TEXAS BOARD OF WATER ENGINEERS

R. M. Dixon, Chairman
H. A. Beckwith, Member
O. F. Dent, Member

CHEMICAL COMPOSITION OF TEXAS SURFACE WATERS, 1953

PREPARED IN COOPERATION WITH THE UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY AND OTHER AGENCIES

JULY, 1956

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Prepared in cooperation with the
United States Department of the Interior, Geological Survey,
and other agencies, under the direction of
Burdge Irelan, District Chemist,
Geological Survey

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CHEMICAL COMPOSITION OF TEXAS SURFACE WATERS, 1953

Introduction

This report makes available to the public data on the chemical quality of the surface waters of Texas in the water year 1953. The results of chemical analyses of water obtained daily from selected points throughout the State and also the results for a number of miscellaneous samples obtained at various points during the period October 1, 1952, to September 30, 1953, are presented.

All natural waters contain dissolved mineral matter. Water in contact with rocks and soils, even for only short periods of time, will dissolve some of the mineral and organic substances. The chemical character of stream waters is dependent on several factors, such as type of soil and rock with which the water is in contact, length of time of the contact, and climatic conditions. In Texas, the variation in chemical composition of different stream waters and, often, at different points on a particular stream is quite wide.

The records of chemical analysis for surface waters given in this volume serve as a basis for determining the suitability of the waters examined for industrial, agricultural, and domestic uses insofar as such use is affected by the dissolved mineral matter in the waters.

Cooperation

This is the ninth in a series of reports covering surface waters of Texas prepared by the U. S. Geological Survey in cooperation with the Texas Board of Water Engineers. These reports may be obtained by writing the Board of Water Engineers, Austin, Texas.

Cooperating in the collection of chemical quality data were the cities of Abilene, Amarillo, Fort Worth, Midland, and Wichita Falls, the Colorado River Municipal Water District, the Canadian River Water Users Association, the Lower Colorado River Authority, the Brazos River Authority, the Sabine River Authority, the Neches River Authority, the San Jacinto Conservation and Reclamation District, the Red Bluff Water Power Control District, the Chambers-Liberty Counties Navigation District, the Pecos River Commission, the Interstate Compact Commissioner of Texas, the U. S. Corps of Engineers, and the U. S. Bureau of Reclamation.

Collection and Analysis of Samples

The samples for which data are given were collected from October 1, 1952, to September 30, 1953. Descriptive statements are given for each sampling station for which regular series of chemical analyses have been made. These statements include the location of the stream sampling station, drainage area, length of time for which records are available, extremes of dissolved solids, hardness, water temperature and other pertinent data. Records of discharge of the streams at, or near, the sampling point for the sampling period are included in most tables of analyses.

During the period October 1, 1952, to September 30, 1953, samples were collected daily at 33 points on Texas streams and twice weekly at 7 sampling points in Trinity Bay near the mouth of the Trinity River. In addition to the chemical-quality data published in this report, temperature data for 25 of the 33 sampling stations and sediment data for 1 of the sampling stations are available in the files of the U. S. Geological Survey, Austin, Tex. Records of chemical quality at 43 additional sampling points for varying lengths of time have been published in previous reports of this series. The location of the active and inactive stations are shown on the accompanying map, and the periods of operation of all the stations are shown on the bar graph.

Daily water samples were usually obtained at or near a Geological Survey gaging station. At several of the sampling stations, samples were collected at frequent intervals throughout the day when there was a rapid change in stage and concentration. Specific conductance was determined on all samples. Composite samples were usually made for 10-day periods using equal volumes of successive samples having similar conductances. At times, where samples obtained during one day showed a wide variation in specific conductance, composites were made by subdividing the day into intervals of similar conductance.

Expression of Results

All data in the accompanying tables are reported in parts per million except mean discharge, tons per acre-foot, tons per day, percent sodium, specific conductance, sodium-absorption ratio, and pH. A part per million is a unit weight of a constituent in a million unit weights of water. Mean discharge is reported in cubic feet per second, which 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. The dissolved solids are reported in tons per day, tons per acre-foot, and parts per million. Values reported for dissolved-solids concentrations less than 1,000 parts per million are residues on evaporation and for concentrations more than 1,000 parts per million are sums of determined constituents unless noted otherwise. In obtaining the sum, the bicarbonate is calculated to carbonate by dividing by 2.03. For those analyses in which a calculated value as sodium is shown for sodium and potassium, this value, in equivalents per million, was used in computing the percent sodium. For those analyses in which sodium is reported separately, the percent sodium represents the equivalent quantity of sodium only. Specific conductance, a measure of a water's ability to conduct an electric current, is reported in micromhos at 25°C. The values for pH are reported on a numerical scale. A water having a pH of 7.0 is considered to be neutral, less than 7.0 increasingly acidic, and greater than 7.0 increasingly alkaline. Sodium and potassium are reported as sodium unless listed separately in the tables. Hardness due to calcium and magnesium and noncarbonate hardness are reported as calcium carbonate ($CaCO_3$).

The methods of analysis were the same as or modifications of those published in standard publications for water analysis. 1/

Weighted-average analyses are reported for those sampling stations for which discharge records are available. The weighted average of analyses represents the approximate composition of water that would be found in a reservoir containing all the water passing a given station during the year, after thorough mixing in the reservoir.

1/ Collins, W. D., Notes on practical water analysis: U. S. Geol. Survey Water-Supply Paper 596-H, pp. 235-261, 1928; American Public Health Association, Standard methods for the examination of water and sewage, 9th ed., 1946; Scott, W. W., Standard methods of chemical analysis, Volume II, 2049-2055, 5th ed., 1939; Theroux, Eldridge, and Mallmann, Laboratory manual for chemical and bacteriological analyses of water and sewage, 3rd ed., 1943.

LOCATION OF QUALITY OF WATER SAMPLING STATIONS

Arkansas River Basin

1. Canadian River near Tascosa
2. Canadian River near Amarillo
3. Canadian River near Borger

Red River Basin

4. Prairie Dog Town Fork Red River near Brice
5. Mulberry Creek near Brice
6. Salt Fork Red River near Wellington
7. Elm Creek near Shamrock
8. Quitaque Creek near Quitaque
9. Pease River near Crowell
10. Little Wichita River near Archer City
11. Little Wichita River near Henrietta
12. Red River near Gainesville
13. Red River at Denison Dam near Denison
14. Sulphur River near Darden

Sabine River Basin

15. Sabine River near Emory
16. Sabine River near Tatum
17. Sabine River at Logansport, La.
18. Sabine River near Ruliff
19. Cow Bayou near Mauriceville

Neches River Basin

20. Neches River near Rockland
21. Neches River at Evadale

Trinity River Basin

22. Clear Fork Trinity River at Fort Worth
23. Trinity River near Oakwood
24. Trinity River at Romayor
25. Trinity River near Moss Bluff
26. Old River near Cove
27. Trinity River at Anahuac
28. Trinity Bay near Anahuac

San Jacinto River Basin

29. San Jacinto River (West Fork) near Humble
30. San Jacinto River near Huffman

Brazos River Basin

31. Double Mountain Fork Brazos River near Rotan
32. Double Mountain Fork Brazos River near Aspermont
33. Salt Fork Brazos River near Peacock
34. Salt Fork Brazos River near Aspermont
35. Clear Fork Brazos River at Nugent
36. Paint Creek near Haskell
37. Clear Fork Brazos River at Fort Griffin
38. Brazos River near South Bend
39. Brazos River at Possum Kingdom Dam near Graford
40. Brazos River near Whitney
41. Leon River near Eastland
42. Lampasas River near Belton
43. Navasota River near Easterly
44. Brazos River at Richmond

LOCATION OF QUALITY OF WATER SAMPLING STATIONS--Continued

Colorado River Basin

45. Colorado River above Bull Creek near Knapp
46. Bull Creek near Ira
47. Bluff Creek near Ira
48. Deep Creek near Dunn
49. Colorado River at Colorado City
50. Morgan Creek near Colorado City
51. Colorado River at Robert Lee
52. Oak Creek near Blackwell
53. Colorado River near San Saba
54. Colorado River at Austin
55. Colorado River at Wharton

Guadalupe River Basin

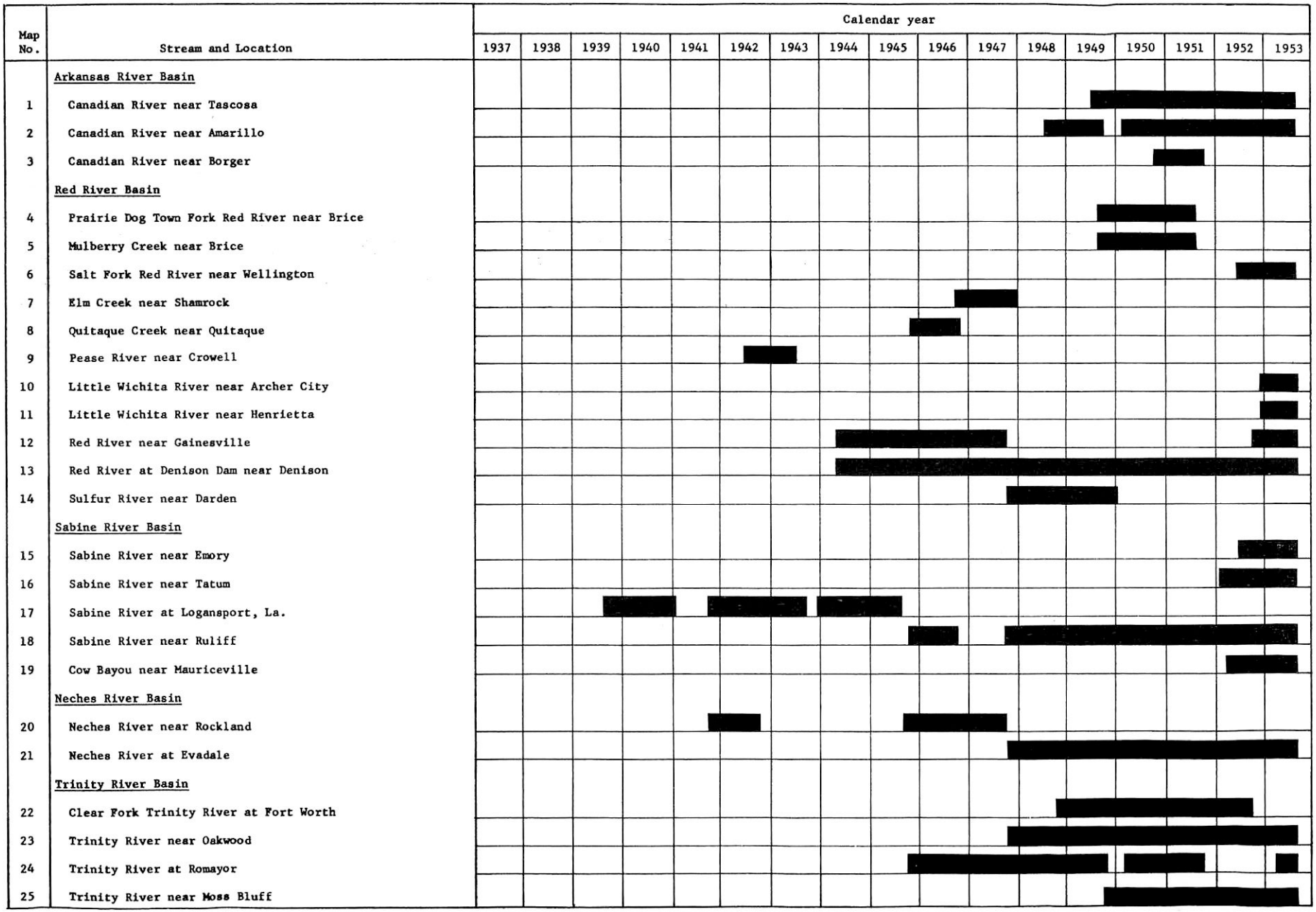
56. Guadalupe River near Spring Branch
57. Guadalupe River at Victoria
58. San Antonio River at Goliad

Nueces River Basin

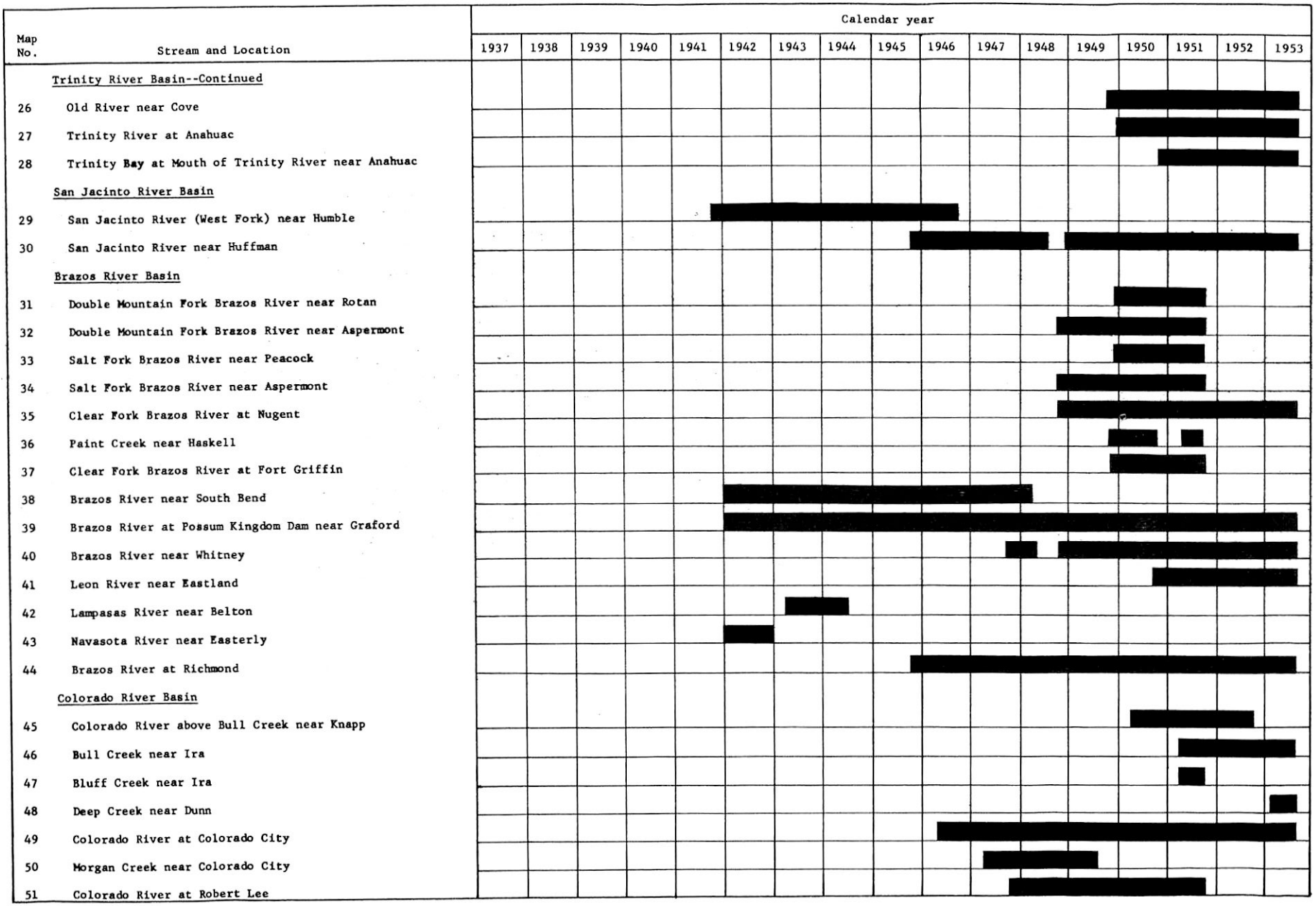
59. Nueces River at Cotulla
60. Nueces River at Tilden
61. Nueces River near Three Rivers
62. Nueces River near Mathis

Rio Grande Basin

63. Salt (Screwbean) Draw near Orla
64. Pecos River near Orla
65. Pecos River at Pecos
66. Toyah Creek near Pecos
67. Salt Draw near Pecos
68. Toyah Creek below Toyah Lake near Pecos
69. Pecos River below Barstow
70. Pecos River below Grandfalls
71. Pecos River near Girvin
72. Pecos River near Sheffield
73. Rio Grande at Roma
74. Rio Grande at Mission Pumping Plant near Mission
75. Rio Grande near San Benito
76. Rio Grande at Los Fresnos Pumping Plant near Brownsville
77. Rio Grande near Brownsville



PERIODS OF OPERATION OF QUALITY OF WATER SAMPLING STATIONS IN TEXAS



PERIODS OF OPERATION OF QUALITY OF WATER SAMPLING STATIONS IN TEXAS—Continued

Map No.	Stream and Location	Calendar year																
		1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953
	Colorado River Basin--Continued																	
52	Oak Creek near Blackwell																	
53	Colorado River near San Saba																	
54	Colorado River at Austin																	
55	Colorado River at Wharton																	
	Guadalupe River Basin																	
56	Guadalupe River near Spring Branch																	
57	Guadalupe River at Victoria																	
58	San Antonio River at Goliad																	
	Nueces River Basin																	
59	Nueces River at Cotulla																	
60	Nueces River at Tilden																	
61	Nueces River near Three Rivers																	
62	Nueces River near Mathis																	
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63	Salt (Screwbean) Draw near Orla																	
64	Pecos River near Orla																	
65	Pecos River at Pecos																	
66	Toyah Creek near Pecos																	
67	Salt Draw near Pecos																	
68	Toyah Creek below Toyah Lake near Pecos																	
69	Pecos River near Barstow																	
70	Pecos River below Grandfalls																	
71	Pecos River near Girvin																	
72	Pecos River near Sheffield																	
73	Rio Grande at Roma																	
74	Rio Grande at Mission Pumping Plant near Mission																	
75	Rio Grande near San Benito																	
76	Rio Grande at Los Fresnos Pumping Plant near Brownsville																	
77	Rio Grande near Brownsville																	

PERIODS OF OPERATION OF QUALITY OF WATER SAMPLING STATIONS IN TEXAS—Continued

ARKANSAS RIVER BASIN

CANADIAN RIVER NEAR TASCOSA, TEX.

LOCATION.--At Boy's Ranch near Tascosa, Oldham County, 20 miles upstream from gaging station near Amarillo, Potter County.
DRAINAGE AREA.--19,287 square miles above gaging station.
RECORDS AVAILABLE.--Chemical analyses: June 1948 to September 1953.
Water temperatures: February 1949 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 1,760 ppm Jan. 1-10; minimum, 413 ppm July 16, 19-24.
Hardness: Maximum, 442 ppm Dec. 21-24, 27-31; minimum, 130 ppm July 16, 19-24.
Specific conductance: Maximum daily, 3,410 micromhos Jan. 8; minimum daily, 492 micromhos July 19.
EXTREMES, 1948-53.--Dissolved solids: Maximum, 2,060 ppm Mar. 18-19, 21-22, 26-27, 1952; minimum, 245 ppm Nov. 21-30, 1948.
Hardness: Maximum, 514 ppm Mar. 18-19, 21-22, 26-27, 1952; minimum, 46 ppm Mar. 9-10, 1952.
Specific conductance: Maximum daily, 3,600 micromhos Mar. 2, 1951; minimum daily, 347 micromhos Feb. 24, 1949.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Amarillo for water year October 1952 to September 1953 given in Water-Supply Paper 1281. Mean discharge values reported are adjusted to reflect small discharge of sewage effluent entering Canadian River between sampling point and gaging station . No other appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
Oct. 1-2, 26, 28-31, 1952	2.1	18		81	43	287		219	415	275	0.8	0.8		1,230	1.67	6.97	379	200	62	6.4	1,950	8.2
Nov. 1-2, 4-16, 18-20	1.6	18		89	49	384		253	423	430	.8	3.0		1,520	2.07	6.57	424	216	66	8.1	2,440	8.0
Nov. 21-24	1.8	14		74	39	295		283	332	288	.6	.8		1,180	1.60	5.73	345	113	65	6.9	1,930	8.0
Dec. 1-8	3.6	15		88	46	431		280	362	522	.8	.8		1,600	2.18	15.6	408	179	70	9.3	2,660	8.0
Dec. 11-20	3.7	18		80	49	397		281	367	458	1.0	4.8		1,510	2.05	15.1	401	170	68	8.6	2,510	8.1
Dec. 21-24, 27-31	3.3	16		90	53	401		322	404	442	1.2	4.0		1,570	2.14	14.0	442	179	66	8.3	2,570	8.0
Jan. 1-10, 1953	12.5	16		73	50	498		229	386	620	1.0	4.5		1,760	2.39	59.4	388	200	74	11	3,000	8.1
Jan. 11-20	5.7	18		70	49	385		267	368	428	1.2	4.2		1,450	1.97	22.3	376	157	69	8.6	2,410	8.1
Jan. 21-25, 27, 30-31	2.1	18		66	39	300		281	328	285	.8	1.2		1,180	1.60	6.69	325	94	67	7.2	1,900	8.0
Feb. 1, 3-8, 10	1.3	16		56	27	224		290	254	166	.7	.8		a888	1.21	3.12	250	13	66	6.2	1,450	8.2
Feb. 12-13, 15	2.0	18		55	29	211		283	240	164	.8	.2		865	1.18	4.67	256	24	64	5.8	1,410	8.0
Feb. 25-27	1.3	19		45	32	271		287	299	200	.7	4.0		1,010	1.37	3.54	244	9	71	7.5	1,640	8.1
Mar. 1-12, 29, 31, Apr. 1-8, 10-12	2.3	36		26	31	244		b221	272	180	.9	2.0		a901	1.23	5.60	192	11	73	7.6	1,460	8.4
May 5-9, 15-17, June 6, 14, 18, 28-29	1.8	24		64	39	457		261	415	470	1.0	1.2		1,600	2.18	7.78	320	106	76	11	2,630	8.2
July 7-15, 17-18, 25-31	67.7	20		44	17	215		227	176	195	.5	2.2		809	1.10	148	180	0	72	7.0	1,340	7.9
July 16, 19-24	2,015	19		34	11	98		184	80	74	.6	1.8		413	.56	2,250	130	0	62	3.7	690	8.2
Aug. 1-6, 18-22	1,407	23		36	12	130		172	100	122	.7	3.5		518	.70	1,970	140	0	67	4.8	873	8.2
Aug. 7-13, 28-31	83.6	23		63	23	279		223	214	318	.8	2.0		1,030	1.40	232	252	69	71	7.7	1,770	8.2
Aug. 14-17, 23-27	858	21		43	15	191		208	149	181	.7	3.0		717	.98	1,660	169	0	71	6.4	1,210	8.2
Sept. 1-4, 7-13	51.0	22		51	19	189		201	177	186	.9	3.5		776	1.06	107	205	40	67	5.7	1,230	8.1
Sept. 5-6, 15-20, 25, 29-30	7.0	27		94	38	483		254	298	650	2.0	2.0		1,720	2.34	32.5	390	182	73	11	2,900	8.2
Weighted average	111	21		38	13	141		187	112	129	0.7	2.7		556	0.76	167	148	0	67	5.0	934	--

a Sum of determined constituents.
b Includes equivalent of 6 ppm of carbonate (CO_3).

CANADIAN RIVER NEAR AMARILLO, TEX.

LOCATION.--At gaging station at bridge on U. S. Highways 87 and 287, 2,000 feet downstream from Pitcher Creek, 2.0 miles downstream from Panhandle & Santa Fe Railway bridge, and 19 miles north of Amarillo, Potter County.
DRAINAGE AREA.--19,287 square miles.
RECORDS AVAILABLE.--Chemical analyses: July 1948 to October 1949, February 1950 to September 1953.
Water temperatures: August 1949 to September 1953.
Sediment Records: August 1949 to September 1952.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 2,320 ppm Dec. 25-29; minimum, 438 ppm Aug. 5-8.
Hardness: Maximum, 860 ppm Dec. 25-29; minimum, 116 ppm Aug. 5-8.
Specific conductance: Maximum daily, 3,980 micromhos Dec. 26; minimum daily, 627 micromhos Aug. 6.
Water temperatures: Minimum observed, freezing point on many days during winter months.
EXTREMES, 1948-53.--Dissolved solids (1950-53): Maximum, 2,320 ppm Dec. 25-29, 1952; minimum, 285 ppm Sept. 3, 1952.
Hardness (1950-53): Maximum, 860 ppm Dec. 25-29, 1952; minimum, 90 ppm Aug. 10-12, 1951.
Specific conductance: Maximum daily, 3,980 micromhos Dec. 26, 1952; minimum daily, 457 micromhos Sept. 3, 1952.
Water temperatures (1949-53): Maximum observed, 95° F June 29, 1951; minimum observed, freezing point on many days during winter months.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1281.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
Oct. 1-12, 20, 1952---	9.82	76		78	49	198		384	170	179	4.8	86		1,030	1.40	27.3	396	82	52	4.3	1,610	7.2
Oct. 13-19----------	9.59	80		60	43	159		324	126	125	5.2	106		886	1.20	22.9	326	61	51	3.8	1,300	8.2
Oct. 21-31----------	10.5	75		66	46	159		326	135	137	4.4	108		911	1.24	25.8	354	86	49	3.7	1,340	8.2
Nov. 1-10----------	11.0	79		62	43	162		315	129	134	4.4	112		903	1.23	26.8	327	69	51	3.9	1,310	8.2
Nov. 11-24----------	11.7	78		71	46	178		374	134	144	5.2	113		957	1.30	30.2	366	60	51	4.1	1,430	7.5
Nov. 25-30----------	9.33	60		142	60	307		281	407	375	3.6	93		1,590	2.16	40.1	601	370	53	5.4	2,460	6.9
Dec. 1-10----------	12.9	75		99	53	243		291	277	260	3.4	113		1,270	1.73	44.2	465	226	53	4.9	1,930	7.5
Dec. 11-20----------	13.7	73		105	53	265		378	277	260	3.8	102		1,320	1.80	48.8	480	170	55	5.3	1,970	7.6
Dec. 21-24, 30-31-----	13.8	68		116	57	270		283	319	320	3.6	107		1,400	1.90	52.2	524	292	53	5.1	2,160	7.3
Dec. 25-29----------	11.4	64		211	81	461		278	656	622	2.6	83		2,320	3.16	71.4	860	632	54	6.8	3,480	7.7
Jan. 1-10, 1953-------	22.5	52		128	59	367		285	432	448	2.6	47		1,680	2.28	102	562	328	59	6.7	2,650	7.4
Jan. 11-20----------	15.7	68		122	62	334		352	366	375	3.4	97		1,600	2.18	67.8	560	271	56	6.1	2,420	7.4
Jan. 21-31----------	11.5	78		94	51	243		303	256	270	3.6	84		1,230	1.67	38.2	444	196	54	5.0	1,900	7.4
Feb. 1-10----------	10.8	80		80	49	211		382	177	187	4.0	111		1,090	1.48	31.8	401	88	53	4.6	1,650	7.4
Feb. 11-19----------	10.2	78		81	48	236		392	185	205	3.6	125		1,150	1.56	31.7	400	78	56	5.1	1,740	7.1
Feb. 20-28----------	9.22	78		78	48	224		412	174	191	4.0	100		1,100	1.50	27.4	392	54	55	4.9	1,680	7.3
Mar. 1-2, 9-11--------	14.2	67		128	57	300		325	373	338	3.6	80		1,510	2.05	57.9	554	288	54	5.5	2,310	7.3
Mar. 3-8, 12-20-------	10.6	76		73	46	201		398	151	162	4.2	107		1,020	1.39	29.2	371	45	54	4.6	1,560	7.2
Mar. 21-31----------	9.05	84		75	50	179		341	169	164	5.2	101		a995	1.35	24.3	392	113	50	3.9	1,540	7.5
Apr. 1-20----------	10.6	82		70	48	171		317	150	159	5.2	111		994	1.35	28.4	372	112	50	3.9	1,490	7.5
Apr. 21-30----------	8.8	82		72	51	231		471	140	183	5.6	108		1,100	1.50	26.1	389	3	56	5.1	1,640	7.5
May 1-10----------	9.85	94		64	52	211		375	144	202	4.4	96		1,050	1.43	27.9	374	66	55	4.7	1,640	7.9
May 11-20----------	10.8	87		61	50	181		320	137	182	2.8	102		984	1.34	28.7	358	96	52	4.1	1,500	8.2
May 21-31----------	7.63	95		64	52	216		434	130	190	4.0	91		1,060	1.44	21.8	374	18	56	4.8	1,590	7.8
June 1-10----------	8.29	89		63	50	171		365	118	168	4.4	78		964	1.31	21.6	362	64	51	3.9	1,460	7.6
June 11-20----------	9.73	87		62	49	174		359	120	174	4.4	73		946	1.29	24.9	356	62	52	4.0	1,440	8.0
June 21-30----------	9.05	84		65	50	165		383	117	158	4.8	68		936	1.27	22.9	368	54	49	3.7	1,430	7.5
July 1-16, 18-21------	446	70		56	41	153		b311	126	139	3.6	62		835	1.14	1,010	308	53	52	3.8	1,240	8.4
July 17, 23-25--------	1,340	30		40	15	96		191	89	80	1.0	7.7		453	.62	1,640	162	5	56	3.3	746	7.9
July 22, 26-31--------	193	34		74	30	245		232	246	272	1.6	9.9		1,030	1.40	537	308	118	63	6.1	1,640	8.1
Aug. 1-4, 9-10--------	191	32		48	20	174		216	155	164	1.2	9.5		733	1.00	378	202	25	65	5.3	1,190	8.0
Aug. 5-8-------------	485	26		30	10	106		196	77	71	1.0	3.0		438	.60	574	116	0	66	4.3	700	8.0
Aug. 11-15, 18, 28-31-	1,040	38		72	31	210		261	200	230	2.0	14		957	1.30	2,690	307	93	60	5.2	1,560	8.2
Aug. 16-17, 19-27-----	999	20		40	15	142		205	126	117	1.2	3.5		576	.78	1,550	162	0	66	4.9	959	8.2
Sept. 1-5, 15, 17-20--	53.0	59		68	39	176		277	164	183	3.6	59		913	1.24	131	330	103	54	4.2	1,400	8.1
Sept. 6-14, 16--------	30.4	60		98	47	279		297	275	330	2.8	51		1,290	1.75	106	438	194	58	5.8	2,040	8.1
Sept. 21-30----------	10.1	77		67	48	149		341	114	146	5.2	87		885	1.20	24.1	364	85	47	3.4	1,350	7.5
Weighted average----	121	41		56	28	164		250	149	158	2.1	26		766	1.04	250	254	50	58	4.5	1,220	--

a Sum of determined constituents.
b Includes equivalent of 8 ppm of carbonate (CO_3).

RED RIVER BASIN

SALT FORK RED RIVER NEAR WELLINGTON, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 83, 4 miles downstream from Fort Worth & Denver (Burlington) Railroad bridge, 4½ miles south of Lutie, and 6½ miles north of Wellington, Collingsworth County.
DRAINAGE AREA.--1,222 square miles, of which 209 square miles is probably non-contributing.
RECORDS AVAILABLE.--Chemical analyses: June 1952 to September 1953.
Water temperatures: June 1952 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 2,860 ppm Dec. 18-30; minimum, 730 ppm Aug. 6, 8, 18-20.
Hardness: Maximum, 1,940 ppm Dec. 18-30; minimum, 455 ppm Aug. 6, 8, 18-20.
Specific conductance: Maximum daily, 3,720 micromhos Dec. 19; minimum daily, 818 micromhos Aug. 6, 19.
Water temperatures: Maximum observed, 77° F Sept. 30; minimum observed, 35° F on several days during winter months.
EXTREMES, June 1952 to September 1953.--Dissolved solids: Maximum, 2,860 ppm Dec. 18-30, 1952; minimum, 730 ppm Aug. 6, 8, 18-20, 1953.
Hardness: Maximum, 1,940 ppm Dec. 18-30, 1952; minimum, 455 ppm Aug. 6, 8, 18-20, 1953.
Specific conductance: Maximum daily, 3,720 micromhos Dec. 19, 1952; minimum daily, 818 micromhos Aug. 6, 19, 1953.
Water temperatures: Maximum observed, 77° F Sept. 30, 1953; minimum observed, 35° F on several days during winter months.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1281.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1952--------	3.13	28		566	92	142		126	1,680	170	0.5	7.7		2,750	3.74	23.2	1,790	1,690	15	1.5	3,020	7.9
Oct. 11-20----------	4.19	29		574	94	160		134	1,730	175	.6	5.6		2,830	3.85	32.0	1,820	1,710	16	1.6	3,120	7.8
Oct. 21-31----------	47.8	22		576	100	138		158	1,700	172	.5	7.5		2,790	3.79	360	1,850	1,720	14	1.4	3,110	7.8
Nov. 1-10----------	5.38	22		588	100	148		159	1,710	200	.3	6.8		2,850	3.88	41.4	1,880	1,750	15	1.5	3,210	7.8
Nov. 11-20----------	6.37	25		552	102	133		124	1,670	170	.8	5.9		2,720	3.70	46.8	1,800	1,700	14	1.4	3,060	7.8
Nov. 21-30----------	45.9	24		544	105	152		139	1,660	192	.8	6.0		2,750	3.74	341	1,790	1,680	16	1.6	3,160	7.8
Dec. 1-10----------	7.36	24		552	102	134		134	1,660	172	.8	5.5		2,720	3.70	54.1	1,800	1,690	14	1.4	3,100	7.8
Dec. 11-17, 31---------	8.44	22		556	102	148		164	1,640	198	.8	6.3		2,750	3.74	62.7	1,810	1,670	15	1.5	3,170	7.8
Dec. 18-30----------	15.0	20		600	108	131		174	1,650	255	.8	5.8		2,860	3.89	116	1,940	1,800	13	1.3	3,370	7.8
Jan. 1-10, 1953--------	8.36	20		570	101	150		192	1,650	200	.8	6.0		2,790	3.79	63.0	1,840	1,680	15	1.5	3,190	7.8
Jan. 11-20----------	7.82	20		564	99	148		155	1,640	208	.8	7.7		2,760	3.75	58.3	1,810	1,690	15	1.5	3,240	7.9
Jan. 21-31----------	10.7	22		512	90	156		160	1,480	218	.8	6.3		2,560	3.48	74.0	1,650	1,520	17	1.7	3,090	7.9
Feb. 1-10----------	9.58	19		538	97	164		168	1,570	225	.8	7.5		2,700	3.67	69.8	1,740	1,600	17	1.7	3,230	7.8
Feb. 11-19----------	10.4	24		548	98	158		146	1,600	228	.9	5.1		2,730	3.71	76.7	1,770	1,650	16	1.6	3,210	7.8
Feb. 20-28----------	28.4	24		532	101	155		146	1,580	220	.8	5.1		2,690	3.66	206	1,740	1,620	16	1.6	3,150	7.8
Mar. 1-10----------	28.9	26		436	90	188		150	1,310	265	.9	4.3		2,390	3.25	186	1,460	1,340	22	2.1	3,010	7.8
Mar. 11-20----------	15.2	34		550	94	153		103	1,660	195	.7	3.5		2,740	3.73	112	1,760	1,670	16	1.6	3,080	7.7
Mar. 21-31----------	13.8	36		518	96	128		72	1,610	160	.7	3.0		2,590	3.52	96.5	1,690	1,630	14	1.4	2,970	7.7
Apr. 1-5, 10-20--------	29.6	38		474	95	179		66	1,520	228	.7	4.5		2,570	3.50	205	1,570	1,520	20	2.0	3,170	7.7
Apr. 6-9----------	71.5	36		286	70	210		146	956	242	.7	1.5		1,870	2.54	361	1,000	882	31	2.9	2,500	7.8
Apr. 21-30----------	7.72	33		532	94	154		72	1,670	175	.7	3.5		2,700	3.67	56.3	1,710	1,660	16	1.6	3,060	7.7
May 1-10----------	6.57	29		538	93	141		81	1,660	165	.7	3.0		2,670	3.63	47.4	1,720	1,660	15	1.5	3,060	7.6
May 11-20----------	12.9	28		542	101	185		110	1,690	225	.7	2.5		2,830	3.85	98.6	1,770	1,680	19	1.9	3,310	7.7
May 21-31----------	6.31	32		528	94	134		63	1,600	195	.6	3.2		2,620	3.56	44.6	1,700	1,650	15	1.4	3,030	7.5
June 1-10----------	2.72	34		544	97	126		67	1,650	180	.6	3.2		2,670	3.63	19.6	1,760	1,700	13	1.3	3,050	7.2
June 11-20----------	1.41	35		514	87	115		75	1,550	150	.5	3.2		2,490	3.39	9.48	1,640	1,580	13	1.2	2,890	7.2
June 21-30----------	1.14	34		460	76	98		75	1,380	120	.5	4.2		2,210	3.01	6.80	1,460	1,400	13	1.1	2,570	7.7
July 1-10----------	1.01	31		470	80	109		121	1,400	125	.5	4.5		2,280	3.10	6.22	1,500	1,400	14	1.2	2,590	7.9
July 11-18----------	3.26	28		540	93	128		130	1,600	165	.6	3.2		2,620	3.56	23.1	1,730	1,620	14	1.3	2,990	7.6
July 19-21, 24-25------	2,871	29		159	33	86	--	130	431	110	.7	3.8		916	1.25	7,100	532	426	26	1.6	1,330	8.0
July 22-23, 26-31------	70.2	40		380	77	179	--	102	1,180	255	.7	3.0		2,160	2.94	409	1,260	1,180	24	2.2	2,750	7.8
Aug. 1-5, 11, 13-17----	27.2	38		546	93	161		138	1,560	250	.9	2.5		2,720	3.70	200	1,740	1,630	17	1.7	3,330	7.8
Aug. 6, 8, 18-20-------	194	26		141	25	51	--	125	359	65	.5	1.5		730	.99	382	455	352	20	1.0	1,080	7.7
Aug. 7, 9-10, 12-------	20.2	32		390	69	131	--	147	1,120	192	.7	2.8		2,010	2.73	110	1,260	1,140	18	1.6	2,540	8.0
Aug. 21-22----------	38.5	32		276	60	138		112	830	195	.6	3.8		1,590	2.16	165	935	843	24	2.0	2,100	8.0
Aug. 23-31----------	11.7	34		498	97	153		67	1,510	242	.8	3.8		2,570	3.50	81.2	1,640	1,590	17	1.6	3,040	7.7
Sept. 1-10----------	7.95	31		544	101	155		89	1,620	245	.8	3.8		2,740	3.73	58.8	1,770	1,700	16	1.6	3,170	7.9
Sept. 11-20----------	5.43	31		550	101	149		87	1,650	225	.8	4.0		2,750	3.74	40.3	1,790	1,720	15	1.5	3,150	7.8
Sept. 21-30----------	5.50	36		560	95	153		90	1,670	215	.7	4.0		2,780	3.78	41.3	1,790	1,710	16	1.6	3,150	7.7
Weighted average-----	55.3	29		238	47	102		128	681	134	0.7	3.8		1,300	1.77	194	788	682	22	1.6	1,730	--

LITTLE WICHITA RIVER NEAR ARCHER CITY, TEX.

LOCATION.--At gaging station at bridge on State Highway 79, 1.5 miles downstream from confluence of North and Middle Forks and 4.8 miles north of Archer City, Archer County.
DRAINAGE AREA.--481 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1952 to September 1953.
Water temperatures: December 1952 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 1,220 ppm Aug. 13-14, 17 (12 p.m. - 6 a.m.); minimum, 230 ppm Aug. 20 (6 a.m. - 12 p.m.), 21-28.
Hardness: Maximum, 282 ppm Aug. 15-16, 17 (12 p.m. - 6 a.m.); minimum, 79 ppm Aug. 20 (6 a.m. - 12 p.m.), 21-28.
Specific conductance: Maximum daily, 2,600 micromhos July 20; minimum daily, 309 micromhos Mar. 18.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1281.

Chemical analyses, in parts per million, December 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
Dec. 30, 1952----------	0.1	8.0		--	--	--		108	--	150	--	2.5		--	--	--	108	20	--	--	681	8.2
Mar. 3-13, 1953--------	a1.11	4.8		38	13	182		112	10	312	--	2.8		647	0.88	1.94	148	56	73	6.5	1,230	7.7
Mar. 14 (12p.m.-6p.m.), 18-20----------	90.4	8.8		26	7.1	54		103	6.2	83	--	5.0		242	.63	59.1	94	10	56	2.4	465	7.7
Mar. 14 (6p.m.-12p.m.), 15-17, 21-29---------	6.33	8.6		28	8.7	102		87	8.9	172	--	6.0		399	.54	6.82	106	34	68	4.3	739	7.6
Apr. 6-13----------	a7.18	6.1		35	12	174		92	12	300	--	4.7		634	.86	12.3	137	62	73	6.5	1,170	7.5
Apr. 19----------	0	--		--	--	--		136	--	308	--	--		--	--	--	154	42	--	--	1,220	8.1
Apr. 24, 26-30, May 1--	a2.11	11		43	14	194		108	7.2	345	--	4.5		730	.99	4.16	165	76	72	6.6	1,340	8.0
Apr. 25, May 12-14, 17-20----------	10.0	12		26	7.8	86		104	7.4	134	--	4.0		343	.47	9.26	97	12	66	3.8	630	7.9
May 5----------	0	--		--	--	--		117	--	390	--	--		--	--	--	194	98	--	--	1,480	8.2
May 10----------	0	--		--	--	--		140	--	400	--	--		--	--	--	211	96	--	--	1,540	8.2
May 15-16----------	63.7	12		34	10	109		107	5.8	188	--	4.5		b416	.57	71.5	126	38	65	4.2	827	7.9
May 26----------	0	--		--	--	--		139	--	170	--	--		--	--	--	124	10	--	--	795	8.2
May 31----------	0	--		--	--	--		167	--	180	--	--		--	--	--	139	2	--	--	855	8.2
June 7----------	0	--		--	--	--		200	--	204	--	--		--	--	--	164	0	--	--	964	--
June 14----------	0	--		--	--	--		212	--	230	--	--		--	--	--	184	10	--	--	1,090	--
June 21----------	0	--		--	--	--		247	--	272	--	--		--	--	--	214	12	--	--	1,260	--
June 28----------	0	--		--	--	--		226	--	325	--	--		--	--	--	207	22	--	--	1,410	--
July 1 (12p.m.-8a.m.), 7-11, 25----------	20.3	17		27	8.0	91		155	7.7	112	0.8	3.0		344	.47	18.9	100	0	66	3.9	628	8.1
July 1 (8a.m.-12p.m.), 2-6, 24----------	a58.1	16		22	6.2	57		120	5.3	68	.8	3.5		247	.34	38.7	80	0	61	2.8	433	8.0
July 19----------	.6	--		--	--	--		200	--	153	--	--		--	--	--	126	0	--	--	816	8.2
July 20-23----------	2.48	13		58	21	328		136	12	578	.8	4.6		1,080	1.47	7.23	231	120	76	9.4	2,090	7.8
July 26-31----------	1.55	14		41	12	138		102	7.6	252	.8	4.0		b519	.71	2.17	152	68	66	4.9	1,010	8.0
Aug. 9----------	0	--		--	--	--		161	--	248	--	--		--	--	--	180	0	--	--	1,080	8.2
Aug. 13-14, 18-19, 20 (12p.m.-6a.m.)----	a30.9	12		36	11	127		115	9.7	215	.8	3.8		b472	.64	39.4	135	41	67	4.8	909	8.0
Aug. 15-16, 17 (12p.m.-6a.m.)----	5.87	11		72	25	362		121	14	675	.8	2.8		1,220	1.66	19.3	282	184	74	9.4	2,360	8.0
Aug. 17 (6a.m.-12p.m.)-	48	15		23	6.9	63		108	7.8	86	.6	4.5		b260	.35	33.7	86	0	62	3.0	471	7.6
Aug. 20 (6a.m.-12p.m.), 21-28----------	a21.1	18		22	5.9	53		113	7.1	65	.5	2.5		b230	.31	13.1	79	0	59	2.6	405	7.9
Sept. 3-9----------	a7.53	16		31	8.6	106		106	8.1	174	.6	2.5		418	.57	8.50	113	26	67	4.4	748	7.7
Sept. 27----------	0	--		--	--	--		191	--	220	--	--		--	--	--	172	16	--	--	975	8.2
Weighted average-----	c6.1	13		27	8.0	84		114	7.1	128	--	3.9		335	0.46	5.52	100	7	64	3.6	622	--

a No flow Jan. 1 to Mar. 2, Mar. 30, 31, Apr. 1-5, 14-23, May 2-11, 21-31, June 1-30, July 12-18, Aug. 1-12, 29-31, Sept. 1-2, 10-30.
b Sum of determined constituents.
c Mean discharge for water year October 1952 to September 1953 was 5.14. Runoff for period January to December 1953 was 89 percent of total for water year.

LITTLE WICHITA RIVER NEAR HENRIETTA, TEX.

LOCATION.--At gaging station at 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 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1952 to September 1953.
Water temperatures: December 1952 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 1,700 ppm Mar. 15 (12 m. - 12 p.m.), 16; minimum, 111 ppm Mar. 14 (12 p.m. - 12 m.), 17 (12 m. - 12 p.m.), 18.
Hardness: Maximum, 700 ppm May 1; minimum, 46 ppm Mar. 27-30.
Specific conductance: Maximum daily, 5,910 micromhos May 1; minimum daily, 103 micromhos Mar. 14.
REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Values reported for dissolved solids are sums of determined constituents unless otherwise noted.
Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1281.

Chemical analyses, in parts per million, December 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Dec. 31, 1952	0	8.6		--	--	--		76	--	322		3.8		--	--	--	140	78	--	--	1,180	7.9
Jan. 3, 1953	0	--		--	--	--		79	--	305		--		--	--	--	136	0	--	--	1,160	7.9
Jan. 9, 14, 21, 22, 30	0	8.6		36	11	159		101	12	270		6.3		a589	0.80	--	135	52	72	6.0	1,080	7.9
Feb. 4	0	--		--	--	--		105	--	288		--		--	--	--	137	54	--	--	1,140	8.1
Feb. 11	0	--		--	--	--		109	--	292		--		--	--	--	137	52	--	--	1,170	8.1
Feb. 13	0	--		--	--	--		110	--	295		--		--	--	--	137	52	--	--	1,160	8.0
Feb. 19	0	--		--	--	--		124	--	300		--		--	--	--	146	57	--	--	1,210	8.2
Feb. 25	0	--		--	--	--		126	--	298		--		--	--	--	150	60	--	--	1,210	8.2
Mar. 6	0	--		--	--	--		143	--	310		--		--	--	--	161	44	--	--	1,260	8.2
Mar. 11	0	--		--	--	--		148	--	302		--		--	--	--	161	40	--	--	1,250	8.2
Mar. 14 (12p.m.-12m.), 17 (12m.-12p.m.), 18	b137	9.4		13	4.3	20		59	5.0	27		3.5		111	.15	41.1	50	2	47	1.2	205	7.7
Mar. 14 (12m.-12p.m.), 19, 20	148.4	11		22	6.6	49		97	6.0	70		6.1		a227	.31	91.0	82	3	57	2.4	418	7.9
Mar. 15 (12p.m.-12m.), 17 (12p.m.-12m.)	153	8.0		28	9.3	99		99	9.5	160		7.3		a390	.53	161	108	27	67	4.1	725	7.9
Mar. 15 (12m.-12p.m.), 16	103.3	14		94	31	514		81	15	988		6.5		1,700	2.31	474	362	296	76	12	3,290	8.0
Mar. 21-25	9.1	15		28	7.9	71		98	6.6	117		5.0		a325	.44	7.99	102	22	60	3.0	573	8.0
Mar. 27-30	b26.9	12		12	4.0	21		59	6.7	22		7.8		114	.16	8.28	46	0	50	1.3	200	7.8
Apr. 1	0	--		--	--	--		84	--	17		--		--	--	--	50	0	--	--	186	7.8
Apr. 3	0	--		--	--	--		71	--	16		--		--	--	--	51	0	--	--	193	8.1
Apr. 7	0	--		--	--	--		83	--	23		--		--	--	--	59	0	--	--	230	8.2
Apr. 14	0	--		--	--	--		67	--	1,370		--		--	--	--	452	397	--	--	4,360	7.8
Apr. 16	0	--		--	--	--		75	--	1,390		--		--	--	--	456	394	--	--	4,510	8.0
Apr. 24	0	--		--	--	--		60	--	1,080		--		--	--	--	364	315	--	--	3,510	7.9
Apr. 30	0	--		--	--	--		72	--	1,880		--		--	--	--	692	633	--	--	5,820	8.0
May 1	0	--		--	--	--		103	--	1,850		--		--	--	--	700	616	--	--	5,910	8.1
May 6	0	--		--	--	--		109	--	1,650		--		--	--	--	600	510	--	--	5,120	8.2
May 12-13, 17 (12m.-12p.m.), 19-23	b20.1	12		24	8.5	91		90	8.1	146		5.0		a358	.49	19.4	95	22	67	4.0	652	7.9
May 14, 16, 17 (12p.m.-12m.)	67.4	13		12	5.4	29		69	5.1	36		4.0		138	.19	25.1	52	0	55	1.8	254	7.8
May 15, 18	81.5	11		36	12	147		98	7.2	260		4.5		526	.72	116	140	59	70	5.4	1,040	8.2
May 25	0	--		--	--	--		116	--	140		--		--	--	--	102	7	--	--	656	8.2
May 30	0	--		--	--	--		124	--	139		--		--	--	--	106	4	--	--	677	--
June 5	0	--		--	--	--		147	--	149		--		--	--	--	124	4	--	--	743	--
June 12	0	--		--	--	--		190	--	184		--		--	--	--	158	2	--	--	898	--
June 19	0	--		--	--	--		213	--	240		--		--	--	--	182	8	--	--	1,050	--
June 26	0	--		--	--	--		248	--	275		--		--	--	--	214	11	--	--	1,260	--
June 30	0	--		--	--	--		199	--	250		--		--	--	--	190	27	--	--	1,140	--

LITTLE WICHITA RIVER NEAR HENRIETTA, TEX.--Continued

Chemical analyses, in parts per million, December 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
July 2-6, 26, 1953----	76.4	15		22	6.4	79		119	6.4	103	0.8	4.0		296	0.40	61.1	82	0	68	3.8	551	8.0
July 9----------	0	--		--	--	--		126	--	102	--	--		--	--	--	90	0	--	--	539	8.2
July 15----------	0	--		--	--	--		136	--	110	--	--		--	--	--	80	0	--	--	580	8.2
July 20----------	0	--		--	--	--		142	--	104	--	--		--	--	--	83	0	--	--	578	8.2
July 24-25----------	374	13		15	5.0	18		78	4.9	16	.8	4.6		115	.16	116	58	0	40	1.0	196	7.7
July 27-30----------	b28.6	14		17	5.5	43		85	4.6	56	.8	5.8		a157	.21	12.1	66	0	59	2.3	347	8.0
Aug. 1----------	0	--		--	--	--		97	--	54	--	--		--	--	--	71	0	--	--	349	8.1
Aug. 4----------	0	--		--	--	--		99	--	52	--	--		--	--	--	72	0	--	--	349	8.1
Aug. 7----------	0	--		--	--	--		106	--	54	--	--		--	--	--	78	0	--	--	362	8.1
Aug. 13-19, 21 (12m.-12p.m.), 23-25------	23.7	11		19	5.5	36		95	5.7	43	.8	3.2		a181	.25	11.6	70	0	53	1.9	310	7.9
Aug. 20----------	62	--		--	--	--		122	--	215	--	--		--	--	--	144	44	--	--	905	8.1
Aug. 21 (12p.m.-12m.), 22----------	130	11		24	7.1	65		103	7.0	95	.8	4.2		265	.36	93.0	89	5	61	3.0	469	8.1
Aug. 26-27, Sept. 7-9-	b3.36	19		22	6.6	45		107	7.8	56	.8	3.5		a230	.31	2.09	82	0	54	2.2	364	8.0
Aug. 29----------	0	--		--	--	--		77	--	33	--	--		--	--	--	56	0	--	--	239	8.1
Aug. 31----------	0	--		--	--	--		78	--	32	--	--		--	--	--	59	0	--	--	241	8.1
Sept. 4----------	0	--		--	--	--		90	--	31	--	--		--	--	--	63	0	--	--	249	8.1
Sept. 12----------	0	--		--	--	--		140	--	72	--	--		--	--	--	102	0	--	--	454	8.2
Sept. 15----------	0	--		--	--	--		140	--	74	--	--		--	--	--	104	0	--	--	463	8.2
Sept. 18----------	0	--		--	--	--		153	--	86	--	--		--	--	--	116	0	--	--	508	8.2
Sept. 24----------	0	--		--	--	--		161	--	91	--	--		--	--	--	120	0	--	--	539	--
Sept. 30----------	0	--		--	--	--		178	--	92	--	--		--	--	--	134	0	--	--	567	--
Weighted average----	12.6	12		23	7.5	73		90	6.4	116	--	4.8		314	0.43	10.7	88	14	64	3.4	542	--

a Residue on evaporation at 180° C.

b No flow Jan. 1 to Mar. 13, Mar. 31 to May 11, May 24 to July 1, July 6-23, 31, Aug. 1-12, 28-31, Sept. 1-6, 10-30.

RED RIVER NEAR GAINESVILLE, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 77, a quarter of a mile downstream from Gulf, Colorado & Santa Fe Railway bridge, 5 miles downstream from Fish Creek, 7 miles north of Gainesville, Cooke County, and at mile 791.5.
DRAINAGE AREA.--30,782 square miles, of which 5,936 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: May 1944 to April 1946, October 1952 to September 1953.
Water temperatures: October 1952 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 6,480 ppm Apr. 11; minimum, 342 ppm July 22-23.
Hardness: Maximum, 1,510 ppm Apr. 11; minimum, 132 ppm July 22-23.
Specific conductance: Maximum daily, 9,890 micromhos Apr. 11; minimum daily, 537 micromhos July 23.
Water temperatures: Maximum observed, 90° F Aug. 2, Sept. 19; minimum observed, 37° F Jan. 17.
EXTREMES, 1944-46, 1952-53.--Dissolved solids: Maximum, 6,480 ppm Apr. 11, 1953; minimum, 250 ppm Sept. 30, Oct. 1-3, 1945.
Hardness: Maximum, 1,510 ppm Apr. 11, 1953; minimum, 120 ppm Sept. 30, Oct. 1-3, 1945.
Specific conductance: Maximum daily, 9,890 micromhos Apr. 11, 1953; minimum daily, 325 micromhos Oct. 1, 1945.
REMARKS.--Records of specific conductance of daily samples for water year October 1952 to September 1953 available in district office at Oklahoma City, Okla. Records of specific conductance of daily samples for period May 1944 to April 1946 available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1281.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1952	138	8.0	0.00	270	90	831	11	136	709	1,450	0.3	2.6	0.90	3,610	4.91	1,350	1,040	932	63	11	5,570	7.7
Oct. 11-20	117	7.5	.00	279	96	860	11	153	703	1,520	.5	1.0	.86	3,710	5.05	1,170	1,090	965	63	11	5,810	7.9
Oct. 21-31	104	6.5	.00	281	97	861	11	173	697	1,510	.3	.6	.83	3,680	5.00	1,030	1,100	958	63	11	5,770	7.8
Nov. 1-10	102	6.5	.30	268	94	836	9.6	181	650	1,440	.5	.7	.77	3,500	4.76	964	1,060	908	63	11	5,540	7.9
Nov. 11-20	112	7.5	.00	264	96	826	9.1	178	642	1,440	.3	1.9	.78	3,450	4.69	1,040	1,050	907	63	11	5,500	8.0
Nov. 21-22	118	--	--	259	96	775		188	640	1,350	--	1.0	--	3,370	4.58	1,070	1,040	886	62	10	5,400	7.9
Nov. 23-30	235	--	--	216	78	613		176	491	1,090	--	1.3	--	2,650	3.60	1,680	860	716	61	9.1	4,350	7.9
Dec. 1-2, 5-9	195	--	--	196	76	543		200	424	975	--	2.2	--	2,400	3.26	1,260	802	638	60	8.4	3,900	7.7
Dec. 3-4, 10	197	--	--	213	82	614		204	478	1,090	--	1.7	--	2,710	3.69	1,440	868	702	61	9.0	4,410	7.5
Dec. 11-20	140	6.5	.00	229	82	658	9.0	214	458	1,220	.3	1.0	.63	2,820	3.84	1,070	908	733	61	9.5	4,580	7.8
Dec. 21-26, 30-31	186	--	--	231	89	659		201	484	1,210	--	.8	--	2,900	3.94	1,460	942	778	60	9.3	4,730	7.7
Dec. 27-29	230	--	--	175	70	515		173	369	935	--	.7	--	2,270	3.09	1,410	724	582	61	8.4	3,760	7.7
Jan. 1-4, 1953	166	--	--	197	58	582		187	398	1,010	--	2.8	--	2,460	3.35	1,100	730	577	63	9.4	4,000	8.0
Jan. 5-7	135	--	--	229	68	681		186	536	1,150	--	.4	--	2,860	3.89	1,040	851	698	64	10	4,650	7.7
Jan. 8-9	130	--	--	235	70	761		196	568	1,260	--	.5	--	3,110	4.23	1,090	874	714	65	11	5,020	7.8
Jan. 10	125	--	--	263	84	916		181	646	1,540	--	.5	--	3,710	5.05	1,250	1,000	853	67	13	5,870	7.9
Jan. 11-20	118	4.0	.00	270	93	906	9.0	194	644	1,580	.3	1.2	.60	3,670	4.99	1,170	1,060	897	65	12	5,900	8.0
Jan. 21-26	115	--	--	272	101	847		202	629	1,500	--	.4	--	3,590	4.88	1,110	1,090	928	63	11	5,820	8.0
Jan. 27-31	116	--	--	261	98	800		214	604	1,410	--	.8	--	3,420	4.65	1,070	1,050	878	62	11	5,450	7.9
Feb. 1-10	110	4.0	.00	263	94	803	9.6	207	618	1,420	.5	.1	.69	3,500	4.76	1,040	1,040	873	62	11	5,420	8.1
Feb. 11, 14-19	190	--	--	257	101	826		168	657	1,440	--	.2	--	3,360	4.57	1,720	1,060	919	63	11	5,500	7.7
Feb. 12-13	134	--	--	226	86	692		191	551	1,200	--	.2	--	2,850	3.88	1,030	918	761	62	9.9	4,720	7.7
Feb. 20	226	--	--	184	69	547		173	501	900	--	.2	--	2,320	3.16	1,420	742	600	62	8.7	3,770	7.8
Feb. 21-26	169	--	--	177	62	509		178	392	885	--	1.0	--	2,220	3.02	1,010	696	550	61	8.4	3,630	7.7
Feb. 27-28	142	--	--	204	77	638		191	418	1,150	--	.2	--	2,730	3.71	1,050	826	669	63	9.7	4,360	7.6
Mar. 1-4	136	--	--	204	68	657		198	402	1,160	--	.6	--	2,680	3.64	984	788	626	64	10	4,450	7.6
Mar. 5-7	123	--	--	191	69	574		210	394	1,010	--	1.4	--	2,450	3.33	814	760	588	62	9.0	4,020	7.7
Mar. 8-10	207	--	--	224	81	710		167	528	1,240	--	.4	--	2,990	4.07	1,670	892	755	63	10	4,800	7.7
Mar. 11-12	308	--	--	240	96	778		125	637	1,360	--	2.2	--	3,470	4.72	2,890	994	891	63	11	5,260	7.9
Mar. 13-14	252	--	--	183	74	603		103	404	1,110	--	1.3	--	2,690	3.66	1,830	761	676	63	9.5	4,230	7.7
Mar. 15-16	1,525	--	--	112	35	325		134	205	570	--	2.9	--	1,440	1.96	5,930	424	314	63	6.9	2,370	8.0
Mar. 17	990	--	--	71	22	200		103	148	325	--	5.7	--	921	1.25	2,460	268	183	62	5.3	1,470	7.8
Mar. 18	5,070	--	--	87	26	248		117	179	410	--	4.4	--	1,140	1.55	15,610	324	228	62	6.0	1,830	7.9
Mar. 19-20	3,345	--	--	60	17	123		108	109	200	--	3.1	--	637	.87	5,750	220	131	55	3.6	1,030	7.8
Mar. 21	1,270	--	--	76	19	168		108	146	275	--	5.7	--	860	1.17	2,950	268	179	58	4.4	1,330	8.1
Mar. 22-23, 28-29	644	--	--	92	29	233		116	206	385	--	2.6	--	1,150	1.56	2,000	348	254	59	5.4	1,780	7.8
Mar. 24-25	513	--	--	108	33	266		119	245	445	--	3.1	--	1,280	1.74	1,770	405	308	59	5.7	2,010	8.1
Mar. 26-27, 30-31	404	--	--	127	39	350		128	281	595	--	2.4	--	1,600	2.18	1,750	478	372	61	6.9	2,550	7.8

RED RIVER NEAR GAINESVILLE, TEX.--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Apr. 1, 3, 9-10-------	2,084			92	28	223		145	178	370		2.4	--	1,090	1.48	6,130	344	226	58	5.2	1,710	8.0
Apr. 2----------	718			195	74	591		135	450	1,060		2.9	--	2,690	3.66	5,210	791	680	62	9.1	4,150	8.0
Apr. 4-6----------	2,123			45	10	69		124	48	105		3.6	--	394	.54	2,260	154	52	49	2.4	628	7.7
Apr. 7-8----------	704			72	21	169		123	127	282		2.4	--	830	1.13	1,580	266	165	58	4.5	1,330	7.7
Apr. 11----------	2,740			450	94	1,730	--	153	1,190	2,750		7.0	--	6,480	8.81	47,940	1,510	1,380	71	19	9,890	7.4
Apr. 12-13----------	1,555			326	66	1,240	--	127	896	1,980		7.8	--	4,650	6.32	19,520	1,080	981	71	16	7,250	7.8
Apr. 14-16----------	757			315	63	1,130	--	126	859	1,800		6.3	0.48	4,400	5.98	8,990	1,040	942	70	15	6,780	7.9
Apr. 17-20----------	374			297	62	992	--	150	775	1,560		5.7	.45	3,940	5.36	3,980	996	873	68	17	6,120	7.9
Apr. 21-22----------	267			289	69	948		147	767	1,520		2.3	--	3,790	5.15	2,730	1,000	884	67	13	6,020	7.9
Apr. 23-24----------	729			188	51	601		141	488	965		.6	--	2,420	3.29	4,760	678	563	66	10	3,970	7.8
Apr. 25----------	1,020			94	24	260		119	158	450		1.7	--	1,100	1.50	3,030	333	236	63	6.2	1,880	7.9
Apr. 26-27, 29--------	425			138	47	484		110	344	810		.6	--	1,880	2.56	2,160	538	448	66	9.1	3,270	7.7
Apr. 28----------	316			116	34	372		117	271	610		1.3	--	1,490	2.03	1,270	430	334	65	7.8	2,520	7.9
Apr. 30----------	360			208	65	720		133	555	1,180		1.3	--	2,880	3.92	2,800	786	678	67	11	4,640	8.0
May 1-4----------	283			262	83	939		126	702	1,560		2.4	--	3,720	5.06	2,840	995	892	67	13	5,880	8.2
May 5-6----------	288			288	93	1,010		136	722	1,720		1.4	--	4,150	5.64	3,230	1,100	988	67	13	6,470	8.1
May 7----------	254			238	77	895		123	598	1,510		3.7	--	3,540	4.81	2,430	910	809	68	13	5,590	8.2
May 8-9----------	235			304	88	1,110		163	845	1,780		2.2	--	4,230	5.75	2,680	1,120	986	68	14	6,570	8.0
May 10----------	218			244	70	805		a173	656	1,290		2.5	--	3,230	4.39	1,900	895	753	66	12	5,080	8.3
May 11-12----------	231			202	59	600		165	510	980		1.4	--	2,550	3.47	1,590	745	610	64	9.6	4,170	7.9
May 13-14----------	274			180	55	509		150	400	880		1.2	--	2,260	3.07	1,670	675	552	62	8.5	3,670	8.2
May 15----------	925			216	70	696		116	514	1,210		2.9	--	3,020	4.11	7,540	825	730	65	11	4,720	8.1
May 16----------	1,540			74	22	185		95	143	318		3.3	--	903	1.23	3,750	276	198	59	4.8	1,460	8.2
May 17----------	2,550			112	31	280		b127	198	495		5.9	--	1,380	1.88	9,500	405	300	60	6.0	2,160	8.3
May 18----------	3,160			87	22	211		119	143	365		7.8	--	1,020	1.39	8,700	308	210	60	5.2	1,640	8.2
May 19----------	3,460			66	16	144		b117	115	228		7.3	--	727	.99	6,790	230	134	58	4.1	1,150	8.3
May 20----------	2,950			92	19	203		c150	141	335		8.5	--	986	1.34	7,850	308	185	59	5.0	1,590	8.4
May 21-22----------	1,188			63	15	129		125	94	208		4.3	--	619	.84	1,990	218	116	56	3.8	1,070	7.5
May 23----------	540			81	21	203		119	142	340		5.6	--	937	1.27	1,370	288	190	61	5.2	1,590	8.2
May 24-25----------	381			114	33	334		c139	224	565		3.1	--	1,450	1.97	1,490	420	306	63	7.1	2,520	8.3
May 26----------	320			132	38	429		a140	268	725		2.4	--	1,800	2.45	1,560	485	370	66	8.5	3,030	8.3
May 27----------	288			142	41	514		112	315	865		3.8	--	2,080	2.83	1,620	525	433	68	9.8	3,600	8.2
May 28----------	254			172	54	681		98	438	1,130		1.7	--	2,680	3.64	1,840	650	570	70	12	4,620	8.1
May 29-30----------	212			272	73	1,050		118	718	1,720		2.2	--	4,130	5.62	2,360	980	884	70	15	6,660	8.2
May 31----------	186			240	71	987		137	624	1,610		4.2	--	3,860	5.25	1,940	890	778	71	14	6,270	8.1

RED RIVER NEAR GAINESVILLE, TEX.--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
June 1	178			232	76	951		140	603	1,570		2.6		3,660	4.98	1,760	890	776	70	14	6,110	8.2
June 2-3	164			272	78	1,050		145	670	1,740		2.6		4,220	5.74	1,870	1,000	881	69	14	6,870	8.1
June 4-7	142			240	70	929		137	621	1,520		2.6		3,710	5.05	1,420	885	772	70	14	5,830	7.5
June 8	328			103	34	306		116	139	580		4.0		1,450	1.97	1,280	395	300	63	6.7	2,380	7.2
June 9	1,150			166	54	600		103	395	1,020		6.4		2,510	3.41	7,790	635	550	67	10	4,090	8.1
June 10	8,330			76	16	184		b144	141	272		8.0		827	1.12	18,600	256	138	61	5.0	1,440	8.3
June 11-13	4,857			58	13	135		127	111	192		4.5		614	.84	8,050	200	96	60	4.2	1,060	7.9
June 14-15	1,485			70	16	178		118	150	265		3.7		786	1.07	3,150	242	146	62	5.0	1,340	7.8
June 16-18	731			82	18	202		133	165	308		3.6		899	1.22	1,770	280	171	61	5.2	1,500	8.2
June 19-20	389			100	25	250		a148	205	398		1.8		1,140	1.55	1,200	354	232	61	5.8	1,870	8.3
June 21-24	271			116	32	316		152	245	515		3.2		1,370	1.86	1,000	420	296	62	6.7	2,280	8.2
June 25	790			137	37	416		134	319	675		5.4		1,720	2.34	3,670	495	385	65	8.1	2,910	7.3
June 26	628			198	62	649		94	533	1,080		7.8		2,670	3.63	4,530	750	673	65	10	4,360	8.1
June 27	360			222	71	749		88	581	1,270		7.1		3,030	4.12	2,950	845	773	66	11	4,990	8.0
June 28	248			140	48	515		58	366	875		4.0		2,040	2.77	1,370	545	498	67	9.6	3,460	7.8
June 29-30	208			126	40	433		79	285	750		3.3		1,750	2.38	983	480	416	66	8.6	2,980	7.9
July 1-2	250			134	40	435		91	264	775		4.3		1,810	2.46	1,220	500	426	65	8.5	3,030	8.0
July 3-4	271			152	50	554		56	247	1,050		6.9		2,310	3.14	1,690	585	539	67	10	3,820	7.8
July 5-6	887			142	33	410		116	209	755		5.8		1,700	2.31	4,070	490	395	65	8.1	2,870	8.0
July 7	961			90	26	280		c142	146	470		9.7		1,140	1.55	2,960	330	214	65	6.7	1,980	8.3
July 8-10	385			61	18	171		135	85	280		5.6		724	.98	753	226	116	62	5.0	1,270	8.1
July 11-12	247			84	23	233		139	128	398		3.8		990	1.35	660	304	190	63	5.8	1,710	8.2
July 13-15	263			98	29	277		141	172	475		2.3		1,180	1.60	838	365	250	62	6.3	2,040	8.2
July 16-19	265			128	45	417		106	280	730		5.0		1,760	2.39	1,260	505	418	64	8.1	2,910	7.8
July 20	1,180			90	28	296		97	189	500		4.3		1,200	1.63	3,820	340	260	65	7.0	2,070	8.1
July 21	2,880			73	18	170		117	104	295		6.2		789	1.07	6,140	256	160	59	4.6	1,330	8.1
July 22-23	3,090			39	8.4	66		105	42	101		4.2		342	.47	2,850	132	46	52	2.5	584	8.0
July 24-29	4,702			186	32	320		109	506	475		7.1		1,650	2.24	20,950	595	506	54	5.7	2,500	8.0
July 30-31	2,335			244	34	552		104	655	835		6.6		2,470	3.36	15,570	750	665	62	8.8	3,800	7.9
Aug. 1-10	660	12	0.00	272	44	627	12	109	718	988	0.5	2.9	0.73	2,820	3.84	5,050	860	770	61	9.3	4,330	7.8
Aug. 11-14	498			284	59	690		113	759	1,110		1.1		3,100	4.22	4,170	950	858	61	9.7	4,730	7.9
Aug. 15-17	500			176	40	418		100	446	685		1.8		1,940	2.64	2,620	605	523	60	7.4	3,020	7.5
Aug. 18-20	529			236	54	604		120	617	980		1.2		2,690	3.66	3,840	810	712	62	9.2	4,120	7.8
Aug. 21, 23-31	2,283			294	42	682		107	799	1,040		3.6		3,050	4.15	18,800	905	818	62	9.9	4,620	7.6
Aug. 22	9,120			220	29	367		149	541	550		8.3		1,860	2.53	45,800	670	548	54	6.2	2,810	7.3
Sept. 1-10	413			254	42	598		103	665	940		2.5		2,690	3.66	3,000	805	720	62	9.2	4,110	7.5
Sept. 11-17	229			175	48	490	--	107	415	800		3.1		2,050	2.79	1,270	634	546	63	8.5	3,410	7.6
Sept. 18-19	158			206	55	600	--	106	518	950		4.8		2,470	3.36	1,050	740	653	64	9.6	4,040	7.9
Sept. 20	146			253	67	728	--	100	663	1,180		4.4		3,030	4.12	1,190	906	824	64	11	4,820	7.7
Sept. 21-25	118			260	69	762	--	112	679	1,240		3.3		3,160	4.30	1,010	932	840	64	11	5,020	7.7
Sept. 26-30	98.2			294	83	903	--	126	754	1,450		4.0		3,670	4.99	973	1,080	972	65	12	5,740	7.5
Weighted average	651	--	--	169	38	434		127	412	698	--	4.6	--	1,910	2.60	3,360	578	474	62	7.8	3,010	--

a Includes equivalent of 3 ppm of carbonate (CO_3).
b Includes equivalent of 2 ppm of carbonate (CO_3).
c Includes equivalent of 4 ppm of carbonate (CO_3).

RED RIVER AT DENISON DAM NEAR DENISON, TEX.

LOCATION.--Immediately below dam on Red River, 1.7 miles upstream from Sand Creek, 4 miles northwest of Denison, Grayson County, and 3 miles upstream from gaging station near Colbert, Bryan County, Okla.
DRAINAGE AREA.--39,719 square miles above dam, 39,777 square miles above gaging station, of which 5,936 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: May 1944 to September 1953.
Water temperatures: October 1945 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 995 ppm Aug. 1-31; minimum, 912 ppm Oct. 1-31.
Hardness: Maximum, 360 ppm June 1-30; minimum, 334 ppm Oct. 1-31.
Specific conductance: Maximum daily, 1,640 micromhos Sept. 18; minimum daily, 1,490 micromhos Nov. 17.
EXTREMES, 1944-53.--Dissolved solids: Maximum, 1,430 ppm Aug. 11-20, Sept. 1-10, 1944; minimum, 464 ppm Oct. 21-31, 1945.
Hardness: Maximum, 522 ppm Aug. 11-20, Sept. 1-10, 1944; minimum, 233 ppm Dec. 21-31, 1945, Jan. 11-20, 1946.
Specific conductance: Maximum daily, 3,520 micromhos Aug. 14, 1944; minimum daily, 362 micromhos May 2, 1944.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Colbert, Okla., for water year October 1952 to September 1953 given in Water-Supply Paper 1281. No appreciable inflow between dam and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1952	2,394	11		88	28	188		140	203	295		1.2		912	1.24	5,890	334	220	55	4.5	1,520	7.9
Nov. 1-30	1,516	11		91	29	184		142	205	295		1.2		921	1.25	3,770	346	230	54	4.3	1,550	7.7
Dec. 1-31	1,355	10		90	29	188		141	209	295		4.0		918	1.25	3,360	344	228	54	4.4	1,550	7.7
Jan. 1-31, 1953	1,503	6.4		90	29	192		144	211	298		4.5		961	1.31	3,900	344	226	55	4.5	1,550	7.9
Feb. 1-28	1,268	5.2		92	30	187		142	210	300		.8		929	1.26	3,180	353	236	53	4.3	1,570	7.9
Mar. 1-31	711	4.6		93	30	187		140	207	305		1.0		934	1.27	1,790	356	241	53	4.3	1,560	7.3
Apr. 1-30	1,748	4.6		94	30	186		145	210	300		2.0		933	1.27	4,400	358	239	53	4.3	1,580	7.9
May 1-31	1,477	7.3		93	30	185		147	211	295		2.5		978	1.33	3,900	356	235	53	4.3	1,570	7.9
June 1-30	2,108	8.0		93	31	182		148	202	300		1.0		919	1.25	5,230	360	238	52	4.2	1,550	8.0
July 1-31	2,517	9.6		93	30	200		147	207	320	0.3	2.8		972	1.32	6,610	356	235	55	4.6	1,620	8.0
Aug. 1-31	2,932	11		92	28	197		140	205	315		1.0		995	1.35	7,880	344	230	55	4.6	1,620	8.0
Sept. 1-30	2,674	16		92	29	194		132	209	315		1.5		a922	1.25	6,660	348	240	55	4.5	1,590	7.7
Weighted average	1,853	9.5		92	29	190		142	207	305		1.9		944	1.28	4,720	348	232	54	4.4	1,570	--

a Sum of determined constituents.

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN TEXAS

REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Instantaneous discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
SALT SPRINGS AT ESTELLINE																						
Oct. 6, 1952	--	31		1,520	312	18,100	140	4,280	28,200		--			52,500	71.4		5,080	4,960	89	--	69,000	7.8
BUCK CREEK NEAR WELLINGTON																						
Oct. 8, 1952	1.24	22		608	141	177	102	1,940	265		7.5			3,210	4.37		2,100	2,010	16	1.7	3,860	8.0
May 11, 1953	3.06	15		568	130	142	73	1,800	225		12			2,930	3.98		1,950	1,890	14	1.4	3,360	7.9
GROESBECK CREEK NEAR QUANAH																						
Jan. 13, 1953	6.50	14		586	117	307	84	1,830	448		5.4			3,350	4.56		1,940	1,870	26	3.0	4,050	7.9
May 11	.34	12		610	131	284	72	1,870	472		8.2			3,420	4.65		2,060	2,000	23	2.7	4,170	7.9
WANDERERS CREEK AT ODELL																						
Jan. 13, 1953	2.04	18		139	74	158	384	446	148		10			1,180	1.60		652	337	35	2.7	1,770	7.8
May 14	1.15	24		90	50	104	321	237	92		21			840	1.14		430	166	35	2.2	1,200	--
CARROLL CREEK 8½ MILES NORTH OF CLARENDON																						
Jan. 13, 1953	1.29	32		31	20	23	190	31	13		2.8			254	.35		160	4	23	.8	488	8.2
Aug. 24	.44	44		--	--	30	208	48	15		1.8			--	--		177	6	27	1.0	468	8.2
SALT FORK RED RIVER NEAR CLARENDON																						
Oct. 8, 1952	1.25	35		48	24	81	168	101	108		.8			526	.72		218	81	45	2.4	841	8.1
Jan. 13, 1953	9.26	36		42	21	48	146	101	50		1.8			397	.54		192	72	35	1.5	669	8.2
July 22	--	--		--	--	--	182	121	76		--			493	.67		244	95	--	--	761	8.2
Aug. 24	1.05	60		50	21	78	123	123	108		.5			536	.73		212	110	45	2.4	801	8.0
LELIA LAKE CREEK NEAR HEDLEY																						
Oct. 8, 1952	5.58	44		73	28	54	143	215	48		7.7			601	.82		297	180	28	1.4	830	8.0
Jan. 13, 1953	6.79	40		66	28	52	105	217	51		9.2			542	.74		280	194	29	1.3	891	8.0
July 22	--	--		--	--	--	188	173	118		--			625	.85		290	136	--	--	1,010	7.9
Aug. 12	8.22	50		51	17	32	170	89	23		3.2			372	.51		197	58	26	1.0	525	8.1
DOZIER CREEK ½ MILE EAST OF DOZIER																						
Mar. 5, 1953	--	24		484	57	44	102	1,290	74		8.7			2,030	2.76		1,440	1,360	6	.5	2,420	7.9

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN TEXAS--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Instantaneous discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
DOZIER CREEK 14 MILES NORTHWEST OF WELLINGTON																						
Mar. 5, 1953	0.23	24		584	82	65	110	1,660	78		8.7			2,560	3.48		1,790	1,700	7	0.7	2,820	8.0
Sept. 18	.23	34		586	84	68	99	1,690	76		9.0			2,600	3.54		1,810	1,730	8	.7	2,810	7.7
SWEETWATER CREEK NEAR WHEELER																						
Jan. 16, 1953	1.69	34		70	16	37	326	26	18		1.5			362	.49		240	0	25	1.0	586	8.1
May 11	3.83	35		30	15	42	201	22	26		3.5			272	.37		137	0	40	1.5	435	8.2
Sept. 8	.08	58		36	14	32	210	21	16		.5			286	.39		147	0	32	1.2	423	8.2
ELM CREEK NEAR SHAMROCK																						
May 11, 1953	1.67	34		129	32	73	102	373	97		5.0			866	1.18		454	370	26	1.5	1,200	8.0
Sept. 8	1.35	60		--	--	--	90	308	121		1.5			--	--		360	--	--	--	1,130	7.9
ROARING SPRINGS NEAR ROARING SPRINGS																						
June 10, 1953	1.47	44		77	31	73	294	77	95		28			570	.78		320	78	33	1.8	960	7.9
NORTH FORK WICHITA RIVER 10 MILES SOUTHEAST OF PADUCAH																						
Jan. 13, 1953	3.08	18		514	133	775	90	1,600	1,250		16			4,350	5.92		1,830	1,760	48	7.9	6,100	7.9
SALT CREEK 6½ MILES SOUTHEAST OF PADUCAH																						
Jan. 13, 1953	1.96	14		1,240	290	11,400	89	3,710	17,800		--			34,500	46.9		4,290	4,210	85	--	47,000	7.8
NORTH FORK WICHITA RIVER 14 MILES SOUTHEAST OF PADUCAH																						
Jan. 13, 1953	8.42	21		797	191	4,730	95	2,410	7,430		--			15,600	21.2		2,770	2,700	79	--	22,900	7.9
NORTH FORK WICHITA RIVER 4½ MILES NORTH OF TRUSCOTT																						
Jan. 13, 1953	12.8	14		870	212	4,250	105	2,650	6,690		--			14,700	20.0		3,040	2,960	75	--	21,200	7.9

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN TEXAS--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Instantaneous discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
SOUTH FORK WICHITA RIVER 6 MILES EAST OF GUTHRIE																						
Jan. 13, 1953---------	4.23	16		1,190	300	8,650		115	3,040	14,000				27,300	37.1		4,200	4,110	82		38,500	7.8
SOUTH FORK WICHITA RIVER 4 MILES NORTH OF BENJAMIN																						
Jan. 13, 1953---------	4.0	24		1,390	387	8,720		108	3,350	14,500				28,400	38.6		5,060	4,970	79		39,900	7.8
WICHITA RIVER AT HEAD OF LAKE KEMP 9 MILES NORTHWEST OF SEYMOUR																						
Jan. 13, 1953---------	8.0	18		792	207	3,550		85	2,320	5,710				12,600	17.1		2,830	2,760	73		18,400	7.8
CADDO LAKE NEAR KARNACK																						
Aug. 25, 1953---------	--	22	0.83	7.0	3.0	23		25	14	31	0.2	0.2		125	.17		30	9	62	1.8	178	6.9

SABINE RIVER BASIN

SABINE RIVER NEAR EMORY, TEX.

LOCATION.--At gaging station at bridge on State Highway 19, 3.0 miles upstream from Giladon Creek, 7.5 miles south of Emory, Rains County, 8.0 miles downstream from McBees Creek, and at mile 501.
DRAINAGE AREA.--965 square miles.
RECORDS AVAILABLE.--Chemical analyses: July 1952 to September 1953.
Water temperatures: July 1952 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 238 ppm July 1-8, 15; minimum, 47 ppm Apr. 24, 29-30.
Hardness: Maximum, 156 ppm June 22-30; minimum, 23 ppm Dec. 19-20.
Specific conductance: Maximum daily, 442 micromhos July 8, 1953; minimum daily, 48.8 micromhos July 18, 1953.
Water temperatures: Maximum observed, 98° F June 11; minimum observed, 38° F Jan. 16.
REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Values reported for dissolved solids are sums of determined constituents. Records of discharge for period July 1952 to September 1953 given in Water-Supply Paper 1392.

Chemical analyses, in parts per million, July 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
July 25-31, 1952------	1.19	9.6		18	3.6	14		80	13	6.2		1.8		105	0.14	0.34	60	0	33	0.8	175	7.3
Aug. 1-12-------------	a.10	12		24	3.2	13		98	11	5.0		1.8		118	.16	.03	73	0	27	.6	210	7.5
Aug. 13-16, 30--------	a0	--		--	--	--		--	--	6		--		--	--	--	--	--	--	--	256	--
Sept. 6---------------	a0	--		--	--	--		--	--	8		--		--	--	--	--	--	--	--	296	--
Nov. 20-30------------	938	7.0		20	3.2	13		73	17	7.0		4.2		107	.15	271	63	3	31	.7	176	7.2
Dec. 1-10-------------	966	7.6		14	2.8	7.5	--	50	13	5.5		3.5		81	.11	211	46	5	26	.5	127	7.1
Dec. 11-18------------	15.8	11		22	3.0	12		72	18	10		1.8		113	.15	4.82	67	8	28	.6	195	7.6
Dec. 19-20------------	1,302	6.8		--	--	5.8		26	7.1	3.8		2.0		62	.08	218	23	2	35	.5	76.4	7.2
Dec. 21-25, 31--------	1,993	9.6		17	2.5	8.1	--	59	13	3.8		1.8		85	.12	457	53	4	25	.5	154	7.5
Dec. 26-30------------	41.2	11		26	3.1	13		89	19	7.5		2.5		126	.17	14.0	78	5	26	.6	212	7.7
Jan. 1-10, 1953-------	470	8.8		21	2.5	12		72	15	8.5		2.0		105	.14	133	63	4	29	.6	182	7.4
Jan. 11-20------------	95.0	8.2		20	2.8	15		71	15	14		1.2		111	.15	28.5	61	3	35	.8	192	7.3
Jan. 21-31------------	281	8.6		22	2.8	15		76	22	7.8		3.0		118	.16	89.5	66	4	33	.8	205	7.3
Feb. 1-10-------------	23.7	10		22	3.3	15		82	16	11		1.8		119	.16	7.61	68	1	32	.8	206	7.7
Feb. 11-14, 22-23-----	22.0	9.4		25	3.8	15		88	21	10		2.0		129	.18	7.66	78	6	29	.7	228	7.5
Feb. 15-21, 24-28-----	22.5	8.0		35	4.3	22		118	32	16		2.5		178	.24	10.8	106	9	32	.9	317	7.4
Mar. 1-9--------------	11.4	7.2		33	4.9	20		112	31	14		2.0		167	.23	5.14	102	11	30	.8	292	7.6
Mar. 10-12, 24--------	794	8.6		19	3.2	10	--	66	15	6.5		2.5		97	.13	208	61	6	26	.6	164	7.5
Mar. 25-31------------	397	10		30	3.4	15		107	15	11		2.8		140	.19	150	89	1	27	.7	244	7.8
Mar. 13-23------------	419	12		32	3.4	20		108	24	13		5.8		163	.22	184	94	5	31	.9	277	7.7
Apr. 1-10-------------	221	11		30	4.3	16		104	19	14		4.2		150	.20	89.5	93	8	27	.7	260	7.5
Apr. 11-12, 14-23-----	166	11		35	4.2	17		125	20	10		4.0		162	.22	72.6	105	2	26	.7	279	7.9
Apr. 13, 25-28--------	2,560	9.6		18	3.2	8.4	--	67	11	5.0		3.0		91	.12	629	58	3	24	.5	153	7.0
Apr. 24, 29-30--------	13,340	5.0		6.6	1.3	4.4	2.9	28	6.9	4.0		1.5		47	.06	1,690	27	4	27	.4	70.1	6.9
May 1-11, 20-22-------	2,815	13		31	3.4	12		112	14	6.0		3.0		137	.19	1,040	91	0	22	.5	235	7.9
May 12-19-------------	6,857	8.6		10	2.4	4.9	3.0	42	6.4	2.8		2.0		61	.08	1,130	35	0	22	.4	95.7	7.8
May 23-31-------------	40.8	15		36	5.1	19		126	26	13		3.5		180	.24	19.8	111	8	27	.8	309	8.2
June 1-10-------------	2.87	14		4.5	5.9	26		156	37	18		2.5		225	.31	1.74	137	9	30	1.0	386	7.8
June 11-21------------	.25	12		49	6.6	25		180	30	16		2.0		230	.31	.16	149	2	26	.9	397	8.0
June 22-30------------	a0	9.2		50	7.5	27		190	29	18		2.5		236	.32	--	156	0	27	.9	422	7.6
July 1-8, 15----------	a0	9.4		45	7.5	32		179	32	22		2.0		238	.32	--	143	0	33	1.2	416	8.0
July 17-20, 22-24-----	349	7.8		13	2.4	8.5	3.1	46	16	4.8		3.2		82	.11	77.3	42	5	29	.6	132	7.1
July 21, 25-31--------	26.6	11		28	4.5	16		95	32	5.8		4.0		148	.20	10.6	88	10	28	.7	249	7.5
Aug. 1-10-------------	.68	17		32	4.3	23		126	32	7.0		2.5		180	.24	.33	98	0	34	1.0	286	7.8
Aug. 11-18, 28-31-----	a1.30	14		28	4.2	17		110	24	5.8		1.5		148	.20	.52	87	0	30	.8	247	7.6
Aug. 19-27------------	22.3	11		16	3.9	10	2.8	73	13	3.8		2.0		98	.13	5.90	56	0	27	.6	159	7.6
Sept. 1-3, 25-29------	a.20	10		22	4.0	11		94	9.7	4.8		2.2		110	.15	.06	71	0	25	.6	186	7.8
Sept. 4-11------------	45.1	9.4		8.1	2.4	5.3	2.7	37	4.5	2.2		3.0		56	.08	6.8	30	0	26	.4	85.2	7.4
Sept. 12-24-----------	.28	11		16	3.2	6.3	2.6	66	9.1	2.8		2.5		86	.12	.07	53	0	20	.4	131	7.6
Weighted average-----	575	8.9		17	2.6	9.7		63	11	5.1		2.5		88	0.12	137	53	2	28	0.6	145	--

a Less than 0.05 second-foot flow Aug. 7-31, September 1952, October, Nov. 1-19, June 22-30, July 1-16, Aug. 11, Sept. 25-30, 1953.

SABINE RIVER NEAR TATUM, TEX.

LOCATION.--At gaging station at bridge on State Highway 43, 5 miles upstream from Potter Creek, 5.2 miles northeast of Tatum, Rusk County, 7 miles downstream from Cherokee Bayou, and at mile 339.
DRAINAGE AREA.--3,586 square miles.
RECORDS AVAILABLE.--Chemical analyses: February 1952 to September 1953.
Water temperatures: February 1952 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 667 ppm July 5-6, 8-9; minimum, 82 ppm May 10-20.
Hardness: Maximum, 91 ppm July 5-6, 8-9; minimum, 29 ppm Sept. 9-10, 12-18.
Specific conductance: Maximum daily, 1,190 micromhos July 5-6; minimum daily, 123 micromhos May 10-11.
Water temperatures: Maximum observed, 94° F June 23; minimum observed, 47° F Feb. 25-26.
EXTREMES (February 1952 to September 1953).--Dissolved solids: Maximum, 667 ppm July 5-6, 8-9, 1953; minimum, 82 ppm May 10-20, 1953.
Hardness: Maximum, 92 ppm June 22-30, 1952; minimum, 29 ppm Sept. 9-10, 12-18, 1953.
Specific conductance: Maximum daily, 1,190 micromhos July 5-6, 1953; minimum daily, 123 micromhos May 10-11, 1953.
Water temperatures: Maximum observed, 94° F June 23, 1953; minimum observed, 47° F Feb. 25-26, 1953.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1952-------	22.9	15		22	8.5	117		83	11	188		0.8		406	0.55	25.1	90	22	74	5.4	767	7.7
Oct. 11-20------------	24.0	14		21	8.7	122		71	15	198		.5		421	.57	27.3	88	30	75	5.6	783	7.6
Oct. 21-31------------	24.5	11		20	8.3	148		59	20	238		.8		477	.65	31.6	84	36	79	7.0	887	7.3
Nov. 1-10-------------	36.2	10		20	7.8	145		59	20	232		.1		466	.63	45.5	82	34	79	6.9	874	7.5
Nov. 11-23------------	13.2	10		16	6.6	136		55	21	210		.1		a427	.58	15.2	67	22	82	7.2	792	7.3
Nov. 24-28------------	458	13		17	7.6	156		32	27	255		.2		510	.69	631	74	48	82	7.9	921	6.9
Nov. 29-30, Dec. 3-10-	2,091	11		12	5.9	34		21	27	57		2.2		208	.28	1,170	54	37	57	2.0	300	6.9
Dec. 1-2, 21-22-------	1,230	14		19	6.9	134		19	37	220		4.7		504	.69	1,670	76	60	79	6.7	871	6.9
Dec. 11-20, 29-31-----	2,421	10		11	5.8	30		24	23	51		1.2		a144	.20	941	51	32	56	1.8	278	6.9
Dec. 23-28------------	2,063	13		13	6.3	52		13	35	87		1.2		a214	.29	1,190	58	48	66	3.0	403	6.7
Jan. 1-5, 8-12, 30, 1953----------	2,325	12		13	6.8	32		27	26	57		1.0		a161	.22	1,010	60	38	54	1.8	305	7.0
Jan. 6-7, 18-20, 25-26, 28----------	1,457	16		19	7.4	83		18	48	138		.5		364	.50	1,430	78	64	70	4.1	601	6.7
Jan. 13-17, 21-24, 27, 29, 31----------	1,112	16		16	4.9	56		23	40	85		1.0		267	.36	802	60	41	67	3.1	420	6.9
Feb. 1-10------------	924	16		17	6.5	64		24	42	102		.8		a260	.35	649	69	50	67	3.3	482	7.1
Feb. 11-19------------	928	16		16	6.6	67		19	40	109		1.0		a265	.36	664	67	52	68	3.5	492	6.5
Feb. 20-28------------	1,182	16		19	8.0	84		15	54	138		1.0		a327	.44	1,040	80	68	70	4.1	610	6.9
Mar. 1-8--------------	912	15		20	8.5	82		17	61	132		.5		364	.50	896	85	71	68	3.9	618	7.1
Mar. 9-10, 25-31------	1,505	14		18	6.6	56		35	44	84		1.2		269	.37	1,090	72	43	63	2.9	443	7.2
Mar. 11-24------------	5,162	11		12	4.5	37		21	30	57		1.0		187	.25	2,610	48	31	63	2.3	298	7.1
Apr. 1-2, 5-6, 12, 16-18, 21, 25-26----	1,796	13		17	5.7	42		39	28	68		1.5		a194	.26	941	66	34	58	2.3	369	7.1
Apr. 3-4, 7-11, 13-15, 19-20--------	1,680	15		19	7.1	62		33	40	100		1.2		a260	.35	1,180	77	50	64	3.1	487	7.0
Apr. 22-24, 27-30-----	2,844	11		12	4.4	30		31	21	46		1.2		a141	.19	1,080	48	23	57	1.9	262	7.2
May 1-9---------------	6,768	8.2		8.9	3.6	19		24	15	30		2.0		a99	.13	1,810	37	17	53	1.4	187	7.0
May 10-20-------------	16,550	7.8		10	3.3	13		34	11	18		1.5		a82	.11	3,660	38	11	42	.9	148	7.1
May 21-31-------------	20,150	9.6		9.6	2.6	17		36	10	21		1.8		118	.16	6,420	35	5	51	1.2	151	7.2
June 1-8--------------	4,934	18		18	4.8	28		45	16	49		2.8		a159	.22	2,120	65	28	48	1.5	303	7.6
June 9-22-------------	311	32		20	6.5	75		53	25	120		1.0		324	.44	272	77	33	68	3.7	549	7.1
June 23-30------------	127	28		21	6.7	93		59	21	149		1.0		372	.51	128	80	32	72	4.5	648	7.3
July 1-4, 7, 10-18----	376	22		16	5.9	98		36	20	160		1.5		372	.51	378	64	35	77	5.3	643	7.4
July 5-6, 8-9---------	152	23		22	8.7	186		37	22	312		1.8		667	.91	274	91	60	82	8.5	1,160	7.3
July 19-31------------	2,731	14		9.8	4.1	37		22	15	62		2.0		190	.26	1,400	41	23	66	2.5	281	7.2
Aug. 1-4, 25, 27, 29--	514	20		12	4.0	41		31	18	63		3.5		195	.27	271	46	21	66	2.6	314	7.4
Aug. 5-14, 21-22, 26, 28, 30-31----------	275	29		15	5.4	64		44	20	100		1.2		263	.36	195	60	24	70	3.6	444	7.5
Aug. 15-20, 23-24-----	279	30		17	5.9	86		51	19	135		1.0		325	.44	245	67	25	74	4.6	563	7.7

SABINE RIVER NEAR TATUM, TEX.--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Sept. 1-4, 26-30-------	296	17		15	5.9	106		34	17	175		1.0		380	0.52	304	62	34	79	5.9	672	7.5
Sept. 5-8, 11, 19-25---	453	16		12	4.5	75		28	15	121		1.8		283	.38	346	48	26	77	4.7	483	7.4
Sept. 9-10, 12-18------	862	13		7.5	2.5	34		21	12	52		1.2		173	.24	403	29	12	72	2.8	241	7.3
Weighted average-----	2,420	11		12	4.2	31		31	19	48		1.6		157	0.21	1,030	48	22	59	2.0	260	--

a Sum of determined constituents.

SABINE RIVER NEAR RULIFF, TEX.

LOCATION.--At gaging station at bridge on State Highway 235, 2.4 miles north of Ruliff, Newton County, 4.2 miles upstream from Kansas City-Southern Railway bridge, 4.5 miles downstream from Cypress Creek and at mile 40.
DRAINAGE AREA.--9,440 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1946, October 1947 to September 1953.
Water temperatures: October 1947 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 232 ppm Feb. 3-5; minimum, 50 ppm Mar. 1-2, 14-26.
Hardness: Maximum, 52 ppm Feb. 3-5; minimum, 8 ppm May 20-24.
Specific conductance: Maximum daily, 417 micromhos Dec. 10-11; minimum daily, 32.9 micromhos May 22.
Water temperatures: Maximum observed, 95° F Aug. 12; minimum observed, 50° F Feb. 24.
EXTREMES, 1945-46, 1947-53.--Dissolved solids: Maximum, 411 ppm Dec. 26-27, 1948; minimum, 35 ppm June 5-11, 1950.
Hardness: Maximum, 64 ppm Aug. 1, 11, 16-19, 21-23, 1948; minimum, 8 ppm May 20-24, 1953.
Specific conductance: Maximum daily, 774 micromhos Dec. 26, 1948; minimum daily, 32.9 micromhos May 22, 1953.
Water temperatures (1947-53): Maximum observed, 95° F Aug. 12, 1953; minimum observed, 34° F Jan. 24, 1948.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1952--------	410	22		7.1	3.1	33		45	5.1	41		1.8		144	0.20	159	30	0	71	2.6	222	7.3
Oct. 11-20-------------	381	22		7.5	3.0	32		45	5.3	41		1.2		144	.20	148	31	0	69	2.5	223	7.2
Oct. 21-31-------------	347	21		7.8	2.9	36		44	5.0	48		2.2		146	.20	137	31	0	71	2.8	230	7.1
Nov. 1-10--------------	355	21		7.2	3.2	37		43	6.0	49		2.0		154	.21	148	31	0	72	2.7	239	7.3
Nov. 11-20-------------	673	18		6.5	3.0	35		39	6.7	46		1.5		142	.19	258	29	0	73	2.9	218	7.2
Nov. 21-30-------------	930	14		7.1	2.9	42		39	9.1	56		.8		159	.22	399	30	0	76	3.4	265	7.1
Dec. 1-9, 16-20--------	3,804	11		6.8	2.8	24		22	12	35		1.5		a104	.14	1,070	28	10	65	2.0	192	6.8
Dec. 10-15-------------	4,022	12		9.8	3.9	49		18	20	78		2.2		a184	.25	2,000	40	26	73	3.4	350	6.9
Dec. 21-31-------------	3,964	12		7.3	3.3	22		22	13	33		1.5		a103	.14	1,100	32	14	60	1.7	184	6.8
Jan. 1-10, 1953--------	6,886	12		7.7	3.5	29		18	17	44		1.8		a124	.17	2,310	34	19	65	2.1	221	7.0
Jan. 11-20-------------	3,827	13		9.9	3.9	33		20	23	50		1.5		a144	.20	1,490	41	24	64	2.2	258	6.9
Jan. 21-31-------------	5,937	13		7.0	3.1	25		17	17	36		1.5		a111	.15	1,780	30	16	64	2.0	193	6.7
Feb. 1-2, 6-20, 23-----	8,507	12		6.5	2.8	20		15	17	28		1.2		a94	.13	2,160	28	15	61	1.6	166	6.8
Feb. 3-5---------------	5,427	15		--	--	55		15	36	85		1.2		232	.32	3,400	52	40	70	3.3	396	6.7
Feb. 21-22, 24-28------	20,140	8.6		4.2	1.7	13		12	12	16		.5		a62	.08	3,370	18	8	62	1.3	105	6.8
Mar. 1-2, 14-26--------	25,660	7.8	0.57	3.1	1.4	8.3	2.2	10	10	11		1.0		a50	.07	3,460	14	6	51	1.0	82.1	6.5
Mar. 3-8, 27-31--------	22,920	11		5.6	2.1	16	2.3	12	14	24		1.0		a82	.11	5,070	23	13	58	1.5	146	6.6
Mar. 9-13--------------	6,436	15		7.2	3.5	27	2.0	15	17	42		1.0		a122	.17	2,120	32	20	63	2.1	223	6.8
Apr. 1-8---------------	13,770	14		8.2	2.6	24		23	20	29		2.0		127	.17	4,720	31	12	62	1.8	190	6.7
Apr. 9-23--------------	4,543	18		12	3.2	37		33	25	50		1.5		186	.25	2,280	43	16	65	2.5	286	6.9
Apr. 24-30-------------	7,384	11		7.3	2.5	21		21	14	30		1.5		a97	.13	1,930	28	11	62	1.7	178	7.0
May 1, 5-7, 10-13, 15, 17-19----------	50,680	4.9		--	--	8.9	2.1	12	6.7	12		1.0		71	.10	9,720	14	4	54	1.0	84.0	6.6
May 2-4, 8-9, 26-27----	65,700	4.6		--	--	5.3	2.0	10	4.9	8.0		1.0		73	.10	12,950	12	4	44	.6	59.1	6.7
May 14, 16, 25, 28-31--	62,330	6.8		5.6	2.3	11		18	9.1	15		3.0		a62	.08	10,430	23	9	51	1.0	115	6.6
May 20-24--------------	108,500	4.1		--	--	2.3	1.2	9	2.3	3.2		.2		52	.07	15,230	8	1	34	.4	33.3	6.9
June 1-9---------------	40,090	8.4		7.5	2.7	12		30	9.7	15		1.5		a72	.10	7,790	30	5	48	1.0	121	7.1
June 10-30-------------	12,260	14		11	3.7	17		44	8.2	24		1.5		a101	.14	3,340	43	7	47	1.1	180	7.6
July 1-9---------------	3,920	16		7.7	2.7	19		31	9.4	24		1.2		a95	.13	1,010	30	4	57	1.5	154	7.1
July 10-18, 25, 30-31--	3,518	18		9.4	3.5	30		40	11	41		.8		a134	.18	1,270	38	5	63	2.1	231	7.2
July 19-24, 26-29------	5,470	14		6.6	2.5	19		26	8.5	26		1.2		a91	.12	1,340	27	6	60	1.6	150	7.4
Aug. 1-10--------------	6,549	15		5.7	2.4	22		18	10	32		1.5		127	.17	2,250	24	9	66	1.9	165	7.3
Aug. 11-20-------------	2,189	22		8.3	3.2	25		34	11	34		1.5		134	.18	792	34	6	62	1.9	198	7.2
Aug. 21-31-------------	2,225	20		7.1	2.6	23		30	8.6	30		2.2		113	.15	679	28	4	64	1.9	167	7.0
Sept. 1-12, 29-30------	2,183	16		6.4	2.5	21		30	6.3	29		1.2		112	.15	660	26	2	64	1.8	159	7.5
Sept. 13-22------------	1,926	19		11	3.8	42		36	12	65		1.2		181	.25	941	43	14	68	2.8	304	7.1
Sept. 23-28------------	1,525	17		10	3.8	55		32	12	85		.5		216	.29	889	40	14	75	3.7	356	7.2
Weighted average-----	12,340	8.7		5.3	2.1	13		18	9.5	18		1.3		81	0.11	2,700	22	7	57	1.2	119	--

a Sum of determined constituents.

COW BAYOU NEAR MAURICEVILLE, TEX.

LOCATION.--At gaging station at bridge on State Highway 235, half a mile upstream from Kansas City Southern Railway Bridge, and 3 miles southwest of Mauriceville, Orange County.
DRAINAGE AREA.--127 square miles.
RECORDS AVAILABLE.--Chemical analyses: March 1952 to September 1953.
Water temperatures: March 1952 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 1,030 ppm July 29-31; minimum, 27 ppm Dec. 4-5, 19-23, 30-31.
Hardness: Maximum, 186 ppm Nov. 1-9; minimum, 9 ppm Dec. 4-5, 19-23, 30-31, Apr. 1-3, 23-30.
Specific conductance: Maximum daily, 2,190 micromhos Aug. 24; minimum daily, 26.7 micromhos Dec. 4.
Water temperatures: Maximum observed, 96° F Aug. 10; minimum observed, 47° F Nov. 29.
EXTREMES, March 1952 to September 1953.--Dissolved solids: Maximum, 1,030 ppm July 29-31, 1953; minimum, 23 ppm Apr. 23-30, 1952.
Hardness: Maximum, 186 ppm Nov. 1-9, 1953; minimum, 9 ppm Dec. 4-5, 19-23, 30-31, 1952; Apr. 1-3, 23-30, 1953.
Specific conductance: Maximum daily, 2,190 micromhos Aug. 24, 1953; minimum daily, 22.0 micromhos Apr. 24, 1952.
Water temperatures: Maximum observed, 96° F Aug. 10, 1953; minimum observed, 47° F Nov. 29, 1952.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1952	0.10	27	--	37	21	173		112	24	310		0.8		648	0.88	1.75	179	87	68	5.6	1,230	7.9
Oct. 11-20	.10	30	--	38	21	167		117	25	300		.8		640	.87	.17	182	86	67	5.4	1,260	7.8
Oct. 21-31	.10	28	--	38	21	177		117	25	315		.8		663	.90	.18	182	86	68	5.7	1,270	7.7
Nov. 1-9	.10	28	--	38	22	174		119	24	312		.8		658	.89	.18	186	88	67	5.5	1,210	7.4
Nov. 10-17	.10	17	--	26	14	120		74	17	216		.8		447	.61	.12	122	62	68	4.7	852	7.5
Nov. 18-20, 29-30	.82	6.6	--	2.2	1.7	12		9	5.4	18		1.0		51	.07	.11	12	5	68	1.5	90.3	6.7
Nov. 21-28	.10	17	--	11	7.1	52		38	11	90		.8		208	.28	.06	57	26	67	3.0	376	7.5
Dec. 1-3, 6-14, 24-29	2.84	8.0	--	3.1	2.7	11		9	5.9	20		.8		56	.08	.43	19	12	55	1.1	94.5	6.5
Dec. 4-5, 19-23, 30-31	27.7	4.6	--	1.8	1.1	4.0	--	8	4.7	6.0		1.0		27	.04	2.02	9	2	49	.6	45.7	6.5
Dec. 15-18	.10	12	--	9.8	6.8	35		30	10	66		.5		155	.21	.04	58	28	59	2.1	284	7.2
Jan. 1-2, 11-20, 1953	10.2	8.0	--	4.2	2.3	14		9	7.9	24		.8		65	.09	1.79	20	13	60	1.3	119	6.4
Jan. 3-10	25.1	9.0	--	3.4	1.7	13		8	7.3	21		.8		60	.08	4.07	16	9	65	1.5	102	6.2
Jan. 21-31	2.83	9.4	--	3.4	1.9	7.7	--	9	8.8	11		.8		47	.06	.36	16	9	51	.8	78.9	6.3
Feb. 1-10	6.22	11	--	3.3	1.9	5.7	--	8	6.5	9.8		.8		43	.06	.72	16	10	44	.6	65.7	6.2
Feb. 11-14, 22, 24, 26-28	358	5.4	--	2.8	1.4	6.0	--	6	4.0	11		1.2		35	.05	33.8	13	8	51	.7	78.1	5.8
Feb. 15-21, 23, 25	239	5.8	--	3.5	1.5	15	1.6	5	4.2	27		1.0		62	.08	40.0	15	11	66	1.7	120	5.6
Mar. 1-3, 25-31	136	6.2	0.66	2.1	1.1	5.0	1.7	8	6.0	6.6		1.0		34	.05	12.5	11	4	45	.7	51.0	6.1
Mar. 4-12	61.4	6.4	--	2.4	1.3	8.4	1.5	7	6.0	14		.5		44	.06	7.29	11	6	58	1.1	71.5	6.2
Mar. 13-24	3.82	11	1.6	3.8	1.9	13	2.0	9	9.0	21		1.0		68	.09	.70	20	13	55	1.4	99.4	6.2
Apr. 1-3, 23-30	263	4.2	--	2.1	1.0	5.1	1.6	8	2.3	8.0		1.0		29	.04	20.6	9	3	49	.7	51.3	6.3
Apr. 4-6, 11-15	10.4	9.0	--	3.2	1.4	9.6	1.8	8	2.1	17		1.5		50	.07	1.40	14	7	57	1.1	83.0	6.2
Apr. 7-10, 16-20	4.63	11	--	4.8	2.2	15		10	2.2	29		2.0		71	.10	.89	21	13	60	1.4	134	6.7
Apr. 21-22	.10	17	--	--	--	44		31	7.2	81		2.0		--	--	--	52	27	65	2.7	346	7.2
May 1-3, 5, 14, 17	471	3.9	.42	2.6	1.5	12		8	3.7	20		2.0		50	.07	63.6	13	7	67	1.5	93.8	6.4
May 4, 6-13, 18-25	733	4.1	.45	2.1	1.1	5.0	1.6	8	2.8	8.0		1.5		31	.04	61.4	11	4	46	.7	52.5	6.6
May 15-16, 26-31	165	6.5	1.4	2.2	1.2	7.8	1.7	7	2.9	14		2.0		43	.06	19.2	13	7	53	1.0	69.6	6.2
June 1, 3-6, 15-17	1.41	11	--	6.2	3.4	24		14	6.5	43		2.5		104	.14	.40	29	18	64	1.9	187	6.3
June 2, 12-14, 28-30	8.93	6.3	--	3.0	1.6	7.1	2.2	8	5.3	12		3.5		45	.06	1.08	14	8	48	.8	72.3	6.2
June 7-11, 18-20	.24	19	--	16	8.1	75		41	15	131		3.0		287	.39	.19	73	40	69	3.8	517	7.8
June 21-27	.20	24	--	27	15	121		81	18	217		2.0		482	.66	.26	129	62	67	4.6	877	8.0
July 1-6, 20-21, 25-28	5.38	5.5	--	9.1	3.5	49		12	7.5	89		1.5		171	.23	2.48	37	27	74	3.5	335	6.9
July 7-19, 22-24	.36	12	--	19	9.2	102		35	9.4	190		1.5		360	.49	.35	86	57	72	4.8	706	7.3
July 29-31	2.63	8.3	--	43	17	325	5.3	8	5.4	620		1.0		1,030	1.40	7.31	178	171	79	11	2,110	6.4
Aug. 1, 19	7.15	2.7	--	5.2	2.0	52		6	4.3	88		1.2		158	.21	3.05	21	16	84	5.0	318	6.2
Aug. 2, 4-5, 16-18	7.38	9.5	--	24	9.4	228		20	8.6	402		1.8		693	.94	13.8	98	82	83	10	1,360	6.8
Aug. 3, 20-21, 30-31	17.3	4.3	--	13	4.5	147		2	5.3	257		1.2		433	.59	20.2	51	50	86	8.9	880	5.3
Aug. 6-15, 22-29	2.01	7.2	--	31	11	329		10	7.7	582		2.0		975	1.33	5.29	122	114	85	13	1,930	6.7
Sept. 1, 26-30	3.08	20	--	20	10	106		63	11	183		.8		382	.52	3.18	91	40	72	4.8	718	8.0
Sept. 2-3, 22-25	4.48	11	--	9.8	5.3	55		31	5.7	95		1.0		198	.27	2.40	46	21	72	3.5	373	7.8
Sept. 4, 10-20	11.9	7.4	--	2.2	1.2	15		14	3.6	19		1.0		56	.08	1.80	10	0	76	2.0	92.3	7.1
Sept. 5-9, 21	77.9	5.2	--	3.6	2.6	27		14	3.0	45		.8		94	.13	19.8	20	8	75	2.7	174	6.8
Weighted average	78.6	4.8	--	2.6	1.3	10		8	3.5	15		1.3		43	0.06	0.91	12	5	65	1.3	78	--

MISCELLANEOUS ANALYSES OF STREAMS IN SABINE RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Instantaneous discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
DUCK CREEK AT U. S. HIGHWAY 69 NEAR LINDALE																						
Apr. 2, 1953----------	--	21	0.42	5.5	3.5	6.8	2.1	14	18	11	0.3	0.2	0.06	76	0.10		29	17	32	0.6	105	6.4
TENAHA CREEK 10 MILES NORTHEAST OF SHELBYVILLE																						
Jan. 21, 1953----------	35.4	16		9.0	7.9	29		29	49	30		1.2		180	0.24		55	31	53	1.7	273	6.7
June 11----------	24.4	16		--	--	19		46	16	16		2.0		132	.18		38	0	52	1.3	164	7.1
BAYOU SIEP 10 MILES NORTHEAST OF PATROON																						
Oct. 13, 1952----------	.4	40		--	--	20		65	3.9	22		.2		141	.19		47	0	49	1.3	191	7.2
Jan. 21, 1953----------	2.88	34		7.0	5.4	17		48	11	18		.2		117	.16		40	0	48	1.2	165	6.9
June 11----------	3.55	30		--	--	17		57	6.5	15		1.5		132	.18		38	0	50	1.2	153	7.1
PATROON BAYOU AT COUNTY ROAD BRIDGE 7 MILES NORTHEAST OF MILAM																						
Jan. 21, 1953----------	10.5	18		11	8.5	18		42	40	18		.2		133	.18		62	28	39	1.0	226	7.2
June 11----------	17.3	18		--	--	14		44	18	11		.5		110	.15		40	4	43	1.0	152	7.6
PALO GAUCHO BAYOU 7 MILES EAST OF MILAM																						
Oct. 14, 1952----------	.2	13		--	--	20		80	6.3	8.0		.8		105	.14		41	0	51	1.3	171	7.7
Apr. 17----------	64.4	18		--	--	5.5	1.4	26	10	6.5		.5		79	.11		26	5	30	.5	88.0	7.5
HOUSEN BAYOU 9 MILES EAST OF YELLOWPINE																						
Apr. 17, 1953----------	11.0	25		--	--	20		33	27	16		.2		137	.19		35	8	55	1.4	175	7.5
SANDY CREEK 9½ MILES EAST OF YELLOWPINE																						
Oct. 14, 1952----------	1.2	21		--	--	6.0		15	3.9	5.0		.8		54	.07		11	0	54	.8	57.0	6.5
Apr. 17, 1953----------	36.6	20		--	--	--		15	--	6.0		.2		63	.09		15	3	--	--	59.9	7.0
MILL CREEK 12 MILES SOUTHEAST OF YELLOWPINE																						
Oct. 14, 1952----------	4.85	18		--	--	5.0		10	2.6	4.0		.5		36	.05		6	0	65	.9	37.7	6.6
Apr. 17, 1953----------	17.1	20		--	--	3.2	1.0	10	2.9	4.5		.2		47	.06		8	0	43	.5	41.0	6.6
INDIAN CREEK 12½ MILES NORTHEAST OF BURKEVILLE																						
Oct. 14, 1952----------	4.04	30		--	--	5.7		12	3.6	4.0		.2		53	.07		7	0	64	.9	44.2	6.6

MISCELLANEOUS ANALYSES OF STREAMS IN SABINE RIVER BASIN IN TEXAS--Continued

Chemical analyses in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Instantaneous discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
BUCK CREEK 12½ MILES NORTHEAST OF BURKEVILLE																						
Oct. 14, 1952	4.21	22				6.1		7.0	3.7	4.5		0.5		35	0.05		3	0	82	1.5	26.5	6.5
HICKMAN CREEK 8½ MILES NORTHEAST OF BURKEVILLE																						
Oct. 16, 1952	4.30	23				3.9		9.0	.7	3.5		.5		37	.05		5	0	63	.8	30.3	6.5
LITTLE COW CREEK 5 MILES SOUTHEAST OF BURKEVILLE																						
Oct. 16, 1952	46.2	19				4.6		12	2.6	4.5		.2		40	.05		9	0	53	.7	42.6	6.7
CANEY CREEK 0.6 MILES EAST OF BON WIER																						
Oct. 17, 1952	4.66	18				5.8		17	1.8	6.0		.5		45	.06		12	0	51	.7	58.0	6.6
Apr. 16, 1953	15.0	17				4.1	1.6	22	2.0	6.5		.5		58	.08		17	0	32	.4	64.9	7.3
DAVIS CREEK 3½ MILES SOUTHWEST OF BON WIER																						
Oct. 17, 1952	.50	13				3.9		8.0	2.6	4.2		2.8		33	.04		9	2	48	.6	41.1	6.4
DEMPSEY CREEK 5 MILES SOUTHWEST OF BON WIER																						
Oct. 17, 1952	.81	30				7.9		18	1.5	6.0		.5		58	.08		8	0	68	1.2	51.9	6.9
BIG COW CREEK 4.8 MILES EAST OF CALL																						
Oct. 17, 1952	38.6	20				5.0		12	1.4	5.2		.2		41	.06		8	0	57	.8	48.4	6.5

NECHES RIVER AT EVADALE, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 96, 200 feet upstream from Gulf, Colorado & Santa Fe Railway bridge at Evadale, Jasper County, 600 feet downstream from Mill Creek, 15 miles upstream from Village Creek and at mile 55.
DRAINAGE AREA.--7,908 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1953.
Water temperatures: October 1947 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 206 ppm Nov. 27-30, Dec. 1-3; minimum, 36 ppm May 5-12, 26-27.
Hardness: Maximum, 48 ppm June 21-30, July 11-20; minimum, 18 ppm May 5-12, 26-27, May 13-22, 24-25, 28-29.
Specific conductance: Maximum daily, 415 micromhos Nov. 29; minimum daily, 49.3 micromhos May 9.
Water temperatures: Maximum observed, 94° F June 29; minimum observed, 49° F Dec. 16.
EXTREMES, 1947-53.--Dissolved solids: Maximum, 218 ppm Dec. 11-20, 1948; minimum, 36 ppm May 5-12, 26-27, 1953.
Hardness: Maximum, 70 ppm Nov. 1-10, 1947; minimum, 16 ppm Sept. 22-25, 27, 1950.
Specific conductance: Maximum daily, 415 micromhos Nov. 29, 1952; minimum daily, 49.3 micromhos May 9, 1953.
Water temperatures: Maximum observed, 94° F June 29, 1953; minimum observed, 37° F Jan. 30-31, 1948, Jan. 31, 1949.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1952-------	184	25		11	4.2	37		70	7.6	40	0.4	1.8		161	0.22	80.0	45	0	64	2.4	261	7.6
Oct. 11-20----------	171	23		12	4.2	35		65	8.3	40	.5	4.0		159	.22	73.4	47	0	61	2.2	265	6.9
Oct. 21-31----------	184	23		11	4.0	40		67	8.6	45	.5	1.2		166	.23	82.5	44	0	66	2.6	285	7.4
Nov. 1-10----------	196	23		11	3.8	42		70	8.1	47	.5	1.5		171	.23	90.5	43	0	68	2.8	292	7.3
Nov. 11-26----------	220	23		11	3.4	36		66	9.0	39	.5	1.2		155	.21	92.1	41	0	66	2.5	253	7.8
Nov. 27-30, Dec. 1-3--	996	20		11	4.2	55		62	18	66	.5	1.0		206	.28	554	45	0	73	3.6	355	7.8
Dec. 4-10----------	2,227	12		8.0	2.7	23		25	20	26	.5	1.2		105	.14	631	31	11	61	1.8	181	7.2
Dec. 11-20----------	1,558	14		7.9	3.3	22		19	27	25	.5	1.0		110	.15	463	33	18	60	1.7	184	6.9
Dec. 21-31----------	1,672	17		9.7	3.8	32		17	28	45	.5	.8		145	.20	655	40	26	64	2.2	251	6.9
Jan. 1-10, 1953-------	3,857	15		8.2	3.0	24		16	23	33	.5	.5		115	.16	1,200	33	20	61	1.8	196	6.9
Jan. 11-13, 25-29-----	6,560	11		5.7	2.5	17		13	17	22	.3	1.0		82	.11	1,450	24	14	60	1.5	144	7.0
Jan. 14-24, 30-31-----	2,689	16		8.8	3.5	32		14	27	46	.3	1.2		142	.19	1,030	36	25	66	2.3	247	7.1
Feb. 1-10----------	4,062	14		8.2	3.4	23		17	25	31	.4	1.0		114	.16	1,250	34	20	60	1.7	195	6.8
Feb. 11-23----------	5,585	14		8.4	3.3	23		18	24	30	.3	1.0		113	.15	1,700	34	20	59	1.7	197	7.0
Feb. 24-28, Mar. 1-4--	14,630	9.6		4.7	1.9	12		13	14	14	.4	1.0		64	.09	2,530	20	9	58	1.2	104	6.9
Mar. 5-10----------	7,830	13		7.4	3.3	19		15	24	24	.4	.5		99	.13	2,090	32	20	56	1.4	167	7.0
Mar. 11-18----------	6,702	14		8.3	3.9	21		16	26	28	.5	.5		110	.15	1,990	37	24	55	1.5	195	7.0
Mar. 19-31----------	20,880	9.8		4.6	2.1	8.3	2.9	13	13	10	.5	.8		58	.08	3,270	20	10	43	.8	91.9	6.5
Apr. 1-10----------	16,140	12		7.1	3.3	15		19	17	20	.4	.5		84	.11	3,660	31	16	51	1.1	145	6.8
Apr. 11-16, 26-30-----	4,011	15		8.8	3.8	21		27	20	27	.3	2.2		111	.15	1,200	38	15	55	1.5	189	7.2
Apr. 17-25----------	1,907	18		11	4.8	27		36	25	34	.4	1.2		139	.19	716	47	18	55	1.7	227	7.2
May 1-4, 23, 30-31----	40,430	8.2		5.0	2.0	10		16	9.2	12	.3	3.5		58	.08	6,330	21	8	53	1.0	108	6.7
May 5-12, 26-27-------	47,180	6.1		4.7	1.4	4.7	--	17	5.9	4.5	.3	.8		36	.05	4,590	18	4	36	.5	57.6	6.8
May 13-22, 24-25, 28-29----------	49,700	7.0		4.2	1.7	5.3		16	7.2	5.5	.2	.8		40	.05	5,370	18	4	40	.5	67.4	6.8
June 1-10----------	27,660	13		6.8	3.1	7.9	2.7	24	10	12	.3	1.5		69	.09	5,150	30	10	34	.6	102	6.5
June 11-20----------	4,639	15		9.9	4.0	13		40	12	16	.3	1.5		92	.13	1,150	41	8	41	.9	147	6.6
June 21-30----------	1,300	15		12	4.5	14		48	10	20	.3	1.5		101	.14	355	48	9	39	.9	171	6.9
July 1-10----------	2,319	20		11	4.6	17		50	9.6	21	.3	1.5		110	.15	689	46	6	44	1.1	177	7.5
July 11-20----------	1,457	22		12	4.3	20		53	10	24	.4	1.5		120	.16	472	48	4	47	1.2	197	7.1
July 21-31----------	2,966	20		11	3.8	18		46	10	23	.3	1.5		111	.15	889	43	6	48	1.2	177	7.4
Aug. 1-10----------	2,383	20		10	3.8	20		37	12	28	.4	1.5		114	.16	733	40	10	52	1.4	178	7.5
Aug. 11-20----------	1,532	18		9.4	3.5	19		35	12	26	.4	1.5		107	.15	443	38	10	52	1.3	178	7.5
Aug. 21-31----------	1,946	18		9.3	3.3	19		36	11	24	.4	1.2		104	.14	546	36	7	53	1.3	167	7.4
Sept. 1-10----------	1,393	23		9.2	3.0	21		43	10	24	.2	1.2		113	.15	425	35	0	56	1.5	179	7.5
Sept. 11-20----------	1,043	29		11	3.7	25		51	10	30	.2	.8		135	.18	380	43	1	56	1.6	211	7.5
Sept. 21-30----------	932	30		10	3.8	31		54	11	36	.2	.8		150	.20	377	41	0	62	2.1	234	7.8
Weighted average----	8,177	10		5.8	2.4	11		19	11	13	0.3	1.5		66	0.09	1,460	24	9	49	1.0	109	--

TRINITY RIVER NEAR OAKWOOD, TEX.

LOCATION.--At gaging station at bridge on U. S. Highways 79 and 84, 1½ miles upstream from International-Great Northern Railroad bridge, 6 miles northeast of Oakwood, Leon County, and at mile 313.
DRAINAGE AREA.--12,912 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1953.
Water temperatures: October 1947 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 4,500 ppm Sept. 7; minimum, 170 ppm May 15-23.
Hardness: Maximum, 365 ppm Sept. 7; minimum, 85 ppm May 15-23.
Specific conductance: Maximum daily, 7,820 micromhos Sept. 7; minimum daily, 198 micromhos May 17.
Water temperatures: Maximum observed, 90° F June 13; minimum observed, 38° F Jan. 16, 24.
EXTREMES, 1947-53.--Dissolved solids: Maximum, 4,500 ppm Sept. 7, 1953; minimum, 165 ppm Feb. 11-19, 1950.
Hardness: Maximum, 365 ppm Sept. 7, 1953; minimum, 85 ppm May 15-23, 1953.
Specific conductance: Maximum daily, 7,820 micromhos Sept. 7, 1953; minimum daily, 198 micromhos May 17, 1953.
Water temperatures: Maximum observed, 90° F Aug. 14, 1952, June 13, 1953; minimum observed, freezing point Feb. 5, 1949, Dec. 15, 21-22, 1951.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
Oct. 1-2, 4-6, 8, 10, 1952	156	17		65	9.6	389		165	211	470		38		1,280	1.74	539	202	66	81	12	2,250	7.6
Oct. 3, 7, 9, 14	153	18		70	12	567		175	184	765		52		1,750	2.38	723	224	80	85	16	3,140	7.4
Oct. 11-13, 15-20	136	16		67	9.9	405		176	200	498		43		1,330	1.81	488	208	64	81	12	2,300	7.6
Oct. 21-31	110	24		66	9.8	380		192	195	418		100		1,290	1.75	383	205	48	80	12	2,120	8.0
Nov. 1-10	126	18		65	10	403		164	204	465		96		1,340	1.82	456	203	68	81	12	2,240	7.6
Nov. 11-18	220	20		66	12	481		170	210	585		96		1,550	2.11	921	214	74	83	14	2,650	7.6
Nov. 19-24, 26-27	929	21		56	10	327		146	193	390		26		1,100	1.50	2,760	181	62	80	11	1,990	7.8
Nov. 25	522	19		90	23	1,620		a336	145	2,420		--		4,480	6.09	6,310	319	44	92	39	7,720	8.4
Nov. 28-29	6,455	9.0		54	4.6	55		141	65	57		12		342	.47	5,960	154	38	44	1.9	574	7.8
Nov. 30, Dec. 1-10	3,541	14		53	6.3	134		115	76	186		16		563	.77	5,380	158	64	65	4.6	977	7.6
Dec. 11-17	573	13		50	6.8	128		132	74	167		14		539	.73	834	153	45	65	4.5	936	7.5
Dec. 18-31	5,097	11		49	5.2	70		127	56	91		5.8		368	.50	5,060	144	40	51	2.5	629	7.5
Jan. 1, 11-13, 15, 23, 25-28, 31, 1953	1,462	12		55	7.0	117		130	92	146		15		555	.75	2,190	166	60	61	4.0	917	7.6
Jan. 2-6	6,686	11		39	4.1	36		108	44	37		7.5		261	.35	4,710	114	26	41	1.5	394	7.7
Jan. 7-10, 24, 29-30	1,115	13		50	6.4	84		117	87	96		16		449	.61	1,350	152	56	55	3.0	713	7.7
Jan. 14, 16-22	883	15		60	7.6	158		138	83	220		18		676	.92	1,610	180	68	66	5.1	1,110	7.8
Feb. 1-10	502	10		60	8.1	153		135	112	190		26		677	.92	918	183	72	65	4.9	1,090	7.4
Feb. 11-18, 25	675	14		60	9.8	214		128	119	282		36		830	1.13	1,510	190	85	71	6.8	1,480	7.9
Feb. 19-24, 26-28	687	13		52	8.5	156		110	124	178		42		643	.87	1,190	164	74	67	5.3	1,070	7.7
Mar. 1-8	555	14		55	8.8	157		117	131	178		37		666	.91	998	173	77	66	5.2	1,090	7.8
Mar. 9-10, 20-31	1,619	13		58	7.2	84		147	76	106		9.3		462	.63	2,020	174	54	51	2.8	761	7.7
Mar. 11-19	16,850	14		33	4.1	30		98	32	33		5.2		235	.32	10,690	99	19	40	1.3	343	7.7
Apr. 1-10	1,072	15		60	7.5	118		159	88	146		12		549	.75	1,590	180	50	59	3.8	934	8.1
Apr. 11-20	1,120	13		59	6.8	96		162	92	103		13		494	.67	1,490	175	42	54	3.2	803	7.9
Apr. 21-29	2,263	13		51	5.6	78		148	77	78		11		412	.56	2,520	150	28	53	2.8	669	7.9
Apr. 30, May 1-14, 24-27	15,180	15		41	3.6	22		125	31	19		5.0		214	.29	8,770	117	15	29	.9	336	8.1
May 15-23	38,340	13		29	3.1	16		91	20	16		3.5		170	.23	17,600	85	11	29	.8	252	8.0
May 28-31	8,895	15		51	5.4	36		154	36	44		3.5		294	.40	7,060	149	23	35	1.3	468	7.9
June 1-7	957	18		64	6.1	79		186	53	102		6.5		446	.61	1,150	184	32	48	2.5	736	7.9
June 8-12, 14-20	373	15		76	7.5	152		219	85	197		6.0		678	.92	683	220	41	60	4.5	1,150	8.2
June 13, 21-30	208	17		74	9.0	248		237	89	335		3.0		937	1.27	526	222	28	71	7.3	1,600	8.2
July 1-10	200	20		74	9.4	315		b267	91	420		2.5		1,060	1.44	572	223	4	75	9.1	1,940	8.5
July 11-20	150	21		75	9.0	358		b287	154	428		4.0		1,190	1.62	482	224	0	78	10	2,090	8.5
July 21-31	567	6.1		50	5.7	166		158	99	190		11		632	.86	968	148	19	71	5.9	1,090	8.0

TRINITY RIVER NEAR OAKWOOD, TEX.--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Aug. 1-4, 11-12--------	195	12		52	6.3	165		171	90	195		7.0		636	0.86	335	156	16	70	5.7	1,130	8.2
Aug. 5-6, 19-23, 29-31----------	208	20		63	8.7	285		252	162	305		9.7		c977	1.33	549	193	0	76	8.9	1,710	8.2
Aug. 7-10, 13-18, 24-28----------	239	22		53	9.0	206		209	113	228		6.9		786	1.07	507	169	0	73	6.9	1,330	8.2
Sept. 1-6----------	290	23		53	6.8	296		238	103	350		10		993	1.35	778	160	0	80	10	1,710	8.2
Sept. 7----------	1,880	23		115	19	1,610		d326	128	2,450		--		4,500	6.12	22,840	365	98	91	37	7,820	8.6
Sept. 8-13----------	755	17		32	4.0	118		129	60	128		5.8		454	.62	925	96	0	73	5.2	758	7.9
Sept. 14-22----------	160	17		50	6.6	223		202	125	235		12		801	1.09	346	152	0	76	7.9	1,350	8.2
Sept. 23-30----------	159	12		69	8.5	356		233	148	448		5.8		1,160	1.58	498	207	16	79	11	2,210	8.2
Weighted average-----	3,164	14		41	4.4	52		117	42	62		7.0		303	0.41	2,590	120	24	48	2.1	487	--

a Includes equivalent of 8 ppm of carbonate (CO_3).
b Includes equivalent of 9 ppm of carbonate (CO_3).
c Sum of determined constituents.
d Includes equivalent of 19 ppm of carbonate (CO_3).

TRINITY RIVER RIVER AT ROMAYOR, TEX.

LOCATION.--At gaging station at bridge on State Highway 105, 1.9 miles south of Romayor, Liberty County, 2.0 miles downstream from Gulf, Colorado & Santa Fe Railway bridge and at mile 94.
DRAINAGE AREA.--17,192 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to November 1949, February 1950 to September 1951, April to September 1953.
Water temperatures: February 1950 to September 1951, April to September 1953.
EXTREMES, 1953.--Dissolved solids: Maximum, 1,410 ppm Sept. 28-30; minimum, 95 ppm Apr. 30, May 2-3, 14-22.
Hardness: Maximum, 242 ppm Sept. 28-30; minimum, 56 ppm Apr. 30, May 2-3, 14-22.
Specific conductance: Maximum daily, 2,720 micromhos Sept. 29; minimum daily, 132 micromhos May 19.
Water temperatures: Maximum observed, 98° F July 18, 27.
EXTREMES, 1945-50, 1953.--Dissolved solids: Maximum, 1,410 ppm Sept. 28-30, 1953; minimum, 95 ppm Apr. 30, May 2-3, 14-22, 1953.
Hardness: Maximum, 242 ppm Sept. 28-30, 1953; minimum, 48 ppm Oct. 3-8, 1949.
Specific conductance: Maximum daily, 2,720 micromhos Sept. 29, 1953; minimum daily, 103 micromhos Nov. 9, 1946.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, April to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Apr. 1-10, 26-29, 1953-	3,231	13		50	6.9	75		133	66	95		5.0		383	0.52	3,340	154	44	51	2.6	677	7.6
Apr. 11-25----------	1,786	15		58	8.3	105		150	80	139		6.1		488	.66	2,350	178	56	56	3.4	875	7.7
Apr. 30, May 2-3, 14-22----------	39,780	9.6		18	2.7	10		57	13	12		2.0		a95	.13	10,200	56	10	29	.6	168	7.4
May 1, 4-13----------	21,700	13		32	3.6	17		95	25	18		4.0		a160	.22	9,370	95	17	28	.8	282	7.8
May 23-31----------	37,340	12		34	3.4	15		107	24	12		2.5		a156	.21	15,730	99	12	25	.7	277	7.7
June 1-8----------	15,750	21		42	4.9	24		136	29	25		1.5		232	.32	9,870	125	14	30	.9	361	7.7
June 9-19----------	1,031	23		52	5.5	43		164	31	55		1.5		317	.43	882	152	18	38	1.5	499	7.9
June 20-30----------	588	12		58	7.2	69		170	44	98		1.0		402	.55	638	174	34	46	2.3	681	7.6
July 1-2, 6, 10-22-----	616	22		59	6.9	86		173	44	123		1.0		450	.61	748	176	34	52	2.8	767	8.0
July 3-5, 7-9----------	570	22		46	5.8	65		131	42	91		2.0		364	.50	560	139	32	51	2.4	601	7.9
July 23-31----------	857	20		67	8.1	136		195	52	200		1.0		616	.84	1,430	200	40	60	4.2	1,070	8.1
Aug. 1-5, 23-31--------	586	24		56	7.1	169		203	79	202		1.8		663	.90	1,050	168	2	69	5.6	1,140	8.2
Aug. 6-16, 21-22-------	396	28		68	8.1	233		233	85	305		1.5		861	1.17	921	203	12	71	7.1	1,500	8.2
Aug. 17-20----------	343	23		78	9.5	374		249	75	540		2.8		1,220	1.66	1,130	234	30	78	11	2,250	8.0
Sept. 1-13----------	818	15		44	5.9	117		138	58	151		1.8		478	.65	1,060	134	22	65	4.4	813	7.8
Sept. 14-19----------	628	14		54	7.3	214		195	114	248		2.2		757	1.03	1,280	164	4	74	7.3	1,280	7.9
Sept. 20-27----------	311	10		64	8.1	271		226	82	362		1.5		915	1.24	768	193	8	75	8.5	1,600	8.1
Sept. 28-30----------	267	11		79	11	446		240	87	655		1.5		1,410	1.92	1,020	242	46	80	12	2,510	7.8
Weighted average-----	b7,220	13		31	3.7	24		95	25	28		2.6		178	0.24	3,470	92	14	36	1.1	309	--

a Sum of determined constituents.
b Represents 66 percent of runoff for water year October 1952 to September 1953.

TRINITY RIVER NEAR MOSS BLUFF, TEX.

LOCATION.--At Devers Pumping Plant Number One, one mile west of Moss Bluff, Liberty County.
RECORDS AVAILABLE.--Chemical analyses: Short periods during summers of 1946 to 1949, daily records October 1949 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 1,010 ppm Nov. 1-10; minimum, 130 ppm May 11-13, 15-20.
Hardness: Maximum, 250 ppm Nov. 1-10; minimum, 65 ppm Apr. 26-30.
Specific conductance: Maximum daily, 2,020 micromhos Nov. 13; minimum daily, 169 micromhos May 19.
EXTREMES, 1949-53.--Dissolved solids: Maximum, 3,640 ppm Aug. 26-27, 1952; minimum, 110 ppm Oct. 4-10, 1949.
Hardness: Maximum, 782 ppm Aug. 26-27, 1952; minimum, 50 ppm Oct. 11-14, 26-27, 1949.
Specific conductance: Maximum daily, 7,630 micromhos Aug. 27, 1952; minimum daily, 127 micromhos Oct. 7, 1949.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1952-------		19		72	10	257		224	71	369		2.2		932	1.27		220	37	72	7.5	1,650	8.2
Oct. 11-20----------		21		74	8.6	210		246	88	272		1.0		808	1.10		220	18	68	6.2	1,380	8.2
Oct. 21-31----------		20		81	9.2	244		254	106	320		1.0		923	1.26		240	32	69	6.9	1,580	8.1
Nov. 1-10----------		21		82	11	280		251	109	382		1.8		1,010	1.37		250	44	71	7.7	1,770	8.2
Nov. 11-21----------		12		64	9.4	279		191	108	378		1.8		956	1.30		198	42	75	8.6	1,690	7.7
Nov. 22-30----------		8.8		31	4.3	83		104	42	102		4.0		a326	.44		95	10	66	3.7	583	7.4
Dec. 1-6----------		8.8		37	4.6	80		130	51	87		5.8		a338	.46		112	5	61	3.3	602	7.5
Dec. 7-11----------		8.4		24	3.5	26		67	24	34		4.0		a157	.21		74	19	43	1.3	285	7.5
Dec. 12-20----------		9.6		39	4.0	45		111	36	57		4.2		267	.36		114	23	46	1.8	442	7.5
Dec. 21-31----------		9.6		32	4.2	28		83	37	34		4.8		a191	.26		97	29	39	1.2	337	7.1
Jan. 1-10, 1953-------		9.0		29	3.9	39		83	27	52		4.0		a205	.28		88	20	49	1.8	373	7.3
Jan. 11-25----------		9.6		34	3.7	39		87	35	52		4.0		246	.33		100	29	46	1.7	392	7.2
Jan. 26-31, Feb. 1----		12		39	5.9	81		89	49	120		5.9		388	.53		122	49	59	3.2	652	7.3
Feb. 2-10----------		11		28	4.1	44		71	38	58		4.5		266	.36		87	28	53	2.1	394	7.0
Feb. 11-19----------		13		34	5.6	53		86	40	76		5.2		309	.42		108	37	52	2.2	492	7.9
Feb. 20-28, Mar. 1-2--		8.8		22	4.0	38		55	26	56		3.0		241	.33		71	26	54	1.9	348	7.7
Mar. 3-10----------		10		42	6.6	85		104	54	122		5.6		407	.55		132	47	58	3.2	695	7.9
Mar. 11-15, 31--------		11		36	5.6	68		94	46	93		6.5		339	.46		113	36	57	2.8	570	7.6
Mar. 16-30----------		11		35	4.3	34		97	35	43		4.3		250	.34		105	26	42	1.5	388	7.3
Apr. 1-10----------		14		52	6.4	66		131	61	89		4.4		380	.52		156	48	48	2.3	634	7.5
Apr. 11-25----------		18		58	7.3	108		162	77	138		3.0		a489	.67		174	42	57	3.6	871	8.1
Apr. 26-30----------		7.0		22	2.4	25		71	19	28		2.8		a141	.19		65	7	46	1.4	248	7.5
May 1-10, 14----------		8.6		31	3.1	22		98	21	24		2.5		a160	.22		90	10	35	1.0	284	7.5
May 11-13, 15-20------		9.6		25	2.5	17		82	16	18		1.8		a130	.18		73	6	34	.9	225	7.9
May 21-31----------		13		29	3.0	18		97	17	18		2.0		a148	.20		85	6	31	.8	259	7.4
June 1-10----------		18		41	3.8	24		132	23	25		3.2		a203	.28		118	10	31	1.0	354	7.4
June 11-20----------		17		54	5.2	38		168	26	51		2.5		284	.39		156	18	35	1.3	491	7.5
June 21-25----------		20		59	5.0	51		186	33	64		1.8		326	.44		168	15	40	1.7	574	7.9
June 26-30----------		11		28	2.5	30		90	17	38		1.5		174	.24		80	7	45	1.4	327	7.3
July 1-10----------		17		56	5.2	65		167	42	86		1.0		356	.48		161	24	47	2.2	642	8.0
July 11-20----------		20		56	5.4	62		164	42	83		1.2		358	.49		162	27	45	2.1	629	7.6
July 21-31----------		24		63	7.4	88		191	39	128		2.0		472	.64		188	31	51	2.8	798	8.2
Aug. 1-4, 7-12, 15-20-		22		58	6.8	139		193	45	190		2.0		578	.79		172	14	64	4.6	1,020	7.9
Aug. 5-6, 13-14-------		20		44	5.1	95		147	32	129		1.8		404	.55		131	10	61	3.6	707	8.2
Aug. 21-30----------		23		72	7.8	202		238	64	275		1.5		804	1.09		212	16	67	6.1	1,370	7.8
Aug. 31, Sept. 1-8----		18		34	4.3	84		123	44	98		1.5		368	.50		102	2	64	3.6	609	7.7
Sept. 9-18----------		18		42	4.6	103		139	44	132		1.0		438	.60		124	10	64	4.0	746	7.7
Sept. 19-30----------		20		57	9.0	184		207	94	220		2.2		703	.96		179	0	69	6.0	1,220	8.1

a Sum of determined constituents.

OLD RIVER NEAR COVE, TEX.

LOCATION.--At Barber Hill Pumping Plant, 5 miles northwest of Cove, Chambers County.
RECORDS AVAILABLE.--Chemical analyses: Short periods during summers of 1946 to 1949, daily records October 1949 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 1,230 ppm Oct. 11-22, 31; minimum, 199 ppm June 22-30.
Hardness: Maximum, 324 ppm Oct. 11-22, 31; minimum, 87 ppm Jan. 1-9.
Specific conductance: Maximum daily, 2,830 micromhos Sept. 25, 30; minimum daily, 320 micromhos June 20.
EXTREMES, 1949-53.--Dissolved solids: Maximum, 3,430 ppm Aug. 18-19, 22, 1952; minimum, 156 ppm Jan. 26-31, Apr. 21-30, 1952.
Hardness: Maximum, 701 ppm Aug. 18-19, 22, 1952; minimum, 57 ppm Jan. 26-31, 1952.
Specific conductance: Maximum daily, 7,710 micromhos Aug. 22, 1952; minimum daily, 224 micromhos Apr. 26, May 1, 1952.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 11-22, 31, 1952--		14		82	29	340		212	105	550		4.5		1,230	1.67		324	150	70	8.2	2,500	7.9
Oct. 23-30----------		12		44	8.0	108		83	56	176		3.2		474	.64		143	75	62	3.9	837	7.5
Nov. 1-15----------		9.2		66	24	328		194	93	508		5.6		1,130	1.54		263	104	73	8.8	2,100	7.8
Nov. 16-19----------		10		38	8.1	89		75	54	144		1.0		408	.55		128	67	60	3.4	726	7.4
Nov. 20-30, Dec. 1----		7.6		60	23	301		174	86	470		5.0		1,040	1.41		244	102	73	8.4	1,930	7.8
Dec. 2-10----------		17		26	6.2	52		102	19	71		.2		270	.37		90	7	56	2.4	448	7.5
Dec. 11-23----------		16		33	6.2	64		104	23	98		.5		322	.44		108	23	56	2.7	543	7.6
Dec. 24-31----------		17		29	4.7	39		97	18	55		.2		244	.33		92	12	48	1.8	381	7.6
Jan. 1-9, 1953--------		19		27	4.8	46		101	16	61		1.0		254	.35		87	4	53	2.1	392	7.5
Jan. 10-13, 15-20-----		16		37	6.5	63		119	21	96		.8		335	.46		119	22	53	2.5	537	7.5
Jan. 21-31----------		13		41	6.8	66		128	26	100		1.0		358	.49		130	26	52	2.5	577	7.4
Feb. 1-10----------		14		33	6.0	49		87	25	81		2.0		297	.40		107	36	50	2.1	462	7.6
Feb. 11-19----------		14		30	5.5	48		85	20	79		1.2		274	.37		97	28	52	2.1	433	7.6
Feb. 20-28----------		14		30	5.5	44		94	18	68		1.0		267	.36		97	20	49	1.9	404	7.6
Mar. 1-10----------		15		35	5.7	42		118	16	63		1.0		273	.37		111	14	45	1.7	420	7.7
Mar. 11-20----------		18		36	6.6	49		118	21	74		1.8		a264	.36		117	20	48	2.0	481	7.8
Mar. 21-31----------		15		39	6.9	58		124	28	85		1.8		a295	.40		126	24	50	2.2	539	7.7
Apr. 1-10----------		19		51	8.4	61		132	56	89		3.5		364	.50		162	54	45	2.1	625	7.7
Apr. 11-17----------		15		49	7.9	88		129	56	127		3.2		a409	.56		155	50	55	3.1	732	8.0
Apr. 19-30----------		10		34	5.4	58		101	33	81		3.0		a274	.37		107	24	54	2.4	505	7.8
May 1-10----------		9.6		33	4.6	46		99	27	64		2.8		a236	.32		101	20	50	2.0	432	8.1
May 11-21----------		21		39	4.2	30		130	24	33		2.8		a218	.30		115	8	36	1.2	372	7.8
May 22-31----------		22		44	5.0	33		150	23	38		2.8		252	.34		130	7	36	1.3	415	7.9
June 1-7, 9-12--------		21		44	6.1	36		150	25	44		2.5		272	.37		135	12	37	1.3	440	7.7
June 13-21----------		12		32	4.9	28		105	23	34		3.5		206	.28		100	14	38	1.2	338	7.5
June 22-30----------		13		32	4.5	26		101	23	32		4.0		199	.27		98	16	37	1.1	332	7.5
July 1-10----------		12		31	4.5	28		103	21	34		3.5		205	.28		96	11	39	1.2	334	7.7
July 11-20----------		15		47	12	128		136	48	200		3.2		546	.74		167	56	63	4.3	991	8.1
July 21-31, Aug. 1-6--		16		46	12	133		140	39	210		4.3		554	.75		164	50	64	4.5	974	7.9
Aug. 7-10----------		15		57	21	239		145	66	395		3.8		904	1.23		228	110	69	6.8	1,600	8.0
Aug. 14----------		--		--	--	--		--	--	402		--		--	--		--	--	--	--	1,770	--
Aug. 19----------		--		--	--	--		--	--	215		--		--	--		--	--	--	--	952	--
Aug. 28----------		--		--	--	--		--	--	150		--		--	--		--	--	--	--	706	--
Sept. 5----------		--		--	--	--		--	--	475		--		--	--		--	--	--	--	1,880	--
Sept. 10----------		--		--	--	--		--	--	480		--		--	--		--	--	--	--	1,930	--
Sept. 14----------		--		--	--	--		--	--	520		--		--	--		--	--	--	--	2,050	--
Sept. 23----------		--		--	--	--		--	--	760		--		--	--		--	--	--	--	2,810	--

a Sum of determined constituents.

TRINITY RIVER AT ANAHUAC, TEX.

LOCATION.--At Lone Star Pumping Plant in Anahuac, Chambers County.
RECORDS AVAILABLE.--Chemical analyses: Short periods during summers of 1946 to 1949, daily records December 1949 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 16,200 ppm Oct. 21-31; minimum, 193 ppm Apr. 30, May 1-12, 15-16.
Hardness: Maximum, 3,550 ppm Oct. 21-31; minimum, 84 ppm Apr. 30, May 1-12, 15-16.
Specific conductance: Maximum daily, 28,400 micromhos Oct. 21-22; minimum daily, 210 micromhos May 5.
EXTREMES, 1949-53.--Dissolved solids: Maximum, 16,200 ppm Oct. 21-31, 1952; minimum, 184 ppm Mar. 1-10, 1950.
Hardness: Maximum, 3,550 ppm Oct. 21-31, 1952; minimum, 52 ppm Dec. 25-31, 1949.
Specific conductance: Maximum daily, 28,400 micromhos Oct. 21-22, 1952; minimum daily, 210 micromhos May 5, 1953.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
Oct. 1-10, 1952-------		13		245	533	4,360		121	1,120	7,810		--		14,100	19.2		2,800	2,700	77	36	22,500	7.5
Oct. 11-18, 20--------		12		350	513	4,600		123	1,180	8,260		--		15,000	20.4		2,980	2,880	77	37	23,700	7.6
Oct. 21-31------------		13		263	704	4,860		126	1,290	8,990		--		16,200	22.0		3,550	3,450	75	35	25,600	7.7
Nov. 1-11------------		11		252	677	4,710		137	1,230	8,700		--		15,600	21.2		3,410	3,300	75	35	24,600	7.6
Nov. 12-18------------		12		208	396	3,160		163	850	5,670		--		10,400	14.1		2,150	2,010	76	30	17,000	7.7
Nov. 19-21, 25-26, 29-		11		102	111	1,060		167	301	1,810		8.5		3,490	4.75		711	574	76	17	6,210	7.9
Nov. 22-24, 27-28, 30-		11		60	32	385		138	140	605		7.8		1,310	1.78		281	168	75	10	2,430	7.9
Dec. 1-3, 6-10--------		7.0		46	22	226		86	74	388		3.8		899	1.22		206	135	71	6.9	1,550	7.6
Dec. 4-5, 11-20-------		8.2		32	8.4	96		76	40	152		5.9		401	.55		114	52	65	3.9	722	7.6
Dec. 21-29, 31--------		10		30	8.4	97		68	36	160		3.0		408	.55		110	54	66	4.0	709	7.6
Jan. 1-10, 1953-------		9.0		28	8.2	94		64	32	157		1.0		399	.54		104	51	66	4.0	679	7.5
Jan. 11-20------------		8.6		27	7.5	88		66	27	147		1.2		388	.53		98	44	66	3.9	634	7.4
Jan. 21-31------------		9.6		32	8.3	93		78	34	153		1.2		421	.57		114	50	64	3.8	689	7.4
Feb. 1-10-------------		12		35	9.5	98		89	34	163		1.8		a397	.54		126	54	63	3.8	760	7.4
Feb. 11-19------------		11		34	8.0	97		85	32	160		1.5		a386	.52		118	48	64	3.9	741	7.5
Feb. 20-28------------		9.6		30	7.9	97		76	26	161		1.2		a370	.50		108	45	66	4.1	705	7.3
Mar. 1-2, 6-7, 9-14, 28----------		11		38	10	202		66	22	352		2.5		736	1.00		136	82	76	7.5	1,330	7.3
Mar. 3----------------		11		56	15	396		54	24	700		6.0		1,240	1.69		201	157	81	12	2,350	7.7
Mar. 15-16, 26-27, 29-31----------		14		41	6.6	77		114	45	108		3.8		a351	.48		130	36	56	2.9	639	7.6
Mar. 17-25------------		14		32	4.5	29		94	30	35		3.8		a194	.26		98	21	39	1.3	351	7.6
Apr. 1-13, 15---------		17		49	6.8	80		122	56	116		4.5		400	.54		150	50	54	2.9	694	7.8
Apr. 16, 18-22, 24-27-		14		58	9.8	138		144	74	202		6.3		599	.81		185	67	62	4.4	1,050	8.0
Apr. 28----------------		8.8		101	191	1,650		112	429	2,900		--		5,330	7.25		1,040	946	78	22	8,990	8.0
Apr. 14, 17, 29-------		10		62	66	599		124	176	1,020		6.0		2,000	2.72		426	324	75	13	3,660	7.7
Apr. 23----------------		11		61	25	235		148	102	378		5.4		962	1.31		255	134	67	6.4	1,620	8.2
Apr. 30, May 1-12, 15-16----------		9.8		28	3.5	22		86	21	27		2.5		193	.26		84	14	36	1.0	280	7.7
May 13-14, 17-22------		9.6		42	12	171		92	31	295		4.0		685	.93		154	79	71	6.0	1,210	7.7
May 23-31-------------		8.8		30	8.7	107		70	21	186		2.0		452	.61		111	54	68	4.4	791	7.4
June 1-8--------------		22		34	7.9	103		103	21	166		1.8		444	.60		118	33	66	4.1	758	8.2
Aug. 3, 6-7, 14-17----		20		42	14	178		121	38	290		1.0		693	.94		162	64	70	6.1	1,230	8.1
Aug. 4-5, 8-13, 30-31-		20		44	9.2	135		131	36	209		1.2		555	.75		148	40	66	4.8	964	8.1
Aug. 18, 20-22, 26-29-		16		56	50	484		127	117	830		1.8		1,620	2.20		345	241	75	11	3,000	7.9
Aug. 23-25------------		15		88	119	1,060		131	263	1,860		1.5		3,470	4.72		709	602	76	17	6,190	8.0
Sept. 1-9, 16---------		21		31	4.8	95		112	40	119		1.0		394	.54		97	5	68	4.2	654	8.1
Sept. 10-15, 17-21----		22		42	7.3	127		126	51	180		.5		518	.70		135	32	67	4.7	888	8.0
Sept. 22-24, 26, 29-30----------		20		66	58	564		131	161	960		.5		1,890	2.57		403	294	75	12	3,500	7.9
Sept. 25, 27-28-------		19		109	207	1,750		133	448	3,080		--		5,680	7.72		1,120	1,010	77	23	9,910	7.8

a Sum of determined constituents.

TRINITY BAY AT MOUTH OF TRINITY RIVER NEAR ANAHUAC, TEX.

LOCATION.--At seven sampling stations in Trinity Bay opposite mouth of Trinity River, near Anahuac, Chambers County. Station 1 - In upper reaches of New Navigation Channel at Fort Anahuac. Station 2 - In Anahuac Channel immediately below delta, about half a mile west of Station 1. Station 3 - In Anahuac Channel about 1½ miles southwest of Station 2. Station 4 - In Trinity Bay at mid-point between Station 3 and New Navigation Channel. Station 5 - In Trinity Bay at mid-point between Ash Point and south end of Anahuac Channel. Station 6 - In Anahuac Channel at south end. Station 7 - In Trinity Bay about 1½ miles west of Station 6.
RECORDS AVAILABLE.--Chemical analyses: Biweekly October 1950 to September 1953.

Specific conductance (micromhos at 25° C) and chloride in parts per million, water year October 1952 to September 1953

Station Number	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride
	Oct. 1, 1952		Oct. 4, 1952		Oct. 8, 1952		Oct. 15, 1952		Oct. 22, 1952	
1 Top	28,300	10,200	28,500	10,200	28,500	10,200	29,300	10,800	29,000	10,700
1 Botton	28,300	10,300	28,300	10,200	28,500	10,200	29,300	10,700	29,000	10,700
2 Top	23,300	8,280	23,600	8,330	25,400	9,020	24,400	8,580	20,700	7,170
2 Bottom	24,300	8,770	24,700	8,870	26,600	9,580	27,700	10,100	21,000	7,350
3 Top	23,500	8,430	23,600	8,430	27,200	9,800	28,600	10,400	21,200	7,420
3 Bottom	24,800	8,940	25,100	8,970	27,200	9,830	29,300	10,800	28,100	10,200
4 Shallow	24,600	8,970	25,100	8,970	26,800	9,630	28,600	10,500	22,000	7,800
5 Shallow	24,600	8,940	25,100	8,970	26,800	9,600	28,600	10,600	22,000	7,750
6 Top	--	--	25,100	8,970	27,000	9,780	28,600	10,500	22,000	7,700
6 Bottom	25,000	9,140	25,400	9,090	27,000	9,880	31,200	11,500	31,100	11,600
7 Top	24,500	8,970	25,100	8,970	26,800	9,780	28,600	10,500	22,000	7,800
7 Bottom	24,500	9,220	25,600	9,190	26,400	9,880	30,900	11,500	31,100	11,500
	Oct. 29, 1952		Nov. 5, 1952		Nov. 12, 1952		Nov. 19, 1952		Nov. 26, 1952	
1 Top	28,800	10,400	28,500	10,400	28,500	10,100	26,400	9,420	10,200	3,220
1 Bottom	28,800	10,400	28,500	10,400	28,100	10,200	28,100	10,100	23,500	8,280
2 Top	26,200	9,460	27,200	9,800	25,600	9,240	5,430	1,560	2,720	710
2 Bottom	27,900	10,300	27,900	10,100	29,000	10,700	5,870	1,740	23,100	8,280
3 Top	27,900	10,400	28,300	10,400	29,500	10,900	6,270	1,900	2,640	695
3 Bottom	28,600	10,600	28,500	10,400	31,900	12,000	19,800	6,910	27,900	10,300
4 Shallow	29,300	10,900	28,500	10,500	30,000	11,100	7,080	2,150	2,980	820
5 Shallow	29,300	10,900	28,800	10,500	30,000	11,100	7,080	2,150	2,910	810
6 Top	29,300	10,900	28,800	10,500	30,000	11,100	7,050	2,150	2,560	692
6 Bottom	29,800	11,200	28,800	10,500	32,200	12,200	20,300	7,080	25,600	9,390
7 Top	29,100	10,800	28,800	10,500	29,700	11,100	7,090	2,140	2,700	710
7 Bottom	29,800	11,200	28,800	10,500	31,900	12,000	7,090	2,170	26,000	9,580
	Dec. 3, 1952		Dec. 10, 1952		Dec. 17, 1952		Dec. 24, 1952		Dec. 31, 1952	
1 Top	10,100	3,220	11,300	3,570	11,100	3,590	12,500	4,110	12,500	4,110
1 Bottom	24,500	8,770	11,300	3,670	11,000	3,620	12,300	4,140	12,300	4,110
2 Top	1,820	415	362	55	468	62	452	65	669	102
2 Bottom	1,820	435	389	64	469	66	460	62	665	105
3 Top	1,740	415	394	66	486	71	487	72	679	107
3 Bottom	1,740	418	390	65	838	176	829	172	652	102
4 Shallow	1,770	428	383	64	4,400	1,330	4,690	1,430	654	102
5 Shallow	1,730	412	436	78	4,430	1,340	4,500	1,340	660	103
6 Top	1,730	412	371	59	4,480	1,340	4,420	1,330	663	104
6 Bottom	1,740	415	391	65	5,120	1,550	5,330	1,610	669	104
7 Top	1,730	410	381	62	4,710	1,410	4,480	1,330	677	104
7 Bottom	1,710	410	499	95	4,940	1,460	4,940	1,460	770	130
	Jan. 7, 1953		Jan. 14, 1953		Jan. 21, 1953		Jan. 28, 1953		Feb. 4, 1953	
1 Top	12,200	4,040	12,500	4,020	8,410	2,600	14,100	4,660	14,200	4,740
1 Bottom	12,100	4,040	12,500	4,040	8,410	2,650	15,000	4,980	15,000	5,030
2 Top	667	104	412	60	540	95	560	94	655	132
2 Bottom	662	103	405	63	535	95	2,990	850	2,180	598
3 Top	654	105	418	65	551	100	606	102	976	222
3 Bottom	652	104	449	72	559	101	1,750	442	954	219
4 Shallow	654	104	411	64	551	101	668	135	626	117
5 Shallow	659	104	423	67	563	100	960	220	2,410	652
6 Top	664	105	417	66	571	103	570	98	2,260	618
6 Bottom	658	102	401	62	591	107	648	133	7,170	2,230
7 Top	397	66	419	66	550	99	596	105	634	108
7 Bottom	391	62	411	64	556	99	9,170	2,920	1,260	302

TRINITY BAY AT MOUTH OF TRINITY RIVER NEAR ANAHUAC, TEX.--Continued

Specific conductance (micromhos at 25° C) and chloride in parts per million, water year October 1952 to September 1953--Continued

Station Number	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride
	Feb. 11, 1953		Feb. 18, 1953		Feb. 25, 1953		Mar. 4, 1953		Mar. 11, 1953	
1 Top	12,900	4,240	13,100	4,240	5,350	1,560	5,300	1,560	5,000	1,470
1 Bottom	13,200	4,360	13,400	4,400	5,080	1,510	5,100	1,510	4,940	1,470
2 Top	770	145	658	114	536	91	543	97	320	40
2 Bottom	9,220	2,950	674	120	539	94	547	97	564	117
3 Top	1,030	242	653	115	652	126	613	117	330	42
3 Bottom	7,550	2,380	666	119	600	113	744	154	330	43
4 Shallow	2,170	575	665	116	600	115	567	102	321	41
5 Shallow	9,600	3,050	658	116	332	43	881	203	881	202
6 Top	--	--	658	116	883	202	885	201	360	49
6 Bottom	3,340	940	653	114	902	205	885	203	322	41
7 Top	7,430	2,320	662	117	326	40	885	204	865	204
7 Bottom	1,260	290	662	117	458	82	897	205	897	205
	Mar. 18, 1953		Mar. 28, 1953		Apr. 1, 1953		Apr. 8, 1953		Apr. 13, 1953	
1 Top	5,020	1,480	5,010	1,480	6,610	2,020	5,790	1,720	5,720	1,700
1 Bottom	4,970	1,460	4,970	1,450	5,550	1,640	5,770	1,710	5,780	1,700
2 Top	337	36	459	60	732	120	727	121	731	124
2 Bottom	344	33	465	62	784	133	734	123	1,010	185
3 Top	335	31	455	59	867	150	1,000	192	857	146
3 Bottom	339	31	552	85	882	153	1,100	222	2,610	680
4 Shallow	335	31	492	70	1,880	480	1,820	435	890	161
5 Shallow	335	32	451	59	1,880	458	1,980	475	2,220	560
6 Top	335	32	457	60	1,160	232	2,440	625	994	199
6 Bottom	335	31	454	60	1,150	228	1,150	228	1,750	428
7 Top	339	31	454	60	909	166	1,150	230	1,870	462
7 Bottom	370	39	456	60	982	191	1,080	208	2,230	572
	Apr. 15, 1953		Apr. 17, 1953		Apr. 20, 1953		Apr. 22, 1953		Apr. 24, 1953	
1 Top	5,620	1,680	5,540	1,650	5,980	1,900	7,320	2,260	9,260	2,950
1 Bottom	5,620	1,680	5,660	1,690	5,920	1,770	7,250	2,210	9,180	2,900
2 Top	794	144	1,560	352	1,620	370	1,530	368	11,100	3,520
2 Bottom	928	169	1,990	488	2,020	482	1,110	218	11,100	3,570
3 Top	350	47	2,490	640	2,470	640	1,050	188	11,000	3,540
3 Bottom	880	147	2,890	770	3,180	770	1,070	198	11,400	3,620
4 Shallow	898	152	2,510	642	1,060	192	1,110	205	11,200	3,590
5 Shallow	913	155	1,050	190	1,070	195	1,030	160	11,200	3,620
6 Top	905	153	2,470	635	--	--	2,560	665	11,200	3,590
6 Bottom	898	150	3,590	1,010	1,070	195	3,580	1,000	11,300	3,640
7 Top	920	155	2,970	800	3,060	820	1,050	175	11,200	3,620
7 Bottom	898	152	5,280	1,550	3,060	820	1,050	185	11,200	3,620
	Apr. 27, 1953		Apr. 29, 1953		May 1, 1953		May 4, 1953		May 6, 1953	
1 Top	8,980	2,850	9,100	2,850	6,890	1,760	5,550	1,650	5,490	1,660
1 Bottom	8,980	2,870	9,030	2,820	6,830	1,720	5,470	1,630	5,760	1,740
2 Top	11,000	3,570	293	26	298	35	270	32	247	27
2 Bottom	11,100	3,590	439	68	277	36	281	40	228	22
3 Top	11,400	3,670	11,200	3,590	273	31	221	22	270	28
3 Bottom	11,200	3,620	328	28	328	46	223	23	288	28
4 Shallow	1,070	182	356	30	288	35	279	28	233	24
5 Shallow	5,240	1,530	308	25	278	32	283	35	271	27
6 Top	11,200	3,540	287	25	--	--	228	23	276	27
6 Bottom	11,200	3,590	326	35	--	--	228	24	230	23
7 Top	11,200	3,570	11,200	3,620	--	--	279	32	271	31
7 Bottom	11,300	3,590	328	27	--	--	283	31	227	22

TRINITY BAY AT MOUTH OF TRINITY RIVER NEAR ANAHUAC, TEX.--Continued

Specific conductance (micromhos at 25° C) and chloride in parts per million, water year October 1952 to September 1953--Continued

Station Number	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride	Specific conductance	Chloride
	May 8, 1953		May 11, 1953		May 13, 1953		May 15, 1953			
1 Top	5,800	1,720	5,410	1,660	4,670	1,340	3,640	1,070		
1 Bottom	5,570	1,670	5,440	1,670	4,750	1,380	3,510	1,030		
2 Top	299	14	240	20	252	22	244	25		
2 Bottom	302	18	--	--	220	18	225	20		
3 Top	337	26	247	21	233	21	258	29		
3 Bottom	305	19	246	19	225	21	283	29		
4 Shallow	306	18	248	19	299	18	258	19		
5 Shallow	308	19	305	19	237	22	222	23		
6 Top	--	--	312	18	250	18	--	--		
6 Bottom	--	--	318	23	264	21	--	--		
7 Top	--	--	305	18	252	18	--	--		
7 Bottom	--	--	318	23	266	21	--	--		
	Aug. 3, 1953		Aug. 5, 1953		Aug. 7, 1953		Aug. 10, 1953		Aug. 12, 1953	
2	1,360	310	1,060	202	1,120	225	1,100	240	1,110	252
3	2,540	675	1,140	232	1,380	310	3,070	850	3,220	900
6	6,470	2,010	5,320	1,610	3,650	1,060	7,750	2,400	5,860	1,790
7	6,610	2,020	5,320	1,590	4,000	1,150	7,050	2,160	5,890	1,780
	Aug. 14, 1953		Aug. 17, 1953		Aug. 19, 1953		Aug. 21, 1953		Aug. 24, 1953	
2	2,540	670	5,580	1,660	6,220	1,880	8,560	2,670	13,500	4,440
3	4,590	1,340	6,710	1,980	6,140	1,860	8,990	2,850	14,100	4,640
6	5,140	1,520	6,280	1,900	12,900	4,260	14,400	4,740	15,600	5,180
7	5,050	1,490	6,280	1,900	10,500	3,340	13,300	4,340	14,500	4,740
	Aug. 26, 1953		Aug. 28, 1953		Aug. 31, 1953		Sept. 2, 1953		Sept. 4, 1953	
2	10,100	3,170	9,510	2,970	1,030	230	547	98	549	97
3	12,100	3,990	11,500	3,770	1,310	305	6,950	2,100	535	93
6	15,100	5,080	14,600	4,880	14,100	4,740	15,300	5,080	14,600	4,790
7	14,700	4,880	14,100	4,640	15,000	5,000	14,700	4,860	11,700	3,690
	Sept. 7, 1953		Sept. 9, 1953		Sept. 11, 1953		Sept. 14, 1953		Sept. 16, 1953	
2	619	122	631	119	708	135	638	131	873	178
3	5,050	1,470	635	119	10,600	3,420	5,130	1,550	2,900	810
6	12,800	4,160	14,900	4,980	16,000	5,380	13,400	4,510	12,300	4,040
7	11,600	3,690	14,700	4,910	15,500	5,230	13,200	4,490	12,200	4,020
	Sept. 18, 1953		Sept. 21, 1953		Sept. 23, 1953		Sept. 25, 1953		Sept. 28, 1953	
2	1,710	432	1,450	360	4,690	1,390	12,100	4,020	11,100	3,540
3	6,130	1,870	2,240	602	5,240	1,590	12,300	4,110	11,200	3,640
6	11,400	3,740	12,500	4,110	8,760	2,800	12,900	4,360	13,700	4,560
7	10,100	3,250	12,500	4,110	8,670	2,770	13,100	4,410	13,700	4,590
	Sept. 30, 1953									
2	5,900	1,770								
3	8,040	2,520								
6	13,300	4,410								
7	12,700	4,190								

MISCELLANEOUS ANALYSES OF STREAMS IN TRINITY RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Instantaneous discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
EAGLE MOUNTAIN LAKE NEAR FORT WORTH																						
Aug. 3, 1953---------	--	--	--	--	--	--	--	146	--	24	--	--	--	--	--		126	--	--	--	350	7.9
LAKE WORTH NEAR FORT WORTH																						
Dec. 16, 1952--------	--	7.0	0.01	38	8.1	21	3.7	153	18	25	0.5	0.2	0.28	204	0.28		128	3	26	0.8	350	8.0
Jan. 12, 1953--------	--	3.0	.00	41	7.8	20	4.5	157	18	24	.3	.5	.13	206	.28		134	6	24	.8	352	7.4
Apr. 28---------------	--	7.2	.00	42	8.2	21	4.3	163	19	26	.4	.0	.09	212	.29		138	5	24	.8	373	8.0
June 2----------------	--	--	--	--	--	--	--	162	--	25	--	--	--	--	--		140	--	--	--	374	7.8
TRINITY RIVER AT NORTH MAIN STREET BRIDGE IN FORT WORTH																						
May 25, 1953---------	--	11	.01	70	6.8	31	5.1	211	45	34	.5	4.7	.18	312	.29		202	30	24	.9	553	7.1
TRINITY RIVER 8.7 MILES UPSTREAM FROM LIBERTY																						
Nov. 1, 1952---------	229	--	--	--	--	--	--	249	--	345	--	--	--	--	--		220	--	--	--	1,670	8.2
Nov. 2----------------	228	--	--	--	--	--	--	248	--	378	--	--	--	--	--		225	--	--	--	1,760	8.2
Nov. 8----------------	235	--	--	--	--	--	--	238	--	455	--	--	--	--	--		218	--	--	--	1,970	8.2

SAN JACINTO RIVER BASIN

SAN JACINTO RIVER NEAR HUFFMAN, TEX.

LOCATION.--At Sheldon pumping plant of City of Houston, 5½ miles downstream from Huffman gaging station at Beaumont, Sour Lake & Western Railway bridge, 0.4 mile downstream from confluence of East and West Forks, and 3.4 miles southwest of Huffman, Harris County.
DRAINAGE AREA.--2,791 square miles (above gaging station).
RECORDS AVAILABLE.--Chemical analyses: September 1945 to July 1948, December 1948 to September 1953.
Water temperatures: January 1949 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 360 ppm Oct. 11-20; minimum, 60 ppm Apr. 30, May 1-7, 14-20.
Hardness: Maximum, 100 ppm Apr. 11-24; minimum, 26 ppm Apr. 30, May 1-7, 14-20.
Specific conductance: Maximum daily, 780 micromhos Nov. 28; minimum daily, 85.1 micromhos May 1.
Water temperatures: Maximum observed, 90° F June 22, 24, 26, Aug. 12; minimum observed, 40° F Jan. 18.
EXTREMES, 1945-53.--Dissolved solids: Maximum, 2,820 ppm Nov. 21-23, 28, 1951; minimum, 44 ppm Oct. 4-10, 1949.
Hardness: Maximum, 566 ppm Nov. 21-23, 28, 1951; minimum, 16 ppm Oct. 4-10, 1949.
Specific conductance: Maximum daily, 6,340 micromhos Nov. 23, 1951; minimum daily, 78.9 micromhos Sept. 1, 1945.
Water temperatures (1949-53): Maximum observed, 92° F July 3, 1952; minimum observed, freezing point Feb. 2, 1951.
REMARKS.--Values reported for dissolved solids are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Huffman for water year October 1952 to September 1953 given in Water-Supply Paper 1282. No appreciable inflow between gaging station and sampling point except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1952	58.1	20		23	5.5	87		81	4.9	140		0.8		a328	0.45	51.5	80	14	70	4.2	596	7.5
Oct. 11-20	53.8	16		24	5.0	101		78	4.7	164		.8		a360	.49	52.3	80	16	73	4.9	678	7.4
Oct. 21-31	51.3	15		23	5.5	94		72	5.8	155		.5		a344	.47	47.6	80	21	72	4.6	640	7.6
Nov. 1-8, 11	75.7	15		23	4.7	94		71	4.8	154		1.2		a343	.47	70.1	77	19	73	4.7	615	7.6
Nov. 9-10, 12-26	172	13		15	4.6	72		61	7.4	109		1.2		252	.34	117	56	6	73	4.1	469	7.4
Nov. 27-30	218	13		20	5.7	99		58	6.6	166		.8		340	.46	200	74	26	75	5.0	646	7.4
Dec. 1-4, 21-22, 28-30	446	15		22	4.9	80		59	7.6	135		1.0		295	.40	355	75	27	70	4.0	565	7.3
Dec. 5-9, 23, 31	1,060	9.6		13	3.1	29		38	5.5	50		1.8		131	.18	375	45	14	58	1.9	257	7.2
Dec. 10-20, 24-27	235	15		19	4.2	49		56	8.4	82		1.2		207	.28	131	65	19	62	2.6	387	7.2
Jan. 1-8, 26-27, 1953	1,209	11		13	3.0	31		42	6.3	49		1.8		136	.18	444	45	10	60	2.0	246	7.2
Jan. 9-19, 28	226	15		22	4.2	52		64	8.8	88		1.0		222	.30	135	70	20	61	2.7	410	7.4
Jan. 20-25, 29-31	508	14		23	4.5	66		66	8.9	111		.8		260	.35	357	76	22	66	3.3	483	7.4
Feb. 1-2, 22-28	3,810	9.6		15	2.5	23		44	6.5	39		1.0		119	.16	1,220	48	12	52	1.5	219	7.1
Feb. 3-4, 8-12, 17-20	536	15		22	3.5	48		61	8.6	80		1.2		208	.28	301	69	19	60	2.5	380	7.4
Feb. 5-7, 13-16, 21	765	15		24	4.8	63		65	8.7	108		1.5		257	.35	531	80	26	63	3.0	481	7.3
Mar. 1-9, 21	988	16		21	4.1	29		59	8.6	52		1.2		161	.22	429	69	21	47	1.5	296	7.5
Mar. 10-19	632	19		27	4.4	44		74	8.8	78		1.0		218	.30	372	85	25	53	2.1	404	7.5
Mar. 20, 22-31	362	18		29	4.5	37		84	7.8	67		1.0		205	.28	200	91	22	47	1.7	384	7.7
Apr. 1-10	193	20		29	4.6	54		85	8.3	92		1.0		251	.34	131	91	22	56	2.4	469	7.7
Apr. 11-24	146	17		31	5.4	59		89	6.8	104		.8		a280	.38	110	100	27	56	2.6	510	7.7
Apr. 25-29	2,300	8.2		8.4	2.8	25		29	5.5	40		2.0		106	.14	658	32	9	63	1.9	202	6.9
Apr. 30, May 1-7, 14-20	18,190	6.6		8.8	1.1	8.2	2.5	28	4.0	12		2.5		60	.08	2,950	26	4	38	.7	103	7.3
May 8-10, 21-25	7,592	9.4		13	2.4	11		42	4.9	18		2.0		82	.11	1,680	42	8	36	.7	150	7.4
May 11-13, 26-31	1,524	14		20	3.3	23		61	8.1	38		2.0		138	.19	568	63	13	44	1.3	250	7.1
June 1-10	354	23		27	4.9	38		87	8.9	62		2.0		a237	.32	227	88	16	49	1.8	361	7.7
June 11-20	297	23		26	5.1	47		84	8.8	78		1.5		a249	.34	200	86	17	54	2.2	406	7.9
June 21-28	192	24		27	4.7	46		90	7.2	75		1.0		a244	.33	126	87	14	54	2.2	402	8.0
June 29-30, July 1-5	706	11		12	2.5	22		44	6.3	31		2.5		109	.15	208	40	4	54	1.5	188	7.4
July 6-10	202	18		19	4.0	45		64	8.4	71		2.0		198	.27	108	64	12	61	2.5	355	7.9
July 11-19	136	18		26	4.7	56		84	7.7	91		1.0		a268	.36	98.4	84	16	59	2.7	450	7.8
July 20-31	163	17		25	5.0	60		83	6.5	98		1.5		a274	.37	121	83	15	61	2.9	471	8.1
Aug. 1-2, 11-20	128	23		23	2.6	61		79	5.5	91		1.5		a259	.35	89.5	68	3	66	3.2	430	7.6
Aug. 3-10	141	19		15	4.8	38		49	4.4	67		1.5		174	.24	66.2	57	17	59	2.2	313	7.4
Aug. 21-31	230	22		20	3.1	62		66	9.6	95		2.0		a273	.37	170	63	9	69	3.5	438	7.5
Sept. 1-4, 8-16	432	20		18	3.7	37		62	6.5	56		3.0		174	.24	203	60	9	57	2.1	306	7.4
Sept. 5-7, 24-30	237	22		22	3.2	58		78	6.0	88		1.2		a262	.36	168	68	4	65	3.1	423	7.5
Sept. 17-23	106	22		23	3.2	50		78	5.8	76		1.5		220	.30	63.0	71	7	60	2.6	388	7.5
Weighted average	1,372	9.4		13	2.1	20		39	5.2	30		2.1		102	0.14	378	41	9	51	1.4	181	--

a Residue at 180° C.

CLEAR FORK BRAZOS RIVER AT NUGENT, TEX.

LOCATION.--At gaging station at county road bridge in Nugent, Jones County, 4 miles upstream from Deadman Creek.
DRAINAGE AREA.--2,220 square miles.
RECORDS AVAILABLE.--Chemical analyses: August 1948 to September 1953.
Water temperatures: August 1948 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 1,330 ppm Feb. 11-28; minimum, 179 ppm July 15-22.
Hardness: Maximum, 610 ppm Feb. 1-10; minimum, 110 ppm July 15-22.
Specific conductance: Maximum daily, 2,620 micromhos Mar. 7; minimum daily, 217 micromhos July 15.
Water temperatures: Maximum observed, 93° F Aug. 8; minimum observed, 39° F Jan. 16.
EXTREMES, 1948-53.--Dissolved solids: Maximum, 3,910 ppm Mar. 21-31, 1949; minimum, 158 ppm Sept. 15-16, 1949.
Hardness: Maximum, 1,520 ppm Feb. 11-19, 1951; minimum, 89 ppm Sept. 15-16, 1949.
Specific conductance: Maximum daily, 6,260 micromhos May 29, 1952; minimum daily, 215 micromhos May 27, 1950.
Water temperatures: Maximum observed, 95° F Aug. 16, 18, 1952; minimum observed, freezing point, Jan. 29, 1949.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-3, 11, 1952----	a0	15		92	24	117		132	233	160		7.8		767	1.04	--	328	220	44	2.8	1,170	7.9
Oct. 18, 25, Nov. 1-9-	a.13	22		102	55	194		191	287	315		4.2		1,070	1.46	0.38	480	324	47	3.9	1,810	8.1
Nov. 10-20----------	29.3	9.6		52	9.9	22		90	103	25		2.8		294	.40	23.3	170	97	22	.7	446	7.7
Nov. 21-30----------	16.7	9.8		54	15	51		114	99	77		1.8		406	.55	18.3	196	102	36	1.6	633	7.8
Dec. 1-10----------	1.20	10		55	19	62		134	103	94		1.5		455	.62	1.47	215	105	39	1.8	717	7.9
Dec. 11-20----------	5.98	13		64	27	87		174	121	135		1.0		586	.80	9.46	270	126	41	2.3	929	8.0
Dec. 21-31----------	1.25	10		94	32	105		163	223	160		3.5		773	1.05	2.61	366	232	38	2.4	1,170	8.0
Jan. 1-10, 1953-------	.11	12		116	47	135		193	319	200		4.3		953	1.30	2.83	483	325	38	2.7	1,550	8.1
Jan. 11-20----------	.10	8.0		112	59	170		195	342	265		1.2		1,050	1.43	.28	522	362	41	3.2	1,730	8.1
Jan. 21-31----------	.10	7.0		108	68	204		196	357	325		1.0		1,170	1.59	.32	549	388	45	3.8	1,940	8.1
Feb. 1-10----------	.13	7.6		114	79	238		225	370	395		.8		1,320	1.80	.46	610	425	46	4.2	2,190	8.0
Feb. 11-28----------	.22	12		82	86	262		131	383	438		4.0		1,330	1.81	.79	558	450	50	4.8	2,250	8.2
Mar. 1-8, 13-18-------	.86	12		92	73	258		178	370	395		4.0		1,290	1.75	3.00	530	384	51	4.9	2,160	8.2
Mar. 9-12, 19-20, 27-31----------	4.49	8.2		66	34	132		b194	176	174		5.0		751	1.02	9.10	304	154	49	3.3	1,190	8.4
Mar. 21-26----------	.23	8.8		48	22	120		158	97	168		4.0		570	.78	.35	210	81	55	3.6	988	8.2
Apr. 1-10----------	.21	12		68	46	160		b214	162	255		3.5		855	1.16	.48	358	192	49	3.7	1,450	8.4
Apr. 11-20----------	a.09	17		78	55	194		c244	191	312		4.0		d971	1.32	.24	420	220	50	4.1	1,700	8.4
Apr. 21-30----------	a.08	17		80	63	221		b254	212	360		3.5		1,080	1.47	.23	458	250	51	4.5	1,890	8.3
May 1-10----------	a0	18		78	71	245		252	230	405		3.0		1,170	1.59	--	486	280	52	4.8	2,070	8.2
May 11-15----------	17.2	12		72	27	106		121	146	191		2.0		704	.96	32.7	290	192	44	2.7	1,100	7.8
May 16-23----------	77.0	21		34	8.5	26		129	29	27		4.2		d213	.29	44.3	120	14	32	1.0	349	8.2
May 24-26----------	.1	19		--	--	29	6.8	154	37	49		4.2		284	.39	.08	154	28	28	1.0	463	8.1
May 29----------	a0	--		--	--	--		166	--	75		--		--	--	--	190	54	--	--	591	8.2
June 7----------	a0	--		--	--	--		b186	--	215		--		--	--	--	290	138	--	--	1,170	8.4
June 14----------	a0	--		--	--	--		162	--	164		--		--	--	--	228	96	--	--	937	8.2
June 21----------	a0	--		--	--	--		b197	--	228		--		--	--	--	290	128	--	--	1,220	8.3
June 29----------	a0	--		--	--	--		b199	--	278		--		--	--	--	332	169	--	--	1,410	8.4
June 30, July 1-5-----	17.2	13		31	11	31		121	30	41		2.5		231	.31	10.7	123	23	36	1.2	395	7.8
July 13----------	a0	--		--	--	--		156	--	83		--		--	--	--	172	44	--	--	602	8.2
July 15-22----------	203	14		32	7.3	15		111	22	17		4.7		179	.24	98.1	110	19	22	.6	301	8.1
July 23-31----------	a2.36	18		35	9.4	21		139	27	20		2.8		212	.29	1.35	126	12	27	.8	349	8.1
Aug. 1-10----------	2.29	19		48	15	36		168	56	44		2.8		317	.43	1.96	182	44	30	1.2	525	8.2
Aug. 11-18----------	a6.42	22		54	15	33		160	81	35		4.0		343	.47	5.97	196	65	27	1.0	522	8.2
Aug. 21-31, Sept. 1-3-	30.5	19		49	11	45		134	72	56		2.2		340	.46	28.0	168	58	37	1.5	545	8.1
Aug. 19-20, Sept. 4-8-	136	15		40	9.5	22		139	34	26		2.0		234	.32	85.9	139	25	26	.8	366	8.1
Sept. 13----------	a0	--		--	--	--		173	--	47		--		--	--	--	174	32	--	--	509	8.2
Sept. 20----------	a0	--		--	--	--		145	--	56		--		--	--	--	155	36	--	--	526	8.1
Weighted average----	12.4	15		40	10	29		124	48	37		3.4		260	0.35	8.7	141	40	31	1.1	419	--

a Flow less than 0.05 cfs Oct. 1-31, Nov. 1-4, Apr. 19-22, May 1-10, 27-31, June 1-29, July 6-14, 27, Aug. 14-17, Sept. 9-30.
b Includes equivalent of 5 ppm of carbonate (CO_3).
c Includes equivalent of 7 ppm of carbonate (CO_3).
d Sum of determined constituents.

BRAZOS RIVER AT POSSUM KINGDOM DAM NEAR GRAFORD, TEX.

LOCATION.--Immediately below dam on Brazos River, 2.6 miles upstream from Loving Creek, 11.3 miles southwest of Graford, Palo Pinto County, and 20 miles upstream from gaging station near Palo Pinto.
DRAINAGE AREA.--22,550 square miles, approximately, of which 9,240 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: January 1942 to September 1953.
Water temperatures: October 1949 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 1,710 ppm June 1-30; minimum, 1,480 ppm Sept. 1-30.
Hardness: Maximum, 524 ppm Feb. 1-28, May 1-31; minimum, 466 ppm Sept. 1-30.
Specific conductance: Maximum daily, 2,990 micromhos June 13; minimum daily, 2,040 micromhos Sept. 6.
Water temperatures: Maximum observed, 74° F on several days during July; minimum observed, 50° F on many days during January, February, and March.
EXTREMES, 1942-53.--Dissolved solids: Maximum, 2,130 ppm Feb. 2-9, 1942; minimum, 829 ppm Sept. 1-10, 1942.
Hardness: Maximum, 661 ppm Feb. 2-9, 1942; minimum, 318 ppm Dec. 21-31, 1942.
Specific conductance: Maximum daily, 3,750 micromhos Feb. 11, 1942; minimum daily, 1,100 micromhos June 20, 1942.
Water temperatures (1949-53): Maximum observed, 76° F Sept. 27-30, 1950; minimum observed, 45° F on several days in February 1951.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Palo Pinto for water year October 1952 to September 1953 given in Water-Supply Paper 1282. No appreciable inflow between dam and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1952-------	22.6	13		148	28	367		140	301	605	--	1.8		1,530	2.08	93	484	370	62	7.2	2,620	7.3
Nov. 1-30-------------	34.1	18		152	27	401		129	327	648	--	1.5		1,640	2.23	151	490	384	64	7.9	2,770	7.6
Dec. 1-31-------------	50.8	16		154	30	400		125	341	650	--	4.8		1,660	2.26	228	508	405	63	7.7	2,820	7.5
Jan. 1-31, 1953-------	25.7	11		156	30	403		127	330	665	--	4.4		1,660	2.26	115	512	408	63	7.8	2,850	7.7
Feb. 1-28-------------	13.8	11		159	31	404		129	338	668	--	4.5		1,680	2.28	63	524	418	63	7.7	2,880	7.7
Mar. 1-31-------------	24.5	11		157	31	397		129	339	652	--	4.0		1,650	2.24	109	519	413	62	7.6	2,870	7.6
Apr. 1-30-------------	36.5	13		158	30	405		131	345	660	--	2.5		1,680	2.28	166	518	410	63	7.7	2,910	7.7
May 1-31--------------	113	12		159	31	406		132	355	658	0.4	1.0		1,690	2.30	516	524	416	63	7.7	2,910	7.6
June 1-30-------------	334	14		158	31	417		137	344	678	.3	1.0		1,710	2.33	1,540	522	409	63	8.0	2,940	7.6
July 1-31-------------	632	13		158	30	411		132	340	672	.3	.8		1,690	2.30	2,880	518	410	63	7.8	2,880	7.7
Aug. 1-31-------------	590	14		154	26	379		129	314	625	--	.8		1,580	2.15	2,520	491	386	63	7.4	2,740	7.6
Sept. 1-30------------	748	13		139	29	356		127	295	588	--	.8		1,480	2.01	2,990	466	362	62	7.2	2,570	7.4
Weighted average----	220	13		152	29	388		130	322	636	--	1.0		1,610	2.19	956	498	392	63	7.5	2,770	--

BRAZOS RIVER NEAR WHITNEY, TEX.

LOCATION.--At Whitney Dam, on State Highway 22, 3.4 miles upstream from gaging station which is 1.0 mile downstream from Coon Creek, 7.5 miles south of Whitney, Hill County, and at mile 439.
DRAINAGE AREA.--26,190 square miles, approximately, above gaging station, of which 9,240 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to May 1948, October 1948 to September 1953.
Water temperatures: October 1947 to May 1948, October 1948 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 1,160 ppm Oct. 21-31, Nov. 1-10; minimum, 547 ppm June 21-30.
Hardness: Maximum, 393 ppm Nov. 11-20; minimum, 190 ppm July 11-20.
Specific conductance: Maximum daily, 2,100 micromhos Oct. 21; minimum daily, 865 micromhos July 27-28.
Water temperatures: Maximum observed, 84° F on several days during July and August; minimum observed, 40° F Jan. 17.
EXTREMES, 1947-53.--Dissolved solids: Maximum, 1,560 ppm Oct. 1-10, 1948; minimum, 183 ppm June 11-20, 1952.
Hardness: Maximum, 542 ppm Oct. 1-10, 1948; minimum, 96 ppm June 11-20, 1952.
Specific conductance: Maximum daily, 2,660 micromhos Oct. 1, 1948; minimum daily, 203 micromhos May 23, 1952.
Water temperatures: Maximum observed, 87° F July 12, 1949; minimum observed, freezing point, Jan. 28-29, 1948.
REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1952-------	65.5	8.8		112	23	251		154	205	408	--	5.9		1,090	1.48	193	374	248	59	5.6	1,910	7.8
Oct. 11-20----------	34.8	8.4		118	23	265		147	228	428	--	4.0		1,150	1.56	108	389	268	60	5.8	1,980	7.7
Oct. 21-31----------	4.02	9.9		118	23	268		150	232	428	--	4.5		1,160	1.58	12.6	389	266	60	5.9	1,990	7.8
Nov. 1-10----------	42.9	8.8		120	22	269		151	233	430	--	2.5		1,160	1.58	134	390	266	60	5.9	2,020	7.9
Nov. 11-20----------	45.5	7.1		118	24	265		157	222	430	--	3.5		1,150	1.56	141	393	264	59	5.8	2,010	7.8
Nov. 21-30----------	36.8	5.8		118	22	262		162	216	422	--	4.0		1,130	1.54	112	385	252	60	5.8	1,990	7.8
Dec. 1-10----------	15.1	7.5		114	22	248		142	219	402	--	4.0		1,090	1.48	44.4	375	258	59	5.6	1,920	8.0
Dec. 11-20----------	70.0	6.0		102	21	221		133	192	360	--	4.8		a972	1.32	184	341	232	58	5.2	1,740	7.8
Dec. 21-31----------	26.5	5.8		92	18	190		123	170	310	--	2.2		902	1.23	64.5	304	202	58	4.7	1,530	7.9
Jan. 1-10, 1953-------	15.5	8.4		84	16	175		124	149	280	--	5.1		824	1.12	34.5	276	174	58	4.6	1,380	7.9
Jan. 11-20----------	8.78	7.4		82	15	168		122	141	270	--	5.5		792	1.08	18.8	266	166	58	4.5	1,330	7.9
Jan. 21-31----------	5.89	6.3		82	15	168		122	143	268	--	5.0		774	1.05	12.3	266	166	58	4.5	1,320	7.9
Feb. 1-10----------	7.79	7.6		82	16	166		126	140	270	--	2.2		781	1.06	16.4	270	168	57	4.4	1,310	7.9
Feb. 11-19----------	30.7	7.8		82	16	164		126	143	265	--	2.2		766	1.04	63.5	270	168	57	4.3	1,300	7.8
Feb. 20-28----------	27.9	6.6		83	16	162		126	141	265	--	2.0		771	1.05	58.1	273	170	56	4.2	1,300	7.8
Mar. 1-10----------	41.0	9.6		82	13	160		131	137	250	--	4.8		786	1.07	87.0	258	150	57	4.3	1,300	8.1
Mar. 11-20----------	30.6	6.2		80	12	162		126	136	250	--	4.8		777	1.06	64.2	249	146	59	4.5	1,290	8.0
Mar. 21-31----------	10.2	5.6		80	13	160		126	136	250	--	4.5		778	1.06	21.4	253	150	58	4.4	1,290	8.0
Apr. 1-10----------	6.72	7.0		81	14	155		131	138	242	--	4.0		767	1.04	13.9	260	152	56	4.2	1,280	7.6
Apr. 11-20----------	3.85	7.0		82	15	150		133	136	240	--	3.0		769	1.05	7.99	266	157	55	4.0	1,280	7.6
Apr. 21-30----------	27.0	6.4		82	15	152		136	139	238	--	5.4		770	1.05	56.1	266	154	55	4.1	1,260	7.7
May 1-10----------	.98	8.2		82	14	144		136	131	230	0.2	1.5		748	1.02	1.98	262	150	54	3.9	1,250	8.0
May 11-20----------	92.1	7.8		79	13	139		138	125	218	.2	2.0		705	.96	175	250	138	55	3.8	1,180	8.0
May 21-31----------	11.8	8.8		67	11	136		159	113	182	.3	2.5		623	.85	19.8	212	82	58	4.1	1,080	8.2
June 1-10----------	98.1	9.6		73	12	129		136	109	202	--	2.2		616	.84	163	232	120	55	3.7	1,080	8.2
June 11-20----------	346	9.6		72	11	118		143	98	185	--	1.2		567	.77	530	224	108	53	3.4	1,010	8.1
June 21-30----------	808	8.8		71	11	112		143	93	178	--	1.2		547	.74	1,190	222	105	52	3.3	985	8.0
July 1-10----------	346	10		71	11	108		149	90	170	--	1.2		591	.80	552	222	100	51	3.2	966	8.1
July 11-20----------	848	11		61	9.2	126		195	93	145	--	2.0		571	.78	1,310	190	30	59	4.0	975	8.2
July 21-31----------	315	9.6		71	11	105		154	87	165	--	1.2		583	.79	496	222	96	51	3.1	975	8.0
Aug. 1-10----------	621	9.4		79	12	132		150	109	210	--	1.5		a627	.85	1,050	246	124	54	3.7	1,150	8.1
Aug. 11-20----------	581	8.4		82	12	143		153	116	225	--	1.0		a662	.90	1,040	254	128	55	3.9	1,200	8.1
Aug. 21-31----------	115	7.0		80	13	154		149	122	240	--	1.0		711	.97	221	253	131	57	4.2	1,230	7.8
Sept. 1-10----------	101	9.4		83	16	158		140	132	258	--	1.2		a727	.99	198	273	158	56	4.1	1,310	7.8
Sept. 11-20----------	109	10		82	14	159		140	128	255	--	2.0		750	1.02	221	262	148	57	4.3	1,280	7.9
Sept. 21-30----------	110	10		86	15	173		146	137	275	--	2.0		a770	1.05	229	276	156	58	4.5	1,360	7.8
Weighted average----	141	9.2		76	12	137		154	112	209	--	1.8		651	0.89	248	239	113	55	3.8	1,140	--

a Sum of determined constituents.

LEON RIVER NEAR EASTLAND, TEX.

LOCATION.--At bridge on county road, 4.2 miles upstream from Colony Creek, 6.2 miles downstream from Texas Electric Service Company dam forming Olden Lake, and 6.6 miles southeast of Eastland, Eastland County.
DRAINAGE AREA.--279 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1950 to September 1953.
Water temperatures: September 1950 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 259 ppm Apr. 6, 8-9; minimum, 77 ppm Nov. 24-26, 28-29.
Hardness: Maximum, 152 ppm Apr. 6, 8-9; minimum, 66 ppm Sept. 3-6.
Specific conductance: Maximum daily, 457 micromhos Apr. 9; minimum daily, 102 micromhos Sept. 3.
EXTREMES, 1950-53.--Dissolved solids: Maximum, 316 ppm Jan. 21-31, Feb. 1-10, 1951; minimum, 77 ppm Nov. 24-26, 28-29, 1952.
Hardness: Maximum, 200 ppm Feb. 1-10, 1951; minimum, 66 ppm Sept. 3-6, 1953.
Specific conductance: Maximum daily, 636 micromhos Mar. 24, 1951; minimum daily, 102 micromhos Sept. 3.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Nov. 24-26, 28-29, 1952-		5.1		21	3.6	2.7	--	69	4.4	4.8		2.8		a77	0.10		67	11	8	0.1	139	7.3
Apr. 6, 8-9, 1953-------		6.6		51	6.1	29		164	13	47		1.0		259	.35		152	18	29	1.0	437	7.5
Apr. 7, 10-11-----------		13		40	3.4	2.2	5.2	140	5.9	3.0		2.0		153	.21		114	0	4	.1	248	7.7
May 12, 16-26-----------		12		28	3.6	6.5	4.7	94	8.1	11		3.5		a123	.17		85	8	14	.3	212	8.0
May 13-15---------------		9.8		44	6.8	27		151	17	38		2.5		245	.33		138	14	30	1.0	400	7.9
May 27-28, July 3-5-----		13		38	4.5	13		134	9.5	14		2.5		187	.25		113	4	20	.5	290	7.6
July 18-25--------------		20		34	4.1	5.3	5.7	114	16	6.0		3.5		163	.22		102	8	10	.2	243	8.1
Aug. 19-27--------------		11		23	3.0	3.9	5.6	87	5.1	5.8		2.5		151	.21		70	0	10	.2	176	7.7
Sept. 3-6---------------		11		22	2.6	4.0	4.9	84	3.8	6.2		2.5		138	.19		66	0	11	.2	172	7.5

a Sum of determined constituents.

BRAZOS RIVER AT RICHMOND, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 59 in Richmond, Fort Bend County, 925 feet downstream from Texas & New Orleans Railroad bridge, and at mile 93.
DRAINAGE AREA.--44,050 square miles, approximately, of which 9,240 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1953.
Water temperatures: November 1950 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 739 ppm Oct. 1-10; minimum, 160 ppm Jan. 1-10.
Hardness: Maximum, 285 ppm Oct. 1-10; minimum, 93 ppm Jan. 1-10.
Specific conductance: Maximum daily, 1,350 micromhos Oct. 2; minimum daily, 203 micromhos May 3.
Water temperatures: Maximum observed, 88° F Aug. 11, 13; minimum observed, 45° F Nov. 30, Dec. 1, 16, Jan. 17.
EXTREMES, 1945-53.--Dissolved solids: Maximum, 1,400 ppm Sept. 1-10, 1951; minimum, 133 ppm Aug. 27-31, 1947.
Hardness: Maximum, 446 ppm Sept. 1-10, 1948; minimum, 74 ppm Jan. 13-14, 18-29, 1950.
Specific conductance: Maximum daily, 2,540 micromhos Sept. 4, 1951; minimum daily, 187 micromhos Aug. 31, 1947.
Water temperatures (1950-53): Maximum observed, 91° F Aug. 5, 1951; minimum observed, 42° F Dec. 6, 1950.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1952--------	142	17	0.00	83	19	138	5.2	216	113	214	0.2	1.5	0.13	739	1.01	283	285	108	51	3.6	1,210	8.2
Oct. 11-20----------	202	20	--	55	24	133	---	162	106	199	.2	4.0	.36	636	.86	347	236	103	55	3.8	1,090	7.7
Oct. 21-31----------	258	21	--	69	25	132	--	217	109	195	.2	4.5	.42	703	.96	490	275	97	51	3.5	1,140	7.6
Nov. 1-10----------	250	18	--	66	22	113	--	232	89	158	.3	4.0	.29	607	.83	410	255	65	49	3.1	1,010	7.7
Nov. 11-20----------	303	21	--	42	20	107	--	162	79	141	.3	1.8	.31	509	.69	416	187	54	55	3.4	857	7.9
Nov. 21-30----------	696	20	--	68	21	106	--	240	82	145	.4	1.0	.17	585	.80	1,100	256	60	47	2.9	978	8.1
Dec. 1-3, 16, 21-22----	3,162	13	--	46	8.1	58	--	136	48	81	.4	3.0	.18	348	.47	2,970	148	37	46	2.1	582	7.8
Dec. 4-12, 25-31-------	4,218	9.8	--	34	4.7	25	--	110	25	28	.5	3.8	.21	200	.27	2,280	104	14	34	1.1	321	7.7
Dec. 13-15, 17-20, 23-24----------	3,278	13	--	42	6.4	43	--	126	39	54	.5	3.0	.28	282	.38	2,500	131	28	42	1.6	459	7.8
Jan. 1-10, 1953--------	9,914	11	--	31	3.7	17	3.2	99	21	20	.5	3.2	.25	a160	.22	4,280	93	11	28	.8	276	7.6
Jan. 11-20----------	2,682	13	--	32	4.4	32	3.9	103	23	42	.5	2.5	.32	a205	.29	1,480	98	14	40	1.4	351	7.6
Jan. 21-31----------	1,195	13	.15	49	7.1	39	3.7	160	40	50	.2	2.2	.22	300	.41	968	151	20	35	1.4	496	7.7
Feb. 1-3, 5-6, 17-19---	2,009	12	.18	49	7.8	42	3.4	160	44	54	.3	1.5	.17	309	.42	1,680	154	24	37	1.5	513	7.7
Feb. 4, 7-16----------	1,574	13	.20	36	5.6	29	3.0	118	27	39	.3	2.2	.22	230	.31	977	113	16	35	1.2	377	7.9
Feb. 20-25----------	2,230	14	--	50	7.2	34	3.4	147	43	50	.3	4.5	.11	301	.41	1,810	154	34	32	1.2	475	8.0
Feb. 26-28, Mar. 1-7---	2,888	13	--	34	5.0	22	3.4	106	22	33	.3	2.0	.12	229	.31	1,790	106	18	30	.9	325	7.8
Mar. 8-16----------	2,750	15	--	55	9.6	39	3.5	171	47	54	.3	3.5	.14	346	.47	2,570	176	36	32	1.3	530	8.0
Mar. 17-31----------	5,653	12	--	36	6.0	25	4.2	111	26	38	.3	4.0	.12	254	.35	3,880	114	24	31	1.0	357	7.7
Apr. 1-4, 26-29--------	1,890	11	--	37	6.2	27	4.4	122	26	35	.3	3.0	.11	233	.32	1,190	118	18	32	1.1	372	7.9
Apr. 5-14, 30----------	1,686	10	--	49	8.8	40	4.1	150	50	49	.3	2.5	.09	308	.42	1,400	158	36	35	1.4	501	7.8
Apr. 15-25----------	378	11	--	67	12	51	4.1	221	61	63	.3	1.5	.10	394	.54	402	216	36	33	1.5	649	7.9
May 1-10----------	11,410	13	--	31	4.5	11	3.8	100	17	12	.2	4.0	.13	162	.22	4,990	96	14	19	.5	243	7.9
May 11-20----------	44,970	13	--	33	4.5	15	3.6	104	18	20	.2	4.5	.13	175	.24	21,250	101	16	24	.6	285	7.8
May 21-31----------	24,200	13	--	31	5.2	11	3.9	105	15	14	.2	4.0	.09	175	.24	11,430	99	13	19	.5	252	7.9
June 1-10----------	4,154	18	--	36	6.2	18	5.1	130	20	24	.3	1.8	.12	203	.28	2,280	116	9	24	.7	324	7.7
June 11-20----------	991	9.6	--	48	9.5	29	4.8	165	37	39	.3	2.2	.14	268	.36	717	159	24	28	1.0	456	7.6
June 21-30----------	594	12	--	52	12	39	4.6	188	46	48	.3	1.2	.19	317	.43	508	179	25	31	1.3	532	7.9
July 1-4, 7-12---------	1,299	14	--	50	11	57	5.3	156	57	79	.3	1.2	.13	362	.49	1,270	170	42	41	1.9	645	8.2
July 5-6, 23-31--------	1,193	13	--	62	13	81	5.7	178	73	119	.3	1.2	.17	473	.64	1,520	208	62	45	2.4	815	8.2
July 13-22----------	471	15	--	56	10	49	5.4	188	44	66	.3	1.2	.11	346	.47	440	180	26	36	1.6	593	8.2
Aug. 1-17----------	396	18	--	50	14	82	4.6	154	70	117	.3	1.2	.18	441	.60	472	182	56	49	2.6	773	7.8
Aug. 18-24, 30-31------	1,356	16	--	52	12	70	4.5	160	60	102	.3	1.2	.17	402	.55	1,470	179	48	45	2.3	709	7.9
Aug. 25-29----------	1,175	13	--	66	14	107	4.9	160	91	167	.3	1.5	.15	558	.76	1,770	222	91	50	3.1	971	7.9
Sept. 1-2, 4, 11, 15, 17-23----------	1,568	16	--	46	8.0	39	3.9	147	43	53	.4	1.8	.16	284	.39	1,200	148	28	36	1.4	491	7.9
Sept. 3, 5-8, 12-14----	3,219	18	--	36	5.6	28	3.8	117	26	38	.4	3.8	.08	227	.31	1,970	113	17	34	1.1	369	7.9
Sept. 9-10, 16, 24-30--	1,391	18	--	54	9.1	45	4.4	181	40	62	.4	1.8	.18	324	.44	1,220	172	24	36	1.5	560	8.1
Weighted average-----	4,105	13	--	36	5.7	23	3.8	115	25	31	0.3	3.6	0.14	215	0.29	2,380	114	20	30	0.9	342	--

a Sum of determined constituents.

MISCELLANEOUS ANALYSES OF STREAMS IN BRAZOS RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Instantaneous discharge (cfs)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium + Potassium (Na+K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (sum)		Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
												Parts per million	Tons per acre-foot	Calcium, magnesium	Noncarbonate				
DOUBLE MOUNTAIN FORK BRAZOS RIVER NEAR LUBBOCK SEWAGE PLANT																			
Mar. 4, 1953	0.17	30	60	100	156	278	14	277	238	--	29	1,040	1.41	560	309	38	2.9	1,800	8.5
Aug. 3	.09	36	60	87	152	274	12	272	202	3.6	18	978	1.33	507	262	39	2.9	1,570	8.4
Sept. 10	.06	48	52	135	232	354	12	402	302	4.0	29	1,390	1.89	684	374	42	3.9	2,180	8.4
DOUBLE MOUNTAIN FORK BRAZOS RIVER ON STATE HIGHWAY 835, 4.3 MILES SOUTHEAST OF LUBBOCK																			
Nov. 5, 1952	1.99	60	91	175	302	439	13	565	425	--	44	1,890	2.57	946	566	41	4.3	2,960	8.3
Dec. 2	2.10	62	90	172	310	420	24	553	428	--	52	1,900	2.58	932	548	42	4.4	2,950	8.5
Mar. 4, 1953	2.26	52	88	164	288	394	24	527	398	--	58	1,790	2.43	894	531	41	4.2	2,800	8.5
Apr. 14	1.80	54	99	145	307	341	19	549	410	--	62	1,810	2.46	843	532	44	4.6	2,780	8.4
June 10	1.32	50	99	160	303	441	19	537	405	--	50	1,840	2.50	905	512	42	4.4	2,860	8.4
Aug. 3	1.21	60	58	154	290	333	18	503	380	--	56	1,680	2.28	778	474	45	4.5	2,570	8.5
Sept. 10	1.74	71	90	168	318	433	32	538	412	4.8	55	1,900	2.58	916	507	43	4.6	2,830	8.5
DOUBLE MOUNTAIN FORK BRAZOS RIVER ON STATE HIGHWAY 835, 7.8 MILES SOUTHEAST OF LUBBOCK																			
Oct. 6, 1952	1.65	13	56	147	280	370	9	491	368	--	7.0	1,550	2.11	744	426	45	4.5	2,510	8.4
Nov. 5	2.93	18	60	157	288	425	11	505	370	--	9.5	1,630	2.22	795	428	44	4.4	2,600	8.4
Dec. 2	3.92	33	57	160	285	388	16	513	372	--	19	1,650	2.24	800	456	44	4.4	2,700	8.5
Mar. 4, 1953	4.32	20	48	158	283	360	18	516	362	--	16	1,600	2.18	770	444	44	4.4	2,550	8.5
June 10	1.13	16	50	132	255	367	9	443	312	--	6.9	1,400	1.90	668	352	45	4.3	2,320	8.4
Aug. 3	2.47	26	52	114	247	293	9	426	300	4.0	5.0	1,330	1.81	598	343	47	4.4	2,100	8.4
Sept. 10	.88	22	50	135	288	332	13	473	358	4.4	3.5	1,510	2.05	680	386	48	4.8	2,420	8.4
DOUBLE MOUNTAIN FORK BRAZOS RIVER, 7.5 MILES NORTHWEST OF SLATON																			
Oct. 6, 1952	.50	29	62	127	248	423	14	375	320	--	5.6	1,390	1.89	676	306	44	4.2	2,240	8.4
Nov. 5	.61	30	62	128	247	426	16	373	318	--	5.8	1,390	1.89	681	306	44	4.1	2,230	8.4
Dec. 2	3.20	12	42	144	282	344	18	475	355	--	4.8	1,500	2.04	697	385	47	4.7	2,400	8.5
Mar. 4, 1953	4.37	6.0	48	153	290	367	22	494	370	--	9.0	1,570	2.14	749	412	46	4.6	2,560	8.6
Apr. 14	2.02	7.7	50	158	296	375	22	516	375	--	11	1,620	2.20	774	430	45	4.6	2,620	8.5
June 10	.25	28	113	129	266	473	17	430	372	--	4.5	1,590	2.16	812	396	42	4.1	2,570	8.4
Aug. 3	.21	19	52	189	371	406	24	645	460	6.4	5.8	1,970	2.68	906	534	47	5.4	3,040	8.5
Sept. 10	.13	36	58	147	287	471	18	371	388	5.2	12	1,550	2.11	749	333	45	4.5	2,490	8.4
DOUBLE MOUNTAIN FORK BRAZOS RIVER ¼ MILE BELOW LOWER BUFFALO LAKES DAM, NEAR SLATON																			
Nov. 5, 1952	.98	38	58	113	217	435	23	303	260	--	4.2	1,230	1.67	609	214	44	3.8	1,990	8.6
Dec. 2	4.36	30	56	122	235	400	24	359	288	--	5.2	1,320	1.80	641	273	44	4.0	2,100	8.6
Mar. 4, 1953	.47	52	66	93	170	448	31	209	195	--	7.7	1,040	1.41	547	128	40	3.2	1,710	8.6
Apr. 14	2.06	20	59	138	254	396	30	416	318	--	13	1,440	1.96	714	340	44	4.1	2,420	8.6
June 10	.28	60	66	78	121	475	15	132	138	--	3.5	846	1.15	485	71	35	2.4	1,410	8.4
Aug. 3	.09	77	46	85	153	424	12	157	180	4.8	.5	923	1.26	464	97	42	3.1	1,470	8.4
Sept. 10	.22	60	26	88	121	350	18	82	195	4.8	.5	767	1.04	427	110	38	2.6	1,460	8.5
DOUBLE MOUNTAIN FORK BRAZOS RIVER ON STATE HIGHWAY 400, 5.5 MILES NORTH OF SLATON																			
Nov. 5, 1952	.71	33	51	119	226	440	19	317	272	--	3.8	1,260	1.71	616	224	44	4.0	2,080	8.5
Dec. 2	2.91	26	56	124	246	416	27	363	295	--	5.0	1,350	1.84	650	264	45	4.2	2,140	8.6
Mar. 4, 1953	.80	14	60	136	258	450	29	388	312	--	9.3	1,430	1.94	708	292	44	4.2	2,350	8.6
Apr. 14	1.82	18	50	142	267	426	30	414	322	--	7.5	1,460	1.99	709	310	45	4.4	2,400	8.6

MISCELLANEOUS ANALYSES OF STREAMS IN BRAZOS RIVER BASIN IN TEXAS--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Instantaneous discharge (cfs)	Silica (SiO_2)	Calcium (Ca)	Magnesium (Mg)	Sodium + Potassium (Na+K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Dissolved solids (sum)		Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
												Parts per million	Tons per acre-foot	Calcium, magnesium	Noncarbonate				
DOUBLE MOUNTAIN FORK BRAZOS RIVER 4.2 MILES NORTHEAST OF SLATON																			
Dec. 2, 1952	1.80	28	58	127	262	407	31	394	310		5.1	1,420	1.93	667	282	46	4.4	2,250	8.6
Mar. 4, 1953	.70	9.6	61	155	349	508	36	520	372		6.6	1,760	2.39	790	313	49	5.4	2,790	8.6
Apr. 14	1.65	15	46	144	309	406	36	465	350		11	1,580	2.15	707	314	49	5.1	2,590	8.7
WHITE RIVER AT COUNTY ROAD CROSSING ABOUT 4½ MILES EAST OF CROSBYTON																			
June 10, 1953	1.08	34	--	--	70	349	22	44	23		.8	a450	.61	250	0	38	1.9	744	8.6
WHITE RIVER AT U. S. HIGHWAY 82, 4½ MILES EAST OF CROSBYTON																			
June 10, 1953	.23	23	--	--	69	315	21	46	25		3.0	a412	.56	228	0	40	2.0	702	8.7
LAMPASAS RIVER AT FORT HOOD																			
July 28, 1953	--	7.0	51	29	134	172	0	20	265	0.4	1.5	593	.81	246	105	54	3.7	1,170	7.6

a Residue on evaporation at 180° C.

BULL CREEK NEAR IRA, TEX.

LOCATION.--At gaging station 267 feet upstream from highway crossing, 1.5 miles upstream from Colorado River, 5.5 miles upstream from Chimney Creek, 5.8 miles west of Ira, Scurry County, and 6.9 miles northwest of Cuthbert.
DRAINAGE AREA.--388 square miles, approximately (contributing area).
RECORDS AVAILABLE.--Chemical analyses: April 1950 to September 1953.
Water temperatures: April 1950 to September 1951.
EXTREMES, 1952-53.--Specific conductance: Maximum daily, 10,400 micromhos July 13; minimum daily, 277 micromhos Nov. 26.
EXTREMES, 1950-53.--Specific conductance: Maximum daily, 10,400 micromhos July 13, 1953; minimum daily, 235 micromhos Sept. 6, 1950, Sept. 26, 1952.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1952-------	0	--		--	--	--		--	--	73		--		--	--	--	--	--	--	--	567	--
Nov. 1-30----------	a.38	--		--	--	--		--	--	112		--		--	--	--	--	--	--	--	722	--
Dec. 1-17----------	0	--		--	--	--		--	--	70		--		--	--	--	--	--	--	--	469	--
Dec. 18-31----------	a1.01	11		26	5.2	37		108	24	36		4.0		210	0.29	0.57	86	0	49	1.7	354	8.1
Jan. 1-17, 1953-------	0	10		43	9.6	95		113	69	131		4.5		b418	.57	--	147	54	58	3.4	764	8.1
Jan. 18-21, Feb. 5-28-	a.08	10		72	18	219		184	134	310		3.5		860	1.17	.19	254	102	65	6.0	1,560	8.2
Mar. 1-31----------	a.15	6.2		98	38	286		207	304	378		3.5		b1,220	1.66	.49	400	231	61	6.2	2,100	8.2
Apr. 1-13----------	1.27	14		--	--	98		162	63	101		3.5		413	.56	1.42	131	0	62	3.7	720	--
Apr. 23-30----------	a7.35	9.2		27	4.3	43		142	33	18		4.0		220	.30	4.37	85	0	53	2.1	366	7.6
May 9----------	0	--		--	--	--		174	--	79		--		--	--	--	118	0	--	--	630	8.2
May 10-20----------	a3.96	36		34	5.3	36		159	22	18		7.7		246	.33	2.63	107	0	42	1.5	386	8.0
May 26----------	0	--		--	--	--		196	--	52		--		--	--	--	134	0	--	--	515	--
June 2----------	0	--		--	--	--		184	--	78		--		--	--	--	127	0	--	--	596	--
June 6----------	0	--		--	--	--		232	--	130		--		--	--	--	167	0	--	--	861	--
June 10----------	0	--		--	--	--		216	--	149		--		--	--	--	167	0	--	--	921	--
June 15----------	0	--		--	--	--		226	--	192		--		--	--	--	184	0	--	--	1,100	--
June 22----------	0	--		--	--	--		262	--	560		--		--	--	--	305	90	--	--	2,480	--
June 29----------	0	--		--	--	--		158	--	2,420		--		--	--	--	630	500	--	--	8,500	8.2
July 5----------	0	--		--	--	--		187	--	1,690		--		--	--	--	660	507	--	--	6,100	8.2
July 13----------	0	--		--	--	--		124	--	3,100		--		--	--	--	760	658	--	--	10,400	8.1
July 27----------	0	--		--	--	--		186	--	2,220		--		--	--	--	645	492	--	--	7,890	8.2
Aug. 1-31----------	a24.9	20		30	5.0	40		131	27	32		3.2		228	.31	15.3	95	0	48	1.8	377	7.9
Sept. 1-30----------	a.63	19		26	4.5	52		142	30	33		3.5		248	.34	.42	83	0	58	2.5	399	7.8

a Includes days of less than 0.05 second-foot flow.
b Sum of determined constituents.

DEEP CREEK NEAR DUNN, TEX.

LOCATION.--At gaging station at bridge on Farm to Market Highway 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.--178 square miles.
RECORDS AVAILABLE.--Chemical analyses: March to September 1953.
Water temperatures: March to September 1953.
REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of discharge for period April to September 1953 given in Water-Supply Paper 1342.

Chemical analyses, in parts per million, March to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 26, 1953	--	11		54	14	101		334	28	75		3.5		474	0.64	--	192	0	53	3.2	828	7.5
Apr. 2, 12	0	14		84	18	111		466	23	83		3.0		592	.81	--	284	0	46	2.9	1,000	8.1
Apr. 23-26	109	14		34	4.8	22		138	13	14		6.9		191	.26	56.2	105	0	31	.9	312	7.9
May 9	0	--		--	--	--		154	--	18		--		--	--	--	109	--	--	--	318	8.2
May 13, 16-18	15.8	18		32	3.1	6.0	5.8	121	5.5	3.0		6.0		146	.20	6.23	93	0	12	.3	222	7.9
July 15-17	16.4	--		--	--	--		109	--	5.5		--		--	--	--	83	--	--	--	201	8.2
Aug. 4-6, 16-18	93.4	16		33	4.0	14		122	9.8	9.5		6.1		160	.22	40.3	99	0	23	.6	262	7.7
Aug. 19-23, 31	124	12		29	3.3	5.4	5.0	108	6.7	3.5		4.5		125	.17	41.8	86	0	11	.3	203	7.7
Sept. 1, 3-5	7.35	9.2		26	3.9	9.7	5.3	92	8.5	7.0		6.5		a121	.16	2.40	81	6	19	.5	198	7.7

a Sum of determined constituents.

COLORADO RIVER AT COLORADO CITY, TEX.

LOCATION.--At gaging station at Colorado City, Mitchell County, 3,517 feet upstream from bridge on U. S. Highway 80, 4,100 feet upstream from Texas & Pacific Railway bridge, 1.6 miles upstream from Lone Wolf Creek, and at mile 796.
DRAINAGE AREA.--4,082 square miles, approximately, of which 2,590 miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: May 1946 to September 1953.
Water temperatures: November 1952 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 26,900 ppm Apr. 1-14; minimum, 443 ppm Aug. 19-22.
Hardness: Maximum, 3,260 ppm Apr. 1-14; minimum, 120 ppm Aug. 19-22.
Specific conductance: Maximum daily, 38,800 micromhos Mar. 31, Apr. 1-5; minimum daily, 680 micromhos Aug. 20.
Water temperatures: Maximum observed, 95° F July 25, Aug. 3; minimum observed, 42° F Dec. 24.
EXTREMES, 1946-53.--Dissolved solids: Maximum, 32,800 ppm Apr. 1-10, 1952; minimum, 176 ppm Oct. 26, 1947.
Hardness: Maximum, 4,500 ppm Aug. 9-12, 1946; minimum, 65 ppm Sept. 15-20, 1949.
Specific conductance: Maximum daily, 45,800 micromhos Apr. 1-10, 1952; minimum daily, 272 micromhos Oct. 26, 1947.
REMARKS.--Values reported for dissolved solids are sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Nov. 24-30, 1952------	a10.8	5.2		402	159	4,380		97	1,100	7,060		--		13,200	18.0	385	1,660	1,580	85	47	20,500	7.6
Dec. 1-10------------	1.22	6.0		415	162	4,840		101	1,160	7,750		--		14,400	19.6	47.4	1,700	1,620	86	51	22,300	7.5
Dec. 11-17, 19--------	2.33	1.1		450	192	5,410		93	1,300	8,680		--		16,100	21.9	101	1,910	1,840	86	54	24,700	7.5
Dec. 18---------------	4.2	3.9		96	31	778		88	224	1,240		7.0		2,420	3.29	27.4	367	295	82	18	4,180	7.6
Dec. 20-31------------	a4.28	2.9		306	128	3,330		109	863	5,350		--		10,000	13.6	116	1,290	1,200	85	40	16,300	7.2
Jan. 1-10, 1953-------	a.31	2.5		413	178	4,890		101	1,210	7,840		--		14,600	19.9	12.2	1,760	1,680	86	51	22,600	7.3
Jan. 11-21------------	a.13	3.9		497	209	6,100		91	1,480	9,740		--		18,100	24.6	6.35	2,100	2,020	86	58	27,700	7.4
Jan. 22-31------------	.32	2.4		575	237	7,010		91	1,700	11,200		--		20,800	28.3	18.0	2,410	2,330	86	62	31,000	7.4
Feb. 1-10-------------	a.19	3.1		619	286	7,830		82	1,840	12,600		--		23,200	31.6	11.9	2,720	2,650	86	65	33,900	7.7
Feb. 11-19------------	a.28	4.0		677	303	8,620		82	2,060	13,800		--		25,500	34.7	19.3	2,940	2,870	86	69	36,800	7.5
Feb. 20-28------------	a.80	2.0		667	295	8,270		96	1,950	13,300		--		24,500	33.3	52.9	2,880	2,800	86	67	35,100	6.8
Mar. 1-7---------------	.77	6.0		690	303	8,280		81	1,930	13,400		--		24,600	33.5	51.1	2,970	2,900	86	66	35,900	7.7
Mar. 8-11--------------	9.45	4.6		350	144	3,700		85	947	6,000		--		11,200	15.2	286	1,470	1,400	85	42	18,200	7.6
Mar. 12-20------------	2.08	3.1		511	229	5,950		79	1,510	9,580		--		17,800	24.2	100	2,220	2,150	85	55	27,500	7.6
Mar. 21-31------------	a.29	8.8		646	300	7,850		58	2,010	12,600		--		23,500	32.0	18.4	2,850	2,800	86	64	34,500	6.9
Apr. 1-14-------------	a.21	5.4		735	348	9,020		58	2,290	14,500		--		26,900	36.6	15.3	3,260	3,220	86	69	38,800	7.2
Apr. 23---------------	169	4.3		648	253	6,820		67	1,840	11,000		--		20,600	28.0	9,400	2,660	2,600	85	57	30,700	7.5
Apr. 24-25------------	118	8.0		98	27	677		104	213	1,074		14		2,160	2.94	682	356	270	81	16	3,840	7.5
Apr. 26-30------------	8.60	4.7		348	141	3,780		90	963	6,090		--		11,400	15.5	265	1,450	1,380	85	43	18,400	7.5
May 1-4---------------	.30	6.7		488	188	5,470		93	1,320	8,820		--		16,300	22.2	13.2	1,990	1,910	86	53	25,300	7.4
May 11-15, 20---------	21.8	5.9		148	46	1,290		85	328	2,090		--		3,950	5.37	232	558	489	83	24	7,040	7.4
May 16-19-------------	202	8.2		90	22	601		105	185	950		4.0		1,910	2.60	1,040	315	229	81	15	3,520	7.4
May 21-22-------------	4.1	6.1		130	45	1,210		78	333	1,930		5.0		3,700	5.03	41.0	510	446	84	23	6,530	7.6
May 23-31-------------	a.38	5.4		200	76	2,160		54	544	3,470		--		6,480	8.81	6.65	812	768	85	33	10,900	7.4
July 15, 17-18, 20-22, 24----------	21.4	11		98	21	582		104	176	940		3.5		1,880	2.56	109	331	246	79	14	3,340	8.0
July 16, 19, 23, 25-27------------	5.62	11		144	33	1,020		124	282	1,640		2.5		3,190	4.34	48.4	495	394	82	20	5,590	8.2
July 28-30------------	0	8.4		191	55	1,830		75	404	2,980		--		5,510	7.49	--	702	641	85	30	9,510	7.5
Aug. 1-2, 4-5, 10-14--	a21.2	8.2		108	33	1,080		85	236	1,620		1.5		3,130	4.26	179	405	336	85	23	5,530	7.5
Aug. 3, 9-------------	28.3	7.5		74	20	519		99	149	820		3.0		1,640	2.23	125	266	186	81	14	3,020	7.9
Aug. 6-8--------------	88.3	14		50	7.4	184		129	61	272		4.5		b666	.91	159	156	50	72	6.4	1,250	7.9
Aug. 15-18, 26-31-----	.95	7.9		152	45	1,450		102	344	2,320		--		4,370	5.94	11.2	564	480	85	26	7,670	7.5
Aug. 19-22------------	692	9.8		39	5.5	104		123	33	147		3.0		b443	.60	828	120	19	65	4.1	776	8.0
Aug. 23-25------------	24.3	9.2		86	23	653		98	161	1,050		.5		2,030	2.76	133	309	228	82	16	3,720	8.2
Sept. 1-3, 5-13-------	12.5	5.7		152	36	1,550		84	321	2,480		--		4,590	6.24	155	527	458	86	29	8,050	7.6
Sept. 4---------------	76	14		14	10	232		95	89	345		3.2		786	1.07	161	156	78	76	8.1	1,430	8.0
Weighted average-----	14.9	9.0		100	29	795		111	213	1,260		--		2,490	3.39	100	368	278	82	18	4,090	--

a Flow less than 0.05 cfs Oct. 4-31, Nov. 1-23, Jan. 9-10, 14, 16, 21, Feb. 9, 18-19, 21-23, Mar. 28-31, Apr. 1-10, 15-22, May 5-10, 27-31, June, July 1-14, 28-31, Aug. 1, Sept. 14-30.
b Residue on evaporation at 180° C.

COLORADO RIVER NEAR SAN SABA, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 190, 5.2 miles downstream from San Saba River, 9.2 miles east of San Saba, San Saba County, and at mile 474.
DRAINAGE AREA.--30,600 square miles, approximately, of which 11,900 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: September 1947 to September 1953.
Water temperatures: September 1947 to September 1953.
Sediment records: December 1950 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 1,100 ppm July 19; minimum, 189 ppm Aug. 22-23, 25-27.
Hardness: Maximum, 332 ppm July 19; minimum, 124 ppm Aug. 22-23, 25-27.
Specific conductance: Maximum daily, 2,010 micromhos July 19; minimum daily, 226 micromhos Mar. 10.
Water temperatures: Maximum observed, 93° F June 14; minimum observed, 42° F Jan. 17.
Sediment concentrations: Maximum daily, 5,930 ppm Aug. 21; minimum daily, 32 ppm Jan. 11.
Sediment loads: Maximum daily, 201,000 tons Aug. 22; minimum daily, 5.6 tons for composite period June 21-30.
EXTREMES, 1947-53.--Dissolved solids: Maximum, 1,530 ppm Oct. 15-19, 1947; minimum, 127 ppm Sept. 11-13, 1952.
Hardness: Maximum, 522 ppm Oct. 15-19, 1947; minimum, 71 ppm June 25-30, 1949.
Specific conductance: Maximum daily, 3,420 micromhos Sept. 20, 1947; minimum daily, 161 micromhos Sept. 11, 1952.
Water temperatures: Maximum observed, 93° F June 14, 1953; minimum observed, freezing point Jan. 29, 1948, Jan. 30, 1951.
Sediment concentrations (1950-53): Maximum daily, 10,200 ppm May 24, 1951; minimum daily, 22 ppm Aug. 13, 1951.
Sediment loads (1950-53): Maximum daily, 394,000 tons Sept. 11, 1952; minimum daily, 0.1 tons for composite period Aug. 20-25, 1952.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1952-------	161	14		61	17	29		243	22	40		6.9		314	0.43	136	222	23	22	0.8	551	7.7
Oct. 11-20------------	91.9	14		66	24	33		288	24	47		8.0		360	.49	89.3	263	27	21	.9	643	8.0
Oct. 21-31------------	70.6	15		62	28	37		297	24	53		8.8		a374	.51	71.3	270	26	23	1.0	663	7.9
Nov. 1-10-------------	94.0	14		60	30	40		304	24	56		9.0		387	.53	98.2	273	24	24	1.1	683	8.0
Nov. 11-20------------	132	12		66	22	54		268	28	84		5.9		412	.56	147	255	36	31	1.5	724	7.9
Nov. 21-24------------	310	14		62	24	55		270	29	83		5.5		a406	.55	340	253	32	32	1.5	724	8.2
Nov. 25-30------------	1,428	9.2		44	10	26		157	26	34		3.8		a230	.31	887	151	22	27	.9	403	8.1
Dec. 1-10-------------	145	12		56	18	28		227	24	42		4.5		a296	.40	116	214	28	22	.8	515	8.2
Dec. 11-20------------	226	14		63	22	29		260	28	45		5.0		a334	.45	204	248	34	20	.8	576	8.2
Dec. 21-30------------	368	12		58	20	37		235	33	54		4.0		a334	.45	332	226	34	26	1.1	584	8.2
Dec. 31, Jan. 1-4, 1953----------	1,096	11		38	11	24		150	17	35		2.8		a213	.29	630	140	17	27	.9	351	8.1
Jan. 5-10-------------	191	12		56	17	29		226	23	43		4.0		a295	.40	152	210	24	23	.9	523	8.2
Jan. 11-22------------	114	13		63	24	33		280	23	50		5.0		368	.50	113	256	26	22	.9	629	8.2
Jan. 23-31------------	93.2	11		64	27	32		299	21	50		4.5		372	.51	93.6	270	26	21	.9	650	8.0
Feb. 1-10-------------	91.7	16		64	28	38		303	24	57		4.2		393	.53	97.3	274	26	23	1.0	679	7.9
Feb. 11-20------------	80.9	13		64	28	35		303	23	52		4.8		382	.52	83.4	274	26	22	.9	662	8.0
Feb. 21-28------------	71.6	8.8		64	29	39		302	26	61		4.5		405	.55	78.3	278	31	23	1.0	693	8.0
Mar. 1-8--------------	69.6	8.2		62	29	39		299	26	59		3.8		386	.52	72.5	274	28	24	1.0	678	8.0
Mar. 9-11-------------	7,773	9.6		44	6.9	17		120	35	27		2.8		213	.29	4,470	138	40	21	.6	350	7.8
Mar. 12-20------------	740	9.8		48	12	39		154	39	60		2.8		306	.42	611	170	44	33	1.3	514	7.9
Mar. 21-31------------	101	11		54	22	32		236	29	48		2.8		329	.45	89.7	225	32	23	.9	558	8.0

COLORADO RIVER NEAR SAN SABA, TEX.--Continued

Chemical analyses, in parts per million, water year October 1952 to September 1953--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Apr. 1-10----------	58.3	16		53	27	41		271	27	56		3.0		370	0.50	58.2	243	21	27	1.1	652	8.2
Apr. 11-20----------	45.4	15		54	31	44		296	25	62		2.8		380	.52	46.6	262	20	27	1.2	677	8.0
Apr. 21-28----------	138	15		53	25	43		b272	24	55		2.8		362	.49	135	235	12	28	1.2	634	8.4
Apr. 29-30----------	3,150	13		36	9.2	19		138	19	24		3.5		204	.28	1,740	128	15	25	.7	337	7.6
May 1-5----------	253	9.6		40	11	21		167	16	24		3.5		213	.29	146	145	8	24	.7	369	8.1
May 6-10----------	67.8	9.6		49	18	25		227	16	33		2.0		272	.37	49.8	196	10	22	.8	474	8.0
May 11, 15, 17, 21-22, 28-31-------	1,526	15		49	12	29		179	29	39		3.0		290	.39	1,190	172	25	27	1.0	475	7.9
May 12-14, 16, 18-20, 23-27----------	2,319	15		41	8.3	19		146	21	24		3.5		226	.31	1,420	136	17	23	.7	361	8.0
June 1-10----------	64.9	17		46	20	28		218	19	42		1.5		308	.42	54.0	197	18	24	.9	505	8.2
June 11-20----------	39.9	19		44	26	40		245	19	58		2.0		359	.49	38.7	217	16	29	1.2	586	8.2
June 21-30----------	29.1	18		42	29	44		252	18	66		1.0		377	.51	29.6	224	18	30	1.3	617	8.2
July 1-5, 10-12, 14-18----------	67.9	22		45	25	52		241	22	75		1.2		378	.51	69.3	216	18	34	1.5	656	8.2
July 6-9, 13, 25-31--	339	20		46	12	35		165	34	48		3.0		298	.41	273	164	29	32	1.2	495	7.9
July 19----------	1,340	18		97	22	275		137	147	470		3.0		a1,100	1.50	3,980	332	220	64	6.6	2,010	8.2
July 20-24----------	915	17		58	11	87		144	74	128		3.0		480	.65	1,190	190	72	50	2.7	815	8.0
Aug. 1-10----------	233	18		49	11	40		150	47	57		3.0		328	.45	206	168	45	34	1.3	526	7.6
Aug. 11-20----------	198	12		58	14	55		163	76	76		1.0		395	.54	211	202	68	37	1.7	650	8.0
Aug. 21, 24, 28-31---	2,078	13		47	8.3	27		158	28	36		2.2		258	.35	1,450	151	22	28	1.0	422	7.9
Aug. 22-23, 25-27----	7,550	12		39	6.4	15		129	24	16		4.0		189	.26	3,850	124	18	21	.6	310	7.8
Sept. 1-5, 18-23-----	177	15		45	12	31		171	24	44		3.5		264	.36	126	162	22	30	1.1	463	7.9
Sept. 6-8----------	1,020	14		58	12	113		151	63	176		3.2		532	.72	1,470	194	70	56	3.5	934	7.8
Sept. 9-17, 24-30----	158	15		47	14	46		187	32	61		2.5		318	.43	136	175	22	36	1.5	550	8.0
Weighted average---	524	13		46	11	29		161	30	41		3.4		266	0.36	376	160	28	28	1.0	446	--

a Sum of determined constituents.
b Includes equivalent of 6 ppm of carbonate (CO_3).

COLORADO RIVER AT AUSTIN, TEX.

LOCATION.--At raw-water intake of Austin City Water Plant, 4½ miles upstream from gaging station which is at Montopolis bridge on U. S. Highway 183 at southeast edge of Austin, Travis County, 2.8 miles upstream from Walnut Creek, 3.8 miles downstream from Waller Creek, 5 miles downstream from Barton Creek, and at mile 290.
DRAINAGE AREA.--38,160 square miles, approximately, of which 11,900 is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1953.
Water temperatures: October 1947 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 250 ppm Oct. 1-31; minimum, 214 ppm July 1-31.
Hardness: Maximum, 168 ppm Dec. 1-31, Mar. 1-31; minimum, 144 ppm June 1-30.
Specific conductance: Maximum daily, 448 micromhos Feb. 17-18; minimum daily, 294 micromhos Apr. 29.
Water temperatures: Maximum observed, 78° F Aug. 13-14, Sept. 4; minimum observed, 52° F Dec. 16, Jan. 16.
EXTREMES, 1947-53.--Dissolved solids: Maximum, 340 ppm Nov. 1-30, 1951; minimum, 214 ppm July 1-31, 1953.
Hardness: Maximum, 197 ppm Jan. 1-31, 1948; minimum, 144 ppm June 1-30, 1953.
Specific conductance: Maximum daily, 591 micromhos July 1, 1948; minimum daily, 294 micromhos Apr. 29, 1953.
Water temperatures: Maximum observed, 87° F on several days during summer months; minimum observed, 43° F Jan. 28, 1948, Feb. 4, 1949.
REMARKS.--Values reported for dissolved solids are residues on evaporation. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1952-------	284	12		45	13	25		178	20	35	0.3	3.0		250	0.34	192	166	20	25	0.8	431	8.2
Nov. 1-30------------	428	10		44	12	23		171	20	32	.3	2.2		236	.32	273	159	19	24	.8	411	7.9
Dec. 1-31------------	301	9.6		46	13	20		176	22	30	.4	2.8		232	.32	189	168	24	21	.7	417	7.9
Jan. 1-31, 1953-------	781	9.8		47	12	19		176	19	28	.3	4.2		242	.33	510	167	22	20	.6	400	7.9
Feb. 1-28------------	983	10		43	11	17		158	15	28	.3	4.5		230	.31	610	153	23	19	.6	383	7.9
Mar. 1-31------------	272	9.4		46	13	19		177	20	28	.2	4.0		232	.32	170	168	23	19	.6	394	8.1
Apr. 1-30------------	970	10		43	12	19		164	19	29	.2	3.0		216	.29	566	157	22	21	.7	387	7.8
May 1-31-------------	1,374	11		43	11	17		161	17	26	.3	3.0		226	.31	838	153	21	20	.6	385	7.9
June 1-30------------	1,985	11		41	10	21		158	17	27	.3	3.0		223	.30	1,200	144	14	24	.8	370	7.9
July 1-31------------	1,893	10		42	11	18		161	17	26	.3	3.2		214	.29	1,090	150	18	21	.6	379	7.9
Aug. 1-31------------	1,307	9.8		42	10	20		162	17	26	.3	2.0		219	.30	773	146	13	23	.7	376	7.9
Sept. 1-30-----------	490	15		46	12	16		178	15	24	.2	2.5		231	.31	306	164	18	17	.5	378	8.1
Weighted average----	921	11		43	11	19		164	17	27	0.3	3.1		225	0.31	560	152	18	21	0.7	384	--

COLORADO RIVER AT WHARTON, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 59 in Wharton, Wharton County, 1,000 feet downstream from Texas & New Orleans Railroad bridge, 12 miles upstream from Jones Creek, and at mile 67.
DRAINAGE AREA.--41,150 square miles, approximately, of which 11,900 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: April 1944 to September 1953.
Water temperatures: October 1945 to September 1948, March 1950 to September 1952.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 331 ppm Oct. 1-31; minimum, 170 ppm Nov. 1-30.
Hardness: Maximum, 211 ppm Oct. 1-31; minimum, 102 ppm Nov. 1-30.
Specific conductance: Maximum daily, 721 micromhos Oct. 3; minimum daily, 211 micromhos Nov. 25.
EXTREMES, 1944-53.--Dissolved solids: Maximum, 386 ppm Apr. 1-10, 1948; minimum, 144 ppm Feb. 24-28, 1949.
Hardness: Maximum, 231 ppm Feb. 1-10, 1947; minimum, 87 ppm Feb. 24-28, 1949.
Specific conductance: Maximum daily, 721 micromhos Oct. 3, 1952; minimum daily, 186 micromhos Feb. 27-28, 1949.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1952--------	383	9.0		55	18	42	--	228	34	54	0.4	1.0	0.11	331	0.45	342	211	24	30	1.3	579	7.7
Nov. 1-30--------------	659	8.4		31	5.9	10	--	101	19	11	.4	3.8	.10	170	.23	302	102	19	18	.4	251	7.7
Dec. 1-31--------------	1,864	11		36	6.0	17	--	113	35	13	.5	2.8	.27	192	.26	966	114	22	24	.7	302	7.5
Jan. 1-31, 1953--------	1,391	5.0		40	12	31	--	161	30	35	.3	1.8	.25	243	.33	913	150	18	31	1.1	421	7.8
Feb. 1-28--------------	1,845	6.5	0.15	38	9.5	23	2.1	140	28	31	.2	2.2	.13	226	.31	1,130	134	20	27	.9	379	7.7
Mar. 1-31--------------	749	5.0		42	12	26	4.1	164	31	37	.3	1.5	.05	240	.33	485	154	20	26	.9	440	7.9
Apr. 1-30--------------	1,202	13		41	11	22	4.0	158	24	32	.3	3.5	.09	236	.32	766	148	18	24	.8	406	8.1
May 1-31---------------	3,849	15		37	5.6	14	3.8	131	14	17	.3	2.5	.04	189	.26	1,960	116	8	20	.6	298	8.1
June 1-30--------------	950	12		39	9.3	18	4.7	148	18	29	.4	1.5	.14	214	.29	549	136	14	22	.7	365	8.0
July 1-31--------------	1,162	12		40	11	20	4.1	162	18	29	.4	1.2	.13	220	.30	690	145	12	22	.7	395	7.9
Aug. 1-31--------------	879	10		33	7.0	14	6.4	129	12	22	.3	1.8	.05	176	.24	418	112	6	20	.6	300	7.8
Sept. 1-30-------------	1,210	16		42	9.4	17	3.8	160	18	22	.4	1.8	.07	a209	.28	683	144	12	20	.6	359	7.9
Weighted average-----	1,345	11		38	8.6	19	3.8	142	22	25	0.3	2.2	0.12	211	0.29	766	130	14	23	0.7	353	--

a Sum of determined constituents.

MISCELLANEOUS ANALYSES OF STREAMS IN COLORADO RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
LAKE J. B. THOMAS NEAR IRA																						
Dec. 31, 1952		7.8	0.16	18	3.4	61	2.2	124	53	25	1.0	3.0	0.18	248	0.34		59	0	68	3.5	396	8.0
Mar. 23, 1953		7.0	.10	20	4.6	59	2.8	112	59	28	1.0	3.5	.24	a240	.33		69	0	64	3.1	--	7.5
May 28		10	.18	22	5.3	70	3.2	147	61	29	.6	4.0	.16	282	.38		77	0	65	3.5	472	7.6
Aug. 13		11	.05	30	8.1	92	4.1	207	76	40	1.1	1.0	.30	374	.51		108	0	64	3.8	621	7.9
CANYON CREEK NEAR IRA																						
Mar. 26, 1953		.7	--	52	18	31		172	102	16	--	.8	--	324	.44		204	62	25	.9	--	8.1
SULPHUR CREEK NEAR IRA																						
Mar. 25, 1953		2.7	--	117	.66	105		180	514	78	--	.2	--	1,080	1.47		564	416	29	1.9	1,490	8.2
LAKE COLORADO CITY NEAR COLORADO CITY																						
Oct. 13, 1952		5.0	.18	25	10	55	1.2	120	61	48	.8	1.0	.15	a266	.36		104	5	53	3.8	470	7.7
MOUNTAIN CREEK RESERVOIR NEAR ROBERT LEE																						
Dec. 31, 1952		1.7	.02	39	6.4	6.1	6.4	146	20	4.2	.4	.5	.12	166	.35		124	4	9	.2	274	7.3

a Sum of determined constituents.

GUADALUPE RIVER AT VICTORIA, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 59 in Victoria, Victoria County, 1,300 feet upstream from Texas & New Orleans Railroad bridge, 10 miles upstream from Coleto Creek, and at mile 51.
DRAINAGE AREA.--5,311 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1946, October 1948 to September 1953.
Water temperatures: November 1950 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 606 ppm July 14-17, 28-30; minimum, 187 ppm Aug. 31, Sept. 1-10.
Hardness: Maximum, 270 ppm Nov. 1-10; minimum, 114 ppm Aug. 31, Sept. 1-10.
Specific conductance: Maximum daily, 1,350 micromhos July 15; minimum daily, 201 micromhos Sept. 1.
Water temperatures: Maximum observed, 89° F June 24; minimum observed, 48° F Jan. 17.
EXTREMES, 1945-46, 1948-53.--Dissolved solids: Maximum, 1,040 ppm Jan. 11-17, 1946; minimum, 175 ppm June 4, 6, 15, 1951.
Hardness: Maximum, 428 ppm Jan. 11-17, 1946; minimum, 103 ppm July 23-31, 1952.
Specific conductance: Maximum daily, 1,950 micromhos Jan. 11-17, 1946; minimum daily, 201 micromhos Sept. 1, 1953.
Water temperatures (1950-53): Maximum observed, 90° F Aug. 4, 27, 1952; minimum observed, 40° F Feb. 1-2, 1951.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1952-------	910	19	0.02	74	16	32	3.2	256	32	57	0.3	4.5	0.16	394	0.54	968	250	40	21	0.9	627	7.8
Oct. 11-20----------	667	15	--	61	21	40	--	217	36	70	.2	6.1	.23	394	.54	710	238	60	27	1.1	643	7.9
Oct. 21-31----------	557	17	--	50	21	43	--	193	36	70	.3	5.4	.25	371	.50	558	212	54	31	1.3	632	7.8
Nov. 1-10----------	512	14	--	72	22	49	--	256	38	84	.2	4.5	.15	446	.61	617	270	60	28	1.3	722	7.5
Nov. 11-20----------	503	20	--	49	18	47	--	195	34	72	.4	4.2	.28	363	.49	493	196	36	34	1.5	601	7.9
Nov. 21-29----------	1,675	17	--	53	14	43	--	202	29	61	.4	3.8	.22	333	.45	1,510	190	24	33	1.4	551	7.9
Nov. 30, Dec. 1, 3-6, 25-29----------	2,493	13	--	37	6.9	19	--	117	21	30	.5	3.2	.17	a189	.26	1,270	121	25	26	.8	346	7.8
Dec. 2, 7-9, 23-24, 30-31----------	2,471	17	--	53	9.8	40	--	172	29	60	.5	4.0	.24	a299	.41	1,990	172	32	34	1.3	524	8.0
Dec. 10-22----------	1,146	18	--	70	17	46	--	242	38	76	.4	4.0	.08	a388	.53	1,200	244	46	29	1.3	684	8.1
Jan. 1, 7-20, 1953----	1,496	19	.09	62	16	36	1.6	219	33	58	.2	4.3	.22	364	.50	1,470	220	41	26	1.1	580	7.9
Jan. 2-6----------	3,794	12	--	36	6.9	23	3.6	118	21	37	.5	3.2	.32	219	.30	2,240	118	22	29	.9	360	7.8
Jan. 21-31----------	891	14	.03	66	19	44	1.5	236	38	77	.2	4.3	.26	a380	.52	914	242	49	28	1.2	676	8.0
Feb. 1-10----------	820	13	.06	65	19	38	2.2	246	36	62	.2	4.8	.20	a361	.49	799	240	38	25	1.1	634	7.8
Feb. 11-19----------	745	14	--	44	21	48	2.7	156	41	93	.2	4.5	.23	361	.49	726	196	68	34	1.5	649	8.2
Feb. 20-28----------	936	11	--	59	21	49	2.6	214	40	87	.3	4.5	.10	399	.54	1,010	234	58	31	1.4	692	8.2
Mar. 1-10----------	704	13	--	64	19	50	3.1	217	41	92	.3	3.8	.11	418	.56	795	238	60	31	1.4	704	8.2
Mar. 11-20----------	661	11	--	59	22	54	3.0	216	39	100	.3	3.5	.25	423	.58	755	238	60	33	1.5	741	8.2
Mar. 21-31----------	592	25	--	64	22	57	--	232	40	99	.3	3.0	.18	454	.62	726	250	60	33	1.6	806	7.9
Apr. 1-10----------	573	18	--	62	21	48	--	234	37	80	.3	3.5	.21	417	.57	645	241	50	30	1.3	695	8.0
Apr. 11-20----------	541	34	--	63	22	59	--	228	40	105	.3	1.5	.33	476	.65	695	248	60	34	1.6	766	8.0
Apr. 21-30----------	1,079	20	--	55	22	59	3.6	202	37	112	.2	4.0	.21	436	.59	1,270	228	62	36	1.7	753	8.2
May 1, 10-11, 13-17, 30----------	1,991	21	--	66	15	52	4.8	212	35	96	.3	4.0	.25	430	.58	2,310	226	52	33	1.5	716	8.1
May 2, 8-9, 12, 23-25, 27-29, 31----------	1,562	21	--	48	11	35	5.0	161	28	56	.3	3.0	.16	310	.42	1,310	165	33	31	1.0	502	8.1
May 3-7, 18-22, 26----	3,998	16	--	38	6.0	19	4.7	125	19	28	.3	4.0	.29	220	.30	2,370	122	20	25	.8	343	8.1
June 1-12----------	410	23	--	57	18	50	5.1	214	33	85	.3	1.5	.17	392	.53	434	216	40	33	1.5	671	7.8
June 13-20----------	301	18	--	62	22	72	5.2	224	41	124	.3	1.0	.24	471	.64	383	245	62	38	2.0	820	7.8
June 21-30----------	277	16	--	56	21	66	4.7	212	40	115	.3	1.2	.22	445	.61	333	226	52	38	1.9	772	7.8
July 1-6, 13, 18, 20-24, 26-27, 31----------	364	21	--	48	20	77	4.5	175	43	130	.4	1.8	.27	445	.61	437	202	58	45	2.4	789	7.9
July 7-12, 19, 25-----	275	22	--	39	19	64	3.9	159	40	102	.4	1.8	.23	375	.51	278	176	45	44	2.1	668	7.8
July 14-17, 28-30-----	269	20	--	56	23	119	5.7	159	54	225	.4	1.8	.32	606	.82	440	234	104	52	3.4	1,080	7.9
Aug. 1-10----------	255	30	--	34	22	76	3.8	153	42	122	.4	.5	.24	a406	.55	280	176	50	48	2.5	706	7.9
Aug. 11-19----------	166	30	--	45	21	66	3.6	193	38	100	.5	.8	.20	a400	.54	179	199	41	41	2.0	681	8.0
Aug. 20-30----------	748	23	--	44	18	54	3.6	188	33	86	.4	.8	.19	a355	.48	717	184	30	38	1.7	615	8.0
Aug. 31, Sept. 1-10---	3,740	16	--	35	6.4	18	4.1	128	18	22	.4	2.8	.14	187	.25	1,890	114	9	25	.7	313	7.8
Sept. 11-20----------	837	18	--	49	10	18	3.4	187	19	24	.4	2.8	.08	a237	.32	536	163	10	19	.6	396	8.1
Sept. 21-30----------	516	18	--	54	14	28	3.5	209	22	41	.3	3.8	.11	a288	.39	401	192	20	24	.9	483	8.0
Weighted average----	1,074	17	--	51	14	37	3.7	179	29	61	0.3	3.5	0.21	319	0.43	925	184	38	30	1.2	538	--

a Sum of determined constituents.

NUECES RIVER BASIN

NUECES RIVER NEAR MATHIS, TEX.

LOCATION.--At intake tower at Lake Corpus Christi, 0.8 mile upstream from gaging station at bridge on U. S. Highway 59, 200 feet downstream from Texas & New Orleans Railroad bridge, and 4 miles southwest of Mathis, San Patricio County.
DRAINAGE AREA.--16,660 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1953.
Water temperatures: October 1947 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 530 ppm May 1-20; minimum, 207 ppm Sept. 1-30.
Hardness: Maximum, 166 ppm Mar. 1-31; minimum, 95 ppm May 21-31.
Specific conductance: Maximum daily, 894 micromhos May 16; minimum daily, 250 micromhos Sept. 9.
Water temperatures: Maximum observed, 88° F June 26; minimum observed, 53° F Dec. 25, Feb. 25.
EXTREMES, 1947-53.--Dissolved solids: Maximum, 548 ppm June 1-30, 1948; minimum, 175 ppm Apr. 27-30, 1949.
Hardness: Maximum, 201 ppm May 1-24, 1951; minimum, 85 ppm Apr. 27-30, 1949.
Specific conductance: Maximum daily, 1,040 micromhos July 1, 1948; minimum daily, 233 micromhos July 30, 1949.
Water temperatures: Maximum observed, 94° F July 27, 1948; minimum observed, 38° F Jan. 31, 1948.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1952--------	53.3	22	--	42	4.0	50	--	175	29	36	0.4	1.0	0.24	274	0.37	39.4	121	0	47	2.0	446	7.6
Nov. 1-30----------	45.5	18	--	44	5.4	47	--	183	31	38	.9	.8	.37	286	.39	35.1	132	0	44	1.8	468	7.8
Dec. 1-31----------	44.1	26	0.05	46	4.7	50	6.1	a198	32	41	.3	1.2	.43	319	.43	38.0	134	0	43	1.9	492	8.4
Jan. 1-31, 1953--------	51.2	22	.10	48	5.1	55	6.2	202	36	47	.3	.8	.62	332	.45	45.9	141	0	45	2.0	522	7.9
Feb. 1-28----------	46.2	22	.12	51	5.0	69	6.7	219	40	62	.4	.2	.65	b365	.50	45.5	148	0	49	2.5	600	8.1
Mar. 1-31----------	52.8	20	--	54	7.5	82	7.3	239	48	76	.4	.5	.41	414	.56	59.0	166	0	50	2.8	699	7.9
Apr. 1-30----------	70.0	23	--	52	7.2	119	7.6	264	56	103	.4	.5	.33	b499	.68	94.3	159	0	61	4.1	852	8.1
May 1-20----------	531	22	--	48	5.9	120	7.6	247	58	112	.4	1.0	.51	530	.72	760	144	0	63	4.3	880	8.2
May 21-31----------	2,754	16	--	33	3.1	40	5.6	128	34	30	.3	3.0	.18	250	.34	1,860	95	0	46	1.8	385	7.6
June 1-30----------	73.4	25	--	38	4.0	46	6.9	162	36	32	.5	1.5	.24	280	.38	55.5	112	0	45	1.9	436	8.2
July 1-31----------	82.4	27	--	46	5.2	54	7.2	c202	38	37	.5	.8	.23	326	.44	72.5	136	0	45	2.0	512	8.4
Aug. 1-31----------	386	40	.05	52	5.2	66	6.7	d226	42	51	.5	1.0	.41	377	.51	393	151	0	47	2.3	579	8.3
Sept. 1-30----------	6,725	20	--	40	4.0	18	3.5	148	20	10	.3	2.0	.15	207	.28	3,760	116	0	24	.7	311	8.0
Weighted average-----	741	21	--	40	4.1	29	4.2	156	25	21	0.3	2.0	0.19	240	0.33	480	117	0	34	1.2	368	--

a Includes equivalent of 1 ppm of carbonate (CO_3).
b Sum of determined constituents.
c Includes equivalent of 4 ppm of carbonate (CO_3).
d Includes equivalent of 5 ppm of carbonate (CO_3).

PECOS RIVER BELOW RED BLUFF DAM, NEAR ORLA, TEX.

LOCATION.--Just below dam, 3 miles upstream from Salt (Screwbean) Draw, 5 miles northwest of Orla, Reeves County, and 14 miles upstream from gaging station near Orla. During period October to November 1952, samples were collected at gaging station.
DRAINAGE AREA.--21,300 square miles, approximately (contributing area), above gaging station.
RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1953.
Water temperatures: March to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 15,600 ppm Sept. 17-30; minimum, 7,570 ppm Mar. 19-31.
Hardness: Maximum, 3,430 ppm July 1-31; minimum, 2,380 ppm Mar. 19-31.
Specific conductance: Maximum daily, 24,200 micromhos Sept. 28, 30; minimum daily, 11,000 micromhos Mar. 31.
EXTREMES, 1937-52.--Dissolved solids: Maximum, 15,600 ppm Sept. 17-39, 1953; minimum, 1,090 ppm June 1-2, 1948.
Hardness: Maximum, 3,430 ppm July 1-31, 1953; minimum, 602 ppm June 1-2, 1948.
Specific conductance: Maximum daily, 24,200 micromhos Sept. 28, 30, 1953; minimum daily, 1,610 micromhos June 2, 1948.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Orla for water year October 1952 to September 1953 given in Water-Supply Paper 1282. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1952-------	4.61	19		710	287	2,840		100	2,600	4,500				11,000	15.0	137	2,950	2,870	68	23	15,900	7.5
Nov. 1-30-------------	3.59	16		685	252	2,050		108	2,420	3,260				8,740	11.9	84.7	2,740	2,660	62	17	12,300	7.7
Mar. 19-31, 1953------	10.2	9.0		570	233	1,790		123	2,070	2,840				7,570	10.3	208	2,380	2,280	62	16	11,100	7.8
Apr. 1-30-------------	8.67	6.4		586	237	1,850		118	2,150	2,920				7,810	10.6	183	2,440	2,340	62	16	11,300	7.6
May 1-4, 12-13, 28-31-	7.88	5.9		625	263	2,130		126	2,300	3,380				8,770	11.9	187	2,640	2,540	64	18	12,800	7.6
May 5-11, 14-27-------	8.62	10		646	298	2,930		142	2,440	4,650				11,000	15.0	256	2,840	2,720	69	24	16,100	7.7
June 1-30-------------	17.2	12		657	266	2,180		136	2,380	3,460				9,020	12.3	419	2,730	2,620	63	18	13,200	7.6
July 1-31-------------	40.1	12		699	409	2,120		124	2,460	3,810				9,570	13.0	1,040	3,430	3,320	57	16	14,300	7.8
Aug. 1-31-------------	26.7	10		716	294	2,470		111	2,630	3,930				10,100	13.7	728	3,000	2,900	64	20	14,600	7.7
Sept. 1-16------------	8.22	50		779	300	2,770		115	2,710	4,450				11,100	15.1	246	3,180	2,990	65	21	15,900	7.7
Sept. 17-30-----------	9.25	23		769	360	4,440		111	2,990	6,990				15,600	21.2	390	3,400	3,220	74	33	22,500	7.6
Weighted average----	a14.6	13		686	316	2,340		121	2,480	3,870				9,760	13.3	385	3,010	2,910	64	19	14,300	--

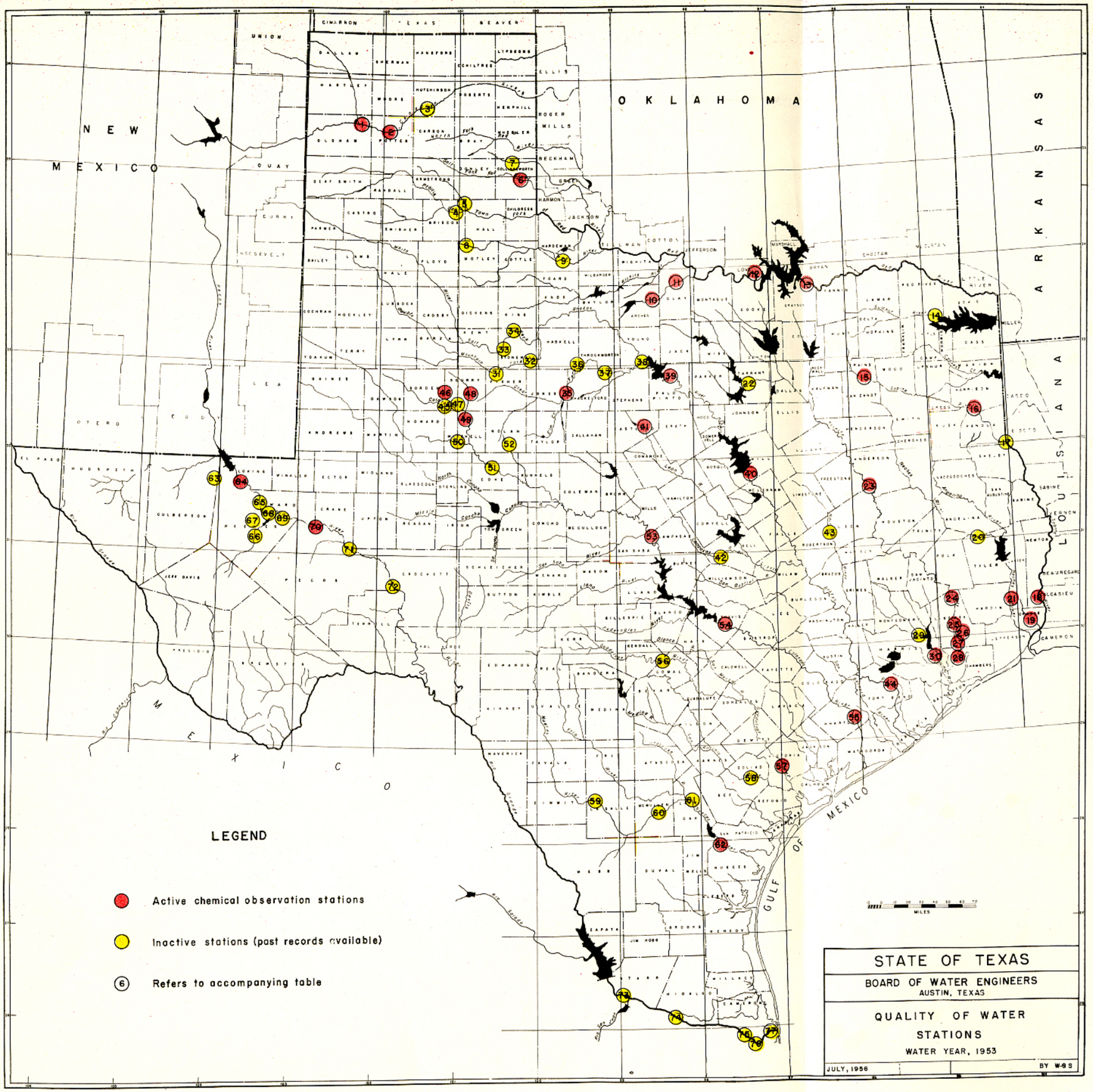
a Represents 79 percent of runoff for water year October 1952 to September 1953.

PECOS RIVER BELOW GRANDFALLS, TEX.

LOCATION.--At gaging station at bridge on State Farm-to-Market Road 11 between Grandfalls and Imperial, 7.1 miles southeast of Grandfalls, Ward County, and 10 miles downstream from Chacatori Draw.
DRAINAGE AREA.--27,820 square miles, approximately (contributing area).
RECORDS AVAILABLE.--Chemical analyses: April 1939 to June 1942, October 1946 to September 1953.
EXTREMES, 1952-53.--Dissolved solids: Maximum, 25,100 ppm Feb. 9-10, 14-15, 18-20; minimum, 10,600 ppm Oct. 1-31.
Hardness: Maximum, 4,460 ppm Mar. 1-31; minimum, 3,320 ppm June 1-30.
Specific conductance: Maximum daily, 35,700 micromhos Feb. 9-10, 15, 19-20; minimum daily, 13,700 micromhos Oct. 10-12, 15.
EXTREMES, 1939-42, 1946-53.--Dissolved solids: Maximum, 25,100 ppm Feb. 9-10, 14-15, 18-20; minimum, 776 ppm June 5, 1947.
Hardness: Maximum, 4,460 ppm Mar. 1-31, 1953; minimum, 316 ppm Apr. 2-4, 1952.
Specific conductance: Maximum daily, 35,700 micromhos Feb. 9-10, 15, 19-20, 1953; minimum daily, 1,220 micromhos May 27, 1941.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1952 to September 1953 given in Water-Supply Paper 1282.

Chemical analyses, in parts per million, water year October 1952 to September 1953

Date of collection	Mean discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1952	13.5	23		777	389	2,420		134	3,070	3,900				10,600	14.4	386	3,540	3,430	60	18	15,100	7.4
Nov. 1-30	14.7	22		746	395	2,560		158	3,020	4,100				10,900	14.8	433	3,490	3,360	62	19	15,300	7.4
Dec. 1-31	18.8	18		751	396	2,730		185	3,000	4,370				11,400	15.5	579	3,500	3,350	63	20	16,000	7.5
Jan. 1-31, 1953	18.3	18		765	390	2,990		193	2,970	4,800				12,000	16.3	593	3,510	3,350	65	22	16,700	7.4
Feb. 1-8, 11-13, 16-17, 21-28	20.0	14		786	407	3,360		187	3,030	5,410				13,100	17.8	707	3,630	3,480	67	24	18,700	7.7
Feb. 9-10, 14-15, 18-20	19.4	14		880	514	7,770		187	3,290	12,500				25,100	34.1	1,310	4,310	4,160	80	51	35,200	7.8
Mar. 1-31	18.2	9.2		940	513	3,650		145	3,790	5,900				14,900	20.3	732	4,460	4,340	64	24	20,400	7.8
Apr. 1-30	13.0	15		800	424	2,910		163	3,180	4,700				12,100	16.5	425	3,740	3,610	63	21	17,100	8.0
May 1-31	10.6	13		883	470	3,270		134	3,560	5,260				13,500	18.4	386	4,140	4,030	63	22	18,600	7.5
June 1-30	8.15	31		868	281	3,160		85	3,360	4,690				12,400	16.9	273	3,320	3,250	67	24	17,000	7.4
July 1-31	6.87	22		861	419	2,780		64	3,320	4,550				12,000	16.3	223	3,870	3,820	61	19	16,700	7.3
Aug. 1-31	6.70	14		838	407	2,680		75	3,200	4,400				11,600	15.8	210	3,760	3,700	61	19	16,200	7.1
Sept. 1-30	8.16	20		817	394	2,620		90	3,090	4,300				11,300	15.4	249	3,660	3,510	61	19	15,700	7.3
Weighted average	13.0	17		799	416	3,090		149	3,210	4,970				12,600	17.1	442	3,700	3,580	64	22	17,600	--


NEW MEXICO
OKLAHOMA
ARKANSAS
LOUISIANA
MEXICO
GULF OF MEXICO
LEGEND
Active chemical observation stations
Inactive stations (past records available)
(6) Refers to accompanying table
MILES
STATE OF TEXAS
BOARD OF WATER ENGINEERS
AUSTIN, TEXAS
QUALITY OF WATER STATIONS
WATER YEAR, 1953
JULY, 1956
BY W-93