	0	*0	0	0	.6	0	0
14			0	.1	.2	0	0	0	0	.5	0	0
15			0	.1	.2	0	0	0	0	.5	0	0
16			0	.1	.2	0	0	0	45	.4	0	0
17			0	.1	.2	0	.1	0	1.6	.4	0	0
18			0	.1	.2	.4	0	*0	.9	.3	0	0
19			0	.1	.2	1.2	0	0	.6	.4	0	0
20			0	.1	.2	.3	0	0	.5	.4	0	0
21	(*)		0	.1	.2	.2	0	0	.5	.3	0	0
22			0	.1	.1	.2	0	.1	.5	.2	0	7.4
23			0	.1	.2	.1	0	0	*.5	.2	0	168
24			.1	.1	.2	.2	0	0	.5	.2	.3	271
25	(*)		.1	.1	.2	.1	3.2	0	.5	.1	.1	35
26			.1	.1	.1	.1	.2	0	.5	.1	.1	8.4
27		(*)	.1	.1	.2	.1	.1	0	.6	.1	.1	1,090
28			.1	.1	.1	.1	0	0	.6	**.1	.1	*454
29			.1	.2	.1	.1	0	.1	.6	.1	.1	163
30			.1	.5	----------	.1	.1	3.3	.6	.1	0	77
31		----------	.1	.2	----------	.1	----------	.4	----------	.1	0	----------
Total	0	0	0.8	3.7	4.8	3.7	4.5	4.1	55.2	11.2	1.4	2,273.8
Mean	0	0	0.03	0.12	0.17	0.12	0.15	0.13	1.84	0.36	0.05	75.8
Ac-ft	0	0	1.6	7.3	9.5	7.3	8.9	8.1	109	22	2.8	4,510

Calendar year 1963: Max 1.4 Min 0 Mean 0.07 Ac-ft 48
Water year 1963-64: Max 1,090 Min 0 Mean 6.46 Ac-ft 4,690

Peak discharge (base, 600 cfs)

Date	Time	Gage height	Discharge
9-27	1900	12.38	4,440

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record Aug. 5-16, Sept. 27-28.

8-2000. Hondo Creek near Tarpley, Tex.

Location.--Lat 29°34', long 99°15', on left bank 460 ft downstream from Ranch Road 462 low-water crossing, 6.2 miles southeast of Tarpley, Bandera County, and 16.7 miles northwest of Hondo.

Drainage area.--86.2 sq mi.

Records available.--August 1952 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,169.1 ft above mean sea level, adjustment unknown (Magnolia Oil Co. bench mark).

Average discharge.--12 years, 27.0 cfs (19,550 acre-ft per year).

Extremes.--Maximum discharge during year, 6,000 cfs Sept. 27 (gage height, 9.72 ft); no flow for many days.
1952-64: Maximum discharge, 69,800 cfs June 17, 1958 (gage height, 28.2 ft, from floodmark), from rating curve defined by current-meter measurements below 300 cfs and by slope-area measurements at 3,340, 18,600 and 69,800 cfs; no flow at times in 1952-57, 1962-64.
Maximum stage since at least 1907, that of June 17, 1958. Flood in July 1932, reached a stage of about 26 ft, from information by local resident.

Remarks.--Records good. Small diversions for irrigation above station.

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

1.1	0	2.1	40
1.2	.2	2.5	88
1.3	.8	3.0	178
1.4	2.0	3.5	303
1.5	4.1	4.0	470
1.6	7.2	5.0	930
1.8	17		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.7	1.2	0.7	14	5.3	6.2	5.6	1.3	0	0.3	0
2	0	.5	*.9	.7	10	5.3	6.2	4.7	1.2	.2	.4	0
3	0	.4	.7	.6	10	5.0	6.2	4.7	1.1	3.9	.1	*0
4	0	.4	.6	.6	26	4.7	5.9	4.4	1.0	1.6	0	0
5	0	.4	.6	.6	*12	4.7	5.6	4.1	29	1.0	0	0
6	0	.3	.6	*.6	10	4.7	5.3	4.4	7.4	.6	0	0
7	0	.2	.6	.6	9.2	4.7	5.3	4.7	2.5	.3	0	0
8	0	4.2	.5	.5	8.4	4.7	5.0	4.7	2.5	.1	0	0
9	0	6.8	.4	.5	8.0	6.0	5.0	5.0	2.5	.1	0	0
10	0	2.5	.6	.4	7.6	4.7	4.7	4.7	2.3	0	0	0
11	0	1.7	.9	.4	7.2	*4.4	5.0	4.4	2.0	0	0	0
12	0	1.7	.8	.4	6.8	4.1	5.0	4.1	1.9	0	0	0
13	0	1.3	1.4	.2	6.8	4.1	*4.7	3.3	1.6	0	0	0
14	0	1.1	2.5	.2	6.2	4.1	4.4	3.1	1.3	0	0	0
15	0	.9	1.4	.4	6.2	3.8	4.1	2.9	1.8	0	0	0
16	0	.7	1.3	1.3	5.3	3.8	4.4	2.7	1.9	0	0	0
17	0	.6	1.3	.8	5.3	3.6	40	2.3	1.7	0	0	0
18	0	.6	1.2	.6	5.3	5.1	10	2.0	1.9	0	0	0
19	0	.9	1.2	.6	4.7	13	7.2	2.2	1.4	0	0	0
20	0	.9	1.4	.5	4.7	8.0	6.5	2.0	1.2	0	0	0
21	0	.6	1.3	.4	6.2	6.2	6.2	3.0	1.1	0	0	0
22	*0	.5	1.1	.5	5.6	5.9	5.9	*3.6	.9	0	0	165
23	0	.5	.9	.6	5.3	6.5	5.9	3.1	.5	0	0	210
24	9.9	.4	1.0	.6	6.5	6.5	5.6	2.7	.3	0	0	64
25	12	.4	1.0	.4	6.8	5.9	7.5	2.5	*1.0	0	0	47
26	28	.7	.9	.3	6.2	5.0	8.5	2.3	.8	0	0	30
27	3.2	4.0	.7	.3	5.9	4.1	6.8	2.0	.4	0	0	823
28	2.2	3.4	.7	.3	5.3	4.1	5.9	2.0	.2	0	0	133
29	1.3	1.4	.8	.8	5.0	4.1	5.6	1.7	.2	*0	0	90
30	1.1	1.3	.8	96	----------	5.0	5.6	1.6	.1	.9	0	69
31	1.0	----------	.8	26	----------	5.6	----------	1.6	----------	0	0	----------
Total	58.7	40.0	30.1	137.4	226.5	162.7	210.2	102.1	73.0	8.7	0.8	1,631
Mean	1.89	1.33	0.97	4.43	7.81	5.25	7.01	3.29	2.43	0.28	0.03	54.4
Ac-ft	116	79	60	273	449	323	417	203	145	17	1.6	3,240

Calendar year 1963: Max 39 Min 0 Mean 2.00 Ac-ft 1,450
Water year 1963-64: Max 823 Min 0 Mean 7.33 Ac-ft 5,320

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
9-23	0930	5.83	1,320
9-27	0530	9.72	6,000

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

8-2005. Hondo Creek near Hondo, Tex.

Location.--Lat 29°27', long 99°11', on left bank 43 ft upstream from Schlentz's Crossing, 7.8 miles northwest of Hondo, Medina County, and 13.5 miles upstream from Verde Creek.

Drainage area.--132 sq mi.

Records available.--August 1952 to October 1964 (discontinued).

Gage.--Water-stage recorder and concrete control. Datum of gage is 986.4 ft above mean sea level (Western Geophysical bench mark).

Average discharge.--12 years, 16.6 cfs (12,020 acre-ft per year).

Extremes.--1963-64: Maximum discharge during water year, 7,240 cfs Sept. 27 (gage height, 7.77 ft, from floodmark), from rating curve extended above 450 cfs as explained below; no flow most of time.

1964: Maximum discharge during October, 11 cfs Oct. 1 (gage height, 0.81 ft), on recession from rise in September; no flow most of time.

1952-64: Maximum discharge, 71,700 cfs June 17, 1958 (gage height, 23.4 ft, from floodmarks), from rating curve defined by current-meter measurements below 450 cfs and by slope-area measurements at 12,500 and 71,700 cfs; no flow most of time.

Maximum stage since at least 1910, 25.8 ft in September 1919, from information by local resident. Flood of June 17, 1958, was second highest since 1910.

Remarks.--Records fair. Most of the low flow of Hondo Creek enters Edwards and associated limestones in Balcones fault zone which crosses basin upstream from station. Small diversions above station for irrigation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Sept. 22-23)

0.6	0	1.5	180
.7	1.5	2.0	384
.8	10	2.5	650
.9	26	3.0	985
1.1	68	4.0	1,840
1.3	119		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Sept. 22	1.6	Sept. 27	1,030
23	117	28	*126
24	99	29	63
25	11	30	24
26	.2		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
September 1964	1,471.8	1,030	0	49.1	2,920
Calendar year 1963	-	0	0	0	0
Water year 1963-64	-	1,030	0	4.02	2,920

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
9-23	1430	3.15	1,100
9-27	0730	7.77	7,240

* Discharge measurement made on this day.

Note.--Flow occurred only on days listed above. Observations of no flow made Oct. 22, Dec. 2, Jan. 6, Feb. 5, Mar. 13, Apr. 13, May 22, June 25, July 29, Sept. 3, 28.

Discharge, in cubic feet per second, October 1964

Oct. 1	5.3
2	.2

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
October 1964	5.5	5.3	0	0.18	11

Note.--Flow occurred only on days listed above. Observation of no flow made Oct. 6.

8-2007. Hondo Creek at King Waterhole, near Hondo, Tex.

Location.--Lat 29°23'16", long 99°08'50", on left bank a quarter of a mile downstream from county road low-water crossing, 2.8 miles north of Hondo, Medina County, and 6.4 miles upstream from Verde Creek.
Drainage area.--142 sq mi.
Records available.--October 1960 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 897.87 ft above mean sea level, datum of 1929.
Extremes.--1960-61: Maximum discharge during water year, 6,180 cfs June 18 (gage height, 8.16 ft), from rating curve defined by current-meter measurements below 1,900 cfs and extended above by logarithmic plotting; no flow most of time.
1963-64: Maximum discharge during water year, 5,580 cfs Sept. 27 (gage height, 7.92 ft, from floodmark), from rating curve extended as explained above; no flow most of time.
1960-64: Maximum discharge, that of June 18, 1961; no flow most of time.
Maximum stage since at least 1875, 20 ft in September 1919, from information by local resident. Other floods occurred in July 1932 (17 ft), and June 17, 1958 (15.6 ft).
Remarks.--Records fair except those for Oct. 1 to Nov. 7, 1960, those below 10 cfs, and those above 2,000 cfs, which are poor. Most of the low flow of Hondo Creek enters Edwards and associated limestones in Balcones fault zone which crosses basin upstream from station. Small diversions above station for irrigation, amounts unknown.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1, 1960, to Mar. 7, 1961)

1.0	0	1.6	12	3.0	310
1.1	.1	1.8	28	3.5	505
1.2	.3	2.1	66	4.0	770
1.3	1.3	2.4	130	5.0	1,550
1.4	3.5	2.7	215	6.0	2,600
1.5	7.3				

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

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Oct. 29	110	Feb. 20	32	Feb. 28	3.2	June 17	323	July 10	0.8
30	5	21	32	Mar. 1	.4	18	1,880	11	.8
Dec. 13	.1	22	33	2	.4	19	143	12	.2
Feb. 10	.3	23	28	3	.4	20	48	23	1.3
16	194	24	18	4	.3	21	18	24	4.3
17	65	25	14	5	.3	22	4.3	25	.5
18	41	26	12	6	.3	23	.6	26	.1
19	33	27	7.8	7	.1	24	.2		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
October 1960	115	110	0	3.7	228
December	.1	.1	0	.003	.2
February	513.3	194	0	18.3	1,020
March	2.2	.4	0	.07	4.4
June	2,417.1	1,880	0	80.6	4,790
July	8.0	4.3	0	.26	16
Water year 1960-61	-	1,880	0	8.37	6,060

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
2-16	1130	4.49	1,120
6-18	1000	8.16	6,180

Note.--Flow occurred only on days listed above. Discharge measurement or observation of no flow made Oct. 5, Nov. 8, 10, Dec. 9, Jan. 3, Feb. 6, 13, 17, Mar. 20, Apr. 3, May 8, June 5, Aug. 22, Sept. 18; field estimate made Dec. 13, Feb. 10, Mar. 1, 6-7, July 11. No gage-height record Oct. 1 to Nov. 7. Stage-discharge relation indefinite Mar. 1-7.

Discharge, in cubic feet per second, water year October 1963 to September 1964

June 16	12	Sept. 27	826
17	5.6	28	104
18	2.5	29	36
19	.8	30	8.9
20	.2		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1964	21.1	12	0	0.70	42
September	974.9	826	0	32.5	1,930
Calendar year 1963	-	0	0	0	0
Water year 1963-64	-	826	0	2.72	1,970

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
9-27	0900	7.92	5,580

Note.--Flow occurred only on days listed above. Discharge measurement or observation of no flow made Oct. 22, Nov. 27, Jan. 6, Feb. 5, Mar. 3, 13, Apr. 13, 16, May 22, 30, June 25, July 10, 23, 29, Sept. 3, 27-28, 30. No gage-height record June 21-23.

8-2015. Seco Creek at Miller Ranch, near Utopia, Tex.

Location.--Lat 29°34', long 99°24', on right bank 200 ft upstream from county road crossing, 4.2 miles downstream from Cascade Creek, and 8 miles southeast of Utopia, Uvalde County.

Drainage area.--43.1 sq mi.

Records available.--May 1961 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,265.8 ft above mean sea level, adjustment unknown (Magnolia Oil Co. bench mark).

Extremes.--Maximum discharge during year, 11,000 cfs Aug. 24 (gage height, 8.5 ft, from floodmark), from rating curve defined by current-meter measurements below 160 cfs and by slope-area measurement at 52,600 cfs; no flow July 8-11, 14-29.
1961-64: Maximum discharge, that of Aug. 24, 1964; no flow for many days in 1963-64.
Maximum stage since at least 1901, 16.4 ft June 17, 1958, from floodmarks (discharge, 52,600 cfs by slope-area measurement).

Remarks.--Records good except those for periods of no gage-height record and those above 200 cfs, which are fair. No diversion above station.

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

Oct. 1 to Dec. 31

1.4	0
1.5	.6
1.6	2.0
1.7	4.6

Jan. 1 to Sept. 30

1.4	0	2.0	24
1.5	.4	2.2	60
1.6	1.6	2.5	160
1.7	3.7	3.0	430
1.8	7.4	3.5	810
1.9	14		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	0.2	0.4	0.2	5	3	2.4	1.9	0.8	0.1	1.3	* 0.7
2	.4	.2	*.4	.2	4	3	2.4	1.8	.7	.9	.8	.5
3	.3	.2	.3	.2	*3.1	2.5	2.4	1.6	.6	.6	.5	.4
4	.2	.2	.3	.2	7.4	2	2.2	1.6	.6	.2	.4	.4
5	.2	.2	.3	.2	4.6	2	2.2	1.6	13	.1	.2	.4
6	.2	.2	.3	*.2	4.0	2	2.0	1.8	2.3	.1	.2	.4
7	.2	.1	.3	.2	3.1	2	2.0	1.8	1.8	.1	.2	.3
8	.2	2.0	.3	.2	3.1	2	2.0	1.8	1.6	0	.2	.3
9	.2	2.2	.2	.2	3.1	3	2.0	1.8	1.3	0	.1	.3
10	.2	1.6	.3	.2	2.8	2.5	1.9	1.8	1.1	0	.1	.2
11	.2	1.2	.4	.2	2.6	1.9	1.9	1.8	.9	0	.1	.2
12	.1	.6	.4	.2	2.6	1.6	2.0	1.6	.8	.1	.1	.2
13	.1	.5	.6	.1	2.8	1.6	*2.0	1.4	.8	.1	.1	.2
14	.1	.4	.8	.1	2.6	1.6	1.9	1.3	.7	0	.1	.2
15	.1	.3	.8	.2	2.4	1.6	1.8	1.3	.7	0	.1	.2
16	.1	.3	.6	.8	2.2	1.6	2.0	1.2	.7	0	.1	.2
17	.1	.3	.6	.5	2.2	1.6	17	.9	.6	0	.1	.7
18	.1	.3	.6	.3	2.2	6.7	4.3	.8	.5	0	.8	1.8
19	.1	.3	.5	.2	1.9	10	3.1	.8	.4	0	.5	1.3
20	.1	.3	.5	.2	1.8	3.4	2.6	*1.1	.3	0	.2	1.2
21	**.1	.3	.6	.2	3.5	2.8	2.4	1.3	.2	0	.2	1.1
22	.1	.3	.6	.2	3	2.6	2.4	1.4	.2	0	.2	*291
23	.1	.3	.5	.2	2.5	2.8	2.4	1.4	*.2	0	.2	618
24	.3	.2	.3	.2	3.5	2.8	2.4	1.3	.2	0	544	116
25	.3	.1	.3	.2	3.5	2.8	3.0	1.3	.6	0	33	*49
26	.6	.1	.3	.1	3	2.6	4.0	1.4	.7	0	3.1	38
27	.6	.7	.2	.1	3	2.6	2.6	1.6	.4	*0	2.0	384
28	.6	.6	.2	.1	3	2.8	2.0	1.4	.2	0	1.8	99
29	.4	.5	.2	1	2.5	2.6	1.9	1.2	.2	0	1.6	75
30	.3	.4	.2	50	----------	2.4	1.9	1.1	.1	7.2	1.3	60
31	.3	----------	.2	10	----------	2.2	----------	.9	----------	1.9	1.1	----------
Total	7.4	15.1	12.5	67.1	91.0	84.6	85.1	44.0	33.2	11.4	594.7	1,741.2
Mean	0.24	0.50	0.40	2.16	3.14	2.73	2.84	1.42	1.11	0.37	19.2	58.0
Ac-ft	15	30	25	133	180	168	169	87	66	23	1,180	3,450

Calendar year 1963: Max 52 Min 0 Mean 1.25 Ac-ft 906
Water year 1963-64: Max 618 Min 0 Mean 7.62 Ac-ft 5,530

Peak discharge (base, 600 cfs)

Date	Time	Gage height	Discharge
8-24	2030	8.5	11,000
9-23	0800	6.63	6,050
9-27	0400	4.95	2,740

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
Note.--No gage-height record Nov. 22 to Dec. 1, Jan. 8 to Feb. 2, Feb. 20 to Mar. 10, May 5-11, 18-20.

8-2025. Seco Creek near D'Hanis, Tex.

Location.--Lat 29°29', long 99°23', on right bank a quarter of a mile downstream from concrete dam and road crossing at Valdina Farms, 2.8 miles upstream from Bartz Spring Creek, and 12.8 miles northwest of D'Hanis, Medina County.
Drainage area.--87.4 sq mi.
Records available.--August 1952 to October 1964 (discontinued).
Gage.--Water-stage recorder. Datum of gage is 1,142.8 ft above mean sea level (levels by Ground Water Branch).
Average discharge.--12 years, 9.68 cfs (7,010 acre-ft per year).
Extremes.--1963-64: Maximum discharge during water year, 7,320 cfs Aug. 24 (gage height, 8.9 ft, from floodmarks), from rating curve explained below; no flow most of time.

1964: Maximum peak discharge during October, 22 cfs Oct. 26 (gage height, 1.76 ft); a higher discharge and stage occurred at 0001 hrs, 25 cfs Oct. 1 (gage height not known), on a falling stage following a peak on Sept. 27, 1964; no flow Oct. 17-25, 29-31.

1952-64: Maximum discharge, 72,000 cfs June 17, 1958 (gage height, 20.8 ft, from floodmark), from rating curve defined by current-meter measurements below 250 cfs and slope-area measurements at 8,110 cfs and 72,000 cfs (adjusted to present site); no flow most of time.

Maximum stage since at least 1866, 26.2 ft in May 1935. Flood of Aug. 31, 1894, reached a stage about 10 ft lower than tnat of May 1935 and was second highest prior to June 17, 1958, from information by local residents.

Remarks.--Records fair. All of low flow of Seco Creek enters Edwards and associated limestones in the Balcones fault zone which crosses basin just north of Uvalde and above this station. No known diversion above station. This station is in reach where losses occur, therefore beginning December 1958 discharge measurements were made at Farm Road 1796 crossing 8.5 miles downstream from gage.

Discharge, in cubic feet per second, water year October 1963 to September 1964

June	16..... a21	Sept.	25..... *43
Aug.	24..... 355		26..... 34
	25..... 72		27..... 390
Sept.	22..... 194		28..... 72
	23..... 532		29..... a39
	24..... 95		30..... a27

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1964	21	21	0	0.7	42
August	427	355	0	13.8	847
September	1,426	532	0	47.5	2,830
Calendar year 1963	-	58	0	.23	167
Water year 1963-64	-	532	0	5.12	3,720

Peak discharge (base, 600 cfs)

Date	Time	Gage height	Discharge
8-24	2230	8.9	7,320
9-23	1000	7.7	5,270
9-27	0600	6.02	2,770

* Discharge measurement made on this day.
a No gage-height record.
Note.--Flow occurred only on days listed above.
Observations of no flow made on Oct. 21, Dec. 2, Jan. 6, Feb. 3, Mar. 13, Apr. 13, May 20, June 23, July 27, Sept. 1, 25; no gage-height record June 17.

Discharge, in cubic feet per second, October 1964

Oct.	1..... a22	Oct.	11..... 4.3
	2..... a19		12..... 3.6
	3..... a17		13..... 4.0
	4..... a15		14..... 2.2
	5..... a14		15..... .8
	6..... *13		16..... .1
	7..... 11		26..... 5.2
	8..... 9.2		27..... a5
	9..... 7.4		28..... .9
	10..... 5.8		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
October 1964	159.5	22	0	5.15	316

* Discharge measurement made on this day.
a No gage-height record.
Note.--Flow occurred only on days listed above. Observation of no flow made on Nov. 10, 1964.

8-2027. Seco Creek at Crook Ranch, near D'Hanis, Tex.

Location.--Lat 29°21'43", long 99°17'05", on left bank 2.9 miles north of D'Hanis, Medina County, and 8.0 miles downstream from Rocky Creek.
Drainage area.--168 sq mi.
Records available.--November 1960 to September 1964.
Gage.--Water-stage recorder. Datum of gage is 900.88 ft above mean sea level, datum of 1929, supplementary adjustment of 1960.
Extremes.--1960-61: Maximum discharge during period November to September, 2,940 cfs June 18 (gage height, 15.45 ft, from floodmark), from rating curve defined by current-meter measurements below 700 cfs and slope-area measurements at 1,250 and 35,800 cfs; no flow most of time.
1963-64: Maximum discharge during water year, 1,650 cfs Sept. 27 (gage height, 12.62 ft, from floodmarks); no flow most of time.
1960-64: Maximum discharge, that of June 18, 1961; no flow most of time.
Maximum stage since at least 1852, 35.7 ft, present site and datum, May 31, 1935, from information by local resident. Other floods occurred Aug. 31, 1894, 33 ft; September 1919, 28 ft; July 2, 1932, 28.2 ft (discharge, 35,800 cfs, by slope-area measurement); June 17, 1958, 32.4 ft; all at present site and datum.
Remarks.--Records good except those for periods of no gage-height record and those above 1,500 cfs, which are fair. Records for 1962-63 water years previously published. All of low flow of Seco Creek enters Edwards and associated limestones in the Balcones fault zone which crosses basin just north of Uvalde and upstream from station. No diversion above station.

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

6.5	0	7.2	17
6.6	.1	7.5	40
6.7	.5	7.8	76
6.8	1.7	8.0	110
6.9	3.6	8.5	220
7.0	6.6	9.0	360
7.1	11	12.0	1,410

Discharge, in cubic feet per second, November 1960 to September 1961

June 18	a1,240	July 21	0.2
19	124	22	.2
20	1.1	23	.2
21	.3	24	.3
22	.1		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1961	1,165.5	1,240	0	45.5	2,710
July	.9	.3	0	.03	1.8

Peak discharge (base, 600 cfs)

Date	Time	Gage height	Discharge
6-18	1430	15.45	2,940

a No gage-height record.
Note.--Flow occurred only on days listed above. Observations of no flow made on Oct. 6, Nov. 8, Dec. 8, Jan. 3, Feb. 6, Mar. 7, Apr. 6, May 8, June 5, July 11, 14, Aug. 22, Sept. 18; field estimate made on July 20; no gage-height record Nov. 1-7, July 3-13.

Discharge, in cubic feet per second, water year October 1963 to September 1964

June 16	*32	Sept. 25	1.1
17	1.6	26	.5
18	.2	27	*422
Aug. 25	a225	28	*43
26	a.4	29	3.8
Sept. 23	256	30	1.0
24	78		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1964	33.8	32	0	1.13	67
August	225.4	225	0	7.27	447
September	805.4	422	0	26.8	1,600
Calendar year 1963	-	0	0	0	0
Water year 1963-64	-	422	0	2.91	2,110

Peak discharge (base, 600 cfs)

Date	Time	Gage height	Discharge
8-25	0600	11.63	1,270
9-23	1500	12.2	1,490
9-27	1000	12.62	1,650

* Discharge measurement made on this day.
a No gage-height record.
Note.--Flow occurred only on days listed above. Observations of no flow made on Oct. 21, Dec. 2, Jan. 6, Feb. 5, Mar. 13, Apr. 13, May 22, 30, June 23, July 27, Aug. 25, Sept. 1, 15, 22; no gage-height record Aug. 27-31.

8-2040. Leona River spring flow near Uvalde, Tex.

Location.--Lat 29°09', long 99°44', on right bank at old road crossing on White's ranch, 3½ miles downstream from Cooks Slough and 4.6 miles southeast of Uvalde, Uvalde County.

Records available.--January 1939 to September 1964. Monthly discharge only for some periods published in WSP 1312. Occasional discharge measurements since 1925 in connection with seepage investigations.

Gage.--Water-stage recorder. Datum of gage is 838.39 ft above mean sea level, datum of 1929.

Average discharge.--25 years, 10.1 cfs (7,310 acre-ft per year).

Extremes.--Maximum daily spring discharge during year, 0.5 cfs Oct. 11, Dec. 23-25, Dec. 27 to Jan. 2; maximum gage height, 10.05 ft Sept. 27 (result of surface flow); no spring flow Jan. 27 to Sept. 30.
1939-64: Maximum daily spring discharge, 42 cfs Mar. 15-20, 1962; maximum gage height, 18.42 ft Aug. 31, 1953 (from floodmark, result of surface flow); no flow at times in 1948-49, 1951-59, 1964.

Remarks.--Records good. Discharge represents flow from several springs that enter river above station and below Uvalde. Surface runoff from precipitation is excluded. No known diversion above station.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	0.2	0.3	0.5								
2	.4	.2	.4	.5								(*)
3	.4	.2	.4	*.4								
4	.4	.3	.4	.4	(*)							
5	.4	.2	.4	.4								
6	.4	.2	.4	.4								
7	.4	.2	.4	.4								
8	.4	.4	.4	.4								
9	.4	.4	.4	.3								
10	.4	.4	.4	.3								
11	.5	.3	.4	.4								
12	.4	.3	.4	.4		(*)						
13	.4	.3	.4	.3		(*)	(*)					
14	.4	.2	.4	.3								
15	.4	.3	.4	.4								
16	.3	.3	.4	.4								
17	.3	.3	.4	.4								
18	.2	.4	.4	.4								
19	.2	.4	.4	.4				(*)				
20	.2	.4	.4	.4								
21	**.2	.4	.4	.4								
22	.2	.3	.4	.4								(e)
23	.3	.2	.5	.4					(*)			(e)
24	.3	.2	.5	.2								(e)
25	.3	.3	.5	.1								(e)
26	.3	*.4	.4	.2								(e)
27	.3	.4	.5	0								(e)
28	.3	.4	.5	0						(*)		(e)
29	.3	.3	.5	0								(e)
30	.3	.2	.5	0								(e)
31	.3	----------	.5	0	----------		----------		----------			----------
Total	10.4	9.0	13.1	9.5	0	0	0	0	0	0	0	0
Mean	0.34	0.30	0.42	0.31	0	0	0	0	0	0	0	0
Ac-ft	21	18	26	19	0	0	0	0	0	0	0	0

Calendar year 1963: Max 15 Min 0.2 Mean 3.89 Ac-ft 2,820
Water year 1963-64: Max 0.5 Min 0 Mean 0.11 Ac-ft 84

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
e Gage height not representative of spring flow.

8-2055. Frio River near Derby, Tex.

Location.--Lat 28°44'10", long 99°08'45", near center of span at downstream side of pier of bridge on U. S. Highway 81, 150 ft upstream from Missouri Pacific Railroad Co. bridge, 750 ft downstream from Leona River, and 2.4 miles south of Derby, Frio County.
Drainage area.--3,493 sq mi.
Records available.--August 1915 to September 1964.
Gage.--Water-stage-recorder and concrete control. Datum of gage is 449.11 ft above mean sea level, datum of 1929, supplementary adjustment of 1960. Aug. 1, 1915, to Apr. 21, 1931, staff gage and Apr. 22, 1931, to Mar. 6, 1940, water-stage recorder at railroad bridge 150 ft downstream at same datum.
Average discharge.--49 years, 128 cfs (92,670 acre-ft per year).
Extremes.--Maximum discharge during year, 2,530 cfs Sept. 29 (gage height, 7.78 ft); no flow most of time.
1915-64: Maximum discharge, 230,000 cfs July 4, 1932 (gage height, 29.45 ft, present site, from flood-marks at former site), from rating curve defined by current-meter measurements below 46,000 cfs and slope-area measurement of peak flow; no flow at times.
Maximum stage since at least 1860, that of July 4, 1932.
Remarks.--Records fair. Part of flow of Frio River and its headwater tributaries enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde. At low-stages most of headwater flow enters this formation. Considerable losses of floodflows into various permeable formations occur downstream from the Balcones fault zone. Many diversions for irrigation above station.
Revisions.--Revised figures of discharge, in cubic feet per second, for the periods June 26-29, 1954, superseding previously published figures, are given herewith:

1954	
June 26	4.8
27	4.6
28	.3
29	.1

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1954	42.6	20	0	1.42	85
Calendar year 1954	9,814.4	4,580	0	26.9	19,470
Water year 1953-54	13,846.5	4,580	0	37.9	27,460

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						0	0	7.9	*0			0
2						0	0	1.8	0			0
3						0	0	0	0			0
4		(*)				0	0	0	0			0
5						0	0	1.7	0			0
6						0	0	1.8	0			0
7						0	0	.3	0	(*)		0
8						0	0	0	0			0
9			(*)			0	0	0	0			0
10						0	0	0	0		(*)	0
11						0	0	0	0			0
12						0	0	0	0			0
13				(*)		0	0	0	0			0
14						0	0	0	0			*0
15						0	0	0	0			0
16						0	0	0	0			0
17						0	0	0	*978			0
18					(*)	0	0	0	1,600			0
19						0	0	0	*211			0
20						112	0	0	54			0
21						*66	0	0	21			0
22						33	0	0	8.6			0
23						*36	0	0	2.2			0
24						16	0	0	.3			0
25						5.1	0	0	0			0
26						.5	0	0	0			78
27						*0	0	0	0			35
28						0	*17	0	0			270
29						0	17	0	0			2,000
30					----------	0	7.7	0	0			1,090
31		----------			----------	0	----------	0	----------			----------
Total	0	0	0	0	0	268.6	41.7	13.5	2,875.1	0	0	3,473
Mean	0	0	0	0	0	8.66	1.39	0.44	95.8	0	0	116
Ac-ft	0	0	0	0	0	533	83	27	5,700	0	0	6,890

Calendar year 1963: Max 606 Min 0 Mean 4.35 Ac-ft 3,150
Water year 1963-64: Max 2,000 Min 0 Mean 18.2 Ac-ft 13,230

Peak discharge (base, 1,100 cfs)

Date	Time	Gage height	Discharge
6-18	0430	7.54	2,300
9-29	1900	7.78	2,530

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

8-2067. San Miguel Creek near Tilden, Tex.

Location.--Lat 28°35'15", long 98°33'00", on left bank 25 ft downstream from State Highway 173, 3 miles upstream from mouth of San Patricio Creek, 7 miles downstream from Clear Creek, 9 miles north of Tilden, McMullen County, and 12 miles upstream from mouth.

Drainage area.--793 sq mi.

Records available.--January to September 1964.

Gage.--Water-stage recorder. Datum of gage is 242.95 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during period, 1,250 cfs Aug. 23 (gage height, 10.20 ft); no flow most of time. Maximum stage since 1919, 32.6 ft in 1942; stage of 1919 flood not known, from information by local residents.

Records.--Records good except those for Mar. 19-22, which are fair. Five diversions above station, amounts unknown. At times excess water from Bexar-Medina-Atascosa Counties Water Improvement District No. 1 system enters San Miguel Creek basin via Chacon Creek, amounts unknown.

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

2.1	0	2.6	10
2.2	.3	2.8	22
2.3	1.2	3.0	36
2.4	3.4	4.0	119
2.5	6.2	6.0	380

Discharge, in cubic feet per second, January to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				-	0	0	0.2	0	0	0	0	0
2				-	0	0	.1	30	3.9	0	0	0
3				-	4.8	0	0	4.0	11	0	0	0
4				-	3.6	0	0	.8	*5.0	0	0	0
5				-	** .2	0	0	.1	20	0	0	0
6				-	.1	0	0	0	85	0	0	0
7				-	0	0	0	0	17	*0	0	0
8				-	0	0	0	0	6.2	0	*0	0
9				-	0	0	0	0	2.6	0	42	0
10				-	0	0	0	0	.2	0	2.3	0
11				-	0	0	0	*0	0	0	.1	0
12				-	0	0	0	0	0	0	*0	0
13				-	0	0	0	0	0	0	0	0
14				-	0	0	0	0	0	0	0	*0
15				-	0	0	0	0	0	0	0	0
16				-	0	0	0	0	0	0	0	5.5
17				-	0	0	.4	0	0	0	0	7.6
18				-	0	2.3	0	0	0	0	0	1.4
19				-	0	a 90	0	0	*0	0	0	.4
20				-	*0	19	0	5.9	0	0	0	.2
21				-	3.2	a 150	0	.8	0	0	0	3.6
22				-	.2	a 80	0	.1	0	0	0	15
23				-	0	34	0	31	0	0	244	1.0
24				-	0	18	0	62	0	0	*344	.2
25				*a 2	0	*10	0	6.5	0	0	*40	**36
26				.8	0	5.9	0	3.7	0	0	8.2	113
27				.4	0	3.6	0	.2	0	0	2.8	23
28				.1	0	1.8	0	0	0	0	.9	24
29				.1	0	.9	*0	0	0	11	.3	196
30				2.1	----------	.5	0	0	0	.9	.1	261
31		----------		.1	----------	.2	----------	0	----------	0	0	----------
Total				-	12.1	416.2	0.7	145.1	150.9	11.9	684.7	687.9
Mean				-	0.42	13.4	0.02	4.68	5.03	0.38	22.1	22.9
Ac-ft				-	24	826	1.4	288	299	24	1,360	1,360

Water year 1963-64: Max - Min - Mean - Ac-ft -

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
a No gage-height record.

8-2070. Frio River at Calliham, Tex.

Location.--Lat 28°29'30", long 98°20'45", on right bank at upstream side of county bridge, 0.5 mile upstream from bridge on Farm Road 99, 1 mile north of Calliham, McMullen County, and 10.4 miles downstream from San Miguel Creek.

Drainage area.--5,491 sq mi.

Records available.--October 1924 to April 1926 (monthly discharge only), April 1932 to September 1964.

Gage.--Water-stage recorder and concrete control. Datum of gage is 153.47 ft above mean sea level, datum of 1929. Prior to Apr. 30, 1926, staff gage at present site and datum.

Average discharge.--33 years (1924-25, 1932-64), 231 cfs (167,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,030 cfs Nov. 10 (gage height, 8.52 ft); no flow at times.
1924-26, 1932-64: Maximum discharge, 70,000 cfs July 6, 1932 (gage height, 39.2 ft, from floodmarks), from rating curve defined by current-meter measurements below 16,000 cfs; no flow at times.
Maximum stage since at least 1870, that of July 6, 1932, from information by local resident.

Remarks.--Records good. Part of flow of Frio River and its headwater tributaries enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde. At low stages most of headwater flow enters this formation. Considerable losses of floodflows into various permeable formations occur downstream from the Balcones fault zone. Many diversions above station for irrigation.

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

2.5	0	3.2	41
2.6	.2	3.5	104
2.7	1.6	4.0	224
2.8	4.9	5.0	426
2.9	10	5.8	938
3.0	18		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	8.6	2.1	0.6	0.9	0.3	8.6	0	2.1	4.1	5.6	1.6
2	*.1	5.4	1.1	.5	.6	.3	6.9	0	12	2.7	1.4	.9
3	0	3.4	.6	.7	.6	.2	5.4	0	9.8	1.4	.3	.5
4	0	2.4	.5	.3	.6	.5	3.4	0	*8.0	.9	.1	.3
5	0	*1.6	.5	.3	.4	.6	2.7	0	4.9	.6	0	.2
6	0	.9	1.4	.3	.3	.3	1.6	0	56	.3	0	.1
7	0	.4	1.6	.4	.3	.2	1.4	0	80	**.1	0	0
8	0	.2	.9	.5	.2	.1	.9	0	29	0	*0	59
9	0	93	.6	.5	.2	.1	.6	0	20	0	176	29
10	0	805	** .6	.4	.2	.1	.5	0	9.8	0	270	2.6
11	0	206	.5	.3	.3	.1	.4	0	5.4	0	176	.7
12	0	80	.5	.3	.3	.1	.3	0	3.0	0	*90	.5
13	0	31	70	.2	.3	.1	.2	0	1.6	0	39	.2
14	0	13	587	**.2	.3	.1	.2	0	.7	0	20	**.1
15	0	6.9	190	.3	.3	.1	.1	0	.4	0	12	0
16	0	5.4	114	.5	.2	0	.1	0	.2	0	7.4	0
17	0	3.7	53	.5	.2	0	.1	0	.1	0	4.1	*0
18	0	2.4	28	1.6	.2	1.2	0	0	0	0	3.4	0
19	0	1.8	15	1.1	**.2	45	0	0	0	0	2.4	0
20	0	1.1	9.2	.7	.2	98	0	0	0	0	1.1	0
21	0	.7	6.4	.6	.7	77	0	0	204	0	.6	0
22	0	.6	4.5	.5	.5	243	0	0	602	0	.3	.3
23	0	.4	3.0	.5	.3	72	0	11	385	0	19	3.5
24	0	.2	2.4	.5	.5	39	0	89	76	0	398	11
25	0	.1	2.1	.7	.5	23	0	63	67	0	437	9.2
26	0	.1	1.6	1.6	.4	*14	0	33	63	0	68	67
27	208	8.5	1.4	1.1	.4	9.8	0	29	16	0	27	77
28	65	20	.9	.9	.4	7.4	0	16	11	0	14	24
29	51	6.9	.7	.7	.4	5.4	*0	8.0	8.0	0	7.4	66
30	28	3.4	.7	1.6	----------	3.7	0	4.5	5.4	148	3.7	255
31	15	----------	.5	2.7	----------	7.5	----------	3.4	----------	31	2.7	----------
Total	367.2	1,313.1	1,101.3	21.6	10.9	649.2	33.4	256.9	1,680.4	189.1	1,786.5	608.7
Mean	11.8	43.8	35.5	0.70	0.38	20.9	1.11	8.29	56.0	6.10	57.6	20.3
Ac-ft	728	2,600	2,180	43	22	1,290	66	510	3,330	375	3,540	1,210

Calendar year 1963: Max 2,410 Min 0 Mean 43.0 Ac-ft 31,110
Water year 1963-64: Max 805 Min 0 Mean 21.9 Ac-ft 15,890

Peak discharge (base, 2,700 cfs).--No peak above base.

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

8-2080. Atascosa River at Whitsett, Tex.

Location.--Lat 28°37'20", long 98°17'05", on right bank 1,400 ft upstream from bridge on Farm Road 99, 1.2 miles west of Whitsett, Live Oak County, and 3.8 miles downstream from LaParita Creek.

Drainage area.--1,171 sq mi.

Records available.--September 1924 to May 1926, May 1932 to September 1964.

Gage.--Water-stage recorder and artificial control. Datum of gage is 159.04 ft above mean sea level, datum of 1929. Prior to May 8, 1926, chain gage at bridge 1,600 ft downstream at datum 1.38 ft higher.

Average discharge.--33 years (1924-25, 1932-64), 126 cfs (91,220 acre-ft per year).

Extremes.--Maximum discharge during year, 1,240 cfs Aug. 24 (gage height, 15.82 ft); no flow for many days. 1924-26, 1932-64: Maximum discharge, 39,300 cfs July 7, 1942 (gage height, 38.3 ft, from floodmark), from rating curve defined by current-meter measurements below 12,000 cfs and slope-area measurement at 38,300 cfs; no flow at times.
Maximum stage since at least 1881, 41 ft in September 1919 (discharge, 50,000 cfs).

Remarks.--Records good. Considerable losses of floodflows into various permeable formations occur upstream from station. Records of the Lower Nueces River Water Supply District indicate that the city of Campbellton allows about 0.1 cfs to flow continuously from well No. 3 and that during the periods June 24-27 and July 21-24 about 6 and 8½ cfs, respectively, were discharged from several artesian wells into the Atascosa River upstream from this station at the request of ranchers for stock water. Small diversions above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1-25)

3.4	0	4.5	28
3.5	.2	5.0	53
3.6	.7	6.0	112
3.7	1.6	9.0	353
3.8	3.2	13.0	810
3.9	5.3	14.0	950
4.0	8.3		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	4.0	16	5.0	29	7.3	4.2	12	4.6	0.8	30	4.2
2	**.1	2.2	9.4	5.0	18	7.3	4.2	11	11	.5	12	3.4
3	.1	1.3	6.1	5.0	14	11	4.0	7.6	*14	.3	5.6	2.5
4	.1	1.1	4.6	5.0	96	14	4.0	7.0	10	.1	2.5	1.9
5	.1	.9	4.0	5.0	216	15	4.0	9.0	6.1	.1	1.3	1.8
6	0	.8	3.6	5.0	49	11	4.0	7.0	3.8	0	.8	1.5
7	0	*.7	3.4	5.0	23	8.6	4.0	5.6	2.2	0	.7	1.3
8	0	.8	4.0	5.0	14	7.0	3.6	5.0	1.6	*0	85	1.2
9	.1	9.2	4.0	5.0	9.7	5.8	3.4	4.4	1.1	0	571	1.2
10	.1	264	4.4	5.0	8.0	5.3	3.2	4.2	.8	0	758	1.2
11	0	295	*4.2	5.0	7.0	4.6	2.8	4.2	.6	0	42	1.2
12	.1	54	4.2	5.0	6.1	4.2	2.8	4.0	.4	0	*23	1.1
13	.1	28	52	4.8	5.6	4.4	2.6	3.2	.3	0	14	1.0
14	.1	16	582	*4.8	5.0	4.4	2.5	2.2	.2	0	10	*.8
15	0	11	449	5.8	4.8	3.8	2.4	2.1	.1	0	6.7	.8
16	.1	8.3	86	8.0	4.6	3.8	2.4	1.8	.2	0	5.3	1.2
17	0	6.7	34	9.7	4.2	3.8	3.4	1.6	.2	0	4.2	1.3
18	0	5.6	22	9.0	4.2	4.1	7.6	1.2	.1	0	3.4	1.6
19	.1	4.8	15	10	*4.0	19	10	.9	.1	0	2.5	1.8
20	.1	4.4	12	9.7	3.8	81	9.0	.8	0	0	2.1	2.1
21	.1	4.2	10	8.0	6.8	74	5.3	2.0	0	0	1.6	3.6
22	.3	4.8	8.6	6.7	18	30	3.8	19	0	.1	1.7	3.2
23	.4	4.2	7.6	6.1	16	19	3.2	16	0	5.0	53	2.2
24	.3	2.8	6.4	5.8	14	15	3.2	15	0	5.3	903	1.6
25	.3	2.4	6.1	6.1	12	13	2.6	14	5.1	2.1	480	2.6
26	.9	2.2	5.8	5.8	9.4	*9.0	2.4	18	28	.2	72	2.5
27	11	6.0	5.8	5.8	9.0	7.3	25	20	9.0	0	30	5.1
28	44	81	5.8	5.6	9.0	6.4	79	27	3.6	0	17	13
29	24	73	5.3	5.3	7.6	5.6	26	21	3.0	0	11	9.7
30	7.6	28	5.0	7.3	----------	4.6	*15	11	2.2	.9	6.7	7.3
31	6.7	----------	5.0	22	----------	4.4	----------	6.7	----------	212	5.0	----------
Total	96.8	927.4	1,391.3	206.3	627.8	413.7	249.6	264.5	108.3	227.4	3,161.1	83.9
Mean	3.12	30.9	44.9	6.65	21.6	13.3	8.32	8.53	3.61	7.34	102	2.80
Ac-ft	192	1,840	2,760	409	1,250	821	495	525	215	451	6,270	166

Calendar year 1963: Max 632 Min 0 Mean 17.1 Ac-ft 12,370
Water year 1963-64: Max 903 Min 0 Mean 21.2 Ac-ft 15,390

Peak discharge (base, 1,500 cfs).--No peak above base.

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

8-2100. Nueces River near Three Rivers, Tex.

Location.--Lat 28°26'10", long 98°11'10", on left bank 100 ft downstream from San Antonio, Uvalde & Gulf (Missouri Pacific) Railroad bridge, half a mile downstream from Frio River, and 2 miles south of Three Rivers, Live Oak County.
Drainage area.--15,600 sq mi.
Records available.--July 1915 to September 1964. Monthly discharge only for November 1919 to January 1920, published in WSP 1312.
Gage.--Water-stage recorder and concrete control. Datum of gage is 101.13 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943. Prior to Apr. 5, 1932, staff gage at railroad bridge 100 ft upstream at same datum.
Average discharge.--49 years, 812 cfs (587,900 acre-ft per year).
Extremes.--Maximum discharge during year, 21,200 cfs Sept. 24 (gage height, 39.19 ft); no flow for several days. 1915-64: Maximum discharge observed, 85,000 cfs Sept. 18, 1919 (gage height, 46.0 ft), from rating curve defined by current-meter measurements below 55,000 cfs; no flow at times.
Maximum stage since about 1875, that of Sept. 18, 1919.
Remarks.--Records good. Part of flow of Nueces and Frio Rivers and their headwater tributaries enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde. At low stages, most of headwater flow enters this formation. Considerable losses of floodflows into various permeable formations occur downstream from the Balcones fault zone. Diversions above station for irrigation and municipal supply. Records of the Lower Nueces River Water Supply District indicate that the city of Campbellton allows about 0.1 cfs to flow continuously from well No. 3 and that during the periods June 24-27 and July 21-24 about 6 and 8½ cfs, respectively, were discharged from several artesian wells into the Atascosa River upstream from this station at the request of ranchers for stock water.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 5-10, Sept. 23-26)

1.1	0	2.5	77	25.0	5,800
1.2	.5	3.0	134	30.0	8,220
1.3	1.8	5.0	395	35.0	13,400
1.5	6.2	10.0	1,320	38.0	19,800
1.8	16	15.0	2,550	38.2	20,500
2.1	33	20.0	4,050		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.7	20	62	6.0	37	9.0	9.3	62	88	6.0	138	880
2	*1.8	46	75	5.8	32	9.3	12	34	86	3.5	32	1,060
3	.9	94	45	5.5	20	9.3	10	29	*73	1.8	11	1,240
4	.3	67	25	5.5	50	12	8.7	18	112	.8	4.8	1,420
5	0	*46	16	5.5	211	15	7.6	9.6	86	.2	1.7	1,080
6	0	31	11	5.5	121	15	6.2	9.0	59	.1	.2	126
7	0	21	8.4	5.3	44	12	5.5	6.8	93	*0	0	62
8	0	14	6.0	5.3	23	9.6	4.6	4.8	62	0	380	40
9	0	991	6.5	5.3	13	7.9	4.0	3.7	39	0	2,300	117
10	0	2,160	*7.3	5.1	9.3	5.8	3.3	3.1	24	0	2,290	52
11	0	1,060	6.2	5.1	7.9	5.3	2.9	14	13	0	*1,330	70
12	0	313	6.2	4.8	6.8	5.1	2.7	10	7.0	0	252	67
13	0	114	75	4.6	6.0	4.4	2.7	4.4	4.0	0	170	38
14	0	67	772	*4.6	5.1	4.4	2.5	2.7	1.8	0	95	31
15	0	40	1,120	6.0	4.8	4.2	2.3	1.6	1.0	0	57	*578
16	0	27	389	9.0	4.4	4.2	1.8	1.0	.7	0	34	950
17	0	19	134	7.9	4.4	4.0	1.8	.8	.3	0	18	1,160
18	0	14	80	9.0	4.2	4.4	2.1	.7	.2	0	9.6	1,300
19	0	12	54	9.6	*4.0	249	5.5	.4	.1	.1	5.8	1,420
20	0	10	38	11	3.7	245	9.3	13	.1	.2	3.5	*1,460
21	0	8.4	28	11	5.3	212	7.6	49	0	0	1.8	1,540
22	.9	7.0	21	8.7	7.4	214	5.3	20	324	0	1.0	2,730
23	29	5.3	16	7.6	21	155	3.5	45	521	0	67	12,200
24	30	5.3	13	6.8	20	99	2.7	61	153	0	423	*20,300
25	46	4.4	11	5.8	18	*84	1.8	463	73	0	1,850	19,200
26	30	3.3	10	5.8	17	54	1.7	618	87	0	762	15,100
27	78	821	9.0	5.5	12	34	1.4	306	53	0	395	10,600
28	203	2,190	8.2	5.5	11	24	52	150	23	0	365	6,980
29	94	333	7.6	6.2	10	17	58	98	13	0	502	4,450
30	68	96	7.0	9.3	----------	13	*24	70	7.9	0	618	2,770
31	33	----------	6.2	17	----------	9.6	----------	67	----------	123	725	----------
Total	617.6	8,639.7	3,073.6	215.6	733.3	1,550.5	262.8	2,175.6	2,005.1	135.7	12,842.4	109,021
Mean	19.9	288	99.1	6.95	25.3	50.0	8.76	70.2	66.8	4.38	414	3,634
Ac-ft	1,220	17,140	6,100	428	1,450	3,080	521	4,320	3,980	269	25,470	216,200

Calendar year 1963: Max 12,400 Min 0 Mean 228 Ac-ft 165,300
Water year 1963-64: Max 20,300 Min 0 Mean 386 Ac-ft 280,200

Peak discharge (base, 6,000 cfs)

Date	Time	Gage height	Discharge
9-24	1900	39.19	21,200

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

8-2105. Lake Corpus Christi near Mathis, Tex.

Location.--Lat 28°02'17", long 97°52'15", on right upstream corner of outlet tower at right end of Wesley E. Seale Dam, 0.6 mile upstream from bridge on State Highway 359, and 4½ miles southwest of Mathis, San Patricio County.
Drainage area.--16,656 sq mi.
Records available.--September 1948 to September 1964. The Soil Conservation Service, U. S. Department of Agriculture, in cooperation with Texas Board of Water Engineers (now Texas Water Commission), collected fragmentary gage-height records in connection with sedimentation studies from Feb. 2, 1942, to July 10, 1947.
Gage.--Wire-weight gage read once daily. Datum of gage is mean sea level, datum of 1929. Prior to Sept. 10, 1948, a painted gage on left side of first buttress wall of left tainter gate of Mathis Dam 0.2 mile upstream at datum 0.52 ft higher. Sept. 10, 1948, to Sept. 30, 1957, wire-weight gage near left end of Mathis Dam 0.2 mile upstream at datum 0.52 ft higher. Oct. 1, 1957, to Apr. 3, 1961, wire-weight gage near left end of Mathis Dam 0.2 mile upstream at present datum.
Extremes.--Maximum contents observed during year, 253,800 acre-ft Sept. 30 (elevation, 91.67 ft); minimum contents observed, 79,200 acre-ft Aug. 7-9; minimum elevation observed, 79.77 ft Aug. 8.
1948-64: Maximum contents observed, that of Sept. 30, 1964; minimum contents observed, 14,740 acre-ft May 5, 1951 (elevation, 67.62 ft).
Revisions.--Figure of maximum gage height observed for the water year 1953 has been revised to 76.56 ft Sept. 9, 1953; figures of maximum contents observed for the water year 1957 has been revised to 54,960 acre-ft May 6, 1957 (gage height, 76.68 ft); superseding figures previously published.
Remarks.--Mathis Dam completed and storage began July 24, 1934. The original capacity at spillway crest (elevation, 74.5 ft) of 54,000 acre-ft had decreased to 39,400 acre-ft by March 1948. Mathis Dam was submerged by Wesley E. Seale Dam which was completed Apr. 26, 1958.
Wesley E. Seale Dam is a rolled-fill earthen dam, 5,930 ft long, with two service spillways. The north spillway is 1,320 ft long and the south spillway 1,080 ft long. Elevation of top of both spillways, 88.0 ft (capacity, 185,900 acre-ft). Spillways equipped with 33 and 27 Ambursen type gates, respectively, which are 37.5 ft wide and 6 ft high which when closed raises the elevation of the lake to 94.0 ft (capacity, 302,100 acre-ft). Gates on north spillway have been in position since construction of dam but those on south spillway were bolted down to spillway elevation until July 1964 when they were raised. Water for municipal supply for city of Corpus Christi is released through 5.0-foot diameter cylinder valve and three rectangular openings 2½ by 4 ft (invert elevation, 55.5 ft, capacity, 140 acre-ft).
Cooperation.--Capacity curve, from a June 1956 survey, prepared by Reagan & McCaughan, Consulting Engineers. Elevation record furnished by city of Corpus Christi.

Capacity table (elevation, in feet, and contents, in acre-feet)

79.0	72,040	88.0	185,900
82.0	101,600	91.0	240,000
85.0	139,700	92.0	259,800

Contents, in acre-feet, at 0700 hours, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	118,300	108,500	128,700	126,000	122,100	118,300	113,300	102,700	100,500	89,820	81,980	89,820
2	118,300	108,500	128,700	126,000	122,100	118,300	113,300	102,700	100,500	89,820	81,980	91,880
3	117,000	108,500	127,300	126,000	122,100	118,300	113,300	101,600	99,400	89,820	81,040	92,920
4	117,000	108,500	127,300	126,000	122,100	117,000	113,300	101,600	99,400	88,800	81,040	95,040
5	117,000	107,300	127,300	126,000	122,100	117,000	113,300	101,600	99,400	88,800	80,120	96,120
6	115,800	107,300	127,300	126,000	122,100	117,000	113,300	101,600	99,400	88,800	80,120	99,400
7	115,800	107,300	127,300	126,000	122,100	117,000	112,100	101,600	98,300	87,800	79,200	99,400
8	115,800	107,300	126,000	124,700	120,800	115,800	112,100	100,500	98,300	86,800	79,200	98,300
9	114,500	107,300	126,000	124,700	120,800	115,800	110,900	100,500	98,300	86,800	79,200	99,400
10	114,500	109,700	126,000	124,700	120,800	115,800	110,900	99,400	97,200	85,820	82,920	99,400
11	114,500	113,300	126,000	124,700	120,800	115,800	110,900	99,400	97,200	85,820	85,820	98,300
12	113,300	115,800	124,700	123,400	120,800	115,800	109,700	99,400	97,200	84,840	88,800	98,300
13	113,300	118,300	124,700	123,400	120,800	114,500	109,700	99,400	97,200	84,840	88,800	98,300
14	113,300	120,800	124,700	123,400	120,800	114,500	109,700	99,400	96,120	83,880	88,800	97,200
15	113,300	120,800	126,000	123,400	119,500	114,500	109,700	98,300	96,120	83,880	88,800	97,200
16	112,100	120,800	128,700	123,400	119,500	114,500	108,500	98,300	95,040	82,920	88,800	97,200
17	112,100	120,800	130,000	124,700	119,500	113,300	108,500	97,200	95,040	82,920	87,800	101,600
18	110,900	120,800	130,000	123,400	119,500	113,300	108,500	97,200	95,040	82,920	86,800	103,900
19	110,900	119,500	130,000	123,400	119,500	113,300	107,300	96,120	93,980	83,880	86,800	106,200
20	110,900	119,500	130,000	123,400	118,300	114,500	107,300	96,120	93,980	85,820	85,820	107,300
21	110,900	119,500	130,000	123,400	118,300	114,500	106,200	96,120	92,920	85,820	85,820	110,900
22	109,700	119,500	130,000	123,400	118,300	115,800	106,200	97,200	92,920	85,820	84,840	113,300
23	109,700	118,300	128,700	123,400	118,300	115,800	106,200	97,200	91,880	84,840	84,840	115,800
24	109,700	118,300	128,700	123,400	118,300	115,800	106,200	97,200	91,880	84,840	84,840	124,700
25	109,700	118,300	128,700	123,400	118,300	115,800	105,000	97,200	91,880	83,880	84,840	139,700
26	109,700	118,300	128,700	122,100	118,300	115,800	105,000	99,400	91,880	83,880	85,820	163,300
27	109,700	118,300	128,700	122,100	118,300	115,800	105,000	100,500	91,880	83,880	86,800	192,700
28	109,700	120,800	128,700	122,100	118,300	115,800	103,900	100,500	91,880	82,920	87,800	221,100
29	109,700	123,400	128,700	122,100	118,300	114,500	103,900	100,500	91,880	82,920	88,800	240,000
30	109,700	126,000	127,300	120,800	----------	114,500	103,900	100,500	90,840	82,920	88,800	253,800
31	109,700	----------	127,300	122,100	----------	114,500	----------	100,500	----------	81,980	89,820	----------
(†)	82.66	-	-	83.71	83.38	83.08	-	81.90	81.03	80.12	80.88	91.67
(‡)	-9,800	+16,300	+1,300	-5,200	-3,800	-3,800	-10,600	-3,400	-9,660	-8,860	+7,840	+163,980

Calendar year 1963..... ‡ +23,400
Water year 1963-64..... ‡ +134,300

† Elevation, in feet, at end of month.
‡ Change in contents, in acre-feet.
Note.--No elevation record Oct. 2, 5-8, 17, 28-29, Nov. 1-2, 5, 9-13, 23-24, 26-30, Dec. 3-4, 8, 12-15, 19, 21-23, 27, 30-31, Jan. 4, 9, 12-13, 16, 20, Feb. 4-5, 7-8, 13, 15, 18, 21-22, 27-28, Mar. 4, 8-9, 15, 21, 26, 28-29, Apr. 3, 8-9, 30, May 12, 30, June 1, 5, 25-26, July 18, Aug. 15, Sept. 13.

8-2110. Nueces River near Mathis, Tex.

Location.--Lat 28°02'17", long 97°51'36", on left bank 6 ft downstream from pier of bridge on State Highway 359, 200 ft downstream from Texas and New Orleans Railroad Co. bridge, 0.6 mile downstream from Wesley E. Seale Dam, and 4 miles southwest of Mathis, San Patricio County.

Drainage area.--16,660 sq mi.

Records available.--August 1939 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 27.53 ft above mean sea level, datum of 1929.

Average discharge.--25 years, 773 cfs (559,600 acre-ft per year).

Extremes.--Maximum discharge during year, 405 cfs June 18; maximum gage height, 16.43 ft Sept. 16 (backwater from Six Mile and Bayou Creeks); minimum discharge, 29 cfs Jan. 29.
1939-64: Maximum discharge, 49,400 cfs July 12, 1942 (gage height, 37.38 ft); minimum daily, 6.8 cfs Aug. 15, 1940.
Maximum stage since at least 1888, about 40 ft about Sept. 20, 1919 (discharge, about 59,000 cfs), from information by Texas and New Orleans Railroad Co.

Remarks.--Records fair. Flow largely regulated by Lake Corpus Christi (see preceding page). Diversions above station for irrigation. Water for municipal and industrial use at Corpus Christi is released from Lake Corpus Christi above gage and is diverted from river at Calallen 36 miles downstream. Records of chemical analyses and water temperature for the water year 1964 are available in the Austin District Office.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*126	83	80	69	69	94	100	73	80	137	140	272
2	127	83	85	69	75	69	94	143	*94	189	140	199
3	128	83	85	75	68	69	91	115	84	143	139	199
4	126	83	85	85	58	75	83	111	68	130	131	179
5	127	83	82	85	58	108	85	101	62	136	179	158
6	127	83	79	85	58	69	91	74	131	131	152	158
7	137	*84	79	87	56	64	149	74	145	170	153	179
8	145	84	79	82	62	75	96	109	76	*143	131	156
9	*145	84	75	69	68	89	91	124	78	204	117	106
10	117	84	*71	69	71	87	157	126	150	144	192	108
11	78	85	73	74	79	126	102	108	146	139	*156	140
12	93	85	74	76	79	85	71	92	147	139	152	160
13	100	87	75	76	69	64	134	117	92	126	150	106
14	100	85	74	*95	60	60	94	156	100	117	166	105
15	89	85	74	80	70	64	88	166	68	132	172	*110
16	85	85	73	71	79	120	145	132	60	158	213	c101
17	136	85	68	67	79	74	96	186	65	143	172	c62
18	111	94	71	74	79	74	94	136	190	91	166	58
19	105	102	71	78	*113	71	98	134	183	45	145	62
20	105	101	71	78	75	71	147	91	109	43	140	63
21	111	101	71	78	63	85	109	55	108	71	186	65
22	105	91	71	79	58	92	109	60	153	87	146	65
23	101	83	89	69	60	89	106	68	248	92	145	68
24	93	83	82	62	70	87	88	62	213	110	106	70
25	85	83	75	73	65	*89	124	58	220	96	154	74
26	85	83	70	79	60	85	135	59	248	104	132	83
27	85	84	69	80	60	78	115	118	241	145	199	88
28	84	84	69	78	61	82	150	78	136	213	145	89
29	83	70	70	73	67	87	*127	76	118	220	152	93
30	83	64	69	67	----------	85	97	122	164	165	213	96
31	83	----------	69	56	----------	96	----------	80	----------	150	192	----------
Total	3,305	2,554	2,328	2,338	1,989	2,563	3,266	3,204	3,977	4,113	4,876	3,472
Mean	107	85.1	75.1	75.4	68.6	82.7	109	103	133	133	157	116
Ac-ft	6,560	5,070	4,620	4,640	3,950	5,080	6,480	6,360	7,890	8,160	9,670	6,890

Calendar year 1963: Max 234 Min 49 Mean 110 Ac-ft 79,900
Water year 1963-64: Max 272 Min 43 Mean 104 Ac-ft 75,370

* Discharge measurement made on this day.
c Backwater from Six Mile and Bayou Creeks.
Note.--Discharge computed from once- or twice-daily staff gage readings and records of gate opening at Mathis Dam Oct. 18 to Nov. 6, Mar. 29 to Apr. 28.

8-2118. San Diego Creek at Alice, Tex.

Location.--Lat 27°45'59", long 98°04'31", at bridge on Edith Drive, Alice, Jim Wells County, 540 ft downstream from Texas and New Orleans Railroad Co. bridge, and 3.2 miles upstream from confluence with Chiltipin Creek.

Drainage area.--319 sq mi.

Records available.--September 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 189.60 ft above mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Extremes.--1963: No flow Sept. 24-30.
1963-64: Maximum discharge during water year, 555 cfs Sept. 16; maximum gage height, 6.28 ft Aug. 9; no flow most of time.
Maximum stage since at least 1928, 18.2 ft April 1949 (equivalent gage height in channel modified in 1955, 17.2 ft), from information from local residents.

Remarks.--Records good. At end of year, flow from 91.2 sq mi above this station was partly controlled by 5 floodwater-retarding structures with a total combined capacity of 20,280 acre-ft below the flood spillway crests, of which 19,500 acre-ft is floodwater-retarding capacity and 780 acre-ft is sediment-pool capacity. One structure was built during the current year and has a total combined capacity below flood spillway crest of 4,320 acre-ft, of which 200 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 4-5, 14-15, Sept. 14, 17-18, 25-26, 28)

2.3	0	3.0	6.7
2.4	.1	3.3	14
2.5	.4	3.6	24
2.6	.9	4.0	40
2.7	1.8	4.4	63
2.8	3.1	4.7	91
2.9	4.7	5.0	140

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	(*)							0	(*)	0	0	a 0
2								0		0	0	a 0
3								0		0	0	a 0
4								0		*16	0	a 0
5								0		* 4.4	0	a 0
6								0		.4	0	a 0
7								0		0	0	a 0
8		(*)						0		* 0	0	a 0
9			(*)					0		0	119	a 0
10								0		0	**1.8	* 0
11								0		0	0	0
12								0		0	0	0
13				(*)				0		0	0	*a 60
14								0		* 17	0	14
15								0		1.8	0	1.0
16								0		0	0	* 74
17								0		0	0	126
18					(*)			0		.1	0	4.3
19								0		.9	0	.1
20								0		*.1	0	0
21								0		0	0	0
22								.1		0	0	2.9
23								* 0		0	0	.4
24						(*)		0		0	65	0
25								* 0		0	*105	12
26								0		0	3.8	5.5
27								0		0	.1	.3
28							(*)	0		0	0	4.4
29								0		0	0	.4
30					----------			0		0	0	0
31		----------			----------		----------	0	----------	0	0	----------
Total	0	0	0	0	0	0	0	0.1	0	40.7	294.7	305.3
Mean	0	0	0	0	0	0	0	0.003	0	1.31	9.51	10.2
Ac-ft	0	0	0	0	0	0	0	0.2	0	81	585	606

Calendar year 1963: Max - Min - Mean - Ac-ft -
Water year 1963-64: Max 126 Min 0 Mean 1.75 Ac-ft 1,270

Peak discharge (base, 250 cfs)

Date	Time	Gage height	Discharge
8- 9	0500	6.28	540
8-25	0100	5.81	344
9-16	2200	6.21	555

* Discharge measurement or observation of no flow made on this day.
** Field estimate made on this day.
a No gage-height record.

8-3656. McKelligon Canyon at El Paso, Tex.

Location.--Lat 31°49'20", long 106°28'15", on left bank 120 ft south of McKelligon Canyon Drive, 0.5 mile south of crest of Sugarloaf Mountain, 0.2 mile west of Alabama Avenue, 1.6 miles west of U. S. Highway 54, and 4.5 miles north of El Paso post office.

Drainage area.--2.3 sq mi, approximately.

Records available.--October 1957 to September 1964.

Gage.--Water-stage recorder and small earth-fill dam with uncontrolled concrete outlet tower. Altitude of gage is 4,257.33 ft above mean sea level (levels by city of El Paso).

Average discharge.--7 years (1957-64), 0.006 cfs (4.3 acre-ft per year).

Extremes.--No flow during year.
1957-64: Maximum discharge, 76 cfs Sept. 11, 1958 (on basis of culvert measurement of peak flow); no flow except Sept. 11-12, 1958.

Remarks.--No flow since Sept. 12, 1958. Flood flow controlled by four small reservoirs upstream with a total capacity of about 95 acre-ft.

Cooperation.--Records furnished by Geological Survey, District Office, Santa Fe, N. Mex.

8-3658. Government ditch at El Paso, Tex.

Location.--Lat 31°47'02", long 106°26'04", at intersection of Montana and Houston Streets, and 2 miles northeast of the business center of El Paso.

Drainage area.--6.4 sq mi, approximately.

Records available.--June 1958 to September 1964.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 3,740 ft (from topographic map).

Average discharge.--6 years, 0.12 cfs (87 acre-ft per year).

Extremes.--Maximum discharge during year, 338 cfs Sept. 11 (gage height, 2.06 ft); no flow most of time.
1958-64: Maximum discharge, 550 cfs Sept. 11, 1958 (gage height, 2.64 ft), from rating curve extended above 148 cfs on basis of slope-area measurement of peak flow; no flow most of time.

Remarks.--Records good.

Cooperation.--Records furnished by Geological Survey, District Office, Santa Fe, N. Mex.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Oct. 16	4.0	Mar. 18	7.5	Aug. 13	0.2
18	.1	19	.1	14	.3
19	.5	July 27	.1	Sept. 11	22
Nov. 18	2.6	Aug. 1	4.4	19	.2
25	.2				

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
October	4.6	4.0	0	0.15	9.1
November	2.8	2.6	0	.09	5.6
December	0	0	0	0	0
Calendar year 1963	12.6	4.0	0	0.04	25.1
March	7.6	7.5	0	.25	15
July	.1	.1	0	.003	.2
August	4.9	4.4	0	.16	9.7
September	22.2	22	0	.74	44
Water year 1963-64	42.2	22	0	0.12	83.6

Peak discharge (base, 100 cfs)

Date	Time	Gage height	Discharge
9-11	1630	2.06	338

Note.--Flow occurred only on days listed above.

8-4075. Pecos River at Red Bluff, N. Mex.

Location.--Lat 32°04'30", long 104°02'20", in sec. 1, T. 26 S., R. 28 E., on right bank at Red Bluff, 0.2 mile downstream from Red Bluff Draw, and 5.5 miles upstream from Delaware River.

Drainage area.--19,540 sq mi, approximately (contributing area).

Records available.--October 1937 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 2,850.05 ft above mean sea level, datum of 1929.

Average discharge.--27 years (1937-64), 221 cfs (160,000 acre-ft per year).

Extremes.--Maximum discharge during year, 1,790 cfs Sept. 14 (gage height, 7.09 ft); minimum, 1.4 cfs July 23 (gage height, 2.63 ft).
1937-64: Maximum discharge, 52,600 cfs May 24, 1941 (gage height, 28.3 ft), from rating curve extended above 30,000 cfs on basis of slope-area measurement of peak flow; minimum, 1.4 cfs Aug. 21, 1954, and July 23, 1964.
Maximum stage known, that of May 24, 1941. Flood in October 1904 reached a stage of 28.0 ft, from information by Panhandle and Santa Fe Railway Co.

Remarks.--Records good except those below 10 cfs, which are fair. Flow regulated by storage in Alamogordo Reservoir, Lake McMillan and Lake Avalon, and by several small diversion dams that divert for power or irrigation. Diversions and ground-water withdrawals above station for irrigation of about 202,000 acres (1959 determination).

Cooperation.--Records furnished by Geological Survey, District Office, Santa Fe, N. Mex.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used July 3-11, July 13 to Aug. 18, Aug. 20 to Sept. 13)

2.5	1.4	3.1	39
2.6	3.5	3.5	98
2.7	8.0	4.0	209
2.9	21	4.7	435

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*67	25	35	55	20	27	18	*13	9.2	9.8	3.3	*3.3
2	47	33	*35	61	21	27	18	12	*8.6	8.6	3.5	3.1
3	34	39	36	61	21	27	18	13	8.6	8.0	3.3	2.7
4	29	39	43	50	21	26	17	11	9.2	8.0	3.1	2.2
5	29	39	45	51	21	24	20	15	13	7.6	2.7	2.0
6	30	41	51	57	21	23	20	11	12	5.8	2.4	2.4
7	31	39	50	52	*22	19	19	7.1	10	6.2	2.4	2.7
8	30	38	50	49	26	20	18	7.6	7.6	*5.3	5.3	2.9
9	29	40	50	55	26	23	17	8.0	7.6	4.8	4.8	3.3
10	28	43	45	52	26	22	13	9.8	8.0	4.0	4.4	2.9
11	*27	45	44	54	26	21	15	9.2	69	3.3	4.4	2.7
12	28	43	54	54	29	21	14	8.6	21	44	4.4	4.5
13	28	39	58	55	29	27	13	10	*31	8.0	4.4	4.0
14	28	*36	58	55	28	28	13	9.8	88	5.3	4.4	406
15	27	34	58	55	33	28	13	17	*186	4.4	*9.2	297
16	28	33	55	55	44	29	12	13	42	3.5	4.4	83
17	29	34	51	*55	46	24	12	17	20	2.9	4.0	29
18	29	33	52	55	46	25	12	16	*13	*1.8	3.5	*17
19	27	35	51	55	46	25	11	*15	8.0	1.8	35	13
20	26	35	54	55	46	23	12	14	6.6	1.8	6.2	186
21	26	35	57	55	40	20	12	13	6.2	1.8	6.6	44
22	26	36	57	39	37	20	15	13	6.2	1.8	5.8	19
23	27	37	52	27	43	20	15	13	*6.6	1.6	4.4	10
24	25	40	52	25	44	20	16	13	*37	3.3	4.0	15
25	25	35	52	23	37	20	18	12	7.6	4.4	3.5	16
26	24	32	55	26	36	18	18	12	9.8	5.0	3.1	16
27	26	33	54	26	38	18	17	12	10	4.5	3.1	15
28	27	35	51	*23	*36	18	16	8.6	10	*5.8	3.1	13
29	*27	36	54	22	30	18	15	5.8	*10	6.6	3.1	18
30	27	36	*54	23	----------	*18	15	6.2	10	5.8	2.9	17
31	26	----------	54	21	----------	18	----------	6.2	----------	3.5	2.9	----------
Total	917	1,098	1,567	1,401	939	697	462	351.9	691.8	189.0	157.6	1,252.7
Mean	29.6	36.6	50.5	45.2	32.4	22.5	15.4	11.4	23.1	6.10	5.08	41.8
Ac-ft	1,820	2,180	3,110	2,780	1,860	1,380	916	698	1,370	375	313	2,480

Calendar year 1963: Max 1,080 Min 7 Mean 44.0 Ac-ft 31,840
Water year 1963-64: Max 406 Min 1.6 Mean 26.6 Ac-ft 19,280

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

* Discharge measurement made on this day.

8-4085. Delaware River near Red Bluff, N. Mex.

Location.--Lat 32°01'25", long 104°03'15", in SE¼ sec. 23, T. 26 S., R. 28 E., near center of channel on downstream side of pier of bridge on U. S. Highway 285, 3.5 miles upstream from mouth, 4 miles south of Red Bluff, and 14 miles south of Malaga.

Drainage area.--689 sq mi.

Records available.--April 1912 to September 1913, May 1914 to June 1915, October 1937 to September 1964. Published as "near Malaga, N. Mex." 1912-13, and as "near Angeles, Tex." 1914-15.

Gage.--Water-stage recorder and concrete control. Datum of gage is 2,900.66 ft above mean sea level, datum of 1929. Prior to May 1914, at site 3 miles upstream at different datum. May 1914 to June 1915 at site 2½ miles downstream at different datum.

Average discharge.--27 years (1937-64), 13.9 cfs (10,060 acre-ft per year).

Extremes.--Maximum discharge during year, 1,030 cfs Aug. 19 (gage height, 4.08 ft); no flow for many days.
1912-13, 1914-15, 1937-64: Maximum discharge, 81,400 cfs Oct. 2, 1955 (gage height, 27.0 ft, from floodmark), from rating curve extended above 1,500 cfs on basis of slope-area measurements at gage heights 8.65, 12.84, 18.00, and 27.0 ft; no flow at times.
Maximum stage known since at least 1911, that of Oct. 2, 1955. Flood of June 27, 1938, reached a stage of 18.00 ft, from floodmark.

Remarks.--Records good. No diversions above station.

Cooperation.--Records furnished by Geological Survey, District Office, Santa Fe, N. Mex.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Aug. 19-20, Sept. 14-15)

0.1	0	1.1	6.5	1.9	26
.3	.2	1.3	10	2.1	38
.5	.7	1.5	14	2.3	64
.7	1.8	1.7	20	2.5	106
.9	3.7				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*1.0	1.0	1.8	1.7	1.8	1.7	1.5	*0.2	0	0	0	0
2	1.0	1.1	*1.8	1.7	1.8	1.7	1.4	.1	*0	*0	0	0
3	1.0	1.0	1.8	1.8	1.8	*1.7	1.2	.1	0	0	0	0
4	.9	1.1	1.8	1.8	1.8	1.6	1.2	.1	0	0	0	0
5	.9	1.0	1.9	1.8	1.8	1.6	1.2	.1	0	0	0	0
6	.9	.9	1.9	1.8	1.8	1.6	1.2	.1	0	0	0	0
7	.8	1.0	1.9	1.8	1.8	1.5	1.1	.1	0	0	0	0
8	.8	1.1	1.8	1.8	1.8	1.5	1.2	0	0	*0	0	0
9	.8	1.2	1.5	1.7	1.8	1.5	1.2	0	0	0	0	0
10	.8	1.4	1.9	1.8	1.8	1.5	1.2	0	0	0	0	0
11	*.8	1.4	1.9	1.8	1.8	1.5	1.2	0	20	0	0	0
12	.8	1.2	1.9	1.8	1.9	1.5	1.0	0	5.6	6.8	0	0
13	.8	1.2	2.0	1.8	1.9	1.5	.9	0	*48	.8	0	0
14	.8	*1.2	2.0	1.8	1.9	1.5	.9	0	*57	*0	0	32
15	.8	1.2	2.0	1.8	1.7	1.5	.8	.4	17	0	*0	*.6
16	.8	1.2	1.9	1.8	1.7	1.5	.9	.1	4.7	0	0	0
17	33	1.1	1.9	*1.8	1.8	1.5	.8	0	1.8	0	0	0
18	15	1.1	1.9	1.8	1.8	2.2	.8	.1	*.6	*0	0	0
19	5.3	1.3	1.9	1.7	1.8	2.4	.8	0	.3	0	96	0
20	2.8	1.4	1.9	1.7	1.8	2.0	.6	.2	.1	0	3.4	0
21	1.9	1.5	1.9	1.7	1.9	1.7	.6	.5	0	0	0	0
22	1.5	1.4	1.9	1.7	2.0	1.6	.5	25	0	0	0	0
23	5.0	1.5	1.9	1.7	2.0	1.5	.5	6.6	*0	*0	0	0
24	3.1	1.5	1.9	1.7	2.0	1.5	.4	.8	11	0	0	0
25	1.5	1.6	1.9	1.7	2.0	1.4	.4	.1	0	0	0	0
26	1.3	1.7	1.9	1.7	1.9	1.4	.3	11	0	0	0	0
27	1.2	1.7	1.8	1.7	1.9	1.4	.3	2.3	0	0	0	0
28	1.2	1.7	1.8	*1.7	*1.7	1.4	.2	.1	0	*0	*0	0
29	*1.2	1.7	1.8	1.7	1.7	1.4	.2	.3	*0	0	0	0
30	1.2	1.8	*1.7	1.7	----------	*1.4	.2	.1	0	0	0	0
31	1.2	----------	1.7	1.8	----------	1.5	----------	0	----------	0	0	----------
Total	90.1	39.2	57.6	54.3	53.2	49.2	24.7	48.4	166.1	7.6	99.4	32.6
Mean	2.91	1.31	1.86	1.75	1.83	1.59	0.82	1.56	5.54	0.25	3.21	1.09
Ac-ft	179	78	114	108	106	98	49	96	329	15	197	65

Calendar year 1963: Max 2,990 Min 0 Mean 18.6 Ac-ft 13,420
Water year 1963-64: Max 96 Min 0 Mean 1.97 Ac-ft 1,430

Peak discharge (base, 1,700 cfs).--No peak above base.

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

8-4100. Red Bluff Reservoir near Orla, Tex.

Location.--Lat 31°54'05", long 103°54'40", at right end of Red Bluff Dam on Pecos River, 3 miles upstream from Salt (Screwbean) Draw, and 4.5 miles north of Orla, Reeves County.

Drainage area.--20,720 sq mi, approximately (contributing area).

Records available.--February 1937 to September 1964. Monthly contents only for some periods, published in WSP 1312.

Gage.--Staff gage read at irregular intervals. Datum of gage is 0.30 ft below mean sea level, datum of 1929.

Extremes.--Maximum contents observed during year, 35,720 acre-ft Feb. 19 (gage height, 2,798.6 ft); minimum observed, 14,000 acre-ft Sept. 6-14 (gage height, 2,784.8 ft).
1937-64: Maximum contents observed, 352,000 acre-ft Sept. 27, 28, 1941 (gage height, 2,846.2 ft, observed on staff gage at service spillway, affected by variable drawdown due to flow through tainter gates); minimum observed, 11,080 acre-ft May 13, 1948 (gage height, 2,781.4 ft).

Remarks.--Reservoir is formed by a rock-faced earth-fill dam 9,200 ft long. Dam completed and storage began in September 1936. The concrete service spillway is equipped with 12 tainter gates 25 ft wide by 15 ft high. The emergency spillway, located on the right bank, is 790 ft long. Water is used for power development and irrigation from Mentone to Grandfalls. Contents computed from intermittent gage readings and figures given herein represent total contents. Data regarding dam and reservoir are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Crest of emergency spillway	2,845.0	340,000
Top of tainter gates	2,842.0	310,000
Crest of service spillway	2,827.0	166,500
Bottom of two 7.0- by 9.0-foot conduits	2,764.0	3,000

Cooperation.--Gage-height records and capacity curve furnished by Red Bluff Water Power and Control District. Capacity curve based on Geological Survey topographic map surveyed in 1925.

Month-end gage heights and contents, water year October 1963 to September 1964

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30	2,796.4	31,100	-
Oct. 31	2,796.1	30,500	-600
Nov. 30	2,796.5	31,300	+800
Dec. 31	2,797.5	33,350	+2,050
Calendar year 1963	-	-	+10,050
Jan. 31	(a)	35,280	+1,930
Feb. 29	2,797.8	33,980	-1,300
Mar. 31	2,797.0	32,300	-1,680
Apr. 30	2,796.5	31,300	-1,000
May 31	2,793.1	25,070	-6,230
June 30	2,789.8	20,140	-4,930
July 31	2,788.7	18,710	-1,430
Aug. 31	2,786.9	16,380	-2,330
Sept. 30	2,788.7	18,710	+2,330
Water year 1963-64	-	-	-12,390

a No gage-height record.

8-4125. Pecos River near Orla, Tex.

Location.--Lat 31°48'14", long 103°48'25", on left bank 600 ft upstream from Pasotex pipeline crossing, 6 miles southeast of Orla, Reeves County, 12 miles downstream from Salt (Screwbean) Draw, and 15 miles downstream from Red Bluff dam.

Drainage area.--21,300 sq mi, approximately (contributing area).

Records available.--May 1937 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 2,718.05 ft above mean sea level, datum of 1929.

Average discharge.--27 years, 219 cfs (158,500 acre-ft per year).

Extremes.--Maximum discharge during year, 870 cfs June 24 (gage height, 3.15 ft); minimum daily, 1.4 cfs July 15. 1937-64: Maximum discharge, 23,700 cfs Sept. 29, 1941 (gage height, 20.74 ft); no flow Sept. 9-14, Nov. 4, 1946.

Remarks.--Records good. Flow regulated by Red Bluff Reservoir (see preceding page) and reservoirs above Carlsbad, N. Mex. Occasional runoff from draws between dam and station. Many diversions above Red Bluff Reservoir for irrigation. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

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

0.59	1.4	1.0	34
.6	1.6	1.1	53
.7	4.1	1.3	103
.8	9.8	1.5	164
.9	20	2.0	368

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	18	11	12	7.0	123	9.0	53	120	10	9.8	112
2	*10	12	11	12	7.0	123	8.3	53	120	9.8	34	112
3	10	12	11	11	*6.4	*126	7.6	53	123	9.0	36	112
4	10	11	11	11	7.0	126	8.3	51	168	7.6	37	115
5	10	10	11	12	7.0	123	8.3	51	175	7.0	37	115
6	12	10	11	21	7.0	123	7.6	51	175	7.0	37	105
7	14	10	11	9.0	7.0	123	7.6	53	171	15	39	16
8	5.3	11	11	9.0	7.0	123	7.6	53	171	47	41	4.5
9	5.3	12	11	9.0	7.0	96	7.6	53	171	47	12	3.4
10	5.3	11	*12	7.0	7.0	15	*7.6	53	171	47	4.1	2.8
11	5.3	11	12	7.0	7.0	9.8	8.3	53	198	47	2.8	2.6
12	5.3	11	12	7.0	7.0	9.0	7.6	53	257	28	2.1	2.6
13	4.9	10	12	7.0	7.0	9.0	7.6	53	178	10	1.9	3.4
14	4.9	10	12	7.0	7.0	9.0	7.6	*53	231	3.7	1.9	3.7
15	4.9	11	12	7.0	6.4	9.0	7.6	53	*178	1.4	1.9	41
16	4.9	10	12	7.0	6.4	9.0	8.3	53	168	5.3	1.9	4.5
17	5.3	10	12	7.0	6.4	9.0	8.3	53	41	7.0	1.9	2.8
18	5.3	10	12	7.0	6.4	112	7.6	53	13	4.5	2.6	2.3
19	7.2	11	12	6.4	7.0	117	7.6	99	13	4.1	3.4	2.3
20	10	11	12	5.8	7.0	19	7.6	231	12	4.1	2.8	3.1
21	10	11	12	6.4	99	13	7.0	165	14	4.1	2.3	3.4
22	10	11	12	6.4	123	12	7.6	120	13	*4.1	1.9	5.3
23	11	11	12	6.4	126	11	7.6	123	10	46	1.7	5.8
24	10	11	11	6.4	126	10	7.6	120	225	11	1.7	4.5
25	10	11	11	6.4	126	9.8	7.6	120	212	5.8	*1.9	43
26	10	11	11	6.4	123	9.8	7.6	120	20	3.7	1.9	12
27	10	11	11	6.4	123	9.8	7.0	120	14	3.1	2.0	7.6
28	10	11	11	6.4	123	9.0	7.0	138	12	2.6	106	5.3
29	11	11	11	7.0	123	9.0	22	129	11	2.6	112	4.9
30	70	11	11	7.0	----------	9.0	51	123	10	2.6	112	4.5
31	278	----------	12	7.0	----------	9.0	----------	120	----------	2.6	112	----------
Total	589.9	332	356	253.4	1,229.0	1,524.2	289.6	2,676	3,395	409.7	765.5	862.3
Mean	19.0	11.1	11.5	8.17	42.4	49.2	9.65	86.3	113	13.2	24.7	28.7
Ac-ft	1,170	659	706	503	2,440	3,020	574	5,310	6,730	813	1,520	1,710

Calendar year 1963: Max 1,460 Min 3.7 Mean 37.7 Ac-ft 27,320
Water year 1963-64: Max 278 Min 1.4 Mean 34.7 Ac-ft 25,160

* Discharge measurement made on this day.

8-4145. Reeves County Water Improvement District No. 2 canal near Mentone.--See page 451.

8-4150. Ward County Water Improvement District No. 3 canal near Barstow.--See page 451.

8-4180. Ward County Irrigation District No. 1 canal near Barstow.--See page 451.

8-4255. Phantom Lake Spring near Toyahvale, Tex.

Location.--Lat 30°56'00", long 103°50'40", on left bank of outlet canal 375 ft below source of spring, 3.5 miles southwest of Toyahvale, Reeves County, and 7.0 miles southwest of Balmorhea.

Records available.--December 1931 to December 1933, March 1942 to September 1964. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 3,472.69 ft above mean sea level (Bureau of Reclamation bench mark). Dec. 21, 1931, to Dec. 31, 1933, water-stage recorder at site 425 ft downstream at datum 3.05 ft higher.

Average discharge.--23 years (1932-33, 1942-64), 13.4 cfs (9,700 acre-ft per year).

Extremes.--Maximum daily discharge during year, 10 cfs Oct. 1-5; minimum daily, 7.4 cfs July 21-31.
1931-33, 1942-64: Maximum daily discharge, 114 cfs Oct. 2, 3, 1932; minimum daily, that of July 21-31, 1964.

Remarks.--Records good. Discharge represents total flow of spring. Water used for irrigation in vicinity of Toyahvale and Balmorhea. There has been no significant development of ground water from wells in vicinity of spring, and the low flow since 1956 appears to be the result of reduction of recharge to the contributing ground-water reservoir.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*10	9.3	9.5	9.3	9.1	8.6	8.3	8.3	8.1	7.9	7.5	7.6
2	10	9.5	9.5	9.3	9.1	8.8	8.4	8.3	8.1	7.8	7.5	7.6
3	10	9.5	9.5	9.3	9.1	8.8	8.4	8.3	8.1	7.8	7.5	7.6
4	10	9.5	9.5	9.1	*9.3	8.6	8.4	8.2	8.1	7.8	7.5	7.6
5	10	9.5	9.5	9.3	9.5	8.6	8.5	8.2	8.1	7.8	7.5	7.6
6	9.8	*9.5	9.5	*9.4	9.5	8.6	8.5	8.1	8.1	7.7	7.5	7.6
7	9.8	9.6	9.5	9.4	9.3	8.6	8.5	8.1	8.3	7.7	7.5	7.6
8	9.8	9.6	9.5	9.4	9.3	8.8	8.6	8.0	8.3	7.7	7.5	7.6
9	9.8	9.6	9.5	9.4	9.3	8.6	*8.8	8.0	8.3	7.7	7.5	7.6
10	9.8	9.6	*9.5	9.5	9.3	*8.8	8.8	8.0	8.3	7.7	7.5	7.6
11	9.6	9.5	9.3	9.5	9.3	8.8	8.8	8.0	8.3	7.6	7.5	7.6
12	9.6	9.5	9.3	9.3	9.3	8.8	8.8	7.6	8.3	7.6	7.5	7.6
13	9.6	9.5	9.3	9.3	9.3	8.8	8.6	*8.0	8.3	7.6	7.5	7.6
14	9.6	9.5	9.1	9.3	9.4	8.8	8.6	8.1	8.3	7.6	7.5	7.6
15	9.6	9.5	9.1	9.3	9.4	8.8	8.6	8.1	8.2	7.6	7.5	7.6
16	9.6	9.5	9.1	9.3	9.5	8.8	8.5	8.1	8.2	7.5	7.5	7.6
17	9.8	9.5	9.1	9.3	9.5	8.8	8.5	8.1	*8.2	7.5	7.6	7.6
18	9.8	9.3	9.0	9.3	9.5	8.8	8.5	8.1	8.2	7.5	7.6	7.6
19	9.8	9.3	9.1	9.1	9.5	8.8	8.4	8.1	8.2	7.5	7.6	7.6
20	9.8	9.5	9.1	9.1	9.5	8.8	8.4	8.1	8.2	7.5	7.6	7.6
21	9.6	9.5	9.1	9.1	9.4	8.8	8.4	8.1	8.1	7.4	7.6	7.6
22	9.6	9.3	9.0	9.1	9.4	8.8	8.3	8.1	8.1	*7.4	7.6	7.6
23	9.8	9.1	9.0	9.1	9.4	8.8	8.3	8.0	8.1	7.4	7.6	7.8
24	9.8	9.3	9.1	9.0	9.3	8.6	8.3	8.0	8.1	7.4	*7.6	8.0
25	9.6	9.3	9.1	9.1	9.3	8.6	8.2	8.0	8.0	7.4	7.6	8.1
26	9.6	9.3	9.0	9.1	9.3	8.6	8.2	8.0	8.0	7.4	7.6	8.1
27	9.5	9.3	9.0	9.1	9.3	8.5	8.2	8.0	8.0	7.4	7.6	8.1
28	9.5	9.3	9.0	9.1	9.0	8.4	8.1	8.0	8.0	7.4	7.6	8.1
29	9.5	9.3	9.0	9.1	8.8	8.3	8.3	8.0	7.9	7.4	7.6	8.1
30	9.5	9.3	8.8	9.1	----------	8.3	8.3	8.0	7.9	7.4	7.6	8.3
31	9.5	----------	9.1	9.1	----------	8.3	----------	8.0	----------	7.4	7.6	----------
Total	301.3	282.8	285.7	286.2	270.2	268.8	253.5	250.0	244.4	234.5	234.0	231.8
Mean	9.72	9.43	9.22	9.23	9.32	8.67	8.45	8.06	8.15	7.56	7.55	7.73
Ac-ft	598	561	567	568	536	533	503	496	485	465	464	460

Calendar year 1963: Max 12 Min 8.1 Mean 8.98 Ac-ft 6,500
Water year 1963-64: Max 10 Min 7.4 Mean 8.59 Ac-ft 6,240

* Discharge measurement made on this day.

Note.--Backwater from checkgate Oct. 1, 5-6, Nov. 9-11, Jan. 7-9, Feb. 14-15, 21-23, 28-29, Mar. 12-13, 15-21, 27-28, Apr. 2-7, 14-27, May 4-6, 18-31, June 1-5, June 15 to July 31, Aug. 2, 10-11, 27, Sept. 9-13, 21-22.

8-4275. San Solomon Springs at Toyahvale, Tex.

Location.--Lat 30°56'40", long 103°47'10", on left bank of South Canal at Toyahvale, Reeves County, 540 ft downstream from spring pool.

Records available.--October 1931 to December 1933, March 1941 to September 1964.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 3,311.02 ft above mean sea level, datum of 1929. Prior to Nov. 18, 1931, water-stage recorder at site about 0.6 mile downstream.

Average discharge.--25 years (1931-33, 1941-64), 34.1 cfs (24,690 acre-ft per year).

Extremes.--Maximum daily discharge during year, 32 cfs Jan. 21 to Feb. 24; minimum daily, 29 cfs Oct. 1 to Nov. 18, Apr. 1 to May 3.
1931-33, 1941-64: Maximum daily discharge, 71 cfs Oct. 7-9, 1932, Oct. 26-30, 1941; minimum daily, 27 cfs Jan. 1-31, 1957.

Remarks.--Records good. Discharge represents total flow of springs and is determined by combining flows in South Canal and two additional outlets (flow measured periodically), Middle and North Canals. Flow into each canal regulated by operation of headgates. Water used for irrigation in vicinity of Balmorhea. There has been no significant development of ground water from wells in vicinity of the spring.

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*29	29	31	31	32	31	29	29	30	31	31	31
2	29	29	31	31	32	31	29	29	30	31	31	31
3	29	29	31	31	32	31	29	29	30	31	31	31
4	29	29	31	31	*32	31	29	30	30	31	31	31
5	29	29	31	31	32	31	29	30	30	31	31	31
6	29	*29	31	31	32	31	29	30	30	31	31	31
7	29	29	31	*31	32	31	29	30	30	31	31	31
8	29	29	31	31	32	31	29	30	30	31	31	31
9	29	29	31	31	32	31	*29	30	30	31	31	31
10	29	29	*31	31	32	*31	29	30	30	31	31	31
11	29	29	31	31	32	31	29	30	30	31	31	31
12	29	29	31	31	32	31	29	30	30	31	31	31
13	29	29	31	31	32	31	29	*30	30	31	31	31
14	29	29	31	31	32	31	29	30	30	31	31	31
15	29	29	31	31	32	31	29	30	30	31	31	31
16	29	29	31	31	32	31	29	30	30	31	31	31
17	29	29	31	31	32	31	29	30	*30	31	31	31
18	29	29	31	31	32	31	29	30	30	31	31	31
19	29	30	31	31	32	31	29	30	30	31	31	31
20	29	30	31	31	32	31	29	30	30	31	31	31
21	29	30	31	32	32	30	29	30	30	*31	31	31
22	29	30	31	32	32	30	29	30	30	31	31	31
23	29	30	31	32	32	30	29	30	30	31	31	31
24	29	30	31	32	32	30	29	30	30	31	*31	31
25	29	30	31	32	31	30	29	30	30	31	31	31
26	29	30	31	32	31	30	29	30	30	31	31	31
27	29	30	31	32	31	30	29	30	30	31	31	31
28	29	30	31	32	31	30	29	30	30	31	31	31
29	29	30	31	32	31	30	29	30	30	31	31	31
30	29	30	31	32	----------	30	29	30	30	31	31	31
31	29	----------	31	32	----------	30	----------	30	----------	31	31	----------
Total	899	882	961	972	923	950	870	927	900	961	961	930
Mean	29.0	29.4	31.0	31.4	31.8	30.6	29.0	29.9	30.0	31.0	31.0	31.0
Ac-ft	1,780	1,750	1,910	1,930	1,830	1,880	1,730	1,840	1,790	1,910	1,910	1,840

Calendar year 1963: Max 32 Min 29 Mean 30.3 Ac-ft 21,900
Water year 1963-64: Max 32 Min 29 Mean 30.4 Ac-ft 22,100

* Discharge measurement made on this day.
Note.--No gage-height record Oct. 12 to Nov. 5, Nov. 15 to Dec. 9, Dec. 30 to Jan. 6, Feb. 24 to Mar. 9, July 10-20.

8-4318. Limpia Creek below Fort Davis, Tex.

Location.--Lat 30°40'50", long 103°47'30", on downstream side of bridge on State Highway 17, 0.7 miles upstream from Frazier Canyon, and 9 miles northeast of Fort Davis, Jeff Davis County.

Drainage area.--227 sq mi.

Records available.--November 1961 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 4,459.22 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 3,700 cfs June 10 (gage height, 7.85 ft); no flow at times.
1961-64: Maximum discharge, 3,700 cfs June 26, 1962, and June 10, 1964; maximum gage height, 7.85 ft June 10, 1964; no flow at times.
Maximum stages since 1904 occurred in 1932 and 1946 (stages unknown), of which the 1932 flood was the greatest, from information by local residents.

Remarks.--Records fair. No diversion above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Mar. 29 to May 27, May 30 to Aug. 17)

1.5	0	2.1	4.0	2.8	44
1.6	.1	2.2	6.4	3.0	70
1.7	.2	2.3	9.6	3.3	133
1.8	.5	2.4	14	3.6	240
1.9	1.1	2.6	26	3.9	420
2.0	2.2				

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*0.6	1	1.3	1.1	0.8	0.7	0.3	0.1	0.1	0.1	12	0.4
2	.6	1	1.2	1.2	.8	.7	.3	.1	.1	.1	.7	.4
3	.6	1	1.2	1.1	.8	.7	.3	.1	.1	.1	.1	.4
4	.6	1	1.3	1.2	*.8	.7	.2	.1	.1	.1	.1	.4
5	.7	1	1.3	1.3	.8	.7	.2	.1	.1	.1	.1	.4
6	.8	*1.0	1.2	1.3	.8	.6	.2	.1	.1	.1	.1	.3
7	1.0	1.0	1.1	*1.4	.8	.6	.2	.1	.1	0	0	.3
8	1.0	1.0	1.0	1.4	.8	.6	.2	.1	.1	.1	.1	.3
9	1.0	1.3	1.1	1.2	.8	.5	*.2	.1	.1	.1	.2	.4
10	1.0	1.2	*1.2	1.2	.7	*.6	.2	.1	391	.1	.1	.4
11	1.0	1.1	1.3	1.2	.7	.5	.2	.1	416	.1	.1	.3
12	1.0	1.1	1.3	1.2	.7	.5	.2	.1	14	.1	.1	.3
13	1.0	1.2	1.3	1.2	.7	.5	.2	**.1	3.4	.1	.1	.4
14	1.0	1.1	1.3	1.2	.7	.5	.2	.1	1.3	.1	.1	.4
15	1.0	1.5	1.3	1.2	.7	.5	.2	.1	.5	.1	.1	.3
16	4.6	1.7	1.2	1.2	.7	.4	.2	.1	.4	0	157	.3
17	20	1.6	1.2	1.2	.7	.4	.2	.1	*.3	0	401	.2
18	7.0	1.4	1.2	1.1	.7	.4	.2	.1	.3	0	142	.2
19	3.1	2.1	1.2	1.0	.7	.4	.2	.1	.2	0	6.5	.2
20	2.1	1.8	1.2	1.0	.7	.4	.2	.1	.2	0	9.8	.2
21	1.5	1.6	1.2	1.0	.7	.4	.1	.1	.2	*0	3.1	.2
22	1	1.3	1.1	1.0	.7	.4	.1	.1	.2	*.2	1.5	.2
23	1	1.1	1.1	1.0	.7	.3	.1	.1	.2	.2	1.1	.2
24	1	1.3	1.0	.8	.7	.2	.1	.1	.2	.1	*.7	.2
25	1	1.4	1.1	.8	.8	.2	.1	.1	.2	.1	.7	.2
26	1	1.3	1.1	.8	.7	.2	.1	23	.2	.1	.6	.2
27	1	1.8	1.1	.8	.7	.2	.1	6.4	.2	.1	.6	.2
28	1	2.0	1.1	.8	.7	.2	.1	12	.2	.1	.6	.2
29	1	1.4	1.2	.8	.7	.2	.1	.4	.2	.1	.5	.2
30	1	1.4	1.1	1.0	----------	.3	.1	.2	.1	26	.5	.2
31	1	----------	1.1	.9	----------	.3	----------	.1	----------	287	.4	----------
Total	61.2	39.7	36.6	33.6	21.3	13.8	5.3	44.6	830.4	315.4	740.6	8.5
Mean	1.97	1.32	1.18	1.08	0.73	0.45	0.18	1.44	27.7	10.2	23.9	0.28
Ac-ft	121	79	73	67	42	27	11	88	1,650	626	1,470	17

Calendar year 1963: Max 463 Min 0 Mean 7.46 Ac-ft 5,410
Water year 1963-64: Max 416 Min 0 Mean 5.88 Ac-ft 4,270

Peak discharge (base, 1,300 cfs)

Date	Time	Gage height	Discharge
6-10	2130	7.85	3,700
8-16	1900	5.57	1,690
8-17	1830	6.37	2,370

* Discharge measurement or observation of no flow made on this day.
Note.--No gage-height record Oct. 22 to Nov. 5.

8-4350. Grandfalls-Big Valley Canal near Barstow.--See page 451.

8-4358. Coyanosa Draw near Fort Stockton, Tex.

Location.--Lat 31°02'25", long 103°08'10", at downstream side of bridge on U. S. Highway 285, 18.4 miles northwest of Fort Stockton, Pecos County.

Drainage area.--1,182 sq mi.

Records available.--February to September 1964.

Gage.--Water-stage recorder. Datum of gage is 2,846.86 ft above mean sea level (Texas Highway Department bridge plans.

Extremes.--Maximum discharge during period February to September, 30 cfs Sept. 23 (gage height, 3.82 ft); no flow most of time.
Maximum high water in 1954 reached a stage of about 19.6 ft. Flood of Sept. 9, 1924, reached a discharge of 4,070 cfs (by slope-area measurement) at a site on U. S. Highway 290 about 8 miles upstream.

Remarks.--Records fair. No known regulation or diversion.

Discharge, in cubic feet per second, February to September 1964

Sept. 23..... 0.3

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
September 1964.....	0.3	0.3	0	0.01	0.6

Note.--Flow occurred only on days listed above. Observations of no flow made Feb. 28, Apr. 10, May 11, June 17, July 21, Aug. 25; field estimate made Sept. 23.

8-4445. Comanche Springs at Fort Stockton, Tex.

Location.--Lat 30°53', long 102°52', on left bank of outlet canal of Pecos County Water Improvement District No. 1 in eastern outskirts of Fort Stockton, Pecos County, 0.2 mile upstream from bridge on U. S. Highway 290, and 0.5 mile downstream from head of springs.

Records available.--June 1899 to September 1935 (discharge measurements only), October 1935 to September 1964. Monthly discharge only for some periods, published in WSP 1312 (discontinued as a continuous-record station; converted to a low-flow partial-record station).

Gage.--Water-stage recorder and concrete control. Datum of gage is 2,922.82 ft above mean sea level, datum of 1929.

Average discharge.--29 years (1935-64), 26.2 cfs (18,970 acre-ft per year).

Extremes.--No flow during year.
1935-64: Maximum daily discharge, 54 cfs Jan. 30, 1942; no flow for many days in 1955-64.
Maximum discharge measured prior to 1941, 66 cfs June 23, 1899; minimum measured, 38.7 cfs July 14, 1936.

Remarks.--No flow since Mar. 19, 1961. Discharge records represent spring flow only. Surface runoff from rainfall and surface water released from small flood-control reservoir located several hundred feet above springs have been eliminated from discharge record. Since about 1950, flow of springs greatly reduced at times by withdrawal from underground reservoir by irrigation wells. Pecos County Water Improvement District No. 1 has a permit to irrigate 6,160 acres from the springs when water is available. Observations of no flow made Oct. 1, Nov. 5, Dec. 9, Jan. 6, Feb. 4, Mar. 10, Apr. 9, May 11, June 17, July 20, Aug. 24; flood runoff and water released from reservoirs above springs eliminated Nov. 19, 27, Jan. 30, Mar. 18-19, May 28-31, June 10-11, 21-22, 24-25, Aug. 15-16, Sept. 23-24, 26-27.

8-4365. Pecos County Water Improvement District No. 2 (upper diversion) canal near Grandfalls.--See page 451.

8-4375. Pecos County Water Improvement District No. 2 canal near Imperial.--See page 451.

8-4376. Pecos County Water Improvement District No. 3 canal near Imperial.--See page 451.

8-4377. Ward County Water Improvement District No. 2 canal near Grandfalls.--See page 451.

8-4465. Pecos River near Girvin, Tex.

Location.--Lat 31°06'35", long 102°25'00", on right bank 2.4 miles upstream from Comanche Creek, 2.6 miles northwest of Girvin, Pecos County, and 7.8 miles upstream from bridge on U. S. Highway 67.

Drainage area.--29,560 sq mi, approximately (contributing area of supplementary gage 7.8 miles downstream).

Records available.--August 1939 to September 1964.

Gage.--Water-stage recorder and combination concrete control and measuring flume. Supplementary water-stage recorder (used as regular gage prior to July 17, 1951, now used only for flows exceeding about 700 cfs) 7.8 miles downstream at datum 2,269.65 ft above mean sea level, datum of 1929.

Average discharge.--25 years, 125 cfs (90,500 acre-ft per year).

Extremes.--Maximum discharge during year, 3.67 cfs Sept. 23 (gage height, 2.68 ft); minimum daily, 2.2 cfs July 18.
1939-64: Maximum discharge, 20,000 cfs Oct. 5, 1941 (gage height, 20.49 ft, at supplementary gage); minimum daily, 2.2 cfs July 18, 1964.
Maximum stage known since at least 1932, that of Oct. 5, 1941.

Remarks.--Records good. Flow largely regulated by reservoirs above Orla. Many diversions above station for irrigation. Records of chemical analyses and water temperatures for the water year 1964 are available in the Austin District Office.

Rating table (gage height, in feet, and discharge, in cubic feet per second)
(Shifting-control method used Oct. 1 to Nov. 11, May 2 to Sept. 23)

0.96	2.2	1.4	39
1.0	3.6	1.6	66
1.05	5.8	1.9	117
1.1	8.7	2.2	186
1.2	17		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*9.4	16	22	23	26	24	21	12	5.8	6.3	4.8	3.2
2	9.4	15	22	23	25	31	21	11	5.8	6.3	6.3	3.2
3	9.4	14	23	23	25	56	21	10	6.8	6.3	6.3	3.2
4	10	15	23	23	25	62	21	9.4	7.4	5.3	6.3	3.2
5	10	*17	23	22	25	*66	21	8.7	13	4.3	6.8	2.8
6	10	17	23	*23	25	68	21	8.7	18	3.9	6.8	3.2
7	11	17	23	24	24	69	20	8.0	15	3.9	6.8	2.8
8	10	18	23	24	24	72	20	8.0	12	3.6	8.7	2.8
9	10	17	*23	24	24	74	*20	8.0	10	3.6	8.0	2.8
10	11	17	24	24	24	74	20	8.7	8.7	3.6	7.4	2.8
11	10	18	24	23	25	75	20	*8.7	8.0	3.6	7.4	2.5
12	9.4	19	25	24	25	75	20	10	7.4	3.6	6.8	3.6
13	9.4	19	25	24	25	75	20	8.7	7.4	3.2	6.3	8.0
14	9.4	18	27	24	25	72	19	8.7	6.8	2.8	5.3	17
15	8.7	18	27	24	24	72	18	8.7	6.3	2.8	5.8	13
16	10	19	27	24	23	74	17	8.0	6.3	2.5	5.8	23
17	10	19	27	24	24	69	17	8.0	6.3	2.5	5.8	13
18	10	19	27	24	23	56	16	8.0	*5.8	2.2	5.8	9.4
19	12	24	28	24	23	62	15	8.0	5.3	2.5	5.8	20
20	11	25	26	25	23	48	14	9.4	5.8	*2.5	5.8	10
21	10	24	25	24	23	38	14	12	5.8	2.8	5.3	8.0
22	12	23	24	24	23	32	14	14	5.8	2.8	4.8	6.8
23	11	24	23	24	23	31	14	11	8.0	4.3	4.8	58
24	14	23	22	25	24	30	13	9.4	8.0	4.3	*4.3	161
25	11	22	22	24	24	28	12	8.0	6.8	4.3	3.6	47
26	12	22	23	27	23	27	12	7.4	6.8	4.3	3.6	139
27	14	23	22	27	23	26	12	8.0	5.8	3.9	3.2	77
28	15	24	22	27	23	25	12	8.0	5.3	3.9	3.2	43
29	15	24	22	27	24	24	12	17	6.3	4.3	3.2	25
30	14	23	23	28	----------	23	12	7.4	6.8	4.8	3.2	21
31	15	----------	23	28	----------	22	----------	5.8	----------	4.8	3.2	----------
Total	343.1	593	743	758	697	1,580	509	286.7	233.3	119.8	171.2	735.3
Mean	11.1	19.8	24.0	24.5	24.0	51.0	17.0	9.25	7.78	3.86	5.52	24.5
Ac-ft	681	1,180	1,470	1,500	1,380	3,130	1,010	569	463	238	340	1,460

Calendar year 1963: Max 46 Min 4.8 Mean 18.9 Ac-ft 13,690
Water year 1963-64: Max 161 Min 2.2 Mean 18.5 Ac-ft 13,420

* Discharge measurement made on this day.

Principal diversions from Pecos River between Red Bluff Reservoir and Imperial, Tex.

Records of discharge are collected for eight canals that divert water from Pecos River between Red Bluff Reservoir and Imperial. Each of these canals is equipped with a water-stage recorder for obtaining gage-height record. All stations are located within 2 miles of canal headgate except as noted herein. Water diverted by these canals is used for irrigation of lands on both sides of Pecos River in Reeves, Ward, and Pecos Counties. Local runoff is eliminated from the record. Stations prior to 1941 were published separately (daily discharge figures for the earlier records).

8-4145. Reeves County Water Improvement District No. 2 canal near Mentone, diverts from right bank, lat 31°37'57", long 103°34'30". Records available, February 1922 to July 1925, August 1939 to September 1957, March to September 1964. Average discharge, 18 years (1922-24, 1939-40, 1942-57), 13.8 cfs (9,990 acre-ft per year). Published as "Farmers Independent Canal near Porterville" 1922-25.

8-4150. Ward County Water Improvement District No. 3 canal near Barstow, diverts from left bank, lat 31°34'28", long 103°30'04". Records available, August 1939 to September 1957, March to September 1964. Average discharge, 16 years (1939-40, 1942-57), 10.8 cfs (7,820 acre-ft per year).

8-4180. Ward County Irrigation District No. 1 canal near Barstow, diverts from left bank, lat 31°32'26", long 103°29'42". Records available, February 1922 to September 1925, August 1939 to September 1957, March to September 1964. Average discharge, 20 years (1922-25, 1939-40, 1941-57), 40.6 cfs (29,390 acre-ft per year). Published as "Barstow Canal near Barstow" 1922-25.

8-4350. Grandfalls-Big Valley Canal near Barstow, diverts from left bank, lat 31°25'21", long 103°15'21". Records available, March 1922 to November 1925, September 1939 to September 1957, March to September 1964. Average discharge, 16 years (1939-40, 1942-57), 5.23 cfs (3,790 acre-ft per year). Water diverted through Ward County Water Improvement District No. 2 canal irrigates most of lands formerly supplied by this canal.

8-4365. Pecos County Water Improvement District No. 2 (upper diversion) canal near Grandfalls, diverts from right bank, lat 31°18'50", long 102°55'10". Gage located 12.5 miles downstream from headgates. Records available, March 1922 to July 1925, August 1939 to September 1957, March to September 1964. Average discharge, 19 years (1923-24, 1939-57), 40.1 cfs (29,030 acre-ft per year). Published as "Imperial High-line Canal near Grandfalls" 1922-25.

8-4375. Pecos County Water Improvement District No. 2 canal near Imperial, diverts from Imperial Reservoir on right bank, lat 31°16'40", long 102°44'05". Records available, April 1940 to September 1957, March to September 1964. Average discharge, 15 years (1942-57), 16.3 cfs (11,800 acre-ft per year).

8-4376. Pecos County Water Improvement District No. 3 canal near Imperial, diverts from Pecos County Water Improvement District No. 2 canal above station near Imperial on that canal, lat 31°17'00", long 102°44'25". Records available, March 1940 to September 1957, March to September 1964. Average discharge, 16 years (1940-41, 1942-57), 15.7 cfs (11,370 acre-ft per year).

8-4377. Ward County Water Improvement District No. 2 canal near Grandfalls, diverts from left bank, lat 31°22'10", long 103°00'20". Records available, August 1939 to September 1957, March to September 1964. Average discharge, 16 years (1939-40, 1942-57), 28.2 cfs (20,420 acre-ft per year).

Several small diversions (pumps) divert water from the Pecos River between Red Bluff Reservoir and Imperial for irrigation of lands adjacent to the river, but no records for them were obtained.

Diversions, in acre-feet, March to September 1964

Month	Reeves County District No. 2 canal near Mentone	Ward County District No. 3 canal near Barstow	Ward County District No. 1 canal near Barstow	Grandfalls-Big Valley canal near Barstow
March 1964	348	0	15	0
April	249	0	0	0
May	786	0	12	0
June	748	0	2,070	0
July	528	0	3.2	0
August	12	0	0	0
September	8.7	0	372	0

Month	Pecos County District No. 2 canal (upper diversion) near Grandfalls	Pecos County District No. 2 canal near Imperial†	Pecos County District No. 3 canal near Imperial†	Ward County District No. 2 canal near Grandfalls
March 1964	219	0	0	0
April	0	0	0	0
May	377	0	0	1,020
June	2,020	0	0	241
July	0	0	0	0
August	0	0	0	0
September	0	0	0	53

† Combined flow of Pecos County Water Improvement District No. 2 canal near Imperial and Pecos County Water Improvement District No. 3 canal near Imperial represents released water from Imperial Reservoir (fed by Pecos County Water Improvement District No. 2 upper diversion canal).

8-4490. Devils River near Juno, Tex.

Location.--Lat 29°57'50", long 101°08'40", on left bank 500 ft downstream from Walter Baker ranchhouse, 2 miles upstream from Phillips Creek, and 13.5 miles southwest of Juno, Val Verde County.

Drainage area.--2,730 sq mi.

Records available.--June 1925 to September 1949, September 1952 to September 1963 (miscellaneous measurements or low-flow partial record only), October 1963 to September 1964.

Gage.--Water-stage recorder. Datum of gage is 1,489.7 ft above mean sea level, datum of 1929.

Average discharge.--25 years (1925-49, 1963-64), 203 cfs (147,000 acre-ft per year).

Extremes.--Maximum discharge during year, 104,000 cfs Sept. 21 (gage height, 21.4 ft, from floodmarks), from rating curve defined by current-meter measurements below 16,000 cfs and by slope-area measurements at 44,700, 104,000, 245,000 and 370,000 cfs; minimum, 15 cfs Aug. 13-14.
1925-49, 1963-64: Maximum discharge, 370,000 cfs Sept. 1, 1932 (gage height, 33.8 ft, from floodmarks); minimum, that of Aug. 13-14, 1964.
Maximum stage since at least 1882, 35.0 ft June 28, 1954, from floodmark, from information by local resident.

Remarks.--Records good except those for period of no gage-height record and above 500 cfs, which are fair. No known diversion upstream from station.

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

1.9	11	6.0	2,555
2.0	23	7.0	4,150
2.2	53	8.0	6,350
2.5	104	10.0	12,320
3.0	230	12.0	20,700
3.5	425	14.0	31,500
4.0	680	16.0	45,600
5.0	1,400		

Discharge, in cubic feet per second, water year October 1963 to September 1964

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	46	40	40	40	41	40	36	29	30	23	21	19
2	46	40	40	40	42	38	36	28	29	23	19	19
3	44	40	40	40	44	38	36	28	28	23	18	19
4	*42	41	40	40	44	*36	36	*28	28	23	18	19
5	42	40	40	40	41	35	34	28	29	22	18	19
6	42	40	40	41	41	36	35	29	26	22	19	19
7	42	40	38	40	40	38	34	28	24	22	19	19
8	42	40	38	40	40	38	34	30	24	22	18	19
9	41	40	38	38	40	38	34	30	24	22	19	19
10	41	40	40	*38	40	36	32	32	24	22	18	21
11	41	40	40	40	40	36	32	32	26	22	18	21
12	41	40	38	38	41	36	32	30	26	22	18	23
13	41	40	41	38	40	36	32	29	24	22	17	23
14	42	38	40	38	40	36	32	28	24	22	17	24
15	42	40	38	38	40	35	30	29	24	22	18	24
16	44	40	38	38	38	35	34	28	23	*22	19	32
17	44	40	38	38	40	35	38	28	23	22	19	26
18	44	41	40	38	40	35	35	26	23	22	18	24
19	44	41	40	36	38	38	35	24	23	22	18	26
20	46	40	40	36	40	35	34	24	23	23	17	73
21	46	40	38	36	41	34	34	24	23	23	18	*39,200
22	44	40	a 40	38	40	34	35	24	23	22	18	8,000
23	44	38	a 40	38	38	36	35	24	24	22	18	26,300
24	44	38	a 40	36	40	35	34	24	24	21	26	26,100
25	44	40	a 40	35	38	36	34	23	24	19	21	12,800
26	42	40	a 40	35	40	34	30	23	24	19	19	2,790
27	42	42	a 40	36	38	35	30	24	24	21	19	5,080
28	41	41	a 40	35	38	35	30	24	24	19	19	2,130
29	40	40	a 40	36	36	35	29	32	24	19	19	630
30	40	40	a 40	121	----------	35	29	38	24	21	19	368
31	40	----------	a 40	42	----------	35	----------	32	----------	21	19	----------
Total	1,324	1,200	1,225	1,263	1,159	1,114	1,001	860	743	672	581	123,886
Mean	42.7	40.0	39.5	40.7	40.0	35.9	33.4	27.7	24.8	21.7	18.7	4,130
Ac-ft	2,630	2,380	2,430	2,510	2,300	2,210	1,990	1,710	1,470	1,330	1,150	245,700

Calendar year Max Min Mean Ac-ft
Water year 1963-64: Max 39,200 Min 17 Mean 369 Ac-ft 267,800

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge
9-21	1200	21.4	104,000
9-23	1900	17.46	59,100
9-25	0900	11.27	17,400
9-26	2400	14.02	31,500

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

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

Low-flow partial-record stations

Measurements of streamflow in Texas made at low-flow partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during water year 1964

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Arkansas River basin				
7-2276	Bonita Creek near Amarillo, Tex.	Lat 35°27', long 101°47', ½ mile south of LX Ranch headquarters and about 17 miles northeast of Amarillo (discontinued).	(a)	1953-64	12-18-63 6- 3-64	1.90 1.13
7-2277	Chicken Creek near Amarillo, Tex.	Lat 35°28'29", long 101°45'35", about 1½ miles northeast of LX Ranch headquarters and about 18 miles northeast of Amarillo.	(a)	1953-64	12-18-63 6- 3-64 9- 9-64	1.63 1.38 b.41
7-2278	Coetas Creek near Amarillo, Tex.	Lat 35°29'40", long 101°44'00", about 2½ miles northeast of LX Ranch headquarters and about 20 miles northeast of Amarillo (discontinued).	(a)	1953-64	12-18-63 6- 3-64	.75 .60
		Red River basin				
7-2976	Prairie Dog Town Fork Red River above Stockton Dam near Canyon, Tex.	Lat 35°04', long 101°49', at end of county road, 2 miles south of Farm Road 1151 and 9½ miles northeast of Canyon.	-	1961-64	11-20-63 1-23-64 3-26-64 5-21-64 7- 9-64 9- 9-64	0 .91 .69 c.06 c.08 0
7-2977	Prairie Dog Town Fork Red River below Stockton Dam near Canyon, Tex.	Lat 35°02', long 101°46', just below Stockton Dam and 10 miles northeast of Canyon.	-	1961-64	11-20-63 1-23-64 3-26-64 5-21-64 9- 9-64	c.03 .06 c.2 .08 b.05
7-2978	Prairie Dog Town Fork Red River above Palo Duro Park near Canyon, Tex.	Lat 34°58'50", long 101°40'35", ¼ mile east of Park Road 5, ½ mile below park boundary and 14 miles east of Canyon.	-	1961-64	11-20-63. 1-23-64 3-26-64 5-21-64 7- 9-64 9-10-64	.11 .42 .14 0 0 0
7-2979	Prairie Dog Town Fork Red River below Palo Duro Park near Canyon, Tex.	Lat 34°55'50", long 101°38'05", at end of Park Road 5 and 17 miles east of Canyon.	-	1961-64	11-20-63 1-23-64 3-26-64 5-21-64 7- 9-64 9- 9-64	d.48 .20 .44 .13 c.04 0
7-2995.5	Buck Creek near Wellington, Tex.	Lat 34°42', long 100°11', at bridge on U. S. Highway 83 and about 10½ miles south of Wellington (discontinued).	e210	1951-64	11-18-63 1-21-64 3-24-64 5- 7-64 7- 1-64	2.29 2.59 3.37 2.31 1.85
7-2995.8	North Groesbeck Creek at North Groesbeck, Tex.	Lat 34°23'50", long 99°50'25", at bridge on Farm Road 1166, 1.4 miles south of North Groesbeck and 10 miles northwest of Quanah (discontinued).	-	1962-64	10- 1-63 12-12-63 2-13-64 4- 8-64 6- 4-64	0 0 0 0 0

See footnotes at end of table.

Discharge measurements made at low-flow partial-record stations during water year 1964--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Red River basin--Continued				
7-2996	North Groesbeck Creek near North Groesbeck, Tex.	Lat 34°23', long 99°48', about 3 miles southeast of North Groesbeck (discontinued).	e150	1951-64	10- 1-63 12-12-63 2-13-64 4- 8-64 6- 4-64	0.80 1.61 .72 1.23 1.47
7-2996.3	South Groesbeck Creek near Goodlet, Tex.	Lat 34°18'35", long 99°52'45", at bridge on Farm Road 2363 and 1.6 miles south of Goodlet (discontinued).	-	1962-64	10- 1-63 12-12-63 2-13-64 4- 8-64 6- 4-64	0 0 0 0 0
7-2996.5	South Groesbeck Creek near Acme, Tex.	Lat 34°21', long 99°47', at county road bridge, 1 mile above confluence with North Groesbeck Creek and 3 miles northeast of Acme (discontinued).	146	1951-64	10- 1-63 12-12-63 2-13-64 4- 8-64 6- 4-64	1.32 1.65 1.74 1.57 2.72
7-2997.5	Wanderers Creek at Odell, Tex.	Lat 34°21', long 99°25', at county road bridge and ¼ mile northwest of Odell Post Office.	199	1949-50, 1952-64	10- 1-63 12-12-63 2-12-64 4- 8-64 6- 4-64	1.14 1.80 3.10 1.88 1.12
7-2998.3	Kelly Creek near Clarendon, Tex.	Lat 35°00', long 100°54', at mouth, ¼ mile above gaging station on Salt Fork Red River and 4 miles north of Clarendon.	-	1951, 1961-64	10-10-63 1-20-64 4- 9-64 7- 1-64 9-10-64	.40 1.07 1.00 .21 b.14
7-2998.9	Lelia Lake Creek below Bell Creek near Hedley, Tex.	Lat 34°56'08", long 100°41'46", 150 ft county road crossing, about 1 mile below mouth of Bell Creek and 5 miles north of Hedley.	74	1964	9-10-64	b.65
7-2999	Lelia Lake Creek near Hedley, Tex.	Lat 34°59', long 100°40', at county road crossing and 8 miles north of Hedley.	e79	1951-64	10-10-63 1-21-64 4-10-64 7- 1-64 9-10-64	5.48 6.62 6.80 2.69 0
7-3014	Sweetwater Creek near Wheeler, Tex.	Lat 35°30'00", long 100°17'30", at bridge on U. S. Highway 83, 4 miles northwest of Wheeler (discontinued).	g164	1951-64	11-19-63 1-21-64 3-25-64 5-14-64	8.48 8.55 7.32 4.20
7-3033	Elm Creek near Shamrock, Tex.	Lat 35°07', long 100°17', at county road bridge, 1,500 ft below Fort Worth and Denver (Burlington) Railway Co. bridge and 6 miles southwest of Shamrock.	(a)	1947-64	10- 9-63 12-17-63 1-21-64 2-26-64 6- 2-64 8- 7-64	2.79 3.06 2.93 3.07 2.97 1.49
7-3075	Quitaque Creek near Quitaque, Tex.	Lat 34°14', long 101°07', ¾ mile above W. F. Saul's Ranchhouse, 1 mile below Wilson Creek, 1.5 miles above Turkey Creek and 10 miles southwest of Quitaque.	h293	1945-59, 1960-64	11-21-63 2-25-64 5-20-64 9- 8-64	d3.93 3.27 1.96 1.25
7-3077	Roaring Springs near Roaring Springs, Tex.	Lat 33°51', long 100°51', 3½ miles south of Roaring Springs.	(a)	1937, 1943-64	3- 3-64 5-11-64	j1.40 j1.35
7-3369.5	Barkman Creek near Leary, Tex.	Lat 33°29'57", long 94°11'31", at bridge on Farm Road 2253, 2.3 miles north of Leary (discontinued).	31.5	1958-64	11-14-63 7-12-64 8- 6-64	0 0 0
7-3441	Caney Creek near Redwater, Tex.	Lat 33°20'52", long 94°17'33", at bridge on U. S. Highway 67 and 2.3 miles southwest of Redwater (discontinued).	18.0	1958-64	11-14-63 7-12-64 8- 6-64	.12 .08 0
7-3443	Aiken Creek near Texarkana, Tex.	Lat 33°24'08", long 94°09'54", at bridge on U. S. Highway 67 and 4.2 miles west of Texarkana.	12.2	1958-60, 1964	11-14-63 12-16-63	.23 1.53

See footnotes at end of table.

Discharge measurements made at low-flow partial-record stations during water year 1964--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Red River basin--Continued				
7-3460.2	Kelly Creek near Marietta, Tex.	Lat 33°06'30", long 94°34'30", at bridge on Farm Road 250, 1¾ miles south of Cornett and 5 miles south of Marietta (discontinued).	50.5	1958-64	11-14-63 7-12-64 8- 6-64	0 0 0
7-3460.4	Hughes Creek near Avinger, Tex.	Lat 32°55'40", long 94°30'23", at bridge on State Highway 155 and 3½ miles northeast of Avinger (discontinued).	e349	1958-64	7-12-64 8- 6-64	.05 0
7-3460.45	Black Cypress Creek near Jefferson, Tex.	Lat 32°46'44", long 94°21'27", at bridge on U. S. Highway 59 and 1.3 miles north of Jefferson.	365	1964k	9-13-64	1.86
7-3460.6	Moccasin Creek near Harleton, Tex.	Lat 32°36'00", long 94°37'20", at bridge on Farm Road 449, 2 miles west of Cartersville and 6 miles south of Harleton (discontinued).	e30	1958-64	11-20-63 7-12-64 8- 6-64	.07 0 0
7-3460.8	Prewitt Creek near Karnack, Tex.	Lat 32°37'40", long 94°15'00", at low-water bridge on county road, 3¼ miles west of State Highway 43 and 5 miles southwest of Karnack (discontinued).	e19	1958-64	7-12-64 8- 6-64	0 0
7-3461	Kitchen Creek near Smithland, Tex.	Lat 32°48'40", long 94°11'00", at bridge on State Highway 49, 1¼ miles west of Smithland, and 5 miles above Caddo Lake.	e27	1958-60, 1964	11-20-63 12-17-63	d6.62 4.61
7-3461.2	Jims Bayou near Kildare, Tex.	Lat 32°53'30", long 94°11'00", at bridge on State Highway 43 and 5.0 miles southeast of Kildare.	82.9	1958-60, 1964	11-20-63 12-17-63	0 2.11
7-3461.4	Frazier Creek near Linden, Tex.	Lat 33°03'15", long 94°17'25", at bridge on U. S. Highway 59 and 4.0 miles northeast of Linden.	47.9	1958-60, 1964	11-20-63 12-16-63	0 3.10
7-3461.6	Frazier Creek near McLeod, Tex.	Lat 32°54'37", long 94°07'16", at bridge on Farm Road 125 and 3.3 miles southwest of McLeod.	199	1964	9-12-64	0
7-3463.2	Black Bayou near Atlanta, Tex.	Lat 33°04'25", long 94°09'45", at bridge on Farm Road 251, 0.9 mile below Texas and Pacific Railway bridge and 2.1 miles south of Atlanta (discontinued).	52.1	1958-64	11-14-63 7-12-64 8- 6-64	.08 0 0
		Sabine River basin				
8-182	Grand Saline Creek near Grand Saline, Tex.	Lat 32°40'21", long 95°36'35", at bridge on U. S. Highway 80, 1.7 miles above mouth and 5.5 miles east of Grand Saline.	91.4	1964	9-16-64	0
8-194	Big Sandy Creek near Winnsboro, Tex.	Lat 32°52'33", long 95°20'23", at bridge on State Highway 37, 0.8 mile below Lake Winnsboro Dam, 1.7 miles above Indian Creek and 6 miles southwest of Winnsboro.	(a)	1963-64	10-16-63 11-15-63 12-19-63 1-27-64 4- 7-64 7-15-64 8- 6-64	0 0 e.5 .50 1.10 0 0
8-220.2	Potters Creek near Marshall, Tex.	Lat 32°26'02", long 94°25'24", at bridge on Farm Road 2625, 5 miles above mouth and 8½ miles southwest of Marshall.	50.5	1962-64	7-30-64	0
8-220.5	Eight Mile Creek near Tatum, Tex.	Lat 32°22'33", long 94°19'32", at bridge on U. S. Highway 59, 3½ miles above mouth and 11½ miles northeast of Tatum.	106	1962-64	7-30-64	1.35
8-220.8	Martin Creek near Beckville, Tex.	Lat 32°15'28", long 94°21'07", at bridge on U. S. Highway 59, 2½ miles above mouth and 6 miles east of Beckville.	192	1962-64	7-31-64	.01
8-221	Irons Bayou near Carthage, Tex.	Lat 32°14'03", long 94°21'06", at bridge on U. S. Highway 59, 2½ miles above mouth and 5 miles north of Carthage.	104	1962-64	7-31-64	0
8-221.5	Six Mile Creek near Carthage, Tex.	Lat 32°07'17", long 94°17'24", at bridge on Farm Road 1401 and 3½ miles southeast of Carthage.	33.9	1962-64	7-30-64	.04

See footnotes at end of table.

Discharge measurements made at low-flow partial-record stations during water year 1964--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Sabine River basin--Continued				
8-223.5	Murvaul Bayou near Carthage, Tex.	Lat 32°04'35", long 94°14'55", at bridge on Farm Road 1401, 2½ miles above mouth and 7 miles southeast of Carthage.	231	1962-64	7-30-64	4.06
8-224.5	Socagee Creek near Deadwood, Tex.	Lat 32°04'42", long 94°07'06", at bridge on State Highway 31, 4½ miles above mouth and 4½ miles south of Deadwood.	201	1962-64	7-30-64 8-10-64	0 0
8-233.3	Half Branch Bayou near Huxley, Tex.	Lat 31°44'16", long 93°51'55", at bridge on county road and about 1.8 miles southeast of Huxley.	4.36	1963-64	9- 4-63 7-30-64	m.17 .06
8-250.2	Mill Branch near Hemphill, Tex.	Lat 31°23'08", long 93°41'58", at bridge, 1 mile east of Harper's Church and 9.2 miles east of Hemphill.	1.27	1963-64	9- 4-63 7-29-64	m.13 .10
8-285.1	Quicksand Creek near Bon Wier, Tex.	Lat 30°44'49", long 93°37'05", at bridge on U. S. Highway 190, 0.7 mile above mouth and 1¼ miles east of Bon Wier.	65.1	1932-33, 1939-54, 1957, 1959-64	11- 3-63	14.1
8-285.2	Caney Creek near Bon Wier, Tex.	Lat 30°44'30", long 93°38'00", at bridge on U. S. Highway 190 and 0.6 mile east of Bon Wier (discontinued).	46.2	1944, 1949, 1952-54, 1957, 1959-64	11- 3-63	5.13
8-285.5	Davis Creek near Bon Wier, Tex.	Lat 30°41'22", long 93°39'52", at bridge on Farm Road 1416, 2 miles above mouth and 3½ miles southwest of Bon Wier (discontinued).	27.1	1952-54, 1959-64	11- 1-63	.14
8-285.7	Dempsey Creek near Bon Wier, Tex.	Lat 30°40'25", long 93°40'42", at bridge on Farm Road 1416, about 1 mile south of Belgrade and about 5 miles southwest of Bon Wier.	11.7	1952-53, 1963-64	11- 1-63	.71
8-296	Big Cow Creek near Belgrade, Tex.	Lat 30°34'14", long 93°44'00", at Fisch Camp, ½ mile above mouth and 8½ miles southwest of Belgrade (discontinued).	342	1925, 1959-64	11- 1-63	55.5
		Neches River basin				
8-313	Flat Creek below Flat Creek Reservoir near Athens, Tex.	Lat 32°12'19", long 95°43'29", below Flat Creek Dam and 7.7 miles east of Athens.	21.6	1963-64	10- 8-63 11- 3-63 4- 1-64 8-19-64 9-25-64	0 0 c.06 0 0
		Trinity River basin				
8-663	Menard Creek near Rye, Tex.	Lat 30°28'58", long 94°46'46", at bridge on State Highway 146 and 2.3 miles northwest of Rye.	152	1950, 1963-64	2-20-64 3- 4-64 3-26-64 5-11-64 8-13-64	bd44.8 bd476 bd87.2 b37.6 8.43
		San Jacinto River basin				
8-712	Tarkington Bayou near mouth near Dayton, Tex.	Lat 30°11'23", long 95°00'05", at county road bridge, about 1.5 miles above mouth and about 12 miles northwest of Dayton.	142	1964	8-10-64	.14
		Brazos River basin				
8-808	White River near Crosbyton, Tex.	Lat 33°41', long 101°10', at county road crossing and 4½ miles east of Crosbyton (discontinued).	(a)	1951-64	11-12-63 2-18-64 5-11-64	1.10 1.56 .66
8-809	White River below falls near Crosbyton, Tex.	Lat 33°39'50", long 101°09'30", at bridge on U. S. Highway 82 and 4½ miles east of Crosbyton.	(a)	1951-64	11-12-63 2-18-64 5-11-64	.94 1.86 .65

See footnotes at end of table.

Discharge measurements made at low-flow partial-record stations during water year 1964--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Brazos River basin--Continued				
8-810.5	Short Croton Creek at mouth near Jayton, Tex.	Lat 33°18', long 100°32', at mouth, 0.2 mile above county road crossing on Croton Creek and 4.7 miles northeast of Jayton.	(a)	1959-64	10- 5-63	0
					11-12-63	0
					11-20-63	b.15
					12-18-63	bc.01
					1-14-64	0
					2-18-64	bc.002
					3-17-64	0
					4-14-64	b0
					5-12-64	0
					6-11-64	b.67
					7-14-64	0
					8-20-64	0
					9-24-64	0
8-811	Croton Creek below mouth of Short Croton Creek near Jayton, Tex.	Lat 33°18', long 100°32', at county road crossing and 4.7 miles northeast of Jayton.	(a)	1959-64	10- 5-63	0
					11-12-63	bc.14
					11-20-63	bd49.3
					12-18-63	b.75
					1-14-64	bc.15
					2-18-64	bc.12
					3-17-64	bc.02
					4-14-64	b0
					5-12-64	0
					6-11-64	bd117
					7-14-64	0
					8-20-64	0
					9-24-64	0
8-814	Salt Croton Creek (formerly Dove Creek) at Weir D near Aspermont, Tex.	Lat 33°23'50", long 100°24'40", in King County, 500 ft above Haystack Creek, 1,000 ft above streamflow station on Salt Croton Creek near Aspermont and 20 miles northwest of Aspermont.	(a)	1957-64	10- 4-63	b.67
					11-13-63	b.58
					12-19-63	b.88
					1-13-64	b.51
					2-17-64	b.88
					3-16-64	b.39
					4-15-64	b.69
					5-13-64	b.41
					5-13-64	.28
					6- 4-64	d1.10
					6-10-64	b.38
					7- 1-64	b.36
					7- 2-64	bd8.24
					7-10-64	.20
					7-14-64	.48
					7-27-64	.18
					7-28-64	.04
					7-28-64	.06
					8- 5-64	.24
					8-12-64	.05
					8-13-64	.06
					8-13-64	.11
					8-19-64	b.49
					8-27-64	1.08
					9-25-64	b.88
8-814.5	Haystack Creek (formerly Hayrick Creek) near Aspermont, Tex.	Lat 33°24'05", long 100°24'40", in King County, 400 ft above Salt Croton Creek and 20 miles northwest of Aspermont.	(a)	1957-64	10- 4-63	b.09
					11-13-63	b.06
					12-19-63	b.26
					1-13-64	b.48
					2-17-64	b.22
					3-16-64	b.24
					4-15-64	b.08
					5-13-64	b.15
					5-13-64	.06
					6- 4-64	.17
					6-10-64	b.04
					7- 1-64	bc.05
					7- 2-64	b.22
					7-10-64	.12
					7-14-64	.05
					7-21-64	.11
					7-27-64	.04
					7-28-64	.11
					7-28-64	.13
					8- 5-64	b.11
					8-12-64	.06
					8-13-64	.11
					8-19-64	bc.02
					8-27-64	.13
					9-25-64	b.14

See footnotes at end of table.

Discharge measurements made at low-flow partial-record stations during water year 1964--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Brazos River basin--Continued				
8-860.1	Hubbard Creek near Moran, Tex.	Lat 32°32'40", long 99°18'00", at county road crossing, 0.8 mile below Farm Road 576 and 8.0 miles west of Moran.	103	1963-64	12- 3-63 3- 9-64 3-16-64 5-18-64	0 0 0 0
8-860.2	Hubbard Creek at U. S. Highway 380 near Moran, Tex.	Lat 32°37'25", long 99°13'10", at bridge on U. S. Highway 380 and 6.1 miles northwest of Moran.	152	1963-64	12- 3-63 3- 9-64 3-16-64 5-18-64 9-22-64	bc.10 bc.40 bc.05 0 b1.39
8-860.3	Deep Creek near Putnam, Tex.	Lat 32°22'40", long 99°15'20", at bridge on U. S. Highway 80, 1.2 miles above Brushy Creek and 3.3 miles west of Putnam.	33.6	1963-64	12- 3-63 3- 9-64 3-16-64 5-19-64	0 bcd5.5 0 0
8-860.4	Brushy Creek near Putnam, Tex.	Lat 32°22'35", long 99°14'40", at bridge on U. S. Highway 80, 1.1 miles above Deep Creek and 3.8 miles west of Putnam.	27.6	1963-64	12- 3-63 3- 9-64 3-16-64 5-19-64	0 bcd4.0 0 0
8-860.45	Mexia Creek near Putnam, Tex.	Lat 32°22'45", long 99°16'10", at bridge on U. S. Highway 80, 1.7 miles above Deep Creek and 4.6 miles west of Putnam.	67.0	1963-64	12- 3-63 3- 9-64 3-16-64 5-19-64	0 0 0 0
8-861.1	Salt Prong Hubbard Creek below Lake McCarty near Albany, Tex.	Lat 32°40'08", long 99°20'40", at first county road crossing below Lake McCarty and 4.4 miles southwest of Albany.	45.5	1963-64	12- 4-63 3- 9-64 3-17-64 5-19-64	0 bc.24 bc.11 0
8-861.3	Cook Creek near Albany, Tex.	Lat 32°44'50", long 99°20'00", at first crossing of Farm Road 1084 and 2.7 miles northwest of Albany.	10.7	1963-64	12- 2-63 3-10-64 3-17-64 5-19-64	b0 bc1.2 bc.18 bc.02
8-862	Salt Prong Hubbard Creek near Albany, Tex.	Lat 32°42'10", long 99°12'20", at bridge on Farm Road 601, 2.7 miles below North Prong Hubbard Creek, 4.9 miles above Hubbard Creek and 5.2 miles southeast of Albany.	116	1962-63, 1964	12- 3-63 3-10-64 3-17-64 5-19-64	bc.20 bcd6.0 .85 bc.18
8-862.2	Big Sandy Creek near Eolian, Tex.	Lat 32°35'15", long 98°58'40", at county road crossing (extension of Farm Road 1032), 2.1 miles above Live Oak Creek and 5.5 miles southeast of Eolian.	91.4	1963-64	12- 3-63 3-10-64 3-17-64 5-19-64 9-23-64	bc.11 bcd4.0 bc.02 0 bd9.17
8-862.3	Battle Creek near Putnam, Tex.	Lat 32°22'40", long 99°09'30", at bridge on U. S. Highway 80, 1.6 miles above Cooper Creek and 2.0 miles east of Putnam.	32.0	1963-64	12- 3-63 3- 9-64 3-16-64 5-19-64	bc.06 bc.75 bc.08 0
8-862.4	Battle Creek near Eolian, Tex.	Lat 32°36'50", long 99°03'15", at bridge on Farm Road 1853, 0.8 mile above Pecan Creek and 4.2 miles southwest of Eolian.	137	1963-64	12- 3-63 3-10-64 3-17-64 5-19-64 9-23-64	0 bcd12 b0 0 bd9.92
8-862.5	Pecan Creek at Farm Road 1853 near Eolian, Tex.	Lat 32°31'45", long 99°03'20", at bridge on Farm Road 1853 and 9.7 miles southwest of Eolian.	6.95	1963-64	12- 3-63 3-10-64 3-17-64 5-19-64 9-23-64	b0 bc.05 bc.01 0 b.25
8-862.6	Pecan Creek near Eolian, Tex.	Lat 32°34'55", long 99°01'55", at county road crossing, 1.5 mile east of Farm Road 1853, 3.2 miles above Battle Creek and 5.4 miles south of Eolian.	25.4	1963-64	12- 2-63 3-10-64 3-17-64 5-19-64 9-23-64	b0 bc.30 b0 0 bd1.90
8-1032	Sulphur Creek above Gold Spring at Lampasas, Tex.	Lat 31°02'40", long 98°11'13", 0.4 mile above Gold Spring and 0.8 mile south of Lampasas.	e77	1957-64	10-31-63 12-11-63 2-20-64 3-26-64 4-29-64 6- 4-64 7- 8-64 8-13-64 9-16-64	0 0 0 0 0 0 0 0 0

See footnotes at end of table.

Discharge measurements made at low-flow partial-record stations during water year 1964--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Brazos River basin--Continued				
8-1033	Sulphur Creek below Gold Spring at Lampasas, Tex.	Lat 31°02'58", long 98°11'09", 0.2 mile south of Lampasas and 0.5 mile below Gold Spring.	(a)	1924, 1931, 1957-64	10-31-63 12-11-63 2-20-64 3-26-64 4-29-64 6- 4-64 7- 8-64 8-13-64 9-16-64	2.12 2.17 2.71 3.17 3.38 1.85 1.44 1.39 2.29
8-1034	Sulphur Creek below Hancock Springs at Lampasas, Tex.	Lat 31°03'14", long 98°10'53", at bridge on U. S. Highway 281, in Hancock Park, 200 ft below discharge outlet from swimming pool and 1,800 ft below city pumping plant.	(a)	1901-2, 1906, 1911, 1924, 1931, 1957-64	10-31-63 12-11-63 2-20-64 3-26-64 4-29-64 6- 4-64 7- 8-64 8-13-64 9-16-64	n7.71 7.68 n9.54 n7.75 n7.94 n8.23 n5.37 n4.95 n7.26
8-1035	Hannah Springs at Lampasas, Tex.	Lat 31°04'08", long 98°10'25", at Hackberry Street low-water crossing in Lampasas and 200 ft below Hannah Springs.	(a)	1901-2, 1906, 1910, 1957-64	10-31-63 12-11-63 2-19-64 3-26-64 4-29-64 6- 4-64 7- 8-64 8-13-64 9-16-64	j1.01 j1.14 j1.08 j1.06 j1.38 j1.30 j1.14 j1.07 j1.19
8-1036	Sulphur Creek at Gunderland Park near Lampasas, Tex.	Lat 31°04'31", long 98°08'31", 0.6 mile above Pecan Branch and 1.5 miles east of Lampasas.	(a)	1957-64	10-31-63 12-11-63 2-19-64 3-25-64 4-29-64 6- 4-64 7- 8-64 8-13-64 9-16-64	11.2 11.8 12.8 12.7 11.0 9.52 6.18 5.64 11.1
8-1037	Sulphur Creek below Lampasas, Tex.	Lat 31°05'10", long 98°03'10", at county road bridge at Hallmark Crossing, 1.8 miles above Lampasas River and 7.2 miles east of Lampasas.	(a)	1958-64	1-15-64 7- 7-64	13.8 6.01
8-1042	Salado Creek above Salado Springs near Salado, Tex.	Lat 30°56'23", long 97°33'16", just below mouth of Elm Creek, above all Salado Springs and 1½ miles above Salado.	133	1948, 1950-64	10- 1-63 10- 9-63 2-17-64 4-30-64 7- 6-64	.38 1.61 6.79 5.03 4.01
8-1043	Salado Springs at Salado, Tex.	Lat 30°56'50", long 97°31'51", at Salado.	(a)	1902-3, 1934, 1948, 1950-64	10- 1-63 12- 9-63 2-17-64 4-30-64 7- 6-64	j7.50 j9.04 j9.35 j12.4 j14.1
8-1048	North Fork San Gabriel River at Georgetown, Tex.	Lat 30°38'40", long 97°40'40", at bridge on U. S. Highway 81.	268	1948, 1962-64	8-10-64 9- 7-64	0 0
8-1049	South Fork San Gabriel River at Georgetown, Tex.	Lat 30°38'33", long 97°40'40", at bridge on U. S. Highway 81.	129	1948, 1962-64	8-10-64 9- 7-64	0 0
8-1112	New Year Creek near Chappell Hill, Tex.	Lat 30°09'57", long 96°13'24", at bridge on Farm Road 2447 and 2.6 miles northeast of Chappell Hill.	167	1948, 1964	8-26-64	0
8-1116	Piney Creek near Bellville, Tex.	Lat 29°57'06", long 96°10'20", at bridge on county road and 5.1 miles east of Bellville.	30.7	1948, 1955, 1958, 1964	9- 1-64	.02
8-1116.5	West Fork Mill Creek near Industry, Tex.	Lat 29°58'55", long 96°30'00", at bridge on Farm Road 109 and 0.6 mile north of Industry.	75.3	1964	8-25-64	0

See footnotes at end of table.

Discharge measurements made at low-flow partial-record stations during water year 1964--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Colorado River basin				
8-1272	Anson Springs near Christoval, Tex.	Lat 31°10', long 100°30', on Boulware Ranch and 4 miles above Christoval (discontinued).	(a)	1941, 1948-50, 1958-64	2-11-64 7-24-64	j11.1 j5.44
8-1290	Spring Creek Springs near Mertzon, Tex.	Lat 31°13', long 100°49', 2.1 miles south of Mertzon and 4.7 miles south of Sherwood (discontinued).	(a)	1943-44, 1948, 1950-52, 1955-64	2- 5-64 7-24-64	j6.36 j5.80
8-1295	Dove Creek Spring near Knickerbocker, Tex.	Lat 31°11', long 100°44', at W. G. Rawls ranchhouse, 500 ft above confluence with Dove Creek, 1¾ miles above Stilson Dam on Dove Creek and 8½ miles southwest of Knickerbocker.	(a)	1944-58p, 1959-64	10-21-63 11-26-63 12-26-63 2- 4-64 3- 9-64 4-13-64 5-18-64 6-15-64 7-21-64 8-26-64	j6.45 j6.62 j6.21 j6.33 j6.26 j6.37 j6.43 j6.08 j5.47 j5.36
8-1439	Springs (formerly Main Springs, Government Springs, and San Saba River) at Fort McKavett, Tex.	Lat 30°49'40", long 100°06'50", at Fort McKavett.	(a)	1902, 1905, 1922, 1942, 1948-49, 1951-52, 1955-56, 1958-64	1-14-64 7-13-64	j14.4 j7.13
8-1465	San Saba Springs at San Saba, Tex.	Lat 31°11'30", long 98°42'50", ¾ mile east of courthouse and 1,000 ft above bridge on U. S. Highway 190 at San Saba.	(a)	1939, 1952, 1957, 1959-64	2-25-64 7-15-64	j9.32 jq7.42
8-1494	South Llano River near Telegraph, Tex.	Lat 30°15'50", long 99°56'00", 3.7 miles above Paint Creek, 5.7 miles south of Telegraph and 18.7 miles southwest of Junction.	(a)	1939, 1952, 1956, 1959-64	1-14-64 7-13-64	15.8 10.8
8-1495	Seven Hundred Springs near Telegraph, Tex.	Lat 30°16'10", long 99°55'30", 3 miles above Paint Creek, 5 miles south of Telegraph and 18 miles southwest of Junction.	(a)	1939, 1952, 1955-56, 1959-64	1-14-64 7-13-64	j16.5 j14.5
8-1554	Barton Creek above Barton Springs at Austin, Tex.	Lat 30°15'48", long 97°46'19", just above upper dam of Barton Creek swimming pool in Zilker Park and above all springs known as Barton Spring at Austin.	125	1919-26p, 1926-40, 1940-58p, 1959-64	11-21-63 1- 2-64 2-15-64 3-14-64 4- 9-64 5- 9-64 6-11-64 7-14-64	0 0 0 0 0 0 0 0
8-1555	Barton Springs at Austin, Tex.	Lat 30°15'49", long 97°46'02", in Zilker Park at Austin.	(a)	1895-1917, 1917-18#, 1918-26p, 1926-40, 1940-58p, 1959-64	11-21-63 1- 2-64 2-15-64 3-14-64 4- 9-64 5- 9-64 6-11-64 7-14-64	20.2 18.7 20.9 19.0 27.2 20.2 21.3 20.2
8-1587	Onion Creek near Driftwood, Tex.	Lat 30°05'00", long 98°00'20", at bridge at lower crossing on Farm Road 150, 3.2 miles southeast of Driftwood and 10 miles west of Buda.	-	1958r, 1962-64	11-11-63 1-12-64 3- 7-64 5- 9-64 7-10-64 9-15-64	0 0 .66 .99 0 0
8-1588	Onion Creek at Buda, Tex.	Lat 30°05'12", long 97°50'49", 600 ft below bridge on Farm Road 967 and 0.4 mile northwest of Buda.	-	1958r, 1962-64	11-11-63 1-12-64 3- 7-64 5- 9-64 7-10-64 9-15-64	0 0 0 0 0 0

See footnotes at end of table.

Discharge measurements made at low-flow partial-record stations during water year 1964--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Colorado River basin--Continued				
8-1591	Onion Creek below Del Valle, Tex.	Lat 30°11'22", long 97°37'12", 600 ft above bridge on State Highway 71 and 2.4 miles southeast of Del Valle.	-	1958r, 1962-64	11-11-63 1-12-64 3- 7-64 5- 9-64 7-10-64 9-15-64	0 c.27 .32 .13 0 0
8-1593	Cedar Creek near Bastrop, Tex.	Lat 30°01'47", long 97°20'19", at county road, 0.6 mile below Walnut Creek and 6.0 miles southeast of Bastrop.	284	1964	8-19-64	0
8-1594	Piney Creek near Bastrop, Tex.	Lat 30°01'43", long 97°18'55", 0.6 mile above mouth and 6.0 miles south of Bastrop.	59.3	1964	8-19-64	0
		Guadalupe River basin				
8-1680	Hueco Springs near New Braunfels, Tex.	Lat 29°45'31", long 98°08'34", two springs located 200 ft and 400 ft west of Guadalupe River, 0.3 mile above mouth of Elm Creek and 4.2 miles north of New Braunfels.	(a)	1944-64	10- 1-63 11- 1-63 12- 2-63 1- 2-64 2- 3-64 3- 2-64 4- 2-64 5- 1-64 6- 1-64 7- 1-64 7-31-64 9- 2-64	0 0 0 0 j11.5 cj.27 cj.5 0 0 j33.9 j2.14 j6.91
8-1686	Blieders Creek at New Braunfels, Tex.	Lat 29°43'14", long 98°07'23", at Grove Avenue crossing in northwest New Braunfels and ¼ mile above mouth.	-	1962-64	10-30-63 2-12-64 5-27-64 8- 3-64	0 0 0 0
8-1687	Panther Canyon at New Braunfels, Tex.	Lat 29°42'47", long 98°08'14", at Landa Park Drive crossing in Landa Park at New Braunfels.	-	1962-64	10-30-63 2-12-64 5-27-64 8- 3-64	0 0 0 0
8-1688	Dry Comal Creek at New Braunfels, Tex.	Lat 29°41'52", long 98°08'11", at Floral Avenue crossing in New Braunfels, 0.6 mile above Missouri Pacific Railroad Co. bridge and 0.9 mile above mouth.	-	1962-64	10-30-63 2-12-64 5-27-64 8- 3-64	c.05 c.22 c.02 0
		Nueces River basin				
8-1910	Nueces River at U. S. Highway 90 near Uvalde, Tex.	Lat 29°12'21", long 99°54'09", at bridge on U. S. Highway 90, 3.3 miles below Southern Pacific Lines bridge, 7.0 miles west of Uvalde and 8.9 miles above present recording gage (discontinued).	(a)	1939, 1959s, 1960-64	10-22-63 11-26-63 1- 2-64 2- 4-64 3- 9-64 4-14-64 5-21-64 6-24-64 7-29-64	0 0 0 0 0 0 0 0 0
8-1955	Frio River at Knippa, Tex.	Lat 29°17'30", long 99°38'50", at bridge on U. S. Highway 90, 100 ft below Southern Pacific Lines bridge, 0.6 mile above confluence with Dry Frio River and 0.6 mile west of Knippa (discontinued).	468	1941-52, 1952-53p, 1960-64	10-21-63 10-25-63 12- 2-63 1- 2-64 2- 5-64 3- 9-64 4-13-64 5-18-64 6-23-64 7-28-64	0 0 0 0 0 0 0 0 0 0
8-1965	Dry Frio River at Knippa, Tex.	Lat 29°17'30", long 99°39'30", at bridge on U. S. Highway 90, 0.7 mile above mouth and 1.1 miles west of Knippa (discontinued).	179	1937, 1952-53p, 1958-59t, 1960-64	10-21-63 10-25-63 12- 2-63 1- 2-64 2- 5-64 3- 9-64 4-13-64 5-18-64 6-23-64 7-28-64	0 0 0 0 0 0 0 0 0 0

See footnotes at end of table.

Discharge measurements made at low-flow partial-record stations during water year 1964--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
		Rio Grande basin				
8-4270	Giffin Springs at Toyahvale, Tex.	Lat 30°57', long 103°47', 2,000 ft northwest of post office in Toyahvale.	(a)	1919, 1922-23, 1925, 1932-33‡ 1941-64	11- 6-63 1- 7-64 3-10-64 5-13-64 7-22-64	j4.87 j4.18 j3.78 j4.04 j4.81
8-4455	San Pedro Springs near Fort Stockton, Tex.	Lat 30°58'30", long 102°49'40", 7 miles northeast of Fort Stockton (discontinued).	(a)	1943, 1947-54, 1956-64	1- 6-64 7-20-64	0 0
8-4563	Las Moras Springs at Brackettville, Tex.	Lat 29°18', long 100°25', in spring pool at Brackettville, 160 ft south of U. S. Highway 90 and 1,550 ft above bridge on Brackettville Fort Clark road.	(a)	1896, 1899- 1900, 1902, 1904-6, 1910, 1912, 1925, 1928, 1951-64	10-22-63 11-26-63 1- 2-64 2- 4-64 3- 9-64 4-14-64 5-19-64 6-18-64 6-19-64 6-19-64 7-29-64 9- 2-64	j3.48 j6.34 j8.23 j8.18 j8.14 j8.67 j7.54 u1.21 u1.66 j2.56 0 0

‡ Operated as a continuous-record station.
a Not applicable.
b Chemical analysis available; sample from pool if no flow indicated.
c Field estimate.
d Not base flow.
e Approximately.
f Of which 154 sq mi is probably noncontributing.
g Of which 8 sq mi is probably noncontributing.
h Of which 258 sq mi is probably noncontributing.
j Springflow.
k Corps of Engineers have collected records at this site since May 1938.
m Measurement made as part of Sabine low-flow investigation.
n Pumping above site.
p Discharge measurements published as a regular gaging station.
q Includes 2.45 cfs pumpage by city of San Saba.
r Published as part of channel gain and loss investigation.
s Published with continuous-record gaging station Nueces River below Uvalde.
t Published with continuous-record gaging station Frio River below Dry Frio River near Uvalde.
u Not representative of springflow.

Crest-stage partial-record stations

The following table contains annual maximum discharges for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained but is not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations during water year 1964

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
		Trinity River basin					
8-556	Joes Creek at Dallas, Tex.	Lat 32°51'33", long 96°53'00", at bridge on State Highway 114, 0.9 mile above mouth, 7.8 miles northeast of Dallas, Dallas County.	7.51	1962-64	7-27-62 10- 8-62 9-21-64	423.6 425.3 420.95	3,100 7,430 1,150
8-571.2	Spanky Branch at McCallum Lane at Dallas, Tex.	Lat 32°57'58", long 96°48'11", at bridge on McCallum Lane, Dallas, Dallas County, 0.5 mile above mouth.	6.77	1962-64	9-21-64	572.02	7,870
8-571.4	Cottonwood Creek at Forest Lane at Dallas, Tex.	Lat 32°54'33", long 96°45'54", at bridge on Forest Lane, Dallas, Dallas County, 0.2 mile above Floyd Branch.	8.50	1962-64	9-21-64	510.09	6,200
8-571.6	Floyd Branch at Forest Lane at Dallas, Tex.	Lat 32°54'33", long 96°45'34", at bridge on Forest Lane, Dallas, Dallas County, 0.3 mile above mouth.	4.17	1962-64	9-21-64	510.26	3,500
8-573.2	Ash Creek at Highland Road at Dallas, Tex.	Lat 32°48'18", long 96°43'04", at bridge on Highland Road, Dallas, Dallas County, 0.4 mile above mouth.	6.92	1963-64	9-21-64	(a)	(†)
8-573.4	Forney Creek at Lawnview Avenue at Dallas, Tex.	Lat 32°46'45", long 96°43'02", at culvert on Lawnview Avenue, Dallas, Dallas County, 0.8 mile above mouth.	1.84	1963-64	9-21-64	430.04	(†)
		Brazos River basin					
8-793	Blackwater Draw tributary near Floyd, N. Mex.	NW¼SW¼ sec. 13, T. 1 S., R. 30 E., 0.5 mile below section road, 10 miles west of Floyd.	b10	1963-64	1964	-	0
		Colorado River basin					
8-1236.1	Seminole Draw tributary near Lovington, N. Mex.	NW¼NE¼ sec. 4, T. 17 S., R. 35 E., ¼ mile above culvert on State Highway 483, 5.1 miles south of Lovington.	b2	1963-64	1964	-	0

† Discharge not determined.
a Peak stage did not reach bottom of gage.
b Approximately.

Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table.

Discharge measurements made at miscellaneous sites during water year 1964

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Red River basin						
Prairie Dog Town Fork Red River	Red River	Lat 35°02', long 101°46', at spillway channel 1,500 ft below Stockton Dam, 10 miles northeast of Canyon, Randall County, Tex.	-	1963	11-20-63 5-21-64	a0.002 0
.....Do.....	.....do.....	Lat 34°58'04", long 101°40'10", at water crossing no. 1 on Park Road No. 5 in Palo Duro State Park, about 15 miles east of Canyon, Randall County, Tex.	-	-	5-21-64	*.06
.....Do.....	.....do.....	Lat 34°57'07", long 101°40'00", at water crossing no. 2 on Park Road No. 5 in Palo Duro State Park, about 15 miles east of Canyon, Randall County, Tex.	-	-	5-21-64	*.40
.....Do.....	.....do.....	Lat 34°56'53", long 101°39'47", at water crossing no. 3 on Park Road No. 5 in Palo Duro State Park, about 15 miles east of Canyon, Randall County, Tex.	-	-	5-21-64	*.44
.....Do.....	.....do.....	Lat 34°56'43", long 101°39'36", at water crossing no. 4 on Park Road No. 5 in Palo Duro State Park, about 15 miles east of Canyon, Randall County, Tex.	-	-	5-21-64	*.46
.....Do.....	.....do.....	Lat 34°56'34", long 101°39'22", at water crossing no. 5 on Park Road No. 5 in Palo Duro State Park, about 15 miles east of Canyon, Randall County, Tex.	-	-	5-21-64	*.23
Buffalo Creek	Wichita River	Lat 33°56'00", long 98°41'24", at county bridge, 1.7 miles southeast of Iowa Park, Wichita County, Tex.	-	1963	11- 5-63 12-10-63 1-10-64 2-12-64 3-10-64 4- 7-64 5- 4-64 6- 3-64 7- 8-64 9-23-64	0 0 0 b.16 0 0 ab.01 b1.14 0 b39.1
Sabine River basin						
Church House Creek	Sabine River	Lat 30°39'52", long 93°41'08", at bridge on Farm Road 1416, 5.8 miles south southwest of Bon Wier, Tex.	-	1963c	11- 1-63	*a.22
Donahoe Creek	.....do.....	Lat 30°37'34", long 93°43'17", at bridge on Farm Road 1416, 9.2 miles southwest of Bon Wier, Tex.	-	1963c	11- 1-63	*a.08
Neches River basin						
Flat Creek	Neches River	Lat 32°13'05", long 95°39'36", at bridge on Farm Road 607, 12 miles east of Athens, Henderson County, Tex.	-	1962-63	10- 8-63	*b.26
Village Creek	.....do.....	Lat 30°28'53", long 94°23'40", at bridge on U. S. Highway 69, about 9 miles northwest of Kountze, Hardin County, Tex.	-	1954, 1957, 1963	3- 3-64	b997
Hickory Creek	Village Creek	Lat 30°33'40", long 94°24'00", at bridge on U. S. Highway 69, about 4 miles south of Warren, Tyler County, Tex.	-	1954, 1957, 1963	3- 2-64	b304
Big Cypress Creek	Turkey Creek	Lat 30°39'35", long 94°23'28", at bridge on U. S. Highway 69, about ¾ mile southwest of Hillister, Tyler County, Tex.	-	1963	3- 2-64	b270
Beech Creek	Village Creek	Lat 30°29'24", long 94°15'43", at bridge on county road about 9 miles east of Village Mills, Hardin County, Tex.	-	1963	3- 3-64	b1,170

See footnotes at end of table.

Discharge measurements made at miscellaneous sites during water year 1964--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Double Bayou basin						
West Fork Double Bayou	Double Bayou	Lat 29°45'39", long 94°38'00", at bridge on Smith Point Road about 3 miles southeast of Anahuac, Chambers County, Tex.	-	1963	12-13-63	44.0
					2- 5-64	179
					2- 5-64	132
					2-25-64	56.4
					2-26-64	22.1
					2-27-64	11.1
					2-28-64	7.31
Trinity River basin						
White Rock Creek	Trinity River	Lat 32°52'03", long 96°42'30", at Skillman Street, about 2.8 miles downstream from station White Rock Creek at Greenville Avenue, Dallas, Tex.	73.1	-	9-21-64	†2,300
Big Elkhart Creek	Trinity River	Lat 31°28', long 95°39', at bridge on Farm Road 227, 11 miles west of Grapeland, Houston County, Tex.	-	1962-63	4-27-64	b146
Bedias Creek	.....do.....	Lat 30°53', long 95°47', at bridge on U. S. Highway 190, 9 miles southeast of Madisonville, Madison County, Tex.	-	1962-63	4-27-64	b740
Gail Creek	White Rock Creek	Lat 31°08', long 95°24', at bridge on Farm Road 1280, 3 miles east of Lovelady, Houston County, Tex.	-	1962-63	4-27-64	b631
White Rock Creek	Trinity River	Lat 30°58', long 95°20', at bridge on State Highway 94, 2.8 miles northeast of Trinity, Trinity County, Tex.	-	1949	12- 1-63	*ab.20
					12-30-63	*b2.37
					5-18-64	*b9.41
Kickapoo Creek	.....do.....	Lat 30°46', long 95°06', at bridge on Farm Road 356, 2.1 miles southeast of Onalaska, Polk County, Tex.	-	1949	12- 4-63	*b6.98
					1- 3-64	*b4.05
					6-17-64	b14.8
Big Creek	.....do.....	Lat 30°31'00", long 94°59'05", at bridge on U. S. Highway 59, about 1½ miles northeast of Shepherd, San Jacinto County, Tex.	-	1963	12- 9-63	*b6.70
					2-17-64	b16.1
					3- 4-64	b73.3
					3-23-64	b24.3
Cedar Bayou basin						
Cedar Bayou	Gulf of Mexico	Lat 29°58'20", long 94°59'10", at bridge on U. S. Highway 90, about 7 miles southwest of Dayton, Liberty County, Tex.	64.9	1963	12-13-63	120
					2- 5-64	210
					2-27-64	40.9
					2-28-64	*23.5
.....Do.....	.....do.....	Lat 29°49'15", long 94°54'35", at bridge on Texas Interstate Highway 10, about 2 miles southwest of Mont Belview, Chambers County, Tex.	-	-	2-25-64	796
					2-26-64	254
San Jacinto River basin						
West Fork San Jacinto River	San Jacinto River	Lat 30°21', long 95°32', at bridge on State Highway 105, 6 miles west northwest of Conroe, Montgomery County, Tex.	-	1962-63	11-26-63	b35.4
					1- 3-64	b29.5
					3- 3-64	ab2,000
Lake Creek	West Fork San Jacinto River	Lat 30°16'48", long 95°42'19", at bridge on Farm Road 149, 6 miles northeast of Magnolia, Montgomery County, Tex.	-	-	4-27-64	425
					4-28-64	681
Barker Ditch	Buffalo Bayou	Lat 29°46'15", long 95°38'42", 300 yards upstream from mouth at Buffalo Bayou, about 1 mile south of Addicks, Harris County, Tex.	-	-	3- 4-64	7.36
Clodine Ditch	.....do.....	Lat 29°45'20", long 95°38'43", at bridge on county road entering Barker Reservoir, about 2 miles south of Addicks, Harris County, Tex.	-	-	3- 4-64	115
					3- 6-64	22.6
Buffalo Bayou	San Jacinto River	Lat 29°46'07", long 95°38'36", at bridge on Addicks-Howell Road about 1.1 miles south of Addicks, Harris County, Tex.	-	1963	3- 5-64	278
					3- 5-64	459
					3- 5-64	549
					3- 5-64	734
					3- 5-64	872
					3- 5-64	954
					3- 6-64	1,320
.....Do.....	.....do.....	Lat 29°47'08", long 95°37'26", at service road bridge upstream from U. S. Highway 90 about 1.2 miles east of Addicks, Harris County, Tex.	-	1963	3- 5-64	596
					3- 6-64	196
					3- 6-64	372
					3- 6-64	508
					3- 6-64	682
					3- 6-64	856
					3- 6-64	1,210

See footnotes at end of table.

Discharge measurements made at miscellaneous sites during water year 1964--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
		San Jacinto River basin--Continued				
Vince Bayou	Buffalo Bayou	Lat 29°41'52", long 95°12'52", at bridge on West Harris Avenue about 1.7 miles south of Buffalo Bayou at Pasadena, Harris County, Tex.	8.05	1963	12-13-63 2-25-64 2-26-64 2-27-64 2-28-64	76.7 30.2 9.95 13.6 5.45
Little Vince Bayou	Vince Bayou	Lat 29°42'38", long 95°12'08", at bridge on East Eagle Street at Pasadena, Harris County, Tex.	-	1963	12-13-63 2-25-64 2-26-64 2-27-64 2-28-64	35.6 13.7 3.71 9.51 1.32
Hunting Bayou	Buffalo Bayou	Lat 29°47'40", long 95°14'42", at bridge on Wallisville Road, about 7 miles northeast of Houston, Harris County, Tex.	19.8	1963	12-13-63 2-26-64 2-28-64	99.0 23.1 15.5
Greens Bayou	.....do.....	Lat 29°50'13", long 95°13'59", at bridge on Ley Road, about 100 yards downstream from junction of Halls and Greens Bayous near Houston, Harris County, Tex.	182	1963	12-13-63 2-25-64 2-27-64 2-28-64	182 740 112 72.2
Carpenters Bayou	.....do.....	Lat 29°46'16", long 95°08'35", at bridge on Texas Interstate Highway 10, about 0.5 mile east of Cloverleaf, Harris County, Tex.	22.3	1963	12-13-63 2-25-64 2-26-64 2-28-64	33.7 83.1 30.3 13.2
Goose Creek	San Jacinto River	Lat 29°48'00", long 95°00'30", at bridge on Texas Interstate Highway 10, about 0.7 mile southeast of McNair, Harris County, Tex.	6.70	1963	12-13-63 2- 5-64 2-26-64 2-27-64 2-28-64	11.5 42.8 8.89 4.63 3.28
		Dickinson Bayou				
Dickinson Bayou	Gulf of Mexico	Lat 29°26'09", long 95°10'11", at bridge on Farm Road 517, about 5 miles east of Alvin, Galveston County, Tex.	15.7	1963	12-13-63 2-25-64 2-26-64 2-27-64 2-28-64	42.4 35.8 15.2 9.49 11.5
		Brazos River basin				
Double Mountain Fork Brazos River	Brazos River	Lat 33°11', long 99°58', at bridge on State Highway 24, 4 miles west of Rule, Haskell County, Tex.	-	-	3-25-64 4-13-64 5-11-64 6-10-64 7-13-64 8-20-64 9-16-64	b0 0 b6.08 0 0 b11.3 b196
Tank Creek	Double Mountain Fork Brazos River	Lat 33°11', long 99°59', at bridge on county road about 1 mile upstream from mouth and 5 miles west of Rule, Haskell County, Tex.	-	-	3-25-64 4-13-64 5-11-64 6-10-64 7-13-64 8-20-64 9-16-64	*ab.04 *ab.02 *ab.01 0 0 0 b93.1
White River	Salt Fork Brazos River	Lat 33°15', long 100°57', about 13 miles northwest of Clairemont, Kent County, Tex.	-	-	3-17-64 4-14-64 5-12-64 6-11-64 7-15-64 8-20-64	0 0 0 b.18 0 0
Salt Creek tributary	Salt Creek	Lat 33°12'50", long 100°52'20", at oil field road about 4 miles upstream from mouth and 7.7 miles northwest of Clairemont, Kent County, Tex.	-	-	5-12-64	*ab.05
Salt Fork Brazos River	Brazos River	Lat 33°12', long 100°45', at bridge on Farm Road 208 and 3 miles north of Clairemont, Kent County, Tex.	-	-	3-17-64 4-14-64 5-12-64 6-11-64 7-15-64 8-20-64	0 0 0 0 0 0

See footnotes at end of table.

Discharge measurements made at miscellaneous sites during water year 1964--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
		Brazos River basin--Continued				
Duck Creek	Salt Fork Brazos River	Lat 33°16', long 100°42', at low-water bridge and 9 miles west of Jayton, Kent County, Tex.	-	-	3-17-64	*b2.51
					4-14-64	*b1.82
					6-11-64	b8.41
					7-14-64	0
					8-20-64	0
Salt Fork Brazos River	Brazos River	Lat 33°10', long 100°26', at county road and 2.4 miles west of Peacock, Stonewall County, Tex.	-	-	3-17-64	*b1.07
					4-14-64	*b.22
					5-12-64	0
					6-12-64	b4.26
					7-15-64	0
					8-20-64	0
Salt Croton Creek (formerly Dove Creek)	Salt Fork Brazos River	Lat 33°24'04", long 100°24'29", 50 ft above Salt Croton streamflow station, 21 miles northwest of Aspermont, Stonewall County, combined flow of Salt Croton Creek at Weir D and Haystack Creek.	-	-	7-14-64	*.53
					7-21-64	*1.12
					7-21-64	*.41
.....Do.....	.....do.....	Lat 33°23'48", long 100°24'22", 3/8 mile below Salt Croton Creek streamflow station, 21 miles northwest of Aspermont, Stonewall County, Tex.	-	-	7- 1-64	*.38
					7-27-64	*.34
					7-28-64	*.19
					8-12-64	*.05
					8-13-64	*.07
					9-25-64	.87
California Creek	Clear Fork Brazos River	Lat 32°53'40", long 99°51'15", at bridge on U. S. Highway 277, 5 miles southwest of Stamford, Jones County, Tex.	-	1963	10-11-63	0
					11-13-63	*ab.01
					12-18-63	*b.33
					2-19-64	*b.83
					4-13-64	*b.39
					7-15-64	0
					8-19-64	0
Hubbard Creek	.....do.....	Lat 32°45'42", long 99°05'35", at bridge on U. S. Highway 180, 11.6 miles west of Breckenridge, Stephens County, Tex.	-	-	4- 4-64	b95.4
Harris Creek	Brazos River	Lat 31°26'30", long 97°26'10", at bridge on U. S. Highway 84, 1.4 miles west of McGregor, McLennan County, Tex.	8.85	-	6-16-64	†10,800
.....Do.....	.....do.....	Lat 31°28'30", long 97°19'15", at bridge on U. S. Highway 84, 5.8 miles east of McGregor, McLennon County, Tex.	20.9	-	6-16-64	†23,500
Little Brazos River	.....do.....	Lat 30°38'30", long 96°31'10", at State Highway 21, 0.8 mile above Brazos River and 7.8 miles west of Bryan, Brazos County, Tex.	-	1963	10- 8-63	ab.15
					12-18-63	b3.80
					2-24-64	b9.06
					3-24-64	b28.2
					6-19-64	b11.1
					8-26-64	b4.14
South Texas Water Co.'s Canal	Brazos River (Diversion)	Lat 29°27'07", long 95°29'30", 1 mile west of Juliff, Fort Bend County, Tex., 2.5 miles below pumps and at concrete flume over Oyster Creek.	-	1939, 1948-49, 1951-52, 1956, 1959, 1963	4-22-64	260
					5-25-64	428
					6-18-64	297
					9- 3-64	157
		Colorado River basin				
Bull Creek	Colorado River	Lat 32°35'54", long 101°05'37", 300 ft above Farm Road 2085 and 5½ miles west of Ira, Scurry County, Tex.	-	-	9-17-64	*b.25
South Concho River	.....do.....	Lat 31°20'13", long 100°28'46", 1,000 ft upstream from Pecan Creek near San Angelo, Tom Green County, Tex.	-	1963	10-16-63	*1.59
					1- 9-64	*2.22
					3-13-64	*1.51
					4-16-64	*2.54
					5-21-64	*2.33
					6-23-64	*1.87
					8- 3-64	*1.25
					8-28-64	*1.33

See footnotes at end of table.

Discharge measurements made at miscellaneous sites during water year 1964--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Colorado River basin--Continued						
San Angelo Reservoir from toe drain on left bank	North Concho River	Lat 31°29'07", long 100°28'36", on toe drain located on left downstream side of San Angelo Reservoir, about 50 ft above North Concho River at San Angelo, Tom Green County, Tex.	-	1959-63	10-22-63 11-29-63 12-27-63 2-13-64 3-13-64 4-16-64 6-16-64 8- 3-64 8-28-64	0.65 .90 .75 .87 .51 .48 .40 .27 .20
Jim Ned Creek	Pecan Bayou	Lat 31°59'10", long 99°25'05", at bridge on U. S. Highway 283, 10.4 miles north of Coleman, Coleman County, Tex.	-	1962-63	4-24-64 6-15-64 9-21-64 9-25-64	b27.4 b8.85 b9.34 b6.21
Pecan Bayou	Colorado River	Lat 31°59'45", long 99°13'55", at old highway bridge on State Highway 206, at Burkett, Coleman County, Tex.	-	-	4-21-64	ab2.5
.....Do.....	.....do.....	Lat 31°54'35", long 99°02'35", at bridge on Farm Road 2559, 13 miles north of Brownwood, Brown County, Tex.	-	-	4-21-64	b2,320
.....Do.....	.....do.....	Lat 31°27'20", long 98°41'40", at bridge on Farm Road 574, 8 miles west of Goldthwaite, Mills County, Tex.	-	-	9-23-64	b477
Clear Creek	San Saba River	Lat 30°54', long 99°55', about 800 ft above mouth and 8 miles west of Menard, Menard County, Tex.	-	1902, 1918, 1920, 1922 1933, 1940, 1942, 1948-49, 1951-52, 1955-56, 1958, 1962, 1963	7-28-64	d10.9
Lower Colorado River Authority's Lane City Canal	Colorado River (Diversion)	Lat 29°12', long 96°03', 1.8 miles southwest of Lane City, Wharton County, Tex.	-	1918, 1962-63	7- 2-64	268
Lower Colorado River Authority's Gulf Coast Canal	.....do.....	Lat 28°59'05", long 96°00'56", just downstream from State Highway 35, 1.8 miles west of Bay City, Matagorda County, Tex.	-	1954, 1962-63	7- 2-64	160
Guadalupe River basin						
Guadalupe River	Gulf of Mexico	Lat 30°04'10", long 99°19'35", at bridge on State Highway 39, 0.5 mile downstream from confluence of North and South Forks, 0.6 mile east of Hunt, Kerr County, Tex.	276	1941, 1942-49‡ 1951-52, 1954,	9-11-64	*28.1
.....Do.....	.....do.....	Lat 30°04'10", long 99°15'30", at road crossing 600 ft downstream from Kerr County Dam, one-half mile upstream from Johnson Creek, three-quarter mile west of Ingram, Kerr County, Tex.	-	1924	9-11-64	*26.2
.....Do.....	.....do.....	Lat 30°02'30", long 99°08'20", at Kerrville, Kerr County, Tex., 800 ft downstream from bridge on State Highway 16.	-	1924	9-11-64	40.7
San Marcos River	Guadalupe River	Lat 29°35'23", long 97°35'05", at bridge on Park Road 11 in Palmetto State Park, 0.6 mile south of Ottine, Gonzales County, Tex., 5.1 miles downstream from Plum Creek.	1,249	1915-43‡ 1947	12- 5-63 3-18-64 7- 1-64 9- 9-64	*b99.8 *b111 *b125 *b79.8

See footnotes at end of table.

Discharge measurements made at miscellaneous sites during water year 1964--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
		San Antonio River basin				
Medina River	San Antonio River	Lat 29°31'45", long 98°56'10", at bridge on county road, 0.6 mile downstream from Medina Dam, 6.9 miles north of Riomedina, Medina County, Tex.	-	-	3- 6-64	73.0
Elm Creek	Cibolo Creek	Lat 29°21'50", long 98°05'06", at bridge on county road, 0.6 mile upstream from mouth, 1.8 miles east of La Vernia, Wilson County, Tex.	-	-	3-11-64 3-21-64	*ab.05 *b1.13
		Mission River basin				
Blanco Creek	Mission River	Lat 28°20'36", long 97°20'00", at State Highway 202, 4.5 miles northwest of Refugio, Refugio County, Tex.	-	1962-63	10- 9-63 12-18-63 2-26-64 5- 6-64 7-15-64 7-20-64 9-24-64	0 *b.34 b39.4 *ab.10 0 b50.8 0
Medio Creek	.....do.....	Lat 28°18'57", long 97°20'23", at bridge on county road 4 miles west of Refugio, Refugio County, Tex.	-	1962-63	10- 9-63 12-18-63 2-26-64 5- 6-64 7-15-64 7-20-64 9-24-64	*ab.02 *b.92 b19.4 *ab.20 0 b242 *ab.4
		Nueces River basin				
Turkey Creek	Nueces River	Lat 28°43', long 99°58', at bridge on Farm Road 1668, about 8 miles west northwest of Crystal City, Zavalla County, Tex.	-	1962	3-24-64 5-12-64 5-18-64 8-24-64 9-13-64 9-16-64 9-23-64	0 b29.3 0 b0 0 ab.6 b2,610
		San Fernando Creek basin				
San Fernando Creek	Gulf of Mexico	Lat 27°43'30", long 97°59'15", at bridge on Farm Road 665, 1 mile upstream from Lattas Creek, 5 miles east southeast of Alice, Jim Wells County, Tex.	-	1962-63#	1-13-64	0
.....Do.....	.....do.....	Lat 27°33'00", long 97°50'27", at bridge on U. S. Highway 77, 2.8 miles northeast of Kingsville, Kleberg County, Tex.	-	1962	7-21-64	b170
		Santa Gertrudis Creek basin				
Santa Gertrudis Creek	Gulf of Mexico	Lat 27°29'06", long 97°52'00", at bridge on U. S. Highway 77, 2 miles south of Kingsville, Kleberg County, Tex.	-	1962	7-21-64	ab.05
Escondido Creek	Santa Gertrudis Creek	Lat 27°28'12", long 97°52'00", at bridge on U. S. Highway 77, 3.0 miles south of Kingsville, Kleberg County, Tex.	-	1962	7-21-64	b0
		Rio Grande basin				
Pecos River	Rio Grande	Lat 31°35'58", long 103°30'16", about 1,000 ft downstream from Ward Co. W.I.D. No. 3 diversion dam, 11.5 miles north of Pecos, Reeves County, Tex.	-	-	6-16-64	138
.....Do.....	.....do.....	Lat 31°32'43", long 103°29'46", about 1,300 ft downstream from Ward Co. Irr. District No. 1 canal diversion dam, 8.5 miles north of Barstow, Ward County, Tex.	-	-	6-16-64	67.0
.....Do.....	.....do.....	Lat 31°28'50", long 103°29'00", at old Sullivan Bridge, 3.8 miles north of Pecos, Reeves County, Tex.	-	-	6-16-64	70.2
.....Do.....	.....do.....	Lat 31°21'51", long 103°06'06", at Pecos Co. W.I.D. No. 2 (Upper Diversion) Dam, 15.3 miles west of Grandfalls, Ward County, Tex.	-	-	5-12-64	1.17

See footnotes at end of table.

Discharge measurements made at miscellaneous sites during water year 1964--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Rio Grande basin--Continued						
Pecos River	Rio Grande	Lat 31°22'48", long 103°02'07", about 300 ft downstream from Ward Co. W.I.D. No. 2 diversion dam and 10 miles west of Grandfalls, Tex.	-	-	5-12-64	0.12

* Base flow.
† Peak discharge.
‡ Operated as a continuous-record gaging station.
a Field estimate.
b Quality water sample taken, if no flow sample from pool.
c At site measured during Sept. 4-5, 1963, Sabine River low-flow investigation.
d Probably affected by 6-inch pump in pool upstream.

San Gabriel River Low-Flow Investigation

Reach.--From U. S. Highway 183 crossing on North San Gabriel River, 9 miles north of Leander, Williamson County, to mouth of San Gabriel River, a distance of 69 river miles.

Purpose.--To determine the apparent gains or losses in the channel under conditions of base flow; to study the effects of geology, cultural influences, and vegetation on the quantity and chemical quality of the base flow; and to evaluate the water for municipal, irrigation, and industrial use.

Summary.--The investigation was made Mar. 16-18, 1964, when the flow of the San Gabriel River was sustained by ground-water inflow and transpiration was negligible. The San Gabriel generally gained flow through the reach, but small losses were occurring on the North Fork San Gabriel River and the lower San Gabriel River. The waters in the upper part of the study were a calcium bicarbonate type, and despite inflow of water of other types, the chemical type of the water in the main stem did not change. During the period of the study the quality of the water was better than that required by the U. S. Public Health Service drinking water standards. The water during low flow had a medium-salinity hazard and low-sodium hazard and thus would be satisfactory for irrigation.

Results of chemical analyses of water samples collected during this investigation are available in the Texas Water Commission Bull. 6510 and in Quality-of-Water Records in Texas, 1964.

Summary of discharge measurements, San Gabriel River base-flow study, March 1964

Date	Stream	Location	River miles[1/]	Water temp. (°F)	Discharge in cfs		Remarks
					Main stream	Tributary	
16	North Fork San Gabriel River	At bridge on U. S. Highway 183, 9 miles north of Leander.	69.0	60	8.48	-	Irregular v-shaped channel cut in limestone and shale.
16	.....Do.....	1.6 miles upstream from mouth of Sowes Creek.	68.0	61	7.65	-	Streambed is limestone ledges with gravel bars. Small faults immediately upstream.
16	.....Do.....	0.8 mile upstream from mouth of Sowes Creek.	67.2	67	7.42	-	Streambed is limestone. Stairstep faults and associated fractures cross streambed upstream.
16	Sowes Creek	At mouth.	66.4	77	-	a0.01	Intersects river along small fault.
16	Unnamed tributary	At mouth, 0.8 mile downstream from mouth of Sowes Creek.	65.6	66	-	a.24	V-shaped channel with rock bottom.
16	.....Do.....	At mouth, 1.2 miles downstream from mouth of Sowes Creek.	65.2	68	-	.18	V-shaped channel. Intersects river along fracture.
16	North Fork San Gabriel River	600 feet above county road crossing, 9.0 miles northwest of Georgetown.	64.4	65	8.56	-	Weathered, flaky, limestone banks. Limestone streambed.
16	Unnamed tributary	At mouth, 7.5 miles northwest of Georgetown.	62.8	74	-	a.05	Clay and gravel, streambed.
16	.....Do.....	At mouth, 6.0 miles northwest of Georgetown.	61.0	55	-	a.06	V-shaped channel. Spring fed.
16	North Fork San Gabriel River	At county road crossing, 5.0 miles northwest of Georgetown.	59.8	64	9.96	-	Bluffs are shale and limestone. Streambed is gravel.
17	Unnamed tributary	At mouth, 2.6 miles upstream from mouth of Middle Fork San Gabriel River.	57.0	52	-	a.08	V-shaped, crossbedded sand channel. Spring fed.
17	.....Do.....	At mouth, 0.6 mile upstream from mouth of Middle Fork San Gabriel River.	55.0	55	-	a.02	V-shaped ravine between rocky hills. Spring fed.
17	North Fork San Gabriel River	200 feet upstream from mouth of Middle Fork San Gabriel River.	54.6	58	11.1	-	Limestone streambed with gravel bars. Minor faults downstream.
17	Middle Fork San Gabriel River	At mouth.	54.4	60	-	1.04	Series of small dams upstream. Spring fed.
16	South Fork San Gabriel River	At bridge on U. S. Highway 183, 4.5 miles north of Leander.	66.8	63	-	1.62	Limestone streambed. Gravel and boulders in channel.
16	[b]Unnamed tributary	At mouth, 8.8 miles upstream from mouth of South Fork San Gabriel River.	62.0	77	-	a.12	Limestone streambed. Spring fed.
16	South Fork San Gabriel River	8.2 miles from mouth.	61.4	77	-	2.14	Large gravel bars. Seepage along right bank. Limestone streambed.
16	[b]Unnamed tributary	At mouth, 8.2 miles upstream from mouth of South Fork San Gabriel River.	61.4	70	-	a.04	V-shaped channel. Seepage along banks.

See footnotes at end of table.

Summary of discharge measurements, San Gabriel River base-flow study, March 1964--Continued

Date	Stream	Location	River miles1/	Water temp. (°F)	Discharge in cfs		Remarks
					Main stream	Tributary	
16	South Fork San Gabriel River	3.9 miles from mouth.	57.0	67	-	3.39	Pools and rapids formed by large gravel bars in channel. Limestone streambed.
16	.....Do.....	At bridge on State Highway 29, at Georgetown.	54.0	72	-	3.16	Pools and rapids formed by gravel bars and boulders in channel. Limestone streambed.
17	San Gabriel River	At gaging station, 1.2 miles northeast of Georgetown.	51.8	62	28.6	-	Large gravel deposits. Banks are soil.
18	Smith Branch	At bridge on State Highway 29, 0.5 mile east of Georgetown.	c51.4	64	-	a.28	Sediment and rubble in streambed.
17	Berry Creek	At county road crossing, 0.5 mile above mouth.	c48.4	63	-	12.5	Gravel streambed.
17	Ranger Branch	600 feet above confluence with Berry Creek.	c48.4	67	-	.37	V-shaped channel. Gravel and sand streambed.
17	Stone Bottom Creek	At county road crossing, 5 miles west of Weir.	c47.0	-	-	a.45	V-shaped channel. Sediment streambed.
17	Weirs Creek	At county road crossing, 0.5 mile south of Weir.	c47.0	-	-	a.30	V-shaped channel. Banks are soil. Gravel streambed.
17	Manske Branch	At mouth.	44.8	75	-	2.26	Rock streambed. Gravel, sediment, and rubble in channel.
17	San Gabriel River	0.5 mile upstream from county road crossing at Jonah.	42.8	73	42.7	-	Low soil banks. Gravel streambed.
17	Unnamed tributary	At mouth, 0.4 mile west of Jonah.	42.6	-	-	a.15	V-shaped channel cut in soil rock.
17	Milam Creek	At bridge at Jonah.	c42.0	-	-	a.14	Sediment and gravel on streambed.
17	San Gabriel River	At bridge on county road, 2.0 miles west of Circleville.	37.8	68	45.7	-	Gravel bars in channel. Gravel streambed.
17	.....Do.....	At bridge on State Highway 95, at Circleville.	35.6	62	47.4	-	Irregular u-shaped channel. Soil and gravel banks. Gravel streambed.
17	Queen Branch	At old highway bridge at Circleville.	c35.0	62	-	.15	Steep u-shaped channel. Gravel streambed. Gravel and soil banks.
18	Unnamed tributary	At mouth, 0.5 mile east of Circleville.	34.0	68	-	a.07	V-shaped channel. Mud streambed.
17	San Gabriel River	1.5 mile south of Friendship.	26.0	65	53.9	-	Rectangular channel with soil banks. Gravel streambed.
17	Williamson Creek	At mouth.	24.6	67	-	.25	V-shaped channel with mud bottom.
17	San Gabriel River	At county road crossing at Laneport.	22.0	67	55.9	-	Steep u-shaped channel. Gravel streambed.
18	Pecan Creek	At mouth.	16.2	-	-	No flow	Narrow u-shaped channel. Soil Banks.
18	San Gabriel River	At bridge on Farm Road 486, near San Gabriel.	16.0	62	58.6	-	Streambed is gravel. Soil banks and cultivated flood plains.
18	.....Do.....	At bridge on county road, 3.5 miles east of San Gabriel.	12.0	63	55.2	-	Streambed is gravel. Eroding soil banks.
18	Alligator Creek	At mouth.	9.8	68	-	a.04	Mud banks and streambed. Swampy terrain.
18	San Gabriel River	2.0 miles southwest of Tracy.	9.6	64	54.4	-	Pools and swift water caused by gravel bars. Steep u-shaped channel with soil banks.

See footnotes at end of table.

Summary of discharge measurements, San Gabriel River base-flow study, March 1964--Continued

Date	Stream	Location	River miles[1/]	Water temp. (°F)	Discharge in cfs		Remarks
					Main stream	Tributary	
17	Brushy Creek	At county road crossing, 2.0 miles west of Round Rock.	-	58	-	3.72	Broken rock streambed with gravel deposits.
18	.....Do.....	At mouth.	5.2	62	-	9.40	Shale streambed with ferruginous concretions.
18	San Gabriel River	At bridge on Farm Road 487, near Rockdale.	4.8	62	68.6	-	Clay and gravel streambed. Black clay banks.
18	.....Do.....	Near mouth, 2.0 miles west of Minerva.	2.8	62	65.5	-	Clay, shale, and gravel streambed.

1/ River mile above mouth.
a Estimated.
b Tributaries to South Fork San Gabriel River.
c River mile on San Gabriel River at mouth of tributary.

Water-Delivery Study: Pecos River, Tex.

Reach.--From Red Bluff Reservoir (station 8-4100) to the stream-gaging station 8-4465, Pecos River near Girvin, a distance of 188.4 river miles.

Purpose.--To determine changes in the quantity and the quality of a uniform flow released from Red Bluff Reservoir to the Girvin stream-gaging station.

Summary.--Of the 4,240 acre-feet of water that passed the stream-gaging station 8-4125, Pecos River near Orla, and was not diverted into canals, 2,480 acre-feet or 58 percent was lost to seepage and evapotranspiration in the 172.1 river miles to the Girvin gage. Because of the cool weather and because the phreatophytes had not begun to grow, most of this loss is attributed to seepage into the ground-water aquifers.

The water in Red Bluff Reservoir at the time of the investigation was of poor quality and most of the ground-water inflow was of poorer quality; the chloride concentration of the water increased from 2,950 ppm (parts per million) in the reservoir to 4,120 ppm at Girvin. The reservoir water at time of the investigation was unsatisfactory for domestic use, unsatisfactory for most industrial uses, and undesirable for irrigation.

Results of chemical analyses of water samples collected during this investigation are available in Quality-of-Water Records in Texas, 1964.

Summary of discharge measurements, Pecos River water-delivery study, March 1964

Date	Stream	Location	River miles[1]	Water temp. (°F)	Discharge in cfs			Remarks
					Main stream	Tributary	Diversion	
3	Bank seepage	Lat 31°54'05", long 103°54'30", about 250 feet downstream from Red Bluff Dam.	0.05	-	-	a0.15	-	Seepage along left river bank which is composed of alluvium.
3	Pecos River	Lat 31°53'58", long 103°54'18", about 1,500 feet downstream from Red Bluff Dam.	.35	47	129	-	-	Channel has bed of small gravel and salt cedars on both banks and short grass on right bank.
3	Salt (Screwbean) Draw	Lat 31°52'33", long 103°53'04", about 500 feet upstream from mouth.	2.9	48	-	a.17	-	Channel has bed of sand and gravel and heavy growth of salt cedars along each bank.
3	Pecos River	Lat 31°48'14", long 103°48'26", 600 feet downstream from stream-gaging station Pecos River near Orla.	14.3	52	124	-	-	Channel has bed of gravel with heavy growth of salt cedars and along each bank. Sandstone outcrops at the gaging station.
3	Reeves Co. WID No. 2 canal	Lat 31°37'57", long 103°34'30", 175 feet downstream from headgates.	43.3	-	-	-	a0.15	Channel is composed of gravel and silt and has heavy growth of salt cedars along each bank.
3	Pecos River	Lat 31°37'57", long 103°34'22", 800 feet downstream from Reeves Co. WID No. 2 channel dam.	43.4	52	110	-	-	Channel is composed of gravel and silt and has grass and salt cedars along each bank.
3	Ward Co. WID No. 3 canal	Lat 31°36'03", long 103°30'14", at headgates of canal.	52.6	-	-	-	b0	Seepage through headgates.
3	Pecos River	Lat 31°35'58", long 103°30'16", 1,000 feet downstream from Ward Co. WID No. 3 dam.	52.8	51	102	-	-	Channel has bed of gravel and salt cedars along each bank.
3	Ward Co. Irr. Dist. No. 1 canal	Lat 31°31'26", long 103°29'44", at headgates of canal.	61.0	-	-	-	a.3	Leakage through gates. There is a sandstone outcrop at channel dam.
3	Pecos River	Lat 31°26'11", long 103°28'00", 300 feet downstream from former stream-gaging station, Pecos River at Pecos.	71.8	50	77.6	-	-	Channel has bed of sand and gravel and steep banks with heavy growth of salt cedars.
4	Toyah Creek	Lat 31°24'46", long 103°19'36", at mouth.	86.3	-	-	0	-	Streambed is sandy loam.
5	Sulphur Well (known locally as The River Well)	Lat 31°25'40", long 103°15'24", at abandoned oil well about 1,000 feet from river.	93.0	73	-	a.08	-	Flow follows a small draw leading to river. No surface flow into river.
4	Grandfalls-Big Valley Canal	Lat 31°25'21", long 103°15'21", at headgates of canal.	93.2	-	-	-	0	Channel has bed of sandy loam and salt cedars along each bank.
4	Pecos River	Lat 31°25'02", long 103°15'28", about ½ mile downstream from Grandfalls-Big Valley diversion dam.	93.6	46	80.2	-	-	Channel has bed of silt and salt cedars along each bank.

See footnotes at end of table.

Summary of discharge measurements, Pecos River water-delivery study, March 1964--Continued

Date	Stream	Location	River miles 1/	Water temp. (°F)	Discharge in cfs			Remarks
					Main stream	Tributary	Diversion	
4	Pecos Co. WID No. 2 canal (upper diversion)	Lat 31°21'51", long 103°06'06", at headgates of canal.	105.6	51	-	-	1.8	Channel has bed of sandy clay.
4	Pecos River	Lat 31°21'54", long 103°06'00", 800 feet downstream from Pecos Co. WID No. 2 (upper diversion) dam.	105.8	54	74.2	-	-	Channel has bed of sand and gravel and grass and salt cedars on both low banks and high banks of sandy loam covered with salt cedars.
4	Ward Co. WID No. 2 canal	Lat 31°22'10", long 103°00'22", at headgates of canal.	111.5	-	-	-	0	Channel is covered with salt cedars.
4	Pecos River	Lat 31°18'20", long 102°52'30", at bridge on State Highway 18, near Grandfalls.	127.4	50	60.6	-	-	Right bank is steep with a few salt cedars. Left bank is low with salt cedars. Two oil wells located in river, one upstream and one downstream from highway bridge.
4	.....Do.....	Lat 31°17'10", long 102°44'30", about ½ mile downstream from former stream-gaging station, Pecos River below Grandfalls.	141.4	52	66.2	-	-	Channel has bed of sandy loam and gravel. Banks are covered with salt cedars.
5	.....Do.....	Lat 31°18'50", long 102°39'20", 300 feet upstream from Farm Road 1053 bridge near Imperial.	150.2	50	68.5	-	-	Channel bed is sandy loam. Banks are low with very few trees. Salt cedars are dense on the flood plain.
5	.....Do.....	Lat 31°16'00", long 102°35'50", at site of former stream-gaging station, Pecos River near Buenavista.	158.2	53	62.7	-	-	Channel has bed of sand and gravel and steep banks. Salt cedars cover each bank.
5	.....Do.....	Lat 31°06'40", long 102°25'00", in flume at stream-gaging station, Pecos River near Girvin (regular gage).	188.4	53	66.2	-	-	Channel has bed of sandy loam and salt cedars along each bank. Concrete control on rock outcrop 60 feet below gage.

1/ Downstream from Red Bluff Dam.
a Estimated.
b Less than 1 gallon per million.
Note.--River mile shown for tributaries and canals is that for main stem at mouth of tributary or canal.

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