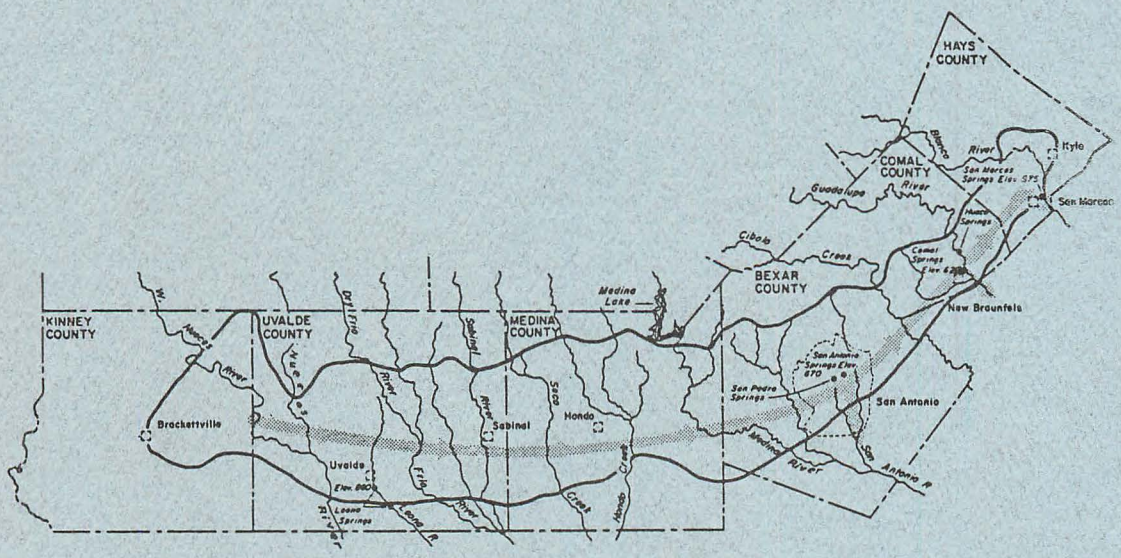
COMPILATION OF HYDROLOGIC DATA FOR THE EDWARDS AQUIFER, SAN ANTONIO AREA, TEXAS, 1991, WITH 1934-91 SUMMARY

Bulletin 51
Edwards Underground Water District
San Antonio, Texas



Prepared by the U.S. GEOLOGICAL SURVEY in cooperation with the EDWARDS UNDERGROUND WATER DISTRICT

RECYCLED PAPER

EDWARDS UNDERGROUND WATER DISTRICT

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Compiled by

D.S. Brown, B.L. Petri, and G.M. Nalley
U.S. Geological Survey

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COMPILATION OF HYDROLOGIC DATA FOR THE EDWARDS AQUIFER, SAN ANTONIO AREA, TEXAS, 1991, WITH 1934-91 SUMMARY

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ABSTRACT

The average estimated annual ground-water recharge to the Edwards aquifer in the San Antonio area, Texas, from 1934 through 1991 was 651,700 acre-feet. Recharge in 1991 was 1,508,400 acre-feet, which is the third largest estimated annual recharge since 1934. The maximum annual recharge of 2,003,600 acre-feet occurred in 1987, and a minimum annual recharge of 43,700 acre-feet occurred in 1956.

The estimated annual discharge from the Edwards aquifer by wells and springs in 1991 was 790,300 acre-feet, which is the fourteenth largest calculated annual discharge since 1934. Annual discharge by wells and springs ranged from a maximum of 960,900 acre-feet in 1977 to a minimum of 388,800 acre-feet in 1955.

Water-level data for wells during 1991 reflected a less-than- to about-average volume of ground water in storage in the aquifer during most of the year.

Water samples from 61 wells (including wells drilled in 1985 that transect the freshwater/saline-water interface) and 3 springs in the Edwards aquifer were analyzed for more than 90 properties or constituents, most of which affect the suitability of the water for domestic use. Concentrations of constituents in water from three wells completed in the freshwater zone exceeded the maximum contaminant levels established for public water systems.

Trace concentrations of volatile organic compounds were detected in samples from seven wells.

Surface-water data for the San Antonio area, which were used to calculate annual recharge to and annual discharge from the Edwards aquifer, consisted of discharge data for streams and springs and contents data for reservoirs. The data are stored in the National Water Information System, a computerized data base operated by the U.S. Geological Survey.

INTRODUCTION

This annual compilation of records of precipitation for the San Antonio area, of ground-water recharge and discharge, water levels, and water quality for the Edwards aquifer, and of surface-water data for the San Antonio area, Texas, is part of a continuing investigation by the U.S. Geological Survey in cooperation with the Edwards Underground Water District.

The calculations of annual ground-water recharge are based on data collected from a network of streamflow-gaging stations and on assumptions that relate the runoff characteristics of gaged areas to ungaged areas (Puente, 1978). The basic approach is to use a water-balance equation in which ground-water recharge within a stream basin is equal to the difference between measured streamflow upstream and downstream from the area used for calculating recharge, plus the estimated runoff within this area. The Edwards aquifer and physiographic regions are shown in figure 1, gaged and ungaged recharge basins are shown in figure 2, and data-collection sites are shown in figure 3.

Annual ground-water discharge is compiled from: (1) Springflow data collected by the U.S. Geological Survey; (2) pumpage data for municipal supply and military and industrial uses collected by the Texas Water Development Board; (3) pumpage data for irrigation estimated by the U.S. Geological Survey using irrigated-acreage data supplied by the U.S. Soil Conservation Service; and (4) pumpage data for domestic supply, stock, and miscellaneous use estimated by the U.S. Geological Survey.

Periodic water-level measurements have been made in observation wells completed in the Edwards aquifer since 1929 to determine changes in ground-water storage in the aquifer. The first continuous water-level recorders were installed during the early 1930's. During 1991, periodic and continuous water-level measurements were made.

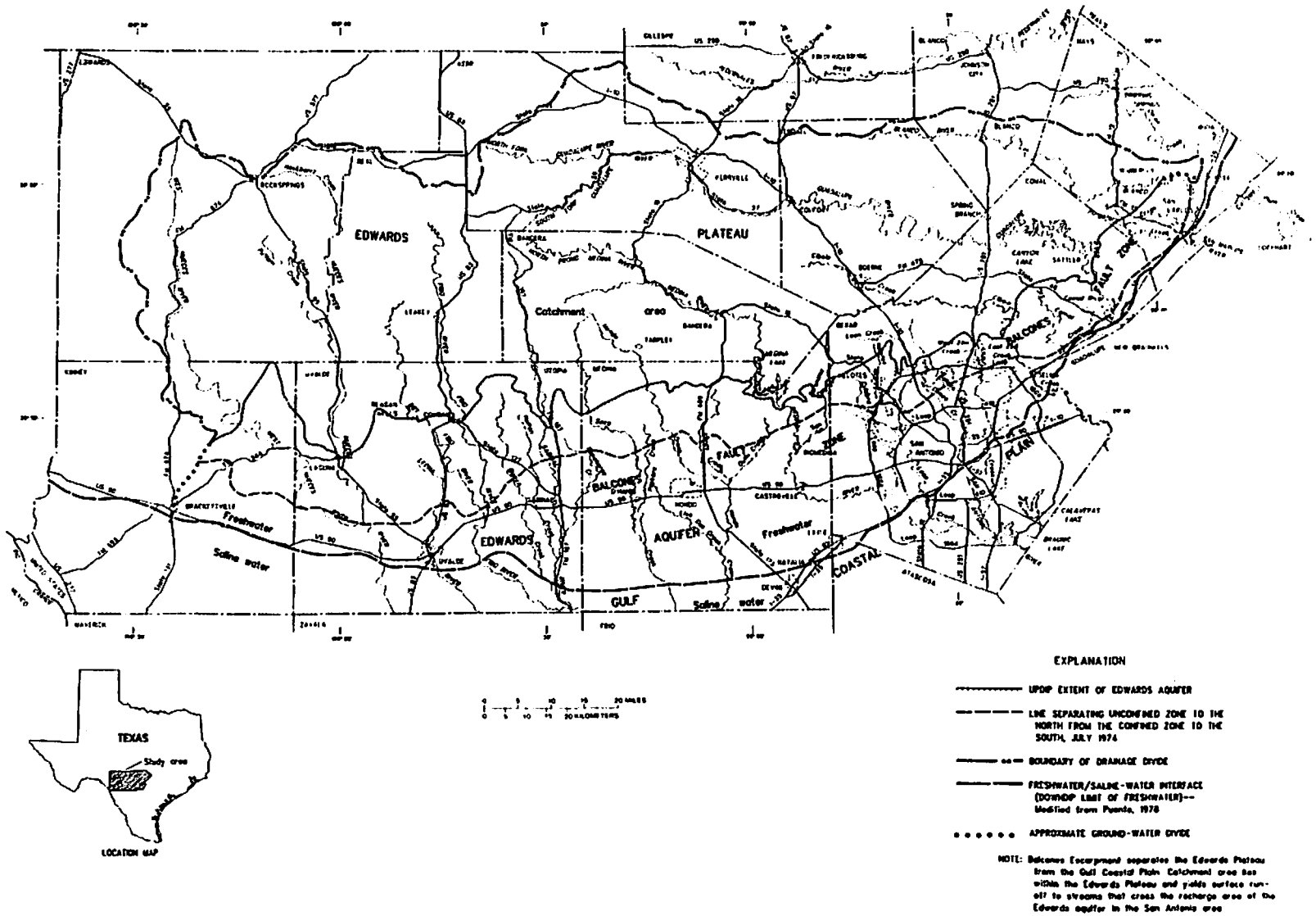

Figure 1.--Location of the Edwards aquifer and physiographic regions in the San Antonio area.

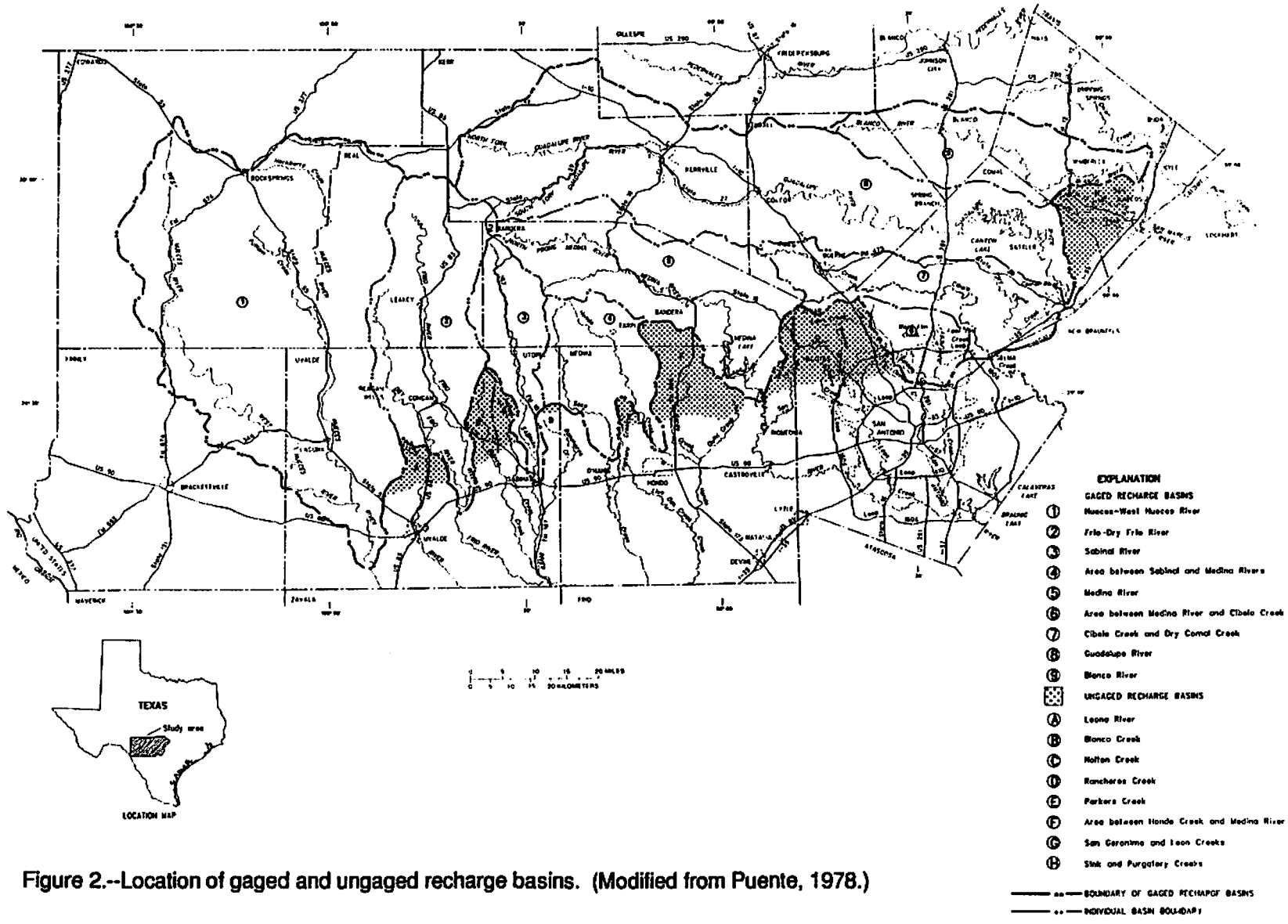

Figure 2.--Location of gaged and ungaged recharge basins. (Modified from Puente, 1978.)

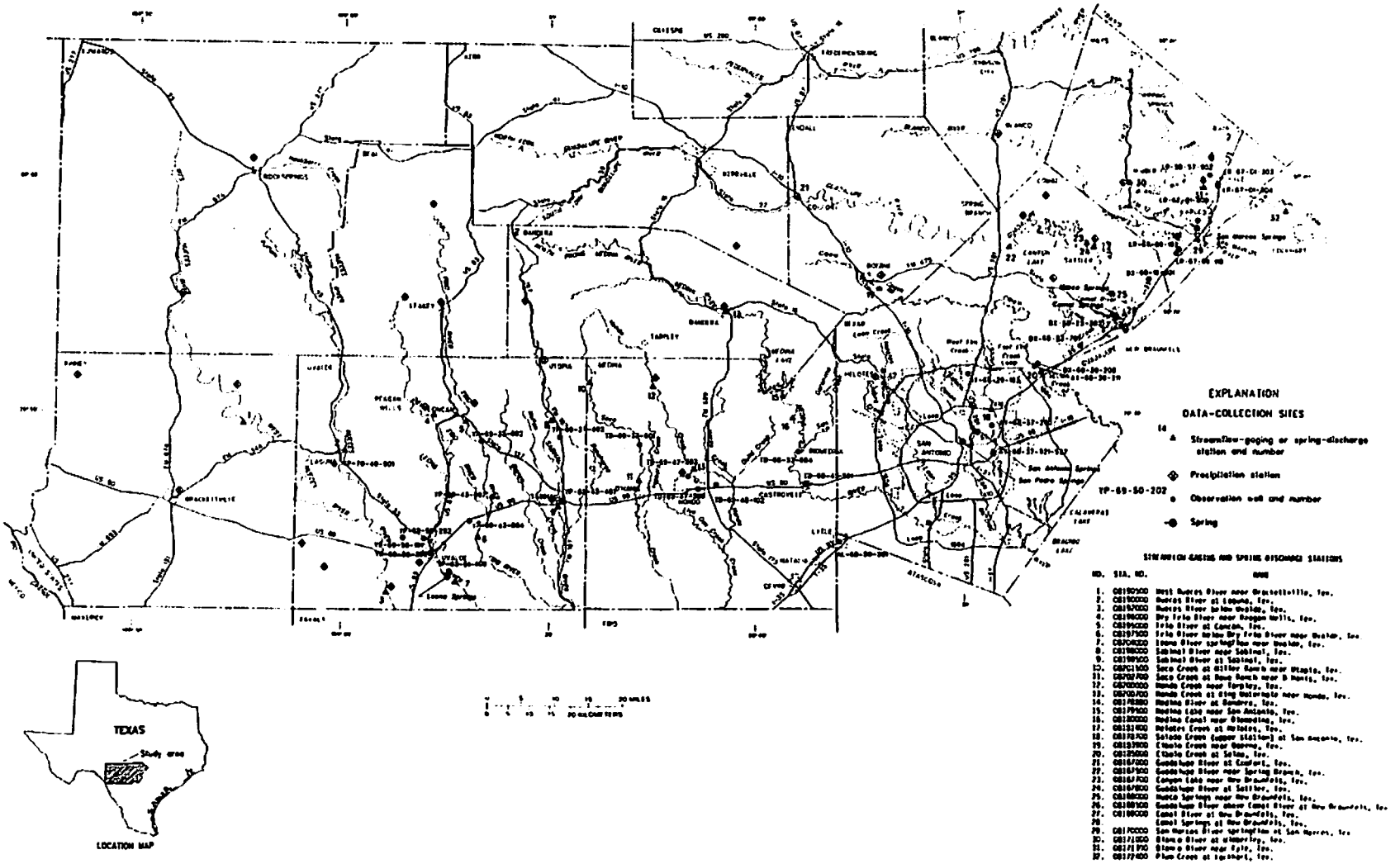

Figure 3.--Location of data-collection sites--streamflow-gaging, spring-discharge, and precipitation stations, observation wells, and springs, 1991. (Modified from Puente, 1978.)

Water-quality samples were collected during 1991 from selected wells completed in and springs discharging from the Edwards aquifer. Samples were analyzed for properties and constituents that affect the domestic use of the water. Monthly samples were collected from wells transecting the freshwater/saline-water interface in order to detect changes in water quality.

Surface-water data for the San Antonio area for the 1991 water year are presented in "Water Resources Data for Texas, Water Year 1991," volume 3 (U.S. Geological Survey, 1992) and are identified by river basins. Provisional data for October-December 1991 were used to calculate ground-water recharge for 1991. Data consist of records of stage, discharge, and water quality of streams and canals; and records of stage, contents, and water quality of lakes and reservoirs. These data are stored in the National Water Information System, a computerized database operated by the U.S. Geological Survey in cooperation with Federal, State, and local agencies.

PRECIPITATION

The annual precipitation for 1934-91 and the long-term average, based on the period of record, at selected stations in the San Antonio area are given in table 1. Annual precipitation for 1991 at seven stations with complete records ranged from about 80 percent greater than the long-term average at New Braunfels to about 10 percent less than the long-term average at Uvalde.

The annual precipitation during 1991 was greater than average at most stations. Fluctuations of reported annual-precipitation totals for San Antonio for 1934-91 are shown in figure 4.

GROUND-WATER RECHARGE

The area used for estimating recharge to the Edwards aquifer in the San Antonio area has been modified slightly from the area described by Puente

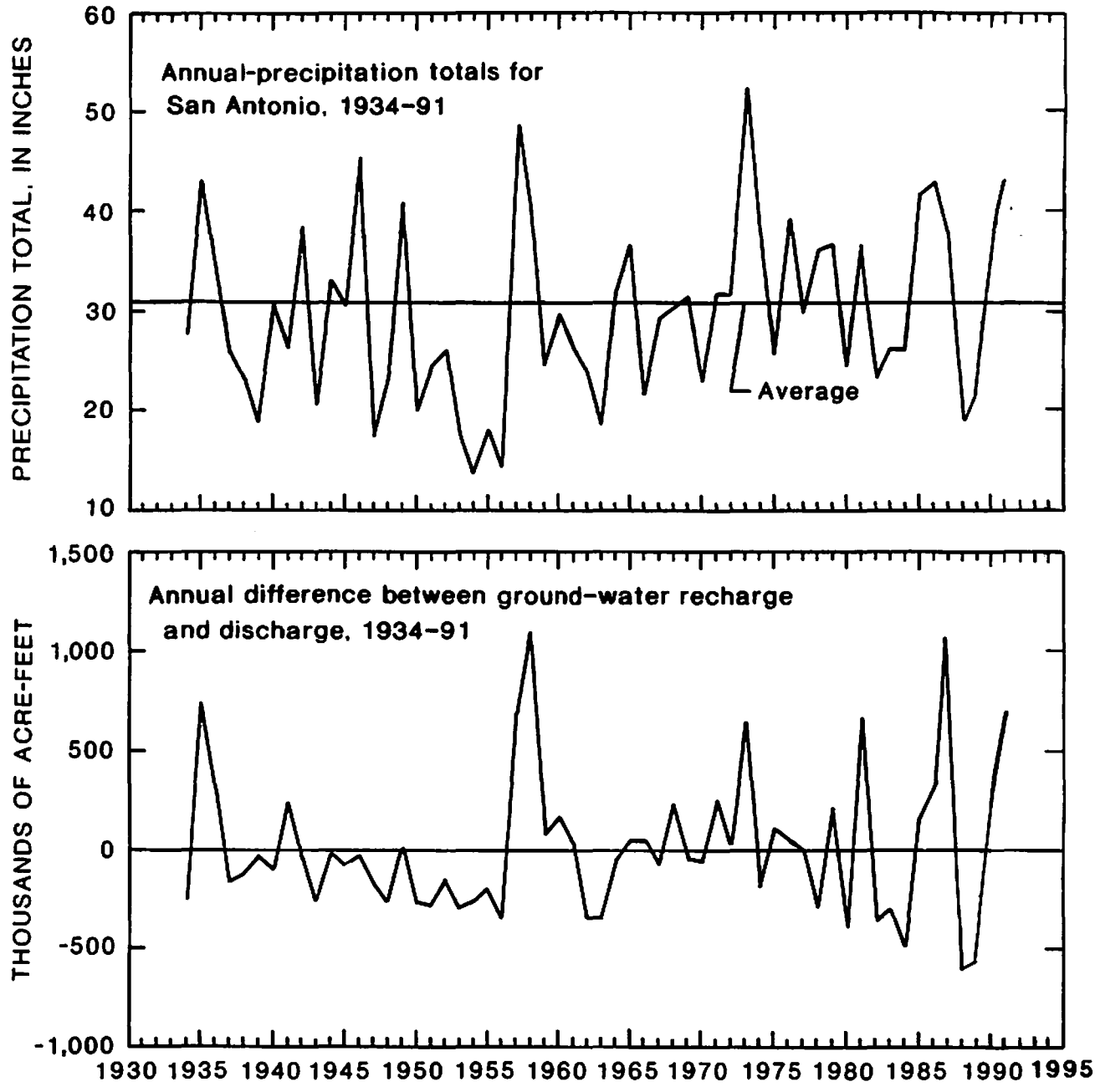

Figure 4.--Annual-precipitation totals for San Antonio, 1934-91, and annual difference between ground-water recharge and discharge, 1934-91.

Table 1.--Annual precipitation for 1934-91 and long-term average precipitation at selected stations a/ [inches]

Calendar year	Brackettville	Uvalde	Sabinal	Hondo	San Antonio	Boerne	New Braunfels	San Marcos
1934	---	16.70	18.07	23.97	27.65	26.78	30.80	35.67
1935	---	41.17	48.21	58.73	42.93	52.93	41.67	41.09
1936	22.34	24.53	26.53	35.27	34.11	47.59	30.41	33.48
1937	16.85	17.88	b/ 9.57	22.93	26.07	32.81	29.19	b/26.03
1938	19.97	13.12	15.39	27.56	23.26	24.14	28.32	28.17
1939	18.38	25.30	c/13.98	23.14	18.83	26.20	13.35	18.59
1940	22.43	27.66	27.51	28.13	30.79	32.29	38.11	43.57
1941	21.52	31.79	b/33.74	44.07	26.34	41.60	42.99	48.41
1942	21.01	19.01	b/11.37	34.83	38.46	31.12	42.08	44.65
1943	c/23.39	20.63	17.21	31.43	20.51	26.33	29.93	25.45
1944	24.76	32.76	b/27.62	32.46	33.19	42.98	43.14	47.42
1945	15.69	22.37	26.60	29.57	30.46	33.50	39.38	c/31.74
1946	19.10	26.41	b/14.16	29.65	45.17	45.62	61.60	52.24
1947	c/22.92	22.67	---	18.98	17.32	21.89	27.52	27.53
1948	b/20.02	18.31	---	28.82	23.64	23.77	c/19.88	b/21.27
1949	31.32	34.41	---	39.90	40.81	41.15	43.21	36.22
1950	17.70	18.27	b/15.28	24.91	19.86	24.94	21.13	21.10
1951	14.71	16.07	15.63	b/24.05	24.44	18.76	24.84	30.88
1952	12.26	18.24	23.16	24.56	26.24	37.54	33.87	39.91
1953	10.12	18.34	21.44	20.61	17.56	21.42	30.06	33.39
1954	19.38	15.60	14.72	11.92	13.70	10.29	10.12	13.42
1955	26.55	18.36	20.87	21.21	18.18	19.27	23.12	26.44
1956	7.58	9.29	11.29	15.54	14.31	12.05	18.41	18.37
1957	34.21	39.30	40.03	35.09	48.83	52.55	51.88	46.51
1958	45.37	39.03	41.18	41.60	39.69	40.94	36.40	39.08
1959	27.51	31.51	27.02	30.68	24.50	35.64	40.45	43.47
1960	19.12	23.98	26.24	32.37	29.76	32.55	34.28	45.48
1961	17.91	26.26	27.24	27.36	26.47	25.45	b/15.70	30.02
1962	10.87	14.12	13.58	17.85	23.90	25.26	27.40	28.47
1963	15.07	16.70	18.99	18.90	18.65	20.66	23.41	19.90
1964	20.75	22.30	23.78	28.29	31.88	27.36	30.65	30.27
1965	21.48	26.21	29.41	30.80	36.65	42.41	45.16	45.00
1966	21.63	20.87	21.54	29.46	21.44	29.05	25.98	27.12
1967	21.95	20.10	23.89	30.33	29.26	26.75	31.74	26.41
1968	17.26	25.20	c/29.88	31.91	30.40	35.14	35.97	37.13
1969	28.53	33.38	33.05	32.30	31.42	38.07	33.01	36.59
1970	16.50	13.59	22.13	30.96	22.74	27.79	35.23	32.30
1971	29.46	31.01	31.00	32.96	31.80	45.24	29.43	31.10
1972	21.21	15.49	21.10	25.43	31.49	35.09	42.02	31.90
1973	30.61	30.85	c/35.14	47.82	52.28	50.93	51.66	47.91
1974	18.25	30.94	c/20.93	c/36.41	37.00	41.80	42.85	b/37.28
1975	26.62	24.92	23.65	b/25.84	25.67	33.49	35.82	48.64
1976	34.40	46.04	40.82	45.21	39.13	45.24	49.06	47.46
1977	15.06	19.90	17.06	19.40	29.64	32.43	24.83	27.69
1978	19.04	18.48	21.28	24.64	35.99	35.17	c/36.35	33.08
1979	16.34	32.35	31.44	28.83	36.64	39.97	36.72	38.74
1980	18.33	23.05	22.67	21.27	24.23	29.02	33.69	29.56
1981	28.73	26.24	30.19	27.40	36.37	41.05	43.23	49.62
1982	19.10	23.35	18.44	21.99	22.96	27.64	21.04	c/22.47
1983	19.35	b/24.45	23.33	c/20.92	26.11	34.60	34.13	36.95
1984	16.24	c/15.33	20.67	b/21.19	25.95	26.97	20.90	b/ 8.26
1985	18.93	b/ 5.76	23.67	21.94	41.43	37.77	37.26	33.54
1986	27.44	c/29.86	c/29.62	c/36.01	42.73	43.52	47.14	42.20
1987	39.45	36.39	38.36	40.09	37.96	39.86	b/37.33	37.94
1988	12.08	15.20	13.52	c/ 9.81	19.01	19.49	c/16.27	21.50
1989	16.98	18.65	17.26	16.10	22.14	25.14	20.99	25.46
1990	c/38.24	24.73	30.06	27.01	38.31	42.51	b/24.58	c/35.14
1991	b/23.28	21.77	35.16	34.54	42.76	48.22	58.09	51.49
Years of record available	92	91	74	89	108	89	96	91
Long-term average	21.16	24.12	25.27	28.33	28.62	33.00	32.34	33.80

a/ Precipitation data from the U.S. Department of Agriculture (1934-40) and U.S. Department of Commerce (1941-91).
b/ Partial record not included in long-term average; missing more than 1 month.
c/ Partial record not included in long-term average; missing 1 month.

(1978) to reflect existing data-collection sites. The delineation of this area is based on surface- and ground-water divides. Recharge to the Edwards aquifer is derived mainly from seepage from streams that cross the outcrop of the aquifer and from direct infiltration of precipitation on the outcrop. Collectively, basins 1-5 in the western part of the recharge zone (fig. 2) have a catchment area of about 2,950 mi^2, which is about 60 percent of the total catchment area for the Edwards aquifer. These basins supply about 70 percent of the total recharge to the aquifer (Burchett and others, 1986). Although some water moves into the Edwards aquifer from aquifers that are hydraulically connected with the Edwards, only recharge from the land surface is used in estimating recharge to the Edwards.

The estimated annual recharge by basin and the average annual recharge for 1934-91 are given in table 2. Recharge in the Guadalupe River basin is not included because the net recharge to the aquifer in this basin is negligible (Puente, 1978).

The annual recharge for 1934-91 ranged from 43,700 acre-ft in 1956 to 2,003,600 acre-ft in 1987. The average annual recharge for 1934-91 was 651,700 acre-ft. The annual recharge for 1991 was 1,508,400 acre-ft, which is the third largest estimated annual recharge since 1934.

GROUND-WATER DISCHARGE

The estimated total discharge by wells and springs in 1991 was 790,300 acre-ft, the fourteenth largest calculated discharge since 1934 (table 3). Annual discharge by wells and springs ranged from a maximum of 960,900 acre-ft in 1977 to a minimum of 388,800 acre-ft in 1955. In 1991, most of the estimated discharge was from wells and constituted about 55 percent of the total discharge. Spring discharge comprised about 45 percent of the total discharge for the year. The estimated annual discharge, by county, from the

Table 2.--Estimated annual recharge to the Edwards aquifer by basin, 1934-91 a/
[thousands of acre-feet]

Calendar year	Nueces-West Nueces River basin	Frio-Dry Frio River basin b/	Sabinal River basin b/	Area between Sabinal River and Medina River basins b/	Medina River basin c/	Area between Medina River basin and Cibolo-Dry Comal Creek basins b/	Cibolo Creek and Dry Comal Creek basin	Blanco River basin b/	Total
1934	8.6	27.9	7.5	19.9	46.5	21.0	28.4	19.8	179.6
1935	411.3	192.3	56.6	166.2	71.1	138.2	182.7	39.8	1,258.2
1936	176.5	157.4	43.5	142.9	91.6	108.9	146.1	42.7	909.6
1937	28.8	75.7	21.5	61.3	80.5	47.8	63.9	21.2	400.7
1938	63.5	69.3	20.9	54.1	65.5	46.2	76.8	36.4	432.7
1939	227.0	49.5	17.0	33.1	42.4	9.3	9.6	11.1	399.0
1940	50.4	60.3	23.8	56.6	38.8	29.3	30.8	18.8	308.8
1941	89.9	151.8	50.6	139.0	54.1	116.3	191.2	57.8	850.7
1942	103.5	95.1	34.0	84.4	51.7	66.9	93.6	28.6	557.8
1943	36.5	42.3	11.1	33.8	41.5	29.5	58.3	20.1	273.1
1944	64.1	76.0	24.8	74.3	50.5	72.5	152.5	46.2	560.9
1945	47.3	71.1	30.8	78.6	54.8	79.6	129.9	35.7	527.8
1946	80.9	54.2	16.5	52.0	51.4	105.1	155.3	40.7	556.1
1947	72.4	77.7	16.7	45.2	44.0	55.5	79.5	31.6	422.6
1948	41.1	25.6	26.0	20.2	14.8	17.5	19.9	13.2	178.3
1949	166.0	86.1	31.5	70.3	33.0	41.8	55.9	23.5	508.1
1950	41.5	35.5	13.3	27.0	23.6	17.3	24.6	17.4	200.2
1951	18.3	28.4	7.3	26.4	21.1	15.3	12.5	10.6	139.9
1952	27.9	15.7	3.2	30.2	25.4	50.1	102.3	20.7	275.5
1953	21.4	15.1	3.2	4.4	36.2	20.1	42.3	24.9	167.6
1954	61.3	31.6	7.1	11.9	25.3	4.2	10.0	10.7	162.1
1955	128.0	22.1	0.6	7.7	16.5	4.3	3.3	9.5	192.0
1956	15.6	4.2	1.6	3.6	6.3	2.0	2.2	8.2	43.7
1957	108.6	133.6	65.4	129.5	55.6	175.6	397.9	76.4	1,142.6
1958	266.7	300.0	223.8	294.9	95.5	190.9	268.7	70.7	1,711.2
1959	109.6	158.9	61.6	96.7	94.7	57.4	77.9	33.6	690.4
1960	88.7	128.1	64.9	127.0	104.0	89.7	160.0	62.4	824.8
1961	85.2	151.3	57.4	105.4	88.3	69.3	110.8	49.4	717.1
1962	47.4	46.6	4.3	23.5	57.3	16.7	24.7	18.9	239.4
1963	39.7	27.0	5.0	10.3	41.9	9.3	21.3	16.2	170.7
1964	126.1	57.1	16.3	61.3	43.3	35.8	51.1	22.2	413.2
1965	97.9	83.0	23.2	104.0	54.6	78.8	115.3	66.7	623.5
1966	169.2	134.0	37.7	78.2	50.5	44.5	66.5	34.6	615.2
1967	82.2	137.9	30.4	64.8	44.7	30.2	57.3	19.0	466.5
1968	130.8	176.0	66.4	198.7	59.9	83.1	120.5	49.3	884.7
1969	119.7	113.8	30.7	84.2	55.4	60.2	99.9	46.6	610.5
1970	112.6	141.9	35.4	81.6	68.0	68.8	113.8	39.5	661.6
1971	263.4	212.4	39.2	155.6	68.7	81.4	82.4	22.2	925.3
1972	108.4	144.6	49.0	154.6	87.9	74.3	104.2	33.4	756.4
1973	190.6	256.9	123.9	286.4	97.6	237.2	211.7	82.2	1,486.5
1974	91.1	135.7	36.1	115.3	96.2	68.1	76.9	39.1	658.5
1975	71.8	143.6	47.9	195.9	93.4	138.8	195.7	85.9	973.0
1976	150.7	238.6	68.2	182.0	94.5	47.9	54.3	57.9	894.1
1977	102.9	193.0	62.7	159.5	77.7	97.9	191.6	66.7	952.0
1978	69.8	73.1	30.9	103.7	76.7	49.6	72.4	26.3	502.5
1979	128.4	201.4	68.6	203.1	89.4	85.4	266.3	75.2	1,117.8
1980	58.6	85.6	42.6	25.3	88.3	18.8	55.4	31.8	406.4
1981	205.0	365.2	105.6	252.1	91.3	165.0	196.8	67.3	1,448.4
1982	19.4	123.4	21.0	90.9	76.8	22.6	44.8	23.5	422.4
1983	79.2	85.9	20.1	42.9	74.4	31.9	62.5	23.2	420.1
1984	32.4	40.4	8.8	18.1	43.9	11.3	16.9	25.9	197.9
1985	105.9	186.9	50.7	148.5	64.7	136.7	259.2	50.7	1,003.3
1986	188.4	192.8	42.2	173.6	74.7	170.2	267.4	44.5	1,153.7
1987	308.5	473.3	110.7	405.5	90.4	229.3	270.9	114.9	2,003.6
1988	59.2	117.9	17.0	24.9	69.9	12.6	28.5	25.5	355.5
1989	52.6	52.6	8.4	13.5	46.9	4.6	12.3	23.6	214.4
1990	479.3	255.0	54.6	131.2	54.0	35.9	71.8	41.3	1,123.2
1991	325.2	421.0	103.1	315.2	52.8	84.5	109.7	96.9	1,508.4
AVERAGE	114.8	125.1	39.7	101.7	60.5	67.5	103.6	38.8	651.7

a/ Differences may occur due to rounding procedures.
b/ Includes recharge from downstream ungaged basins.
c/ Recharge to Edwards aquifer from the Medina River basin consists entirely of losses from Medina Lake (Puente, 1978, p. 23).

Table 3.--Estimated annual discharge from the Edwards aquifer by county, 1934-91 a/
[thousands of acre-feet]

Year	Kinney-Uvalde Counties	Medina County	Bexar County	Comal County	Hays County	Total	Total well discharge	Total spring discharge
1934	12.6	1.3	109.3	229.1	85.6	437.9	101.9	336.0
1935	12.2	1.5	171.8	237.2	96.9	519.6	103.7	415.9
1936	26.6	1.5	215.2	261.7	93.2	598.2	112.7	485.5
1937	28.3	1.5	201.8	252.5	87.1	571.2	120.2	451.0
1938	25.2	1.6	187.6	250.0	93.4	557.8	120.1	437.7
1939	18.2	1.6	122.5	219.4	71.1	432.8	118.9	313.9
1940	16.1	1.6	116.7	203.8	78.4	416.6	120.1	296.5
1941	17.9	1.6	197.4	250.0	134.3	601.2	136.8	464.4
1942	22.5	1.7	203.2	255.1	112.2	594.7	144.6	450.1
1943	19.2	1.7	172.0	249.2	97.2	539.3	149.1	390.2
1944	11.6	1.7	166.3	252.5	135.3	567.4	147.3	420.1
1945	12.4	1.7	199.8	263.1	137.8	614.8	153.3	461.5
1946	6.2	1.7	180.1	261.9	134.0	583.9	155.0	428.9
1947	13.8	2.0	193.3	256.8	127.6	593.5	167.0	426.5
1948	9.2	1.9	159.2	203.0	77.3	450.6	168.7	281.9
1949	13.2	2.0	165.3	209.5	89.8	479.8	179.4	300.4
1950	17.8	2.2	177.3	191.1	78.3	466.7	193.8	272.9
1951	16.9	2.2	186.9	150.5	69.1	425.6	209.7	215.9
1952	22.7	3.1	187.1	133.2	78.8	424.9	215.4	209.5
1953	27.5	4.0	193.7	141.7	101.4	468.3	229.8	238.5
1954	26.6	6.3	208.9	101.0	81.5	424.3	246.2	178.1
1955	28.3	11.1	215.2	70.1	64.1	388.8	261.0	127.8
1956	59.6	17.7	229.6	33.6	50.4	390.9	321.1	69.8
1957	29.0	11.9	189.4	113.2	113.0	456.5	237.3	219.2
1958	23.7	6.6	199.5	231.8	155.9	617.5	219.3	398.2
1959	43.0	8.3	217.5	231.7	118.5	619.0	234.5	384.5
1960	53.7	7.6	215.4	235.2	143.5	655.4	227.1	428.3
1961	56.5	6.4	230.3	249.5	140.8	683.5	228.2	455.3
1962	64.6	8.1	220.0	197.5	98.8	589.0	267.9	321.1
1963	51.4	9.7	217.3	155.7	81.9	516.0	276.4	239.6
1964	49.3	8.6	201.0	141.8	73.3	474.0	260.2	213.8
1965	46.8	10.0	201.1	194.7	126.3	578.9	256.1	322.8
1966	48.5	10.4	198.0	198.9	115.4	571.2	255.9	315.3
1967	81.1	15.2	239.7	139.1	82.3	557.4	341.3	216.1
1968	58.0	9.9	207.1	238.2	146.8	660.0	251.7	408.3
1969	88.5	13.6	216.3	218.2	122.1	658.7	307.5	351.2
1970	100.9	16.5	230.6	229.2	149.9	727.1	329.4	397.7
1971	117.0	32.4	262.8	168.2	99.1	679.5	406.8	272.7
1972	112.6	28.8	247.7	234.3	123.7	747.1	371.3	375.8
1973	96.5	14.9	273.0	289.3	164.3	838.0	310.4	527.6
1974	133.3	28.6	272.1	286.1	141.1	861.2	377.4	483.8
1975	112.0	22.6	259.0	296.0	178.6	868.2	327.8	540.4
1976	136.4	19.4	253.2	279.7	164.7	853.4	349.5	503.9
1977	156.5	19.9	317.5	295.0	172.0	960.9	380.6	580.3
1978	154.3	38.7	269.5	245.7	99.1	807.3	431.8	375.5
1979	130.1	32.9	294.5	300.0	157.0	914.5	391.5	523.0
1980	151.0	39.9	300.3	220.3	107.9	819.4	491.1	328.3
1981	104.2	26.1	280.7	241.8	141.6	794.4	387.1	407.3
1982	129.2	33.4	305.1	213.2	105.5	786.4	453.1	333.3
1983	107.7	29.7	277.6	186.6	118.5	720.1	418.5	301.6
1984	156.9	46.9	309.7	108.9	85.7	702.3	529.8	172.5
1985	156.9	59.2	295.5	200.0	144.9	856.5	522.5	334.0
1986	b/91.7	41.9	294.0	229.3	160.4	b/817.3	429.3	b/388.1
1987	b/94.9	15.9	326.6	286.2	198.4	b/922.0	364.1	b/558.0
1988	b/156.7	82.2	317.4	236.5	116.9	b/909.7	540.0	b/369.8
1989	156.9	70.5	305.6	147.9	85.6	766.6	542.4	224.1
1990	118.1	69.7	276.8	171.3	94.1	730.0	489.4	240.6
1991	76.6	25.6	315.5	221.9	151.0	790.3	436.0	354.3

a/ Differences may occur due to rounding procedures.
b/ Differs from Bulletins 46-48 due to correcting an error found in the method of calculating the Leona Gravel underflow.

Edwards aquifer during 1934-91 is given in table 3. The annual difference between ground-water recharge and discharge for 1934-91 is shown in figure 4. The calculated average daily and total annual discharge by county and by water use for 1991 is given in table 4.

The total estimated discharge from wells (table 3) was 436,000 acre-ft. Well discharge in Bexar County was 311,800 acre-ft, which is about 72 percent of the total well discharge. Most of this well discharge was for municipal supply and military use. Other wells in Bexar County, along with most of the large wells in Uvalde and Medina Counties, supplied water from the Edwards aquifer for the irrigation of about 67,800 acres. The number of acres of each crop type irrigated was estimated using data obtained from the U.S. Soil Conservation Service. The quantity of irrigation water withdrawn from the Edwards aquifer is calculated by multiplying the duty value for each crop type by the estimated number of acres of that crop type. The remaining discharge was for industrial use, domestic supply, stock, and miscellaneous use, and was primarily from wells in Bexar County.

The total estimated spring discharge (table 3) was 354,300 acre-ft for 1991. The major springs from which discharge was estimated include Leona Springs in Uvalde County, San Antonio and San Pedro Springs in Bexar County, Comal and Hueco Springs in Comal County, and San Marcos Springs in Hays County. The combined major spring discharge in Comal and Hays Counties was 338,600 acre-ft, which is about 96 percent of the total spring discharge for the year. The estimated discharge from Leona Springs includes underflow into the alluvial gravels along the stream.

WATER LEVELS AND GROUND-WATER STORAGE

Water levels have been measured periodically in selected observation wells completed in the Edwards aquifer since 1929 to determine changes in

1991

Table 4.--Calculated average daily and total annual discharge from the Edwards aquifer by county and by water use, 1991 a/

[--, data not available]

County	Springs	Municipal supply and military use	Irrigation	Industrial use	Domestic supply, stock, and miscellaneous use b/	Total (million gallons per year)	Total (thousand acre-feet per year)
	Million gallons per day						
Kinney	--	0.3 (.336 thou af/yr)	0.5 (=.37 thou af/yr)	--	0.2	364.8	1.1
Uvalde	10.7	4.2	49.5	0.7	2.2	24,589.9	75.5
Medina	--	5.0	17.2	--	0.6	8,355.3	25.6
Bexar	3.3	187.7	11.5	48.9	30.3	102,807.5	315.5
Comal	177.8	8.9	0.2	10.6	0.6	72,299.4	221.9
Hays	124.4	8.8	0.1	0.1	1.3	49,194.0	151.0
Total (million gallons per year)	115,445.5	78,366.7	28,827.1	21,998.3	12,864.0	257,501.6	
Total (thousand acre-feet per year)	354.3	240.5 - .34 = 240.16	88.5 - .37 = 88.13	67.5	=396.5 39.5 + 67.5 = 395.79		790.3

a/ Differences may occur due to rounding procedures.
b/ Includes pumpage from private schools, country clubs, parks, flowing wells, and cemeteries.

Kinney = 0.5 mgd = 1.535 af/d

1.535 af/d × 365 d/yr = 366 af/yr

366 af/yr = .366 thou af/yr

0.3 mgd = 0.92 a.f./d × 365 dy/yr = 336 af/yr

= .336 thou af/yr

ground-water storage. During the early 1930's, continuous water-level recorders were installed on some of the observation wells.

Water levels in wells fluctuate mainly in response to the change in ground-water storage in the aquifer. Changes in ground-water storage occur when there are differences between the quantities of recharge and discharge. When recharge is greater than discharge, water levels rise and spring discharge increases; when discharge is greater than recharge, water levels decline and spring discharge decreases. During 1991, total recharge was greater than total discharge and was reflected in rising water levels in observation wells at the end of the year. The annual difference between ground-water recharge and discharge for 1934-91 is shown in figure 4. The accumulated difference between ground-water recharge and discharge and the annual average water level for an observation well in Bexar County are shown in figure 5. The observation well is a composite record of wells CY-26 and AY-68-37-203 (J-17).

In 1991, the general trend of water levels for five selected observation wells in the artesian part of the aquifer was slightly downward in the first three quarters of the year, but the trend was upward in the last quarter. This reflected greater-than-normal recharge or less-than-normal discharge, or both, for the entire year. The annual and period-of-record high and low water levels recorded for these five selected observation wells during 1934-91 are given in table 5.

In 1991, water levels in wells shown in figure 3 were measured periodically or were recorded on a continuous basis (Appendix A, Water Levels). The water-level data from all wells with 1991 measurements indicated a general downward trend, reflecting less recharge than discharge for most of the year, although total recharge exceeded total discharge because of excessive precipitation near the end of the year. The water-level data also

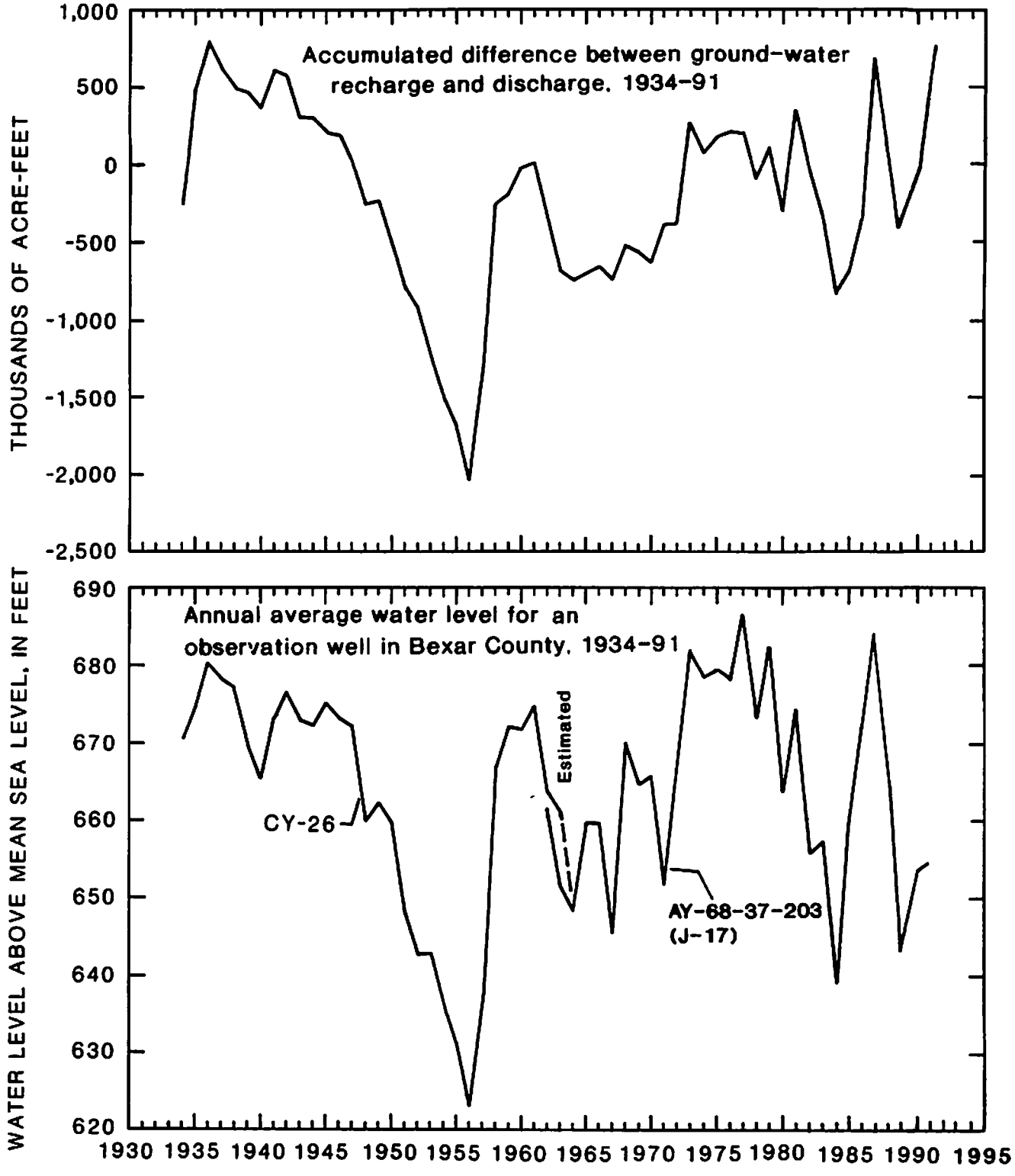

Figure 5.--Accumulated difference between ground-water recharge and discharge, and annual average water level for an observation well in Bexar County, 1934-91.

Table 5.--Annual and period of record high and low water levels measured in selected observation wells completed in the Edwards aquifer, 1934-91

[lsd, land-surface datum; ft, feet. Measurements in feet above mean sea level]

Year	YP-69-50-302 a/ H-5-1 (Uvalde Co.) lsd 904.85 ft		TD-68-41-301 a/ J-1-82 (Medina Co.) lsd 756.84 ft		AY-68-37-203 a/b/ J-17 (Bexar Co.) lsd 730.81 ft		DX-68-23-302 a/ G-49 (Comal Co.) lsd 642.7 ft		LR-67-01-304 a/ H-23 (Hays Co.) lsd 718.0 ft	
	High	Low	High	Low	High	Low	High	Low	High	Low
1934	866.61	--	--	--	675.20	666.81	--	--	--	--
1935	872.12	--	--	--	681.31	666.80	--	--	--	--
1936	876.63	876.51	--	--	683.02	676.62	--	--	--	--
1937	878.11	877.08	--	--	682.08	674.92	--	--	583.4	581.6
1938	875.79	873.95	--	--	681.39	673.58	--	--	590.6	581.5
1939	873.35	869.58	--	--	674.10	665.69	--	--	580.6	569.6
1940	872.33	868.53	--	--	671.43	660.96	--	--	572.2	568.7
1941	875.70	867.74	--	--	682.46	668.26	--	--	587.7	578.6
1942	875.75	871.87	--	--	685.36	669.74	--	--	580.8	573.7
1943	874.53	867.98	--	--	679.58	668.51	--	--	578.2	574.6
1944	869.30	866.80	--	--	677.62	667.13	--	--	580.5	579.3
1945	870.08	865.17	--	--	681.91	668.81	--	--	581.8	--
1946	867.06	862.87	--	--	681.15	663.61	--	--	580.3	--
1947	870.73	867.08	--	--	680.70	665.81	--	--	577.3	577.0
1948	868.37	860.49	--	--	667.74	653.68	624.4	624.3	560.5	559.4
1949	871.15	859.09	--	--	671.59	655.55	626.7	624.1	562.3	561.8
1950	871.24	861.79	686.97	674.86	665.38	653.76	625.2	624.0	575.8	575.2
1951	861.78	846.84	675.17	659.91	656.01	640.63	624.2	622.5	575.3	569.4
1952	846.80	834.87	663.77	649.92	650.49	633.44	623.0	621.5	573.0	569.1
1953	835.21	817.79	665.12	647.69	651.52	630.53	623.6	621.1	584.5	573.2
1954	836.71	823.14	660.34	642.44	646.34	628.09	623.1	620.5	581.8	562.8
1955	834.30	824.05	649.13	635.59	638.49	624.24	621.9	619.8	575.7	558.4
1956	834.20	814.20	641.58	622.31	632.22	612.51	621.0	613.3	569.8	542.2
1957	840.85	810.95	666.11	632.99	653.77	624.36	624.7	620.1	584.9	568.3
1958	866.09	840.82	704.35	665.74	679.56	653.26	626.6	624.6	593.6	580.8
1959	876.06	866.20	703.82	688.95	677.66	661.47	627.1	625.1	591.4	580.5
1960	876.92	873.09	706.29	686.00	679.39	657.86	627.1	624.9	589.4	584.3
1961	878.48	875.60	710.31	693.38	681.16	663.90	627.3	625.7	591.6	573.2
1962	878.26	869.72	703.59	676.34	675.51	646.94	626.3	623.2	584.1	565.0
1963	869.69	860.93	689.12	659.19	665.80	635.02	625.0	621.7	581.6	560.0
1964	860.93	848.97	676.28	654.78	657.04	632.83	624.1	621.6	578.2	562.8
1965	865.82	860.33	689.63	666.77	674.99	645.64	626.6	623.5	590.1	573.4
1966	867.23	860.16	686.06	665.00	668.79	642.74	625.9	623.1	589.0	566.6
1967	867.38	856.44	679.44	645.19	659.69	624.91	624.6	620.0	582.8	556.6
1968	873.31	864.83	701.95	679.19	678.33	655.87	627.2	624.6	593.8	574.4
1969	874.98	866.51	694.76	670.49	676.10	642.77	626.3	623.4	588.7	567.7
1970	876.11	871.32	700.74	678.83	677.08	650.41	627.2	624.3	593.2	575.0
1971	877.65	863.95	701.30	646.43	674.58	627.89	626.2	621.0	577.1	551.5
1972	877.78	874.56	704.59	676.71	678.99	651.17	626.7	624.1	579.7	567.3
1973	881.63	874.50	731.23	690.06	696.52	665.92	629.8	626.1	589.9	572.3
1974	881.35	875.97	723.84	695.96	689.22	660.88	629.1	625.8	593.6	558.5
1975	882.10	879.41	720.99	708.15	686.92	671.99	629.3	626.5	589.8	571.4
1976	884.93	875.97	732.34	694.88	693.11	663.76	629.4	625.8	584.6	571.2
1977	886.21	881.31	737.82	715.27	695.95	675.63	630.2	627.6	587.4	562.1
1978	882.56	875.62	722.40	681.66	684.11	650.13	628.1	624.5	572.0	540.4
1979	881.95	876.06	728.22	710.29	690.52	676.40	629.0	627.3	584.9	572.0
1980	879.07	868.00	716.09	666.76	680.29	640.76	627.5	623.0	572.0	551.8
1981	881.80	867.90	723.17	698.77	685.99	668.57	628.0	625.5	586.2	565.5
1982	881.83	876.35	717.12	682.77	680.45	645.33	627.3	623.6	584.7	544.7
1983	877.05	871.25	698.16	667.69	669.92	642.11	625.6	623.0	588.7	560.4
1984	873.26	856.91	684.52	642.03	656.97	623.29	624.4	619.6	582.5	544.3
1985	876.85	862.24	698.98	670.68	674.50	644.05	626.8	623.3	591.4	561.8
1986	877.82	872.20	704.64	674.19	685.59	649.81	627.7	624.1	595.0	576.3
1987	889.08	877.86	743.48	711.12	699.23	676.88	630.4	627.2	595.9	583.5
1988	887.03	877.99	725.34	679.89	684.87	647.74	627.9	623.9	593.2	585.9
1989	879.02	866.64	695.30	650.52	663.90	626.98	624.9	620.5	581.7	571.5
1990	872.91	861.58	679.47	640.79	658.11	622.66	624.3	620.3	577.6	561.2
1991	873.75	865.36	703.81	666.12	680.32	640.54	627.3	623.3	593.8	575.1
Record	High	Low	High	Low	High	Low	High	Low	High	Low
	889.08	810.95	743.48	622.31	699.23	c/612.51	630.4	613.3	595.9	540.4
Month	June	Apr.	June	Aug.	June	Aug.	June	Aug.	Sept.	July
Year	1987	1957	1987	1956	1987	1956	1987	1956	1987	1978
Period of record	1929-32, 1934-91		1950-91		1932-91		1948-91		1937-91	

a/ New State well number replaces old well number.
b/ Replaces well CY-26, reflects same water level; composite record of wells CY-26 and AY-68-37-203 (J-17).
c/ Record low for well CY-26.

show that increases in storage occurred primarily in the last quarter of the year, which is reflective of the greater-than-average precipitation for the year. As indicated by the water levels, the volume of water in storage in the Edwards aquifer for most of 1991 was less-than to about average.

The water levels in observation wells for 1991 are given in Appendix A. Water-level measurements furnished by the Edwards Underground Water District are reported in feet below land-surface datum; water-level measurements collected by the U.S. Geological Survey are actual elevation above mean sea level. Water levels in wells equipped with continuous water-level recorders are listed in Appendix A for every fifth day and for the end of the month. If known, the altitude of the land surface above mean sea level is given in the well description.

Tabulations of current and historical water-level measurements are available from the Edwards Underground Water District in San Antonio, Texas. Water levels in about 80 additional wells are measured annually in the San Antonio area by personnel of the Texas Water Development Board. Data for these wells are available from the Texas Water Development Board in Austin, Texas. Records also are on file in the office of the U.S. Geological Survey in San Antonio, Texas.

WATER QUALITY FOR WELLS AND SPRINGS

Water-quality samples were collected at 61 selected wells and 3 springs during 1991 (fig. 6). The data-collection sites with historical water-quality data for the area are shown in figures 7 and 8. An enlargement of the San Antonio area is shown in figure 8. Although some of the wells previously sampled are no longer in use, additional samples can be collected at most of the wells in order to detect changes in water quality.

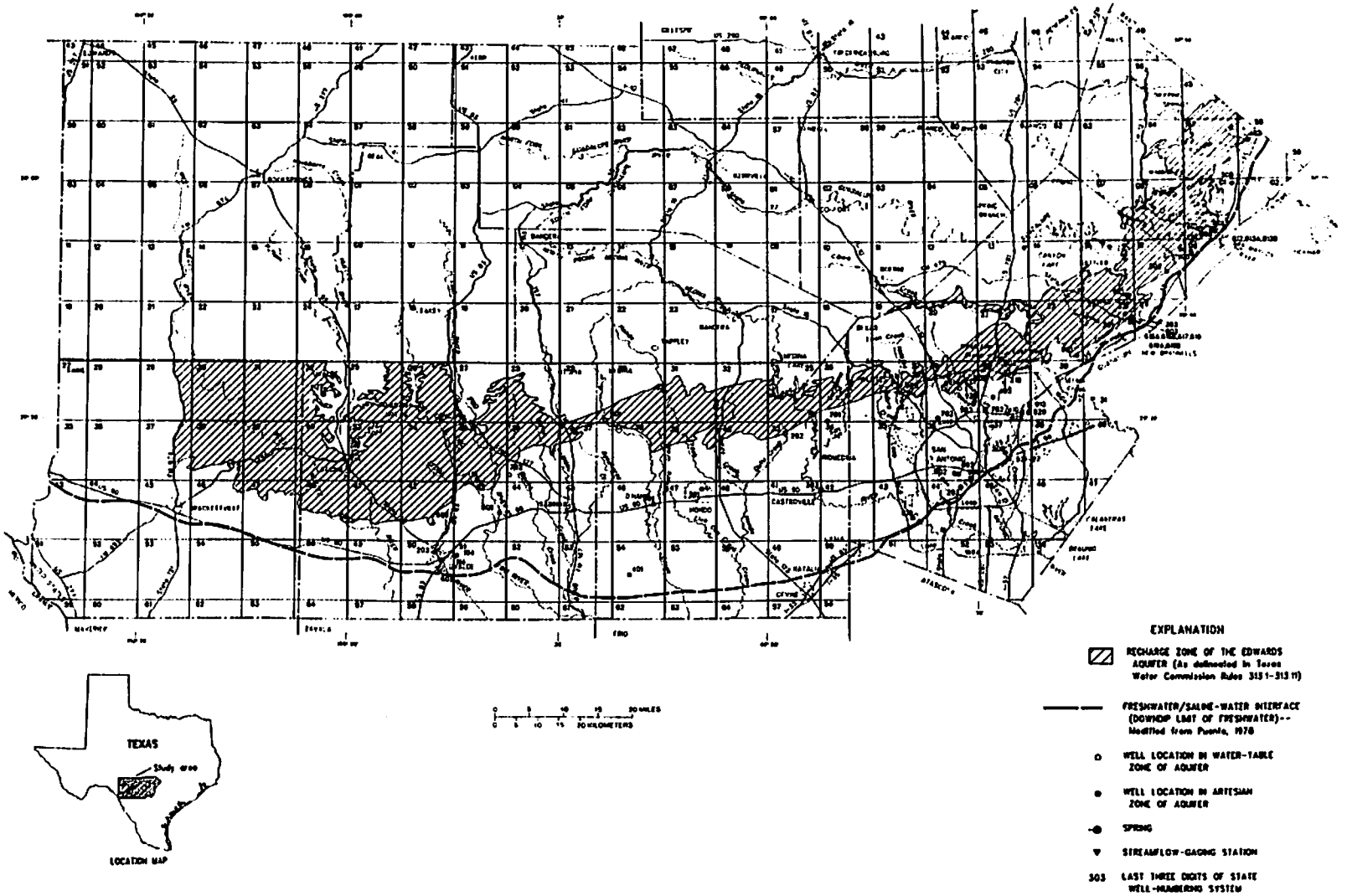

Figure 6.--Location of water-quality data-collection sites--wells, springs, and streams--sampled in 1991.

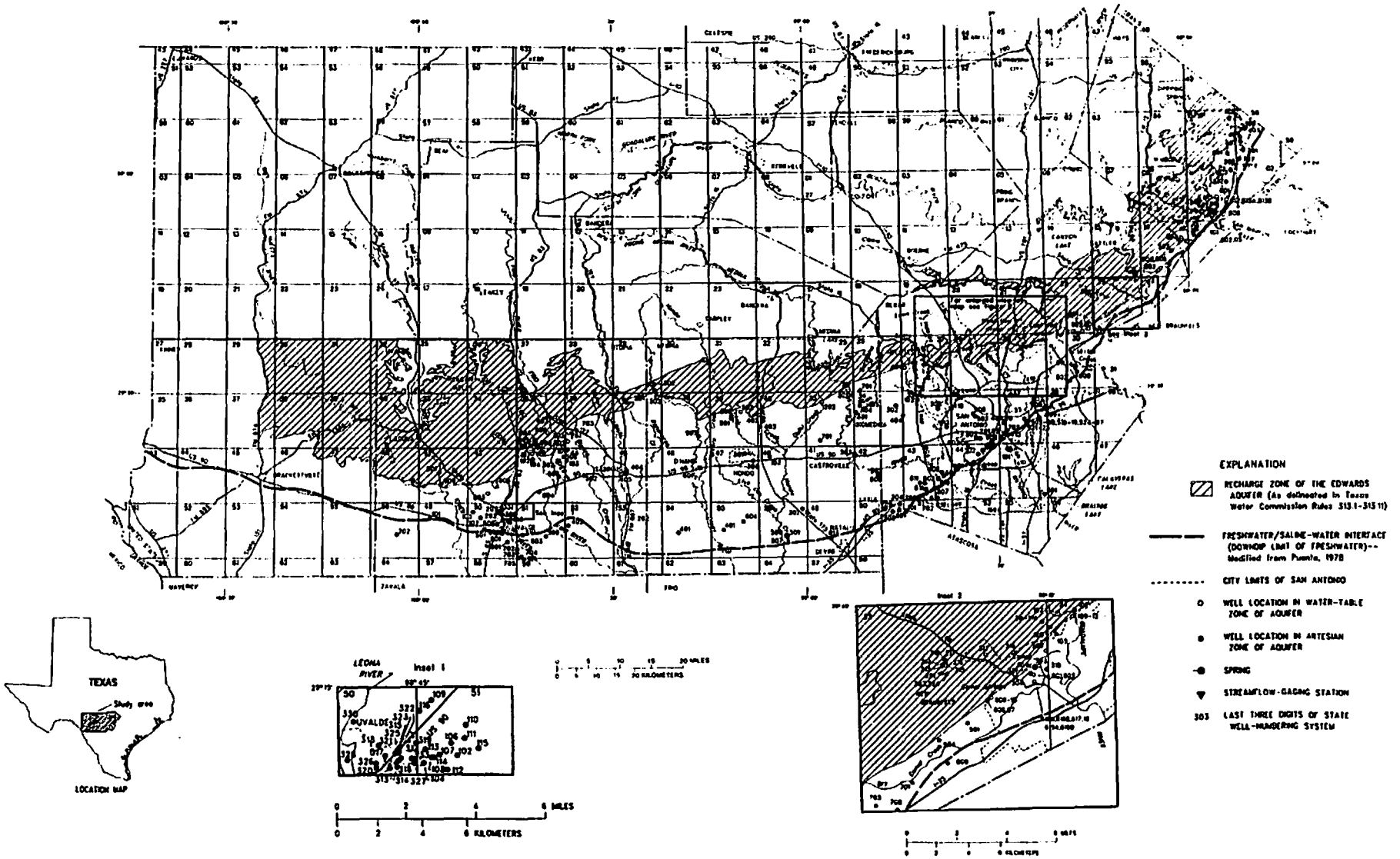

Figure 7. — Location of water-quality data-collection sites — wells, springs, and streams — sampled during 1972-91.

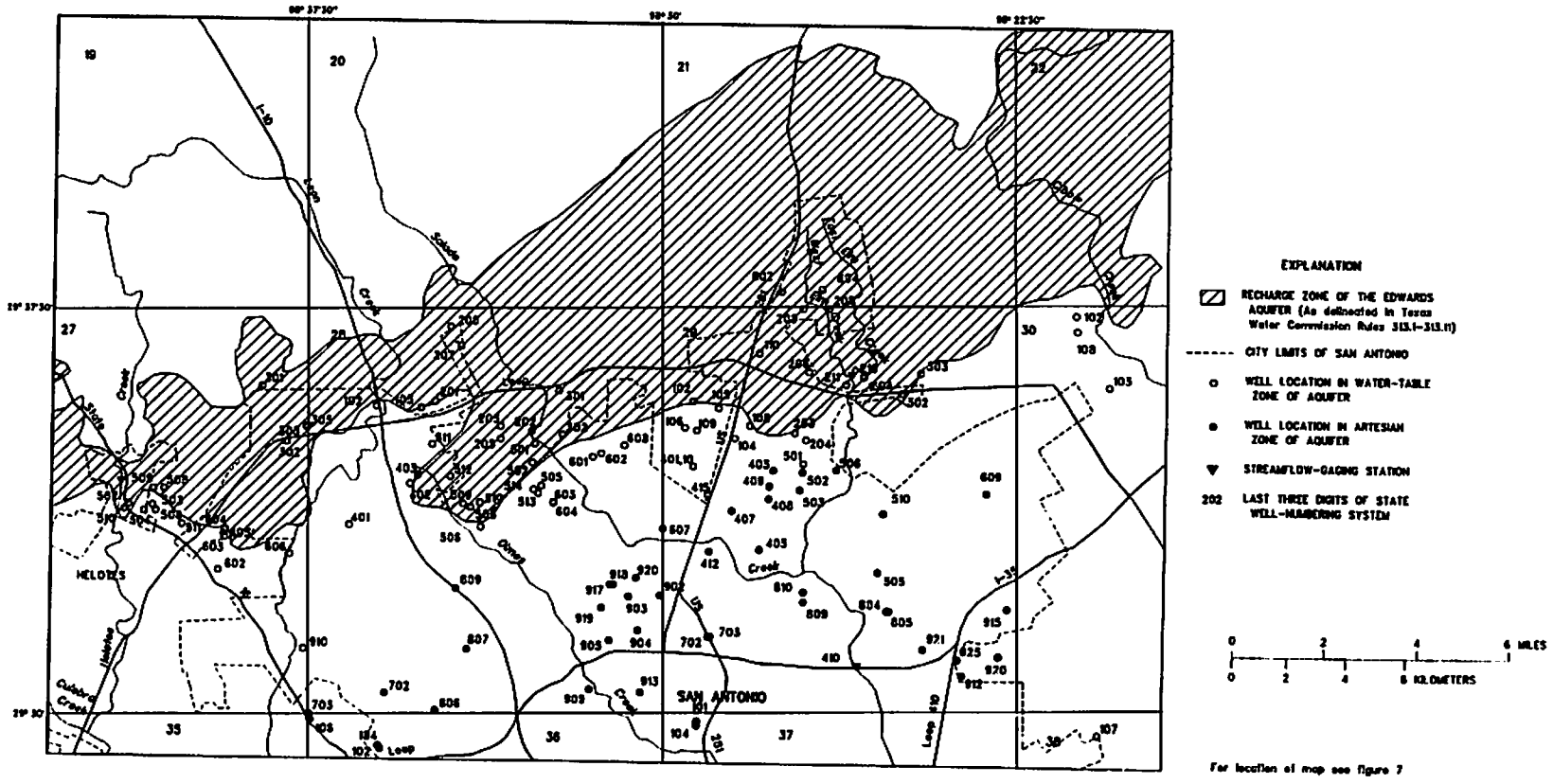

Figure 8.--Location of water-quality data-collection sites--wells, springs, and streams--sampled during 1972-91 in the northern San Antonio area.

The general classification of water based on dissolved-solids concentration (Winslow and Kister, 1956, p. 5) presented below is used for classifying ground water in Texas:

Description	Dissolved-solids concentration (mg/L) 1/
Fresh	Less than 1,000
Slightly saline	1,000 to 3,000
Moderately saline	3,000 to 10,000
Very saline	10,000 to 35,000
Brine	More than 35,000

1/ Milligrams per liter (mg/L) is considered equivalent to parts per million (ppm) for water containing less than 7,000 mg/L dissolved solids.

A transitional interface exists between the freshwater zone and the downdip, saline-water zone. A line of 1,000-mg/L dissolved-solids concentrations defines an arbitrary boundary between the freshwater zone and the saline-water zone. Locally, this line is referred to as the freshwater/saline-water interface, which defines the farthest downdip extent of potable water (Pavlicek and others, 1987).

The freshwater/saline-water interface is shown in figures 1, 6, and 7. South and southeast of the interface, the water from wells is slightly to moderately saline and has large concentrations of sulfate and chloride. Water from some wells north of the interface and from all wells south of the interface contains hydrogen sulfide gas. Wells completed in the freshwater zone near the interface can yield freshwater from the upper part of the aquifer and slightly saline water from the lower part (Reeves, 1971, p. 5). For many purposes, the dissolved-solids concentration is a major limitation on the use of water.

A sampling program was begun in 1985 to drill wells that transect the freshwater/saline-water interface in order to detect changes in water quality as the hydraulic head in the aquifer changes. This program was started in response to the concern that increased withdrawals from the aquifer might result in the encroachment of saline water into the freshwater zone of the aquifer. As part of the water-quality program, monthly samples are collected and analyzed. Other samples are collected and analyzed when certain water-level and spring-discharge criteria are met.

The results of the analyses of water samples that were collected from the Edwards aquifer during 1991 are given in Appendix B, Water Quality. Many of the samples were analyzed for more than 90 properties or constituents, most of which affect the suitability of the water for domestic use. The analyses included determinations of the concentrations of selected properties, common inorganic constituents, nutrients, and dissolved organic carbon; minor elements, including heavy metals; pesticides; and volatile organic compounds. Analyses of samples from wells and springs in the freshwater zone of the aquifer showed that three wells (AY-68-21-804, YP-69-51-104, and YP-69-51-114) each had one constituent that exceeded the maximum contaminant levels (MCL's) established for public water systems (Appendix B).

In 1991, samples from 14 wells and 3 springs were collected and analyzed for pesticides. The results of the analyses showed that water from 13 of the wells and the 3 springs contained no detectable concentrations of pesticides. A sample from one well (AY-68-28-608), however, had a diazinon concentration of 0.01 µg/L.

The samples collected in 1991 for analysis of volatile organic compounds were analyzed for, but the analyses were not limited to, the following compounds on the U.S. Environmental Protection Agency Priority Pollutant list:

Volatile Organic Compounds

Benzene	1,3-Dichloropropene
Bromoform	1,3-Dichlorobenzene
Carbon tetrachloride	Ethylbenzene
Chlorobenzene	Methyl bromide
Chlorodibromomethane	Methylene chloride
Chloroethane	1,1,2,2-Tetrachlorethane
2-Chloroethyl vinyl ether	Tetrachloroethylene
Chloroform	Toluene
Dichlorobromomethane	1,1,1-Trichloroethane
1,1-Dichloroethane	1,1,2-Trichloroethane
1,2-Dichloroethane	Trichloroethylene
1,1-Dichloroethylene	Trichlorofluoromethane
1,2-trans-Dichloroethene	Vinyl chloride
1,2-Dichloropropane	

Analytical methods used for the determination of the volatile organic compounds are described by Wershaw and others (1983) in "Methods for the Determination of Organic Substances in Water and Fluvial Sediments." Although concentrations for chloroform, toluene, benzene, and methylene chloride are given in Appendix B, Water Quality, these compounds are common solvents used in the laboratory, and their presence in a sample often can be traced to contamination of the sample by laboratory atmosphere.

The volatile organic compounds are determined by purge and trap followed by gas chromatography/mass spectrometry. A water sample is purged with helium and the purgeable volatile organic compounds are carried by the helium and trapped on a porous polymer sorbent. The trapped compounds are thermally desorbed into the gas chromatograph and detected by mass spectrometry.

Mass spectra are obtained for every compound that elutes from the gas chromatograph in sufficient concentration to yield a discernible peak. A computerized search is performed for the unknowns using National Institute of Standards and Technology computer library reference spectra of about 35,000

compounds. Although most common volatile organic compounds can be identified by this method, many of the samples contain compounds that cannot be identified because the concentrations were too small or because reliable library matches could not be obtained.

The U.S. Environmental Protection Agency's (1991) MCL's for nine volatile organic compounds are given at the end of Appendix B, Water Quality. The MCL's are enforceable standards and are set as close to the maximum contaminant level goals (MCLG's) as is feasible. The MCL's are based on availability and performance of treatment technologies; the availability, performance, and cost of analytical methods; and costs for achieving various levels of removal.

The MCLG's are nonenforceable health goals that are set at levels which would result in no known or anticipated adverse health effects with an adequate margin of safety. The MCLG's for substances considered to be probable human carcinogens are set at zero, and MCLG's for substances not treated as probable human carcinogens are based on chronic toxicity or other data. The final MCLG's for nine volatile organic compounds in drinking water are:

Compound	MCLG (µg/L)
Benzene	0
Carbon tetrachloride	0
1,4-Dichlorobenzene	75
1,2-Dichloroethane	0
1,1-Dichloroethylene	7
Tetrachloroethylene	0
1,1,1-Trichloroethane	200
Trichloroethylene	0
Vinyl chloride	0

Sampling for volatile organic compounds in 1991 was concentrated in areas, such as the water-table part of the aquifer, where possible or

suspected degradation of water quality might occur. Sampling in other areas of the aquifer was conducted on a rotational, monitoring basis.

In 1991, 26 wells and 1 spring were sampled and analyzed for volatile organic compounds. The results of the analyses showed that samples from 19 of the wells and the spring contained no detectable concentrations of volatile organic compounds. Samples from seven wells, however, contained one or more measurable volatile organic compounds. The concentrations ranged from 0.20 to 7.6 µg/L. Samples from five wells contained one or more volatile organic compounds at concentrations equal to or greater than 1.0 µg/L.

Trihalomethanes, which include dichlorobromomethane, bromoform, chlorodibromomethane, and chloroform, were detected in a sample from well LR-67-01-806. Concentrations above the detection threshold ranged from 0.40 to 4.3 µg/L. The principal source of trihalomethanes in drinking water is the chemical interaction of chlorine (added for disinfection) with natural humic substances in untreated water.

Tetrachloroethylene or trichloroethylene or both were detected in six of the wells sampled. These wells were AY-68-27-503, AY-68-28-903, AY-68-28-920, LR-67-01-806, YP-69-51-104, and YP-69-51-114. Concentrations above the detection threshold ranged from 0.20 to 7.6 µg/L.

SURFACE-WATER DATA

Discharge (or stage) data for streams, contents (or stage) data for lakes and reservoirs, and chemical-quality, water-temperature, and suspended-sediment data for streams are published in U.S. Geological Survey Water-Supply Papers or in U.S. Geological Survey Water-Data Reports. These reports may be examined in the libraries of principal cities of the United States or in the offices of the Water Resources Division of the U.S. Geological Survey.

Discharge data for streams and springs, contents data for reservoirs, and water-quality data for streams and a reservoir collected at selected stations

in the vicinity of the Edwards aquifer in the San Antonio area are given in Appendix C, Surface Water. These data are used in the calculation of the annual recharge to and the annual discharge from the aquifer.

Water-quality data collected at stations upstream from the recharge zone are used to evaluate the quality of water recharging the aquifer. Data collected at gaging stations throughout the area provide streamflow and water-quality information for areas of different types of land uses and for floods of various magnitudes during all seasons of the year. Data-collection sites are shown in figure 3.

APPENDIX A. WATER LEVELS

Water levels measured in observation wells completed in the Edwards aquifer, 1991
(Water levels furnished by Edwards Underground Water District)

[diam., diameter; in., inches; ft, feet; lsd, land surface datum; msl, mean sea level; Eom, end of month; ....., data missing]

291342098475401. AL-68-50-201. Public-supply artesian well in Edwards aquifer, diam. 10 to 8 in., depth 2,379 ft, cased to 2,304 ft. Lsd 724.14 ft above msl. Highest water level 14.12 ft below lsd, Nov. 12, 1973; lowest 87.62 ft below lsd, Jan. 12, 1957. Records available 1957-88, 1991.

Date	Water level
Mar. 12, 1991	55.25
Apr. 2	57.38
Apr. 7	47.87
July 3	58.45

Date	Water level
Sept. 19, 1991	63.63
Oct. 10	62.17
Nov. 8	60.65
Dec. 21	35.42

293522098291201. AY-68-29-103 (F-214). Unused water-table well in Edwards aquifer, diam. 10 in., depth 547 ft, cased to 100 ft. Lsd 952.67 ft above msl. Highest water level 224.38 ft below lsd, July 29, 1987; lowest 284.35 ft below lsd, Nov. 21, 1957. Records available 1957-91.

Highest 1991 water level 260.94 ft below lsd on Dec. 31; lowest 1991 water level 277.96 ft on Jan. 1.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	277.70	275.10	274.98	271.10	265.78	263.04	262.18	264.12	266.11	267.43	269.66	270.67
10	277.57	275.47	275.58	268.36	264.36	262.95	262.12	264.62	266.57	268.22	269.83	270.70
15	277.50	275.70	275.24	267.82	263.30	262.75	262.67	265.25	266.57	268.76	270.00	271.03
20	277.30	274.34	273.50	268.19	262.79	263.22	262.70	265.71	266.80	269.16	270.33	265.25
25	277.17	275.14	273.73	268.20	262.48	262.02	262.67	265.75	266.75	269.48	270.51	262.18
Eom	277.30	274.92	273.88	268.50	262.55	262.14	263.44	266.17	267.19	269.56	270.37	260.94

293617098194001. AY-68-30-211 (G-69). Unused artesian well in Edwards aquifer, diam. 6 in., depth 777 ft, cased to 230 ft. Lsd 776.45 ft above msl. Highest water level 85.70 ft below lsd, Oct. 16, 1973; lowest 154.16 ft below lsd, Aug. 3, 1984. Records available 1964-86, 1989-91.

Date	Water level
Mar. 6, 1991	125.64
Apr. 1	128.63
Apr. 29	122.12
May 29	122.09

Date	Water level
July 1, 1991	126.82
Aug. 1	134.20
Sept. 17	133.05

Date	Water level
Oct. 9, 1991	127.54
Nov. 11	132.32
Dec. 4	130.56

292845098255401. AY-68-37-203 (J-17)a/. Unused artesian well in Edwards aquifer, diam. 6 in., depth 874 ft, cased to 491 ft. Lsd 730.81 ft above msl. Highest water level 31.58 ft below lsd, June 17, 1987; lowest 110.05 ftb/ below lsd, Aug. 17, 1956. Records available 1932-91c/.

Highest 1991 water level 50.49 ft below lsd on Dec. 31; lowest 1991 water level 90.27 ft below lsd on Aug. 22.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	77.65	70.68	71.55	71.35	65.85	77.85	74.48	87.07	84.15	80.64	80.84	77.33
10	76.76	69.31	74.10	66.51	63.45	80.60	73.60	86.99	83.41	81.55	80.22	75.92
15	76.24	70.37	75.15	65.75	62.57	83.23	76.78	89.26	82.05	83.43	80.88	74.41
20	.....	70.27	73.83	66.22	62.52	82.34	80.12	88.71	81.30	83.53	79.87	64.40
25	73.10	70.50	73.97	67.56	65.64	77.50	80.32	86.44	80.00	84.41	79.36	53.65
Eom	73.17	70.92	76.65	69.45	73.70	75.63	84.15	87.30	80.33	82.53	77.37	50.49

294720098030001. DX-68-16-801 (G-25). Domestic water-table well in Edwards aquifer, diam. 6 in., depth 210 ft, casing information not available. Lsd 752.71 ft above msl. Highest water level 128.19 ft below lsd, June 22, 1981; lowest 169.56 ft below lsd, Oct. 1, 1956. Records available 1936-91.

Date	Water level
Mar. 6, 1991	145.53
Apr. 1	145.78
Apr. 29	142.94
May 29	139.65

Date	Water level
July 1, 1981	140.03
July 29	141.77
Sept. 17	145.56

Date	Water level
Oct. 9, 1991	145.96
Nov. 12	146.70
Dec. 4	146.56

294310098080001. DX-68-23-302 (G-49). Unused water-table well in Edwards aquifer, diam. 8 to 3 in., depth 230 ft, cased to 24 ft. Lsd 642.7 ft above msl. Highest water level 12.30 ft below lsd, June 25, 1987; lowest 29.36 ft below lsd, Aug. 21, 1956. Records available 1948-91.

Highest 1991 water level 15.37 ft below lsd on Dec. 31; lowest 1991 water level 19.45 ft below lsd on Aug. 22.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	19.03	18.21	18.04	18.20	17.24	17.76	18.02	18.98	19.17	18.82	19.00	18.70
10	18.90	18.06	18.21	17.78	16.94	18.02	17.92	19.10	19.08	18.88	18.93	18.62
15	18.83	18.05	18.31	17.56	16.91	18.31	17.98	19.36	18.98	19.00	18.97	18.50
20	18.60	18.04	18.24	17.50	16.84	18.40	18.28	19.41	18.96	19.08	18.90	16.50
25	18.51	18.02	18.27	17.51	16.96	18.23	18.41	19.30	18.80	19.20	18.86	16.15
Eom	18.43	18.02	18.43	17.52	17.34	18.07	18.70	19.38	18.78	19.10	18.73	15.73

293855098125901. DX-68-23-701 (H-20). Domestic artesian well in Edwards aquifer, diam. 4 in., depth 300 ft, cased to 300 ft. Lsd 684.45 ft above msl. Highest water level 17.84 ft below lsd, Oct. 29, 1973; lowest 70.07 ft below lsd, Oct. 2, 1956. Records available 1934, 1937-91.

Date	Water level
Mar. 6, 1991	43.13
Apr. 1	44.90
Apr. 29	40.25
May 29	34.79

Date	Water level
July 1, 1991	43.86
July 29	47.14
Sept. 17	48.10

Date	Water level
Oct. 9, 1991	47.87
Nov. 12	48.04
Dec. 4	46.54

293636098190901. DX-68-30-208 (H-36). Unused artesian well in Edwards aquifer, diam. 8 in., depth 292 ft, casing slotted 272 to 292 ft. Lsd 797.81 ft above msl. Highest water level 109.05 ft below lsd, June 14, 15, 1987; lowest 184.45 ft below lsd, Aug. 18, 1956. Records available 1945, 1955-91.

Highest 1991 water level 130.06 ft below lsd on Dec. 22; lowest 1991 water level 158.75 ft below lsd on Aug. 22.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	152.53	147.20	146.77	144.12	140.40	146.95	147.46	.....	.....	.....	153.95	151.40
10	151.84	146.19	148.10	143.48	139.20	149.67	146.70	.....	.....	153.72	153.63	150.60
15	151.42	146.36	148.97	142.50	138.47	.....	147.90	158.50	.....	154.83	153.72	.....
20	149.25	146.30	148.01	142.28	138.28	.....	150.20	158.35	153.93	155.30	153.22	136.90
25	148.87	146.35	148.36	142.60	139.51	149.45	151.06	157.57	153.09	155.90	153.00	130.38
Eom	148.80	146.33	149.80	.....	143.70	148.37	154.09	158.15	153.03	154.82	152.04	130.40

300025097533501. LR-58-57-902 (E-65). Domestic water-table well in Edwards aquifer, diam. 6 in., depth 450 ft, casing information not available. Lsd 821.55 ft above msl. Highest water level 179.86 ft below lsd, May 25, 1977; lowest 247.63 ft below lsd, Aug. 29, 1956. Records available 1943, 1950-52, 1954, 1956, 1958, 1961, 1971-91.

Date	Water level
Mar. 6, 1991	202.97
Apr. 1	206.51
Apr. 29	202.96
May 29	190.86

Date	Water level
July 1, 1991	193.11
July 29	198.87
Sept. 17	205.03

Date	Water level
Oct. 9, 1991	204.20
Nov. 12	210.28
Dec. 4	214.67

295923097523101. LR-67-01-303. Kyle city well. Unused water-table well in Edwards aquifer, diam. 8 in., depth 593 ft, cased to 305 ft. Lsd 715 ft above msl. Recorder established June 28, 1991.

Highest 1991 water level 124.81 ft below lsd on Dec. 31; lowest 1991 water level 146.15 ft below lsd on July 15.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	.....	.....	.....	.....	.....	.....	143.83	135.92	130.73	127.40	128.98	130.14
10	.....	.....	.....	.....	.....	.....	144.10	134.42	129.45	127.58	128.83	130.65
15	.....	.....	.....	.....	.....	.....	146.15	135.14	128.97	130.03	128.75	130.83
20	.....	.....	.....	.....	.....	.....	136.30	133.24	128.60	129.80	129.60	129.85
25	.....	.....	.....	.....	.....	.....	142.80	132.32	127.94	125.05	130.27	128.09
Eom	.....	.....	.....	.....	.....	144.27	135.84	133.10	127.47	129.63	129.57	124.81

295909097523301. LR-67-01-304 (LR-67-02-102) (H-23). Unused artesian well in Edwards aquifer, diam. 5 in., depth 372 ft, cased to 340 ft. Lsd 718.0 ft above msl. Highest water level 122.14 ft below lsd, Sept. 30, 1987; lowest 177.60 ft below lsd, July 10, 1978. Records available 1937-91.

Date	Water level
Mar. 6, 1991	132.13
Apr. 1	131.12
Apr. 29	133.58
May 29	142.20
July 1, 1991	142.90
July 29	141.26
Sept. 17	130.15
Oct. 9	127.22
Nov. 12, 1991	128.68
Dec. 4	131.70
Dec. 31	124.18

295443097554201. LR-67-01-809 (H-49). Domestic water-table well in Edwards aquifer, diam. 34 in., depth 32.5 ft, casing information not available. Lsd 601.7 ft above msl. Highest water level 17.60 ft below lsd, June 15, 1987; lowest 27.42 ft below lsd, Dec. 25, 31, 1989. Records available 1937, 1950, 1954-55, 1980-91.

Highest 1991 water level 19.32 ft below lsd on Dec. 31; lowest 1991 water level 26.66 ft below lsd on Jan. 1.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	26.60	24.87	24.75	24.83	23.82	23.68	24.33	25.10	25.32	25.20	25.60	26.06
10	25.92	24.70	24.84	24.26	23.47	23.85	24.45	25.17	25.40	25.33	25.65	26.05
15	25.58	24.67	24.89	24.02	23.35	23.87	24.58	25.29	25.46	25.40	25.69	26.03
20	25.35	24.67	24.74	23.85	23.36	24.04	24.74	25.38	25.40	25.47	25.80	23.10
25	25.24	24.70	24.74	23.79	23.43	24.14	24.83	25.33	25.22	25.55	25.87	19.58
Eom	25.13	24.71	24.87	23.85	23.53	24.20	24.94	25.35	25.18	25.57	25.90	19.32

295103097583301. LR-67-09-102 (LR-68-16-601) (H-95). Unused artesian well in Edwards aquifer, diam. 6 in., depth 194 ft, casing information not available. Lsd 696.80 ft above msl. Highest water level 108.48 ft below lsd, June 1, 1976; lowest 125.30 ft below lsd, Apr. 11, 1978. Records available 1937-57, 1959-72, 1974-91.

Date	Water level
Apr. 1, 1991	118.70
Apr. 29	117.61
May 29	116.94
July 1, 1991	117.62
July 29	118.30
Sept. 17	118.75
Oct. 9, 1991	119.11
Nov. 12	120.15
Dec. 4	123.45

295035097585501. LR-67-09-110. SWT farm well. Unused artesian well in Edwards aquifer, diam. 7 in., depth 634 ft, cased to 141.50 ft. Lsd 678.5 ft above msl. Highest water level 89.18 ft below lsd, June 22, 1987; lowest 102.29 ft below lsd, Oct. 6, 1984. Records available 1973-91.

Highest 1991 water level 89.90 ft below lsd on Dec. 31; lowest 1991 water level 101.30 ft below lsd on Jan. 5.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	101.30	99.89	99.73	99.70	98.54	98.32	98.85	99.58	100.03	100.19	100.47	100.65
10	100.47	99.67	99.82	98.98	98.22	98.46	98.94	99.70	100.07	100.21	100.50	100.67
15	100.34	99.62	99.87	98.73	98.01	98.51	99.06	99.83	100.12	100.29	100.51	100.68
20	100.18	99.63	99.74	98.65	97.98	98.58	99.22	99.92	100.21	100.35	100.53	100.41
25	100.10	99.64	99.73	98.65	98.02	98.71	99.33	99.98	100.16	100.38	100.56	91.01
Eom	100.08	99.65	99.83	98.69	98.17	98.78	99.44	100.01	100.16	100.43	100.57	89.90

292519099531701. TD-68-33-604 (J-1-41). Domestic artesian well in Edwards aquifer, diam. 6 in., depth 641 ft, cased to 58 ft. Lsd 846.00 ft above msl. Highest water level 96.90 ft below lsd, Apr. 28, 1977; lowest 217.74 ft below lsd, Aug. 31, 1956. Records available 1930, 1934-46, 1951-52, 1954-91.

Date	Water level
Mar. 13, 1991	158.50
Apr. 2	161.15
June 5	174.77
July 3, 1991	162.54
July 31	168.08
Sept. 20	166.52
Oct. 8, 1991	163.53
Nov. 6	163.02
Dec. 10	158.84

292110098530001. TD-68-41-301 (J-1-82). Unused artesian well in Edwards aquifer, diam. 6 in., depth 712 ft, casing information not available. Lsd 756.84 ft above msl. Highest water level 13.36 ft below lsd, June 21, 1987; lowest 134.53 ft below lsd, Aug. 18, 1956. Records available 1950-91.

Highest 1991 water level 53.03 ft below lsd on Dec. 31; lowest 1991 water level 90.72 ft below lsd on Aug. 17.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	76.98	72.82	71.79	75.92	71.18	82.77	79.33	88.54	86.63	80.80	80.98	77.30
10	76.29	71.63	73.42	71.60	68.78	86.76	78.65	88.88	.....	81.07	80.23	75.72
15	75.62	71.43	74.56	70.25	67.07	88.12	80.11	90.22	.....	81.85	80.20	74.92
20	75.10	71.48	74.10	69.52	66.13	86.82	83.15	90.37	83.37	82.44	79.62	70.80
25	74.10	71.34	74.42	69.47	69.75	83.50	85.08	89.62	81.75	82.80	78.90	58.05
Eom	73.76	71.30	76.03	70.60	77.74	81.55	86.60	89.17	81.12	82.25	77.77	53.03

292618099165901. TD-69-38-601 (I-2-104). Unused water-table well in Edwards aquifer, diam. 7 in., depth 538 ft, cased to 74 ft. Lsd 1,008.3 ft above msl. Highest water level 73.41 ft below lsd, Sept. 1, 1979; lowest 274.60 ft below lsd, Sept. 21, 1957. Records available 1957-91.

Highest 1991 water level 147.72 ft below lsd on Dec. 31; lowest 1991 water level 169.35 ft below lsd on Mar. 30.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	163.45	165.05	166.36	167.65	165.82	163.83	163.93	165.80	167.76	159.65	159.87	159.33
10	163.72	165.24	168.10	167.60	164.82	163.95	164.06	166.16	168.43	159.63	160.40	159.37
15	164.00	165.55	167.55	167.33	164.03	163.75	164.32	166.60	166.75	159.57	159.92	159.52
20	164.01	165.85	167.80	167.50	163.67	163.72	164.57	167.22	160.89	159.56	159.55	155.10
25	164.47	166.45	168.11	167.54	163.52	163.68	164.83	167.82	159.60	159.60	159.36	148.45
Eom	164.95	166.35	168.92	167.80	163.60	164.00	165.27	168.14	159.67	159.67	159.17	147.72

292209099094801. TD-69-47-302 (I-3-148). Unused artesian well in Edwards aquifer, diam. 5 in., depth 1,410 ft, casing information not available. Lsd 956.1 ft above msl. Highest water level 181.17 ft below lsd, June 22, 1987; lowest 294.74 ft below lsd, June 15, 1971. Records available 1960-91.

Date	Water level
Apr. 4, 1991	256.10
May 7	248.46
June 6	270.16

Date	Water level
July 18, 1991	265.33
Aug. 1	273.57
Sept. 19	261.02

Date	Water level
Oct. 8, 1991	256.90
Nov. 8	255.98

292045099081801. TD-69-47-306 (I-3-134). Unused artesian well in Edwards aquifer, diam. 12 in., depth 1,600 ft, cased to 1,485 ft. Lsd 887.5 ft above msl. Highest water level 113.51 ft below lsd, June 22, 1987; lowest water level 236.99 ft below lsd, June 30, 1990. Record available 1986-91.

Highest 1991 water level 162.35 ft below lsd on Dec. 31; lowest 1991 water level 206.86 ft below lsd on Aug. 3.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	188.50	183.64	184.23	188.30	183.17	.....	.....	205.95	199.15	191.34	190.00	186.78
10	187.47	182.53	186.55	182.92	180.35	.....	.....	203.82	197.90	191.41	190.00	185.98
15	186.89	183.02	187.94	181.69	178.77	.....	.....	205.67	197.24	192.57	190.39	185.37
20	185.76	183.20	187.01	181.27	179.10	.....	200.15	204.84	194.80	193.13	189.17	180.03
25	184.85	183.26	187.58	181.53	186.64	.....	202.24	203.72	192.59	193.60	188.15	167.45
Eom	184.94	183.42	.....	184.27	.....	.....	203.70	202.55	191.63	192.46	187.73	162.35

292110099054501. TD-69-48-102 (I-3-146). Irrigation artesian well in Edwards aquifer, diam. 12 in., depth 1,654 ft, cased to 1,320 ft. Lsd 867.2 ft above msl. Highest water level 95.26 ft below lsd, Apr. 28, 1977; lowest 257.36 ft below lsd, Aug. 14, 1963. Records available 1958-91.

Date	Water level
Mar. 12, 1991	171.45
Apr. 3	170.71
May 7	163.37

Date	Water level
July 18, 1991	179.14
July 31	186.48
Sept. 20	176.13

Date	Water level
Oct. 8, 1991	172.42
Nov. 8	171.90
Dec. 27	146.10

292339099401501. YP-69-35-602 (YP-69-35-501) (H-2-23). Unused water-table well in Edwards aquifer, diam. 7 in., depth 237 ft, cased to 57 ft. Lsd 1,170.8 ft above msl. Highest water level 23.52 ft below lsd, July 18, 1976; lowest 70.34 ft below lsd, Apr. 3, 1991. Records available 1957-91.

Date	Water level
Mar. 8, 1991	69.25
Apr. 3	70.34
May 6	63.88
June 4	65.43
July 11, 1991	68.05
July 31	65.20
Sept. 20	40.97
Oct. 7, 1991	46.64
Nov. 6	55.36
Dec. 10	58.05

292711099282201. YP-69-37-402. Unused water-table well in Edwards aquifer, diam. 6 in., depth 694 ft, cased to 233 ft. Lsd 1,158 ft above msl. Highest water level 256.05 ft below lsd, July 21, 1977; lowest 385.67 ft below lsd, Dec. 25, 1984. Records available 1974-91.

Highest 1991 water level 338.88 ft below lsd on Dec. 31; lowest 1991 water level 365.94 ft below lsd on Aug. 26-27.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	354.95	355.97	357.15	359.47	360.09	358.57	361.15	363.52	.....	358.03	351.79	346.76
10	355.15	356.23	357.80	359.42	359.52	359.22	361.56	363.90	.....	356.40	351.28	345.85
15	355.20	356.45	357.78	359.76	358.94	359.55	362.00	364.53	.....	355.10	350.67	345.50
20	355.50	356.81	358.15	360.05	358.54	359.86	362.35	365.05	.....	354.08	350.05	344.39
25	355.76	356.77	358.47	359.98	358.22	360.27	362.73	365.92	362.02	353.33	348.62	340.57
Eom	356.30	356.98	359.45	360.47	358.12	360.70	363.25	.....	359.76	352.83	347.46	338.88

291935099381801. YP-69-43-607. Knippa well. Monitoring well in Edwards aquifer, diam. 8 in., depth 913 ft, cased to 196 ft, 5-in. steel liner slotted 294 to 314 ft, obstructed at 315 ft. Lsd 1,010.0 ft above msl. Recorder established Dec. 4, 1990.

Highest 1991 water level 220.13 ft below lsd on Dec. 31; lowest 1991 water level 263.00 ft below lsd on Aug. 4.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	244.70	242.68	.....	247.75	246.14	256.00	259.45	.....	.....	240.40	238.72	238.62
10	244.15	242.67	.....	246.10	245.27	257.99	258.09	.....	.....	339.17	238.24	239.30
15	243.67	243.85	246.31	245.27	244.78	259.04	258.20	.....	.....	239.90	239.17	239.67
20	243.48	.....	246.57	244.97	246.11	257.80	260.30	.....	.....	241.78	237.40	238.20
25	243.17	.....	246.86	244.67	247.67	259.32	256.00	.....	244.01	243.73	237.26	224.08
Eom	243.09	.....	247.80	245.45	252.20	261.92	260.80	.....	242.24	241.70	237.82	220.13

291633099413301. YP-69-43-804. Irrigation artesian well in Edwards aquifer, diam. 16 in., depth 967 ft, cased to 365 ft. Lsd 975.00 ft above msl. Highest water level 74.60 ft below lsd, Sept. 29, 1987; lowest 305.60 ft below lsd, Dec. 7, 1971. Records available 1971-89, 1991.

Date	Water level
May 6, 1991	155.22
June 4	167.88
Sept. 20	186.90

291909099281001. YP-69-45-401 (I-4-35) (I-4-4). Unused artesian well in Edwards aquifer, diam. 10 in., depth 1,476 ft, cased to 937 ft. Lsd 954.04 ft above msl. Highest water level 118.64 ft below lsd, May 20, 1977; lowest 290.03 ft below lsd, Oct. 13, 1956. Records available 1956-91.

Highest 1991 water level 185.33 ft below lsd on Dec. 31; lowest 1991 water level 226.80 ft below lsd on Aug. 4.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	205.61	202.94	204.78	208.70	204.87	.....	220.38	225.47	220.81	207.91	205.70	201.55
10	204.75	202.67	206.70	205.53	204.28	222.27	218.87	223.74	220.00	207.36	205.26	201.52
15	204.15	204.08	207.31	204.40	203.33	222.73	218.98	224.42	218.50	207.85	.....	201.55
20	203.80	203.70	207.42	204.00	204.41	219.88	222.70	224.35	213.90	208.19	203.45	199.10
25	203.14	204.29	207.57	204.06	.....	222.29	221.76	223.37	210.91	208.19	202.10	189.30
Eom	203.60	204.53	208.91	204.25	.....	222.73	223.70	223.10	208.98	207.70	201.80	185.33

291426099510201. YP-69-50-101 (H-4-6). Stock artesian well in Edwards aquifer, diam. 8 in., depth 100 ft, casing information not available. Lsd 950.6 ft above msl. Highest water level 48.15 ft below lsd, May 29, 1980; lowest 126.17 ft below lsd, Mar. 14, 1957. Records available 1929-33, 1935-42, 1944-91.

Date	Water level
Mar. 8, 1991	62.70
May 6	65.26
June 4	68.23
July 11, 1991	72.23
July 31	69.30
Sept. 20	69.09
Oct. 7, 1991	66.74
Nov. 6	65.39
Dec. 10	63.56

291414099475301. YP-69-50-202 (H-5-209). Unused artesian well in Edwards aquifer, diam. 6 in., depth 137 ft, cased to 65 ft, casing collapsed at 59.0 ft (1990). Lsd 928.00 ft above msl. Highest water level 30.95 ft below lsd, Sept. 29, 1987; lowest water level 115.02 ft below lsd, Mar. 11, 1957. Records available 1956-91.

Date	Water level
Mar. 8, 1991	51.80
Apr. 3	54.38
May 6	55.82
June 4	59.04
July 11, 1991	Dry
July 31	Dry
Sept. 20	Dry
Oct. 7, 1991	56.74
Nov. 6	55.16
Dec. 10	53.15

291237099471201. YP-69-50-302 (H-5-1). Unused artesian well in Edwards aquifer, diam. 12 in., depth 350 ft, casing information not available. Lsd 904.85 ft above msl. Highest water level 15.82 ft below lsd, June 15-18, 1987; lowest 93.90 ft below lsd, Apr. 13, 1957. Records available 1929-32, 1934-91.

Highest 1991 water level 31.10 ft below lsd on Feb. 5; lowest 1991 water level 39.49 ft below lsd on Aug. 22.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	31.68	31.10	32.00	33.15	34.12	36.75	38.75	38.96	38.84	36.89	35.57	33.93
10	31.50	31.15	32.32	33.17	34.10	37.05	38.67	39.08	38.62	36.76	35.26	33.77
15	31.38	31.29	32.40	33.09	34.20	37.36	38.62	39.30	38.52	36.50	34.97	33.45
20	31.23	31.35	32.45	33.32	34.57	37.63	38.63	39.40	38.07	36.35	34.66	33.02
25	31.18	31.55	32.63	33.60	35.15	38.20	38.50	39.20	37.59	36.15	34.40	32.57
Eom	31.18	31.67	32.90	34.05	36.02	38.63	38.60	39.03	37.22	35.90	34.17	32.17

291025099442701. YP-69-51-406 (H-5-259). Unused water-table well in Leona Formation, diam. 14 in., depth 74 ft, casing information not available. Lsd 874.9 ft above msl. Highest water level 15.81 ft below lsd, June 5, 1987; lowest 61.38 ft below lsd, Mar. 13, 1957. Records available 1956-57, 1966-91.

Highest 1991 water level 29.20 ft below lsd on Dec. 31; lowest 1991 water level 37.93 ft below lsd on June 8.

Highest water level for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	29.73	32.46	31.95	32.60	33.12	37.07	35.91	34.17	32.92	31.50	33.28	32.53
10	30.33	32.00	32.40	31.80	34.28	37.44	35.40	34.08	32.63	32.65	33.55	31.44
15	29.95	31.37	33.13	31.25	33.57	36.92	35.20	34.18	32.93	33.75	32.45	30.83
20	30.33	31.75	33.41	31.04	33.20	35.25	34.98	33.73	32.00	34.10	31.68	30.24
25	32.45	31.60	33.74	32.10	35.75	36.50	34.10	33.12	31.53	33.60	31.53	29.48
Eom	33.80	31.72	33.10	32.92	36.07	36.37	34.10	32.80	31.21	33.35	31.27	29.20

292344100002701. YP-70-40-901 (G-3-19). Unused water-table well in Edwards aquifer, diam. 7 in., depth 140 ft, cased to 70 ft. Lsd 1,122.0 ft above msl. Highest water level 37.03 ft below lsd, Apr. 7, 1988; lowest 45.93 ft below lsd, Mar. 8, 1991. Records available 1957-91.

Date	Water level
Mar. 8, 1991	45.93
Apr. 3	45.82
May 6	43.57
June 4	43.63
July 11, 1991	43.64
July 31	43.62
Sept. 20	42.23
Oct. 7, 1991	43.32
Nov. 6	43.47
Dec. 10	43.67

a/ Replaces well CY-26 and reflects the same water level; composite record of wells CY-26 and AY-68-37-203 (J-17).
b/ Record low for well CY-26. Equivalent water level for AY-68-37-203 (J-17) would be 118.30 ft below lsd.
c/ Composite record of wells CY-26 and AY-68-37-203 (J-17).

Water-level elevations in transect wells completed in the Edwards aquifer, Bexar County, 1991
(Data collected by U.S. Geological Survey)

[diam., diameter; in., inches; ft, feet; lsd, land surface datum; msl, mean sea level; Eom, end of month; ....., data missing]

292505098254001. AY-68-37-521 (A-1). A transect well in the artesian part of the Edwards aquifer, diam. 9 to 2 in., depth 1,489 ft, cased to 1,275 ft. Lsd 621.17 ft above msl. Records available 1986-91.

Highest 1991 water-level elevation 675.15 ft above msl on Dec. 30; lowest 1991 water-level elevation 637.52 ft above msl on Aug. 22.

Highest water-level elevation for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	650.05	656.13	655.20	651.82	660.38	649.51	652.66	640.75	643.54	646.61	646.56	650.53
10	651.07	657.95	652.66	660.34	663.46	646.57	653.54	640.84	644.53	646.47	647.10	651.97
15	651.64	657.17	652.03	661.38	664.84	644.23	651.00	638.56	645.87	645.37	646.76	654.31
20	654.45	657.26	652.71	661.19	664.78	644.99	647.52	638.24	646.65	644.73	.....	658.87
25	654.31	656.56	652.94	659.79	661.09	648.34	646.13	640.71	647.81	643.82	648.16	670.73
Eom	654.42	656.40	650.39	657.70	653.66	650.71	643.33	639.98	647.47	645.73	650.27	.....

292505098254002. AY-68-37-522 (A-2). A transect well in the artesian part of the Edwards aquifer, diam. 9 to 2 in., depth 1,075 ft, cased to 1,075 ft. Lsd 621.17 ft above msl. Records available 1986-91.

Highest 1991 water-level elevation 676.04 ft above msl on Dec. 30; lowest 1991 water-level elevation 638.96 ft above msl on Aug. 22.

Highest water-level elevation for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	651.46	658.01	657.44	653.18	661.82	650.77	654.07	641.97	644.89	646.99	647.07	650.78
10	652.49	659.77	654.93	661.74	664.84	647.79	654.90	642.04	645.88	646.53	648.12	652.25
15	653.06	658.97	654.22	662.73	666.14	645.45	652.31	639.69	647.22	644.96	647.70	654.13
20	655.88	659.03	.....	662.62	666.05	646.18	648.76	639.67	647.97	644.63	.....	659.24
25	655.84	658.49	.....	661.11	662.46	649.69	647.47	642.17	649.10	643.91	648.42	671.42
Eom	655.92	658.30	.....	659.13	654.96	652.10	644.63	641.35	649.15	646.47	650.56	.....

292505098254003. AY-68-37-523 (A-3). A transect well in the artesian part of the Edwards aquifer, diam. 9 to 2 in., depth 1,175 ft, cased to 1,175 ft. Lsd 621.17 ft above msl. Records available 1986-91.

Highest 1991 water-level elevation 675.56 ft above msl on Dec. 30; lowest 1991 water-level elevation 637.39 ft above msl on Aug. 22.

Highest water-level elevation for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	650.46	657.01	656.41	652.22	660.72	649.67	652.74	640.58	643.51	646.50	646.39	650.73
10	651.50	658.80	653.87	660.78	663.83	646.69	653.61	640.69	644.51	646.63	646.91	651.92
15	652.08	657.97	653.13	661.74	665.16	644.28	650.99	638.31	645.86	644.68	646.69	654.02
20	654.89	658.02	653.88	661.58	665.09	645.05	647.42	638.14	646.59	644.22	.....	658.84
25	654.77	657.41	654.21	659.95	661.40	648.53	646.07	640.67	647.84	643.41	648.04	670.82
Eom	654.86	657.25	651.55	658.47	653.84	650.93	643.21	639.85	647.75	645.65	650.15	.....

292546098260001. AY-68-37-524 (C-1). A transect well in the artesian part of the Edwards aquifer, diam. 9 to 2 in., depth 1,396 ft, cased to 881 ft. Lsd 625.84 ft above msl. Records available 1986-91.

Highest 1991 water-level elevation 679.55 ft above msl on Dec. 30; lowest 1991 water-level elevation 640.32 ft above msl on Aug. 22.

Highest water-level elevation for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	653.29	660.36	659.06	656.07	664.49	652.00	655.98	643.18	646.51	649.82	649.61	653.55
10	654.36	661.73	656.35	664.03	667.13	649.29	656.53	643.26	647.31	648.88	650.15	654.96
15	654.83	660.71	655.97	664.77	668.14	647.29	653.70	640.93	648.90	646.94	649.81	656.51
20	658.07	660.81	656.73	664.49	667.86	647.85	650.01	641.06	649.56	646.83	650.69	664.13
25	657.91	660.44	656.88	663.08	664.26	652.29	649.00	643.88	650.66	645.80	651.41	675.99
Eom	657.82	660.13	654.41	660.71	656.31	654.37	645.73	642.90	.....	648.50	653.41	.....

292546098260002. AY-68-37-525 (C-2). A transect well in the artesian part of the Edwards aquifer, diam. 9 to 2 in., depth 1,150 ft, cased to 1,150 ft. Lsd 624.82 ft above msl. Records available 1986-91.

Highest 1991 water-level elevation 674.85 ft above msl on Dec. 30; lowest 1991 water-level elevation 636.34 ft above msl on Aug. 22.

Highest water-level elevation for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	649.34	655.64	655.50	651.09	659.53	649.31	651.16	639.50	641.99	645.77	645.80	649.63
10	650.35	657.56	652.89	659.68	662.74	646.05	652.26	639.51	643.28	645.23	646.38	651.07
15	651.02	656.82	651.95	660.69	664.20	643.44	649.89	637.13	644.39	643.47	646.17	652.47
20	653.63	656.91	653.26	660.65	664.23	644.38	646.39	636.99	645.08	643.17	.....	657.94
25	653.67	656.43	653.18	659.17	660.96	647.50	645.17	639.17	645.95	642.04	647.16	670.29
Eom	653.67	656.30	650.52	657.31	653.57	650.00	642.33	638.42	.....	644.20	649.38	.....

292556098260701. AY-68-37-526 (D-1). A transect well in the artesian part of the Edwards aquifer, diam. 9 to 2 in., depth 1,384 ft, cased to 1,223 ft. Lsd 643.26 ft above msl. Records available 1986-91.

Highest 1991 water-level elevation 680.17 ft above msl on Dec. 30; lowest 1991 water-level elevation 640.02 ft above msl on Aug. 22.

Highest water-level elevation for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
10	654.05	661.14	655.43	663.46	666.41	648.21	656.42	643.15	647.18	649.00	650.45	655.26
15	654.51	660.10	655.20	664.01	667.33	646.21	653.52	640.76	648.79	647.05	650.04	656.84
20	657.83	660.20	655.73	664.02	667.00	646.75	649.82	640.87	649.46	646.98	.....	664.82
25	657.55	659.76	655.93	662.16	663.27	651.23	648.73	643.75	650.34	645.91	651.66	676.66
Eom	657.51	659.48	653.64	659.98	655.25	653.42	645.48	642.84	649.86	648.82	653.65	.....

292556098260702. AY-68-37-527 (D-2). A transect well in the artesian part of the Edwards aquifer, diam. 4 to 7 in., depth 926 ft, cased to 926 ft. Lsd 642.59 ft above msl. Records available 1986-91.

Highest 1991 water-level elevation 680.27 ft above msl on Dec. 30; lowest 1991 water-level elevation 640.23 ft above msl on Aug. 22.

Highest water-level elevation for the day, from recorder graph, 1991

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	652.94	659.74	658.09	655.48	663.82	650.76	655.96	643.16	646.25	649.88	649.74	653.69
10	653.99	661.09	655.32	663.47	666.42	648.01	656.43	643.28	646.97	648.91	650.28	655.10
15	654.42	660.05	655.06	664.02	667.32	646.08	653.53	.....	648.58	646.94	649.86	656.69
20	657.78	660.15	655.98	664.02	666.98	646.61	649.81	641.04	649.23	646.86	.....	664.70
25	657.71	659.88	656.00	662.35	663.39	651.38	649.05	643.89	650.46	645.93	651.63	676.89
Eom	657.57	659.52	653.62	660.04	655.19	653.40	645.65	643.07	649.84	648.72	653.55	.....

APPENDIX B. WATER QUALITY

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1991

[ft, feet; min, minutes; gal/min, gallons per minute; µS/cm, microsiemens per centimeter at 25 degrees Celsius; °C, degrees Celsius; mg/L, milligrams per liter; $CaCO_3$, calcium carbonate; E, estimated; wat, dis, fix end, water, dissolved, fixed endpoint titration; <, less than; NO_2+NO_3, nitrite plus nitrate; --, no data or not applicable]

BEXAR COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Specific conductance (µS/cm)	pH, water, whole, field (standard units)	Temperature, water (°C)	Hardness, total (mg/L $CaCO_3$)
AY-68-21-804	04-23-91	1030	279.00	60	7.0	590	6.7	23.0	310
AY-68-27-303	04-23-91	1200	354.00	70	5.0	535	6.9	23.5	270
AY-68-27-503	04-23-91	1330	375.00	75	20	520	7.0	22.5	250
AY-68-28-514	07-16-91	0830	510.00	30	1250	575	6.6	23.0	280
AY-68-28-608	04-08-91	1130	500.00	60	10	360	6.4	21.0	190
AY-68-28-702	07-23-91	0800	450.00	1440	1070	564	6.9	22.0	290
AY-68-28-903	08-15-91	0925	762.00	35	3500	823	6.7	22.5	400
AY-68-28-920	06-11-91	0900	360.00	60	12	985	6.5	22.5	450
AY-68-29-210	04-23-91	0900	329.00	70	7.0	538	6.6	23.0	270
AY-68-29-405	07-15-91	1130	395.00	30	200	665	6.8	23.5	340
AY-68-29-702	07-15-91	1000	872.00	E1440	5000	584	6.6	22.5	290
AY-68-29-915	07-16-91	1030	824.00	1440	5000	504	7.1	24.5	240
AY-68-29-920	06-11-91	1140	655.00	150	1150	495	6.9	25.0	240
AY-68-29-925	06-11-91	1100	525.00	60	13	480	7.4	25.0	230
AY-68-36-802	08-15-91	1125	1479	20	1000	495	7.3	26.5	240
AY-68-36-803	08-15-91	1205	1409	55	2000	487	7.3	25.0	240
AY-68-36-908	08-15-91	1040	1708	30	1000	489	7.3	26.5	240
AY-68-37-508	06-11-91	1300	1311	1440	2500	495	7.0	27.0	240
AY-68-37-521	01-22-91	1040	1275	50	30	5480	6.6	30.0	2100
AY-68-37-521	02-21-91	1050	1275	60	30	5490	6.8	30.5	2200
AY-68-37-521	03-19-91	1520	1275	53	20	5480	6.5	31.0	2100
AY-68-37-521	04-22-91	1110	1275	60	27	5500	6.8	31.0	1900
AY-68-37-521	05-21-91	1430	1275	60	30	5550	6.6	31.0	2300
AY-68-37-521	06-24-91	1150	1275	50	30	5560	6.7	31.0	2100
AY-68-37-521	07-22-91	1150	1275	60	18	5540	6.8	32.0	2200
AY-68-37-521	08-19-91	1200	1275	75	20	5540	6.8	31.0	2200
AY-68-37-521	09-23-91	1330	1275	60	20	5550	6.8	31.0	2200
AY-68-37-521	10-22-91	1030	1275	95	13	978	7.2	26.0	390
AY-68-37-521	10-22-91	1320	1275	60	25	5560	6.7	30.0	2300
AY-68-37-521	11-20-91	1120	1275	70	21	5480	6.8	30.5	2100
AY-68-37-521	12-23-91	1145	1275	50	25	5440	6.7	30.5	2200
AY-68-37-522	01-22-91	1030	1075	40	30	4340	6.8	29.0	1600
AY-68-37-522	02-21-91	1100	1075	65	30	4340	6.9	30.0	1700
AY-68-37-522	03-19-91	1440	1075	28	25	4380	6.6	30.0	1700
AY-68-37-522	04-22-91	1120	1075	70	22	4350	6.9	30.5	1600
AY-68-37-522	05-21-91	1450	1075	60	25	4380	6.7	31.0	1700
AY-68-37-522	07-22-91	1200	1075	E70	18	4400	6.8	30.5	1700
AY-68-37-522	08-19-91	1345	1075	90	20	4400	6.8	31.0	1700
AY-68-37-522	10-22-91	1330	1075	70	25	4410	6.8	30.5	1700
AY-68-37-522	11-20-91	1140	1075	50	19	4330	6.8	29.5	1700
AY-68-37-522	12-23-91	1200	1075	65	25	4320	6.8	31.0	1700
AY-68-37-523	01-22-91	1050	1175	25	25	5690	6.7	29.0	2200
AY-68-37-523	02-21-91	1115	1175	75	25	5710	6.8	30.0	2200
AY-68-37-523	03-19-91	1600	1175	66	15	5700	6.6	30.0	2200
AY-68-37-523	04-22-91	1130	1175	80	27	5730	6.7	30.5	2200
AY-68-37-523	05-21-91	1515	1175	60	30	5750	6.7	24.5	2300
AY-68-37-523	06-24-91	1215	1175	75	18	5800	6.8	30.0	2200
AY-68-37-523	07-22-91	1210	1175	80	14	5790	6.7	30.0	2300
AY-68-37-523	08-19-91	1400	1175	110	15	5780	6.7	29.5	2300
AY-68-37-523	09-23-91	1350	1175	80	13	5780	6.8	30.0	2200

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

BEXAR COUNTY--Continued

Local identifier	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity, wat, dis, fix end, field (mg/L CaCO3)	Sulfate, dissolved (mg/L)	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Silica, dissolved (mg/L)
AY-68-21-804	120	2.2	4.8	0.60	280	2.3	20	<0.10	12
AY-68-27-303	93	9.6	5.9	0.80	250	9.1	9.1	<0.10	11
AY-68-27-503	72	17	8.1	1.1	250	16	13	0.20	10
AY-68-28-514	99	9.0	8.4	1.1	270	15	15	0.20	12
AY-68-28-608	66	5.6	3.5	1.1	170	10	6.6	0.10	8.5
AY-68-28-702	89	16	9.4	1.3	250	26	15	0.20	11
AY-68-28-903	140	12	29	2.0	360	27	33	0.20	17
AY-68-28-920	170	6.0	46	1.7	450	32	44	0.20	21
AY-68-29-210	95	8.3	5.0	0.70	270	11	6.2	<0.10	10
AY-68-29-405	120	8.9	12	1.8	310	13	19	0.20	14
AY-68-29-702	93	13	9.9	1.1	260	28	16	0.20	11
AY-68-29-915	70	15	11	1.3	220	19	18	0.30	12
AY-68-29-920	70	16	10	1.2	210	18	20	0.30	12
AY-68-29-925	52	25	11	1.7	200	36	17	1.0	10
AY-68-36-802	57	24	11	1.2	210	28	19	0.40	12
AY-68-36-803	70	15	9.7	1.1	210	15	21	0.20	12
AY-68-36-908	68	17	10	1.1	210	20	21	0.30	12
AY-68-37-508	69	17	9.8	1.2	210	22	22	0.30	12
AY-68-37-521	540	190	470	29	250	1700	920	3.1	19
AY-68-37-521	560	200	470	30	250	1500	910	2.5	19
AY-68-37-521	490	210	460	28	250	1600	920	2.7	19
AY-68-37-521	450	200	470	28	250	2100	900	1.7	19
AY-68-37-521	580	210	460	29	250	1900	950	2.4	19
AY-68-37-521	530	190	470	29	250	1800	890	2.8	19
AY-68-37-521	560	200	460	28	260	1900	890	2.6	19
AY-68-37-521	550	200	460	30	260	1900	910	3.7	19
AY-68-37-521	560	200	460	28	260	1800	860	2.8	19
AY-68-37-521	97	35	50	3.6	210	190	97	0.70	11
AY-68-37-521	580	200	460	30	250	2100	820	2.7	18
AY-68-37-521	530	200	470	28	250	1700	820	2.7	19
AY-68-37-521	550	200	450	29	250	1800	940	3.3	19
AY-68-37-522	420	140	350	24	230	1700	660	2.0	17
AY-68-37-522	420	150	360	23	230	1500	660	2.6	17
AY-68-37-522	430	160	360	23	230	1600	680	2.8	18
AY-68-37-522	400	150	350	23	240	1500	680	1.8	17
AY-68-37-522	440	150	350	23	230	1400	710	2.4	18
AY-68-37-522	430	150	360	22	240	1400	670	2.2	17
AY-68-37-522	430	160	350	24	230	1400	690	3.1	18
AY-68-37-522	440	150	350	25	230	1300	640	2.4	17
AY-68-37-522	430	160	350	23	230	1300	630	2.3	18
AY-68-37-522	440	150	350	24	230	1300	660	1.9	17
AY-68-37-523	540	200	500	30	250	1900	990	3.2	18
AY-68-37-523	540	210	500	31	250	2200	990	2.7	18
AY-68-37-523	530	220	500	30	250	1900	1100	3.4	18
AY-68-37-523	550	210	490	29	250	1900	950	1.7	18
AY-68-37-523	560	210	510	29	250	2000	950	2.7	18
AY-68-37-523	520	210	500	30	250	1900	950	2.6	18
AY-68-37-523	560	220	500	29	250	1900	970	2.6	18
AY-68-37-523	550	220	500	29	270	1800	990	5.0	18
AY-68-37-523	550	210	490	30	250	2000	820	2.5	19

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

BEXAR COUNTY--Continued

Local identifier	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrate, total (mg/L)	Nitrogen, nitrite, total (mg/L)	Nitrogen, NO_2+NO_3, total (mg/L)	Nitrogen, ammonia, total (mg/L)	Nitrogen, ammonia + organic, total (mg/L)	Nitrogen, total (mg/L)	Phosphorus, total (mg/L)	Carbon, organic, dissolved (mg/L)
AY-68-21-804	330	--	<0.010	1.90	<0.010	<0.20	--	<0.010	0.5
AY-68-27-303	287	--	<0.010	2.40	<0.010	0.30	2.7	<0.010	1.3
AY-68-27-503	286	--	<0.010	1.50	0.010	<0.20	--	0.010	1.0
AY-68-28-514	321	--	<0.010	1.30	0.060	<0.20	--	<0.010	--
AY-68-28-608	204	0.709	0.041	0.750	<0.010	0.30	1.0	0.050	--
AY-68-28-702	320	--	<0.010	1.70	<0.010	0.30	2.0	<0.010	--
AY-68-28-903	476	--	<0.010	0.570	0.140	0.20	0.77	<0.010	--
AY-68-28-920	591	--	<0.010	0.330	0.060	0.30	0.63	0.021	1.0
AY-68-29-210	299	--	<0.010	1.30	<0.010	<0.20	--	<0.010	0.6
AY-68-29-405	376	--	<0.010	2.20	0.060	<0.20	--	<0.010	--
AY-68-29-702	329	--	<0.010	1.60	0.060	<0.20	--	<0.010	--
AY-68-29-915	277	--	<0.010	1.80	0.080	<0.20	--	0.030	--
AY-68-29-920	275	--	<0.010	2.20	<0.010	0.20	2.4	0.021	0.3
AY-68-29-925	274	--	<0.010	<0.050	0.100	0.30	--	0.021	0.3
AY-68-36-802	279	--	<0.010	0.930	0.021	<0.20	--	<0.010	--
AY-68-36-803	268	--	<0.010	2.00	0.021	<0.20	--	<0.010	--
AY-68-36-908	272	--	<0.010	1.70	0.210	0.30	2.0	0.010	--
AY-68-37-508	277	--	<0.010	1.70	<0.010	0.30	2.0	0.020	--
AY-68-37-521	4020	--	--	--	--	--	--	--	--
AY-68-37-521	3840	--	--	--	--	--	--	--	--
AY-68-37-521	3880	--	--	--	--	--	--	--	--
AY-68-37-521	4320	--	--	--	--	--	--	--	--
AY-68-37-521	4300	--	--	--	--	--	--	--	--
AY-68-37-521	4080	--	--	--	--	--	--	--	--
AY-68-37-521	4210	--	--	--	--	--	--	--	--
AY-68-37-521	4230	--	--	--	--	--	--	--	--
AY-68-37-521	4080	--	--	--	--	--	--	--	--
AY-68-37-521	610	--	--	--	--	--	--	--	--
AY-68-37-521	4360	--	--	--	--	--	--	--	--
AY-68-37-521	3920	--	--	--	--	--	--	--	--
AY-68-37-521	4140	--	--	--	--	--	--	--	--
AY-68-37-522	3450	--	--	--	--	--	--	--	--
AY-68-37-522	3270	--	--	--	--	--	--	--	--
AY-68-37-522	3410	--	--	--	--	--	--	--	--
AY-68-37-522	3260	--	--	--	--	--	--	--	--
AY-68-37-522	3230	--	--	--	--	--	--	--	--
AY-68-37-522	3190	--	--	--	--	--	--	--	--
AY-68-37-522	3210	--	--	--	--	--	--	--	--
AY-68-37-522	3060	--	--	--	--	--	--	--	--
AY-68-37-522	3050	--	--	--	--	--	--	--	--
AY-68-37-522	3080	--	--	--	--	--	--	--	--
AY-68-37-523	4330	--	--	--	--	--	--	--	--
AY-68-37-523	4640	--	--	--	--	--	--	--	--
AY-68-37-523	4450	--	--	--	--	--	--	--	--
AY-68-37-523	4300	--	--	--	--	--	--	--	--
AY-68-37-523	4430	--	--	--	--	--	--	--	--
AY-68-37-523	4280	--	--	--	--	--	--	--	--
AY-68-37-523	4350	--	--	--	--	--	--	--	--
AY-68-37-523	4270	--	--	--	--	--	--	--	--
AY-68-37-523	4270	--	--	--	--	--	--	--	--

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

BEXAR COUNTY--Continued

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Specific conductance (µS/cm)	pH, water, whole, field (standard units)	Temperature, water (°C)	Hardness, total (mg/L CaCO3)
AY-68-37-523	10-22-91	1340	1175	80	15	5790	6.7	30.0	2400
AY-68-37-523	11-20-91	1200	1175	90	15	5620	6.8	29.5	2200
AY-68-37-523	12-23-91	1215	1175	80	17	5720	6.7	30.5	2300
AY-68-37-524	01-22-91	0930	881.00	60	40	948	6.7	27.5	370
AY-68-37-524	02-21-91	0920	881.00	50	45	952	6.9	27.0	380
AY-68-37-524	03-19-91	1245	881.00	50	30	955	6.8	28.5	370
AY-68-37-524	04-22-91	0945	881.00	45	40	963	6.9	28.0	370
AY-68-37-524	05-21-91	1345	881.00	60	40	956	6.7	28.5	370
AY-68-37-524	06-24-91	1030	881.00	60	35	953	7.0	28.5	380
AY-68-37-524	07-22-91	1030	881.00	60	35	953	7.0	28.0	380
AY-68-37-524	08-19-91	1200	881.00	60	25	956	7.1	28.5	390
AY-68-37-524	10-22-91	1155	881.00	60	25	937	7.2	28.0	370
AY-68-37-524	11-20-91	0945	881.00	60	35	890	7.2	27.5	370
AY-68-37-524	12-23-91	1015	881.00	50	37	913	7.1	28.5	380
AY-68-37-525	01-22-91	0940	1150	70	35	6210	6.6	28.0	2400
AY-68-37-525	02-21-91	0930	1150	60	35	6220	6.9	28.5	2400
AY-68-37-525	03-19-91	1330	1150	50	20	6250	6.5	29.0	2400
AY-68-37-525	04-22-91	1000	1150	60	25	6280	6.9	28.5	2500
AY-68-37-525	05-21-91	1400	1150	60	25	6280	6.7	27.5	2500
AY-68-37-525	06-24-91	1045	1150	75	15	6280	6.8	29.0	2300
AY-68-37-525	07-22-91	1040	1150	70	22	6290	6.8	28.5	2500
AY-68-37-525	08-19-91	1210	1150	75	15	6260	6.8	28.0	2500
AY-68-37-525	09-23-91	1215	1150	85	20	6300	6.9	29.0	2400
AY-68-37-525	10-22-91	1215	1150	75	18	6300	6.8	28.0	2500
AY-68-37-525	11-20-91	1000	1150	75	25	6240	6.7	28.0	2400
AY-68-37-525	12-23-91	1025	1150	60	26	6190	6.7	28.5	2600
AY-68-37-526	01-22-91	0830	1223	115	10	888	6.9	25.0	360
AY-68-37-526	02-21-91	0810	1223	90	13	920	7.3	25.0	370
AY-68-37-526	03-19-91	1010	1223	105	10	868	7.5	25.5	360
AY-68-37-526	04-22-91	0845	1223	85	14	923	7.0	26.0	370
AY-68-37-526	05-21-91	1215	1223	60	20	928	7.4	26.5	370
AY-68-37-526	06-24-91	0915	1223	130	9.4	888	7.2	26.0	350
AY-68-37-526	07-22-91	0915	1223	105	12	891	7.7	25.5	340
AY-68-37-526	08-19-91	0850	1223	100	13	898	7.5	26.5	390
AY-68-37-526	09-23-91	1040	1223	90	13	901	7.5	26.5	380
AY-68-37-526	11-20-91	0825	1223	95	13	929	7.5	25.5	380
AY-68-37-526	12-23-91	0835	1223	65	18	853	7.3	26.0	350
AY-68-37-527	01-22-91	0815	926.00	40	142	513	6.8	26.0	240
AY-68-37-527	02-21-91	0800	926.00	40	140	509	7.0	26.0	240
AY-68-37-527	03-19-91	1130	926.00	60	100	508	7.1	26.5	240
AY-68-37-527	04-22-91	0850	926.00	50	200	511	7.1	26.5	230
AY-68-37-527	05-21-91	1200	926.00	60	50	508	6.8	26.5	230
AY-68-37-527	06-24-91	0800	926.00	50	120	514	7.0	26.5	240
AY-68-37-527	07-22-91	0840	926.00	50	106	525	6.8	26.5	240
AY-68-37-527	08-19-91	0840	926.00	100	60	512	7.2	26.5	240
AY-68-37-527	09-23-91	1015	926.00	60	90	514	7.2	26.5	250
AY-68-37-527	10-22-91	1000	926.00	60	80	519	7.2	26.0	240
AY-68-37-527	11-20-91	0800	926.00	E60	100	508	7.1	26.0	240
AY-68-37-527	12-23-91	0820	926.00	40	250	509	6.6	26.5	230
AY-68-43-610	03-14-91	1200	1856	1440	1000	646	6.7	29.5	290
AY-68-44-203	08-15-91	1240	1580	30	1000	487	7.3	26.5	240

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

BEXAR COUNTY--Continued

Local identifier	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity, wat, dis, fix end, field (mg/L CaCO3)	Sulfate, dissolved (mg/L)	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Silica, dissolved (mg/L)
AY-68-37-523	580	220	490	30	250	2000	1000	3.0	17
AY-68-37-523	550	210	480	29	250	1500	780	2.4	18
AY-68-37-523	570	220	480	31	250	1900	930	2.8	19
AY-68-37-524	96	32	48	4.4	210	190	83	1.3	14
AY-68-37-524	98	32	48	4.3	210	210	80	1.1	14
AY-68-37-524	96	32	46	4.6	200	210	82	1.1	14
AY-68-37-524	97	32	47	4.6	210	190	82	1.2	14
AY-68-37-524	96	32	46	4.4	200	200	81	1.1	14
AY-68-37-524	97	33	49	4.7	200	190	82	1.1	14
AY-68-37-524	98	32	47	4.0	200	190	84	1.1	14
AY-68-37-524	100	33	46	4.6	210	190	81	1.2	14
AY-68-37-524	97	31	48	4.6	210	200	85	1.1	13
AY-68-37-524	99	31	46	4.4	210	180	81	1.2	14
AY-68-37-524	99	33	48	4.7	210	180	81	<0.10	14
AY-68-37-525	570	230	570	33	240	1800	1100	3.1	18
AY-68-37-525	570	240	570	33	250	1700	1100	2.7	18
AY-68-37-525	550	250	560	33	250	2100	1100	4.6	18
AY-68-37-525	580	250	580	32	250	2100	1100	1.7	18
AY-68-37-525	600	250	560	33	240	2100	370	3.1	18
AY-68-37-525	540	240	570	32	240	2100	1100	2.7	18
AY-68-37-525	570	250	570	33	240	2000	1100	2.5	18
AY-68-37-525	560	260	560	33	250	2000	1100	3.3	18
AY-68-37-525	580	240	560	34	240	2200	1000	2.5	18
AY-68-37-525	600	250	550	34	240	2100	1100	3.0	17
AY-68-37-525	560	250	550	31	240	2000	1000	2.5	18
AY-68-37-525	610	260	560	34	250	2100	1000	3.3	19
AY-68-37-526	92	32	41	3.1	210	150	80	0.70	11
AY-68-37-526	94	33	42	3.1	210	170	82	0.70	12
AY-68-37-526	90	32	40	3.0	210	150	77	0.60	11
AY-68-37-526	92	33	41	3.0	210	160	80	0.70	12
AY-68-37-526	93	33	43	3.2	210	170	82	0.70	12
AY-68-37-526	89	32	43	3.4	200	150	81	0.60	11
AY-68-37-526	85	32	45	3.2	190	150	84	0.50	11
AY-68-37-526	98	36	47	3.7	210	170	90	0.70	12
AY-68-37-526	95	35	45	3.6	210	170	86	0.60	12
AY-68-37-526	97	33	46	3.3	210	170	88	0.70	12
AY-68-37-526	88	32	36	2.9	210	110	58	0.60	12
AY-68-37-527	67	17	12	1.3	200	34	24	0.20	12
AY-68-37-527	68	17	12	1.3	200	30	23	0.20	12
AY-68-37-527	67	17	12	1.3	200	29	24	0.30	12
AY-68-37-527	66	17	11	1.2	200	28	23	0.20	12
AY-68-37-527	66	17	11	1.3	210	25	23	0.30	12
AY-68-37-527	68	18	12	1.4	200	30	24	0.30	12
AY-68-37-527	68	18	13	1.3	200	32	25	0.30	12
AY-68-37-527	68	17	11	1.2	200	30	24	0.20	12
AY-68-37-527	69	18	12	1.2	200	30	22	0.30	12
AY-68-37-527	68	17	13	1.3	200	33	27	0.30	11
AY-68-37-527	69	17	13	1.3	200	32	23	0.30	12
AY-68-37-527	66	17	12	1.4	210	32	27	0.30	12
AY-68-43-610	81	22	20	1.8	250	87	38	0.40	12
AY-68-44-203	68	16	9.9	1.1	210	21	21	0.20	12

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

BEXAR COUNTY--Continued

Local identifier	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrate, total (mg/L)	Nitrogen, nitrite, total (mg/L)	Nitrogen, NO_2+NO_3, total (mg/L)	Nitrogen, ammonia, total (mg/L)	Nitrogen, ammonia + organic, total (mg/L)	Nitrogen, total (mg/L)	Phosphorus, total (mg/L)	Carbon, organic, dissolved (mg/L)
AY-68-37-523	4490	--	--	--	--	--	--	--	--
AY-68-37-523	3720	--	--	--	--	--	--	--	--
AY-68-37-523	4300	--	--	--	--	--	--	--	--
AY-68-37-524	592	--	--	--	--	--	--	--	--
AY-68-37-524	616	--	--	--	--	--	--	--	--
AY-68-37-524	607	--	--	--	--	--	--	--	--
AY-68-37-524	591	--	--	--	--	--	--	--	--
AY-68-37-524	596	--	--	--	--	--	--	--	--
AY-68-37-524	593	--	--	--	--	--	--	--	--
AY-68-37-524	592	--	--	--	--	--	--	--	--
AY-68-37-524	593	--	--	--	--	--	--	--	--
AY-68-37-524	603	--	--	--	--	--	--	--	--
AY-68-37-524	583	--	--	--	--	--	--	--	--
AY-68-37-524	584	--	--	--	--	--	--	--	--
AY-68-37-525	4470	--	--	--	--	--	--	--	--
AY-68-37-525	4380	--	--	--	--	--	--	--	--
AY-68-37-525	4770	--	--	--	--	--	--	--	--
AY-68-37-525	4810	--	--	--	--	--	--	--	--
AY-68-37-525	4080	--	--	--	--	--	--	--	--
AY-68-37-525	4750	--	--	--	--	--	--	--	--
AY-68-37-525	4690	--	--	--	--	--	--	--	--
AY-68-37-525	4680	--	--	--	--	--	--	--	--
AY-68-37-525	4780	--	--	--	--	--	--	--	--
AY-68-37-525	4800	--	--	--	--	--	--	--	--
AY-68-37-525	4560	--	--	--	--	--	--	--	--
AY-68-37-525	4740	--	--	--	--	--	--	--	--
AY-68-37-526	536	--	--	--	--	--	--	--	--
AY-68-37-526	565	--	--	--	--	--	--	--	--
AY-68-37-526	529	--	--	--	--	--	--	--	--
AY-68-37-526	549	--	--	--	--	--	--	--	--
AY-68-37-526	560	--	--	--	--	--	--	--	--
AY-68-37-526	532	--	--	--	--	--	--	--	--
AY-68-37-526	527	--	--	--	--	--	--	--	--
AY-68-37-526	582	--	--	--	--	--	--	--	--
AY-68-37-526	574	--	--	--	--	--	--	--	--
AY-68-37-526	577	--	--	--	--	--	--	--	--
AY-68-37-526	467	--	--	--	--	--	--	--	--
AY-68-37-527	289	--	--	--	--	--	--	--	--
AY-68-37-527	282	--	--	--	--	--	--	--	--
AY-68-37-527	283	--	--	--	--	--	--	--	--
AY-68-37-527	280	--	--	--	--	--	--	--	--
AY-68-37-527	282	--	--	--	--	--	--	--	--
AY-68-37-527	284	--	--	--	--	--	--	--	--
AY-68-37-527	288	--	--	--	--	--	--	--	--
AY-68-37-527	282	--	--	--	--	--	--	--	--
AY-68-37-527	286	--	--	--	--	--	--	--	--
AY-68-37-527	290	--	--	--	--	--	--	--	--
AY-68-37-527	288	--	--	--	--	--	--	--	--
AY-68-37-527	292	--	--	--	--	--	--	--	--
AY-68-43-610	414	--	--	--	--	--	--	--	--
AY-68-44-203	272	--	<0.010	1.70	0.010	0.30	2.0	<0.010	--

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

COMAL COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Specific conductance (µS/cm)	pH, water, whole, field (standard units)	Temperature, water (°C)	Hardness, total (mg/L CaCO3)
DX-68-15-901	04-02-91	1000	a/--	--	--	599	6.7	21.0	310
DX-68-16-502	07-30-91	1730	230.00	60	250	577	6.8	23.5	290
DX-68-22-901	07-30-91	1020	255.00	20	1200	503	7.1	22.5	260
DX-68-23-301	06-10-91	1400	a/--	--	--	534	6.8	22.5	270
DX-68-23-303	07-08-91	1530	1045	30	4200	545	7.2	24.5	270
DX-68-23-316	06-10-91	1520	350.00	50	10	540	6.8	23.5	300
DX-68-23-602	07-08-91	1445	790.00	75	2700	516	7.1	22.5	250
DX-68-23-616A	01-11-91	0830	576.00	70	14	2970	6.8	25.0	780
DX-68-23-616A	02-11-91	1250	576.00	60	14	2900	6.9	25.0	860
DX-68-23-616A	03-11-91	0910	576.00	60	14	2830	7.1	25.0	850
DX-68-23-616A	04-09-91	1315	576.00	60	14	2890	7.0	25.5	800
DX-68-23-616A	05-09-91	1430	576.00	60	14	2940	7.0	25.5	800
DX-68-23-616A	06-10-91	0950	576.00	60	14	3040	6.9	25.0	800
DX-68-23-616A	07-09-91	1200	576.00	70	14	2950	6.9	26.0	760
DX-68-23-616A	08-12-91	1145	576.00	60	14	2860	6.9	26.0	810
DX-68-23-616A	09-11-91	1320	576.00	E50	14	2960	6.9	25.5	810
DX-68-23-616A	10-10-91	1100	576.00	75	14	2960	7.2	26.0	880
DX-68-23-616A	11-13-91	1200	576.00	77	14	2910	7.1	25.0	860
DX-68-23-616A	12-10-91	1410	576.00	60	14	2880	7.1	25.5	800
DX-68-23-616B	01-11-91	0820	738.00	60	13	1720	6.9	25.5	490
DX-68-23-616B	02-11-91	1300	738.00	75	13	1710	7.2	26.0	500
DX-68-23-616B	03-11-91	0920	738.00	70	13	1680	7.1	25.0	510
DX-68-23-616B	04-09-91	1330	738.00	75	13	1730	7.0	26.0	500
DX-68-23-616B	05-09-91	1500	738.00	90	12	1750	6.9	26.0	490
DX-68-23-616B	06-10-91	0940	738.00	50	13	1710	6.9	26.0	490
DX-68-23-616B	07-09-91	1215	738.00	85	12	1720	6.9	26.5	520
DX-68-23-616B	08-12-91	1200	738.00	75	11	1650	7.0	25.5	550
DX-68-23-616B	09-11-91	1330	738.00	60	12	1750	7.2	26.5	510
DX-68-23-616B	10-10-91	1115	738.00	75	12	1770	7.3	26.5	480
DX-68-23-616B	11-13-91	1215	738.00	81	12	1730	7.2	25.0	490
DX-68-23-616B	12-10-91	1400	738.00	50	13	1730	7.2	26.0	460
DX-68-23-617	01-11-91	1130	916.50	60	14	555	6.9	25.5	240
DX-68-23-617	02-11-91	1010	916.50	60	14	542	7.1	25.5	250
DX-68-23-617	03-11-91	1100	916.50	60	14	555	7.3	25.0	240
DX-68-23-617	04-09-91	1130	916.50	60	14	550	6.7	26.5	250
DX-68-23-617	05-10-91	1310	916.50	35	14	560	6.8	26.0	250
DX-68-23-617	06-10-91	1130	916.50	60	14	554	6.9	26.0	250
DX-68-23-617	07-09-91	1420	--	60	13	553	7.0	26.5	250
DX-68-23-617	08-12-91	1445	743.00	75	14	560	6.9	26.5	270
DX-68-23-617	09-11-91	1030	916.50	60	14	545	7.1	26.5	260
DX-68-23-617	10-15-91	1015	916.50	45	14	551	7.4	26.0	240
DX-68-23-617	11-13-91	1530	916.50	60	14	548	7.3	25.0	260
DX-68-23-617	12-10-91	1050	743.00	60	13	560	7.3	26.0	250
DX-68-23-618	01-11-91	1020	660.10	70	13	630	7.0	25.0	270
DX-68-23-618	02-11-91	1115	660.10	60	13	615	7.3	25.0	270
DX-68-23-618	03-11-91	1200	660.10	60	--	627	7.3	25.0	260
DX-68-23-618	04-09-91	1145	660.10	75	13	622	7.0	25.5	270
DX-68-23-618	05-10-91	1505	660.10	45	13	619	6.9	25.5	260
DX-68-23-618	06-10-91	1200	660.10	90	13	617	7.3	25.5	270
DX-68-23-618	07-09-91	1530	660.10	60	13	611	7.4	26.0	260
DX-68-23-618	08-12-91	1500	660.10	90	13	626	7.0	26.0	290
DX-68-23-618	09-11-91	1100	660.10	90	13	610	7.4	26.0	280
DX-68-23-618	10-11-91	1530	660.10	70	13	619	7.5	26.5	260
DX-68-23-618	11-13-91	1415	660.10	80	13	612	7.3	25.0	270
DX-68-23-618	12-10-91	1200	660.10	--	13	623	7.4	26.0	250

a/ Spring.

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

COMAL COUNTY--Continued

Local identifier	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity, wat, dis, fix end, field (mg/L CaCO3)	Sulfate, dissolved (mg/L)	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Silica, dissolved (mg/L)
DX-68-15-901	99	15	8.7	1.2	280	20	16	0.20	10
DX-68-16-502	90	16	8.7	1.1	260	21	14	0.20	12
DX-68-22-901	84	11	5.3	0.90	240	9.7	11	0.20	11
DX-68-23-301	80	16	10	1.4	240	26	15	0.20	12
DX-68-23-303	79	17	9.9	1.6	220	29	16	0.30	12
DX-68-23-316	97	13	6.2	0.90	270	11	12	0.20	10
DX-68-23-602	78	14	8.3	1.5	220	22	15	0.20	12
DX-68-23-616A	160	93	300	20	260	550	510	2.4	13
DX-68-23-616A	180	99	310	20	260	540	520	2.3	13
DX-68-23-616A	180	98	320	22	260	560	490	2.7	13
DX-68-23-616A	160	97	310	20	270	550	490	2.8	14
DX-68-23-616A	160	98	310	22	270	550	520	3.0	13
DX-68-23-616A	160	97	320	19	230	580	540	3.4	13
DX-68-23-616A	150	93	310	49	270	570	520	2.6	13
DX-68-23-616A	160	100	310	20	270	560	510	2.9	13
DX-68-23-616A	160	100	310	22	270	560	500	2.8	13
DX-68-23-616A	170	110	300	21	270	660	530	3.0	13
DX-68-23-616A	180	100	310	21	280	590	520	2.7	13
DX-68-23-616A	160	97	310	21	280	540	580	2.5	13
DX-68-23-616B	99	59	150	11	240	300	260	2.7	13
DX-68-23-616B	100	61	150	11	240	290	250	2.4	13
DX-68-23-616B	100	62	150	9.9	240	290	250	2.7	13
DX-68-23-616B	98	61	150	11	240	280	240	2.9	13
DX-68-23-616B	97	61	150	11	240	290	270	3.3	13
DX-68-23-616B	99	58	150	11	240	300	260	2.7	13
DX-68-23-616B	110	60	150	13	240	310	260	3.0	13
DX-68-23-616B	110	68	140	11	240	290	250	2.9	13
DX-68-23-616B	100	62	150	10	270	290	260	2.7	13
DX-68-23-616B	96	59	140	11	240	290	260	3.2	13
DX-68-23-616B	100	59	140	11	240	290	260	2.8	13
DX-68-23-616B	94	55	140	11	240	290	280	2.7	13
DX-68-23-617	55	25	12	5.5	210	49	21	0.90	12
DX-68-23-617	57	25	11	4.7	200	49	17	0.90	12
DX-68-23-617	55	24	10	3.9	210	50	18	1.1	12
DX-68-23-617	56	26	12	4.1	210	51	18	1.1	12
DX-68-23-617	57	26	11	3.5	220	50	21	1.3	12
DX-68-23-617	59	25	11	2.6	220	52	18	1.3	12
DX-68-23-617	62	24	10	2.9	220	54	17	1.3	12
DX-68-23-617	61	29	11	2.7	220	55	18	1.3	12
DX-68-23-617	58	27	11	2.8	220	56	15	1.2	12
DX-68-23-617	56	25	10	2.7	220	55	20	1.3	12
DX-68-23-617	61	26	11	2.6	230	61	20	1.1	12
DX-68-23-617	57	25	11	2.4	220	62	20	1.2	12
DX-68-23-618	54	33	27	2.9	200	60	44	2.3	13
DX-68-23-618	54	33	26	2.8	210	60	44	2.4	13
DX-68-23-618	53	32	25	2.7	200	60	40	2.3	13
DX-68-23-618	52	33	27	2.6	200	60	40	2.4	13
DX-68-23-618	51	32	26	3.0	230	60	44	2.6	13
DX-68-23-618	56	32	26	2.7	210	67	44	2.5	13
DX-68-23-618	52	32	25	2.7	210	64	41	2.5	13
DX-68-23-618	55	37	26	2.5	210	64	41	2.5	13
DX-68-23-618	55	34	26	2.6	210	62	42	2.3	13
DX-68-23-618	52	31	22	2.6	210	60	43	2.4	13
DX-68-23-618	55	32	25	2.3	220	71	46	2.5	13
DX-68-23-618	51	30	23	2.5	210	67	44	2.3	13

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

COMAL COUNTY--Continued

Local identifier	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrate, total (mg/L)	Nitrogen, nitrite, total (mg/L)	Nitrogen, NO_2+NO_3, total (mg/L)	Nitrogen, ammonia, total (mg/L)	Nitrogen, ammonia + organic, total (mg/L)	Nitrogen, total (mg/L)	Phosphorus, total (mg/L)	Carbon, organic, dissolved (mg/L)
DX-68-15-901	336	--	<0.010	1.30	<0.010	<0.20	--	<0.010	--
DX-68-16-502	321	--	<0.010	1.60	<0.010	<0.20	--	0.010	--
DX-68-22-901	275	--	<0.010	1.70	0.010	0.20	1.9	0.010	--
DX-68-23-301	305	--	<0.010	1.90	<0.010	<0.20	--	<0.010	0.8
DX-68-23-303	299	--	<0.010	1.80	0.020	0.20	2.0	<0.010	0.7
DX-68-23-316	312	--	<0.010	1.40	<0.010	0.20	1.6	<0.010	0.6
DX-68-23-602	280	2.09	0.010	2.10	0.020	<0.20	--	<0.010	1.2
DX-68-23-616A	1800	--	--	--	--	--	--	--	--
DX-68-23-616A	1840	--	--	--	--	--	--	--	--
DX-68-23-616A	1840	--	--	--	--	--	--	--	--
DX-68-23-616A	1800	--	--	--	--	--	--	--	--
DX-68-23-616A	1840	--	--	--	--	--	--	--	--
DX-68-23-616A	1870	--	--	--	--	--	--	--	--
DX-68-23-616A	1870	--	--	--	--	--	--	--	--
DX-68-23-616A	1840	--	--	--	--	--	--	--	--
DX-68-23-616A	1830	--	--	--	--	--	--	--	--
DX-68-23-616A	1970	--	--	--	--	--	--	--	--
DX-68-23-616A	1900	--	--	--	--	--	--	--	--
DX-68-23-616A	1890	--	--	--	--	--	--	--	--
DX-68-23-616B	1040	--	--	--	--	--	--	--	--
DX-68-23-616B	1020	--	--	--	--	--	--	--	--
DX-68-23-616B	1020	--	--	--	--	--	--	--	--
DX-68-23-616B	997	--	--	--	--	--	--	--	--
DX-68-23-616B	1040	--	--	--	--	--	--	--	--
DX-68-23-616B	1030	--	--	--	--	--	--	--	--
DX-68-23-616B	1060	--	--	--	--	--	--	--	--
DX-68-23-616B	1030	--	--	--	--	--	--	--	--
DX-68-23-616B	1050	--	--	--	--	--	--	--	--
DX-68-23-616B	1020	--	--	--	--	--	--	--	--
DX-68-23-616B	1020	--	--	--	--	--	--	--	--
DX-68-23-616B	1030	--	--	--	--	--	--	--	--
DX-68-23-617	308	--	--	--	--	--	--	--	--
DX-68-23-617	295	--	--	--	--	--	--	--	--
DX-68-23-617	301	--	--	--	--	--	--	--	--
DX-68-23-617	307	--	--	--	--	--	--	--	--
DX-68-23-617	311	--	--	--	--	--	--	--	--
DX-68-23-617	311	--	--	--	--	--	--	--	--
DX-68-23-617	312	--	--	--	--	--	--	--	--
DX-68-23-617	320	--	--	--	--	--	--	--	--
DX-68-23-617	314	--	--	--	--	--	--	--	--
DX-68-23-617	316	--	--	--	--	--	--	--	--
DX-68-23-617	330	--	--	--	--	--	--	--	--
DX-68-23-617	321	--	--	--	--	--	--	--	--
DX-68-23-618	359	--	--	--	--	--	--	--	--
DX-68-23-618	361	--	--	--	--	--	--	--	--
DX-68-23-618	350	--	--	--	--	--	--	--	--
DX-68-23-618	352	--	--	--	--	--	--	--	--
DX-68-23-618	371	--	--	--	--	--	--	--	--
DX-68-23-618	367	--	--	--	--	--	--	--	--
DX-68-23-618	358	--	--	--	--	--	--	--	--
DX-68-23-618	365	--	--	--	--	--	--	--	--
DX-68-23-618	360	--	--	--	--	--	--	--	--
DX-68-23-618	354	--	--	--	--	--	--	--	--
DX-68-23-618	381	--	--	--	--	--	--	--	--
DX-68-23-618	356	--	--	--	--	--	--	--	--

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

COMAL COUNTY--Continued

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Specific conductance (µS/cm)	pH, water, whole, field (standard units)	Temperature, water (°C)	Hardness, total (mg/L CaCO3)
DX-68-23-619A	01-11-91	1345	652.00	60	12	574	6.8	25.5	250
DX-68-23-619A	02-11-91	0830	652.00	60	12	556	7.0	25.5	250
DX-68-23-619A	03-11-91	1325	652.00	60	12	574	7.2	25.5	250
DX-68-23-619A	04-09-91	1000	652.00	60	12	564	6.8	25.5	260
DX-68-23-619A	05-09-91	1200	652.00	85	12	569	6.9	26.0	260
DX-68-23-619A	06-10-91	1300	652.00	45	12	558	7.0	25.5	250
DX-68-23-619A	07-09-91	1650	652.00	60	12	561	6.9	26.0	240
DX-68-23-619A	08-12-91	1600	652.00	60	12	565	7.3	25.5	280
DX-68-23-619A	09-11-91	0845	652.00	45	12	550	7.3	25.5	260
DX-68-23-619A	10-15-91	1230	652.00	85	12	553	7.1	25.5	250
DX-68-23-619A	11-13-91	1635	652.00	45	12	550	7.2	24.0	260
DX-68-23-619A	12-10-91	0905	652.00	40	12	558	7.0	25.5	240
DX-68-23-619B	01-11-91	1400	787.00	75	13	560	6.7	25.5	250
DX-68-23-619B	02-11-91	0840	787.00	70	13	542	6.9	26.0	260
DX-68-23-619B	03-11-91	1340	787.00	70	13	564	7.1	26.0	260
DX-68-23-619B	04-09-91	1015	787.00	75	13	560	6.9	26.0	250
DX-68-23-619B	05-09-91	1230	787.00	115	13	559	7.0	26.0	250
DX-68-23-619B	06-10-91	1315	787.00	60	13	550	7.2	26.5	250
DX-68-23-619B	07-09-91	1710	787.00	75	13	544	7.2	26.0	260
DX-68-23-619B	08-12-91	1645	787.00	45	13	558	6.9	26.5	280
DX-68-23-619B	09-11-91	0900	787.00	60	13	545	7.2	26.0	260
DX-68-23-619B	10-15-91	1150	787.00	45	13	547	7.1	26.0	240
DX-68-23-619B	11-13-91	1645	787.00	55	13	546	7.2	24.0	260
DX-68-23-619B	12-10-91	0915	787.00	50	13	554	7.1	25.5	270

Local identifier	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity, wat, dis, fix end, field (mg/L CaCO3)	Sulfate, dissolved (mg/L)	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Silica, dissolved (mg/L)
DX-68-23-619A	57	26	15	4.3	210	53	23	1.5	13
DX-68-23-619A	57	26	15	4.0	220	52	22	1.4	12
DX-68-23-619A	56	26	14	3.6	210	53	20	1.6	12
DX-68-23-619A	56	28	15	3.4	210	54	23	1.7	13
DX-68-23-619A	56	28	14	3.1	210	52	24	2.0	13
DX-68-23-619A	57	27	15	3.0	210	56	23	1.8	12
DX-68-23-619A	55	26	14	2.9	220	55	23	1.8	12
DX-68-23-619A	58	32	14	2.6	210	56	22	1.9	12
DX-68-23-619A	57	29	14	2.7	210	54	20	1.8	13
DX-68-23-619A	54	27	13	2.7	210	56	24	1.9	13
DX-68-23-619A	58	27	13	2.4	220	60	26	1.9	12
DX-68-23-619A	52	26	13	2.5	210	64	27	1.9	12
DX-68-23-619B	60	25	12	1.8	220	46	20	1.2	12
DX-68-23-619B	61	26	12	1.7	230	43	22	1.5	12
DX-68-23-619B	62	26	12	1.6	220	47	17	1.4	12
DX-68-23-619B	59	26	12	1.7	220	49	21	1.4	12
DX-68-23-619B	59	26	11	1.5	220	46	20	1.5	12
DX-68-23-619B	62	24	12	1.5	220	50	18	1.4	12
DX-68-23-619B	65	24	10	1.5	220	51	19	1.5	12
DX-68-23-619B	64	28	11	1.4	230	50	18	1.5	12
DX-68-23-619B	60	26	12	1.5	230	48	16	1.4	12
DX-68-23-619B	58	24	10	1.4	220	48	22	1.5	12
DX-68-23-619B	63	25	11	1.3	230	54	21	1.5	12
DX-68-23-619B	63	27	12	1.4	220	52	20	1.4	12

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

COMAL COUNTY--Continued

Local identifier	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrate, total (mg/L)	Nitrogen, nitrite, total (mg/L)	Nitrogen, NO_2+NO_3, total (mg/L)	Nitrogen, ammonia, total (mg/L)	Nitrogen, ammonia + organic, total (mg/L)	Nitrogen, total (mg/L)	Phosphorus, total (mg/L)	Carbon, organic, dissolved (mg/L)
DX-68-23-619A	320	--	--	--	--	--	--	--	--
DX-68-23-619A	321	--	--	--	--	--	--	--	--
DX-68-23-619A	315	--	--	--	--	--	--	--	--
DX-68-23-619A	321	--	--	--	--	--	--	--	--
DX-68-23-619A	320	--	--	--	--	--	--	--	--
DX-68-23-619A	322	--	--	--	--	--	--	--	--
DX-68-23-619A	319	--	--	--	--	--	--	--	--
DX-68-23-619A	327	--	--	--	--	--	--	--	--
DX-68-23-619A	318	--	--	--	--	--	--	--	--
DX-68-23-619A	319	--	--	--	--	--	--	--	--
DX-68-23-619A	329	--	--	--	--	--	--	--	--
DX-68-23-619A	326	--	--	--	--	--	--	--	--
DX-68-23-619B	312	--	--	--	--	--	--	--	--
DX-68-23-619B	315	--	--	--	--	--	--	--	--
DX-68-23-619B	312	--	--	--	--	--	--	--	--
DX-68-23-619B	313	--	--	--	--	--	--	--	--
DX-68-23-619B	310	--	--	--	--	--	--	--	--
DX-68-23-619B	315	--	--	--	--	--	--	--	--
DX-68-23-619B	317	--	--	--	--	--	--	--	--
DX-68-23-619B	321	--	--	--	--	--	--	--	--
DX-68-23-619B	312	--	--	--	--	--	--	--	--
DX-68-23-619B	311	--	--	--	--	--	--	--	--
DX-68-23-619B	324	--	--	--	--	--	--	--	--
DX-68-23-619B	322	--	--	--	--	--	--	--	--

HAYS COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Specific conductance (µS/cm)	pH, water, whole, field (standard units)	Temperature, water (°C)	Hardness, total (mg/L $CaCO_3$)
LR-58-58-403	03-22-91	0825	390.00	15	--	586	7.2	22.0	290
LR-67-01-308	07-24-91	1700	765.00	20	400	697	6.9	25.0	300
LR-67-01-701	07-19-91	1115	--	30	10	560	6.9	23.0	290
LR-67-01-801	07-01-91	1130	a/--	--	--	580	6.8	21.5	300
LR-67-01-806	07-01-91	0930	715.00	1440	1600	590	6.7	22.5	310
LR-67-01-812	02-12-91	0910	543.00	60	7.2	14700	6.6	23.0	4200
LR-67-01-812	05-15-91	0900	543.00	40	12	14100	6.7	24.0	4000
LR-67-01-812	08-14-91	0815	543.00	60	11	15000	6.6	24.5	4500
LR-67-01-812	11-18-91	1045	543.00	45	10	13800	6.5	24.0	4000
LR-67-01-813A	02-12-91	1215	564.00	60	12	14600	6.5	24.0	4200
LR-67-01-813A	05-15-91	1045	564.00	60	10	14100	6.7	24.0	4100
LR-67-01-813A	08-14-91	1000	564.00	60	10	14700	6.6	24.5	4400
LR-67-01-813A	11-18-91	1210	564.00	40	10	14100	6.5	24.0	4000
LR-67-01-813B	02-12-91	1100	699.00	50	13	13900	6.5	25.0	4100
LR-67-01-813B	05-15-91	1200	699.00	60	12	14300	6.6	25.0	3900
LR-67-01-813B	08-14-91	1100	699.00	60	13	14800	6.6	25.5	4300
LR-67-01-813B	11-18-91	1310	699.00	50	13	13900	6.5	25.0	3800
LR-67-09-105	07-30-91	1340	330.00	760	2000	630	6.9	23.5	290
LR-67-09-111	07-30-91	1640	264.00	60	200	598	6.9	23.5	290

a/ Spring.

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

HAYS COUNTY--Continued

Local identifier	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity, wat, dis, fix end, field (mg/L CaCO3)	Sulfate, dissolved (mg/L)	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Silica, dissolved (mg/L)
LR-58-58-403	76	24	5.9	1.3	270	27	9.9	0.50	11
LR-67-01-308	62	35	9.2	1.9	230	140	13	3.1	13
LR-67-01-701	98	12	7.2	0.70	260	10	11	0.10	11
LR-67-01-801	87	19	12	1.5	250	26	21	0.20	11
LR-67-01-806	95	17	13	1.3	260	28	23	0.20	12
LR-67-01-812	920	450	2000	84	390	2500	3500	2.6	15
LR-67-01-812	870	440	1900	85	400	2900	3900	20	15
LR-67-01-812	950	520	1900	84	390	3200	3800	2.7	15
LR-67-01-812	860	450	1900	81	390	2800	3600	2.3	15
LR-67-01-813A	920	450	1900	89	400	2700	3600	2.3	16
LR-67-01-813A	890	460	1900	84	400	3100	4000	2.4	15
LR-67-01-813A	940	510	1900	83	400	3000	3600	2.8	15
LR-67-01-813A	860	450	1900	78	390	2800	3600	2.7	15
LR-67-01-813B	900	440	2000	88	340	2700	4100	2.3	15
LR-67-01-813B	850	430	1900	88	390	3000	3900	2.2	14
LR-67-01-813B	920	480	1900	82	390	3000	3600	2.8	14
LR-67-01-813B	830	430	1900	80	390	2800	3700	2.7	14
LR-67-09-105	90	17	14	1.4	250	36	29	0.30	12
LR-67-09-111	89	16	11	1.2	260	28	22	0.30	12

Local identifier	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrate, total (mg/L)	Nitrogen, nitrite, total (mg/L)	Nitrogen, NO2+NO3, total (mg/L)	Nitrogen, ammonia, total (mg/L)	Nitrogen, ammonia + organic, total (mg/L)	Nitrogen, total (mg/L)	Phosphorus, total (mg/L)	Carbon, organic, dissolved (mg/L)
LR-58-58-403	318	1.19	0.010	1.20	0.050	<0.20	--	<0.010	--
LR-67-01-308	414	--	<0.010	<0.050	0.150	0.50	--	<0.010	--
LR-67-01-701	307	--	<0.010	2.80	<0.010	0.50	3.3	0.010	--
LR-67-01-801	327	--	<0.010	0.980	0.010	0.30	1.3	<0.010	0.5
LR-67-01-806	348	--	<0.010	1.70	<0.010	<0.20	--	<0.010	0.5
LR-67-01-812	9710	--	--	--	--	--	--	--	--
LR-67-01-812	10400	--	--	--	--	--	--	--	--
LR-67-01-812	10700	--	--	--	--	--	--	--	--
LR-67-01-812	9940	--	--	--	--	--	--	--	--
LR-67-01-813A	9910	--	--	--	--	--	--	--	--
LR-67-01-813A	10700	--	--	--	--	--	--	--	--
LR-67-01-813A	10300	--	--	--	--	--	--	--	--
LR-67-01-813A	9940	--	--	--	--	--	--	--	--
LR-67-01-813B	10400	--	--	--	--	--	--	--	--
LR-67-01-813B	10400	--	--	--	--	--	--	--	--
LR-67-01-813B	10200	--	--	--	--	--	--	--	--
LR-67-01-813B	9990	--	--	--	--	--	--	--	--
LR-67-09-105	351	--	<0.010	1.60	<0.010	<0.20	--	<0.010	0.5
LR-67-09-111	335	--	<0.010	1.60	<0.010	<0.20	--	0.010	0.6

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

MEDINA COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Specific conductance (µS/cm)	pH, water, whole, field (standard units)	Temperature, water (°C)	Hardness, total (mg/L CaCO3)	Calcium, dissolved (mg/L)
TD-68-26-701	06-05-91	1200	750.00	531	7.2	23.5	270	74
TD-68-33-202	06-25-91	0840	279.00	450	6.7	22.5	230	76
TD-68-41-303	04-30-91	1015	717.00	481	6.8	24.0	230	69
TD-69-29-901	06-25-91	1130	276.00	456	6.9	23.0	230	84
TD-69-46-601	04-30-91	1145	1289	464	6.9	23.5	230	70
TD-69-47-301	04-30-91	1330	1510	465	6.9	24.5	230	68
TD-69-54-401	07-26-91	0930	2000	550	7.1	24.0	230	67

Local identifier	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity, wat. dis, fix end, field (mg/L CaCO3)	Sulfate, dissolved (mg/L)	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Silica, dissolved (mg/L)
TD-68-26-701	20	8.0	1.3	210	47	13	0.30	12
TD-68-33-202	10	7.1	1.0	190	28	9.3	<0.10	11
TD-68-41-303	15	8.5	1.0	200	14	21	0.20	12
TD-69-29-901	6.1	5.2	1.0	220	9.9	8.6	0.10	12
TD-69-46-601	14	7.4	1.0	210	15	14	0.10	12
TD-69-47-301	15	7.2	1.1	210	15	14	0.20	12
TD-69-54-401	15	24	1.2	200	14	51	0.40	11

Local identifier	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrite, total (mg/L)	Nitrogen, NO2+NO3, total (mg/L)	Nitrogen, ammonia, total (mg/L)	Nitrogen, ammonia + organic, total (mg/L)	Nitrogen, total (mg/L)	Phosphorus, total (mg/L)	Carbon, organic, dissolved (mg/L)
TD-68-26-701	300	<0.010	1.10	<0.010	0.20	1.3	<0.010	0.4
TD-68-33-202	258	<0.010	0.850	0.030	<0.20	--	0.010	0.4
TD-68-41-303	263	<0.010	2.10	0.030	0.40	2.5	0.020	0.5
TD-69-29-901	259	<0.010	1.10	0.030	<0.20	--	<0.010	--
TD-69-46-601	258	<0.010	1.60	0.010	0.20	1.8	0.020	0.4
TD-69-47-301	259	<0.010	1.80	0.020	0.30	2.1	0.020	--
TD-69-54-401	306	--	--	--	--	--	--	--

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

UVALDE COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Specific conductance (µS/cm)	pH, water, whole, field (standard units)	Temperature, water (°C)	Hardness, total (mg/L CaCO3)	Calcium, dissolved (mg/L)
YP-69-36-702	06-25-91	1245	538.00	456	7.1	22.5	220	65
YP-69-42-606	06-04-91	1030	525.00	548	6.9	23.5	250	86
YP-69-43-606	06-04-91	0900	698.00	509	6.6	23.5	240	81
YP-69-50-203	06-04-91	1330	525.00	575	7.1	24.0	260	88
YP-69-50-609	06-04-91	1130	640.00	675	6.9	24.0	290	100
YP-69-51-104	06-04-91	1430	430.00	836	6.9	25.0	350	120
YP-69-51-114	06-05-91	0900	565.00	885	6.8	24.5	380	130

Local identifier	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Alkalinity, wat, dis, fix end, field (mg/L CaCO3)	Sulfate, dissolved (mg/L)	Chloride, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Silica, dissolved (mg/L)
YP-69-36-702	15	9.5	1.0	190	13	23	0.10	12
YP-69-42-606	8.8	16	1.0	210	13	36	0.10	12
YP-69-43-606	10	13	1.0	210	16	26	0.10	12
YP-69-50-203	10	16	1.1	200	13	40	0.10	12
YP-69-50-609	9.3	24	1.1	230	33	52	0.20	13
YP-69-51-104	13	32	1.3	250	38	81	0.50	16
YP-69-51-114	14	34	1.4	260	42	89	0.50	16

Local identifier	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, nitrite, total (mg/L)	Nitrogen, NO2+NO3, total (mg/L)	Nitrogen, ammonia, total (mg/L)	Nitrogen, ammonia + organic, total (mg/L)	Nitrogen, total (mg/L)	Phosphorus, total (mg/L)	Carbon, organic, dissolved (mg/L)
YP-69-36-702	250	<0.010	2.10	0.030	0.20	2.3	<0.010	0.5
YP-69-42-606	297	<0.010	3.70	<0.010	0.50	4.2	<0.010	0.5
YP-69-43-606	285	<0.010	2.80	<0.010	0.30	3.1	<0.010	0.5
YP-69-50-203	298	<0.010	3.10	<0.010	1.2	4.3	<0.010	0.5
YP-69-50-609	369	<0.010	4.00	0.020	0.50	4.5	0.020	--
YP-69-51-104	454	<0.010	4.40	<0.010	0.20	4.6	<0.010	0.4
YP-69-51-114	484	<0.010	4.40	<0.010	0.40	4.8	<0.010	0.5

Analytical data for minor elements in water from wells completed in and springs discharging from the Edwards aquifer, 1991

[ft, feet; min, minutes; gal/min, gallons per minute; µg/L, micrograms per liter; <, less than; E, estimated; --, no data or not applicable]

BEXAR COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)
AY-68-21-804	04-23-91	1030	279.00	60	7.0	<1	30	<1.0	<1
AY-68-27-303	04-23-91	1200	354.00	70	5.0	<1	32	<1.0	<1
AY-68-27-503	04-23-91	1330	375.00	75	20	<1	27	<1.0	<1
AY-68-28-514	07-16-91	0830	510.00	30	1250	<1	34	<1.0	<1
AY-68-28-608	04-08-91	1130	500.00	60	10	<1	20	<1.0	<1
AY-68-28-702	07-23-91	0800	450.00	1440	1070	<1	33	<1.0	<1
AY-68-28-903	08-15-91	0925	762.00	35	3500	<1	63	<1.0	<1
AY-68-28-920	06-11-91	0900	360.00	60	12	<1	93	<1.0	<1
AY-68-29-210	04-23-91	0900	329.00	70	7.0	<1	30	<1.0	<1
AY-68-29-405	07-15-91	1130	395.00	30	200	<1	50	<1.0	<1
AY-68-29-702	07-15-91	1000	872.00	E1440	5000	<1	33	<1.0	<1
AY-68-29-915	07-16-91	1030	824.00	1440	5000	<1	46	<1.0	<1
AY-68-29-920	06-11-91	1140	655.00	150	1150	<1	71	<1.0	<1
AY-68-29-925	06-11-91	1100	525.00	60	13	<1	46	<1.0	<1
AY-68-36-802	08-15-91	1125	1479	20	1000	1	160	<1.0	<1
AY-68-36-803	08-15-91	1205	1409	55	2000	<1	51	<1.0	<1
AY-68-36-908	08-15-91	1040	1708	30	1000	<1	93	<1.0	<1
AY-68-37-508	06-11-91	1300	1311	1440	2500	<1	110	<1.0	<1
AY-68-37-521	02-21-91	1050	1275	60	30	<1	100	<1.0	2
AY-68-37-522	02-21-91	1100	1075	65	30	<1	100	<1.0	1

Local identifier	Copper, dissolved (µg/L)	Iron, dissolved (µg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (µg/L)	Mercury, dissolved (µg/L)	Selenium, dissolved (µg/L)	Silver, dissolved (µg/L)	Zinc, dissolved (µg/L)
AY-68-21-804	1	4	<1	<1	2.7	<1	<1.0	590
AY-68-27-303	6	88	1	7	<0.1	<1	<1.0	870
AY-68-27-503	4	9	5	<1	0.2	<2	<1.0	320
AY-68-28-514	9	<3	<1	<1	<0.1	<1	<1.0	8
AY-68-28-608	2	9	1	2	<0.1	<1	<1.0	180
AY-68-28-702	6	3	<1	<1	<0.1	<1	<1.0	9
AY-68-28-903	9	7	4	1	0.7	<1	<1.0	39
AY-68-28-920	2	92	2	92	<0.1	<1	<1.0	1000
AY-68-29-210	<1	29	2	3	<0.1	<2	<1.0	960
AY-68-29-405	13	40	1	<1	<0.1	<1	<1.0	33
AY-68-29-702	12	3	1	<1	<0.1	<1	<1.0	10
AY-68-29-915	6	<3	<1	<1	<0.1	<1	<1.0	<3
AY-68-29-920	5	7	1	<1	<0.1	<1	<1.0	16
AY-68-29-925	1	1000	1	30	<0.1	<1	<1.0	140
AY-68-36-802	2	<3	<1	<1	0.1	2	<1.0	6
AY-68-36-803	2	<3	2	<1	0.2	<1	<1.0	7
AY-68-36-908	1	<3	<1	<1	<0.1	<1	<1.0	10
AY-68-37-508	4	6	1	<1	0.1	<1	<1.0	21
AY-68-37-521	<1	60	<1	20	0.1	<1	<1.0	<10
AY-68-37-522	<1	170	<1	40	0.2	<1	<1.0	<10

Analytical data for minor elements in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

BEXAR COUNTY--Continued

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)
AY-68-37-523	02-21-91	1115	1175	75	25	<1	100	<1.0	1
AY-68-37-524	02-21-91	0920	881.00	50	45	9	60	1.0	<1
AY-68-37-525	02-21-91	0930	1150	60	35	<1	100	<1.0	1
AY-68-37-526	02-21-91	0810	1223	90	13	<1	120	2.0	<1
AY-68-37-527	02-21-91	0800	926.00	40	140	<1	100	<1.0	<1
AY-68-43-610	03-14-91	1200	1856	1440	1000	20	96	<1.0	<1
AY-68-44-203	08-15-91	1240	1580	30	1000	<1	90	<1.0	<1

Local identifier	Copper, dissolved (µg/L)	Iron, dissolved (µg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (µg/L)	Mercury, dissolved (µg/L)	Selenium, dissolved (µg/L)	Silver, dissolved (µg/L)	Zinc, dissolved (µg/L)
AY-68-37-523	<1	50	<1	30	0.8	<1	<1.0	<10
AY-68-37-524	1	1800	<1	19	0.1	<1	<1.0	11
AY-68-37-525	<1	80	<1	30	0.1	<1	<1.0	<10
AY-68-37-526	1	1700	<1	47	0.1	<1	<1.0	8
AY-68-37-527	<1	51	<1	7	<0.1	<1	<1.0	8
AY-68-43-610	<1	75	<1	<1	<0.1	<1	<1.0	<3
AY-68-44-203	3	7	<1	<1	<0.1	<1	<1.0	12

COMAL COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)
DX-68-15-901	04-02-91	1000	a/--	--	--	<1	33	<1.0	<1
DX-68-16-502	07-30-91	1730	230.00	60	250	<1	38	<1.0	2
DX-68-22-901	07-30-91	1020	255.00	20	1200	<1	27	<1.0	6
DX-68-23-301	06-10-91	1400	a/--	--	--	<1	47	1.0	1
DX-68-23-303	07-08-91	1530	1045	30	4200	<1	51	<1.0	<1
DX-68-23-316	06-10-91	1520	350.00	50	10	<1	32	<1.0	<1
DX-68-23-602	07-08-91	1445	790.00	75	2700	<1	34	<1.0	<1
DX-68-23-616A	02-11-91	1250	576.00	60	14	<1	<100	<1.0	<1
DX-68-23-616B	02-11-91	1300	738.00	75	13	<1	35	<1.0	<1
DX-68-23-617	02-11-91	1010	916.50	60	14	2	120	<1.0	<1
DX-68-23-618	02-11-91	1115	660.10	60	13	<1	42	<1.0	<1
DX-68-23-619A	02-11-91	0830	652.00	60	12	1	110	<1.0	<1
DX-68-23-619B	02-11-91	0840	787.00	70	13	4	130	<1.0	<1

a/ Spring.

Analytical data for minor elements in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

COMAL COUNTY--Continued

Local identifier	Copper, dissolved (µg/L)	Iron, dissolved (µg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (µg/L)	Mercury, dissolved (µg/L)	Selenium, dissolved (µg/L)	Silver, dissolved (µg/L)	Zinc, dissolved (µg/L)
DX-68-15-901	1	42	<1	<1	<0.1	1	<1.0	23
DX-68-16-502	1	3	<1	<1	<0.1	<1	<1.0	<3
DX-68-22-901	5	<3	2	<1	0.1	<1	<1.0	20
DX-68-23-301	2	45	1	2	<0.1	<1	<1.0	45
DX-68-23-303	6	7	1	1	<0.1	<1	<1.0	53
DX-68-23-316	1	32	3	<1	<0.1	<1	<1.0	430
DX-68-23-602	5	<3	<1	<1	<0.1	<1	<1.0	7
DX-68-23-616A	<1	150	<1	20	0.2	<1	<1.0	<10
DX-68-23-616B	<1	140	<1	13	0.2	<1	<1.0	5
DX-68-23-617	<1	17	1	3	<0.1	<1	<1.0	14
DX-68-23-618	1	68	<1	5	<0.1	<1	<1.0	5
DX-68-23-619A	4	310	<1	16	<0.1	<1	<1.0	10
DX-68-23-619B	<1	46	<1	5	<0.1	<1	<1.0	13

HAYS COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)
LR-67-01-308	07-24-91	1700	765.00	20	400	<1	51	<1.0	<1
LR-67-01-701	07-19-91	1115	--	30	10	<1	34	<1.0	<1
LR-67-01-801	07-01-91	1130	a/--	--	--	<1	34	<1.0	<1
LR-67-01-806	07-01-91	0930	115.00	1440	1600	<1	38	<1.0	<1
LR-67-01-812	02-12-91	0910	543.00	60	7.2	<1	100	<1.0	10
LR-67-01-813A	02-12-91	1215	564.00	60	12	<1	<100	<1.0	6
LR-67-01-813B	02-12-91	1100	699.00	50	13	<1	100	<1.0	6
LR-67-09-105	07-30-91	1340	330.00	760	2000	<1	39	<1.0	1
LR-67-09-111	07-30-91	1640	264.00	60	200	<1	39	<1.0	<1

Local identifier	Copper, dissolved (µg/L)	Iron, dissolved (µg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (µg/L)	Mercury, dissolved (µg/L)	Selenium, dissolved (µg/L)	Silver, dissolved (µg/L)	Zinc, dissolved (µg/L)
LR-67-01-308	2	26	<1	2	<0.1	<1	<1.0	14
LR-67-01-701	6	5	<1	<1	<0.1	<1	<1.0	10
LR-67-01-801	5	5	1	<1	<0.1	<1	<1.0	12
LR-67-01-806	9	6	1	<1	<0.1	<1	<1.0	10
LR-67-01-812	<1	120	1	40	0.2	<1	<1.0	20
LR-67-01-813A	<1	90	2	40	0.1	<2	<1.0	30
LR-67-01-813B	<1	90	1	30	0.1	<2	<1.0	20
LR-67-09-105	4	4	<1	<1	<0.1	<1	<1.0	20
LR-67-09-111	9	4	4	<1	<0.1	<1	<1.0	84

a/ Spring.

Analytical data for minor elements in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

MEDINA COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)
TD-68-26-701	06-05-91	1200	750.00	<1	31	<1.0	<1
TD-68-33-202	06-25-91	0840	279.00	<1	34	<1.0	<1
TD-68-41-303	04-30-91	1015	717.00	<1	44	<1.0	1
TD-69-29-901	06-25-91	1130	276.00	<1	30	<1.0	<1
TD-69-46-601	04-30-91	1145	1289	<1	36	<1.0	<1
TD-69-47-301	04-30-91	1330	1510	<1	38	<1.0	<1
TD-69-54-401	07-26-91	0930	2000	<1	160	<1.0	<1

Local identifier	Copper, dissolved (µg/L)	Iron, dissolved (µg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (µg/L)	Mercury, dissolved (µg/L)	Selenium, dissolved (µg/L)	Silver, dissolved (µg/L)	Zinc, dissolved (µg/L)
TD-68-26-701	5	6	<1	<1	0.1	<1	<1.0	10
TD-68-33-202	3	9	2	<1	<0.1	<1	<1.0	160
TD-68-41-303	10	5	2	<1	0.2	<1	<1.0	27
TD-69-29-901	4	7	3	1	<0.1	<1	<1.0	500
TD-69-46-601	4	4	<1	<1	0.1	<1	<1.0	21
TD-69-47-301	2	22	1	<1	0.3	<1	<1.0	42
TD-69-54-401	2	51	<1	9	<0.1	<1	<1.0	62

UVALDE COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Arsenic, dissolved (µg/L)	Barium, dissolved (µg/L)	Cadmium, dissolved (µg/L)	Chromium, dissolved (µg/L)
YP-69-36-702	06-25-91	1245	538.00	<1	34	<1.0	<1
YP-69-42-606	06-04-91	1030	525.00	<1	52	<1.0	<1
YP-69-43-606	06-04-91	0900	698.00	<1	50	<1.0	9
YP-69-50-203	06-04-91	1330	525.00	1	52	<1.0	6
YP-69-50-609	06-04-91	1130	640.00	1	100	<1.0	<1
YP-69-51-104	06-04-91	1430	430.00	1	100	<1.0	20
YP-69-51-114	06-05-91	0900	565.00	<1	110	<1.0	<1

Local identifier	Copper, dissolved (µg/L)	Iron, dissolved (µg/L)	Lead, dissolved (µg/L)	Manganese, dissolved (µg/L)	Mercury, dissolved (µg/L)	Selenium, dissolved (µg/L)	Silver, dissolved (µg/L)	Zinc, dissolved (µg/L)
YP-69-36-702	1	7	1	<1	<0.1	<1	<1.0	23
YP-69-42-606	7	14	1	<1	0.2	<1	<1.0	14
YP-69-43-606	2	10	<1	<1	0.2	<1	<1.0	22
YP-69-50-203	6	4	1	<1	<0.1	<1	<1.0	10
YP-69-50-609	4	4	<1	<1	0.2	<1	<1.0	14
YP-69-51-104	8	5	1	<1	0.1	<1	<1.0	13
YP-69-51-114	6	10	<1	<1	0.3	<1	<1.0	82

Analytical data for pesticides in water from wells completed in and springs discharging from the Edwards aquifer, 1991

[ft, feet; min, minutes; gal/min, gallons per minute; µg/L, micrograms per liter; <, less than; --, not applicable or no data]

BEXAR COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Perthane, total (µg/L)	Naphthalenes, polychlor., total (µg/L)	Aldrin, total (µg/L)
AY-68-21-804	04-23-91	1030	279.00	60	7.0	<0.1	<0.10	<0.010
AY-68-27-303	04-23-91	1200	354.00	70	5.0	<0.1	<0.10	<0.010
AY-68-28-608	04-08-91	1130	500.00	60	10	<0.1	<0.10	<0.010
AY-68-29-210	04-23-91	0900	329.00	70	7.0	<0.1	<0.10	<0.010

Local identifier	Lindane, total (µg/L)	Chlordane, total (µg/L)	DDD, total (µg/L)	DDE, total (µg/L)	DDT, total (µg/L)	Dieldrin, total (µg/L)	Endosulfan, total (µg/L)	Endrin, total (µg/L)
AY-68-21-804	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
AY-68-27-303	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
AY-68-28-608	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
AY-68-29-210	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

Local identifier	Ethion, total (µg/L)	Toxaphene, total (µg/L)	Heptachlor, total (µg/L)	Heptachlor epoxide, total (µg/L)	PCB, total (µg/L)	Malathion, total (µg/L)	Parathion, total (µg/L)	Diazinon, total (µg/L)
AY-68-21-804	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
AY-68-27-303	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
AY-68-28-608	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	0.01
AY-68-29-210	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01

Local identifier	Methyl parathion, total (µg/L)	2,4-D, total (µg/L)	2,4,-5-T, total (µg/L)	Mirex, total (µg/L)	Silvex, total (µg/L)	Trithion, total (µg/L)	Methyl trithion, total (µg/L)
AY-68-21-804	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AY-68-27-303	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AY-68-28-608	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AY-68-29-210	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

COMAL COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Perthane, total (µg/L)	Naphthalenes, polychlor., total (µg/L)	Aldrin, total (µg/L)
DX-68-15-901	04-02-91	1000	a/--	--	--	<0.1	<0.10	<0.010
DX-68-23-301	06-10-91	1400	a/--	--	--	<0.1	<0.10	<0.010
DX-68-23-316	06-10-91	1520	350.00	50	10	<0.1	<0.10	<0.010

a/ Spring.

Analytical data for pesticides in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

COMAL COUNTY--Continued

Local identifier	Lindane, total (µg/L)	Chlordane, total (µg/L)	DDD, total (µg/L)	DDE, total (µg/L)	DDT, total (µg/L)	Dieldrin, total (µg/L)	Endosulfan, total (µg/L)	Endrin, total (µg/L)
DX-68-15-901	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
DX-68-23-301	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
DX-68-23-316	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

Local identifier	Ethion, total (µg/L)	Toxaphene, total (µg/L)	Heptachlor, total (µg/L)	Heptachlor epoxide, total (µg/L)	PCB, total (µg/L)	Malathion, total (µg/L)	Parathion, total (µg/L)	Diazinon, total (µg/L)
DX-68-15-901	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
DX-68-23-301	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
DX-68-23-316	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01

Local identifier	Methyl parathion, total (µg/L)	2,4-D, total (µg/L)	2,4,-5-T, total (µg/L)	Mirex, total (µg/L)	Silvex, total (µg/L)	Trithion, total (µg/L)	Methyl trithion, total (µg/L)
DX-68-15-901	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
DX-68-23-301	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
DX-68-23-316	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

HAYS COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Perthane, total (µg/L)	Naphthalenes, polychlor., total (µg/L)	Aldrin, total (µg/L)
LR-67-01-801	07-01-91	1130	a/--	--	--	<0.1	<0.10	<0.010
LR-67-09-105	07-30-91	1340	330.00	760	2000	<0.1	<0.10	<0.010

Local identifier	Lindane, total (µg/L)	Chlordane, total (µg/L)	DDD, total (µg/L)	DDE, total (µg/L)	DDT, total (µg/L)	Dieldrin, total (µg/L)	Endosulfan, total (µg/L)	Endrin, total (µg/L)
LR-67-01-801	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
LR-67-09-105	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

Local identifier	Ethion, total (µg/L)	Toxaphene, total (µg/L)	Heptachlor, total (µg/L)	Heptachlor epoxide, total (µg/L)	PCB, total (µg/L)	Malathion, total (µg/L)	Parathion, total (µg/L)	Diazinon, total (µg/L)
LR-67-01-801	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
LR-67-09-105	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01

a/ Spring.

Analytical data for pesticides in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

HAYS COUNTY--Continued

Local identifier	Methyl parathion, total (µg/L)	2,4-D, total (µg/L)	2,4,-5-T, total (µg/L)	Mirex, total (µg/L)	Silvex, total (µg/L)	Trithion, total (µg/L)
LR-67-01-801	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LR-67-09-105	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

MEDINA COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Perthane, total (µg/L)	Naphthalenes, polychlor., total (µg/L)	Aldrin, total (µg/L)	Lindane, total (µg/L)	Chlordane, total (µg/L)	DDD, total (µg/L)	DDE, total (µg/L)
TD-68-33-202	06-25-91	0840	279.00	<0.1	<0.10	<0.010	<0.010	<0.1	<0.010	<0.010
TD-69-29-901	06-25-91	1130	276.00	<0.1	<0.10	<0.010	<0.010	<0.1	<0.010	<0.010
TD-69-46-601	04-30-91	1145	1289	<0.1	<0.10	<0.010	<0.010	<0.1	<0.010	<0.010

Local identifier	DDT, total (µg/L)	Dieldrin, total (µg/L)	Endosulfan, total (µg/L)	Endrin, total (µg/L)	Ethion, total (µg/L)	Toxaphene, total (µg/L)	Heptachlor, total (µg/L)	Heptachlor epoxide, total (µg/L)	PCB, total (µg/L)	Malathion, total (µg/L)
TD-68-33-202	<0.010	<0.010	<0.010	<0.010	<0.01	<1	<0.010	<0.010	<0.1	<0.01
TD-69-29-901	<0.010	<0.010	<0.010	<0.010	<0.01	<1	<0.010	<0.010	<0.1	<0.01
TD-69-46-601	<0.010	<0.010	<0.010	<0.010	<0.01	<1	<0.010	<0.010	<0.1	<0.01

Local identifier	Parathion, total (µg/L)	Diazinon, total (µg/L)	Methyl parathion, total (µg/L)	2,4-D, total (µg/L)	2,4,-5-T, total (µg/L)	Mirex, total (µg/L)	Silvex, total (µg/L)	Trithion, total (µg/L)	Methyl trithion, total (µg/L)
TD-68-33-202	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TD-69-29-901	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TD-69-46-601	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--

UVALDE COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Perthane, total (µg/L)	Naphthalenes, polychlor., total (µg/L)	Aldrin, total (µg/L)	Lindane, total (µg/L)	Chlordane, total (µg/L)	DDD, total (µg/L)	DDE, total (µg/L)
YP-69-36-702	06-25-91	1245	538.00	<0.1	<0.10	<0.010	<0.010	<0.1	<0.010	<0.010
YP-69-42-606	06-04-91	1030	525.00	<0.1	<0.10	<0.010	<0.010	<0.1	<0.010	<0.010
YP-69-43-606	06-04-91	0900	698.00	<0.1	<0.10	<0.010	<0.010	<0.1	<0.010	<0.010
YP-69-50-609	06-04-91	1130	640.00	<0.1	<0.10	<0.010	<0.010	<0.1	<0.010	<0.010
YP-69-51-104	06-04-91	1430	430.00	<0.1	<0.10	<0.010	<0.010	<0.1	<0.010	<0.010

Analytical data for pesticides in water from wells completed in and springs discharging from the Edwards aquifer, 1991--Continued

UVALDE COUNTY--Continued

Local identifier	DDT, total (µg/L)	Dieldrin, total (µg/L)	Endosulfan, total (µg/L)	Endrin, total (µg/L)	Ethion, total (µg/L)	Toxaphene, total (µg/L)	Heptachlor, total (µg/L)	Heptachlor epoxide, total (µg/L)	PCB, total (µg/L)	Malathion, total (µg/L)
YP-69-36-702	<0.010	<0.010	<0.010	<0.010	<0.01	<1	<0.010	<0.010	<0.1	<0.01
YP-69-42-606	<0.010	<0.010	<0.010	<0.010	<0.01	<1	<0.010	<0.010	<0.1	<0.01
YP-69-43-606	<0.010	<0.010	<0.010	<0.010	<0.01	<1	<0.010	<0.010	<0.1	<0.01
YP-69-50-609	<0.010	<0.010	<0.010	<0.010	<0.01	<1	<0.010	<0.010	<0.1	<0.01
YP-69-51-104	<0.010	<0.010	<0.010	<0.010	<0.01	<1	<0.010	<0.010	<0.1	<0.01

Local identifier	Parathion, total (µg/L)	Diazinon, total (µg/L)	Methyl parathion, total (µg/L)	2,4-D, total (µg/L)	2,4,-5-T, total (µg/L)	Mirex, total (µg/L)	Silvex, total (µg/L)	Trithion, total (µg/L)	Methyl trithion, total (µg/L)
YP-69-36-702	<0.01	<0.01	<0.01	--	--	<0.01	--	<0.01	<0.01
YP-69-42-606	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
YP-69-43-606	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
YP-69-50-609	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
YP-69-51-104	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Analytical data for volatile organic compounds in water from wells completed in and a spring discharging from the Edwards aquifer, 1991

[ft, feet; min, minutes; gal/min, gallons per minute; µg/L, micrograms per liter; <, less than; tot rec, total recoverable; --, not applicable or no data]

BEXAR COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Dichlorobromomethane, total (µg/L)	Carbon tetrachloride, total (µg/L)	1,2-Dichloroethane, total (µg/L)	Bromoform, total (µg/L)	Chlorodibromomethane, total (µg/L)
AY-68-21-804	04-23-91	1030	279.00	60	7.0	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-27-303	04-23-91	1200	354.00	70	5.0	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-27-503	04-23-91	1330	375.00	75	20	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-28-608	04-08-91	1130	500.00	60	10	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-28-903	08-15-91	0925	762.00	35	3500	<0.2	<0.2	<0.2	<0.2	<0.2

Local identifier	Chloroform, total (µg/L)	Toluene, total (µg/L)	Benzene, total (µg/L)	Chlorobenzene, total (µg/L)	Chloroethane, total (µg/L)	Ethylbenzene, total (µg/L)	Methyl bromide, total (µg/L)	Methyl chloride, total (µg/L)	Methylene chloride, total (µg/L)	Tetrachloroethylene, total (µg/L)
AY-68-21-804	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-27-303	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	0.6	<0.2
AY-68-27-503	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	0.2
AY-68-28-608	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-28-903	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	2.0

Local identifier	Trichlorofluoromethane, total (µg/L)	1,1-Dichloroethane, total (µg/L)	1,1-Dichloroethylene, total (µg/L)	1,1,1-Trichloroethane, total (µg/L)	1,1,2-Trichloroethane, total (µg/L)	1,1,2,2-Tetrachloroethane, total (µg/L)	1,2-Dichlorobenzene, total (µg/L)	1,2-Dichloropropane, total (µg/L)	1,2-trans-Dichloroethene, total (µg/L)	1,3-Dichloropropene, total (µg/L)
AY-68-21-804	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
AY-68-27-303	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
AY-68-27-503	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
AY-68-28-608	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
AY-68-28-903	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	1.0	<0.20

Local identifier	1,3-Dichlorobenzene, total (µg/L)	1,4-Dichlorobenzene, total (µg/L)	2-Chloroethyl vinyl ether, total (µg/L)	Dichlorodifluoromethane, total (µg/L)	Cis-1,3-Dichloropropene, total (µg/L)	Vinyl chloride, total (µg/L)	Trichloroethylene, total (µg/l)	Styrene, total (µg/L)	Xylene, total, water whole, tot rec (µg/L)
AY-68-21-804	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-27-303	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-27-503	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-28-608	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-28-903	<0.2	0.5	<0.2	1.6	<0.2	<0.2	0.9	<0.2	<0.2

Analytical data for volatile organic compounds in water from wells completed in and a spring discharging from the Edwards aquifer, 1991--Continued

BEXAR COUNTY--Continued

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Dichlorobromomethane, total (µg/L)	Carbon tetrachloride, total (µg/L)	1,2-Dichloroethane, total (µg/L)	Bromoform, total (µg/L)	Chlorodibromomethane, total (µg/L)
AY-68-28-920	06-11-91	0900	360.00	60	12	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-29-210	04-23-91	0900	329.00	70	7.0	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-29-920	06-11-91	1140	655.00	150	1150	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-29-925	06-11-91	1100	525.00	60	13	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-36-802	08-15-91	1125	1479	20	1000	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-36-803	08-15-91	1205	1409	55	2000	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-36-908	08-15-91	1040	1708	30	1000	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-44-203	08-15-91	1240	1580	30	1000	<0.2	<0.2	<0.2	<0.2	<0.2

Local identifier	Chloroform, total (µg/L)	Toluene, total (µg/L)	Benzene, total (µg/L)	Chlorobenzene, total (µg/L)	Chloroethane, total (µg/L)	Ethylbenzene, total (µg/L)	Methyl bromide, total (µg/L)	Methyl chloride, total (µg/L)	Methylene chloride, total (µg/L)	Tetrachloroethylene, total (µg/L)
AY-68-28-920	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	4.1
AY-68-29-210	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-29-920	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-29-925	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-36-802	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-36-803	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-36-908	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-44-203	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Local identifier	Trichlorofluoromethane, total (µg/L)	1,1-Dichloroethane, total (µg/L)	1,1-Dichloroethylene, total (µg/L)	1,1,1-Trichloroethane, total (µg/L)	1,1,2-Trichloroethane, total (µg/L)	1,1,2,2-Tetrachloroethane, total (µg/L)	1,2-Dichlorobenzene, total (µg/L)	1,2-Dichloropropane, total (µg/L)	1,2-trans-Dichloroethene, total (µg/L)	1,3-Dichloropropene, total (µg/L)
AY-68-28-920	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2.1	<0.20
AY-68-29-210	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
AY-68-29-920	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
AY-68-29-925	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
AY-68-36-802	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
AY-68-36-803	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
AY-68-36-908	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
AY-68-44-203	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20

Local identifier	1,3-Dichlorobenzene, total (µg/L)	1,4-Dichlorobenzene, total (µg/L)	2-Chloroethyl vinyl ether, total (µg/L)	Dichlorodifluoromethane, total (µg/L)	Cis-1,3-Dichloropropene, total (µg/L)	Vinyl chloride, total (µg/L)	Trichloroethylene, total (µg/l)	Styrene, total (µg/L)	Xylene, total, water whole, tot rec (µg/L)
AY-68-28-920	<0.2	0.4	<0.2	1.0	<0.2	<0.2	2.3	<0.2	<0.2
AY-68-29-210	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-29-920	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-29-925	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-36-802	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-36-803	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-36-908	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
AY-68-44-203	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Analytical data for volatile organic compounds in water from wells completed in and a spring discharging from the Edwards aquifer, 1991--Continued

COMAL COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Dichlorobromomethane, total (µg/L)	Carbon tetrachloride, total (µg/L)	1,2-Dichloroethane, total (µg/L)	Bromoform, total (µg/L)	Chlorodibromomethane, total (µg/L)
DX-68-23-301	06-10-91	1400	a/--	--	--	<0.2	<0.2	<0.2	<0.2	<0.2
DX-68-23-303	07-08-91	1530	1045	30	4200	<0.2	<0.2	<0.2	<0.2	<0.2
DX-68-23-316	06-10-91	1520	350.00	50	10	<0.2	<0.2	<0.2	<0.2	<0.2

Local identifier	Chloroform, total (µg/L)	Toluene, total (µg/L)	Benzene, total (µg/L)	Chlorobenzene, total (µg/L)	Chloroethane, total (µg/L)	Ethylbenzene, total (µg/L)	Methyl bromide, total (µg/L)	Methyl chloride, total (µg/L)	Methylene chloride, total (µg/L)	Tetrachloroethylene, total (µg/L)
DX-68-23-301	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
DX-68-23-303	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
DX-68-23-316	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Local identifier	Trichlorofluoromethane, total (µg/L)	1,1-Dichloroethane, total (µg/L)	1,1-Dichloroethylene, total (µg/L)	1,1,1-Trichloroethane, total (µg/L)	1,1,2-Trichloroethane, total (µg/L)	1,1,2,2-Tetrachloroethane, total (µg/L)	1,2-Dichlorobenzene, total (µg/L)	1,2-Dichloropropane, total (µg/L)	1,2-trans-Dichloroethene, total (µg/L)	1,3-Dichloropropene, total (µg/L)
DX-68-23-301	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
DX-68-23-303	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
DX-68-23-316	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20

Local identifier	1,3-Dichlorobenzene, total (µg/L)	1,4-Dichlorobenzene, total (µg/L)	2-Chloroethyl vinyl ether, total (µg/L)	Dichlorodifluoromethane, total (µg/L)	Cis-1,3-Dichloropropene, total (µg/L)	Vinyl chloride, total (µg/L)	Trichloroethylene, total (µg/l)	Styrene, total (µg/L)	Xylene, total, water whole, tot rec (µg/L)
DX-68-23-301	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
DX-68-23-303	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
DX-68-23-316	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

HAYS COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Pump or flow period prior to sampling (min)	Flow rate, instantaneous (gal/min)	Dichlorobromomethane, total (µg/L)	Carbon tetrachloride, total (µg/L)	1,2-Dichloroethane, total (µg/L)	Bromoform, total (µg/L)	Chlorodibromomethane, total (µg/L)
LR-58-58-403	05-15-91	0850	390.00	15	--	<3.0	<3.0	<3.0	<3.0	<3.0
LR-67-01-806	07-01-91	0930	115.00	1440	1600	<0.2	<0.2	<0.2	4.3	0.4
LR-67-09-105	07-30-91	1340	330.00	760	2000	<0.2	<0.2	<0.2	<0.2	<0.2

a/ Spring

Analytical data for volatile organic compounds in water from wells completed in and a spring discharging from the Edwards aquifer, 1991--Continued

HAYS COUNTY--Continued

Local identifier	Chloroform, total (µg/L)	Toluene, total (µg/L)	Benzene, total (µg/L)	Chlorobenzene, total (µg/L)	Chloroethane, total (µg/L)	Ethylbenzene, total (µg/L)	Methyl bromide, total (µg/L)	Methyl chloride, total (µg/L)	Methylene chloride, total (µg/L)	Tetrachloroethylene, total (µg/L)
LR-58-58-403	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
LR-67-01-806	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	0.4
LR-67-09-105	<0.2	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Local identifier	Trichlorofluoromethane, total (µg/L)	1,1-Dichloroethane, total (µg/L)	1,1-Dichloroethylene, total (µg/L)	1,1,1-Trichloroethane, total (µg/L)	1,1,2-Trichloroethane, total (µg/L)	1,1,2,2-Tetrachloroethane, total (µg/L)	1,2-Dichlorobenzene, total (µg/L)	1,2-Dichloropropane, total (µg/L)	1,2-trans-Dichloroethene, total (µg/L)	1,3-Dichloropropene, total (µg/L)
LR-58-58-403	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
LR-67-01-806	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
LR-67-09-105	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20

Local identifier	1,3-Dichlorobenzene, total (µg/L)	1,4-Dichlorobenzene, total (µg/L)	2-Chloroethyl vinyl ether, total (µg/L)	Dichlorodifluoromethane, total (µg/L)	Cis-1,3-Dichloropropene, total (µg/L)	Vinyl chloride, total (µg/L)	Trichloroethylene, total (µg/l)	Styrene, total (µg/L)	Xylene, total, water whole, tot rec (µg/L)
LR-58-58-403	<3.0	<3.0	<3.0	<3.0	<3.0	<1.0	<3.0	<3.0	<3.0
LR-67-01-806	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
LR-67-09-105	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

MEDINA COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Dichlorobromomethane, total (µg/L)	Carbon tetrachloride, total (µg/L)	1,2-Dichloroethane, total (µg/L)	Bromoform, total (µg/L)	Chlorodibromomethane, total (µg/L)	Chloroform, total (µg/L)	Toluene, total (µg/L)
TD-68-26-701	06-05-91	1200	750.00	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TD-68-41-303	04-30-91	1015	717.00	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TD-69-46-601	04-30-91	1145	1289	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Local identifier	Benzene, total (µg/L)	Chlorobenzene, total (µg/L)	Chloroethane, total (µg/L)	Ethylbenzene, total (µg/L)	Methyl bromide, total (µg/L)	Methyl chloride, total (µg/L)	Methylene chloride, total (µg/L)	Tetrachloroethylene, total (µg/L)	Trichlorofluoromethane, total (µg/L)
TD-68-26-701	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TD-68-41-303	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TD-69-46-601	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Analytical data for volatile organic compounds in water from wells completed in and a spring discharging from the Edwards aquifer, 1991--Continued

MEDINA COUNTY--Continued

Local identifier	1,1-Dichloroethane, total (µg/L)	1,1-Dichloroethylene, total (µg/L)	1,1,1-Trichloroethane, total (µg/L)	1,1,2-Trichloroethane, total (µg/L)	1,1,2,2-Tetrachloroethane, total (µg/L)	1,2-Dichlorobenzene, total (µg/L)	1,2-Dichloropropane, total (µg/L)	1,2-trans-Dichloroethene, total (µg/L)	1,3-Dichloropropene, total (µg/L)
TD-68-26-701	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
TD-68-41-303	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
TD-69-46-601	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20

Local identifier	1,3-Dichlorobenzene, total (µg/L)	1,4-Dichlorobenzene, total (µg/L)	2-Chloroethyl vinyl ether, total (µg/L)	Dichlorodifluoromethane, total (µg/L)	Cis-1,3-Dichloropropene, total (µg/L)	Vinyl chloride, total (µg/L)	Trichloroethylene, total (µg/l)	Styrene, total (µg/L)	Xylene, total, water whole, tot rec (µg/L)
TD-68-26-701	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TD-68-41-303	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TD-69-46-601	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

UVALDE COUNTY

Local identifier	Date	Time	Depth of well, total (ft)	Dichlorobromomethane, total (µg/L)	Carbon tetrachloride, total (µg/L)	1,2-Dichloroethane, total (µg/L)	Bromoform, total (µg/L)	Chlorodibromomethane, total (µg/L)	Chloroform, total (µg/L)	Toluene, total (µg/L)
YP-69-42-606	06-04-91	1030	525.00	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
YP-69-43-606	06-04-91	0900	698.00	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
YP-69-50-203	06-04-91	1330	525.00	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
YP-69-51-104	06-04-91	1430	430.00	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
YP-69-51-114	06-05-91	0900	565.00	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Local identifier	Benzene, total (µg/L)	Chlorobenzene, total (µg/L)	Chloroethane, total (µg/L)	Ethylbenzene, total (µg/L)	Methyl bromide, total (µg/L)	Methyl chloride, total (µg/L)	Methylene chloride, total (µg/L)	Tetrachloroethylene, total (µg/L)	Trichlorofluoromethane, total (µg/L)
YP-69-42-606	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
YP-69-43-606	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
YP-69-50-203	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
YP-69-51-104	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	5.5	<0.2
YP-69-51-114	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	7.6	<0.2

Local identifier	1,1-Dichloroethane, total (µg/L)	1,1-Dichloroethylene, total (µg/L)	1,1,1-Trichloroethane, total (µg/L)	1,1,2-Trichloroethane, total (µg/L)	1,1,2,2-Tetrachloroethane, total (µg/L)	1,2-Dichlorobenzene, total (µg/L)	1,2-Dichloropropane, total (µg/L)	1,2-trans-Dichloroethene, total (µg/L)	1,3-Dichloropropene, total (µg/L)
YP-69-42-606	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
YP-69-43-606	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
YP-69-50-203	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
YP-69-51-104	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20
YP-69-51-114	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20

Analytical data for volatile organic compounds in water from wells completed in and a spring discharging from the Edwards aquifer, 1991--Continued

UVALDE COUNTY--Continued

Local identifier	1,3-Dichlorobenzene, total (µg/L)	1,4-Dichlorobenzene, total (µg/L)	2-Chloroethyl vinyl ether, total (µg/L)	Dichlorodifluoromethane, total (µg/L)	Cis-1,3-Dichloropropene, total (µg/L)	Vinyl chloride, total (µg/L)	Trichloroethylene, total (µg/l)	Styrene, total (µg/L)	Xylene, total, water whole, tot rec (µg/L)
YP-69-42-606	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
YP-69-43-606	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
YP-69-50-203	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
YP-69-51-104	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
YP-69-51-114	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Summary of maximum contaminant levels for pH and selected constituents in water distributed by public water systems 1/

[--, not applicable; mg/L, milligram per liter; µg/L, microgram per liter]

Constituent 2/	Maximum contaminant level 3/	Secondary maximum contaminant level 4/
	Inorganic chemicals and related properties	
pH (standard units)	--	6.5 - 8.5
Sulfate (SO_4)	--	250 mg/L
Chloride (Cl)	--	250 mg/L
Fluoride	4 mg/L	2 mg/L
Dissolved solids	--	500 mg/L
Nitrate (as N)	10 mg/L	--
Arsenic (As)	50 µg/L	--
Barium (Ba)	1,000 µg/L	--
Cadmium (Cd)	5 µg/L	--
Chromium (Cr)	100 µg/L	--
Copper (Cu)	--	1,000 µg/L
Iron (Fe)	--	300 µg/L
Lead (Pb)	50 µg/L	--
Manganese (Mn)	--	50 µg/L
Mercury (Hg)	2 µg/L	--
Selenium (Se)	50 µg/L	--
Silver (Ag)	50 µg/L	--
Zinc (Zn)	--	5,000 µg/L
	Organic chemicals	
Chlorinated hydrocarbons		
Endrin	0.2 µg/L	--
Lindane	0.2 µg/L	--
Methoxychlor	40 µg/L	--
Toxaphene	3 µg/L	--
Chlorophenoxys		
2,4-D	70 µg/L	--
Silvex	50 µg/L	--

Summary of maximum contaminant levels for pH and selected constituents in water distributed by public water systems--Continued 1/

Constituent 2/	Maximum contaminant level 3/	Secondary maximum contaminant level 4/
	Volatile organic compounds 5/	
Benzene	5 µg/L	--
Carbon tetrachloride	5 µg/L	--
1,4-Dichlorobenzene	75 µg/L	--
1,2-Dichloroethane	5 µg/L	--
1,1-Dichloroethylene	7 µg/L	--
Tetrachloroethylene	5 µg/L	--
1,1,1-Trichloroethane	200 µg/L	--
Trichloroethylene	5 µg/L	--
Vinyl chloride	2 µg/L	--

1/ Public water system.--A system for the provision of piped water to the public for human consumption, if such system has at least 15 service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.
2/ Constituent.--Any physical, chemical, biological, or radiological substance or matter in water.
3/ Maximum contaminant level.--The maximum permissible level of a contaminant in water which is delivered to the free flowing outlet of the ultimate user of a public water system. Maximum contaminant levels are those levels set by the U.S. Environmental Protection Agency (1990a) in the National Primary Drinking Water Regulations. These regulations deal with contaminants that may have a significant direct impact on the health of the consumer and are enforceable by the U.S. Environmental Protection Agency.
4/ Secondary maximum contaminant level.--The advisable maximum level of a contaminant in water which is delivered to the free flowing outlet of the ultimate user of a public water system. Secondary maximum contaminant levels are those levels proposed by the U.S. Environmental Protection Agency (1990b) in the National Secondary Drinking Water Regulations. These regulations deal with contaminants that may not have a significant direct impact on the health of the consumer, but their presence in excessive quantities may affect the esthetic qualities of the water and may discourage the use of a drinking-water supply by the public.
5/ U.S. Environmental Protection Agency (1991).

APPENDIX C. SURFACE WATER

Streamflow, springflow, reservoir contents, and water-quality data for streams and a reservoir, October 1990 to September 1991

08167000 GUADALUPE RIVER AT COMFORT, TX

LOCATION.--Lat 29°58'10", long 98°53'33", Kendall County, Hydrologic Unit 12100201, on right bank at downstream side of southbound bridge on Interstate Highway 10 at Comfort, 0.5 mi downstream from Cypress Creek, and at mile 396.2.

DRAINAGE AREA.--839 mi².

PERIOD OF RECORD.--May 1939 to current year.

REVISED RECORDS.--WSP 1632: 1958. WSP 1732: 1939(M). WSP 2123: Drainage area, 1944(M), 1952(M), 1957(M), 1960(M).

GAGE.--Water-stage recorder. Datum of gage is 1,369.83 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 27, 1939, nonrecording gage. Nov. 27, 1939, to June 2, 1980, water-stage recorder at site 0.4 mi upstream at datum 2.22 ft higher. June 2, 1980, to Sept. 30, 1986, at present site at datum 2.00 ft higher.

REMARKS.--No estimated daily discharges. Records good. Many small diversions above station for irrigation. Satellite telemeter at station.

AVERAGE DISCHARGE.--52 years (water years 1940-91), 202 ft³/s (146,300 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 240,000 ft³/s Aug. 2, 1978 (gage height, 40.90 ft), from high-water mark in well, from rating curve extended above 74,000 ft³/s on basis of current-meter measurement of 124,000 ft³/s (at gage height 32.47 ft) and slope-area measurement of 182,000 ft³/s (at gage height 38.4 ft), made at former gaging station "near Comfort" 5 mi upstream; no flow at times in 1952-57, 1963-64. All stages are at site and datum then in use. Maximum stage since at least 1848, that of Aug. 2, 1978.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 1869 reached a stage of 42.3 ft, present datum, from report by U.S. Army Corps of Engineers. Flood of July 1, 1932, reached a stage of 38.4 ft, from floodmark, and from information by State Department of Highways and Public Transportation. Flood of July 16, 1900, reached about the same stage as that of July 1, 1932, from information by local residents. All stages are at site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,600 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Sept. 15	0800	*10,000	*13.28	No other peak greater than base discharge.			

Minimum daily discharge, 51 ft³/s Aug. 15, 16.

by

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	115	115	116	115	142	144	116	107	90	97	70	57
2	114	112	115	118	139	144	116	99	90	98	64	103
3	111	111	120	133	135	137	116	169	90	91	62	142
4	111	141	115	126	146	127	116	156	103	96	59	163
5	111	154	113	123	219	126	187	184	104	119	58	93
6	111	138	111	123	241	125	199	147	99	107	56	84
7	110	130	113	122	210	126	160	133	98	95	54	85
8	108	137	112	119	187	125	151	212	92	91	52	82
9	238	155	112	124	174	124	141	211	92	90	56	80
10	171	141	112	152	166	122	129	168	107	85	60	80
11	139	134	111	143	164	123	123	159	98	82	59	78
12	125	129	112	137	162	124	123	146	354	81	58	74
13	120	126	112	130	162	122	123	144	198	76	55	71
14	115	123	116	126	158	119	157	173	191	75	52	71
15	113	123	116	125	149	119	178	148	162	72	51	2540
16	111	123	116	122	146	122	137	146	161	70	51	622
17	122	124	116	122	150	129	125	220	155	69	53	811
18	138	125	117	204	152	128	120	170	128	88	76	418
19	121	121	112	216	159	127	118	155	117	74	70	388
20	115	119	112	185	151	124	113	140	109	69	59	365
21	131	118	112	165	147	125	106	130	103	67	60	375
22	191	125	110	156	148	130	106	127	100	65	58	311
23	157	141	107	151	143	127	102	120	126	66	61	283
24	139	138	106	151	142	121	100	117	107	70	67	269
25	129	136	105	145	141	117	100	123	100	72	66	239
26	123	132	107	143	139	117	101	123	96	71	62	215
27	120	131	110	141	139	120	101	115	91	70	62	196
28	119	128	111	140	138	119	102	106	85	67	60	182
29	116	122	114	140	---	118	115	102	80	65	58	178
30	115	118	120	140	---	110	115	98	85	65	56	168
31	115	---	118	142	---	115	---	94	---	67	56	---
TOTAL	3974	3870	3499	4379	4449	3856	3796	4442	3611	2470	1841	8823
MEAN	128	129	113	141	159	124	127	143	120	79.7	59.4	294
MAX	238	155	120	216	241	144	199	220	354	119	76	2540
MIN	108	111	105	115	135	110	100	94	80	65	51	57
AC-FT	7880	7680	6940	8690	8820	7650	7530	8810	7160	4900	3650	17500

CAL YR 1990	TOTAL	72988	MEAN	200	MAX	13600	MIN	35	AC-FT	144800
WTR YR 1991	TOTAL	49010	MEAN	134	MAX	2540	MIN	51	AC-FT	97210

08167500 GUADALUPE RIVER NEAR SPRING BRANCH, TX

LOCATION.--Lat 29°23'00", long 98°23'00", Comal County, Hydrologic Unit 12100201, at downstream side of bridge on Ranch Road 311, 1.9 mi southeast of Spring Branch Post Office, 7.5 mi downstream from Curry Creek, and at mile 334.4.

DRAINAGE AREA.--1,315 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1922 to current year.

REVISED RECORDS.--WSP 1562: 1923-24, 1926, 1927-28(M), 1929, 1930(M). WSP 2123: Drainage area.

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage is 948.10 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 14, 1981, at site 220 ft downstream at same datum.

REMARKS.--Records good. Several small diversions above station for irrigation. Satellite telemeter at station.

AVERAGE DISCHARGE.--69 years, 328 ft³/s (237,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 160,000 ft³/s Aug. 3, 1978 (gage height, 45.25 ft, from floodmark), from rating curve extended above 55,600 ft³/s on basis of slope-area measurement of peak flow; no flow at times in 1951-52, 1954-56, and 1963-64.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1859, about 53 ft in 1869; flood in July 1900 reached a stage of about 49 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Sept. 16	0200	*5,560	*9.92	No other peak greater than base discharge.			

Minimum daily discharge, 69 ft³/s Aug. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	151	152	164	151	237	294	188	223	214	170	96	80
2	148	151	167	156	237	291	191	221	205	182	94	e140
3	144	151	164	185	237	284	187	259	201	174	91	e200
4	144	157	158	180	393	273	189	326	202	167	86	237
5	141	164	159	177	528	261	328	457	202	198	84	215
6	143	203	157	170	560	256	313	382	202	216	83	155
7	140	183	155	168	511	248	414	313	190	190	80	137
8	138	202	154	163	464	246	324	682	189	176	80	127
9	193	261	155	172	433	240	286	860	184	163	76	122
10	326	237	152	184	408	231	261	578	175	156	74	114
11	246	216	153	206	388	231	253	489	186	147	74	111
12	197	201	154	206	377	233	244	444	294	140	76	111
13	178	192	155	195	373	228	240	413	505	136	75	107
14	167	186	153	190	361	224	409	392	322	129	72	106
15	160	185	153	184	341	220	381	414	296	124	75	177
16	156	184	157	178	323	228	357	387	266	121	69	2380
17	151	183	158	171	327	240	299	381	336	118	70	752
18	163	180	155	210	333	229	283	432	329	113	72	779
19	170	180	151	334	350	226	272	374	242	122	74	482
20	161	180	150	338	340	223	256	358	217	121	91	444
21	166	177	146	294	325	223	246	333	200	110	87	404
22	201	174	142	274	320	222	243	314	208	104	83	395
23	240	178	143	261	314	218	234	303	349	116	106	379
24	212	185	140	268	307	214	227	288	310	128	110	428
25	190	192	140	265	301	207	223	282	226	110	99	330
26	176	188	140	252	291	206	220	283	199	107	93	295
27	168	187	141	248	288	201	217	271	185	106	88	265
28	162	180	144	243	285	200	215	257	173	103	83	246
29	159	173	146	244	---	199	271	242	162	102	81	231
30	155	168	146	240	---	191	230	232	161	97	80	226
31	153	---	147	241	---	189	---	225	---	105	79	---
TOTAL	5399	5550	4699	6748	9952	7176	8001	11415	7130	4251	2581	10175
MEAN	174	185	152	218	355	231	267	368	238	137	83.3	339
MAX	326	261	167	338	560	294	414	860	505	216	110	2380
MIN	138	151	140	151	237	189	187	221	161	97	69	80
AC-FT	10710	11010	9320	13380	19740	14230	15870	22640	14140	8430	5120	20180

CAL YR 1990 TOTAL 107523 MEAN 295 MAX 10900 MIN 76 AC-FT 213300
WTR YR 1991 TOTAL 83077 MEAN 228 MAX 2380 MIN 69 AC-FT 164800

e Estimated

08167500 GUADALUPE RIVER NEAR SPRING BRANCH, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1980 to September 1982, October 1989 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CACO3)
NOV 20...	1150	178	501	8.2	20.5	2	1.7	8.5	97	--	240
JAN 07...	1153	178	493	8.2	9.0	2	3.2	11.6	102	2.4	240
APR 11...	0745	267	501	8.1	21.0	5	5.2	7.5	88	0.8	240
JUN 06...	1025	188	486	8.2	27.0	5	11	7.6	98	1.0	230
JUL 29...	1115	105	450	8.2	28.5	7	22	7.0	92	2.6	220
AUG 28...	0805	82	466	7.8	26.5	1	9.2	7.0	90	0.9	220

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
NOV 20...	24	63	19	12	0.3	1.8	210	22	19	0.40	10
JAN 07...	28	63	19	12	0.3	1.9	210	26	34	0.30	9.6
APR 11...	30	66	19	11	0.3	1.6	210	23	20	0.30	10
JUN 06...	27	64	18	11	0.3	1.5	210	18	19	0.10	12
JUL 29...	25	58	18	13	0.4	2.2	190	22	22	0.20	15
AUG 28...	18	56	19	13	0.4	1.7	200	23	25	0.30	14

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
NOV 20...	274	11	7	4	--	<0.010	0.400	0.040	0.16	0.20	0.020
JAN 07...	291	28	11	17	--	<0.010	0.700	0.040	0.16	0.20	<0.010
APR 11...	279	21	13	8	0.400	0.030	0.430	0.040	0.26	0.30	0.030
JUN 06...	269	18	5	13	--	<0.010	0.330	<0.010	--	0.30	0.010
JUL 29...	267	22	10	12	1.47	0.030	1.50	0.120	1.6	1.7	0.030
AUG 28...	273	15	12	3	--	<0.010	0.160	0.020	--	<0.20	0.030

DATE	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
NOV 20...	<0.010	1.4	--	--	--	--	--	--	--	--	--
JAN 07...	<0.010	<0.1	<1	37	<0.5	<1.0	<5	<3	<10	5	<10
APR 11...	0.020	2.2	--	--	--	--	--	--	--	--	--
JUN 06...	<0.010	1.6	1	39	<0.5	<1.0	<5	<3	<10	11	<10
JUL 29...	0.010	2.7	--	--	--	--	--	--	--	--	--
AUG 28...	<0.010	2.4	<1	30	<0.5	<1.0	<5	<3	<10	<3	<10

08167500 GUADALUPE RIVER NEAR SPRING BRANCH, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
NOV										
20...	--	--	--	--	--	--	--	--	--	--
JAN										
07...	9	1	<0.1	<10	<10	<1	<1.0	510	<6	6
APR										
11...	--	--	--	--	--	--	--	--	--	--
JUN										
06...	6	2	<0.1	<10	<10	<1	<1.0	550	<6	5
JUL										
29...	--	--	--	--	--	--	--	--	--	--
AUG										
28...	8	<1	<0.1	<10	<10	<1	<1.0	530	<6	<3

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX

LOCATION.--Lat 29°52'07", long 98°11'55", Comal County, Hydrologic Unit 12100201, in intake structure of Canyon Dam on Guadalupe River, 12 mi northwest of New Braunfels, and at mile 303.0.

DRAINAGE AREA.--1,432 mi².

WATER-DISCHGARGE RECORDS

PERIOD OF RECORD.--July 1962 to current year. Prior to October 1970, published as Canyon Reservoir.

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Sept. 24, 1964, nonrecording gage at present site and datum.

REMARKS.--The lake is formed by a rolled earthfill dam 6,830 ft long, consisting of the main dam 4,410 ft long, an earthen dike 210 ft long, a 1,260-foot-long uncontrolled broad-crested-type spillway, and a 950-foot concrete and earthen nonoverflow section. Deliberate impoundment began June 16, 1964, and main part of dam was completed in August 1964. The flood-control outlet works consist of a 10.0-foot-diameter conduit controlled by two 5.7 by 10.0-foot hydraulically operated slide gates. The lake was built for water conservation and flood control. Capacity table beginning Oct. 1, 1974, is based on a sedimentation survey of August 1972. Small diversions above the lake for irrigation. Gage-height telemeter at station. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	974.0	-
Crest of spillway	943.0	736,700
Top of conservation pool	909.0	382,000
Lowest gated outlet (invert)	775.0	240

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers and reviewed by the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 732,600 acre-ft June 19, 1987 (elevation, 942.68 ft); minimum observed since conservation pool first reached in April 1968, 311,200 acre-ft Nov. 24, 1984 (elevation, 899.85 ft).

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 378,100 acre-ft Feb. 13-14, 19 (elevation, 908.52 ft); minimum daily, 332,000 acre-ft Sept. 1 (elevation, 902.67 ft).

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

902.0	327,000	906.0	357,800	908.0	373,800
904.0	342,200	907.0	365,800	909.0	382,000

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	364600	364600	367100	363000	370400	374600	357600	363100	359300	353100	340900	332000
2	364300	364600	367100	363600	370500	374600	357300	362700	358600	352800	340600	334600
3	364300	364600	366800	363800	370700	373700	357200	362700	358300	352500	340100	334700
4	364200	365100	366600	363800	373200	373200	358700	362800	358000	352000	339700	334900
5	364200	364900	366400	363900	374300	372700	362400	362800	357600	351900	339300	334900
6	364100	364800	366200	364000	375200	372200	363400	362400	357300	351400	339100	334900
7	363900	364800	365900	363900	375900	371600	365000	362000	357000	351100	338700	334800
8	364000	366600	365800	363900	376400	371100	365600	363400	356700	351000	338400	334700
9	365200	366500	365600	364900	376900	370400	366100	364400	356400	350600	338000	334500
10	365200	366600	365400	365000	377300	370000	366500	364900	355900	350100	337800	334300
11	365200	366600	365400	365200	377700	369100	366900	364900	355700	349700	337400	334100
12	365100	366700	365300	365200	377900	368700	367100	365000	355800	349200	336900	334000
13	365000	366800	365200	365300	378100	368000	367400	365300	356000	348800	336500	333700
14	364900	366800	365100	365500	378100	367400	368700	365800	355800	348400	336400	333700
15	364700	367000	365100	365500	377900	367000	369000	366100	355800	348100	336500	333800
16	364500	366900	365000	365500	377800	366900	369400	366700	355600	347600	336200	337700
17	364900	367000	365200	365600	377800	366400	369700	366800	355800	347200	335900	338900
18	364700	367100	365000	366800	377800	365800	369900	366700	355700	346800	335600	340500
19	364600	367100	364900	367200	378100	365400	369700	366500	355400	346300	335300	340700
20	364500	367200	364900	367700	377800	364800	369100	366100	355000	345800	334900	340800
21	365000	367300	364900	367900	377600	364200	368600	365700	354600	345300	334700	340900
22	364900	367500	364700	368200	377200	363400	368200	365300	355400	345100	334900	341200
23	365000	367600	364200	368700	376800	362900	367500	365000	355700	344700	334700	342600
24	365000	367500	363700	369000	376500	362200	367000	364500	355700	344300	334400	343000
25	365000	367600	363400	369200	376300	361800	366500	363900	355500	343700	334100	342900
26	365000	367700	363400	369500	375700	361300	366000	363300	355100	343200	333800	342700
27	364900	367800	363300	369800	375200	360700	365400	362700	354700	342800	333500	342600
28	364900	367600	363300	369900	374900	360200	365200	362200	354100	342300	333100	342300
29	364900	367400	363200	370000	---	359300	364600	361500	353900	341900	332800	342000
30	364800	367200	363200	370300	---	358800	363900	360800	353500	341600	332800	341800
31	364700	---	363000	370300	---	358000	---	360000	---	341300	332400	---
MAX	365200	367800	367100	370300	378100	374600	369900	366800	359300	353100	340900	343000
MIN	363900	364600	363000	363000	370400	358000	357200	360000	353500	341300	332400	332000
(†)	906.87	907.18	906.65	907.57	908.13	906.02	906.77	906.28	905.46	903.89	902.72	903.95
(ϕ)	+100	+2500	-4200	+7300	+4600	-16900	+5900	-3900	-6500	-12200	-8900	+9400

CAL YR 1990 MAX 389800 MIN 330300 +31800
WTR YR 1991 MAX 378100 MIN 332000 -22800

(†) Elevation, in feet, at end of month.
(ϕ) Change in contents, in acre-feet.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1969 to September 1982. February 1990 to current year.

295148098115201 - CANYON LAKE SITE AR

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
JAN							
31...	0930	1.00	375	8.3	11.0	8.7	80
31...	0932	10.0	375	8.3	11.0	8.6	79
31...	0934	20.0	375	8.3	11.0	8.6	79
31...	0936	30.0	375	8.3	11.0	8.6	79
31...	0938	40.0	375	8.3	11.0	8.6	79
31...	0940	50.0	375	8.3	11.0	8.6	79
31...	0942	60.0	375	8.3	11.0	8.6	79
31...	0944	70.0	377	8.3	11.0	8.6	79
31...	0946	75.0	377	8.3	11.0	8.6	79
MAY							
16...	0855	1.00	365	8.3	23.5	8.1	99
16...	0857	10.0	365	8.3	23.0	8.1	98
16...	0859	20.0	365	8.3	23.0	8.0	97
16...	0901	30.0	368	8.2	22.0	7.2	86
16...	0903	40.0	394	8.0	19.5	5.8	66
16...	0905	50.0	393	8.1	17.5	6.5	71
16...	0907	60.0	393	8.2	17.0	6.7	72
16...	0909	70.0	393	8.1	16.5	6.3	67
16...	0911	75.0	393	8.1	16.5	6.1	65
AUG							
12...	1035	1.00	369	8.2	28.5	7.0	93
12...	1037	10.0	369	8.2	28.5	6.9	92
12...	1039	20.0	369	8.1	28.5	6.7	89
12...	1041	30.0	379	7.8	27.5	3.7	48
12...	1043	40.0	390	7.6	26.5	1.4	18
12...	1045	50.0	419	7.5	22.0	0.9	11
12...	1047	60.0	422	7.6	20.0	1.5	17
12...	1049	72.0	418	7.6	19.5	1.8	20

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX--Continued

295206098115501 - CANYON LAKE SITE AC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	RESER-VOIR STORAGE (AC-FT)	SAM-PLING DEPTH (FEET)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TRANS-PAR-ENCY (SECCHI DISK) (M)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)
JAN												
31...	1005	370000	1.00	375	8.3	11.0	1.80	8.6	79	K12	K1	180
31...	1007	--	10.0	375	8.3	11.0	--	8.6	79	--	--	--
31...	1009	--	20.0	375	8.3	11.0	--	8.6	79	--	--	--
31...	1011	--	30.0	375	8.3	11.0	--	8.6	79	--	--	--
31...	1013	--	40.0	375	8.3	11.0	--	8.6	79	--	--	--
31...	1015	--	50.0	375	8.3	11.0	--	8.6	79	--	--	--
31...	1017	--	60.0	375	8.3	11.0	--	8.6	79	--	--	--
31...	1019	--	70.0	375	8.3	11.0	--	8.4	77	--	--	--
31...	1021	--	80.0	377	8.3	11.0	--	8.4	77	--	--	--
31...	1023	--	90.0	377	8.2	11.0	--	8.1	74	--	--	--
31...	1025	--	100	377	8.2	11.0	--	7.9	73	--	--	--
31...	1027	--	110	380	8.1	11.0	--	7.3	67	--	--	--
31...	1029	--	120	382	8.1	11.0	--	6.9	63	--	--	--
31...	1031	--	130	382	8.1	11.0	--	6.8	63	--	--	--
31...	1033	--	140	382	8.0	11.0	--	6.6	61	--	--	--
31...	1035	--	149	382	8.0	11.0	--	6.6	61	--	--	180
MAY												
16...	0925	367000	1.00	369	8.3	24.0	2.20	7.9	98	<1	K4	180
16...	0927	--	10.0	369	8.3	23.5	--	7.9	97	--	--	--
16...	0929	--	20.0	369	8.3	23.0	--	8.0	97	--	--	--
16...	0931	--	30.0	369	8.2	22.0	--	7.5	89	--	--	--
16...	0933	--	40.0	396	8.0	19.0	--	5.8	65	--	--	--
16...	0935	--	50.0	396	8.1	18.0	--	6.1	67	--	--	--
16...	0937	--	60.0	396	8.2	17.0	--	6.5	70	--	--	--
16...	0939	--	70.0	393	8.2	16.5	--	6.4	68	--	--	--
16...	0941	--	80.0	393	8.1	15.5	--	6.2	65	--	--	--
16...	0943	--	90.0	393	8.1	15.0	--	5.9	61	--	--	--
16...	0945	--	100	393	8.0	14.5	--	5.5	56	--	--	--
16...	0947	--	110	393	7.9	14.5	--	4.2	43	--	--	--
16...	0949	--	120	394	7.8	14.0	--	2.8	28	--	--	--
16...	0951	--	130	394	7.7	14.0	--	1.8	18	--	--	--
16...	0953	--	140	394	7.7	14.0	--	1.8	18	--	--	--
16...	0955	--	147	394	7.7	14.0	--	1.1	11	--	--	190
AUG												
12...	0920	337000	1.00	368	8.2	28.5	3.80	7.0	93	K2	K1	180
12...	0922	--	10.0	368	8.2	28.5	--	7.0	93	--	--	--
12...	0924	--	20.0	368	8.1	28.5	--	6.8	90	--	--	--
12...	0926	--	30.0	381	7.7	27.0	--	3.2	41	--	--	--
12...	0928	--	40.0	392	7.5	26.0	--	1.0	13	--	--	--
12...	0930	--	50.0	410	7.5	23.5	--	0.5	6	--	--	--
12...	0932	--	60.0	421	7.6	20.0	--	1.8	20	--	--	--
12...	0934	--	70.0	415	7.7	18.5	--	3.1	34	--	--	--
12...	0936	--	80.0	415	7.8	18.0	--	3.2	35	--	--	--
12...	0938	--	90.0	415	7.7	18.0	--	2.7	29	--	--	--
12...	0940	--	100	415	7.7	17.5	--	2.4	26	--	--	--
12...	0942	--	115	417	7.6	17.0	--	0	0	--	--	--
12...	0944	--	110	417	7.6	17.0	--	0.9	10	--	--	--
12...	0946	--	120	419	7.6	16.5	--	0	0	--	--	--
12...	0948	--	130	423	7.6	16.0	--	0	0	--	--	--
12...	0950	--	144	423	7.6	16.0	--	0	0	--	--	200

295206098115501 - CANYON LAKE SITE AC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
JAN											
31...	23	43	17	10	0.3	2.1	150	23	16	0.20	9.3
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	27	44	17	10	0.3	2.0	150	24	16	0.20	9.1
MAY											
16...	32	43	18	11	0.4	1.8	150	22	19	0.30	8.1
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	35	47	18	11	0.3	2.0	160	22	19	0.30	10
AUG											
12...	37	39	19	11	0.4	1.8	140	20	18	0.20	8.6
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	31	49	19	11	0.3	1.8	170	20	18	0.20	13

295206098115501 - CANYON LAKE SITE AC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
JAN											
31...	213	--	<0.010	0.100	<0.010	--	0.30	<0.010	0.010	4	<1
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	<0.010	0.100	<0.010	--	0.40	<0.010	0.010	310	<10
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	214	0.090	0.010	0.100	0.030	0.27	0.30	0.020	0.020	6	31
MAY											
16...	213	--	<0.010	0.062	<0.010	--	0.40	<0.010	<0.010	3	<1
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	<0.010	0.190	<0.010	--	0.70	0.010	<0.010	<10	<10
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	0.220	0.010	0.230	0.020	0.38	0.40	0.010	<0.010	20	<10
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	224	0.190	0.020	0.210	0.030	0.57	0.60	0.040	0.020	67	100
AUG											
12...	201	--	<0.010	<0.050	<0.010	--	0.30	<0.010	<0.010	<3	<1
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	<0.010	0.220	<0.010	--	0.20	<0.010	<0.010	<10	<10
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	<0.010	0.200	<0.010	--	0.30	0.010	<0.010	20	20
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	234	--	<0.010	<0.050	0.210	0.29	0.50	0.020	<0.010	170	300

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX--Continued

295241098132101 - CANYON LAKE SITE BC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
JAN							
31...	1045	1.00	375	8.3	11.0	8.6	79
31...	1047	10.0	375	8.3	11.0	8.6	79
31...	1049	20.0	375	8.3	11.0	8.6	79
31...	1051	30.0	375	8.3	11.0	8.6	79
31...	1053	40.0	375	8.3	11.0	8.6	79
31...	1055	50.0	375	8.3	11.0	8.5	78
31...	1057	60.0	375	8.3	11.0	8.5	78
31...	1059	70.0	375	8.3	11.0	8.5	78
31...	1101	80.0	375	8.3	11.0	8.5	78
31...	1103	90.0	375	8.3	11.0	8.5	78
31...	1107	100	375	8.3	11.0	8.5	78
31...	1109	110	375	8.3	11.0	8.5	78
31...	1111	120	375	8.3	11.0	8.5	78
31...	1113	130	375	8.3	10.5	8.5	77
MAY							
16...	1040	1.00	369	8.3	24.0	7.7	95
16...	1042	10.0	369	8.3	23.5	7.8	95
16...	1044	20.0	369	8.3	23.0	7.7	93
16...	1046	30.0	405	8.0	21.5	5.8	68
16...	1048	40.0	396	8.0	19.0	5.4	60
16...	1050	50.0	396	8.1	17.5	5.9	64
16...	1052	60.0	396	8.1	17.0	5.6	60
16...	1054	70.0	396	8.0	16.5	5.4	57
16...	1056	80.0	396	7.9	15.5	3.8	39
16...	1058	90.0	396	7.8	15.0	2.8	29
16...	1100	100	396	7.7	14.5	2.1	21
16...	1102	110	396	7.7	14.5	1.7	17
16...	1104	120	396	7.6	14.0	0.6	6
16...	1106	129	396	7.6	14.5	0.5	5
AUG							
12...	1110	1.00	368	8.2	29.0	6.7	90
12...	1112	10.0	368	8.2	29.0	6.7	90
12...	1114	20.0	370	8.2	29.0	6.6	88
12...	1116	30.0	370	8.1	28.5	6.4	85
12...	1118	40.0	399	7.5	25.5	0.1	1
12...	1120	50.0	423	7.5	22.0	0	0
12...	1122	60.0	428	7.5	20.0	0	0
12...	1124	70.0	425	7.5	19.0	0	0
12...	1126	80.0	425	7.5	18.5	0	0
12...	1128	90.0	425	7.5	18.0	0	0
12...	1130	100	425	7.6	17.5	0	0
12...	1132	110	425	7.6	17.5	0	0
12...	1134	123	425	7.6	17.0	0	0

295240098152001 - CANYON LAKE SITE CC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
JAN							
31...	1348	1.00	375	8.4	12.0	8.9	84
31...	1350	10.0	375	8.4	11.5	8.9	83
31...	1352	20.0	375	8.4	11.5	8.9	83
31...	1354	30.0	375	8.4	11.5	8.9	83
31...	1356	40.0	375	8.4	11.5	8.8	82
31...	1358	50.0	377	8.4	11.5	8.8	82
31...	1400	60.0	377	8.4	11.5	8.7	81
31...	1402	70.0	377	8.3	11.0	8.6	79
31...	1404	77.0	377	8.3	11.0	8.5	78
AUG							
12...	1405	1.00	369	8.2	29.5	6.9	93
12...	1407	10.0	369	8.2	29.5	6.9	93
12...	1409	20.0	370	8.1	29.0	6.3	85
12...	1411	30.0	378	7.8	28.5	3.9	52
12...	1413	40.0	404	7.4	25.5	0	0
12...	1415	50.0	431	7.4	22.0	0	0
12...	1417	60.0	434	7.4	20.5	0	0
12...	1419	69.0	434	7.4	19.5	0	0

295349098143101 - CANYON LAKE SITE DC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
JAN											
31...	1230	1.00	378	8.4	11.5	1.80	8.8	82	K10	K2	180
31...	1232	10.0	378	8.4	11.0	--	8.8	81	--	--	--
31...	1234	20.0	378	8.4	11.0	--	8.8	81	--	--	--
31...	1236	30.0	378	8.3	11.0	--	8.7	80	--	--	--
31...	1238	40.0	378	8.3	11.0	--	8.6	79	--	--	--
31...	1240	50.0	378	8.3	11.0	--	8.7	80	--	--	--
31...	1242	60.0	381	8.3	11.0	--	8.6	79	--	--	--
31...	1244	70.0	392	8.2	11.0	--	8.1	75	--	--	--
31...	1246	80.0	398	8.2	10.5	--	8.0	73	--	--	--
31...	1248	89.0	388	8.2	10.5	--	8.0	73	--	--	190
MAY											
16...	1220	1.00	367	8.3	25.0	1.40	7.5	94	K1	K6	180
16...	1222	10.0	367	8.3	24.5	--	7.6	94	--	--	--
16...	1224	20.0	367	8.3	24.0	--	7.6	93	--	--	--
16...	1226	30.0	396	8.0	22.0	--	5.9	70	--	--	--
16...	1228	40.0	411	7.8	19.0	--	4.3	48	--	--	--
16...	1230	50.0	405	7.9	17.0	--	4.2	45	--	--	--
16...	1232	60.0	405	7.9	16.5	--	3.7	39	--	--	--
16...	1234	70.0	405	7.8	16.0	--	2.8	29	--	--	--
16...	1236	80.0	405	7.7	15.5	--	1.3	13	--	--	--
16...	1238	88.0	405	7.7	15.5	--	0.9	9	--	--	200
AUG											
12...	1245	1.00	370	8.2	29.5	1.70	6.7	91	22	57	170
12...	1247	10.0	370	8.2	29.5	--	6.7	91	--	--	--
12...	1249	20.0	370	8.2	29.5	--	6.6	89	--	--	--
12...	1251	30.0	370	8.1	29.0	--	6.0	80	--	--	--
12...	1253	35.0	381	7.7	28.0	--	2.8	37	--	--	--
12...	1255	40.0	407	7.4	25.5	--	0	0	--	--	--
12...	1257	50.0	440	7.4	21.5	--	0	0	--	--	--
12...	1259	60.0	444	7.4	20.0	--	0	0	--	--	--
12...	1301	70.0	440	7.4	19.0	--	0	0	--	--	--
12...	1303	86.0	435	7.4	18.5	--	0	0	--	--	210

DATE	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
JAN											
31...	21	43	17	10	0.3	2.1	160	23	16	0.20	9.1
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	19	47	17	10	0.3	1.9	170	24	17	0.20	9.1
MAY											
16...	27	43	17	10	0.3	1.8	150	20	17	0.40	8.0
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	30	49	18	11	0.3	2.0	170	25	21	0.30	10
AUG											
12...	31	38	18	10	0.3	1.8	140	20	16	0.20	8.9
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	30	55	18	10	0.3	1.7	180	13	18	0.20	13

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX--Continued

295349098143101 - CANYON LAKE SITE DC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHORUS ORTHO TOTAL (MG/L AS P)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)
JAN											
31...	214	--	<0.010	0.100	<0.010	--	0.40	0.020	<0.010	13	<1
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	<0.010	0.100	<0.010	--	0.50	0.010	<0.010	<10	<10
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	227	--	<0.010	0.200	0.030	0.37	0.40	0.020	0.020	7	2
MAY											
16...	207	--	<0.010	0.061	<0.010	--	0.30	<0.010	<0.010	<3	<1
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	<0.010	0.230	0.010	3.8	3.8	0.010	<0.010	20	<10
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	237	0.250	0.020	0.270	0.030	0.67	0.70	0.050	0.020	9	82
AUG											
12...	196	--	<0.010	<0.050	<0.010	--	0.20	<0.010	<0.010	<3	<1
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	<0.010	<0.050	<0.010	--	0.40	<0.010	<0.010	<10	<10
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	<0.010	<0.050	0.040	0.36	0.40	0.010	<0.010	10	80
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	238	--	<0.010	<0.050	0.270	0.23	0.50	0.010	<0.010	370	260

295329098151001 - CANYON LAKE SITE EC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
JAN							
31...	1200	1.00	378	8.4	11.5	8.9	83
31...	1202	10.0	378	8.4	11.0	8.9	82
31...	1204	20.0	378	8.4	11.0	8.8	81
31...	1206	30.0	378	8.4	11.0	8.8	81
31...	1208	40.0	378	8.3	11.0	8.7	80
31...	1210	50.0	378	8.3	11.0	8.5	78
31...	1212	60.0	383	8.3	11.0	8.3	76
31...	1214	70.0	387	8.2	11.0	8.3	76
31...	1216	80.0	395	8.2	10.5	8.1	74
31...	1218	90.0	415	8.2	10.5	7.6	69
31...	1220	100	415	8.2	10.5	7.5	68
MAY							
16...	1125	1.00	369	8.3	24.5	7.6	94
16...	1127	10.0	369	8.2	24.0	7.6	94
16...	1129	20.0	375	8.2	24.0	7.4	91
16...	1131	30.0	396	8.1	23.5	6.8	83
16...	1133	40.0	430	7.6	19.0	3.3	37
16...	1135	50.0	405	7.9	17.5	4.3	47
16...	1137	60.0	405	7.9	17.0	4.3	46
16...	1139	70.0	405	7.9	16.5	3.8	40
16...	1141	80.0	405	7.8	15.5	2.5	26
16...	1143	90.0	405	7.7	15.5	1.4	15
16...	1145	99.0	405	7.7	15.5	0.7	7
AUG							
12...	1200	1.00	372	8.2	29.5	6.6	89
12...	1202	10.0	372	8.2	29.5	6.6	89
12...	1204	20.0	371	8.2	29.5	6.4	86
12...	1206	30.0	378	8.0	29.0	5.2	70
12...	1208	40.0	412	7.4	25.5	0	0
12...	1210	50.0	440	7.4	22.0	0	0
12...	1212	60.0	451	7.4	20.0	0	0
12...	1214	70.0	441	7.4	19.0	0	0
12...	1216	80.0	435	7.4	18.5	0	0
12...	1218	94.0	435	7.4	18.5	0	0

295349098173701 - CANYON LAKE SITE FC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
JAN											
31...	1310	1.00	398	8.3	12.0	0.80	8.9	84	K6	<1	190
31...	1312	10.0	398	8.3	11.0	--	8.8	81	--	--	--
31...	1314	20.0	398	8.3	11.0	--	8.8	81	--	--	--
31...	1316	30.0	398	8.3	11.0	--	8.7	80	--	--	--
31...	1318	40.0	398	8.3	11.0	--	8.5	78	--	--	--
31...	1320	50.0	440	8.2	11.0	--	7.8	72	--	--	--
31...	1322	60.0	453	8.1	11.0	--	7.5	69	--	--	--
31...	1324	65.0	456	8.1	11.0	--	7.3	67	--	--	220
MAY											
16...	1315	1.00	385	8.2	25.5	1.40	7.4	94	<1	--	190
16...	1317	30.0	429	7.9	23.5	--	5.3	65	--	--	--
16...	1319	40.0	447	7.5	19.0	--	3.2	36	--	--	--
16...	1321	50.0	429	7.6	18.0	--	2.1	23	--	--	--
16...	1323	60.0	425	7.6	17.0	--	0.6	6	--	--	210
AUG											
12...	1330	1.00	378	8.2	30.5	1.10	6.5	89	<2	K3	180
12...	1332	10.0	378	8.2	30.0	--	6.5	89	--	--	--
12...	1334	20.0	388	8.1	30.0	--	6.0	82	--	--	--
12...	1336	30.0	406	7.7	29.5	--	2.6	35	--	--	--
12...	1338	35.0	426	7.4	28.5	--	0	0	--	--	--
12...	1340	40.0	452	7.2	27.0	--	0	0	--	--	--
12...	1342	50.0	504	7.2	22.0	--	0	0	--	--	--
12...	1344	59.0	507	7.2	21.5	--	0	0	--	--	260

DATE	HARDNESS NONCARB DISSOLV FLD, AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
JAN											
31...	20	47	17	10	0.3	2.0	170	23	16	0.20	8.9
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	24	59	18	11	0.3	1.6	200	26	18	0.20	9.2
MAY											
16...	29	46	18	10	0.3	1.8	160	22	18	0.30	8.8
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	31	55	18	10	0.3	1.8	180	22	20	0.30	10
AUG											
12...	34	40	19	11	0.4	1.8	140	24	18	0.20	10
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	32	76	16	9.2	0.3	1.5	220	14	17	0.20	14

295349098173701 - CANYON LAKE SITE FC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
JAN											
31...	224	--	<0.010	0.200	<0.010	--	0.20	<0.010	0.010	7	<1
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	<0.010	0.200	0.010	0.19	0.20	<0.010	0.020	20	<10
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	261	--	<0.010	0.400	0.040	0.26	0.30	<0.010	0.020	11	5
MAY											
16...	221	--	<0.010	0.100	<0.010	--	0.40	0.010	<0.010	<3	<1
16...	--	0.220	0.020	0.240	0.030	0.37	0.40	0.020	<0.010	<10	<10
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	245	0.220	0.020	0.240	0.040	0.36	0.40	0.050	0.020	6	110
AUG											
12...	210	--	<0.010	<0.050	<0.010	--	0.30	0.010	<0.010	8	<1
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	0.010	<0.050	0.030	0.37	0.40	0.030	<0.010	10	20
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	<0.010	<0.050	0.200	0.40	0.60	0.030	<0.010	80	190
12...	--	--	--	--	--	--	--	--	--	--	--
12...	283	--	<0.010	<0.050	0.460	0.44	0.90	0.050	<0.010	610	240

Canyon Lake AC (295206098115501)

Phytoplankton Analyses October 1990 to September 1991

Date	1-31-91
Time	1009
TOTAL CELLS/mL	57,346
NUMBER OF SPECIES	19
DEPTH COLLECTED (ft.)	3.0

Organisms	Cells/mL
BACILLARIOPHYTA (Diatoms)	
Order Centrales	
Cyclotella meneghiniana	262
Stephanodiscus astraea var. *minutula*	65
Order Pennales	
Achnanthes minutissima	41
Nitzschia acicularis	82
Nitzschia palea	41
Nitzschia sp.	41
Synedra radians	123
CHLOROPHYTA (Green algae)	
Chlamydomonas sp.	1,634
Chlorella ellipsoidea	2,124
Chlorococcum humicola	327
Pediastrum simplex	1,307
Scenedesmus bijuga	490
Tetraëdron minimum	653
CYANOPHYTA (Blue-green algae)	
Aphanocapsa delicatissima	42,313
Chroococcus sp.	4,738
Dactylococcopsis raphidioides	490
Synechococcus sp.	1,144
EUGLENOPHYTA (Euglenoids)	
Euglena sp.	327
CRYPTOPHYTA (Cryptomonads)	
Rhodomonas minuta	1,144

Canyon Lake FC (295349098173701)

Phytoplankton Analyses October 1990 to September 1991

Date	1-31-91
Time	1310
TOTAL CELLS/mL	71,065
NUMBER OF SPECIES	22
DEPTH COLLECTED (ft.)	1.2

Organisms	Cells/mL
BACILLARIOPHYTA (Diatoms)	
Order Centrales	
Cyclotella meneghiniana	163
Stephanodiscus astraea var. *minutula*	163
Stephanodiscus niagarae	163
Order Pennales	
Achnanthes minutissima	77
Nitzschia acicularis	181
Nitzschia palea	52
Nitzschia sp.	129
Synedra radians	52
CHLOROPHYTA (Green algae)	
Chlamydomonas sp.	163
Chlorella ellipsoidea	3,594
Clorococcum humicola	1,634
Cosmarium sp.	163
CHRYSOPHYTA (Golden-brown algae)	
Kephyrion sp.	163
Mallomonas sp.	163
CYANOPHYTA (Blue-green algae)	
Aphanocapsa delicatissima	37,902
Aphanothece nidulans	12,253
Chroococcus multicoloratus	980
Chroococcus sp.	1,634
Dactylococcopsis raphidioides	653
Synechococcus sp.	9,639
CRYPTOPHYTA (Cryptomonads)	
Cryptomonas erosa	327
Rhodomonas minuta	817

Canyon Lake AC (295206098115501)

Phytoplankton Analyses October 1990 to September 1991

Date	5-16-91
Time	0925
TOTAL CELLS/mL	90,943
NUMBER OF SPECIES	10
DEPTH COLLECTED (ft.)	3.6

Organisms	Cells/mL
BACILLARIOPHYTA (Diatoms)	
Order Centrales	
Cyclotella meneghiniana	340
Cyclotella ocellata	5,106
CHLOROPHYTA (Green algae)	
Chlamydomonas sp.	1,634
Chlorella ellipsoidea	1,634
Scenedesmus bijuga	1,089
Spaerocystis schroeteri	17,426
CHRYSOPHYTA (Golder-brown algae)	
Unknown flagellate	545
CYANOPHYTA (Blue-green algae)	
Aphanocapsa delicatissima	60,446
Chroococcus sp.	1,089
CRYPTOPHYTA (Cryptomonads)	
Cryptomonas erosa	1,634

Canyon Lake FC (295349098173701)

Phytoplankton Analyses October 1990 to September 1991

Date	5-16-91
Time	1315
TOTAL CELLS/mL	142,132
NUMBER OF SPECIES	13
DEPTH COLLECTED (ft.)	2.2

Organisms	Cells/mL
BACILLARIOPHYTA (Diatoms)	
Order Centrales	
Cyclotella ocellata	1,089
Cyclotella operculata	2,178
CHLOROPHYTA (Green algae)	
Chlorococcum humicola	5,718
Chlorella ellipsoidea	2,451
Chlamydomonas sp.	2,451
Cosmarium sp.	817
Crucigenia tetrapedia	3,267
Tetraëdron minimum	817
Scenedesmus bijuga	817
CHRYSOPHYTA (Golden-brown algae)	
Unknown flagellate	817
CYANOPHYTA (Blue-green algae)	
Aphanocapsa delicatissima	112,724
Aphanocapsa elachista	6,535
Chroococcus sp.	2,451

Canyon Lake AC (295206098115501)

Phytoplankton Analyses October 1990 to September 1991

Date	8-12-91
Time	0920
TOTAL CELLS/mL	54,488
NUMBER OF SPECIES	11
DEPTH COLLECTED (ft.)	6.2

Organisms	Cells/mL
BACILLARIOPHYTA (Diatoms)	
Order Centrales	
Stephanodiscus hantzschia	981
CHLOROPHYTA (Green algae)	
Chlorella vulgaris	1,744
Oocystis parva	218
Scenedesmus bijuga	436
Unknown chlorophyte sp. 1	327
CHRYSOPHYTA (Golden-brown algae)	
Ochromonas granularis	109
Ochromonas minuscula	109
Ochromonas nana	218
CYANOPHYTA (Blue-green algae)	
Aphanocapsa elachista var. *planctonica*	45,551
Gloeocapsa punctata	545
Lyngbya limnetica	4,250

Canyon Lake FC (295349098173701)

Phytoplankton Analyses October 1990 to September 1991

Date	8-12-91
Time	1330
TOTAL CELLS/mL	105,496
NUMBER OF SPECIES	15
DEPTH COLLECTED (ft.)	1.8

Organisms	Cells/mL
BACILLARIOPHYTA (Diatoms)	
Order Pennales	
Synedra ulna	211
CHLOROPHYTA (Green algae)	
Chlamydomonas globosa	211
Chlorella vulgaris	4,853
Cosmarium sp. 1	211
Golenkinia sp. 1	422
Oocystis parva	1,055
Tetraedron regulare	211
CHRYSOPHYTA (Golden-brown algae)	
Mallomonas sp. 1	211
Ochromonas nana	211
Unknown statospore sp. 1	211
CYANOPHYTA (Blue-green algae)	
Aphanocapsa elachista var. *planctonica*	66,040
Lyngbya limnetica	6,752
Merismopedia minima	23,420
Raphidiopsis curvata	844
PYRROPHYTA (Dinoflagellate)	
Gymnodinium sp. 1	633

08167800 GUADALUPE RIVER AT SATTLER, TX

LOCATION.--Lat 29°51'32", long 98°10'47", Comal County, Hydrologic Unit 12100202, on right bank 200 ft upstream from Horseshoe Falls, 0.8 mi north of Sattler, 1.8 mi downstream from Canyon Dam, 2.3 mi upstream from Heiser Hollow, 11.2 mi north of New Braunfels, and at mile 301.2.

DRAINAGE AREA.--1,436 mi², of which 1,432 mi² is above Canyon Dam.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1960 to current year.

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 742.24 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--No estimated daily discharges. Records good. Since July 21, 1962, flow completely regulated by Canyon Lake (station 08167700) 1.8 mi upstream. Small diversions above station for irrigation. Satellite telemeter at station.

AVERAGE DISCHARGE.--29 years (water years 1963-91) since regulation began at Canyon Lake, 414 ft³/s (299,900 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,800 ft³/s Oct. 29, 1960 (gage height, 12.20 ft). Maximum discharge since closure of Canyon Dam on July 21, 1962, 5,850 ft³/s Aug. 5, 1978 (gage height, 8.31 ft); no flow July 31 to Aug. 6, 1962 (result of closure of Canyon Dam), and part of Jan. 29, 30, Feb. 1, 1965 (result of closure while constructing present control).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in July 1869 (stage unknown) has not been exceeded since that date; flood in July 1900 (stage unknown) exceeded 39 ft; maximum stage since at least 1904, 39 ft in July 1932 and June 1935, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 628 ft³/s Apr. 5 at 0100 hours (gage height, 5.75 ft); minimum daily, 133 ft³/s Oct. 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	148	143	171	184	209	567	413	594	568	374	203	178
2	149	143	173	179	209	568	296	594	568	374	218	174
3	149	143	176	187	209	562	296	595	432	374	218	176
4	144	147	176	187	230	561	299	594	355	374	218	176
5	135	148	176	187	221	561	381	591	360	374	218	176
6	150	148	178	187	247	556	327	587	360	374	203	176
7	149	148	179	185	315	555	322	587	364	374	184	176
8	149	147	179	181	320	555	314	596	365	374	200	176
9	163	143	179	186	300	555	309	601	365	374	180	176
10	150	143	179	184	283	555	309	601	365	349	174	174
11	148	143	174	183	287	555	309	601	357	296	178	174
12	156	140	174	181	339	555	309	601	360	296	184	174
13	151	142	163	181	416	555	309	423	360	296	185	174
14	152	138	176	181	425	555	314	300	360	296	196	175
15	153	141	176	181	432	555	313	300	360	288	175	170
16	148	141	176	181	432	562	313	300	360	290	191	171
17	139	144	177	180	432	568	313	419	360	300	179	174
18	140	145	181	180	433	558	414	587	360	300	179	228
19	136	145	177	179	476	555	607	587	364	300	174	258
20	134	146	176	179	525	555	601	587	365	293	165	245
21	135	155	180	179	542	555	601	587	365	292	164	241
22	136	171	180	179	550	555	601	587	366	292	170	241
23	136	168	179	179	557	555	601	587	374	292	181	262
24	136	164	179	179	566	555	598	587	374	292	181	290
25	134	163	179	179	554	555	594	587	374	292	176	309
26	133	161	179	179	541	555	594	587	374	292	177	322
27	139	165	181	179	542	555	594	582	374	292	175	313
28	139	168	184	189	545	558	594	581	374	285	176	318
29	145	170	184	204	---	568	594	485	374	281	176	318
30	146	171	184	209	---	568	594	568	374	219	176	318
31	143	---	184	209	---	568	---	568	---	182	176	---
TOTAL	4465	4534	5509	5717	11137	17315	13033	16951	11431	9681	5750	6633
MEAN	144	151	178	184	398	559	434	547	381	312	185	221
MAX	163	171	184	209	566	568	607	601	568	374	218	322
MIN	133	138	163	179	209	555	296	300	355	182	164	170
AC-FT	8860	8990	10930	11340	22090	34340	25850	33620	22670	19200	11410	13160

CAL YR 1990 TOTAL 94467 MEAN 259 MAX 581 MIN 92 AC-FT 187400
WTR YR 1991 TOTAL 112156 MEAN 307 MAX 607 MIN 133 AC-FT 222500

08167800 GUADALUPE RIVER AT SATTLER, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: September 1962 to August 1982. January 1990 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: June 1984 to September 1987.

INSTRUMENTATION.--From June 1984 to September 1987, water temperature was continuously recorded at this station.

EXTREMES FOR PERIOD OF RECORD.--
WATER TEMPERATURE: Maximum, 25.5°C on several days during September 1987; minimum, 9.5°C Mar. 8-10, 1985.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CACO3)
JAN 31...	1545	221	376	8.0	11.5	5	7.0	10.4	97	0.5	180
MAY 16...	1430	300	408	7.9	14.0	2	2.6	7.0	70	0.7	190
AUG 12...	1530	195	410	7.7	17.0	1	3.0	7.1	76	1.1	190

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
JAN 31...	21	43	17	10	0.3	2.0	160	23	17	0.20	9.2
MAY 16...	28	48	17	11	0.3	1.9	160	18	17	0.20	10
AUG 12...	24	49	17	11	0.3	2.0	170	19	17	0.20	11

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)
JAN 31...	216	6	4	2	<0.010	0.200	<0.010	--	0.20	<0.010	<0.010
MAY 16...	221	12	6	6	<0.010	0.210	<0.010	--	0.40	0.010	<0.010
AUG 12...	228	2	1	1	<0.010	0.160	0.020	0.28	0.30	0.020	<0.010

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
JAN 31...	2.8	<1	30	<0.5	<1.0	<5	<3	<10	<3	<10
MAY 16...	2.1	<1	34	<0.5	<1.0	<5	<3	<10	9	<10
AUG 12...	1.9	1	35	0.6	<1.0	<5	<3	<10	<3	<10

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
JAN 31...	5	1	<0.1	<10	<10	<1	<1.0	390	<6	13
MAY 16...	5	2	<0.1	<10	<10	<1	<1.0	410	<6	<3
AUG 12...	6	58	<0.1	<10	<10	<1	<1.0	420	<6	<3

08168000 HUECO SPRINGS NEAR NEW BRAUNFELS, TX

LOCATION.--Lat 29°45'34", long 98°08'24", Comal County, Hydrologic Unit 12100202, two springs located 1,700 ft upstream from mouth of unnamed tributary which enters the Guadalupe River at Slumber Falls, and 4.2 mi north of New Braunfels.

DRAINAGE AREA.--Not applicable.

PERIOD OF RECORD.--August 1944 to current year. Miscellaneous measurements only.

GAGE.--None.

REMARKS.--Discharge represents flow from springs. Surface runoff from precipitation is excluded. No diversion above station.

EXTREMES FOR PERIOD OF RECORD.--Maximum spring discharge measured 131 ft^3/s Jan. 21, 1968; no flow at times in 1948-49, 1951-57, 1963-64, 1967, 1984, and 1989.

DISCHARGE MEASUREMENTS, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)
Nov. 23, 1990	17.0	Apr. 3, 1991	19.1	July 22, 1991	55.1
Jan. 17, 1991	13.1	May 20	82.1	Sept. 27	26.2

08168500 GUADALUPE RIVER ABOVE COMAL RIVER AT NEW BRAUNFELS, TX

LOCATION.--Lat 29°42'53", long 98°06'35", Comal County, Hydrologic Unit 12100202, on right bank at New Braunfels, 1.1 mi upstream from Comal River, 21.9 mi downstream from Canyon Lake, and at mile 281.1.

DRAINAGE AREA.--1,518 mi², of which 1,432 mi² is above Canyon Dam.

PERIOD OF RECORD.--December 1927 to current year.

REVISED RECORDS.--WSP 898: 1935. WSP 1562: 1932. WSP 2123: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 586.65 ft above National Geodetic Vertical Datum of of 1929.

REMARKS.--No estimated daily discharges. Records good. Small diversions for irrigation below station 08167800 and above this station. Since July 21, 1962, flow largely regulated by Canyon Lake (station 08167700) 21.9 mi upstream. Satellite telemeter at station.

AVERAGE DISCHARGE.--34 years (water years 1929-62) prior to regulation by Canyon Lake, 372 ft³/s (269,500 acre-ft/yr); 29 years (water years 1963-91) regulated, 500 ft³/s (362,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 101,000 ft³/s June 15, 1935 (gage height, 32.95 ft). Maximum discharge since closure of Canyon Dam on July 21, 1962, 92,600 ft³/s May 12, 1972 (gage height, 31.65 ft); no flow July 8, 9, July 17 to Aug. 20, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1845, 38 ft July 8, 1869, and in December 1913, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,420 ft³/s Apr. 5 at 0600 hours (gage height, 4.48 ft); minimum daily, 144 ft³/s Oct. 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	161	155	201	196	273	622	524	692	683	462	237	208
2	161	155	205	204	270	616	315	692	678	460	269	211
3	159	155	206	199	270	606	313	792	613	455	267	246
4	158	168	209	205	458	602	313	763	454	457	261	249
5	147	158	210	205	492	602	1080	764	460	454	258	238
6	160	158	210	205	452	596	717	749	462	454	255	234
7	148	158	210	203	509	593	668	742	470	458	237	229
8	155	206	210	198	506	593	604	830	462	493	239	229
9	262	252	210	249	486	593	558	818	460	463	240	220
10	191	226	210	264	456	593	524	794	453	461	219	219
11	174	205	206	249	462	593	508	782	456	388	221	217
12	174	193	205	244	465	593	490	772	467	378	218	215
13	174	188	198	238	568	593	478	700	453	373	229	216
14	169	184	190	233	576	593	527	494	469	371	228	215
15	169	178	196	228	572	596	497	481	456	368	229	213
16	170	178	196	225	568	618	480	481	452	363	228	212
17	157	178	199	223	568	612	472	494	450	366	221	213
18	152	178	199	285	567	602	475	726	444	365	217	219
19	150	178	196	333	571	602	734	723	444	363	215	332
20	148	178	200	316	601	602	730	721	438	363	201	299
21	161	179	199	294	634	602	730	721	435	360	201	283
22	151	199	196	282	637	595	727	716	440	357	217	279
23	150	202	194	272	637	593	721	711	495	363	234	323
24	148	197	191	276	637	593	721	708	463	363	220	369
25	148	196	193	264	626	593	717	700	462	361	211	361
26	144	196	191	261	609	593	711	693	462	356	209	366
27	150	196	191	258	602	589	708	693	462	357	206	362
28	149	200	196	259	604	584	710	689	462	348	205	363
29	154	193	196	276	---	584	699	604	467	342	205	363
30	157	203	196	283	---	582	692	682	473	320	206	363
31	155	---	194	279	---	578	---	683	---	249	208	---
TOTAL	5006	5590	6203	7706	14676	18506	18143	21610	14345	12091	7010	8066
MEAN	161	186	200	249	524	597	605	697	478	390	226	269
MAX	262	252	210	333	637	622	1080	830	683	493	269	369
MIN	144	155	190	196	270	578	313	481	435	249	201	208
AC-FT	9930	11090	12300	15280	29110	36710	35990	42860	28450	23980	13900	16000

CAL YR 1990	TOTAL	110354	MEAN	302	MAX	773	MIN	98	AC-FT	218900
WTR YR 1991	TOTAL	138952	MEAN	381	MAX	1080	MIN	144	AC-FT	275600

08169000 COMAL RIVER AT NEW BRAUNFELS, TX

LOCATION.--Lat 29°42'21", long 98°07'20", Comal County, Hydrologic Unit 12100202, on right bank 200 ft upstream from San Antonio Street viaduct in New Braunfels and 1.1 mi upstream from mouth.

DRAINAGE AREA.--130 mi². Normal flow of river comes from springs; drainage area not applicable.

PERIOD OF RECORD.--1882 to current year (1882 to November 1927, discharge measurements only).

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Concrete control since Oct. 1, 1955. Datum of gage is 582.80 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. The flow from Comal Springs emerges from the Edwards and associated limestones in the Balcones Fault Zone. Except during periods of rainfall, flow of river is primarily from Comal Springs about 1.0 mi upstream. Flow is affected at times by cleanup operations by the city of New Braunfels at Landa Park Lake and at times by discharge from the flood-detention pools of five floodwater-retarding structures with a combined detention capacity of 17,580 acre-ft. These structures control runoff from 74.6 mi² above station. Satellite telemeter at station.

AVERAGE DISCHARGE.--59 years (water years 1933-91), 291 ft³/s (210,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 60,800 ft³/s May 11, 1972 (gage height, 36.55 ft, from floodmark), from rating curve extended above 13,000 ft³/s on basis of contracted-opening measurements on Blieders and Dry Comal Creeks and unit rainfall-runoff studies; no flow from Comal Springs from June 13 to Nov. 3, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood information begins with flood of July 8, 1869, which reached a stage of 36.91 ft, from painted and dated marks in old Rennert Brewery 0.5 mi downstream; the flood of Oct. 17, 1870, reached a stage of 37.65 ft at same site (probably some backwater from Guadalupe River).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,100 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
May 3	2000	*1,610	*6.62	No other peak greater than base discharge.			

Minimum daily discharge, 168 ft³/s Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	174	187	212	210	235	255	231	259	269	244	212	192
2	172	188	210	212	235	250	230	259	267	240	207	197
3	173	189	210	212	237	248	230	633	263	245	209	194
4	172	192	209	211	331	249	230	504	260	241	206	195
5	170	193	209	212	272	247	681	485	250	249	205	195
6	171	194	209	213	252	245	432	298	252	249	200	197
7	171	193	209	213	250	243	307	289	251	249	202	199
8	168	237	209	212	250	241	276	553	254	324	203	202
9	195	209	209	236	250	242	265	347	247	266	200	201
10	179	204	209	226	251	239	263	305	245	251	202	200
11	181	205	209	222	249	239	264	295	237	251	199	198
12	181	205	209	220	249	237	266	296	236	246	195	200
13	182	203	209	220	250	235	261	297	236	248	188	199
14	183	204	209	219	250	236	301	299	241	248	187	201
15	183	206	209	219	249	238	291	296	238	247	189	204
16	183	206	209	219	248	242	270	307	237	239	183	206
17	183	207	209	219	249	246	267	303	239	239	186	203
18	182	208	209	460	249	240	266	297	231	241	186	204
19	182	209	209	260	250	239	267	297	229	236	187	205
20	183	213	210	236	248	239	259	299	229	235	181	205
21	200	213	209	234	250	239	267	293	223	235	180	207
22	189	213	208	230	248	239	267	293	235	231	189	205
23	187	213	207	232	249	238	264	291	266	230	187	342
24	187	213	205	241	249	238	264	287	240	230	183	259
25	188	213	206	236	250	237	264	288	235	228	190	222
26	190	212	208	236	248	236	266	291	237	223	188	218
27	189	212	208	236	248	235	261	286	241	228	187	218
28	190	212	208	236	250	230	267	280	236	224	187	217
29	189	211	210	235	---	232	264	278	242	225	185	217
30	187	211	209	235	---	231	261	278	245	216	186	216
31	187	---	210	234	---	233	---	274	---	215	185	---
TOTAL	5651	6175	6474	7236	7046	7438	8502	10057	7311	7473	5974	6318
MEAN	182	206	209	233	252	240	283	324	244	241	193	211
MAX	200	237	212	460	331	255	681	633	269	324	212	342
MIN	168	187	205	210	235	230	230	259	223	215	180	192
AC-FT	11210	12250	12840	14350	13980	14750	16860	19950	14500	14820	11850	12530

CAL YR 1990 TOTAL 65361 MEAN 179 MAX 420 MIN 46 AC-FT 129600
WTR YR 1991 TOTAL 85655 MEAN 235 MAX 681 MIN 168 AC-FT 169900

GUADALUPE RIVER BASIN

COMAL SPRINGS AT NEW BRAUNFELS, TX

LOCATION.--Lat 29°42'21", long 98°07'20", Comal County, Hydrologic Unit 12100202, on right bank 200 ft upstream from San Antonio Street viaduct in New Braunfels and 1.1 mi upstream from mouth.

DRAINAGE AREA.--Not applicable. Flow at station has been corrected to reflect only flow from Comal Springs.

PERIOD OF RECORD.--1882 to current year (1882 to November 1927, discharge measurements only).

GAGE.--Water-stage recorder. Concrete control since Oct. 1, 1955. Datum of gage is 582.80 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--The flow from Comal Springs emerges from the Edwards and associated limestones in the Balcones fault zone. Except during periods of rainfall, flow of river is primarily from Comal Springs about 1.0 mi upstream. Flow to gaging station 08169000 Comal River at New Braunfels, Tex., has been corrected to reflect only that flow from Comal Springs.

AVERAGE DISCHARGE.--64 years (water years 1928-91), 283 ft^3/s, 204,907 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily spring discharge, 671 ft^3/s Nov. 25, 1985; no flow June 13 to Nov. 4, 1956.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	174	187	212	210	235	251	231	259	269	244	212	192
2	172	188	210	212	235	250	230	259	267	240	207	194
3	173	189	210	212	237	248	230	298	263	245	209	194
4	172	192	209	211	275	249	230	340	260	241	206	195
5	170	193	209	212	272	247	336	354	250	249	205	195
6	171	194	209	213	252	245	364	298	252	249	200	197
7	171	193	209	213	250	243	307	289	251	249	202	199
8	168	219	209	212	250	241	276	323	254	267	203	202
9	175	206	209	226	250	242	265	336	247	266	200	201
10	179	204	209	226	251	239	263	305	245	251	202	200
11	181	205	209	222	249	239	264	295	237	251	199	198
12	181	205	209	220	249	237	266	296	236	246	195	200
13	182	203	209	220	250	235	261	297	236	248	188	199
14	183	204	209	219	250	236	288	299	236	248	187	201
15	183	206	209	219	249	236	291	296	238	247	189	204
16	183	206	209	219	248	240	270	304	237	239	183	206
17	183	207	209	219	249	244	267	303	239	239	186	203
18	182	208	209	275	249	240	266	297	231	241	186	204
19	182	209	209	251	250	239	267	297	229	236	187	205
20	183	213	210	236	248	239	259	299	229	235	181	205
21	190	213	209	234	250	239	267	293	223	235	180	207
22	189	213	208	230	248	239	267	293	233	231	181	205
23	187	213	207	232	249	238	264	291	251	230	187	236
24	187	213	205	233	249	238	264	287	240	230	183	247
25	188	213	206	236	250	237	264	288	235	228	190	222
26	190	212	208	236	248	236	266	291	237	223	188	218
27	189	212	208	236	248	235	261	286	241	228	187	218
28	190	212	208	236	250	230	263	280	236	224	187	217
29	189	211	210	235	---	232	264	278	242	225	185	217
30	187	211	209	235	---	231	261	278	245	216	186	216
31	187	---	210	234	---	233	---	274	---	215	185	---
TOTAL	5621	6154	6474	7024	6990	7428	8072	9183	7289	7416	5966	6197
MEAN	181	205	209	227	250	240	269	296	243	239	192	207
MAX	190	219	212	275	275	251	364	354	269	267	212	247
MIN	168	187	205	210	235	230	230	259	223	215	180	192
AC-FT	11150	12210	12840	13930	13860	14730	16010	18210	14460	14710	11830	12290

CAL YR 1990 TOTAL 64574 MEAN 177 MAX 243 MIN 46 AC-FT 128100
WTR YR 1991 TOTAL 83814 MEAN 230 MAX 364 MIN 168 AC-FT 166200

08170000 SAN MARCOS RIVER SPRINGFLOW AT SAN MARCOS, TX

LOCATION (REVISED).--Lat 29°50'35", long 97°58'55", Hays County, Hydrologic Unit 12100203, at ground-water well No. LR-67-09-110, 1250 ft southwest of the intersection of FM 2439 and McCarty Lane, and 3.7 mi south of San Marcos.

DRAINAGE AREA.--Normal flow of river comes from springs, drainage area of stream not applicable.

PERIOD OF RECORD.--May 1956 to current year. June 1915 to January 1916, March 1916 to September 1921, and May to September 1956, published as San Marcos River at San Marcos; records include some surface runoff. Periodic measurements of springflow were made at this location outside period of records since Nov. 14, 1894, and are published as miscellaneous measurements. October 1956 to September 1988, at site 0.7 mi downstream from bridge on Interstate Highway 35, and 2.1 mi upstream from Blanco River.

REVISED RECORDS.--WSP 1923: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 678.50 ft, which is mean land surface, above National Geodetic Vertical Datum of 1929. June 10, 1915, to Jan. 19, 1916, nonrecording gage at site 0.5 mi upstream from Interstate Highway 35, and Mar. 13, 1916, to Sept. 7, 1921, water-stage recorder about 0.7 mi downstream from Interstate Highway 35, datum relations unknown. May 1956 to September 1988, water-stage recorder, 0.7 mi downstream from Interstate Highway 35, and 2.1 mi upstream from Blanco River, datum 536.82 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily springflow. Records fair. Springflow is computed from a regression equation developed using water-level data from a water well LR-67-09-110, and measurements of springflow. Entire flow of river is from San Marcos Springs, located about 1.1 mi upstream from Interstate Highway 35, except during periods of local runoff. San Marcos Springs emerge from the Edwards and associated limestones in the Balcones Fault Zone. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--35 years (water years 1957-91), 165 ft³/s (119,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily spring discharge (estimated), 427 ft³/s June 14, 1987; minimum daily, 46 ft³/s Aug. 15, 16, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum daily spring discharge, 225 ft³/s May 14-24; minimum daily spring, 114 ft³/s Dec. 30 to Jan. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	120	117	121	114	187	194	193	214	222	211	198	187
2	119	117	121	115	186	195	192	214	221	210	198	187
3	119	117	121	115	186	194	192	215	220	210	197	186
4	118	116	121	115	187	194	191	216	220	210	196	186
5	118	116	120	116	190	194	192	217	220	210	196	187
6	118	116	120	116	192	193	198	217	219	209	195	186
7	117	116	119	116	192	193	203	217	218	209	195	186
8	117	117	119	116	193	193	206	218	218	208	194	186
9	116	121	119	150	194	192	207	220	218	208	194	186
10	117	122	119	174	194	192	209	222	217	208	194	186
11	118	123	119	179	194	192	210	223	217	208	193	185
12	118	123	119	180	195	192	210	223	216	208	193	185
13	118	123	119	180	195	192	211	224	216	207	192	185
14	119	123	119	180	195	191	212	225	216	207	192	185
15	119	123	119	180	194	191	214	225	216	206	191	185
16	119	123	118	180	195	191	215	225	216	205	191	184
17	119	123	118	180	195	192	216	225	216	204	191	183
18	118	123	118	180	195	193	216	225	216	204	190	183
19	118	123	118	183	195	194	216	225	215	204	190	183
20	119	123	118	183	195	194	216	225	215	203	189	183
21	118	123	118	185	195	195	216	225	214	202	188	183
22	118	123	117	185	195	194	216	225	214	202	188	183
23	118	122	117	186	195	194	216	225	213	201	187	183
24	118	122	116	186	195	194	216	225	212	201	188	183
25	118	122	116	186	195	194	216	224	212	201	188	183
26	118	122	116	187	195	194	216	224	212	200	188	184
27	118	122	116	187	195	194	216	224	212	200	188	184
28	117	121	116	187	195	194	216	224	212	200	188	184
29	117	121	116	187	---	193	216	223	211	200	187	184
30	117	121	114	187	---	193	215	223	211	199	187	184
31	117	---	114	187	---	192	---	222	---	199	187	---
TOTAL	3658	3624	3661	5102	5409	5987	6278	6879	6475	6354	5933	5539
MEAN	118	121	118	165	193	193	209	222	216	205	191	185
MAX	120	123	121	187	195	195	216	225	222	211	198	187
MIN	116	116	114	114	186	191	191	214	211	199	187	183
AC-FT	7260	7190	7260	10120	10730	11880	12450	13640	12840	12600	11770	10990

CAL YR 1990 TOTAL 41626 MEAN 114 MAX 141 MIN 81 AC-FT 82570
WTR YR 1991 TOTAL 64899 MEAN 178 MAX 225 MIN 114 AC-FT 128700

08171000 BLANCO RIVER AT WIMBERLEY, TX

LOCATION.--Lat 29°59'39", long 98°05'19", Hays County, Hydrologic Unit 12100203, on left bank at downstream side of highway, near left end of bridge on Ranch Road 12, 0.3 mi southeast of Wimberley, 2,200 ft downstream from Cypress Creek, and at mile 29.0.

DRAINAGE AREA.--355 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1924 to September 1926, June 1928 to current year.

REVISED RECORDS.--WSP 1562: 1929, 1930-31(M), 1935-36(M), 1938(M), 1941-42(M), 1947(M), 1949(M). WSP 2123: Drainage area.

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage is 797.23 ft above National Geodetic Vertical Datum of 1929. Aug. 6, 1924, to Sept. 30, 1926, nonrecording gage at site 1,030 ft upstream at datum 5.00 ft higher. Recording gage from June 6, 1928, to June 12, 1975, at site 1,000 ft upstream at datum 5.00 ft higher.

REMARKS.--No estimated daily discharges. Records good. There are many small diversions above station. Satellite telemeter at station.

AVERAGE DISCHARGE.--65 years (water years 1925-26, 1929-91), 126 ft³/s (4.82 in/yr), 91,290 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 113,000 ft³/s May 28, 1929 (gage height, 33.3 ft, from floodmark), present site and datum, from rating curve extended above 30,000 ft³/s on basis of slope-area measurements of 95,000 and 113,000 ft³/s; minimum, 0.6 ft³/s Aug. 16, 1956.
Maximum stage since at least 1869, that of May 28, 1929.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in July 1869 reached a stage of 25 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,800 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 5	0200	2,870	7.50	Sept. 2	1900	3,050	7.65
Apr. 14	1430	2,660	7.31	Sept. 18	2330	2,820	7.45
June 23	0430	*3,280	*7.84				

Minimum daily discharge, 19 ft³/s Oct. 7, 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	26	35	31	119	153	102	187	148	73	43	40
2	23	25	35	57	118	153	103	178	140	73	42	382
3	23	26	35	72	118	148	103	290	137	83	41	128
4	22	30	33	54	445	138	103	250	134	97	39	90
5	21	27	33	54	461	136	878	567	133	84	38	78
6	20	27	34	54	362	135	527	315	130	74	38	75
7	19	30	33	51	315	130	675	251	138	71	39	71
8	19	60	33	49	288	127	486	619	126	72	38	68
9	47	57	33	170	266	122	363	723	123	70	37	66
10	28	46	33	156	254	120	309	461	120	68	36	64
11	38	46	33	119	240	120	292	397	115	66	35	64
12	37	44	34	103	228	120	274	357	134	64	35	60
13	33	41	33	97	223	118	257	329	139	62	33	63
14	30	40	33	93	197	115	1090	312	134	60	50	63
15	28	41	33	85	185	116	640	298	124	59	61	64
16	28	38	32	78	177	116	438	286	119	58	39	60
17	28	36	32	76	174	116	388	281	125	58	37	60
18	26	35	33	158	177	115	365	264	116	57	37	276
19	24	35	33	176	195	116	400	248	111	53	35	727
20	24	36	33	163	203	115	342	236	103	52	33	185
21	29	36	33	151	180	115	308	234	97	51	33	141
22	28	37	30	144	172	114	295	219	96	51	42	123
23	27	37	28	143	173	109	270	202	706	49	48	171
24	29	33	29	150	164	109	252	192	146	49	38	321
25	30	34	29	144	158	109	242	336	109	49	36	237
26	30	36	31	141	151	108	233	219	95	49	36	181
27	29	36	31	140	148	110	221	185	86	49	36	155
28	28	35	31	137	149	109	211	171	78	46	36	139
29	26	35	32	136	---	106	215	164	75	46	34	125
30	26	34	32	128	---	104	218	157	76	46	36	115
31	26	---	31	121	---	103	---	151	---	44	38	---
TOTAL	849	1099	1003	3431	6040	3725	10600	9079	4113	1883	1199	4392
MEAN	27.4	36.6	32.4	111	216	120	353	293	137	60.7	38.7	146
MAX	47	60	35	176	461	153	1090	723	706	97	61	727
MIN	19	25	28	31	118	103	102	151	75	44	33	40
AC-FT	1680	2180	1990	6810	11980	7390	21030	18010	8160	3730	2380	8710

CAL YR 1990 TOTAL 25013 MEAN 68.5 MAX 2880 MIN 15 AC-FT 49610
WTR YR 1991 TOTAL 47413 MEAN 130 MAX 1090 MIN 19 AC-FT 94040

08171000 BLANCO RIVER AT WIMBERLEY, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: April 1962 to December 1973. Chemical, biochemical, and pesticide analyses: January 1974 to September 1979, February 1988 to current year. Sediment analyses: November 1965 to April 1966.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: December 1976 to September 1978.

INSTRUMENTATION.--From December 1976 to September 1978 water temperature was recorded continuously at this station.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum daily, 36.0°C July 16, 1978; minimum daily, 2.5°C Jan. 20, 1978.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
DEC 06...	0925	34	478	8.0	10.0	1	1.2	10.7	97	0.8	K16
MAR 06...	1153	134	500	7.9	20.0	2	2.8	9.5	108	0.4	26
JUN 12...	1108	130	444	8.1	25.5	6	2.0	8.0	101	0	180

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
DEC 06...	20	240	49	67	18	8.4	0.2	1.4	190	34	14
MAR 06...	K15	240	30	72	15	7.9	0.2	1.2	210	23	13
JUN 12...	80	230	25	67	14	7.6	0.2	1.1	200	22	14

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)
DEC 06...	0.40	7.9	266	<1	<1	--	0.290	0.010	0.300	0.020	0.18
MAR 06...	0.20	7.8	268	6	5	1	--	<0.010	0.400	0.020	--
JUN 12...	0.10	10	256	1	1	0	--	<0.010	0.240	0.020	0.18

DATE	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
DEC 06...	0.20	<0.010	<0.010	1.3	--	--	--	--	--	--	--
MAR 06...	<0.20	0.040	<0.010	1.3	<1	30	0.7	<1.0	<5	<3	<10
JUN 12...	0.20	0.030	<0.010	1.5	<1	29	<0.5	<1.0	<5	<3	<10

DATE	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)
DEC 06...	--	--	--	--	--	--	--	--	--	--	--
MAR 06...	5	20	7	3	<0.1	<10	<10	<1	<1.0	330	<6
JUN 12...	5	<10	5	2	<0.1	<10	<10	<1	1.0	360	<6

08171000 BLANCO RIVER AT WIMBERLEY, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)
DEC 06...	--	--	--	--	--	--	--	--	--	--	--
MAR 06...	6	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01
JUN 12...	5	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
DEC 06...	--	--	--	--	--	--	--	--	--	--
MAR 06...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
JUN 12...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
DEC 06...	--	--	--	--	--	--	--	--	--	--
MAR 06...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
JUN 12...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01

08171300 BLANCO RIVER NEAR KYLE, TX

LOCATION.--Lat 29°58'45", long 97°54'35", Hays County, Hydrologic Unit 12100203, on left bank 800 ft downstream from Tarbutton Ranch House (Hatchett Ranch), 2.2 mi southwest of Kyle, 4.2 mi downstream from Halifax Creek, and 6.3 mi upstream from bridge on U.S. Highway 81.

DRAINAGE AREA.--412 mi².

PERIOD OF RECORD.--May 1956 to current year.

REVISED RECORDS.--WSP 1923: 1957-58, 1960(M). WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 620.12 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Records good except those for estimated daily discharges, which are fair. Small diversions above station for irrigation. Most of the low flow of the Blanco River enters the Edwards and associated limestones in the Balcones Fault Zone which crosses the basin upstream from this station and below the station at Wimberley. Several observations of water temperature were made during the year. Recording rain gage at this station.

AVERAGE DISCHARGE.--35 years, 148 ft³/s (4.88 in/yr), 107,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 98,000 ft³/s May 2, 1958 (gage height, 36.3 ft, from floodmark), from rating curve extended above 37,000 ft³/s on basis of slope-area measurement of 139,000 ft³/s and slope-conveyance study; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1882, about 40 ft in May 1929, from information by local residents (discharge, 139,000 ft³/s). Flood of Sept. 11, 1952, reached a stage of 38.0 ft (discharge, 115,000 ft³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 14	1900	*2,500	*10.70	No other peak greater than base discharge.			

Minimum daily discharge, 1.3 ft³/s Oct. 3, 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	5.2	15	14	125	156	82	183	146	84	38	28
2	1.7	5.1	16	20	120	148	80	175	140	80	37	335
3	1.3	5.0	16	62	118	146	81	240	141	79	37	334
4	1.3	7.2	15	42	395	138	79	238	137	105	34	102
5	1.5	12	15	36	417	132	692	456	132	105	34	70
6	2.3	8.4	15	36	359	130	416	306	131	84	34	61
7	2.3	6.6	16	33	316	127	574	239	137	76	32	60
8	1.8	35	16	31	283	123	431	369	129	82	32	52
9	62	74	16	387	265	119	347	805	125	81	29	47
10	30	39	16	313	252	116	293	427	122	73	28	43
11	12	31	16	191	236	115	276	362	118	69	26	47
12	19	30	16	146	225	116	249	329	136	66	24	42
13	15	27	16	123	218	112	219	303	135	64	23	38
14	11	25	15	110	207	110	851	286	133	63	21	46
15	9.0	24	15	100	189	114	728	272	127	61	78	63
16	7.0	23	15	87	184	122	407	262	119	58	38	49
17	5.9	22	14	80	181	119	360	258	127	56	29	43
18	5.5	21	14	179	179	113	342	245	120	58	28	46
19	4.3	20	14	229	196	111	347	232	114	53	27	e688
20	3.3	20	14	201	196	109	324	222	108	51	24	e254
21	5.9	21	15	179	192	108	286	217	99	49	23	173
22	12	22	14	168	176	105	273	208	93	49	23	137
23	9.0	22	13	160	172	99	252	196	557	48	88	e174
24	6.4	20	13	176	166	97	240	188	198	48	39	e236
25	8.0	18	13	163	160	96	228	254	134	46	30	e276
26	8.4	19	14	156	154	97	219	226	115	45	26	e227
27	8.1	19	16	152	149	94	210	182	101	48	26	e198
28	7.7	18	15	147	149	92	201	169	92	44	25	174
29	6.4	16	15	141	---	91	201	161	88	42	24	151
30	5.6	15	16	138	---	86	203	156	89	42	22	135
31	5.4	---	15	131	---	85	---	150	---	40	27	---
TOTAL	281.3	630.5	464	4131	5979	3526	9491	8316	4143	1949	1006	4329
MEAN	9.07	21.0	15.0	133	214	114	316	268	138	62.9	32.5	144
MAX	62	74	16	387	417	156	851	805	557	105	88	688
MIN	1.3	5.0	13	14	118	85	79	150	88	40	21	28
AC-FT	558	1250	920	8190	11860	6990	18830	16490	8220	3870	2000	8590
CFSM	.02	.05	.04	.32	.52	.28	.77	.65	.34	.15	.08	.35
IN.	.03	.06	.04	.37	.54	.32	.86	.75	.37	.18	.09	.39

CAL YR 1990	TOTAL	16436.70	MEAN	45.0	MAX	2180	MIN	.00	AC-FT	32600	CFSM	.11	IN.	1.48
WTR YR 1991	TOTAL	44245.8	MEAN	121	MAX	851	MIN	1.3	AC-FT	87760	CFSM	.29	IN.	4.00

e Estimated

08172400 PLUM CREEK AT LOCKHART, TX

LOCATION.--Lat 29°55'22", long 97°40'44", Caldwell County, Hydrologic Unit 12100203, on right bank 548 ft upstream from bridge on U.S. Highway 183, 2.7 mi north of Lockhart, 3.7 mi upstream from Town Creek, 5.0 mi downstream from Brushy Creek, and 30.4 mi upstream from mouth.

DRAINAGE AREA.--112 mi².

PERIOD OF RECORD.--April 1959 to current year.

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 431.19 ft above National Geodetic Vertical Datum of 1929. Apr. 30, 1959, to July 25, 1968, at site 548 ft downstream at present datum.

REMARKS.--No estimated daily discharges. Records good. No known diversion above station. Flow is affected at times by discharge from the flood-detention pools of 17 floodwater-retarding structures with a combined capacity of 24,850 acre-ft. These structures control runoff from 67.8 mi² above this station. One observation of water temperature was made during the year.

AVERAGE DISCHARGE.--32 years, 45.4 ft³/s (32,890 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,700 ft³/s Nov. 24, 1985 (gage height, 20.89 ft); no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1905, 22 ft in June 1936 at present site; flood in 1951 reached a stage of 20 ft at present site, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Jan. 9	2100	*4,450	*15.84	No other peaks greater than base discharge.			

Minimum daily discharge, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	18	23	3.9	3.0	.95	14	.00	.00
2	.00	.00	.00	.02	16	24	3.3	2.9	.70	9.4	.00	.00
3	.00	.00	.00	49	14	17	3.1	240	.75	6.1	.00	.00
4	.00	.00	.00	53	352	14	3.4	94	21	110	.00	.00
5	.00	.00	.00	32	321	11	71	302	15	119	.00	.00
6	.00	.00	.00	23	191	9.1	135	218	9.0	83	.00	.00
7	.00	.00	.00	18	114	7.4	162	150	6.7	56	.00	.00
8	.00	.00	.00	14	69	6.1	132	337	4.6	45	.00	.00
9	.00	138	.00	1700	45	4.5	77	410	4.2	58	.00	.00
10	.00	28	.00	1500	32	3.0	48	229	3.0	31	.00	.00
11	.00	16	.00	564	25	2.8	33	149	2.2	18	.00	.00
12	.00	12	.00	456	20	2.4	25	93	242	11	.00	.00
13	.00	9.7	.00	350	17	2.0	20	58	263	5.1	.00	.00
14	.00	7.4	.00	310	15	1.8	139	39	195	2.7	.00	.00
15	.00	4.6	.00	360	12	2.7	226	29	151	1.6	.00	.00
16	.00	2.9	.00	212	10	45	123	21	117	.83	.00	.00
17	.00	2.6	.00	160	9.7	216	67	18	102	.27	.00	.00
18	.00	2.2	.00	559	10	163	103	15	104	.10	.00	.00
19	.00	1.5	.00	360	13	122	113	12	73	.02	.00	.00
20	.00	.99	.00	225	13	82	68	13	51	.00	.00	.00
21	.00	.67	.00	155	12	60	43	13	38	.00	.00	.00
22	.00	.44	.00	101	19	47	30	11	30	.00	.00	.00
23	.00	.33	.00	64	19	35	21	8.6	23	.00	.00	.00
24	.00	.22	.00	104	17	26	16	6.5	23	.00	.00	.00
25	.00	.13	.00	83	14	21	13	5.1	17	.00	.00	.00
26	.00	.10	.00	52	11	18	9.9	3.9	18	.00	.00	.00
27	.00	.10	.00	38	9.6	15	7.7	3.0	13	.00	.00	.00
28	.00	.05	.00	30	8.5	13	6.0	2.2	8.0	.00	.00	.00
29	.00	.02	.00	26	---	9.8	4.7	1.8	10	.00	.00	.00
30	.00	.00	.00	23	---	6.8	3.9	1.6	18	.00	.00	.00
31	.00	---	.00	21	---	5.0	---	1.2	---	.00	.00	---
TOTAL	0.00	227.95	0.00	7642.02	1426.8	1015.4	1710.9	2490.8	1564.10	571.12	0.00	0.00
MEAN	.000	7.60	.000	247	51.0	32.8	57.0	80.3	52.1	18.4	.000	.000
MAX	.00	138	.00	1700	352	216	226	410	263	119	.00	.00
MIN	.00	.00	.00	.00	8.5	1.8	3.1	1.2	.70	.00	.00	.00
AC-FT	.00	452	.00	15160	2830	2010	3390	4940	3100	1130	.00	.00

CAL YR 1990	TOTAL	287.72	MEAN	.79	MAX	138	MIN	.00	AC-FT	571
WTR YR 1991	TOTAL	16649.09	MEAN	45.6	MAX	1700	MIN	.00	AC-FT	33020

08178700 SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TX

LOCATION.--Lat 29°30'57", long 98°25'51", Bexar County, Hydrologic Unit 12100301, on right bank at downstream side of eastbound bridge on Interstate Highway 410 in San Antonio, 1.0 mi west of Northeast School, 1.1 mi upstream from Perrin-Beitel Creek, and 2.7 mi east of San Antonio International Airport.

DRAINAGE AREA.--137 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1960 to current year.

GAGE.--Water-stage recorder with concrete control. Datum of gage is 684.60 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. There are some diversions upstream from gage for irrigation. Flow is affected at times by discharge from the flood-detention pools of eleven floodwater-retarding structures with a combined detention capacity of 26,770 acre-ft. These structures control runoff from 74.6 mi² above this station. Recording rain gage at station with two additional recording rain gages in the watershed.

AVERAGE DISCHARGE.--31 years, 9.61 ft³/s (6,960 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,900 ft³/s May 12, 1972 (gage height, 15.22 ft), from rating curve extended above 8,000 ft³/s on basis of slope-area measurement of peak flow; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1853, 23 to 24 ft in October 1913. Flood in September 1921 reached a stage of 18 ft, and flood of Sept. 27, 1946, reached a stage of 18.2 ft, and are the second and third highest since 1899.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,900 ft³/s Apr. 5 at 0600 hours (gage height, 12.04 ft); no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.09	.01	.00	.14	1.4	4.8	.53	3.3	1.5	3.2	.73	.84
2	.09	.00	.00	4.9	2.5	3.0	.25	5.1	1.5	.45	.86	1.9
3	.08	.00	.00	2.1	2.9	2.6	.18	820	1.3	.17	.93	2.9
4	.03	10	.00	1.2	174	2.5	.79	152	1.5	.17	.86	.40
5	.01	1.2	.00	1.7	27	2.6	2750	102	1.3	.15	.62	.11
6	.09	.16	.01	.81	10	2.5	328	12	.91	.14	.93	.07
7	.11	.09	.00	.32	9.0	1.5	162	8.3	5.1	.14	.92	.08
8	.09	51	.00	.16	6.9	.64	20	65	1.1	16	.93	.09
9	175	35	.00	5.3	3.5	.60	9.9	22	.32	3.0	.87	.09
10	13	3.8	.00	3.1	3.2	.51	8.4	10	.61	.78	.77	.07
11	6.6	1.8	.00	.89	2.9	.51	8.5	8.5	.28	.40	.63	.05
12	6.1	1.3	.00	.41	2.9	.60	8.4	7.6	.14	.39	.63	.10
13	5.0	e1.1	.00	.23	2.9	.40	9.2	14	.13	.26	.61	.11
14	.53	e.90	.00	.14	2.9	.32	62	8.4	.13	.24	.51	.14
15	.12	e.70	.02	.15	2.6	2.8	15	8.0	.28	.24	.76	1.8
16	.10	e.50	.05	.14	1.6	4.4	8.1	7.3	.36	.24	.77	.13
17	.08	.43	.07	.23	1.3	8.4	7.5	7.6	.29	.24	.83	.09
18	.03	.12	.01	241	2.8	2.1	7.6	7.1	.18	.75	.64	.07
19	.01	.09	.00	19	17	1.3	7.1	7.1	.14	.93	.63	.09
20	.01	.09	.01	4.2	8.2	1.2	6.6	6.5	.25	.76	.65	.16
21	8.9	.18	.04	4.8	3.0	.91	7.0	6.8	.18	.38	.61	.08
22	1.8	.36	.00	5.1	2.6	.72	8.3	8.0	.33	2.0	.53	.04
23	.33	.12	.00	5.4	1.8	.52	8.6	3.9	13	2.7	.62	.04
24	.14	.12	.00	14	1.1	.40	5.7	2.1	5.5	.67	.54	.05
25	.11	.09	.00	5.2	.66	.40	1.9	2.3	.92	.40	.16	.52
26	.08	.07	.08	1.6	2.3	.40	3.7	2.2	.25	.43	.17	.10
27	.19	.06	.06	1.2	2.9	.30	3.9	1.8	.16	.40	.17	.04
28	.11	.01	.03	1.1	2.9	.32	4.1	1.8	.21	.40	.18	.02
29	.07	.00	.05	1.1	---	.46	4.3	1.8	.25	.57	.18	.02
30	.01	.00	.11	7.0	---	.37	3.6	1.7	1.3	.77	.17	.00
31	.00	---	.12	2.1	---	.84	---	1.5	---	.72	.28	---
TOTAL	218.91	109.30	0.66	334.72	302.76	48.92	3471.15	1315.7	39.42	38.09	18.69	10.20
MEAN	7.06	3.64	.021	10.8	10.8	1.58	116	42.4	1.31	1.23	.60	.34
MAX	175	51	.12	241	174	8.4	2750	820	13	16	.93	2.9
MIN	.00	.00	.00	.14	.66	.30	.18	1.5	.13	.14	.16	.00
AC-FT	434	217	1.3	664	601	97	6890	2610	78	76	37	20

CAL YR 1990	TOTAL	2451.73	MEAN	6.72	MAX	664	MIN	.00	AC-FT 4860
WTR YR 1991	TOTAL	5908.52	MEAN	16.2	MAX	2750	MIN	.00	AC-FT 11720

e Estimated

08178700 SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: November 1968 to current year. Sediment analyses: November 1971 to September 1973. Water temperatures: November 1968 to current year. Bacteria analyses: May 1976 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
JAN												
18...	0730	598	161	8.9	10.5	120	570	10.6	97	2.7	K12000	120000
18...	1320	258	129	8.1	10.5	10	100	10.2	94	1.8	--	170000
MAR												
28...	1100	0.20	556	7.6	20.0	20	2.6	7.0	80	3.0	--	--
APR												
05...	0920	3250	162	7.9	17.0	22	69	8.4	89	5.4	--	--
JUN												
25...	1230	0.93	346	7.6	28.0	55	3.7	6.6	86	4.0	--	--
27...	1015	0.40	384	7.6	27.5	30	2.0	4.3	55	2.2	110	260
JUL												
31...	1030	0.77	532	7.6	27.0	--	--	4.6	59	--	--	--
AUG												
28...	1000	0.19	635	7.5	26.5	6	0.30	4.0	51	1.2	--	--
28...	1015	0.19	635	7.5	26.5	2	0.60	4.0	51	1.2	2000	530

DATE	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
JAN												
18...	160	0	60	1.8	7.9	0.3	8.1	160	17	9.7	0.20	9.8
18...	77	0	29	1.2	3.4	0.2	5.5	81	8.4	5.0	0.10	5.2
MAR												
28...	210	37	75	6.5	23	0.7	10	180	69	31	0.40	8.5
APR												
05...	--	--	--	1.9	3.0	--	4.9	52	5.3	14	<0.10	21
JUN												
25...	140	20	51	3.4	12	0.4	9.5	120	21	15	0.20	11
27...	150	18	55	3.8	12	0.4	9.1	130	29	16	0.30	11
JUL												
31...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
28...	270	38	96	7.1	22	0.6	10	230	58	33	0.30	15
28...	260	34	94	7.2	23	0.6	11	230	57	33	0.30	15

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)
JAN												
18...	213	1550	408	1140	0.470	--	0.030	--	0.500	--	0.050	--
18...	106	164	39	125	0.470	--	0.030	--	0.500	--	0.050	--
MAR												
28...	330	18	8	10	--	0.026	<0.010	0.003	<0.050	0.029	0.030	0.033
APR												
05...	--	89	29	60	0.110	--	0.050	--	0.160	--	0.030	--
JUN												
25...	196	9	6	3	--	0.027	<0.010	0.010	0.150	0.037	0.040	0.014
27...	217	2	2	0	--	--	<0.010	--	<0.050	--	0.040	--
JUL												
31...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
28...	380	<1	<1	--	--	0.032	<0.010	0.001	<0.050	0.033	0.030	0.002
28...	380	1	1	0	--	--	<0.010	--	<0.050	--	0.030	--

08178700 SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P)	PHOSPHORUS ORTHO TOTAL (MG/L AS P)	PHOSPHATE, ORTHO, DISSOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)
JAN												
18...	0.55	0.60	0.300	--	0.180	--	12	--	--	--	2	--
18...	0.55	0.60	0.290	--	0.220	--	8.0	--	--	--	--	--
MAR												
28...	0.47	0.50	0.020	<0.001	<0.010	--	5.9	<0.010	90	1	--	<100
APR												
05...	0.47	0.50	0.080	--	0.020	--	4.6	--	--	--	2	--
JUN												
25...	0.96	1.0	0.120	0.056	0.050	0.17	9.5	<0.010	210	3	--	<100
27...	0.56	0.60	0.080	--	0.030	--	8.4	--	--	--	--	--
JUL												
31...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
28...	0.37	0.40	0.021	0.020	0.010	0.06	3.7	<0.010	20	2	--	100
28...	0.37	0.40	0.030	--	<0.010	--	3.6	--	--	--	2	--

DATE	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)
JAN												
18...	73	<0.5	--	<1.0	--	<5	<3	--	<10	--	590	--
18...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
28...	--	--	<1	--	2	--	--	2	--	120	--	2
APR												
05...	54	0.9	--	<1.0	--	<5	<3	--	<10	--	1600	--
JUN												
25...	--	--	<1	--	2	--	--	4	--	300	--	1
27...	--	--	--	--	--	--	--	--	--	--	--	--
JUL												
31...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
28...	--	--	<1	--	<1	--	--	<1	--	80	--	<1
28...	79	<0.5	--	2.0	--	<5	<3	--	<10	--	9	--

DATE	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)
JAN												
18...	<10	580	57	--	0.2	<10	--	<10	--	<1	--	<1.0
18...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
28...	--	--	--	0.40	--	--	3	--	<1	--	<1	--
APR												
05...	10	89	170	--	<0.1	<10	--	<10	--	<1	--	<1.0
JUN												
25...	--	--	--	<0.10	--	--	3	--	<1	--	<1	--
27...	--	--	--	--	--	--	--	--	--	--	--	--
JUL												
31...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
28...	--	--	--	<0.10	--	--	<1	--	<1	--	<1	--
28...	<10	180	29	--	<0.1	<10	--	<10	--	<1	--	2.0

DATE	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)
JAN												
18...	160	11	--	16	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
28...	--	--	<10	--	--	--	--	--	--	--	--	--
APR												
05...	130	14	--	36	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.18
JUN												
25...	--	--	<10	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--
JUL												
31...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
28...	--	--	<10	--	--	--	--	--	--	--	--	--
28...	400	6	--	10	--	--	--	--	--	--	--	--

08178700 SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
JAN											
18...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
MAR											
28...	--	--	--	--	--	--	--	--	--	--	--
APR											
05...	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
JUN											
25...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
JUL											
31...	--	--	--	--	--	--	--	--	--	--	--
AUG											
28...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
JAN											
18...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
MAR											
28...	--	--	--	--	--	--	--	--	--	--	--
APR											
05...	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
JUN											
25...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
JUL											
31...	--	--	--	--	--	--	--	--	--	--	--
AUG											
28...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--

08178880 MEDINA RIVER AT BANDERA, TX

LOCATION.--Lat 29°43'25", long 99°04'11", Bandera County, Hydrologic Unit 12100302, on left bank, 40 ft downstream from centerline of State Highway 173 at Bandera, 1.9 mi upstream from Bandera Creek, and 5.6 mi downstream from Indian Creek.

DRAINAGE AREA.--427 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,189.46 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Several small diversions upstream from station.

AVERAGE DISCHARGE.--9 years, 136 ft³/s (98,530 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 55,800 ft³/s June 3, 1987 (gage height, 24.90 ft), from rating curve extended above 27,000 ft³/s; minimum daily, 2.2 ft³/s Aug. 7, 11, 13, 14, 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1880, 46.62 ft Aug. 2, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,400 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
May 2	2000	1,460	8.25	Sept. 15	0800	*3,510	*10.60

Minimum daily discharge, 19 ft³/s Sept. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60	56	53	47	64	63	50	56	72	52	30	19
2	59	56	53	52	63	62	51	245	71	52	29	20
3	58	55	53	49	62	60	51	89	68	50	29	25
4	59	60	51	48	69	58	51	127	71	54	27	30
5	59	66	51	50	71	56	210	124	69	53	26	33
6	59	65	51	50	82	55	93	101	70	49	26	33
7	58	64	49	49	86	54	89	90	68	49	26	37
8	57	68	49	49	78	53	80	113	65	51	26	33
9	76	68	49	49	75	53	75	119	69	50	25	33
10	80	66	49	52	73	52	72	116	78	52	24	35
11	80	63	49	54	71	52	72	105	74	51	23	33
12	71	61	49	53	70	53	69	95	120	49	24	31
13	66	60	49	51	69	51	67	101	117	46	23	30
14	64	58	49	49	68	51	71	108	93	44	23	37
15	62	58	49	48	66	50	64	101	88	42	22	2130
16	61	58	49	46	64	52	63	104	83	41	22	577
17	60	57	50	47	65	55	63	123	76	41	21	287
18	61	57	48	69	67	54	63	105	69	40	22	219
19	63	57	48	98	69	53	63	97	65	38	23	172
20	60	57	48	97	66	53	61	91	60	36	22	325
21	59	57	48	86	65	55	60	85	57	36	22	318
22	69	57	46	78	64	54	60	83	56	34	25	258
23	76	58	47	74	62	53	58	80	55	35	28	333
24	70	58	47	74	61	54	58	78	57	38	23	250
25	66	58	46	70	61	53	58	90	54	38	22	205
26	63	57	47	69	59	53	58	81	49	36	21	184
27	60	57	47	68	59	53	57	77	49	35	20	171
28	59	55	46	66	59	52	58	73	46	34	20	161
29	58	53	47	66	---	51	58	72	46	33	20	152
30	58	53	47	65	---	49	57	69	49	32	20	146
31	57	---	47	64	---	50	---	68	---	31	20	---
TOTAL	1968	1773	1511	1887	1888	1667	2060	3066	2064	1322	734	6317
MEAN	63.5	59.1	48.7	60.9	67.4	53.8	68.7	98.9	68.8	42.6	23.7	211
MAX	80	68	53	98	86	63	210	245	120	54	30	2130
MIN	57	53	46	46	59	49	50	56	46	31	20	19
AC-FT	3900	3520	3000	3740	3740	3310	4090	6080	4090	2620	1460	12530

CAL YR 1990 TOTAL 36108 MEAN 98.9 MAX 2900 MIN 26 AC-FT 71620
WTR YR 1991 TOTAL 26257 MEAN 71.9 MAX 2130 MIN 19 AC-FT 52080

08178880 MEDINA RIVER AT BANDERA, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: January 1983 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
FEB 07...	1421	88	543	8.0	14.0	<1	0.60	10.3	104	0.4	K17
MAY 30...	0830	67	533	8.0	26.0	1	2.1	7.6	94	0.5	K24
AUG 13...	1125	23	582	7.8	28.0	1	3.3	7.2	95	0.8	120

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB 07...	28	280	100	82	19	6.9	0.2	1.1	180	94	13
MAY 30...	130	280	96	83	17	6.4	0.2	2.1	180	84	17
AUG 13...	21	310	140	88	21	7.6	0.2	1.5	160	140	10

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)
FEB 07...	0.20	8.7	335	5	<1	--	--	<0.010	0.220	<0.010	--
MAY 30...	0.30	12	330	8	4	4	0.150	0.010	0.160	0.030	0.77
AUG 13...	0.30	13	381	<1	<1	--	--	0.010	<0.050	0.060	--

DATE	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
FEB 07...	0.50	<0.010	<0.010	0.9	<1	29	<0.5	<1.0	<5	<3	<10
MAY 30...	0.80	<0.010	<0.010	1.3	--	--	--	--	--	--	--
AUG 13...	<0.20	0.010	0.030	1.3	<1	37	<0.5	<1.0	<5	<3	<10

DATE	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)
FEB 07...	10	<10	9	1	<0.1	<10	<10	<1	<1.0	810	<6
MAY 30...	--	--	--	--	--	--	--	--	--	--	--
AUG 13...	5	<10	8	4	<0.1	<10	<10	<1	<1.0	1100	<6

DATE	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)
FEB 07...	<10	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01
MAY 30...	--	--	--	--	--	--	--	--	--	--	--
AUG 13...	<3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01

08178880 MEDINA RIVER AT BANDERA, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
FEB 07...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
MAY 30...	--	--	--	--	--	--	--	--	--	--
AUG 13...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	--

DATE	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 07...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY 30...	--	--	--	--	--	--	--	--	--	--
AUG 13...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01

08179500 MEDINA LAKE NEAR SAN ANTONIO, TX

LOCATION.--Lat 29°32'24", long 98°56'01", Medina County, Hydrologic Unit 12100302, at gate-operating platform, 5/6 ft from left end of Medina Dam on Medina River, 4.2 mi upstream from Medina diversion dam, 13 mi north of Castroville, 28 mi west of San Antonio, and 70.4 mi upstream from mouth.

DRAINAGE AREA.--634 mi².

PERIOD OF RECORD.--May 1913 to current year. Prior to October 1965, monthend contents only.
Water-quality records.--Chemical analyses: October 1969 to September 1984.

REVISED RECORDS.--WSP 1923: Drainage area.

GAGE.--Nonrecording gage read once daily if stage changing materially, otherwise intermittently. Datum of gage is 7.80 ft below National Geodetic Vertical Datum of 1929.

REMARKS.--The lake is formed by a gravity-type concrete dam, 1,580 ft long. The dam was completed and storage began May 7, 1913. The uncontrolled spillway is a cut through natural rock 880 ft long, with a 3-foot-wide cutoff wall, located near right end of dam. The dam and lake are owned and operated by Bexar-Medina-Atascosa Counties Water Improvement District No. 1, which has a permit (from the Texas Department of Water Resources) to irrigate 150,000 acres annually. An undetermined amount of water from the lake enters the Edwards and associated limestones in the Balcones Fault Zone, part of which is above and part below the dam. Water is released downstream to Medina Diversion Reservoir where it is diverted into Medina Canal by the Water District. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam	1,084.0	-
Crest of spillway	1,072.0	254,000
Water-supply outlet pipes (invert)	966.5	4,780
Lowest gated outlet (invert)	920.0	0

COOPERATION.--Capacity table, based on survey made prior to June 1912, and gage-height record were provided by the Bexar-Medina-Atascosa Counties Water Improvement District No. 1.

EXTREMES (at 0800) FOR PERIOD OF RECORD.--Maximum contents observed, 289,900 acre-ft May 29, 1987 (gage height, 1,078.2 ft); minimum observed since lake first filled, 780 acre-ft about Apr. 11, 1948 (gage height, 944.0 ft).

EXTREMES (at 0800) FOR CURRENT YEAR.--Maximum contents, 104,800 acre-ft May 30 (gage height, 1,036.6 ft); minimum, 88,150 acre-ft Sept. 2, 5, 6, 10-14 (gage height, 1,030.8 ft).

Capacity table (gage height, in feet, and contents, in acre-feet)

1,030.0	85,860	1,033.0	94,460	1,036.0	103,100
1,031.0	88,730	1,034.0	97,320	1,037.0	105,900
1,032.0	91,590	1,035.0	100,200		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY OBSERVATION AT 08:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	103600	100800	99040	95030	96180	97320	94460	94460	104200	102200	99620	89010
2	103300	100800	99040	95030	96180	97320	94460	94170	103600	102200	98760	88150
3	103300	100800	99040	95030	96460	97320	94170	97320	103300	102500	98760	88440
4	103300	100800	99040	95030	96750	97320	94170	99330	103100	102500	98470	88440
5	103100	100800	98760	95030	96750	97320	94460	99620	103100	103300	97900	88150
6	103100	100800	98760	95600	96750	97320	94740	99900	102800	103600	97610	88150
7	103100	100800	98470	95890	97320	97040	95030	100200	102500	103600	97320	88730
8	102800	101300	98470	95030	97320	97040	94740	100800	101900	103600	97040	88440
9	103100	101600	98180	95320	97320	97040	94740	101300	101600	103600	96750	88440
10	102800	101300	98180	95600	97320	96750	94740	101600	101300	103600	96460	88150
11	102500	101300	97900	95600	97320	96460	94740	101900	101000	103900	96180	88150
12	102500	100800	97900	95600	97320	96180	95030	102200	101000	103600	95600	88150
13	102500	100800	97900	95320	97320	96460	95030	102500	101000	103600	95320	88150
14	102200	100800	97900	95320	97610	96180	95030	102500	100800	103900	94740	88150
15	102200	100800	97610	95320	97610	95890	95320	103100	101000	103300	94460	88440
16	101900	100500	97610	95320	97320	95890	95030	103100	100800	103600	94170	92170
17	101900	100500	97610	95600	97320	95600	95030	103600	100500	103300	93880	93020
18	101900	100500	97610	95600	97320	95890	95030	103900	100500	103100	93310	93600
19	101600	100200	97320	95890	97610	95600	95030	103900	100200	103100	93310	93880
20	101600	100200	97040	96180	97610	95320	95030	103900	100200	103100	92740	95030
21	101600	100200	97040	96750	97610	95320	95320	104200	99900	102800	92450	95320
22	101600	100200	96750	95890	97320	95030	95030	104200	99900	102500	92170	95890
23	101300	100200	96750	95890	97610	95320	95030	104500	101600	102200	91590	96180
24	101300	99900	96750	96180	97320	95320	95030	104200	101600	101900	91590	97320
25	101300	99900	96750	96180	97320	95320	95030	104200	101900	101600	91020	98180
26	101000	99900	96460	96180	97320	95030	94740	104200	101900	101300	90730	98760
27	101000	99620	96180	96180	97320	95030	94740	104200	101900	101000	90450	98760
28	101000	99620	95600	96180	97320	94740	94740	104200	101900	100800	89870	98760
29	101000	99330	95320	95890	---	94740	94740	---	101900	100500	89590	99040
30	101000	99330	95320	96460	---	94740	94460	104800	101900	100200	89010	99330
31	100800	---	95320	96180	---	94460	---	104200	---	100200	88730	---
MAX	103600	101600	99040	96750	97610	97320	95320	---	104200	103900	99620	99330
MIN	100800	99330	95320	95030	96180	94460	94170	---	99900	100200	88730	88150
(†)	1035.2	1034.7	1033.3	1033.6	1034.0	1033.0	1033.0	1036.4	1035.6	1035.0	1031.0	1034.7
(Φ)	-3100	-1470	-4010	+860	+1140	-2860	0	+9740	-2300	-1700	-11470	+10600

CAL YR 1990 MAX 110200 MIN 78640 (Φ) +7740
WTR YR 1991 MAX 104800 MIN 88150 (Φ) -4570

(†) Gage height, in feet, at end of month.
(Φ) Change in contents, in acre-feet.

08180000 MEDINA CANAL NEAR RIOMEDINA, TX

LOCATION.--Lat 29°30'19", long 98°54'11", Medina County, Hydrologic Unit 12100302, in center of canal, 350 ft downstream from county highway bridge, 1,900 ft downstream from head of canal and diversion dam, 4.6 mi downstream from Medina Dam, 4.7 mi north of Riomedina, and 25 mi northwest of San Antonio.

PERIOD OF RECORD.--March 1922 to May 1934, July 1957 to current year.

REVISED RECORDS.--WSP 568: 1922. WSP 1712: 1922(M), 1924, 1926.

GAGE.--Water-stage recorder. Elevation of gage is 910 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Station is above all diversions from canal. Canal diverts water from right end of Medina Diversion Dam 1,900 ft upstream from gage. Water is used for irrigation downstream near La Coste and Natalia. Prior to November 1984, double-barrel flume in canal 54 ft downstream from gage. Satellite telemeter at station.

AVERAGE DISCHARGE.--45 years (water years 1923-33, 1958-91), 45.0 ft^3/s (32,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 216 ft^3/s May 6, 1971; no flow at times.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	45	52	37	.00	8.5	52	78	201	29	129	130
2	62	43	51	22	.00	14	61	74	197	7.8	128	133
3	55	41	50	13	.00	13	62	45	203	17	127	123
4	58	39	40	.00	.00	29	65	40	207	29	122	72
5	64	37	45	.00	.00	37	18	41	212	36	117	56
6	69	27	47	.00	.00	42	.00	57	207	42	119	48
7	69	22	49	.00	.00	47	.00	65	203	42	120	49
8	61	7.5	49	.00	.00	47	.00	26	197	43	122	31
9	24	.00	49	.00	.00	47	.00	.00	202	42	119	31
10	25	.00	51	.00	.00	46	.00	.00	201	42	109	58
11	41	.00	51	.00	.00	46	.00	.00	193	44	108	47
12	41	.00	50	.00	.00	46	.00	.00	193	45	115	33
13	42	7.5	52	.00	.00	52	.00	.00	194	45	124	25
14	43	28	52	.00	.00	61	.00	.00	199	44	127	25
15	43	36	50	.00	.00	50	.00	.00	200	45	128	24
16	47	25	49	.00	.00	17	.00	8.0	202	59	130	29
17	51	19	52	.00	.00	3.7	.00	13	139	74	130	36
18	50	19	49	.00	11	2.5	.00	13	144	93	125	34
19	51	22	53	.00	29	27	7.7	13	153	111	111	30
20	50	30	57	.00	29	39	14	16	146	105	114	12
21	25	25	56	13	18	32	26	17	147	105	123	.00
22	9.9	19	55	25	11	32	26	30	135	109	124	.00
23	31	20	56	22	10	32	35	58	24	119	119	.66
24	37	19	53	20	.00	31	47	66	34	121	122	2.0
25	37	19	51	16	.00	36	47	64	56	129	125	1.3
26	38	32	52	.00	.00	47	45	71	68	138	128	.47
27	37	39	42	.00	.00	46	45	106	67	138	130	12
28	37	49	34	.00	.00	45	45	142	68	137	130	29
29	36	54	36	.00	---	44	49	174	48	131	135	29
30	34	53	38	.00	---	43	65	191	54	119	144	37
31	43	---	39	.00	---	42	---	204	---	121	124	---
TOTAL	1376.9	777.00	1510	168.00	108.00	1104.7	709.70	1612.00	4494	2361.8	3828	1137.43
MEAN	44.4	25.9	48.7	5.42	3.86	35.6	23.7	52.0	150	76.2	123	37.9
MAX	69	54	57	37	29	61	65	204	212	138	144	133
MIN	9.9	.00	34	.00	.00	2.5	.00	.00	24	7.8	108	.00
AC-FT	2730	1540	3000	333	214	2190	1410	3200	8910	4680	7590	2260

CAL YR 1990	TOTAL	21973.89	MEAN	60.2	MAX	193	MIN	.00	AC-FT 43590
WTR YR 1991	TOTAL	19187.53	MEAN	52.6	MAX	212	MIN	.00	AC-FT 38060

08181400 HELOTES CREEK AT HELOTES, TX

LOCATION.--Lat 29°34'42", long 98°41'29", Bexar County, Hydrologic Unit 12100302, 42 ft to left and 44 ft downstream from centerline of bridge on State Highway 16, 0.1 mi northwest of Helotes, and 8.6 mi upstream from mouth.

DRAINAGE AREA.--15.0 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1968 to current year.

REVISED RECORDS.--WRD TX-73-1: 1972(M).

GAGE.--Water-stage recorder. Datum of gage is 1,014.82 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. An undetermined amount of flow is diverted for domestic use above station, and some streamflow enters the Edwards and associated limestones through the Balcones Fault Zone in the vicinity of the gage. Recording rain gage at station.

AVERAGE DISCHARGE.--23 years, 4.01 ft³/s (3.63 in/yr), 2,910 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,680 ft³/s July 16, 1973 (gage height, 10.8 ft, from floodmarks), from rating curve extended above 5,000 ft³/s; no flow most of time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1923, 13.7 ft in 1927, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 140 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
May 3	1245	*2,460	*6.01	July 4	1445	772	4.12
June 22	2330	923	4.35				

Minimum daily discharge, no flow most of year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.01	.00	.00	.12	15	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	14	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	185	.00	13	.00	.90
4	.00	.00	.00	.00	5.8	.00	.07	59	.00	89	.00	.00
5	.00	.00	.00	.00	13	.00	10	44	.00	69	.00	.00
6	.00	.00	.00	.00	11	.00	3.0	33	.00	51	.00	.01
7	.00	.00	.00	.00	4.7	.00	.00	26	.00	40	.00	.00
8	.00	.00	.00	.00	.98	.00	.00	35	.00	34	.00	.00
9	.00	.00	.00	.00	2.7	.00	.00	35	.00	27	.00	.00
10	.00	.00	.00	.00	1.5	.00	.00	32	.00	23	.00	.00
11	.00	.00	.00	.00	e.10	.00	.00	27	.00	20	.00	.00
12	.00	.00	.00	.00	e.00	.00	.00	23	4.7	18	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	22	6.2	16	.00	.09
14	.00	.00	.00	.00	.00	.00	9.5	20	6.8	14	.00	.00
15	.00	.00	.00	.00	.00	.00	5.7	18	6.8	13	.00	.00
16	.00	.00	.00	.00	.00	.00	.13	17	4.6	11	.00	.00
17	.00	.00	.00	.00	.00	.00	.68	16	4.1	10	.05	.00
18	.00	.00	.00	.03	.00	.00	.00	14	2.9	9.7	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	13	2.1	8.4	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	12	1.4	7.7	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	11	.47	7.0	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	9.6	46	6.6	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	8.8	69	6.5	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	8.4	35	5.2	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	8.2	24	4.0	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	7.1	19	2.9	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	5.8	16	2.4	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	4.8	14	.91	.00	.00
29	.00	.00	.00	.00	---	.00	.00	4.1	13	.53	.00	.00
30	.00	.00	.00	.00	---	.00	.00	2.6	16	.32	.00	.00
31	.00	---	.00	.00	---	.00	---	.84	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.03	39.78	0.01	29.08	702.24	292.19	539.16	0.05	1.00
MEAN	.000	.000	.000	.001	1.42	.000	.97	22.7	9.74	17.4	.002	.033
MAX	.00	.00	.00	.03	13	.01	10	185	69	89	.05	.90
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.06	79	.02	58	1390	580	1070	.1	2.0
CFSM	.00	.00	.00	.00	.09	.00	.06	1.51	.65	1.16	.00	.00
IN.	.00	.00	.00	.00	.10	.00	.07	1.74	.72	1.34	.00	.00

CAL YR 1990 TOTAL 403.79 MEAN 1.11 MAX 40 MIN .00 AC-FT 801 CFSM .07 IN. 1.00
WTR YR 1991 TOTAL 1603.54 MEAN 4.39 MAX 185 MIN .00 AC-FT 3180 CFSM .29 IN. 3.98

e Estimated

08181400 HELOTES CREEK AT HELOTES, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: May 1969 to current year. Pesticide analyses: May 1969 to June 1981, October 1984 to current year. Sediment analyses: October 1968 to September 1973.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
APR											
05...	0910	22	388	7.2	18.0	130	230	8.8	96	2.2	5200
06...	1125	3.5	467	7.8	18.0	13	3.5	8.6	93	1.4	700
MAY											
03...	1415	706	237	7.4	19.5	65	250	7.8	88	6.7	31000
03...	1540	292	242	7.3	20.0	70	370	7.8	89	3.8	38000
08...	0940	34	473	7.8	20.0	70	150	9.4	107	1.5	K970

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
APR											
05...	11000	240	83	75	12	14	0.4	2.1	150	21	18
06...	1200	230	35	69	14	14	0.4	1.5	200	30	21
MAY											
03...	62000	110	16	38	4.7	3.3	0.1	2.9	98	10	6.9
03...	43000	120	21	40	4.6	3.3	0.1	3.0	98	10	3.9
08...	3800	240	25	75	12	8.0	0.2	1.4	210	15	12

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)
APR											
05...	<0.10	8.4	243	492	113	379	0.350	0.150	0.500	0.120	0.78
06...	<0.10	7.6	274	7	4	3	0.200	0.010	0.210	0.020	0.28
MAY											
03...	0.10	6.0	131	1920	430	1490	0.420	0.160	0.580	0.260	2.4
03...	0.10	6.7	131	832	248	584	0.660	0.110	0.770	0.150	0.65
08...	<0.10	8.7	259	408	100	308	0.330	0.070	0.400	0.350	0.25

DATE	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
APR											
05...	0.90	0.340	0.170	14	1	27	<0.5	<1.0	<5	<3	<10
06...	0.30	0.030	0.020	3.9	--	--	--	--	--	--	--
MAY											
03...	2.7	0.240	0.160	13	--	--	--	--	--	--	--
03...	0.80	0.100	0.090	20	<1	12	<0.5	<1.0	<5	<3	<10
08...	0.60	0.220	0.150	3.3	--	--	--	--	--	--	--

DATE	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)
APR											
05...	320	<10	5	30	<0.1	<10	<10	<1	<1.0	170	<6
06...	--	--	--	--	--	--	--	--	--	--	--
MAY											
03...	--	--	--	--	--	--	--	--	--	--	--
03...	110	<10	<4	3	<0.1	<10	<10	<1	<1.0	48	<6
08...	--	--	--	--	--	--	--	--	--	--	--

DATE	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)
APR											
05...	10	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.30	<0.010	<0.01
06...	--	--	--	--	--	--	--	--	--	--	--
MAY											
03...	--	--	--	--	--	--	--	--	--	--	--
03...	6	--	--	--	--	--	--	--	--	--	--
08...	--	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01

08181400 HELOTES CREEK AT HELOTES, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
APR										
05...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	0.01	<0.01	<0.01	<0.01
06...	--	--	--	--	--	--	--	--	--	--
MAY										
03...	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--
08...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
APR										
05...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	0.11	0.03	<0.01
06...	--	--	--	--	--	--	--	--	--	--
MAY										
03...	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--
08...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01

08183900 CIBOLO CREEK NEAR BOERNE, TX

LOCATION.--Lat 29°46'26", long 98°41'50", Kendall County, Hydrologic Unit 12100304, on left bank 0.6 mi upstream from Southern Pacific Lines bridge, 0.9 mi downstream from Menger Creek, and 2.5 mi southeast of Boerne.

DRAINAGE AREA.--68.4 mi².

PERIOD OF RECORD.--March 1962 to current year.

REVISED RECORDS.--WRD TX-73-1: 1964-65, 1966(P), 1968-72(P).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,339.61 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. No known diversion above station. Flow is affected at times by discharge from the flood-detention pools of four floodwater-retarding structures with a combined detention capacity of 8,850 acre-ft. These structures control runoff from 34.0 mi².

AVERAGE DISCHARGE.--29 years, 27.1 ft³/s (5.38 in/yr), 19,630 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36,400 ft³/s Sept. 27, 1964 (gage height, 19.15 ft, from floodmark), from rating curve extended above 2,500 ft³/s on basis of slope-area measurement at 12,000 ft³/s and contracted-opening measurement of 36,400 ft³/s; no flow at times in 1962-64, 1966-67, 1971, and 1984.
Maximum stage since at least 1892, that of Sept. 27, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--The second highest flood occurred in 1952 and reached a stage of 16.3 ft (discharge, 25,600 ft³/s), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 900 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
May 8	1215	*410	*3.56				

Minimum daily discharge, 1.4 ft³/s Aug. 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.5	7.0	8.7	7.8	17	21	14	17	28	20	4.3	2.8
2	6.9	7.2	8.7	13	17	20	14	35	28	16	4.2	4.8
3	7.3	7.1	8.7	17	17	20	14	43	28	14	4.0	10
4	8.1	16	8.7	16	90	17	14	42	28	12	3.7	6.1
5	7.2	9.5	7.6	15	46	17	28	35	30	12	3.4	5.6
6	7.6	7.7	7.6	15	37	16	22	27	27	13	3.4	6.1
7	6.5	7.2	7.4	14	33	16	30	23	26	11	3.4	5.6
8	6.0	46	7.4	13	31	17	21	129	24	9.2	3.4	4.1
9	24	18	7.4	17	30	16	18	64	19	7.8	3.4	3.5
10	8.6	12	7.4	18	29	15	16	52	20	7.8	3.2	3.2
11	6.6	10	7.4	17	30	15	18	47	17	6.6	3.3	3.1
12	6.0	8.9	7.2	15	28	15	16	43	83	4.5	3.2	3.1
13	5.6	8.7	7.0	14	29	14	16	44	47	6.2	2.9	3.1
14	5.7	8.4	7.3	13	28	14	78	42	31	6.2	2.9	3.9
15	5.8	8.3	8.3	15	26	15	34	38	27	7.0	3.1	11
16	6.2	8.9	8.1	14	24	18	28	36	25	7.4	2.5	7.6
17	6.1	9.4	8.5	15	25	20	26	38	62	7.4	2.4	6.0
18	6.0	9.7	8.2	50	25	17	26	37	40	8.5	2.0	4.9
19	5.9	9.7	8.3	27	30	17	26	35	31	8.3	2.2	14
20	6.2	9.7	8.3	24	24	16	22	34	27	7.9	1.7	20
21	24	9.7	8.5	21	23	16	21	32	26	7.6	1.4	6.7
22	12	14	9.0	19	22	16	21	30	29	8.0	1.6	5.1
23	9.9	13	9.7	19	21	15	20	29	152	8.8	5.6	29
24	8.8	11	9.7	23	20	14	20	28	59	7.7	4.0	18
25	7.6	11	9.7	20	20	14	20	40	36	7.2	3.2	14
26	7.1	11	9.7	19	18	14	20	32	27	6.8	3.1	11
27	7.0	11	8.9	19	18	14	21	29	22	6.3	3.1	9.8
28	6.7	10	8.6	19	18	15	21	27	19	5.5	2.9	8.5
29	6.6	9.3	8.7	19	---	15	20	25	17	5.8	2.9	7.2
30	6.6	8.6	9.3	21	---	13	18	26	20	5.8	5.2	6.7
31	6.6	---	9.2	18	---	16	---	26	---	4.8	6.9	---
TOTAL	252.7	338.0	259.2	566.8	776	498	683	1185	1055	267.1	102.5	244.5
MEAN	8.15	11.3	8.36	18.3	27.7	16.1	22.8	38.2	35.2	8.62	3.31	8.15
MAX	24	46	9.7	50	90	21	78	129	152	20	6.9	29
MIN	5.6	7.0	7.0	7.8	17	13	14	17	17	4.5	1.4	2.8
AC-FT	501	670	514	1120	1540	988	1350	2350	2090	530	203	485
CFSM	.12	.16	.12	.27	.41	.23	.33	.56	.51	.13	.05	.12
IN.	.14	.18	.14	.31	.42	.27	.37	.64	.57	.15	.06	.13

CAL YR 1990	TOTAL	4921.26	MEAN	13.5	MAX	449	MIN	.37	AC-FT	9760	CFSM	.20	IN.	2.68
WTR YR 1991	TOTAL	6227.8	MEAN	17.1	MAX	152	MIN	1.4	AC-FT	12350	CFSM	.25	IN.	3.39

08185000 CIBOLO CREEK AT SELMA, TX

LOCATION.--Lat 29°35'38", long 98°18'39", Bexar-Guadalupe County line, Hydrologic Unit 12100304, on right bank 0.6 mi downstream from Missouri-Kansas-Texas Railroad Co. bridge and 0.9 mi upstream from bridge on Interstate Highway 35 at Selma.

DRAINAGE AREA.--274 mi².

PERIOD OF RECORD.--March 1946 to current year. Figures for water year 1960 in WSP 1813 are in error and should be disregarded.

REVISED RECORDS.--WSP 1923: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 728.34 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Small diversion above station. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see station 08183900. Considerable flow of Cibolo Creek enters the Edwards and associated limestones in the Balcones Fault Zone, that crosses basin between this station and the station near Boerne (station 08183900).

AVERAGE DISCHARGE.--45 years, 15.2 ft³/s (11,010 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 65,000 ft³/s July 16, 1973 (gage height, 26.2 ft, from floodmark), from rating curve extended above 16,000 ft³/s on basis of field estimate of 54,000 ft³/s and contracted-opening measurement of 65,000 ft³/s; no flow most of time.
Maximum stage since at least 1869, that of July 16, 1973.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 26 ft occurred in 1889, but stage for flood in 1913 is unknown, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 5	0800	*6,280	*9.92	June 23	1500	1,360	6.20

Minimum daily discharge, no flow for most of year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	68	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	47	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	2060	22	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	157	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	46	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	1.9	17	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.72	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	16	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	303	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	81	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.06	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	16.00	0.00	0.00	2264.90	154.72	384.06	0.00	0.00	0.00
MEAN	.000	.000	.000	.52	.000	.000	75.5	4.99	12.8	.000	.000	.000
MAX	.00	.00	.00	16	.00	.00	2060	68	303	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	32	.00	.00	4490	307	762	.00	.00	.00

CAL YR 1990	TOTAL	0.04	MEAN	.00	MAX	0.04	MIN	.00	AC-FT	0.08
WTR YR 1991	TOTAL	2819.68	MEAN	7.73	MAX	2060	MIN	.00	AC-FT	5590

08190000 NUECES RIVER AT LAGUNA, TX

LOCATION.--Lat 29°25'42", long 99°59'49", Uvalde County, Hydrologic Unit 12110101, on right bank 0.5 mi downstream from Sycamore Creek, 1.0 mi northeast of Laguna, and at mile 370.8.

DRAINAGE AREA.--737 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1923 to current year.

REVISED RECORDS.--WSP 1562: 1930, 1931(M), 1932, 1939. WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,119.72 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 26, 1925, nonrecording gage at site 2 mi downstream at different datum.

REMARKS.--No estimated daily discharges. Records good. There are many small diversions above station for irrigation.

AVERAGE DISCHARGE.--68 years, 152 ft³/s (2.80 in/yr), 110,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 307,000 ft³/s Sept. 24, 1955 (gage height, 29.95 ft, in gage well, 32.7 ft, from outside floodmarks), from rating curve extended above 40,000 ft³/s on basis of float measurement of 110,000 ft³/s and slope-area measurements of 213,000 and 307,000 ft³/s; minimum, 2.6 ft³/s Mar. 14-16, 1957. Maximum stage since at least 1866, that of Sept. 24, 1955.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1913 reached a stage of about 29 ft (discharge, 210,000 ft³/s); flood of Sept. 21, 1923, reached a stage of about 26.5 ft (discharge, 160,000 ft³/s); from information by local residents. Discharges based on rating curve mentioned above.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Sept. 16	0930	*36,700	*16.33	No other peak greater than base discharge.			

Minimum daily discharge, 38 ft³/s July 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	151	116	108	92	94	92	71	64	49	55	64	43
2	148	114	108	93	93	88	71	71	49	57	60	43
3	146	114	106	94	93	85	71	71	48	51	58	43
4	144	124	105	94	96	85	72	71	47	51	55	45
5	141	121	104	94	104	84	123	70	46	50	55	46
6	138	117	104	94	105	84	105	68	46	48	53	48
7	136	121	103	93	101	84	95	66	47	47	52	55
8	137	132	102	92	98	83	88	64	45	52	51	52
9	160	129	101	94	97	82	85	62	46	49	50	49
10	146	125	101	96	97	81	84	62	45	45	48	48
11	142	123	99	94	96	81	84	61	45	44	47	49
12	136	122	99	92	95	80	84	59	55	43	46	49
13	136	120	98	91	95	78	82	71	48	43	46	54
14	134	119	98	91	94	77	80	72	60	49	46	78
15	132	118	98	92	92	78	78	70	92	44	46	1240
16	128	117	100	92	92	80	76	70	79	42	44	16800
17	129	116	100	96	93	80	77	68	73	41	44	4550
18	132	115	97	103	93	78	77	66	69	40	45	1940
19	128	115	95	104	94	77	76	64	66	39	47	1620
20	126	113	96	101	91	77	73	62	63	38	45	1450
21	136	113	95	99	94	78	72	59	61	53	44	1150
22	136	114	95	100	93	77	71	58	59	81	44	952
23	130	114	95	100	91	76	70	57	57	120	44	821
24	128	113	95	98	90	75	70	56	55	105	44	729
25	126	112	94	97	90	75	70	55	54	92	43	648
26	123	112	94	96	90	75	70	54	51	84	43	589
27	122	112	94	95	89	75	70	52	49	79	42	546
28	120	110	94	95	89	73	70	51	48	75	42	508
29	119	109	95	94	---	72	67	51	50	72	42	481
30	118	108	95	94	---	71	65	50	53	69	41	455
31	117	---	93	96	---	72	---	49	---	67	41	---
TOTAL	4145	3508	3061	2956	2639	2453	2347	1924	1655	1825	1472	35181
MEAN	134	117	98.7	95.4	94.2	79.1	78.2	62.1	55.2	58.9	47.5	1173
MAX	160	132	108	104	105	92	123	72	92	120	64	16800
MIN	117	108	93	91	89	71	65	49	45	38	41	43
AC-FT	8220	6960	6070	5860	5230	4870	4660	3820	3280	3620	2920	69780
CFSM	.18	.16	.13	.13	.13	.11	.11	.08	.07	.08	.06	1.59
IN.	.21	.18	.15	.15	.13	.12	.12	.10	.08	.09	.07	1.78

CAL YR 1990	TOTAL 85830	MEAN 235	MAX 6240	MIN 49	AC-FT 170200	CFSM .32	IN. 4.33
WTR YR 1991	TOTAL 63166	MEAN 173	MAX 16800	MIN 38	AC-FT 125300	CFSM .23	IN. 3.19

PERIOD OF RECORD.--Chemical analyses: May 1949 to June 1952, September 1964 to current year. Chemical, biochemical, and pesticide analyses: February 1970 to current year. Sediment analyses: January 1966.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
FEB 12...	1038	96	397	8.6	16.5	5	--	9.3	99	0.9	--	K20
MAY 29...	1240	44	386	7.9	26.5	3	0.50	9.0	113	0.6	K16	K8
AUG 14...	0812	46	421	7.8	25.0	<1	0.50	6.6	84	4.5	43	250

DATE	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
FEB 12...	200	2	58	14	7.6	0.2	0.80	200	14	14	<0.10	10
MAY 29...	200	19	57	13	7.2	0.2	3.5	180	13	21	0.20	11
AUG 14...	220	23	63	15	7.6	0.2	0.90	200	13	11	0.10	13

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)
FEB 12...	239	--	--	0.790	0.010	0.800	<0.010	0.40	<0.010	0.020	0.7	<1
MAY 29...	232	<1	<1	0.580	0.010	0.590	<0.010	0.20	<0.010	<0.010	1.0	--
AUG 14...	241	<1	<1	0.460	0.020	0.480	0.030	<0.20	<0.010	<0.010	0.8	<1

DATE	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)
FEB 12...	36	<0.5	<1.0	<5	<3	<10	<3	<10	6	<1	0.1	<10
MAY 29...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 14...	44	0.5	<1.0	<5	<3	<10	3	<10	6	<1	<0.1	<10

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)
FEB 12...	<10	<1	<1.0	230	<6	5	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010
MAY 29...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 14...	<10	<1	<1.0	260	<6	5	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010

DATE	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)
FEB 12...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01
MAY 29...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 14...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01

08190000 NUECES RIVER AT LAGUNA, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB												
12...	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY												
29...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
14...	<0.01	--	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01

08190500 WEST NUECES RIVER NEAR BRACKETTVILLE, TX

LOCATION.--Lat 29°28'21", long 100°14'10", Kinney County, Hydrologic Unit 12110102, at Wilson Ranch on Farm Road 3199, 1.3 mi upstream from Miguel Canyon, 16.0 mi northeast of Brackettville, and 40.2 mi upstream from mouth.

DRAINAGE AREA.--694 mi².

PERIOD OF RECORD.--September 1939 to September 1950, April 1956 to current year.

REVISED RECORDS.--WSP 1312: 1949(M). WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,326.79 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 14, 1940, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. In ordinary years, a large part of streamflow is lost by seepage into the Balcones Fault Zone of the Edwards and associated limestones above station. No known diversion above station.

AVERAGE DISCHARGE.--46 years (water years 1940-50, 1957-91), 34.4 ft³/s (24,920 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 246,000 ft³/s Sept. 20, 1964 (gage height, 31.3 ft, from floodmark), from rating curve extended above 4,500 ft³/s on basis of slope-area measurements of 10,000, 51,000, 150,000, and 246,000 ft³/s; no flow most of time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1879, about 40 ft June 14, 1935 (discharge, 550,000 ft³/s, based on slope-area measurements of 580,000 ft³/s at site 33 mi upstream from gage) and 536,000 ft³/s (at site 24 mi downstream from gage, present site and datum), from gage-height relation of 1935 and 1955 flood peaks at site 0.6 mi upstream. Flood in 1900 reached a stage of about 34 ft, and flood of Sept. 24, 1955, reached a stage of 27.1 ft, from floodmark at present site (discharge, 150,000 ft³/s, by slope-area measurement).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Sept. 16	0700	*25,100	a*16.40	No other peak greater than base discharge.			

a From floodmark.

Minimum daily discharge, 0.22 ft³/s for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.6	1.1	.78	.64	.54	.57	.71	.51	.22	.29	1.0	.26
2	4.9	1.1	.78	.64	.57	.54	.71	.47	.22	.26	.97	.30
3	4.6	1.1	.75	.64	.57	.51	.71	.49	.22	.26	.86	.30
4	4.0	1.3	.75	.64	.63	.54	.73	.66	.22	.22	.79	.43
5	3.7	1.0	.78	.64	.62	.57	1.5	.65	.22	.22	.82	.67
6	3.4	1.1	.78	.64	.57	.57	1.1	.54	.49	.22	.76	.78
7	3.2	1.2	.78	.64	.56	.57	1.1	.48	.29	.22	.68	.80
8	2.7	1.2	.78	.64	.51	.57	1.1	.35	.25	.27	.64	.80
9	2.4	1.1	.78	.64	.51	.61	1.1	.35	.22	.29	.64	.78
10	2.2	1.0	.78	.62	.51	.64	1.1	.35	.22	.30	.63	.71
11	2.2	1.0	.78	.55	.51	.64	.86	.35	.22	.29	.56	.71
12	2.2	1.0	.78	.51	.51	.62	.86	.35	.22	.26	.47	.65
13	2.0	1.0	.78	.51	.49	.64	.87	.71	.22	.26	.44	.62
14	1.9	1.0	.84	.51	.45	.67	.74	.47	.40	.30	.40	1.0
15	1.9	1.0	.86	.51	.45	.71	.71	.39	.53	.30	.40	1540
16	1.9	1.0	.86	.51	.45	.71	.71	.35	.58	.32	.40	4090
17	1.8	1.0	.86	.59	.45	.71	.71	.35	.71	.35	.40	367
18	1.7	1.0	.72	.80	.50	.71	.71	.34	.71	.35	.40	228
19	1.7	.95	.74	.61	.55	.71	.67	.30	.65	.35	.40	200
20	1.6	.89	.78	.52	.51	.71	.64	.30	.59	.30	.40	185
21	1.8	.86	.78	.51	.56	.73	.64	.30	.56	.42	.40	176
22	1.6	.86	.73	.51	.51	.70	.64	.30	.51	1.0	.39	168
23	1.5	.86	.61	.51	.51	.64	.57	.30	.45	2.1	.35	158
24	1.4	.86	.57	.51	.51	.69	.57	.30	.35	4.8	.35	146
25	1.3	.86	.57	.51	.49	.73	.57	.30	.31	4.6	.35	124
26	1.3	.86	.57	.51	.45	.78	.57	.26	.30	3.2	.35	112
27	1.3	.86	.58	.51	.45	.78	.61	.22	.26	2.2	.35	104
28	1.2	.86	.64	.51	.45	.76	.61	.22	.26	1.6	.35	94
29	1.2	.80	.67	.51	---	.59	.55	.22	.26	1.3	.35	83
30	1.2	.78	.71	.55	---	.67	.51	.22	.31	1.1	.31	70
31	1.2	---	.67	.51	---	.71	---	.22	---	1.1	.28	---
TOTAL	70.6	29.50	22.84	17.65	14.39	20.30	23.18	11.62	10.97	29.05	15.89	7853.81
MEAN	2.28	.98	.74	.57	.51	.65	.77	.37	.37	.94	.51	262
MAX	5.6	1.3	.86	.80	.63	.78	1.5	.71	.71	4.8	1.0	4090
MIN	1.2	.78	.57	.51	.45	.51	.51	.22	.22	.22	.28	.26
AC-FT	140	59	45	35	29	40	46	23	22	58	32	15580

CAL YR 1990	TOTAL	30703.82	MEAN	84.1	MAX	8060	MIN	.08	AC-FT 60900
WTR YR 1991	TOTAL	8119.80	MEAN	22.2	MAX	4090	MIN	.22	AC-FT 16110

08192000 NUECES RIVER BELOW UVALDE, TX

LOCATION.--Lat 29°07'25", long 99°53'40", Uvalde County, Hydrologic Unit 12110103, on right bank at McDaniel Ranch, 6.2 mi upstream from bridge on U.S. Highway 83, 8.8 mi southwest of Uvalde, 18.2 mi downstream from West Nueces River, and at mile 338.7.

DRAINAGE AREA.--1,861 mi².

PERIOD OF RECORD.--April 1939 to current year. October 1927 to April 1939, published as "near Uvalde"; records are equivalent only during periods of flood flow.

REVISED RECORDS.--WSP 1732: 1956(M). WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 796.12 ft above National Geodetic Vertical Datum of 1929. Oct. 4, 1927, to Apr. 30, 1939, water-stage recorder at site 6.2 mi upstream at different datum.

REMARKS.--No estimated daily discharges. Records good. Part of the flow of the Nueces River enters the Edwards and associated limestones in the Balcones Fault Zone that crosses the basin downstream from Laguna (station 08190000) and upstream from this station. At low stage, most of headwater flow enters this formation. There are many small diversions above station for irrigation. Two observations of water temperature were made during the year.

AVERAGE DISCHARGE.--52 years, 126 ft³/s (91,290 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 189,000 ft³/s Sept. 24, 1955 (gage height, 24.61 ft, from floodmark), from rating curve extended above 34,000 ft³/s on basis of conveyance study and slope-area measurement of peak flow; no flow at times in 1951-57.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1836, 40.4 ft June 14, 1935, from floodmark (discharge at former site, 616,000 ft³/s, by slope-area measurement). Large floods also occurred in 1901 and 1913, stages unknown.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 250 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Sept. 16	2230	*36,600	*14.33	No other peak greater than base discharge.			

Minimum daily discharge, 8.4 ft³/s Aug. 17, 20-23, 27-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	95	55	47	40	35	34	28	22	16	15	9.9	11
2	92	54	46	40	35	32	28	25	16	15	9.5	9.0
3	90	53	45	40	35	32	28	25	16	14	9.2	9.1
4	88	51	45	39	37	32	28	23	15	13	9.7	9.3
5	85	51	45	40	39	32	33	22	15	13	12	9.0
6	82	51	45	40	37	31	28	22	15	12	9.9	9.0
7	79	55	45	40	36	32	29	22	15	12	10	10
8	76	57	45	39	36	32	28	23	15	14	9.8	9.8
9	83	53	45	40	36	32	27	22	14	14	9.7	9.5
10	81	56	44	39	36	32	27	22	14	12	9.5	9.5
11	80	56	44	38	36	32	27	22	14	11	9.2	9.3
12	78	55	44	37	36	31	28	21	14	11	9.0	9.0
13	76	55	44	38	36	30	28	24	14	11	8.7	9.1
14	73	55	44	38	36	31	26	21	14	11	9.0	9.6
15	72	53	44	36	36	31	27	20	17	12	8.8	15
16	70	53	43	37	36	31	27	20	14	11	8.7	13200
17	68	53	42	39	36	29	26	19	13	11	8.4	9540
18	65	51	40	43	36	29	26	19	13	10	8.5	2490
19	63	51	41	37	36	30	26	19	12	10	8.7	1450
20	62	51	42	37	35	30	25	18	12	10	8.4	1380
21	64	51	42	37	35	29	25	18	12	12	8.4	1100
22	61	50	41	36	35	28	25	18	12	15	8.4	903
23	63	50	41	36	35	29	25	18	12	11	8.4	783
24	64	50	41	36	35	29	25	18	12	11	8.7	656
25	62	50	41	36	34	29	25	18	12	11	9.1	561
26	60	49	41	36	34	29	25	18	12	11	8.8	492
27	60	48	40	36	34	29	24	17	12	11	8.4	439
28	58	48	40	36	34	28	24	17	12	10	8.4	403
29	57	47	41	36	---	26	23	16	12	11	8.4	373
30	56	47	40	35	---	28	23	16	14	10	8.4	348
31	55	---	40	35	---	28	---	16	---	10	8.8	---
TOTAL	2218	1559	1328	1172	997	937	794	621	410	365	280.8	34265.2
MEAN	71.5	52.0	42.8	37.8	35.6	30.2	26.5	20.0	13.7	11.8	9.06	1142
MAX	95	57	47	43	39	34	33	25	17	15	12	13200
MIN	55	47	40	35	34	26	23	16	12	10	8.4	9.0
AC-FT	4400	3090	2630	2320	1980	1860	1570	1230	813	724	557	67970

CAL YR 1990 TOTAL 78297.1 MEAN 215 MAX 8630 MIN 8.2 AC-FT 155300
WTR YR 1991 TOTAL 44947.0 MEAN 123 MAX 13200 MIN 8.4 AC-FT 89150

08195000 FRIO RIVER AT CONCAN, TX

LOCATION.--Lat 29°29'18", long 99°42'16", Uvalde County, Hydrologic Unit 12110106, on left bank 0.7 mi southeast of Concan Post Office, 15 mi upstream from Dry Frio River, and 222.8 mi upstream from mouth.

DRAINAGE AREA.--389 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1923 to September 1929, October 1930 to current year.

REVISED RECORDS.--WSP 1342: Drainage area. WSP 1512: 1926, 1931-32, 1934(M), 1935-36. WSP 1712: 1958. WSP 1923: 1954(M), 1957(M). WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,203.71 ft above National Geodetic Vertical Datum of 1929. Oct. 26, 1923, to July 28, 1924, nonrecording gage at site 86 ft upstream at datum 5.08 ft lower. July 29, 1924, to Oct. 3, 1930, nonrecording gage, and Oct. 4, 1930, to May 18, 1939, water-stage recorder, at site 130 ft downstream at present datum.

REMARKS.--No estimated daily discharges. Records good. Many small diversions for irrigation above station.

AVERAGE DISCHARGE.--66 years (water years 1925-29, 1931-91), 118 ft³/s (4.12 in/yr), 85,490 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 162,000 ft³/s July 1, 1932 (gage height, 34.44 ft, from floodmarks), from rating curve extended above 44,000 ft³/s on basis of flow-over-dam measurement of 56,600 ft³/s and slope-area measurement of 162,000 ft³/s; no flow Aug. 5, 1956, to Jan 6, 1957.
Maximum stage since at least 1869, that of July 1, 1932.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
July 21	1300	6,560	8.54	Sept. 20	1030	638	4.93
Sept. 16	1100	*50,700	a*22.40	Sept. 23	1300	5,230	7.90

a From floodmark.

Minimum daily discharge, 31 ft³/s Aug. 30, 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	125	102	89	83	77	78	63	54	56	51	51	36
2	126	102	91	85	76	74	64	93	56	49	49	40
3	126	102	88	85	77	72	65	89	56	48	47	39
4	124	109	88	85	80	72	65	68	56	46	44	38
5	121	107	88	86	87	70	92	65	53	48	48	37
6	118	109	89	85	95	71	77	62	54	47	46	37
7	116	110	89	83	92	72	75	61	53	45	44	42
8	114	114	89	83	89	72	72	69	52	52	42	45
9	134	112	88	85	86	72	71	73	60	52	41	41
10	125	111	87	86	84	70	70	70	54	47	40	40
11	121	108	87	84	84	70	70	68	55	46	38	39
12	117	106	86	83	83	70	69	65	64	45	38	40
13	115	105	86	83	82	69	67	90	60	44	35	40
14	113	104	86	82	80	70	66	77	68	43	35	59
15	111	103	86	80	81	70	63	73	86	43	36	2560
16	110	102	89	77	81	72	64	71	69	43	35	8660
17	110	102	87	79	82	70	65	70	64	43	34	1210
18	121	101	83	91	80	70	64	68	63	41	36	559
19	118	100	85	84	81	70	64	65	62	40	35	444
20	114	100	89	81	80	70	62	63	60	39	34	551
21	122	97	89	80	80	71	61	63	59	1010	33	448
22	120	95	86	80	77	68	59	64	57	313	32	380
23	119	95	86	78	77	67	58	62	54	149	35	1660
24	115	95	86	79	77	67	59	61	53	102	35	608
25	112	95	86	77	77	67	60	62	52	81	35	472
26	110	95	86	77	75	67	60	59	52	71	34	413
27	108	95	85	77	75	66	59	57	46	65	32	375
28	106	92	84	75	75	65	67	56	47	57	32	348
29	105	92	88	75	---	63	58	56	49	53	32	330
30	104	90	86	75	---	64	55	55	51	55	31	314
31	102	---	83	76	---	65	---	56	---	53	31	---
TOTAL	3602	3050	2695	2519	2270	2154	1964	2065	1721	2921	1170	19905
MEAN	116	102	86.9	81.3	81.1	69.5	65.5	66.6	57.4	94.2	37.7	663
MAX	134	114	91	91	95	78	92	93	86	1010	51	8660
MIN	102	90	83	75	75	63	55	54	46	39	31	36
AC-FT	7140	6050	5350	5000	4500	4270	3900	4100	3410	5790	2320	39480
CFSM	.30	.26	.22	.21	.21	.18	.17	.17	.15	.24	.10	1.71
IN.	.34	.29	.26	.24	.22	.21	.19	.20	.16	.28	.11	1.90

CAL YR 1990	TOTAL	52517	MEAN	144	MAX	2370	MIN	46	AC-FT	104200	CFSM	.37	IN.	5.02
WTR YR 1991	TOTAL	46036	MEAN	126	MAX	8660	MIN	31	AC-FT	91310	CFSM	.32	IN.	4.40

PERIOD OF RECORD.--Chemical analyses: June 1952, December 1964 to July 1965. Chemical, biochemical, and pesticide analyses: August 1968 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
FEB 13...	1028	84	397	8.0	16.5	<1	0.30	8.9	96	1.3	21
MAY 29...	0820	56	389	7.9	27.0	1	0.50	6.8	86	0.8	K68
AUG 14...	1147	35	370	7.8	27.0	<1	1.4	6.5	85	0.8	26

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB 13...	26	200	25	58	14	7.0	0.2	0.70	180	14	13
MAY 29...	80	200	25	56	14	6.9	0.2	1.0	170	15	17
AUG 14...	K13	190	24	52	14	7.0	0.2	0.90	160	16	11

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)
FEB 13...	<0.10	9.6	223	22	18	4	0.690	0.010	0.700	<0.010	--
MAY 29...	0.20	12	226	1	<1	--	0.340	0.010	0.350	0.020	0.78
AUG 14...	0.20	12	212	<1	<1	--	0.280	0.020	0.300	0.040	--

DATE	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
FEB 13...	0.30	0.010	0.030	--	<1	30	<0.5	<1.0	<5	<3	<10
MAY 29...	0.80	0.010	<0.010	1.5	--	--	--	--	--	--	--
AUG 14...	<0.20	<0.010	<0.010	1.7	<1	33	<0.5	<1.0	<5	<3	<10

DATE	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)
FEB 13...	17	<10	7	<1	<0.1	<10	<10	<1	<1.0	240	<6
MAY 29...	--	--	--	--	--	--	--	--	--	--	--
AUG 14...	5	<10	5	2	0.1	<10	<10	<1	1.0	270	<6

DATE	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)
FEB 13...	15	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01
MAY 29...	--	--	--	--	--	--	--	--	--	--	--
AUG 14...	<3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
FEB 13...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
MAY 29...	--	--	--	--	--	--	--	--	--	--
AUG 14...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	--

DATE	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 13...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY 29...	--	--	--	--	--	--	--	--	--	--
AUG 14...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01

08196000 DRY FRIO RIVER NEAR REAGAN WELLS, TX

LOCATION.--Lat 29°30'16", long 99°46'52", Uvalde County, Hydrologic Unit 12110106, on right bank 2.3 mi upstream from bridge on U.S. Highway 83, 3.1 mi upstream from Rocky Creek, 4.3 mi southeast of Reagan Wells, and 26.9 mi upstream from mouth.

DRAINAGE AREA.--126 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1952 to current year.

REVISED RECORDS.--WSP 1712: 1953. WSP 1923: 1955(M). WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,335.2 ft above National Geodetic Vertical Datum of 1929, from State Department of Highways and Public Transportation datum.

REMARKS.--No estimated daily discharges. Records good. There are several small diversions above station.

AVERAGE DISCHARGE.--39 years, 34.7 ft³/s (3.74 in/yr), 25,140 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 123,000 ft³/s Aug. 13, 1966 (gage height, 27.6 ft, from floodmark), from rating curve extended above 900 ft³/s on basis of slope-area measurements of 11,400, 30,700, 64,700, and 123,000 ft³/s; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1875 occurred in 1880 (about 33 ft). Flood of June 14, 1935, reached a stage of 26.0 ft (discharge, 64,700 ft³/s, determined at site 2.6 mi upstream), and flood of July 1, 1932, reached a stage of 23 ft (discharge, 30,700 ft³/s, determined at site 2.0 mi upstream), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Sept. 15	0615	*4,230	*8.81	Sept. 23	1300	275	3.26

Minimum daily discharge, 2.7 ft³/s Aug. 23, 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	12	11	9.5	10	11	10	7.4	5.5	7.8	5.1	3.0
2	16	12	11	9.9	10	11	10	11	5.4	6.9	4.9	3.2
3	16	12	11	10	10	11	10	19	5.2	6.3	4.6	3.8
4	16	14	11	10	11	11	11	15	5.1	6.1	4.4	4.4
5	16	13	11	10	12	11	27	12	4.9	6.6	4.5	4.4
6	16	13	11	10	12	11	18	10	4.7	6.4	4.5	4.3
7	15	14	11	10	12	11	14	9.4	4.7	6.2	4.2	4.5
8	15	15	11	9.9	12	11	13	10	5.3	6.4	4.0	5.0
9	21	15	11	10	12	10	13	11	8.4	6.2	4.0	5.0
10	20	14	10	11	12	10	12	9.9	6.0	5.9	3.8	4.7
11	18	14	10	11	12	10	12	9.2	5.4	5.7	3.6	4.5
12	16	13	10	10	11	10	12	8.5	9.0	5.4	3.5	4.5
13	16	13	9.8	9.9	11	10	11	20	30	5.3	3.3	4.5
14	15	13	9.8	9.8	11	9.8	11	19	19	5.0	3.2	149
15	15	12	10	9.6	11	9.8	10	15	31	5.9	3.2	1380
16	14	12	10	9.6	11	10	9.6	14	22	7.2	3.2	1020
17	14	12	10	10	11	11	9.4	13	18	6.1	3.1	325
18	15	12	10	13	11	11	9.7	12	16	5.7	3.1	217
19	15	12	9.5	12	11	11	9.5	11	15	6.3	3.2	183
20	14	12	9.4	12	11	11	8.8	10	14	5.7	3.1	190
21	15	12	9.4	11	11	11	8.6	9.9	13	5.6	2.9	173
22	16	12	9.4	11	11	11	8.5	9.1	12	6.8	2.8	150
23	16	12	9.2	11	11	11	8.2	8.5	11	9.0	2.7	184
24	15	12	9.0	11	11	10	8.4	7.9	10	8.7	2.7	199
25	14	12	9.0	10	11	10	8.3	7.8	9.2	7.7	2.8	152
26	13	12	9.0	10	11	11	8.5	7.4	8.4	7.0	2.8	129
27	12	12	9.4	10	11	11	8.9	7.1	7.6	6.4	3.1	115
28	13	12	9.4	10	11	11	9.9	6.3	7.1	6.0	3.2	105
29	13	11	9.8	10	---	10	9.2	5.9	7.0	5.9	3.2	95
30	13	11	10	10	---	10	8.2	5.7	7.6	5.7	3.1	88
31	13	---	9.8	10	---	10	---	5.5	---	5.4	3.1	---
TOTAL	473	377	310.9	321.2	312	327.6	327.7	327.5	327.5	197.3	108.9	4909.8
MEAN	15.3	12.6	10.0	10.4	11.1	10.6	10.9	10.6	10.9	6.36	3.51	164
MAX	21	15	11	13	12	11	27	20	31	9.0	5.1	1380
MIN	12	11	9.0	9.5	10	9.8	8.2	5.5	4.7	5.0	2.7	3.0
AC-FT	938	748	617	637	619	650	650	650	650	391	216	9740
CFSM	.12	.10	.08	.08	.09	.08	.09	.08	.09	.05	.03	1.30
IN.	.14	.11	.09	.09	.09	.10	.10	.10	.10	.06	.03	1.45

CAL YR 1990 TOTAL 9723.3 MEAN 26.6 MAX 599 MIN 2.9 AC-FT 19290 CFSM .21 IN. 2.87
WTR YR 1991 TOTAL 8320.4 MEAN 22.8 MAX 1380 MIN 2.7 AC-FT 16500 CFSM .18 IN. 2.46

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: January 1966 to current year. Pesticide analyses: January 1974 to current year. Sediment analyses: January 1966.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
FEB 13...	1508	11	358	8.0	15.0	1	0.60	9.9	104	1.1	K4
MAY 29...	0925	9.4	375	7.9	25.0	3	1.0	7.9	97	0.6	K30
AUG 14...	1014	4.2	380	7.8	25.5	1	1.0	7.3	93	0.7	32

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB 13...	K17	180	9	51	12	6.1	0.2	0.50	170	15	9.9
MAY 29...	74	200	22	58	13	5.8	0.2	0.60	180	17	15
AUG 14...	92	190	23	55	13	6.2	0.2	0.60	170	13	12

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)
FEB 13...	<0.10	8.0	204	7	7	0	--	<0.010	0.500	<0.010	0.30
MAY 29...	0.10	11	226	<1	<1	--	0.210	0.010	0.220	<0.010	0.20
AUG 14...	0.10	13	214	<1	<1	--	0.089	0.010	0.099	0.030	<0.20

DATE	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)
FEB 13...	0.010	0.020	--	<1	31	<0.5	<1.0	<5	<3	<10	<3
MAY 29...	<0.010	<0.010	1.3	--	--	--	--	--	--	--	--
AUG 14...	<0.010	<0.010	1.4	<1	38	<0.5	<1.0	<5	<3	<10	5

DATE	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
FEB 13...	<10	6	<1	<0.1	<10	<10	<1	<1.0	340	<6	4
MAY 29...	--	--	--	--	--	--	--	--	--	--	--
AUG 14...	<10	5	2	0.4	<10	<10	<1	<1.0	380	<6	3

DATE	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)
FEB 13...	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01
MAY 29...	--	--	--	--	--	--	--	--	--	--
AUG 14...	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01

08196000 DRY FRIO RIVER NEAR REAGAN WELLS, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
FEB 13...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
MAY 29...	--	--	--	--	--	--	--	--	--	--
AUG 14...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	--

DATE	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 13...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY 29...	--	--	--	--	--	--	--	--	--	--
AUG 14...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01

08197500 FRIO RIVER BELOW DRY FRIO RIVER NEAR UVALDE, TX

LOCATION.--Lat 29°14'44", long 99°40'27", Uvalde County, Hydrologic Unit 12110106, on right bank 1.1 mi upstream from Farm Road 1023, 5.7 mi downstream from Dry Frio River, 6.3 mi downstream from bridge on U.S. Highway 90, 7.2 mi northeast of Uvalde, and 194.5 mi upstream from mouth.

DRAINAGE AREA.--631 mi².

PERIOD OF RECORD.--September 1952 to current year. Sum of records published as Frio River at Knippa and Dry Frio River at Knippa for period September 1952 to September 1953 is equivalent to record for this station.

REVISED RECORDS.--WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 882.47 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Part of flow of Frio River enters the Edwards and associated limestones in the Balcones Fault Zone, that crosses the basin between Concan (station 08195000) and this station. Most of the low flow enters this formation. Many diversions for irrigation above station. Satellite telemeter at station.

AVERAGE DISCHARGE.--39 years, 33.4 ft³/s (24,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 99,600 ft³/s May 29, 1987 (gage height, 25.05 ft, from floodmark), from rating curve extended above 12,000 ft³/s on basis of slope-area measurements of 24,400, 53,000, and 88,500 ft³/s; no flow most of time each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1887, about 35 ft in 1894. Flood of July 1, 1932, reached a stage of about 30 ft. A higher flood than that of 1894 occurred prior to 1887. Above information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Sept. 16	1730	*36,400	*16.88	Sept. 23	1900	4,200	8.04

Minimum daily discharge, no flow most of year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1430
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	7350
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1730
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	466
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	280
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	283
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	283
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	110	.00	177
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.9	.00	1250
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	665
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	284
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	189
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	138
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	105
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	81
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	63
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	113.95	0.00	14774.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.000	3.68	.000	492
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.00	110	.00	7350
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	.00	.00	226	.00	29300

CAL YR 1990 TOTAL 5212.69 MEAN 14.3 MAX 1240 MIN .00 AC-FT 10340
WTR YR 1991 TOTAL 14887.95 MEAN 40.8 MAX 7350 MIN .00 AC-FT 29530

08198000 SABINAL RIVER NEAR SABINAL, TX

LOCATION.--Lat 29°29'27", long 99°29'33", Uvalde County, Hydrologic Unit 12110106, on right bank 108 ft upstream from concrete dam, 2.3 mi downstream from mouth of Onion Creek, 12.5 mi north of Sabinal, and 41.6 mi upstream from mouth.

DRAINAGE AREA.--206 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1942 to current year.

REVISED RECORDS.--WSP 1312: 1943(M), 1944(M), 1947(M).

GAGE.--Water-stage recorder. Datum of gage is 1,131.20 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 9, 1971, at site 0.3 mi downstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. There are several small diversions above station for irrigation.

AVERAGE DISCHARGE.--49 years, 58.9 ft³/s (3.88 in/yr), 42,670 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 55,200 ft³/s June 17, 1958 (gage height, 28.3 ft, from floodmark, at present site), from rating curve extended above 6,900 ft³/s on basis of slope-area measurement of 55,200 ft³/s; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1892, about 33 ft July 2, 1932, from information by local residents. There is a legend that a flood in the middle 1800's reached a stage of nearly 63 ft; see flood history for station 08198500.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Sept. 15	0600	*11,600	*13.00	No other peak greater than base discharge.			

Minimum daily discharge, 15 ft³/s May 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	52	37	29	22	e23	24	19	15	24	54	30	17
2	50	35	29	22	e22	24	19	75	24	54	29	18
3	50	34	29	23	e22	23	19	73	24	49	27	33
4	50	36	28	23	e29	22	19	40	25	48	27	25
5	49	40	29	23	e32	22	47	34	26	46	26	22
6	48	41	28	24	e29	21	38	32	24	46	27	21
7	47	40	27	24	e26	20	35	30	24	46	26	28
8	46	39	27	23	e25	20	30	36	23	44	26	33
9	62	39	27	e23	e24	20	27	35	30	45	26	29
10	57	37	26	e23	e23	20	24	36	26	44	26	26
11	52	36	27	e25	24	20	24	32	33	44	24	24
12	50	35	26	e24	22	20	23	30	118	42	23	24
13	48	34	26	e24	22	20	21	39	85	40	22	23
14	46	34	26	e23	23	20	20	40	69	38	22	23
15	44	34	26	e23	22	20	19	40	90	35	22	3170
16	44	34	25	e22	22	20	19	37	78	35	22	377
17	44	34	24	e22	22	22	19	40	70	35	23	234
18	43	33	24	e36	23	22	19	42	67	35	22	205
19	44	32	23	e32	24	22	20	39	65	35	22	164
20	44	32	24	e28	23	22	19	37	63	32	20	189
21	48	32	24	e27	23	22	17	35	61	31	19	202
22	50	32	22	e26	23	22	17	34	60	70	19	181
23	47	31	22	e25	22	20	17	34	56	53	18	200
24	44	30	23	e25	22	21	17	34	56	44	19	210
25	42	30	23	e25	22	20	17	39	56	38	19	181
26	40	30	23	e24	22	20	17	33	54	35	19	167
27	40	30	23	e24	23	20	18	30	52	35	18	157
28	40	29	23	e24	23	20	17	28	50	34	18	149
29	39	29	23	e24	---	19	16	27	48	34	18	139
30	39	29	23	e23	---	19	16	24	51	36	17	135
31	39	---	22	e23	---	19	---	24	---	33	16	---
TOTAL	1438	1018	781	759	662	646	649	1124	1532	1290	692	6406
MEAN	46.4	33.9	25.2	24.5	23.6	20.8	21.6	36.3	51.1	41.6	22.3	214
MAX	62	41	29	36	32	24	47	75	118	70	30	3170
MIN	39	29	22	22	22	19	16	15	23	31	16	17
AC-FT	2850	2020	1550	1510	1310	1280	1290	2230	3040	2560	1370	12710
CFSM	.23	.16	.12	.12	.11	.10	.11	.18	.25	.20	.11	1.04
IN.	.26	.18	.14	.14	.12	.12	.12	.20	.28	.23	.12	1.16

CAL YR 1990	TOTAL	21047.0	MEAN	57.7	MAX	2640	MIN	7.8	AC-FT	41750	CFSM	.28	IN.	3.80
WTR YR 1991	TOTAL	16997	MEAN	46.6	MAX	3170	MIN	15	AC-FT	33710	CFSM	.23	IN.	3.07

e Estimated

08198000 SABINAL RIVER NEAR SABINAL, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: November 1964 to July 1965. Chemical and biochemical analyses: February 1970 to current year. Pesticide analyses: August 1971 to current year. Sediment analyses: November 1965.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
FEB 11...	1604	25	454	8.0	16.0	<1	0.60	9.7	102	1.4	--
MAY 28...	1705	18	431	8.0	28.0	2	0.50	8.4	109	0.7	88
AUG 15...	0845	15	428	7.8	26.5	1	0.30	6.1	79	0.8	--

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB 11...	K1	230	29	70	13	8.3	0.2	0.90	200	32	12
MAY 28...	100	220	35	68	13	7.7	0.2	1.9	190	25	11
AUG 15...	150	210	32	62	13	8.1	0.2	1.0	180	30	14

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)
FEB 11...	0.10	10	267	11	11	0	--	<0.010	0.300	<0.010	0.30
MAY 28...	0.20	13	253	<1	<1	--	0.150	0.010	0.160	<0.010	0.30
AUG 15...	0.20	14	249	1	1	0	0.067	0.010	0.077	0.030	<0.20

DATE	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)
FEB 11...	0.030	0.020	--	<1	31	<0.5	<1.0	<5	<3	<10	5
MAY 28...	<0.010	<0.010	1.2	--	--	--	--	--	--	--	--
AUG 15...	<0.010	<0.010	--	<1	33	<0.5	<1.0	<5	<3	<10	5

DATE	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
FEB 11...	<10	8	<1	<0.1	<10	<10	<1	<1.0	330	<6	12
MAY 28...	--	--	--	--	--	--	--	--	--	--	--
AUG 15...	<10	6	1	<0.1	<10	<10	<1	<1.0	320	<6	5

DATE	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)
FEB 11...	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01
MAY 28...	--	--	--	--	--	--	--	--	--	--
AUG 15...	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01

08198000 SABINAL RIVER NEAR SABINAL, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
FEB 11...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
MAY 28...	--	--	--	--	--	--	--	--	--	--
AUG 15...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	--

DATE	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 11...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY 28...	--	--	--	--	--	--	--	--	--	--
AUG 15...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01

08198500 SABINAL RIVER AT SABINAL, TX

LOCATION.--Lat 29°18'05", long 99°28'46", Uvalde County, Hydrologic Unit 12110106, on left bank 80 ft downstream from bridge on U.S. Highway 90, 1,100 ft downstream from Southern Pacific Lines railroad bridge, 0.8 mi west of Sabinal, 5.8 mi upstream from Ranchero Creek, and 223 mi upstream from mouth.

DRAINAGE AREA.--241 mi².

PERIOD OF RECORD.--September 1952 to current year.

REVISED RECORDS.--WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 882.17 ft above National Geodetic Vertical Datum of 1929. Prior to July 29, 1958, nonrecording gage, and July 29, 1958, to Mar. 19, 1964, water-stage recorder at site 80 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records fair. Several small diversions for irrigation above station. Most of low flow of the Sabinal River enters the Edwards and associated limestones in the Balcones Fault Zone, that crosses basin upstream from this station and downstream from Sabinal River near Sabinal (station 08198000). Satellite telemeter at station.

AVERAGE DISCHARGE.--39 years, 32.6 ft³/s (23,620 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 73,300 ft³/s June 17, 1958 (gage height, 33.3 ft); no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1890, 40 ft Aug. 24, 1919, from information by local residents. Flood of July 2, 1932, reached a stage of 31 ft (discharge, 60,000 ft³/s), from information by Southern Pacific Lines. There is a legend that a flood in 1858 covered the townsite of Sabinal. The stage would have been 70 to 80 ft, which seems unlikely. However, it is possible that a flood occurred in 1858 that covered part of the townsite and was higher than any flood since that date.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Sept. 15	1300	*28,100	*23.95	No other peak greater than base discharge.			

Minimum daily discharge, 0.71 ft³/s June 2, 3, Sept. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	2.3	2.0	1.5	1.3	1.1	1.6	2.0	.75	1.3	1.1	.85
2	3.4	2.2	2.0	1.5	1.3	1.1	1.6	3.5	.71	1.1	1.2	1.0
3	3.4	2.2	2.0	1.5	1.3	1.1	1.4	2.3	.71	1.1	1.2	1.1
4	3.4	2.2	1.9	1.5	1.6	1.2	1.3	1.8	.92	1.1	1.2	1.2
5	3.4	2.2	1.9	1.5	1.3	1.3	2.6	1.8	1.0	1.1	1.2	1.1
6	3.4	2.2	1.8	1.5	1.2	1.4	2.2	1.8	1.1	1.2	1.2	1.0
7	3.3	2.2	1.8	1.5	1.2	1.4	2.5	1.7	1.1	1.2	1.2	1.0
8	3.3	2.4	1.8	1.5	1.2	1.4	2.8	2.6	1.1	1.3	1.1	1.0
9	8.9	2.2	1.8	1.5	1.2	1.4	2.9	1.9	1.3	1.2	1.1	.95
10	3.3	2.1	1.8	1.6	1.2	1.5	2.9	1.8	1.3	1.1	1.1	.85
11	3.3	2.1	1.8	1.6	1.2	1.6	3.1	1.8	1.3	1.1	1.1	.71
12	3.3	2.1	1.8	1.6	1.2	1.6	3.1	1.6	1.2	1.0	1.3	.85
13	3.2	2.1	1.8	1.6	1.2	1.6	3.2	1.6	1.2	1.0	1.3	.78
14	3.1	2.1	1.8	1.6	1.2	1.5	5.2	1.5	1.2	1.1	1.3	.77
15	3.1	2.1	1.8	1.5	1.2	1.5	2.8	1.5	2.4	1.1	1.3	2520
16	3.1	2.1	1.8	1.6	1.2	1.4	2.7	1.5	1.3	1.1	1.2	382
17	3.0	2.1	1.8	1.5	1.2	1.4	2.6	1.5	1.2	1.1	1.2	134
18	3.0	2.1	1.8	2.5	1.2	1.4	2.6	1.4	1.2	1.1	1.2	98
19	3.0	2.1	1.8	1.3	1.2	1.4	2.5	1.4	1.3	1.1	1.2	63
20	3.0	2.1	1.8	1.3	1.2	1.5	2.5	1.3	1.3	1.1	1.2	57
21	4.0	2.1	1.8	1.3	1.2	1.5	2.5	1.3	1.3	1.3	1.0	67
22	3.1	2.1	1.8	1.3	1.2	1.4	2.4	1.2	1.2	2.5	1.2	58
23	2.7	2.1	1.7	1.3	1.2	1.4	2.4	1.2	1.1	1.5	1.1	43
24	2.5	2.1	1.7	1.3	1.2	1.4	2.3	1.3	1.1	1.3	.93	75
25	2.4	2.1	1.7	1.3	1.1	1.4	2.2	1.4	1.1	1.2	.93	56
26	2.4	2.1	1.7	1.3	1.1	1.3	2.2	1.1	1.1	1.1	.93	44
27	2.4	2.1	1.5	1.3	1.1	1.3	2.1	1.0	1.1	1.0	1.1	36
28	2.4	2.1	1.5	1.3	1.1	1.3	2.1	.93	1.1	1.0	1.1	28
29	2.4	2.0	1.5	1.3	---	1.3	2.1	.91	1.1	1.0	1.1	23
30	2.4	2.0	1.5	1.3	---	1.2	2.0	.78	1.3	1.0	.97	19
31	2.4	---	1.5	1.3	---	1.3	---	.78	---	1.1	.85	---
TOTAL	99.6	64.0	54.7	45.4	34.0	42.6	74.4	48.20	35.09	36.5	35.11	3716.16
MEAN	3.21	2.13	1.76	1.46	1.21	1.37	2.48	1.55	1.17	1.18	1.13	124
MAX	8.9	2.4	2.0	2.5	1.6	1.6	5.2	3.5	2.4	2.5	1.3	2520
MIN	2.4	2.0	1.5	1.3	1.1	1.1	1.3	.78	.71	1.0	.85	.71
AC-FT	198	127	108	90	67	84	148	96	70	72	70	7370

CAL YR 1990	TOTAL	5868.70	MEAN	16.1	MAX	1650	MIN	.85	AC-FT 11640
WTR YR 1991	TOTAL	4285.76	MEAN	11.7	MAX	2520	MIN	.71	AC-FT 8500

08200000 HONDO CREEK NEAR TARPLEY, TX

LOCATION.--Lat 29°34'10", long 99°14'47", Medina County, Hydrologic Unit 12110107, on left bank 460 ft downstream from bridge on Ranch Road 462, 6.3 mi southeast of Tarpley, and 16.6 mi northwest of Hondo.

DRAINAGE AREA.--95.6 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1952 to current year.

REVISED RECORDS.--WSP 1712: 1957. WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,169.1 ft, from Magnolia Oil Co. datum.

REMARKS.--Records good. There are several small diversions for irrigation above station.

AVERAGE DISCHARGE.--39 years, 39.4 ft³/s (5.60 in/yr), 28,550 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 69,800 ft³/s June 17, 1958 (gage height, 28.2 ft, from floodmark), from rating curve extended above 2,600 ft³/s on basis of slope-area measurements of 18,600 and 69,800 ft³/s; no flow at times.
Maximum stage since at least 1907, that of June 17, 1958.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in July 1932 reached a stage of about 26 ft (discharge, 58,500 ft³/s), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 5	0415	4,000	6.66	May 4	1745	861	3.79
May 2	1815	5,280	7.68	Sept. 15	0045	*5,580	*7.92

Minimum daily discharge, 3.9 ft³/s Dec. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	9.8	6.1	4.4	7.2	8.5	5.4	17	37	50	14	6.1
2	16	9.4	6.4	6.7	7.0	7.5	5.4	622	36	40	14	41
3	16	9.0	6.1	6.3	7.1	7.1	5.6	105	36	35	13	18
4	16	12	5.9	5.5	9.2	7.0	5.7	127	44	34	13	11
5	17	11	5.6	5.8	10	6.8	580	66	34	35	13	8.4
6	15	9.8	5.5	5.6	9.5	6.7	41	54	33	33	13	9.4
7	14	9.7	5.3	5.2	8.6	6.6	31	52	31	31	13	11
8	14	14	5.3	5.0	8.4	6.5	28	69	31	30	13	8.8
9	26	11	5.2	5.9	8.4	6.4	25	65	82	31	12	8.3
10	16	9.3	5.2	6.4	8.5	6.2	24	59	41	29	11	7.9
11	15	9.0	5.3	5.9	8.4	6.4	33	58	81	28	11	9.4
12	14	8.7	5.1	5.5	8.4	6.3	25	55	91	26	10	8.4
13	13	8.6	5.2	5.2	8.7	6.1	23	77	51	26	9.9	10
14	13	8.4	5.2	5.0	8.2	6.0	41	69	49	25	9.8	48
15	13	8.4	5.3	5.0	7.9	6.3	29	62	64	25	9.7	1210
16	13	8.0	5.4	4.7	8.1	6.7	27	68	54	23	9.4	80
17	13	8.0	5.4	5.0	8.7	6.9	26	66	51	22	10	89
18	12	8.0	4.9	14	8.7	6.4	25	60	50	22	13	66
19	11	8.0	4.6	11	9.6	6.3	25	59	48	21	9.3	61
20	11	7.8	4.7	8.9	8.1	6.5	23	57	46	20	8.5	209
21	15	7.8	4.6	8.3	8.2	6.8	22	55	45	20	8.0	139
22	14	7.5	4.1	8.2	7.9	6.5	22	54	45	29	7.9	117
23	12	7.6	3.9	8.2	7.8	6.1	20	52	51	24	10	116
24	11	7.3	4.0	8.9	7.8	6.0	20	50	44	22	7.6	111
25	11	7.3	4.1	7.8	7.8	6.0	20	48	41	19	6.8	99
26	10	7.3	4.1	7.5	7.6	6.2	20	45	39	18	6.4	91
27	10	7.2	4.1	8.0	7.5	6.1	19	43	37	18	6.2	84
28	10	6.7	4.4	7.8	7.5	5.9	19	41	35	17	6.2	79
29	10	6.2	5.0	7.7	---	5.5	18	40	40	17	5.9	74
30	9.9	6.1	5.0	8.0	---	5.4	17	38	41	17	6.0	70
31	9.9	---	4.4	7.6	---	5.7	---	37	---	16	5.8	---
TOTAL	416.8	258.9	155.4	215.0	230.8	199.4	1225.1	2370	1408	803	306.4	2900.7
MEAN	13.4	8.63	5.01	6.94	8.24	6.43	40.8	76.5	46.9	25.9	9.88	96.7
MAX	26	14	6.4	14	10	8.5	580	622	91	50	14	1210
MIN	9.9	6.1	3.9	4.4	7.0	5.4	5.4	17	31	16	5.8	6.1
AC-FT	827	514	308	426	458	396	2430	4700	2790	1590	608	5750
CFSM	.14	.09	.05	.07	.09	.07	.43	.80	.49	.27	.10	1.01
IN.	.16	.10	.06	.08	.09	.08	.48	.92	.55	.31	.12	1.13

CAL YR 1990	TOTAL	10057.7	MEAN	27.6	MAX	638	MIN	2.8	AC-FT	19950	CFSM	.29	IN.	3.91
WTR YR 1991	TOTAL	10489.5	MEAN	28.7	MAX	1210	MIN	3.9	AC-FT	20810	CFSM	.30	IN.	4.08

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: November 1965 to September 1969. Chemical and biochemical analyses: February 1970 to current year. Pesticide analyses: August 1971 to current year. Sediment analyses: November to December 1965.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
FEB 08...	1303	8.4	393	8.1	13.0	1	0.40	10.1	99	0.7	--
MAY 28...	1315	38	424	7.9	27.0	3	0.40	8.2	104	0.9	K14
AUG 13...	1230	11	379	7.9	30.0	1	0.60	8.6	119	1.0	23

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB 08...	27	200	53	61	11	6.8	0.2	1.0	150	48	12
MAY 28...	K24	220	39	72	10	7.0	0.2	1.3	180	24	15
AUG 13...	33	180	41	56	10	8.5	0.3	1.1	140	42	11

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)
FEB 08...	0.10	8.0	235	16	4	12	--	<0.010	<0.100	0.010	0.69
MAY 28...	0.20	11	250	<1	<1	--	0.270	0.010	0.280	<0.010	--
AUG 13...	0.30	14	227	<1	<1	--	0.120	0.010	0.130	0.030	0.27

DATE	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
FEB 08...	0.70	<0.010	<0.010	1.3	<1	23	<0.5	<1.0	<5	<3	<10
MAY 28...	0.60	<0.010	<0.010	1.3	--	--	--	--	--	--	--
AUG 13...	0.30	<0.010	<0.010	1.5	<1	27	<0.5	<1.0	<5	<3	<10

DATE	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)
FEB 08...	6	<10	6	<1	<0.1	<10	<10	<1	<1.0	380	<6
MAY 28...	--	--	--	--	--	--	--	--	--	--	--
AUG 13...	4	<10	6	2	<0.1	<10	<10	<1	<1.0	360	<6

DATE	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)
FEB 08...	8	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01
MAY 28...	--	--	--	--	--	--	--	--	--	--	--
AUG 13...	5	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
FEB 08...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
MAY 28...	--	--	--	--	--	--	--	--	--	--
AUG 13...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	--

DATE	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 08...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY 28...	--	--	--	--	--	--	--	--	--	--
AUG 13...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01

08200700 HONDO CREEK AT KING WATERHOLE NEAR HONDO, TX

LOCATION.--Lat 29°23'26", long 99°09'04", Medina County, Hydrologic Unit 12110107, on left bank 0.3 mi downstream from county road low-water crossing, 3.1 mi north of Hondo, 7.8 mi upstream from Verde Creek, and 55.4 mi upstream from mouth.

DRAINAGE AREA.--149 mi².

PERIOD OF RECORD.--October 1960 to current year.

REVISED RECORDS.--WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 897.87 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Most of the low flow of Hondo Creek enters the Edwards and associated limestones in the Balcones Fault Zone, that crosses the basin between Tarpley (station 08200000) and this station. There are several small diversions above station for irrigation. Satellite telemeter at station.

AVERAGE DISCHARGE.--31 years, 15.1 ft³/s (10,940 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 51,800 ft³/s May 29, 1987 (gage height, 17.19 ft), from rating curve extended above 16.0 ft; no flow most of time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1875, 21 ft in September 1919, from information by local resident. Other floods occurred in July 1932, stage 18 ft, and June 17, 1958, stage 17 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Apr. 5	0930	2,020	4.80	Sept. 15	0500	*5,090	*6.50
May 2	2200	4,520	6.23	Sept. 17	2300	516	3.23

Minimum daily discharge, no flow most of year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	261	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	163	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	21	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	252	6.3	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	24	2.4	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	5.9	.71	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	1.7	.64	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.26	.76	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.18	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	784
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	24
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	27
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	80
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.6
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	28
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	38
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	11
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.7
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.2
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.29
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	283.86	455.99	0.00	0.00	0.00	997.80
MEAN	.000	.000	.000	.000	.000	.000	9.46	14.7	.000	.000	.000	33.3
MAX	.00	.00	.00	.00	.00	.00	252	261	.00	.00	.00	784
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	563	904	.00	.00	.00	1980

CAL YR 1990 TOTAL 1097.03 MEAN 3.01 MAX 178 MIN .00 AC-FT 2180
WTR YR 1991 TOTAL 1737.65 MEAN 4.76 MAX 784 MIN .00 AC-FT 3450

08201500 SECO CREEK AT MILLER RANCH NEAR UTOPIA, TX

LOCATION.--Lat 29°34'23", long 99°24'10", Medina County, Hydrologic Unit 12110107, on right bank 200 ft upstream from county road crossing, 4.5 mi downstream from Cascade Creek, 7.9 mi southeast of Utopia, and 58.0 mi upstream from mouth.

DRAINAGE AREA.--45.0 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1961 to current year.

REVISED RECORDS.--WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder, crest-stage gages, and concrete control. Datum of gage is 1,265.8 ft. from Magnolia Oil Company datum, adjustment unknown.

REMARKS.--Records good. No known diversions above station.

AVERAGE DISCHARGE.--30 years, 18.7 ft³/s (5.64 in/yr), 13,550 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,500 ft³/s July 15, 1973 (gage height, 14.4 ft, from floodmark), from rating curve extended above 910 ft³/s on basis of field estimate of flow over and around the end of dam, 14,100 ft³/s, and slope-area measurement of 52,600 ft³/s; no flow for many days in 1963, 1964, 1989, and 1990.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1901, 16.4 ft June 17, 1958, from floodmarks (discharge, 52,600 ft³/s, by slope-area measurement of peak flow).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
May 2	1630	*3,380	*5.31	Sept. 15	0500	1,600	4.22

Minimum daily discharge, 2.6 ft³/s Apr. 30, May 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	11	6.1	3.6	4.9	5.8	3.9	2.6	14	11	7.4	3.9
2	27	11	6.1	4.2	4.9	5.1	3.6	237	14	11	6.5	6.4
3	25	10	5.9	4.5	4.9	4.6	3.6	26	14	10	6.4	9.0
4	25	14	5.7	4.6	5.9	4.6	3.6	18	15	9.5	6.0	4.4
5	24	12	5.7	4.6	6.4	4.6	22	16	12	14	6.0	3.3
6	24	11	5.7	4.6	6.1	4.6	6.3	15	11	12	5.6	3.1
7	22	10	5.1	4.4	5.7	4.6	4.9	14	10	9.4	5.7	4.7
8	20	12	4.9	4.3	5.3	4.6	4.6	25	11	9.0	6.9	3.5
9	42	10	4.9	4.9	5.3	4.6	4.2	18	19	8.8	5.3	3.0
10	24	9.6	4.9	5.3	5.3	4.4	3.9	16	12	7.7	5.0	2.8
11	21	9.6	4.9	4.3	5.3	4.3	5.7	16	12	6.9	4.6	2.8
12	20	9.1	4.9	4.3	5.3	4.3	4.6	15	48	6.5	4.6	2.8
13	19	9.0	4.9	4.3	5.3	4.3	4.0	38	20	6.5	4.6	3.2
14	19	9.0	4.9	4.3	5.3	4.3	6.3	24	22	6.7	4.6	6.2
15	18	9.0	4.9	4.0	5.3	4.3	3.7	24	26	11	4.6	231
16	18	8.5	4.9	3.9	5.3	4.6	3.6	25	21	6.4	4.6	31
17	17	8.4	4.9	4.1	5.7	5.1	3.6	25	19	5.7	4.3	28
18	16	8.1	4.3	12	5.7	4.3	3.6	23	18	5.6	4.3	26
19	15	7.9	4.3	6.2	6.2	4.3	3.6	21	18	4.9	4.3	24
20	15	7.7	4.3	5.3	5.7	4.3	3.5	20	17	4.6	4.0	57
21	20	7.4	4.3	4.6	5.7	4.6	3.2	20	16	15	3.9	49
22	17	7.4	4.3	4.6	5.7	4.4	3.2	19	15	49	3.8	44
23	15	7.4	4.0	4.6	5.7	4.0	2.9	18	16	11	3.7	91
24	14	7.4	4.2	4.9	5.7	3.9	2.9	18	15	9.8	3.8	e74
25	14	7.4	3.9	4.9	5.6	3.9	3.2	20	13	8.3	3.6	56
26	14	7.1	3.9	4.9	5.3	3.9	3.4	17	12	7.9	3.4	51
27	13	7.0	3.9	4.9	5.3	3.9	3.2	16	11	7.4	3.4	47
28	12	6.7	3.9	4.9	5.3	3.9	2.9	16	11	7.2	3.3	43
29	12	6.1	4.2	4.9	---	3.6	3.0	16	11	10	3.1	41
30	11	6.1	4.1	4.9	---	3.7	2.6	16	11	12	3.1	38
31	11	---	3.7	5.1	---	3.9	---	14	---	7.9	3.1	---
TOTAL	592	266.9	146.6	150.9	154.1	135.3	133.3	808.6	484	312.7	143.5	990.1
MEAN	19.1	8.90	4.73	4.87	5.50	4.36	4.44	26.1	16.1	10.1	4.63	33.0
MAX	42	14	6.1	12	6.4	5.8	22	237	48	49	7.4	231
MIN	11	6.1	3.7	3.6	4.9	3.6	2.6	2.6	10	4.6	3.1	2.8
AC-FT	1170	529	291	299	306	268	264	1600	960	620	285	1960
CFSM	.42	.20	.11	.11	.12	.10	.10	.58	.36	.22	.10	.73
IN.	.49	.22	.12	.12	.13	.11	.11	.67	.40	.26	.12	.82

CAL YR 1990	TOTAL	6516.5	MEAN	17.9	MAX	467	MIN	1.1	AC-FT	12930	CFSM	.40	IN.	5.39
WTR YR 1991	TOTAL	4318.0	MEAN	11.8	MAX	237	MIN	2.6	AC-FT	8560	CFSM	.26	IN.	3.57

e Estimated

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: November 1965 to September 1969. Chemical and biochemical analyses: March 1970 to current year. Pesticide analyses: January 1974 to current year. Sediment analyses: November 1965.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
FEB 14...	0937	5.3	415	8.0	14.5	<1	0.70	9.2	95	1.4	K2
MAY 28...	1545	14	377	8.2	31.5	2	3.0	8.7	121	0.6	K2
AUG 15...	1030	3.6	364	8.2	27.0	2	0.60	8.4	110	0.8	--

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB 14...	160	210	58	65	12	7.4	0.2	0.90	150	51	11
MAY 28...	68	200	44	62	10	6.4	0.2	1.1	150	34	11
AUG 15...	150	180	45	56	10	6.9	0.2	1.0	140	38	13

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)
FEB 14...	0.10	9.7	250	8	8	0	0.090	0.010	0.100	<0.010	0.20
MAY 28...	<0.10	11	227	3	3	0	0.170	0.010	0.180	<0.010	<0.20
AUG 15...	0.20	14	221	<1	<1	--	0.081	0.010	0.091	0.030	<0.20

DATE	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)
FEB 14...	<0.010	0.020	--	<1	28	<0.5	<1.0	<5	<3	<10	15
MAY 28...	<0.010	<0.010	1.3	--	--	--	--	--	--	--	--
AUG 15...	<0.010	<0.010	1.2	<1	25	<0.5	<1.0	<5	<3	<10	4

DATE	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
FEB 14...	<10	7	<1	<0.1	<10	<10	<1	<1.0	470	<6	19
MAY 28...	--	--	--	--	--	--	--	--	--	--	--
AUG 15...	<10	6	1	<0.1	<10	<10	<1	<1.0	380	<6	3

DATE	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)
FEB 14...	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01
MAY 28...	--	--	--	--	--	--	--	--	--	--
AUG 15...	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01

08201500 SECO CREEK AT MILLER RANCH NEAR UTOPIA, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
FEB 14...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
MAY 28...	--	--	--	--	--	--	--	--	--	--
AUG 15...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	--

DATE	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 14...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY 28...	--	--	--	--	--	--	--	--	--	--
AUG 15...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01

08202700 SECO CREEK AT ROWE RANCH NEAR D'HANIS, TX

LOCATION.--Lat 29°21'43", long 99°17'05", Medina County, Hydrologic Unit 12110107, on left bank 2.9 mi north of D'Hanis and 8.0 mi downstream from Rocky Creek.

DRAINAGE AREA.--168 mi².

PERIOD OF RECORD.--November 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 900.88 ft above National Geodetic Vertical Datum of 1929. Prior to October 1970, published as "at Crook Ranch, near D'Hanis".

REMARKS.--No estimated daily discharges. Records fair. All of the low flow of Seco Creek enters the Edwards and associated limestones in the Balcones Fault Zone that crosses the basin between Miller Ranch (station 08201500) and this station. No known diversion above station.

AVERAGE DISCHARGE.--30 years (water years 1962-91), 8.35 ft³/s (6,050 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,800 ft³/s May 29, 1987 (gage height, 28.20 ft), from rating curve extended above 25,100 ft³/s on basis of slope-area measurement of 35,800 ft³/s; no flow most of time each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1852, 35.7 ft May 31, 1935, from information by local resident. Other floods occurred Aug. 31, 1894, 33 ft; September 1919, 28 ft; July 2, 1932, 28.2 ft (discharge, 35,800 ft³/s), by slope-area measurement; and June 17, 1958, 32.4 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Sept. 15	1030	*3,650	*12.82	Sept. 20	1230	765	10.04

Minimum daily discharge, no flow most of year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	30	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.82	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	637
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	23
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.1
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.22
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	201
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	27
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.7
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.84
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.33
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.82	0.00	0.00	0.00	893.20
MEAN	.000	.000	.000	.000	.000	.000	.000	.99	.000	.000	.000	29.8
MAX	.00	.00	.00	.00	.00	.00	.00	30	.00	.00	.00	637
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	61	.00	.00	.00	1770

CAL YR 1990	TOTAL	862.01	MEAN	2.36	MAX	589	MIN	.00	AC-FT 1710
WTR YR 1991	TOTAL	924.02	MEAN	2.53	MAX	637	MIN	.00	AC-FT 1830

NUECES RIVER BASIN

08204000 LEONA RIVER SPRINGFLOW NEAR UVALDE, TX

LOCATION.--Lat 29°09'15", long 99°44'35", Uvalde County, Hydrologic Unit 12110106, at old road crossing on White's Ranch, 2.0 mi downstream from Cooks Slough, and 4.7 mi southeast of Uvalde.

DRAINAGE AREA.--Not applicable. Normal flow of river comes from springs.

PERIOD OF RECORD.--1939 to current year. Miscellaneous discharge measurements 1925-39 in connection with seepage investigations. Operated as continuous record station from January 1939 to September 1965. Miscellaneous discharge measurements since September 1965. Continous recorder station reestablished Aug. 27, 1991.

GAGE.--Continous recording. Datum of gage is 838.39 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Discharge represents flow from several springs that enter river above station and below Uvalde. Surface runoff from precipitation is excluded. No known diversion above station.

AVERAGE DISCHARGE.--26 years (during period of continuous record, water years 1940-65), 9.72 ft^3/s, 7,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--(1939 to current year.) Maximum measured spring discharge, 82 ft^3/s May 25, 1977; no flow at times in 1948-49, 1951-59, 1964-68, 1984-85, and 1990-91.

DISCHARGE MEASUREMENTS, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)
Oct. 23, 1990	14.0	Feb. 20, 1991	17.2	Aug. 13, 1991	0.0
Dec. 17	19.4	Apr. 9	10.4	Aug. 27	0.17

APPENDIX D. SUPPLEMENTAL INFORMATION

DEFINITIONS OF TERMS

Technical terms and abbreviations used in this report are defined as follows:

acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 ft and is equivalent to 43,560 ft^3 (cubic feet), about 326,000 gal (gallons), or 1,233 m^3.

algae are mostly aquatic single-celled, colonial, or multicelled plants, containing chlorophyll and lacking roots, stems, and leaves.

bacteria (COLS./100 ML) are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped in colonies. Some bacteria cause disease, while others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

fecal-coliform bacteria are bacteria that are present in the intestines or feces of warm-blooded animals. They often are used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms that produce blue colonies within 24 hours when incubated at 44.5 °C ±0.2 °C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

fecal-streptococcal bacteria are bacteria also found in the intestines of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria that are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all organisms that produce red or pink colonies within 48 hours at 35 °C ±1.0 °C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by microorganisms, such as bacteria.

cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually milliliters (mL).

color unit is produced by 1 mg/L of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

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

cubic foot per second (ft^3/s) is the rate of discharge representing a volume of 1 ft^3 passing a given point during 1 second and is equivalent to 7.48 gal/s (gallons per second), or 448.8 gal/min, or 0.02832 m^3/s.

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

DEG C, °C is the abbreviation for degrees Celsius.

discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment) that passes a given point within a given period of time.

mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period.

instantaneous discharge is the discharge at a particular instant of time. dissolved refers to that material in a representative water sample that passes through a 0.45-μm (micrometer) membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

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

drainage basin is a part of the surface of the earth that is occupied by a drainage system that consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

duty is that amount of water applied to a particular crop in a year when the seasonal precipitation occurrences and crop needs are taken into account, usually measured in acre-inches.

gage height is the water-surface elevation referred to some arbitrary gage datum. Gage height often is used interchangeably with the more general term "stage," although gage height is more appropriate when used with a reading on a gage.

gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an eight-digit number.

micrograms per liter (UG/L, µg/L) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand µg/L is equivalent to 1 mg/L.

milligrams per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represent the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in milligrams per liter and is based on the mass of dry sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (mean sea level) is a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada. It was formerly called Sea Level Datum of 1929. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

nephelometric turbidity unit (NTU) is the reporting unit for turbidity.

organism is any living entity.

partial-record station is a particular site where limited streamflow and/or water-quality data are collected systematically over a period of years for use in hydrologic analyses.

pesticides are chemical compounds used to control undesirable organisms. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and river.

phytoplankton is the plant part of the plankton. They usually are microscopic and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because

they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment and commonly are known as algae.

polychlorinated biphenyls (PCB's) are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organochlorine insecticides.

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

sodium adsorption ratio is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Waters range in respect to sodium hazard from those that can be used for irrigation on almost all soils to those that are generally unsatisfactory for irrigation.

solute is any substance derived from the atmosphere, vegetation, soil, or rocks that is dissolved in water.

specific conductance (US/CM, µS/cm) is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25 °C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids concentration of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance. This relation is not constant from well to well or from stream to stream, and it may vary in the same source with changes in the composition of the water.

stage-discharge relation is the relation between gage height (stage) and volume of water, per unit of time, flowing in a channel.

streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow"

uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

suspended, total refers to the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45-µm membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total." Determinations of "suspended, total" constituents are made either by analyzing parts of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

total is the total amount of a given constituent in a representative water-suspended sediment sample regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating that the sample consists of a water-suspended sediment mixture and that the analytical method determined all of the constituent in the sample.)

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports (WRD was used as an abbreviation for "Water Resources Data" in reports published prior to 1976).

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

METRIC CONVERSIONS

The inch-pound units of measurement used in this report may be converted to metric units by using the following conversions factors:

From	Multiply by	To obtain
acre	0.4047	hectare (ha)
acre-foot (acre-ft)	1,233	cubic meter (m^3)
	0.001233	cubic hectometer (hm^3)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
foot (ft)	0.3048	meter (m)
gallon per minute (gal/min)	0.06308	liter per second (L/s)
inch (in.)	25.4	millimeter (mm)
mile (mi)	1.609	kilometer (km)
million gallons per day (Mgal/d)	0.04381	cubic meter per second (m^3/s)
million gallons per year (Mgal/yr)	3,785	cubic meter per year (m^3/yr)
square mile (mi^2)	2.590	square kilometer (km^2)

To convert °C (degrees Celsius) to °F (degrees Fahrenheit):

$$°F = 9/5 \times °C + 32.$$

PREVIOUS AND RELATED STUDIES

The U.S. Geological Survey and the Texas Water Development Board have been collecting hydrologic and geologic data in the San Antonio area on a continuing basis since 1929. Comprehensive reports of previous investigations include Livingston and others (1936); George (1952); Lang (1954); Petitt and George (1956); Arnow (1959); Holt (1959); Bennett and Sayre (1962); Garza (1962, 1966); Welder and Reeves (1962); DeCook (1963); and Maclay and Small (1976). The Texas Water Development Board has conducted extensive hydrologic and geologic studies to provide data for construction of a digital model of the aquifer.

In 1968, the U.S. Geological Survey, in cooperation with the Texas Water Development Board and the Edwards Underground Water District, began a continuing program to collect historical-reference data for detecting pollution and for determining changes in the quality of water in the Edwards aquifer. The results of the study from August 1968 to August 1969 were reported by Reeves and Blakey (1970), and the results from August 1968 to April 1972 were reported by Reeves, Rawson, and Blakey (1972). A progress report for August 1968 to January 1975 was made by Reeves (1976). Compilations of water-quality data for February 1975 to September 1977 were reported by Reeves (1978); for October 1977 to September 1978 and October 1978 to December 1979 were reported by Reeves, Maclay, Grimm, and Davis (1980, 1981); for January-December 1980 were reported by Reeves, Maclay, and Davis (1982); for January-December 1981 were reported by Reeves, Maclay, and Ozuna (1984); for January-December 1982 and January 1983 to December 1984 were reported by Reeves and Ozuna (1985, 1986); for January-December 1985 were reported by Ozuna, Nalley, and Bowman (1987); for January-December 1986 were reported by Ozuna, Nalley, and Stein (1988); for January-December 1987 were reported by Nalley and Rettman (1988); for January-December 1988 were reported by Nalley (1989); for January-December

1989 were reported by Nalley and Thomas (1990); and for January-December 1990 were reported by Brown, Gilhousen, and Nalley (1991).

In related studies, the U.S. Geological Survey, in cooperation with the Texas Water Development Board and the City of San Antonio, collected data from 1969 to 1980 on the quantity and quality of urban runoff in San Antonio. Data collected in the urban study have been reported in an annual series of hydrologic-data reports by Land (1971-72), Steger (1973-75), Gonzalez (1976), Harmsen (1977-78), Perez and Harmsen (1980), and Perez (1981-83).

Additional reports on the geology and hydrology of the San Antonio area as well as reports on recharge, discharge, water levels, and water quality for the Edwards aquifer are given in the section "Selected References."

WELL-NUMBERING SYSTEM

The well-numbering system in Texas was developed by the Texas Water Development Board for use throughout the State. Under this system, each 1-degree quadrangle is given a number consisting of two digits. These are the first two digits in the well number. Each 1-degree quadrangle is divided into 7-1/2-minute quadrangles, which are given two-digit numbers from 01 to 64. These are the third and fourth digits of the well number. Each 7-1/2-minute quadrangle is divided into 2-1/2-minute quadrangles, which are given a single-digit number from 1 to 9. This is the fifth digit of the well number. Finally, each well within a 2-1/2-minute quadrangle is given a two-digit number in the order in which it was inventoried, starting with 01. These are the last two digits of the well number.

In addition to the seven-digit well number, a two-letter prefix is used to identify the county. The prefix for each county in the San Antonio area is as follows: AL, Atascosa; AY, Bexar; DX, Comal; LR, Hays; TD, Medina; and YP, Uvalde.

Each water-level observation well is also identified by a 15-digit number based on latitude and longitude and by a local number that is provided for continuity with older reports. The first 6 digits of the 15-digit number are degrees, minutes, and seconds of north latitude; the next 7 digits are degrees (including a leading 0 for those less than 100), minutes, and seconds of west longitude; and the final 2 digits are sequential numbers assigned in the order in which the wells are established in that 1-second quadrangle. The second seven-digit number is the State well number. A number inside parentheses is a number assigned to the well in some publication prior to 1978.

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