EDWARDS AQUIFER AUTHORITY

HYDROGEOLOGIC DATA REPORT FOR 2001

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REPORT 02-01

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1.0 INTRODUCTION

The Balcones Fault Zone Edwards Aquifer in south central Texas is one of the most permeable and productive aquifers in the United States. The San Antonio segment of the aquifer, which is the subject of this report, extends from the groundwater divide near Brackettville in Kinney County, east to the city of San Antonio in Bexar County, then northeast to the groundwater divide near Kyle in Hays County—a distance of approximately 180 miles **(Figure 1.1)**. The aquifer is the primary source of water for approximately 1.7 million people in the region and provides most of the water for agriculture and industry. In addition, the aquifer discharges through a series of large springs that provide aquatic habitat for a number of threatened and endangered species. Springflow also provides a significant portion of water for downstream interests in the Guadalupe River basin.

The Edwards Aquifer Authority (the Authority) was created by the Texas Legislature in 1993 to replace the Edwards Underground Water District (EUWD) as a special regional management district in charge of the San Antonio segment of the Edwards Aquifer. The Authority's jurisdictional area encompasses all or parts of an eight-county area including Uvalde, Medina, Atascosa, Bexar, Comal, Guadalupe, Hays, and Caldwell counties **(Figure 1.1)**. The Authority is governed by a 17-member board of directors, with voting members elected to represent the 15 districts across the region and two non-voting members appointed by other entities. Directors represent agricultural, industrial, domestic, municipal, spring, and downstream user groups. The Legislature also created a South Central Texas Water Advisory Committee (SCTWAC) to interact with the Authority when issues related to downstream water rights are being addressed.

The Legislature mandated the Authority take all necessary measures to effectively manage the resource to ensure domestic and municipal water supplies, to promote the operation of existing agriculture and industry, to protect terrestrial and aquatic habitat, and to sustain the economic development of the region. To accomplish these goals, the Authority is vested with all of the "powers, rights, and privileges necessary to manage, conserve, preserve, and protect the Edwards Aquifer, and to increase the recharge of, and prevent the waste or pollution of water in, the aquifer."

This report presents the results of the Authority's Edwards Aquifer Data Collection Program for calendar year 2001. The Authority and cooperating agencies collected a wide variety of data regarding the Edwards Aquifer including water levels, water quality samples, precipitation measurements, and stream and spring discharges. In addition, this report contains historical annual data for the period of record (1934-2001). Chapters 2 through 7 describe each type of data that were collected, and Chapter 8 contains a summary of the year. Chapters 9 and 10 contain definitions and references, respectively.

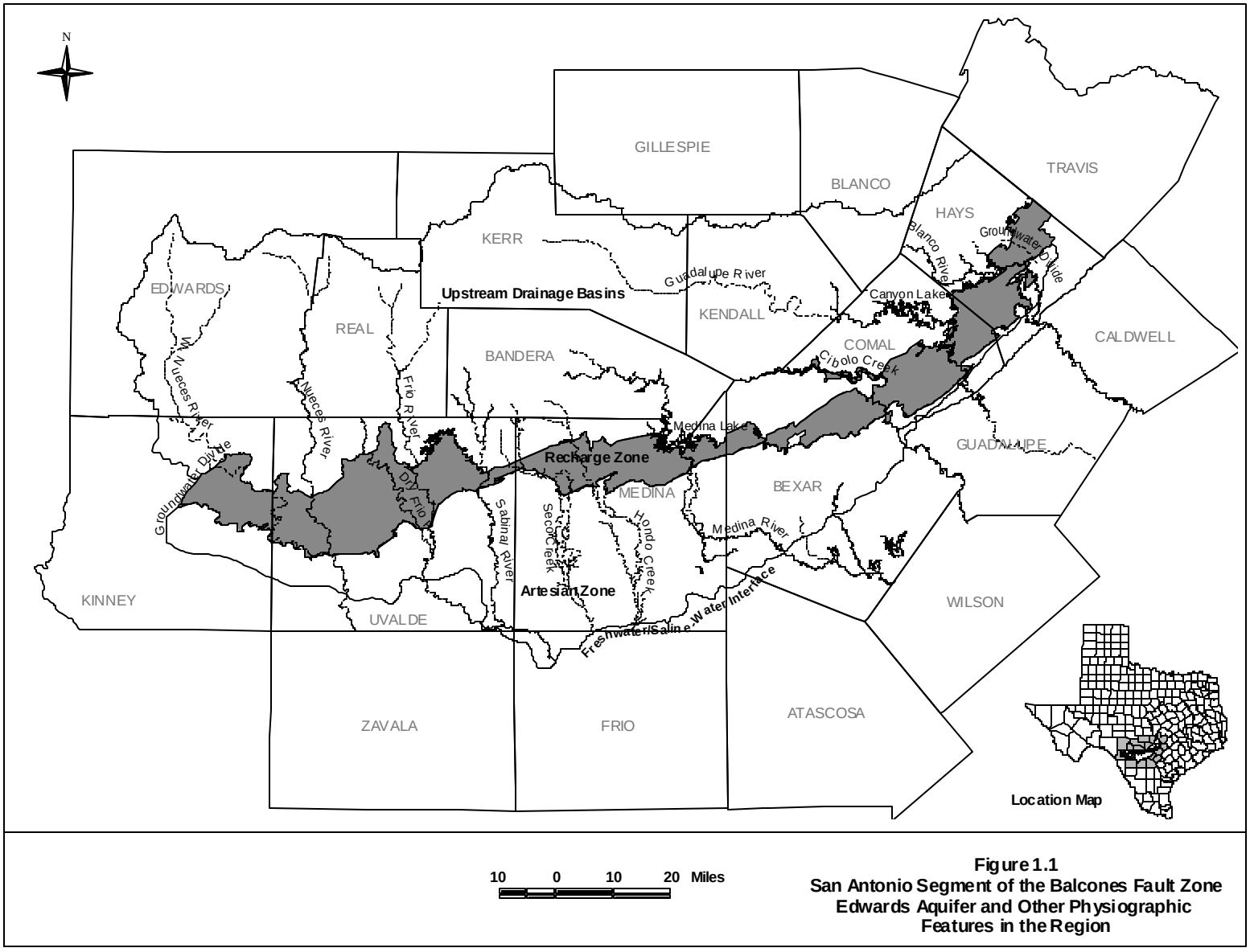


Figure 1.1
San Antonio Segment of the Balcones Fault Zone
Edwards Aquifer and Other Physiographic Features in the Region

2.0 HYDROGEOLOGY OF THE EDWARDS AQUIFER

The Edwards Aquifer is one of the largest and most important karst aquifer systems in the United States. Generally, the water quality in the aquifer is among the best in the United States. The aquifer extends through parts of Kinney, Uvalde, Medina, Frio, Atascosa, Bexar, Comal, Guadalupe, and Hays counties in south central Texas and covers an area approximately 180 miles long and 5 to 40 miles wide. The aquifer is the primary water source for much of this area including the City of San Antonio, the eighth largest city in the United States. Historically, the cities of San Marcos, New Braunfels, and San Antonio were founded around large springs that flow from the aquifer. As the region grew, wells were drilled into the aquifer to supplement the water supplied by the springs. In addition, the Edwards Aquifer is the principal source of water for agriculture and industry in the region.

The Edwards Aquifer is contained within the Cretaceous age Edwards Group limestone (Edwards Limestone) and associated units. The aquifer is generally capped by the Del Rio Clay and overlays the Glen Rose Formation (upper unit of the Trinity Aquifer). The Edwards Limestone and associated units range from 450 to over 600 feet thick in the region. A series of faults in the Balcones Fault Zone has exposed the Edwards Limestone at the surface along the southern boundary of the Texas Hill Country. Down faulting has dropped the Edwards Limestone to great depths below the surface along the aquifer's southern boundary. In some areas, fresh water can be found in the Edwards Limestone as much as 4,000 feet below the surface.

Water circulates through the Edwards Aquifer as part of the hydrologic cycle from recharge areas to discharge points (springs and wells). There are approximately 1,500 square miles of Edwards Limestone exposed at the ground surface, which comprises the recharge zone of the aquifer. Streams flow south from the drainage area (the Texas Hill Country) and lose all or most of their baseflow as they cross the recharge zone. In addition, a portion of the rainfall that falls directly on the recharge zone also enters the aquifer. Groundwater moves through the aquifer and ultimately discharges from a number of locations such as Leona Springs in Uvalde County; San Pedro and San Antonio springs in Bexar County; Hueco and Comal springs in Comal County; and San Marcos Springs in Hays County. In addition, domestic, municipal, agricultural, and industrial wells throughout the region discharge water from the aquifer. Residence time in the aquifer ranges from a few hours or days to many years depending upon depth of circulation, location, and other aquifer parameters.

The Edwards Aquifer is a karst aquifer that is characterized by the presence of sinkholes, sinking streams, caves, springs, and a well-integrated subsurface drainage system. It is one of the most productive karst groundwater systems in the United States, characterized by extremely productive water wells and high spring discharges. The aquifer contains extremely high (cavernous) porosity and permeability that is characteristic of many karst aquifers. In contrast, aquifers that occur in sand and gravel or in bedrock, such as sandstone, have a much lower permeability. The Edwards Aquifer transmits very large volumes of water, and groundwater levels respond quickly to rainfall (recharge) events.

Historically, water quality in the Edwards Aquifer has been protected by its great depth below population centers and undeveloped land in the recharge zone and drainage area. However; there are many potential threats to the quality of water in the aquifer from various sources including the transport and use of hazardous materials and other chemicals on the recharge zone, abandoned water wells, and urban non-point runoff. The high porosity and permeability of the Edwards Aquifer allows fast infiltration of contaminants from the ground surface with little or no filtration.

3.0 GROUNDWATER LEVELS

The Authority currently maintains a groundwater level monitoring network from eastern Kinney County to central Hays County. **Figure 3.1** shows the locations of the Authority's observation well network within the Edwards Aquifer region. The water level observation network includes both the water table (unconfined) and the artesian (confined) zones of the Edwards Aquifer, and water levels are monitored through manual measurements, continuous recorders, or electronic data loggers. All water level measurements are recorded in feet above mean sea level (msl). Many of the wells have at least partial historical records dating back to the 1930s. Water levels were measured by hand until the United States Geological Survey (USGS) introduced continuous water level recorders in some of the observation wells in the 1930s. More recently, electronic data loggers are replacing the old drum recorders.

In 2001, the Authority's Water Level Data Collection Program consisted of 40 digital recorder-equipped observation wells and periodic manual (tapedown) measurements from 16 observation wells. The digital recorders measure water levels at 15-minute intervals with either a float device or a pressure transducer. The data are recorded by the equipment at the site and then downloaded during a periodic site inspection or by modem. To augment the water level observation network, Authority staff measures water levels at 16 observation wells on a monthly basis and approximately 200 additional wells under a synoptic water level monitoring program three times each year. These periodic measurements are made manually with steel tape and electric line measuring devices. Water level data collected by the Authority are forwarded to interested federal, state, and regional agencies.

The Authority and its predecessor, the EUWD, also have collected water level data from the Trinity Aquifer in northern Bexar County since 1991 and the Leona Aquifer in southern Uvalde County since 1966. Water level monitoring of the Edwards Aquifer and associated hydrogeologic units adds to the base of scientific knowledge and helps in the management of this regional water resource.

Historical water level trends, precipitation measurements, and discharges from springs and wells are used as a basis for projections of future aquifer level and spring discharge trends. Rising water levels generally indicate that the amount of water recharging the aquifer is greater than the amount being discharged through springs and wells. During droughts or when there is a high demand for water, water levels and springflows generally decline, which reflects greater groundwater discharge than groundwater recharge. **Table 3.1** lists the annual records of high and low water levels measured in five selected Edwards Aquifer observation wells.

Water levels are typically highest in the Spring and then decline during the Summer before rebounding in the Fall and Winter. The maximum decrease in water levels at the Bexar County index well (AY-68-37-203, or J-17) in 2001 was 30.0 feet (682.8 feet above msl on May 13th to 652.8 feet above msl on August 16th). Water levels then increased 32.1 feet during the last quarter of the year from 652.8 feet above msl on August 16th to 684.9 feet above msl on December 31st. Similarly, water levels rose from 722.4 feet to 735.4 feet in the City of Hondo index well and from 873.4 feet to 877.2 feet in the City of Uvalde index well during 2001 **(Appendix A: Tables A-1-A-6)**.

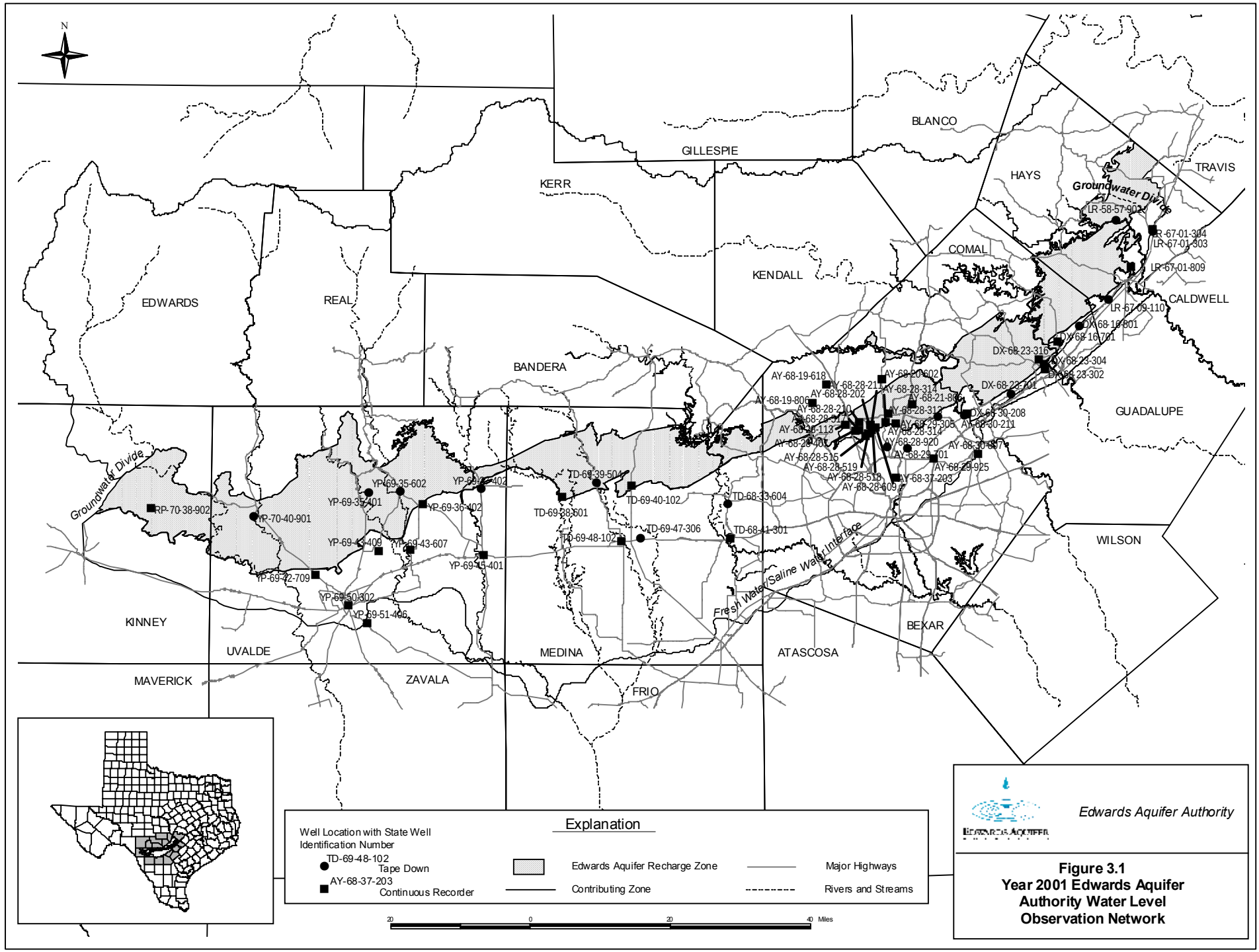


Figure 3.1
Year 2001 Edwards Aquifer Authority Water Level Observation Network

Table 3.1 Highest and lowest recorded water levels for selected observation wells in the San Antonio region of the Edwards Aquifer, 1934-2001 (measured in feet above Mean Sea Level).

	City of Uvalde Uvalde County YP-69-50-302[a] (J-27)		Castroville Medina County TD-68-41-301[b]		San Antonio Bexar County AY-68-37-203[c] (J-17)		New Braunfels Comal County DX-68-23-302[d]		Kyle Well Hays County LR-67-01-304[e]	
Year	High	Low	High	Low	High	Low	High	Low	High	Low
1934	----	----	----	----	675.2	666.8	----	----	----	----
1935	----	----	----	----	681.3	666.8	----	----	----	----
1936	876.6	876.5	----	----	683.0	676.6	----	----	----	----
1937	878.1	877.1	----	----	682.1	674.9	----	----	583.4	581.6
1938	875.8	874.0	----	----	681.4	673.6	----	----	590.6	581.5
1939	873.4	869.6	----	----	674.1	665.7	----	----	580.6	569.6
1940	872.3	868.5	----	----	671.4	661.0	----	----	572.2	568.7
1941	875.7	867.7	----	----	682.5	668.3	----	----	587.7	578.6
1942	875.8	871.9	----	----	685.4	669.7	----	----	580.8	573.7
1943	874.5	868.0	----	----	679.6	668.5	----	----	578.2	574.6
1944	869.3	866.8	----	----	677.6	667.1	----	----	580.5	579.3
1945	870.1	865.2	----	----	681.9	668.8	----	----	----	----
1946	867.1	862.9	----	----	681.2	663.6	----	----	----	----
1947	870.7	867.1	----	----	680.7	665.8	----	----	577.3	577.0
1948	868.4	860.5	----	----	667.7	653.7	624.4	624.3	560.5	559.4
1949	871.2	859.1	----	----	671.6	655.6	626.7	624.1	562.3	561.8
1950	871.2	861.8	687.0	674.9	665.4	653.8	625.2	624.0	575.8	575.2
1951	861.8	846.8	675.2	659.9	656.0	640.6	624.2	622.5	575.3	569.4
1952	846.8	834.9	663.8	649.9	650.5	633.4	623.0	621.5	573.0	569.1
1953	835.2	817.8	665.1	647.7	651.5	630.5	623.6	621.1	584.5	573.2
1954	836.7	823.1	660.3	642.4	646.3	628.9	623.1	620.5	581.8	562.8
1955	834.3	824.1	649.1	635.6	638.5	624.2	621.9	619.8	575.7	558.4
1956	834.2	814.2	641.6	622.3	632.2	612.5	621.0	613.3	569.8	542.2
1957	840.9	811.0	666.1	633.0	653.8	624.4	624.7	620.1	584.9	568.3
1958	866.1	840.8	704.4	665.7	679.6	653.3	626.6	624.6	593.6	580.8
1959	876.1	866.2	703.8	689.0	677.7	661.5	627.1	625.1	591.4	580.5
1960	876.9	873.1	706.3	686.0	679.4	657.9	627.1	624.9	589.4	584.3
1961	878.5	875.6	710.3	693.4	681.2	663.9	627.3	625.7	591.6	573.2
1962	878.3	867.7	703.6	676.3	675.5	646.9	626.3	623.2	584.1	565.0
1963	869.7	860.9	689.1	659.2	665.8	635.0	625.0	621.7	581.6	560.0
1964	860.9	849.0	676.3	654.8	657.1	632.8	624.1	621.6	578.2	562.8
1965	865.8	860.3	689.6	666.8	675.0	645.6	626.6	623.5	590.1	573.4
1966	867.2	860.2	686.1	665.0	668.8	642.7	625.9	623.1	589.0	566.6
1967	867.4	856.4	679.4	645.2	659.7	624.9	624.6	620.0	582.8	556.6
1968	873.3	864.8	702.0	679.2	678.3	655.9	627.2	624.6	593.8	574.4
1969	875.0	866.5	694.8	670.5	676.1	642.8	626.3	623.4	588.7	567.7
1970	876.1	871.3	700.7	678.8	677.1	650.4	627.2	624.3	593.2	575.0
1971	877.7	864.0	701.3	646.4	674.6	627.9	626.2	621.0	577.1	551.3
1972	877.8	874.6	704.6	676.7	679.0	651.2	626.7	624.1	579.7	576.3
1973	881.6	874.5	731.2	690.1	696.5	665.9	629.8	626.1	589.9	572.3
1974	881.4	876.0	723.8	696.0	689.2	660.9	629.1	625.8	593.6	558.5
1975	882.1	879.4	721.0	708.2	686.9	672.0	629.3	626.5	589.8	571.4
1976	884.9	876.0	732.4	694.9	693.1	663.8	629.4	625.8	584.6	571.2
1977	886.2	881.3	737.8	715.3	696.0	675.6	630.2	627.6	587.4	562.1
1978	882.6	875.6	722.4	681.7	684.1	650.1	628.1	624.5	572.0	540.4
1979	882.0	876.1	728.2	710.3	690.5	676.4	629.0	627.3	584.9	572.0
1980	879.1	868.0	716.1	666.8	680.3	640.8	627.5	623.0	572.0	551.8
1981	881.8	867.9	723.2	698.8	686.0	668.6	628.0	625.5	586.2	565.5
1982	881.8	876.4	717.1	682.8	680.5	645.3	627.3	623.6	584.7	544.7
1983	877.1	871.3	698.2	667.7	670.0	642.1	625.6	623.0	588.7	560.4
1984	873.3	856.9	684.5	642.0	657.0	623.3	624.4	619.6	582.5	544.3
1985	876.9	862.2	699.0	670.7	674.5	644.1	626.8	623.3	591.4	561.8
1986	877.8	872.2	704.6	674.2	685.6	649.8	627.7	624.1	595.0	576.3
1987	889.1	877.9	743.5	711.1	699.2	676.9	630.4	627.2	595.9	583.5
1988	887.0	878.0	725.3	679.9	684.9	647.7	627.9	623.9	593.2	585.9
1989	879.0	866.6	695.3	650.5	663.9	626.4	624.9	620.5	571.7	571.5

(Table 3.1 continued)

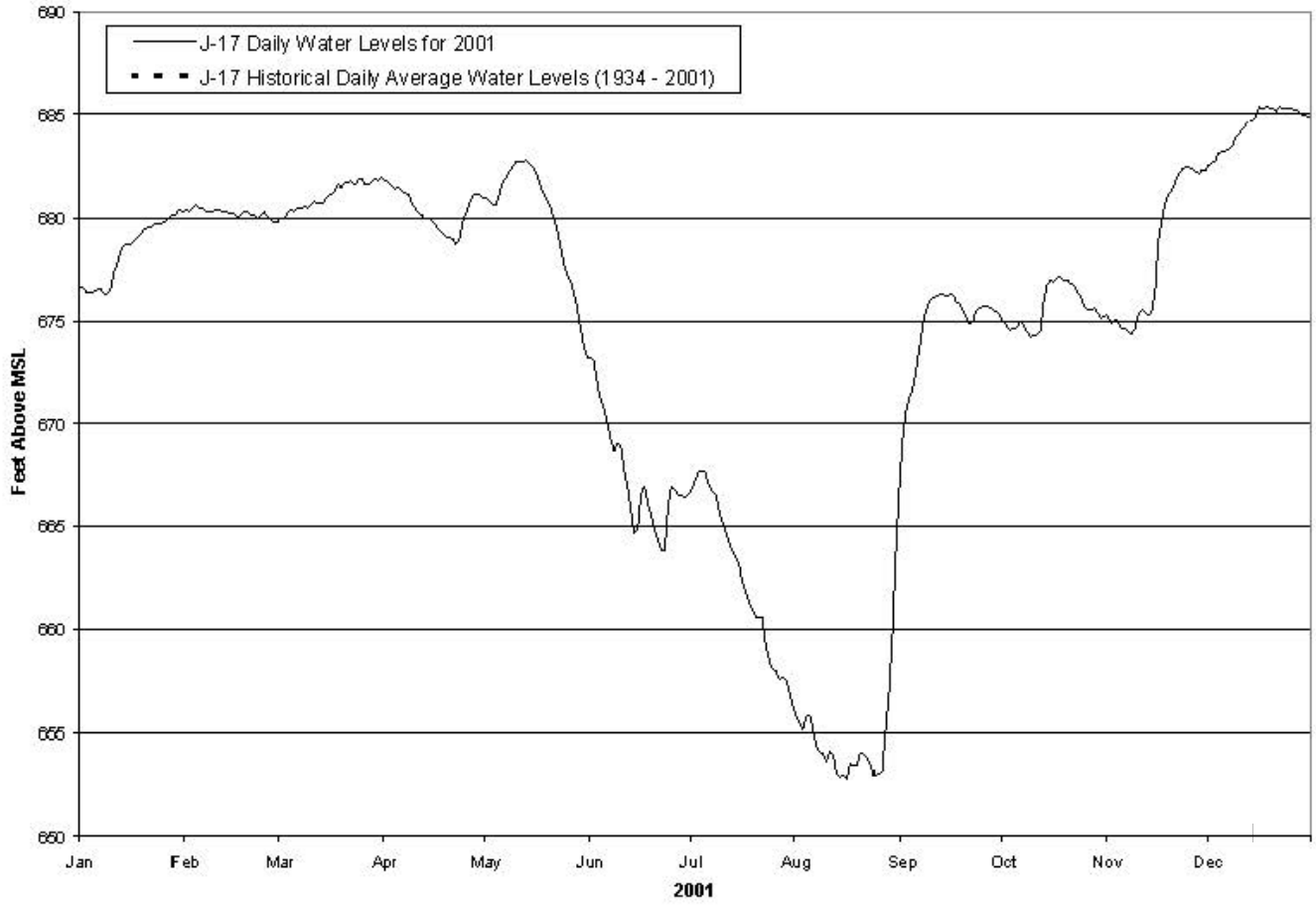
Year	City of Uvalde Uvalde County YP-69-50-302[a]		Castroville Medina County TD-68-41-301[b]		San Antonio Bexar County AY-68-37-203[c]		New Braunfels Comal County DX-68-23-302[d]		Kyle Well Hays County LR-67-01-304[e]	
	High	Low	High	Low	High	Low	High	Low	High	Low
1990	872.9	861.6	679.5	640.8	658.1	622.7	624.3	620.3	577.6	561.2
1991	873.8	865.4	703.8	666.1	680.3	640.5	627.0	623.3	593.8	575.1
1992	885.2	872.9	743.6	704.3	703.3	680.7	630.9	627.0	595.4	586.2
1993	884.9	877.3	730.2	706.6	692.8	672.0	629.4	626.9	593.7	575.9
1994	----	----	718.6	684.1	679.2	652.1	627.2	624.7	575.0	545.3
1995	877.2	871.1	703.0	681.8	676.5	651.1	626.8	624.5	575.4	552.4
1996	874.2	859.0	693.0	650.2	664.9	627.5	625.3	621.2	573.2	551.3
1997	882.3	868.2	700.5	672.7	677.9	648.7	626.4	623.6	575.8	559.0
1998	880.6	868.7	717.1	669.1	688.9	640.0	629.6	622.9	575.6	552.4
1999	880.7	876.8	716.4	682.9	686.4	656.9	628.7	624.9	588.6	537.9
2000	878.3	868.0	700.4	662.5	676.7	635.5	626.8	622.2	549.2	544.6
2001	877.2	872.7	713.4	685.9	682.8	652.8	628.3	624.5	563.9	544.6
Average	High	Low	High	Low	High	Low	High	Low	High	Low
	872.6	863.7	701.6	672.4	675.6	651.7	626.6	623.4	582.2	565.9
Record	High	Low	High	Low	High	Low	High	Low	High	Low
Level	889.1	811.0	743.6	622.3	703.3	612.5	630.9	613.3	595.9	540.4
Month	June	April	June	Aug.	June	Aug.	June	Aug.	Sept.	July
Year	1987	1957	1992	1956	1992	1956	1992	1956	1987	1978

Data source: Edwards Aquifer Authority, 2002.
[a] Continuous monitoring equipment established on October 24, 1940.
[b] Continuous monitoring equipment established on May 25, 1950.
[c] Continuous monitoring equipment established on January 1, 1963.
[d] Continuous monitoring equipment established on November 4, 1948.
[e] Values based on monthly tape down measurements (No continuous monitoring equipment installed in this well).

During most of 2001, the water levels and springflows in the Edwards Aquifer were above average based on water level records from the Authority's index wells and United States Geological Survey (USGS) discharge measurements. Frequent rainfall in late 2000 boosted water levels and springflows, and they remained high through June 2001. The lower water levels in July through early September 2001 were the result of below average precipitation during the Summer and increased water demands for landscape watering and other water uses. Although water levels declined steeply during the Summer of 2001, they never reached 650 feet msl at J-17, which is the trigger level for Stage I water use restrictions in the Authority's proposed rules and previous emergency drought management rules. **Figure 3.2** compares the J-17 average daily water level for the period of record with water levels for the year 2001. Recharge from rainfall in late June 2001 probably averted the need for water use restrictions, and the lowest water level at J-17 was 652.8 feet msl. In 2001, springflows at Comal and San Marcos springs reached lows of 243 cubic feet per second (cfs) and 162 cfs, respectively, when water levels at J-17 and other wells reached their minimums. Springflows also rebounded after the rainfall increased in fall 2001. **Tables A-1** through **A-6** in **Appendix A** show 2001 water levels for selected observation wells.

Appendix B contains the 2001 hydrographs, with precipitation measurements, for the index wells in Bexar, Medina, and Uvalde counties. **Appendix B** also contains the 2001 hydrographs, with precipitation measurements, for Comal and San Marcos springs in Comal and Hays counties, respectively. The hydrographs indicate the periods of relatively lower and higher water levels and show that water levels in the Edwards Aquifer respond rapidly to rainfall events.

Figure 3.2 Comparison of the monthly average water level for the period of record 1934-2001 and the daily high water level at the Bexar County index well, J-17 (AY-68-37-203)



4.0 PRECIPITATION

4.1 Precipitation in the Edwards Aquifer Region

The San Antonio region is situated between the semi-arid Chihuahuan Desert area to the west and a wetter more humid Coastal Plain to the east. Consequently, the average annual precipitation ranges from approximately 20 inches in the western part of the region to approximately 32 inches in the eastern part of the region. The average annual precipitation for San Antonio is approximately 30 inches, although annual precipitation has ranged from 13 to 52 inches since 1934 (United States Department of Commerce, 2002). Aquifer water levels and springflow respond quickly to precipitation and decrease during periods of low precipitation.

Precipitation data are used to calculate recharge to the Edwards Aquifer, to monitor any precipitation trends that may affect recharge to the aquifer, to evaluate the effectiveness of the Authority's Precipitation Enhancement Program (see Section 4.2), and to investigate groundwater flowpaths by correlating rainfall and water-level responses in wells. Precipitation data are gathered from the Authority's Real Time Data Network rain gauge stations, the National Oceanic and Atmospheric Administration (NOAA) weather stations, and the USGS rain gauge stations located throughout the region. **Figure 4.1** shows the locations of precipitation gauging stations used by the Authority to record precipitation in 2001.

The amount of rainfall received in San Antonio in 2001 was approximately 21 percent above average. Average precipitation in San Antonio for the period between 1934 and 2001 is 30.21 inches. In 2001, the total precipitation measured at the San Antonio International Airport was 36.72 inches, 6.51 inches above average. **Figure 4.2** is a graph of precipitation data for San Antonio from 1934 to 2001.

Figure 4.1 Sites used by the Edwards Aquifer Authority and other agencies to monitor precipitation in 2001.

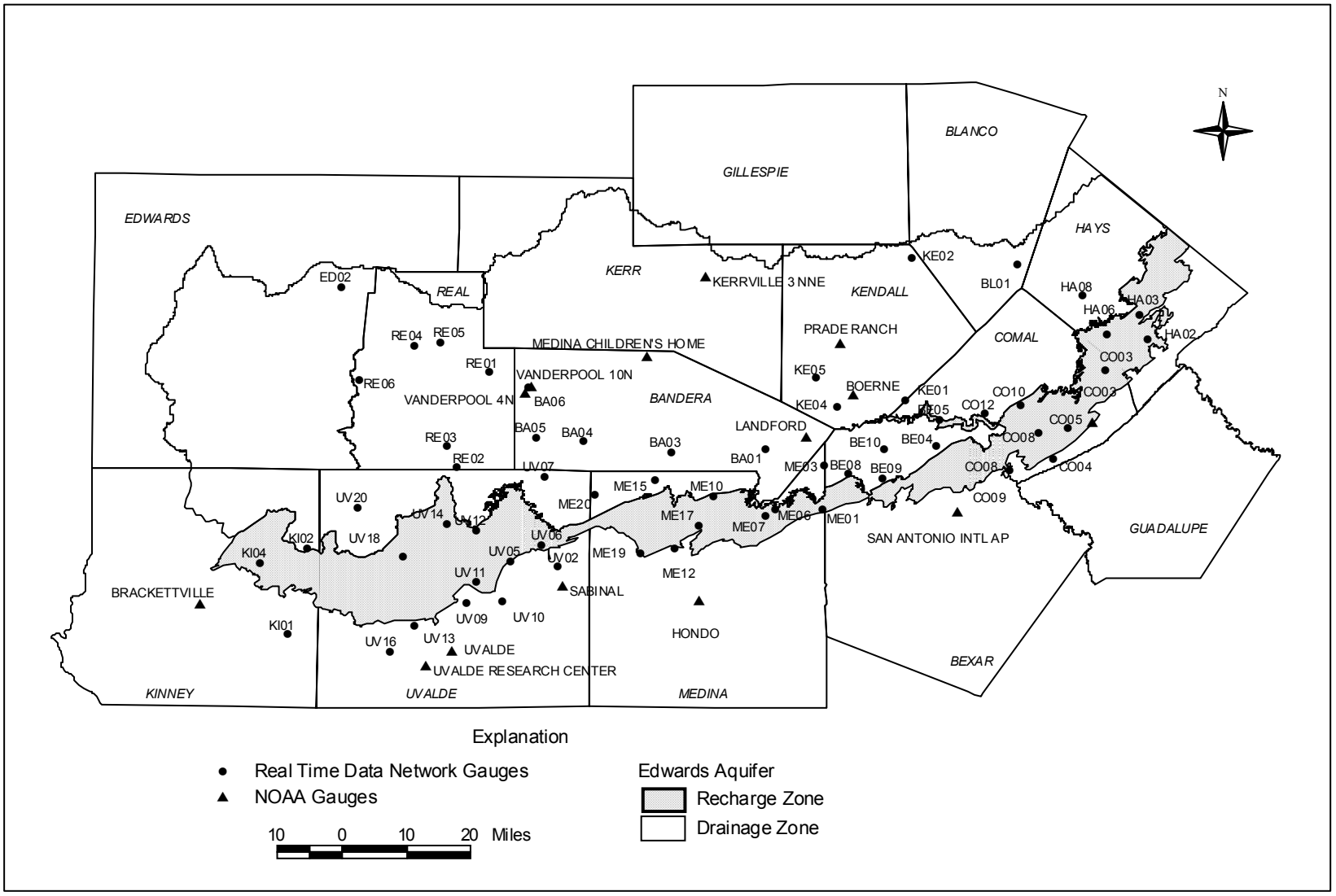


Figure 4.2 Annual precipitation and average precipitation for San Antonio, 1934-2001.

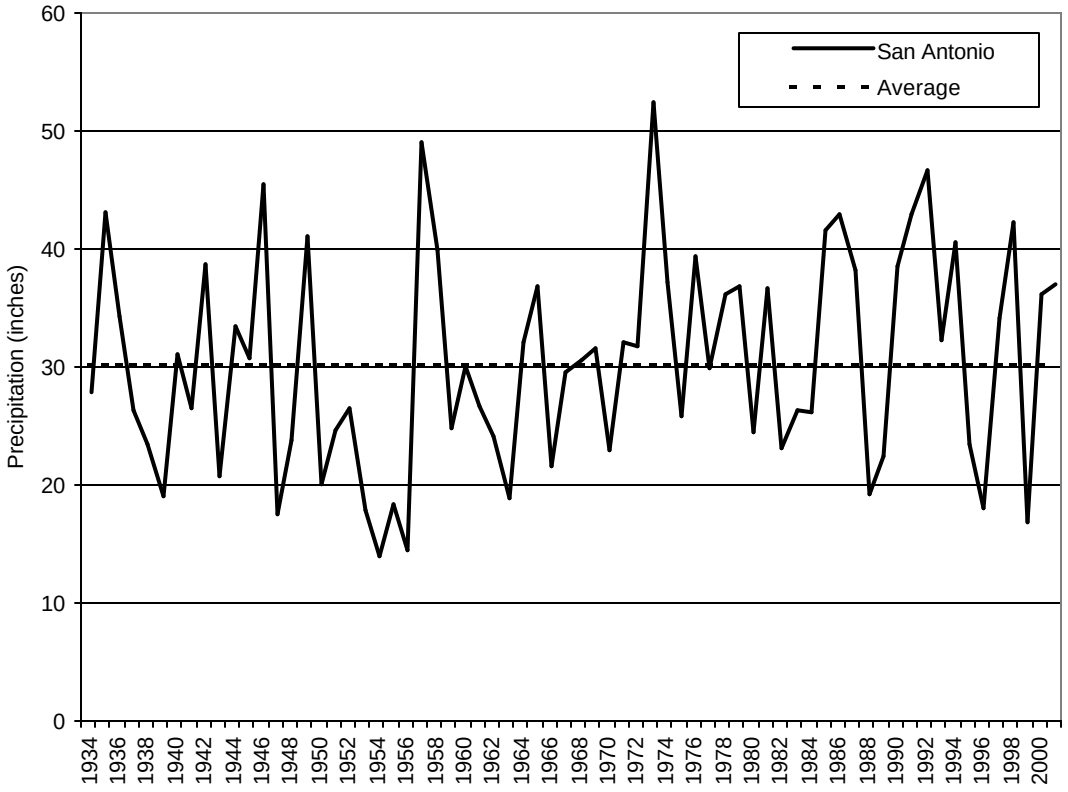


Table 4.1 lists annual precipitation for selected rain gauges in the region. **Table 4.2** shows monthly measurements for 2001 at selected rain gauge stations across the region. **Table 4.3** lists monthly totals for rainfall at each of the Real Time Data Network rain gauge stations. In 2001, the Authority's Real Time Data Network included 59 rain gauge sites indicated on **Figure 4.1**. Most, but not all of the rain gauge stations are on the recharge zone and drainage area.

Figure 4.3 shows the distribution of precipitation in the Edwards Aquifer region for 2001 based on measurements from the Authority's Real Time Network and NOAA stations. Total rainfall ranged from 15.92 to 53.91 inches. The lowest rainfall occurred in a band from southern Kinney County to central Uvalde County, while the highest rainfall occurred at a station in southern Kendall County. Relatively high rainfall (approximately 35 inches) occurred all across the drainage area from Edwards County eastward to Comal County and accounted for the higher than average recharge to the aquifer in 2001 (see Section 5).

Figure 4.3 Distribution of Precipitation, 2001

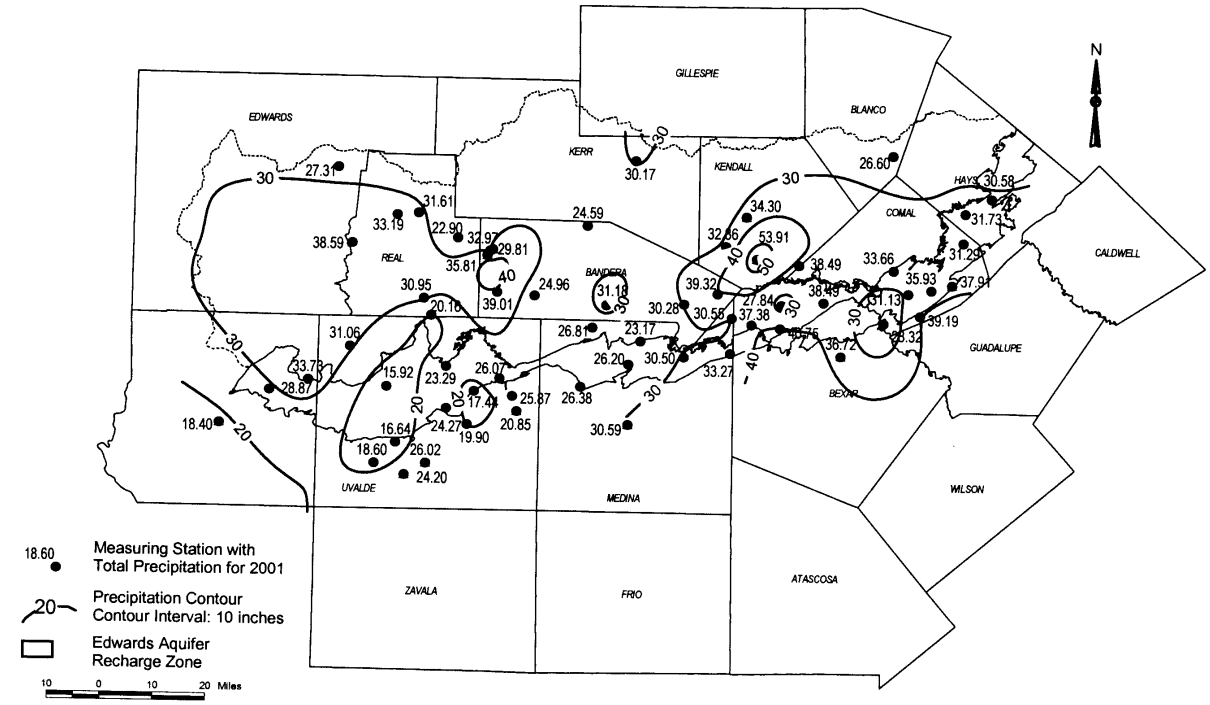


Table 4.1 Annual precipitation for selected rain gauges in the Edwards Aquifer region, 1934-2001 (measured in inches).

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	9.57a	22.93	26.07	32.81	29.19	26.03a
1938	19.97	13.12	15.39	27.56	23.26	24.14	28.32	28.17
1939	18.38	25.30	13.98b	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	33.74a	44.07	26.34	41.60	42.99	48.41
1942	21.01	19.01	11.37a	34.83	38.46	31.12	42.08	44.65
1943	23.39b	20.63	17.21	31.43	20.51	26.33	29.93	25.45
1944	24.76	32.76	27.62a	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	31.74b
1946	19.10	26.41	14.16a	29.65	45.17	45.62	61.60	52.24
1947	22.92b	22.67	---	18.98	17.32	21.89	27.52	27.53
1948	20.02a	18.31	---	28.82	23.64	23.77	19.88b	21.27a
1949	31.32	34.41	---	39.90	40.81	41.15	43.21	36.22
1950	17.70	18.27	15.28a	24.91	19.86	24.94	21.13	21.10
1951	14.71	16.07	15.63	24.05a	24.44	18.76	24.84	30.88
1952	12.26	18.24	23.16	25.56	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	15.70a	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	29.88b	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	35.14b	47.82	52.28	50.93	51.66	47.91
1974	18.25	30.94	20.93b	36.41b	37.00	41.80	42.85	37.28a
1975	26.62	24.92	23.65	25.84a	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	29.69
1978	19.04	18.48	21.28	24.64	35.99	35.17	36.35b	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	39.02	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	22.47b
1983	19.35	24.45a	23.33	20.92b	26.11	34.60	34.13	36.95
1984	16.24	15.33b	20.67	21.19a	25.95	26.97	20.90	8.26a
1985	18.93	5.76a	23.67	21.94	41.43	37.77	37.26	33.54
1986	27.44	29.86b	29.62b	36.01b	42.73	43.52	47.14	42.20
1987	39.45	36.39	38.36	40.09	37.96	39.86	37.33a	37.94
1988	12.08	15.20	13.52	9.81b	19.01	19.49	16.27b	21.50
1989	16.98	18.65	17.26	16.10	22.14	25.14	20.99	25.46
1990	38.24b	24.73	30.06	27.01	38.31	42.51	24.58a	35.14b
1991	23.11	21.77	31.12	34.55	42.76	48.22	56.55	51.07
1992	22.22	27.85a	37.73	45.34	46.49	64.17	38.84b	40.33b
1993	15.18	9.32c	13.20	16.60	32.00	24.02	19.54b	24.01b
1994	22.85a	39.61	29.32	22.38b	40.42	40.98	35.76a	40.85

(**Table 4.1** continued)

Year	Brackettville	Uvalde	Sabinal	Hondo	San Antonio	Boerne	New Braunfels	San Marcos
1995	25.87	19.47	27.55	24.55	23.20	30.29	23.29	32.57
1996	20.32b	16.20	14.20	15.50	17.80	24.57	19.00	28.20
1997	---	27.77	35.74	37.54	33.94	---	41.65	43.56
1998	24.15	27.40b	20.66b	30.44a	42.10	45.74	52.98	58.51
1999	19.88	19.08	2.55b	16.94	16.63	18.67	21.07	19.38
2000	18.11b	23.84	22.87	32.49	35.86	46.30a	36.34b	40.56
2001	18.40	26.02	25.87	30.59	36.72	53.91	37.91	42.41
Years of Record	99	98	83	97	117	97	102	98
Annual Average	21.57	23.72	24.02	28.36	30.21	34.16	33.22	34.45

Data source: US Department of Commerce (2002), NOAA (1934-2001).
a indicates partial record not included in long-term average; missing one month.
b indicates partial record not included in long-term average; missing more than one month.
--- indicates no data available.

Table 4.2 Monthly precipitation data from selected Edwards Aquifer Authority and National Oceanic and Atmospheric Administration precipitation-gauging stations, 2001 (measured in inches).

Gauge	County	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Total
San Antonio Intl. Airport	Bexar	2.85	0.70	2.77	2.29	2.48	3.39	0.50	7.83	4.05	2.07	4.36	3.43	36.72
Vanderpool 10N	Bandera	2.60	1.80	3.59	1.66	2.68	1.36	0.84	4.27	3.25	3.48	6.20	1.24	32.97
Vanderpool 4N	Bandera	2.73	2.30	3.31	2.02	2.80	1.07	1.39	4.79	4.35	2.94	6.38	1.73	35.81
Children's Home	Bandera	2.81	1.71	2.37	1.90	2.70	--	--	3.60	0.35	3.15	3.90	2.10	24.59
Landford	Bandera	2.87	1.60	3.05	2.55	4.80	0.55	0.00	6.35	6.45	2.90	5.90	2.30	39.32
New Braunfels	Comal	3.65	0.82	1.53	2.10	4.20	1.06	0.53	9.09	3.67	2.44	5.67	3.15	37.91
San Marcos	Hays	2.91	1.07	3.08	2.33	6.44	2.61	2.36	7.61	2.37	2.03	5.31	4.09	42.21
Kerrville 3 NNE	Kerr	3.05	1.62	2.86	1.74	2.72	0.34	0.07	3.14	6.51	3.03	3.15	1.94	30.17
Hondo	Medina	2.49	0.92	2.83	2.69	3.54	0.31	0.34	4.22	4.34	2.34	3.67	2.90	30.59
Brackettville	Kinney	1.10	0.62	2.16	0.25	2.37	1.01	0.73	3.82	1.91	1.60	2.83	0.00	18.40
Prade Ranch	Real	2.45	1.23	2.39	2.77	3.85	0.27	0.00	4.16	3.70	0.90	10.18	2.40	34.30
Sabinal	Uvalde	2.29	0.71	1.30	1.33	1.83	1.93	1.05	7.40	0.69	0.81	6.20	0.33	25.87
Uvalde	Uvalde	1.70	0.63	1.64	0.66	3.68	0.54	1.70	5.64	5.22	1.12	1.97	1.52	26.02
Utopia 22	Uvalde	2.00	0.85	1.80	1.45	3.00	1.15	1.60	5.30	0.80	0.00	0.00	0.00	17.95

Gauge	County	Average	Total	Deviation from Average
San Antonio Intl. Airport	Bexar	30.21	36.72	+6.51
New Braunfels	Comal	33.22	37.91	+4.69
San Marcos	Hays	34.45	42.41	+7.96
Hondo	Medina	28.36	30.59	+2.23
Uvalde	Uvalde	23.72	26.02	+2.30

Data source: Edwards Aquifer Authority and US Department of Commerce (NOAA), 2002.
a Partial record not included in long-term average; missing one month.
b Partial record not included in long-term average; missing more than one month.
--- indicates missing or incomplete data for the month.

Table 4.3 2001 Monthly Precipitation Totals for the Real Time Data Network Rain Gauges

	BA01	BA03	BA04	BA05	BA06	BE04	BE05	BE08	BE09	BE10	BL01	CO03	CO04	CO05	CO08	CO09	CO10	CO12	ED02	HA02
January	1.5	1.5	0.0	3.3	1.6	3.9	0.1	3.9	3.3	0.0	0.0	0.0	2.8	3.6	0.7	1.4	3.5	0.7	1.6	0.4*
February	1.0	1.6	0.0	2.8	2.2	1.6	1.9	3.4	1.5	1.0	0.0	0.2	0.6	1.8	0.5	0.0	2.0	1.1	2.4	0*
March	1.7	3.5	0.0	3.5	2.2	3.8	0.2*	3.4	3.5	2.9	1.8	2.7	2.7	2.4	2.7	1.2	3.1	0*	1.5	1.1
April	1.3	0.0	1.1	2.1	2.7	2.9	0.3*	2.1	2.1	1.6	1.2	1.3	2.6	1.7	3.0	2.7	2.2	0*	0.8	1.2
May	3.4	0.0	5.1	3.5	1.4	3.1	1.3	2.3	3.2	1.8	2.9	1.9	3.7	2.7	4.2	1.8	4.9	0*	2.4	1.3
June	0.8	1.4	0.7	0.2	0.9	2.8	0.0	4.5	3.2	2.3	0.0	1.5	2.0	0.7	2.1	2.7	1.9	0*	0.4	0.4
July	0.0	2.7	0.4	1.5	1.2	0.2	0.0	0.0	0.0	0.7	0.0	0.8	3.5	0.4	0.3	1.7	0.6	0*	2.3	0.0
August	7.9	4.3	4.8	3.5	4.2	7.7	5.9	5.5	7.3	6.7	7.0	5.5	5.6	5.3	6.6	4.2	5.5	0*	3.8	2.0
September	4.4	1.6	2.9	5.5	3.7	2.3	2.0	3.3	4.0	2.5	3.5	2.8	4.0	3.5	3.1	4.0	2.6	0.9	1.6	4.7
October	1.2	1.1	1.5	2.9	2.8	1.9	0.9	0.7	1.6	1.3	2.0	0.3	2.1	1.5	0.9	0.9	1.1	2.0	1.6	1.4
November	5.4	10.1	6.1	7.7	6.1	4.6	2.9	4.4	6.6	4.2	6.4	10.6	6.4	7.0	4.6	1.6	4.1	6.8	6.0	1.5
December	1.8	3.4	2.3	2.4	0.9	3.9	2.8	3.8	4.6	2.8	1.9	3.8	3.4	5.4	2.7	1.3	2.4	7.9	3.0	1.1
Total	30.3	31.2	25.0	39.0	29.8	38.5	18.4*	37.4	40.8	27.8	26.6	31.3	39.2	35.9	31.1	23.3	33.7	19.4	27.3	15.1*

	HA03	HA06	HA08	KE01	KE02	KE04	KE05	KI01	KI02	KI04	ME01	ME03	ME06	ME07	ME10	ME12	ME15	ME17	ME19	ME20
January	1.0	0.0	0.0	2.3	1.9	0.0	0.7	0.0	1.9	2.3	3.3	2.6	1.3	3.4	2.4	1.7	1.4	3.0	2.2	0.0
February	3.1	0.0	0.8	1.1	1.6	0.0	2.3	0.0	1.8	0.3	1.0	1.2	0.6	1.6	2.9	0.9	3.4	1.0	1.7	0.0
March	2.6	1.8	1.3	2.1	0.4	0.0	3.0	0.0	1.9	2.4	3.5	2.2	2.0	3.4	1.4	2.0	2.8	3.3	2.5	0.0
April	1.5	1.8	0.0	1.6	1.0	0.8	1.3	0.5	1.1	0.4	2.3	2.4	1.4	1.5	1.2	1.1	3.1	1.2	1.4	1.0
May	2.0	2.6	0.4	5.6	0.9	3.2	3.6	2.5	6.8	4.8	3.3	2.3	3.0	3.3	2.6	2.3	3.5	2.3	2.8	1.9
June	0.0	0.5	0.0	3.2	0.1	1.8	1.0	0.7	0.3	0.9	2.0	2.3	0.7	1.3	0.0	0.0	2.3	1.4	1.8	1.2
July	0.9	0.4	0.0	0.0	0.0	0.0	0.0	2.2	1.6	3.4	0.2	0.0	0.2	0.1	0.4	0.0	0.2	0.2	0.7	0.2
August	1.6	3.6	3.7	8.5	4.8	3.4	4.1	2.6	3.7	3.6	4.1	4.8	0.7	5.2	4.0	0.6	1.6	4.1	4.1	3.4
September	0.0	3.7	2.0	1.7	2.6	1.5	3.9	2.7	0.6	3.0	3.4	3.3	0.4	3.3	2.6	0*	1.6	2.5	2.7	1.6
October	1.0	1.2	1.3	2.1	1.1	2.4	2.6	0.2	2.4	0.4	1.3	1.3	2.6	2.3	1.2	0.5	2.5	0.4	1.2	1.8
November	11.5	11.5	0.6*	7.5	0.0	2.3	7.4	2.4	9.6	2.2	5.5	5.5	3.5	3.4	2.4	2.2	2.2	4.0	3.0	6.2
December	5.5	4.7	3.6	2.8	1.0	3.6	2.9	1.0	2.2	5.1	3.5	2.6	1.8	1.8	2.1	2.0	2.3	2.8	2.3	2.3
Totals	30.6	31.7	13.0*	38.5	15.4*	18.9*	32.9	14.5*	33.7	28.9	33.3	30.6	13.2*	30.5	23.2	13.2*	26.8	26.2	26.4	19.6*

	RE01	RE02	RE03	RE04	RE05	RE06	UV02	UV05	UV06	UV07	UV09	UV10	UV11	UV12	UV13	UV14	UV16	UV18	UV20
January	0.0	0.9	2.9	1.6	1.1	0.9	1.5	1.2	1.9	0.0	1.1	0.2	3.1	4.1	1.0	0.0	0.9	1.4	2.8
February	0.0	0.0	1.6	1.9	1.7	1.2	1.5	0.6	1.2	0.0	0.7	3.0	1.4	1.4	0.8	0.0	0.1	0.4	1.8
March	0.0	0.0	3.2	2.3	1.8	1.9	2.3	2.0	2.6	0.0	0.7	1.8	2.9	2.7	0.6	0.0	0.6	1.0	1.9
April	1.6	1.3	1.8	1.6	2.3	1.3	0.0	0.6	0.0	0.8	0.7	0.0	0.8	1.0	2.0	0.6	0.5	0.4	0.6
May	3.0	3.6	5.9	4.1	4.1	4.2	3.0	2.9	3.9	3.1	2.2	3.8	3.5	3.1	2.7	2.1	3.7	2.4	7.2
June	0.0	0.0	1.6	0.7	0.5	0.9	0.2	0.5	2.1	0.5	0.3	0.9	0.4	0.0	0.2	0.2	1.2	0.2	0.8
July	0.8	0.0	0.5	0.2	0.6	2.6	0.4	1.7	3.2	1.3	0.6	0.8	1.5	0.5	3.1	0.6	2.8	1.5	0.0
August	3.1	1.9	1.6	4.5	3.7	10.9	4.5	3.3	5.0	4.3	1.2	3.5	2.0	1.8	0.7	1.9	2.1	1.8	1.9
September	3.9	3.1	1.5	5.3	4.0	2.6	1.7	0.3	1.4	1.5	1.8	1.9	2.2	0.3	2.0	0.2	3.5	1.2	1.8
October	1.9	1.8	2.3	0.9	1.5	0.6	2.0	3.0	3.0	2.6	0.4	1.6	1.2	2.3	0.1	2.2	0.3	1.6	1.4
November	7.5	6.0	6.7	6.6	8.9	8.9	2.9	0.3	0.8	3.9	1.8	1.3	3.9	5.1	1.9	4.8	1.9	3.1	9.4
December	1.1	1.6	1.4	3.4	1.4	2.6	1.0	1.2	1.2	1.7	1.0	1.1	1.4	1.1	1.7	1.2	1.0	1.0	1.6
Totals	22.9	20.2	31.0	33.2	31.6	38.6	20.9	17.4	26.1	19.8*	12.5*	19.9	24.3	23.3	16.6	13.6*	18.6	15.9	31.1

*Indicates incomplete data set due to equipment problems
Rain gauge locations are shown on **Figure 4.1**.

Rainfall in 2001 in the region was generally above average, especially in Comal and Hays counties. Above to near normal rainfall occurred in the Winter and early Spring months, and below average rainfall amounts were recorded in the Summer months. Rainfall was at least 20 percent above average in January, March, August, September, November, and December; average or below average rainfall fell in January, February, April, May, June, July, and October.

4.2 Precipitation Enhancement Program (PEP)

The Authority board of directors voted in fall of 1997 to pursue a permit from the Texas Natural Resources Conservation Commission (TNRCC) to conduct precipitation enhancement (cloud-seeding). The permit was granted by the TNRCC in October 1998 to the Authority's precipitation enhancement contractor, Weather Modification, Inc., (WMI) and is valid for four years beginning in January 1999 and ending in December 2002. The Authority's PEP project area consists of 6.37 million acres across south Texas, covering all or parts of 12 counties including Real (east of US Highway 83), Kerr, Kendall, Blanco, Bandera, Uvalde, Medina, Bexar, Comal, Hays, Guadalupe, and Caldwell. The permit allows the Authority, through its contractor, to conduct precipitation enhancement anytime during the year, including the traditional period of April through September. The goals of the PEP are:

- To enhance rainfall in a targeted area by using state-of-the-art cloud seeding technology and procedures to seed suitable convective clouds (Weather Modification, Inc., 2002);
- To increase the average annual quantity of water that may be withdrawn from the aquifer;
- To reduce the periods of low water levels and resulting threatened springflows;
- To reduce and delay potentially large expenditures to import surface water for aquifer recharge; and
- To develop and demonstrate weather modification management techniques that will improve reliability and efficiency of water supply at desired locations.

Research performed by Woodley and Associates indicates that precipitation enhancement can increase rainfall by as much as 21 percent from those clouds that have been seeded, which would significantly increase recharge to the aquifer. In addition to increasing direct recharge, the increased rainfall also decreases demand for lawn watering and crop irrigation.

The 2001 PEP was operational from April 15th through September 15th. Weather Modification, Inc. (WMI) reported that the PEP operations in 2001 "successfully achieved its objective, to seed cells believed to have the potential to produce precipitation." During the five-month project period, the PEP completed the following:

- Two aircraft completed 58 seeding and reconnaissance missions.
- The flights totaled 152.97 hours on 36 days.
- 21.7 kg of seeding agent was dispersed (834 ejectable flares and 82.8 gallons of silver iodide-acetone solution).

According to WMI, fewer hours were flown, and less seeding materials were used in 2001 compared to 1999 and 2000, because the program was operational for fewer months in 2001. However, the operations were limited by the number of days suitable for seeding, especially during June, July, and early August (Weather Modification, Inc., 2001). A detailed assessment of the seeding effectiveness is beyond the scope of the present Weather Modification, Inc. contract. However, preliminary analyses of the radar storm tracking data support the

hypotheses that seeding accelerates rainfall development and promotes rain within storms from seeded storms (Weather Modification, Inc., 2002). The Authority, the Texas Water Development Board (TWDB), and the TNRCC are currently funding a study to evaluate the effectiveness of weather modification. When those studies are completed, the Authority board of directors will determine if the Authority will participate in or conduct a PEP in future years.

5.0 GROUNDWATER RECHARGE

Recharge to the Edwards Aquifer originates as precipitation on the drainage area and recharge zone. The area consists of nine drainage basins that extend across the recharge zone as indicated in **Figure 5.1**. These basins are also listed below in **Table 5.1**.

Table 5.1 Drainage basins that cross the Edwards Aquifer Recharge Zone.

Nueces/West Nueces River basin
Frio/Dry Frio River basin
Sabinal River basin
Area between Sabinal River and Medina River basins
Medina River basin
Area between Medina River and Cibolo/Dry Comal Creek basins
Cibolo Creek and Dry Comal Creek basin
Guadalupe River basin
Blanco River basin

Most of the recharge is from surface water that infiltrates into the recharge zone, although some recharge also flows into the Edwards Aquifer from adjacent aquifers such as the Trinity aquifer. Estimates of the contribution from adjacent hydraulically connected aquifers range from 5,000 to 60,000 acre feet per year. However, only surface water data from precipitation and streamflows are utilized to calculate total recharge.

The USGS has calculated groundwater recharge to the Edwards Aquifer since 1934. **Table 5.2** lists estimated annual recharge by river basin from 1934 through 2001, based on USGS calculations. The USGS estimates that annual recharge for the period of record (1934 to 2001) ranged from 43,700 acre-feet at the height of the drought of record in 1956, to 2,486,000 acre-feet in 1992. In 2001, estimated recharge was 1,069,400 acre-feet. Average annual recharge from 1934 to 2001 was 684,700 acre-feet, and since 1992, the average annual recharge is approximately 876,200 acre-feet. The median annual recharge for 1934 through 2001 is 557,000 acre-feet, and the median annual recharge for the last 10 years is 576,300 acre-feet. **Figure 5.2** is a graph of annual recharge and the ten-year floating average recharge estimate for the San Antonio segment of the Balcones Fault Zone Edwards Aquifer from 1934 to 2001.

Recharge directly increases groundwater levels in the aquifer. Water levels rise during periods of higher-than-normal recharge and generally decline during periods of below-normal recharge. In 2001, relatively frequent rainfall during the spring and above-normal rainfall during the fall significantly recharged the Edwards Aquifer compared to the 2000 recharge estimate of 614,500 acre-feet.

The Authority operates four recharge dams located in the Edwards Aquifer Recharge Zone as indicated in **Figure 5.1**. Recharge is calculated with a linear regression analysis using annual rainfall. **Table 5.3** shows the annual historical recharge for each site since construction. A total recharge of 6,696 acre-feet occurred at the dams in 2001. Like the regional recharge calculations described above, all four structures contributed recharge above their historical average.

Table 5.2 does not include the Guadalupe River basin because the current method of estimating recharge is based on the interpretation that the basin does not recharge the aquifer. The Authority is currently reviewing the recharge calculation methodology for possible revision.

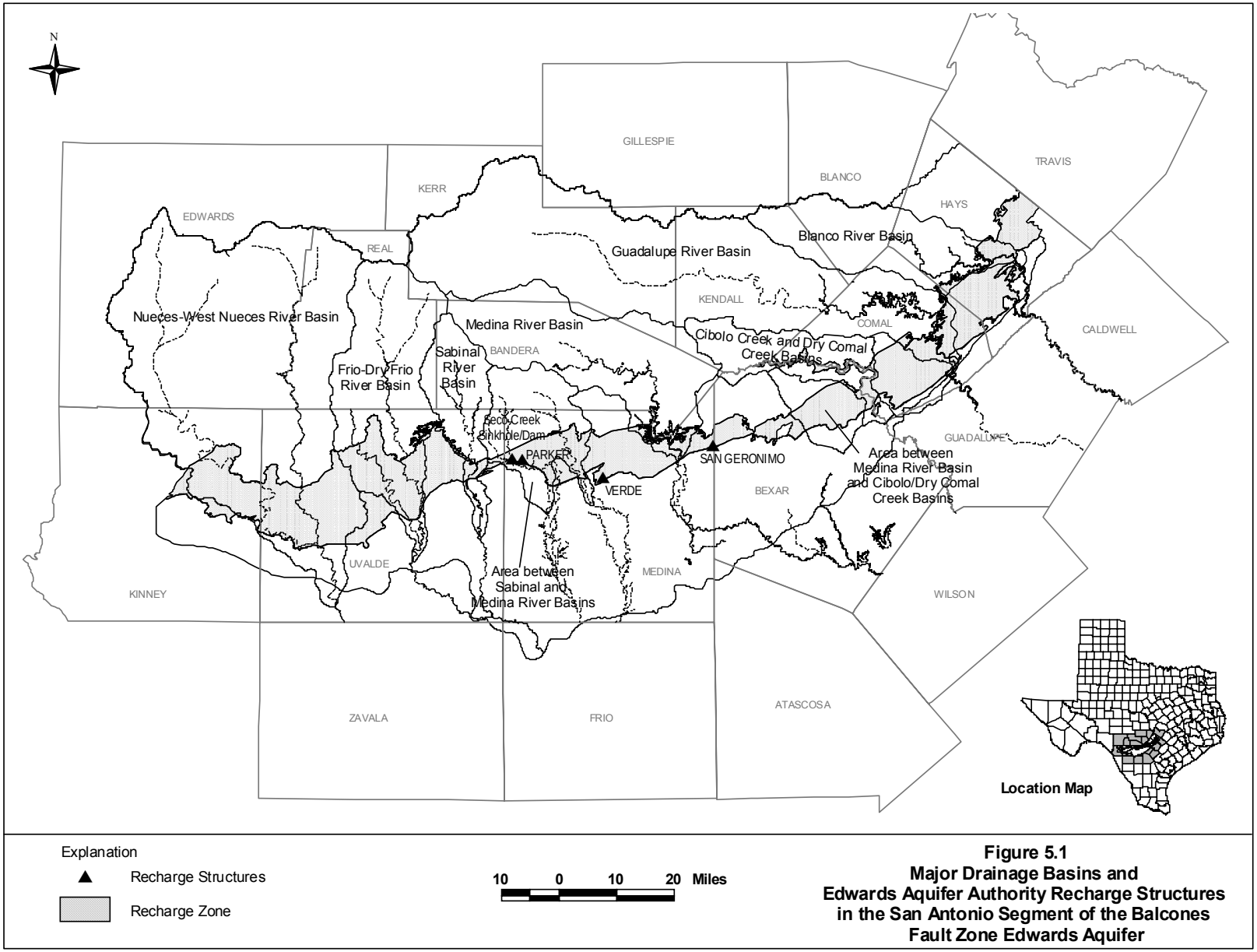


Figure 5.1
Major Drainage Basins and Edwards Aquifer Authority Recharge Structures in the San Antonio Segment of the Balcones Fault Zone Edwards Aquifer

Table 5.2 Estimated annual groundwater recharge to the Edwards Aquifer by drainage basin, 1934-2001 (measured in thousands of acre-feet).

Year	Nueces River/ West Nueces River basin	Frio River/ Dry Frio River basin	Sabinal River basin	Area between Sabinal River and Medina River basin	Medina River basin	Area between Medina River and Cibolo Creek/ Dry Comal Creek basin	Cibolo Creek/Dry Comal Creek basin	Blanco River basin	Total*
1934	8.6	27.9	7.5	19.9	46.5	21	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	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

(**Table 5.2** continued)

Year	Nueces River/ West Nueces River basin	Frio River/ Dry Frio River basin	Sabinal River basin	Area between Sabinal River and Medina River basin	Medina River basin	Area between Medina River and Cibolo Creek/ Dry Comal Creek basin	Cibolo Creek/Dry Comal Creek basin	Blanco River basin	Total*
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	1,448.3
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	197.7
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	1,153.8
1987	308.5	473.3	110.7	405.5	90.4	229.3	270.9	114.9	2,003.5
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	1,123.1
1991	325.2	421.0	103.1	315.2	52.8	84.5	109.7	96.9	1,508.4
1992	234.1	586.9	201.1	566.1	91.4	290.6	286.6	226.9	2,486.0
1993	32.6	78.5	29.6	60.8	78.5	38.9	90.9	37.8	447.6
1994	124.6	151.5	29.5	45.1	61.1	34.1	55.6	36.6	538.1
1995	107.1	147.6	34.7	62.4	61.7	36.2	51.1	30.6	531.3
1996	130.0	92.0	11.4	9.4	42.3	10.6	14.7	13.9	324.3
1997	176.9	209.1	57.0	208.4	63.3	193.4	144.2	82.3	1,134.6
1998	141.5	214.8	72.5	201.4	80.3	86.2	240.9	104.7	1,142.3
1999	101.4	136.8	30.8	57.2	77.1	21.2	27.9	21.0	473.4
2000	238.4	123.0	33.1	55.2	53.4	28.6	48.6	34.1	614.5
2001	297.5	126.7	66.2	124.1	90.0	101.5	173.7	89.7	1,069.4
For the period of record 1934-2001:									
Average	121.2	134.1	42.2	107.2	61.9	69.9	105.0	43.1	684.7
Median	102.2	123.2	31.2	78.4	60.5	49.9	77.4	34.4	557.0
For the period of record 1992-2001 (last 10 years):									
Average	158.4	186.7	56.6	139.0	69.9	84.1	113.4	67.8	876.2
Median	135.8	142.2	33.9	61.6	70.2	37.6	73.3	37.2	576.3

Data source: USGS, 2001.
*Total may not be equal to sum of basin values due to rounding.

Figure 5.2 Estimat5ed annual recharge and ten-year floating average recharge for the San Antonio segment of the Balcones Fault Zone Edwards Aquifer 1934-2001

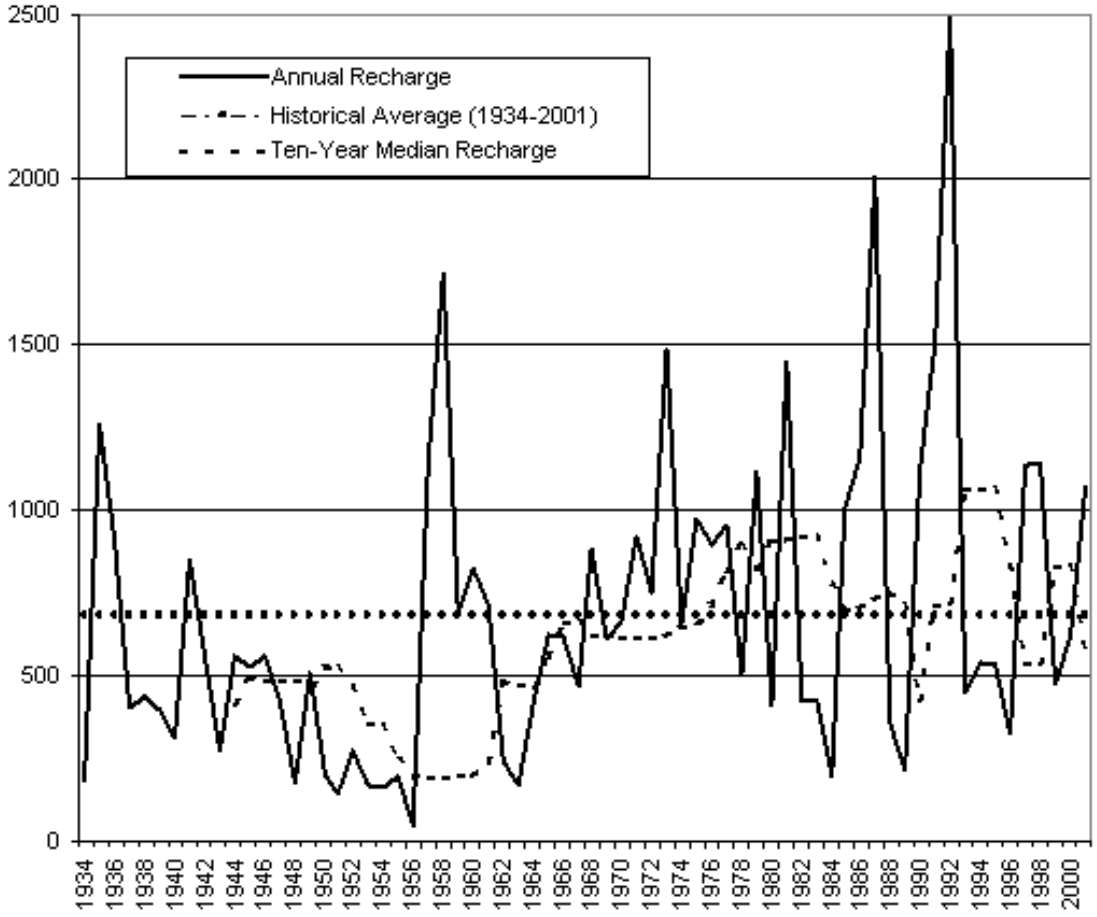


Table 5.3 Estimated annual Edwards Aquifer recharge from Edwards Aquifer Authority recharge projects (measured in acre-feet).

Year	Parker (4-20-74)	Verde (4-28-78)	San Geronimo (11-13-79)	Seco (10-21-82)	Annual Total
1974	160	---	---	---	160
1975	620	---	---	---	620
1976	2,018	---	---	---	2,018
1977	6	---	---	---	6
1978	98	150	---	---	248
1979	2,315	1,725	0	---	4,040
1980	0	371	903	---	1,274
1981	772	1,923	1,407	---	4,102
1982	3	112	91	0	206
1983	0	254	0	0	254
1984	251	246	0	143	640
1985	232	440	1,097	643	2,412
1986	217	889	963	1,580	3,649
1987	2,104	4,141	1,176	12,915	20,336
1988	0	0	0	0	0
1989	0	0	0	0	0
1990	49	176	41	479	745
1991	647	966	1,647	2,160	5,420
1992	723	2,775	2,874	14,631	21,003
1993	0	0	334	508	842
1994	159	0	0	5	164
1995	18	79	51	880	1,028
1996	0	0	0	0	0
1997	2,941a	2,154b	1,579b	7,515b	14,189b
1998	1,469a/b	1,160b	872b	3,796b	7,297
1999	0b	0b	0b	50c	50b/c
2000	901b	1,371b	1,023b	4,606b	7,901b
2001	526b	657b/d	1,085b/d	2,154b/d	4,422b/d
Total	16,229	19,589	15,143	52,065	103,026
Average	580	816	658	2,603	3,680
Median	189	313	334	576	935

Data source: USGS and Edwards Aquifer Authority, 2002.
a = Written communication from USGS - San Antonio Subdistrict Office.
Note: 1997 recharge for Verde, San Geronimo, and Seco Creek dams was revised and corrected by revising the linear regression analysis.
b = Determined by linear regression analysis.
c = Linear regression analysis indicates zero recharge; however, one recharge event was observed that was estimated to have recharged 50 acre feet.
d = Recharge estimates derived using stage recorder data. Estimates calculated by HDR Engineering, Inc., August 2002.
--- = indicates years prior to construction of the recharge structure.

Page revised with new recharge amounts for 2001 on 9/26/02.

The 2001 recharge estimates shown in **Table 5.3** for Parker Creek, Verde Creek, San Geronimo, and Seco Creek dams were estimated with a linear regression equation that calculates recharge from rainfall. The equation was developed from historical recharge measurements for each dam and rainfall obtained from the National Weather Service. However, all of the measurements are considered provisional, because the Authority is currently revising its method of calculating recharge.

The historical average annual recharge attributed to the recharge dams is based on a period of record that reflects the date of construction through 2001. The historical average annual recharge contributed by the combined structures is 3,761 acre-feet.

6.0 GROUNDWATER DISCHARGE AND USAGE

Groundwater discharges from the Edwards Aquifer as springflow or as water pumped from wells. Springflow is the primary basis of recreational economies in New Braunfels and San Marcos, and the springs provide habitat for threatened and endangered animal and plant species. Wells provide water for many diverse uses in south central Texas, including irrigation, municipal water supplies, industrial applications, and domestic/livestock consumption. The amount of groundwater discharged as springflow has historically been greater than the amount discharged through wells for any of the above-mentioned uses.

Estimates of annual groundwater discharge from springflow and pumping for the Edwards Aquifer are available from 1934 to 2001 (**Table 6.1**). Annual groundwater discharge estimates range from a low of 388,800 acre-feet in 1955 to a high of 1,130,000 acre-feet in 1992. In 2001, the total groundwater discharge from the Edwards Aquifer from wells and springs was estimated at 897,200 acre-feet.

Springflow was calculated by measuring streamflow downstream of the springs and converting the streamflow measurements to spring discharge. Continuous recording equipment is located at Comal and San Marcos springs. Periodic measurements were performed at the Leona, San Pedro, San Antonio, and Hueco springs.

Springflow from 1934 to 2001 has varied from a low of 69,800 acre-feet in 1956 to a high of 802,800 acre-feet in 1992 (**Table 6.1**). **Table 6.2** lists the monthly estimated discharge in 2001 for the six primary Edwards Aquifer springs. Spring discharge from the Edwards Aquifer for 2001 was calculated at 529,448 acre-feet. Spring discharge accounted for approximately 60 percent of total discharge from the Edwards Aquifer in 2001 (**Tables 6.1 and 6.2**).

Figure 6.2 is a graph comparing Edwards Aquifer well discharge to springflow. The figure shows the variability in springflow and the general trend of increasing well discharge over the period of record. The lowest estimated annual aquifer pumping level was 101,900 acre-feet recorded in 1934. Since 1934, pumping from the Edwards Aquifer has increased to 367,700 acre-feet in 2001, or an increase of approximately 260 percent. Average annual well production was estimated to be 303,300 acre-feet per year for the period of record from 1934 to 2001, while the estimated 10-year average for pumping from 1992 through 2001 was 410,800 acre-feet (**Table 6.1**). Reported groundwater pumping accounted for 367,700 acre-feet of water discharged from the Edwards Aquifer in 2001. Unreported pumping was negligible.

Table 6.3 shows the 2001 discharge data by use for the counties in the region. The discharge estimates were compiled from pumpage data reported by municipal, industrial, and agricultural users to the Authority. The Authority estimated pumpage for domestic supply, stock, and miscellaneous use. **Table 6.4** shows annual Edwards Aquifer groundwater discharge by use from 1955 to 2001, and the estimated 10-year average and median for pumping by use from 1992 through 2001 are also included in this table.

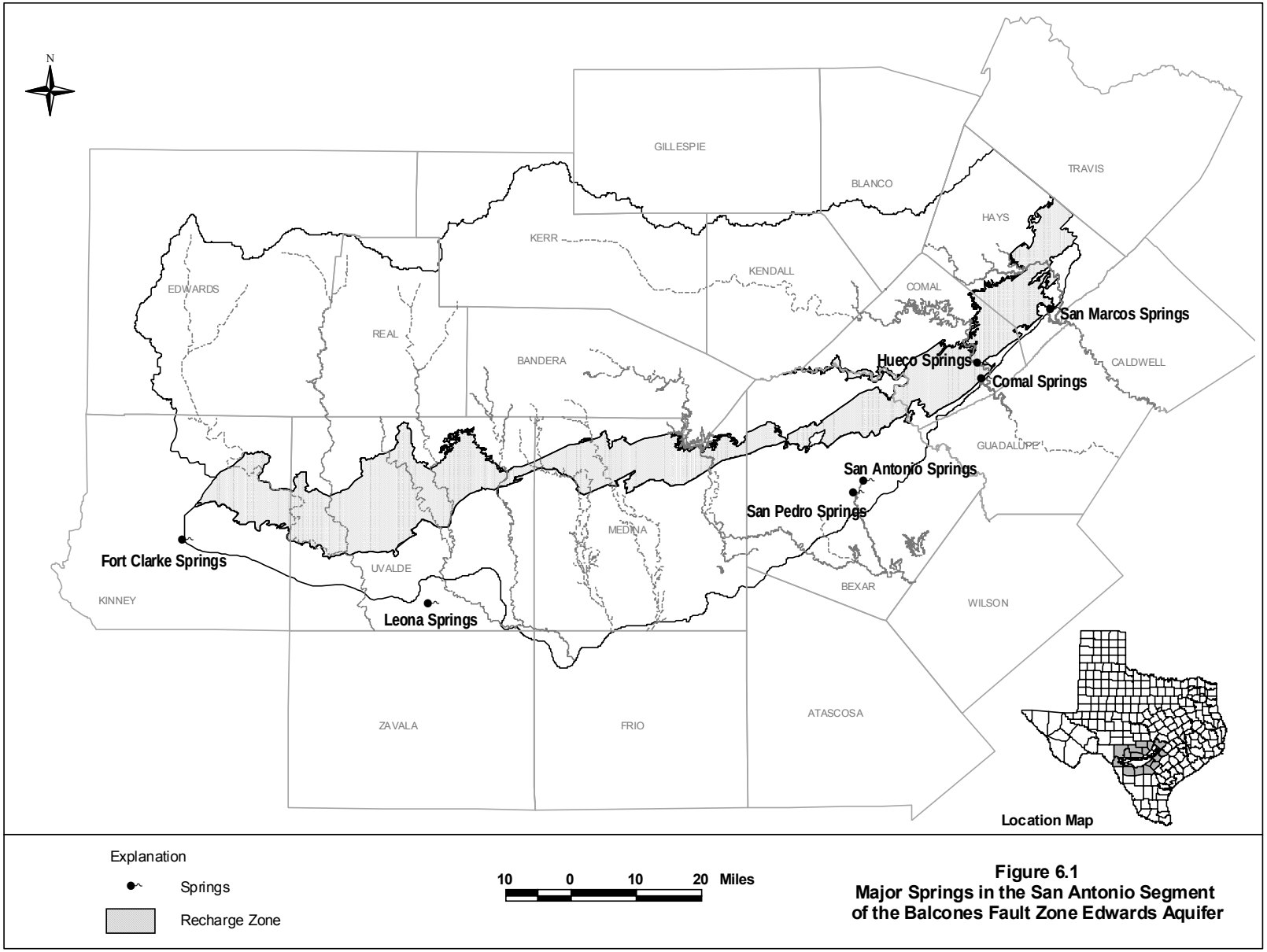


Figure 6.1
Major Springs in the San Antonio Segment of the Balcones Fault Zone Edwards Aquifer

Table 6.1 Annual estimated groundwater discharge data by county for the Edwards Aquifer, 1934-2001 (measured in thousands of acre-feet).

Year	Kinney Uvalde	Medina	Bexar	Comal	Hays	Total	Total Wells	Total Springs
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	708.1	529.8	178.3
1985	156.9	59.2	295.5	200.0	144.9	856.5	522.5	334.0
1986	91.7	41.9	294.0	229.3	160.4	817.3	429.3	388.0
1987	94.9	15.9	326.6	286.2	198.4	922.0	364.1	557.9
1988	156.7	82.2	317.4	236.5	116.9	909.7	540.0	369.7

(Table 6.1 continued)

Year	Kinney Uvalde	Medina	Bexar	Comal	Hays	Total	Total Wells	Total Springs
1989	156.9	70.5	305.6	147.9	85.6	766.5	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	790.6	436.0	354.6
1992	76.5	9.3	370.5	412.4	261.3	1130.0	327.2	802.8
1993	107.5	17.8	371.0	349.5	151.0	996.7	407.3	589.4
1994	95.5	41.1	297.7	269.8	110.6	814.8	424.6	390.2
1995	90.8	35.2	*272.1	235.0	127.8	761.0	399.6	361.3
1996	117.6	66.3	*286.8	150.2	84.7	705.6	493.6	212.0
1997	77.0	31.4	260.2	243.3	149.2	761.1	377.1	383.9
1998	113.1a	51.3	312.4b	271.8c	168.8	917.6	453.5	464.1
1999	104.0	49.2	307.1b	295.5c	143.0	898.8	442.7	456.1
2000	89.1	45.1	283.6b	226.1c	108.4	752.3	414.8	337.5
2001	68.6	33.9	291.6	327.7	175.4	890.0	367.7	529.6
For period of record 1934-2001:								
Average	71.3	20.2	239.0	221.9	119.6	672.0	303.3	368.7
Median	66.6	12.8	230.0	231.8	116.2	659.4	309.0	375.7
For period of record 1992-2001 (last 10 years):								
Average	94.0	38.1	305.3	278.1	148.0	862.8	410.8	452.7
Median	93.2	38.2	294.7	270.8	146.1	852.4	411.1	423.2

Data source: USGS and Edwards Aquifer Authority, 2001.
a USGS estimated Kinney County irrigation discharge.
b Includes reports of Edwards Aquifer irrigators in Atascosa County.
c Includes reports of Edwards Aquifer industrial and municipal users in Guadalupe County.
Differences may occur due to rounding.
*In 1995, the USGS revised the method of calculating domestic/livestock pumping, which significantly decreased the estimate for subsequent years.

Table 6.2 Estimated spring discharge from the Edwards Aquifer, 2001 (measured in acre-feet).

Month	Leona Springs and Leona River Underflow	San Pedro Springs	San Antonio Springs	Comal Springs	Hueco Springs	San Marcos Springs	Total Monthly Discharge From Springs
January	1,404	509	2,247	21,790	6,253	14,550	46,753
February	1,608	561	2,551	19,850	5,925	14,170	44,665
March	2,108	718	3,096	21,910	6,703	16,130	50,665
April	1,582	710	2,775	21,000	6,064	15,100	47,231
May	1,056	765	2,912	22,310	6,119	14,390	47,552
June	822	292	108	19,430	5,959	12,390	39,001
July	818	185	0	18,400	4,981	11,660	36,044
August	854	40	0	15,780	4,050	10,800	31,524
September	1,265	518	1,176	19,360	5,529	12,730	40,578
October	1,579	541	1,462	20,890	6,592	12,280	43,344
November	1,264	634	2,247	21,520	5,689	14,060	45,414
December	1,159	928	4,411	25,040	5,519	19,620	56,677
Total	15,520	6,400	22,985	247,280	69,383	167,880	529,448

Data source: USGS, 2001.
Differences may occur due to rounding.

Figure 6.2 Groundwater pumping compared to springflow from the Edwards Aquifer, 1934-2001 measured in thousands of acre-feet).

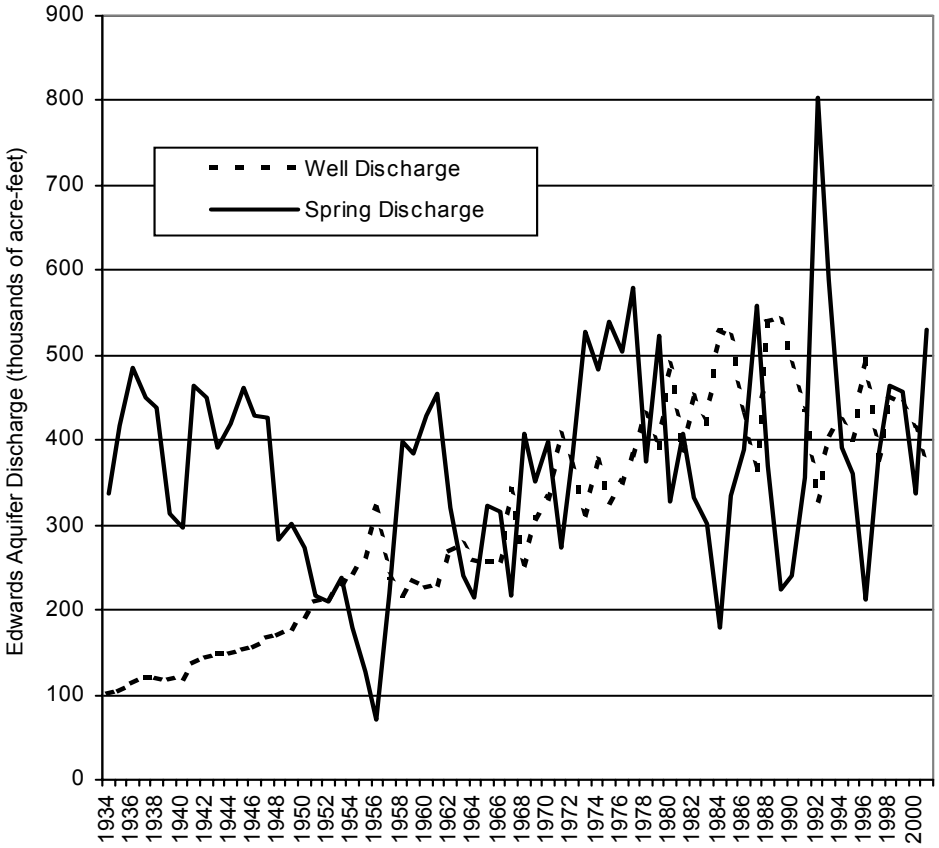


Table 6.3 Total groundwater discharge from the Edwards Aquifer, 2001 (measured in thousands of acre-feet).

County	Irrigation	Municipal /Military	Domestic /Stock	Industrial	Total Wells	Springs	Total Wells & Springs
Bexar	9.3a	224.9	8.8	19.2	262.2	29.4e	291.6
Comal	0.04b	3.9d	0.3	6.8d	11.0	316.7e	327.7
Hays	0.06b	4.9	0.8	1.7	7.5	167.9e	175.4
Medina	25.8b	6.4	0.9	0.8	33.9	0.0	33.9
Uvalde	43.2b	4.8	2.3	0.9	51.2	15.5e	66.7
Kinney	0.6	1.0	0.3	0.0	1.9	0.0	1.9
Total	79.0	245.9	13.4	29.4	367.7	529.5	897.2

Differences may occur due to rounding.
Data source: Edwards Aquifer Authority, and USGS 2001.
a Includes Atascosa County.
b Estimated from reports of Edwards Aquifer irrigators.
c Estimated by Edwards Aquifer Authority.
d Includes Guadalupe County.
e Estimated by the USGS.

Table 6.4 Annual estimated Edwards Aquifer groundwater discharge by use, 1955-2001 (measured in thousands of acre-feet).

Year	Irrigation	Municipal	Domestic/ Stock	Industrial/ Commercial	Springs
1955	85.2	120.5	30.1	25.1	127.8
1956	127.2	138.3	28.9	22.4	69.8
1957	68.8	116.1	29.8	22.6	219.2
1958	47.2	113.7	33.4	25.1	398.2
1959	60.0	118.9	31.5	24.2	384.5
1960	54.9	121.1	29.1	23.3	428.3
1961	52.1	124.5	29.6	22.2	455.3
1962	72.7	143.7	28.8	22.8	321.1
1963	75.4	151.8	27.8	21.8	239.6
1964	72.6	140.2	26.3	21.7	213.8
1965	68.0	138.8	27.0	22.3	322.8
1966	68.2	141.8	23.3	22.6	315.3
1967	119.4	171.0	25.1	25.8	216.1
1968	59.3	146.9	25.5	20.0	408.3
1969	95.2	162.0	29.2	21.1	351.2
1970	110.1	167.5	29.3	22.5	397.7
1971	159.4	196.2	28.6	22.6	272.7
1972	128.8	190.5	30.8	21.1	375.8
1973	82.2	177.1	32.3	18.8	527.6
1974	140.4	174.6	33.5	15.1	483.3
1975	96.4	182.5	33.6	15.3	540.4
1976	118.2	182.1	34.6	14.7	503.9
1977	124.2	205.3	38.1	13.0	580.3
1978	165.8	214.2	40.3	11.5	375.5
1979	126.8	208.9	40.7	15.2	523.0
1980	177.9	256.2	43.3	13.7	328.3
1981	101.8	231.8	40.9	12.6	407.3
1982	130.0	268.6	39.5	15.0	333.3
1983	115.9	249.2	38.8	14.7	301.5
1984	191.2	287.2	36.2	15.2	178.3
1985	203.1	263.7	39.2	16.5	334.0
1986	104.2	266.3	42.0	16.8	388.0
1987	40.9	260.9	43.5	18.7	557.9
1988	193.1	286.2	41.9	18.8	369.7
1989	196.2	285.2	38.2	22.9	224.1
1990	172.9	254.9	37.9	23.7	240.6
1991	88.5	240.5	39.5	67.5	354.6
1992	27.1	236.5	34.8	29.0	802.8
1993	69.3	252.0	49.9	36.1	589.4
1994	104.5	247.0	33.9	39.3	390.2
1995	95.6	255.0	11.6*	37.3	361.3
1996	181.3	261.3	12.3*	38.8	212.0
1997	77.4a,b	253.0	12.3*	34.4	383.9
1998	131.9a	266.5	13.4*	41.7b	464.1
1999	113.6	273.3	13.4*	42.4	456.1
2000	106.3	261.3	13.4*	33.8	337.5
2001	79.0	245.9	13.4*	29.4	529.4
		For period of record 1955-2001:			
Average	108.1	205.3	31.0	24.1	374.4
Median	104.2	208.9	31.5	22.4	375.5

Data source: USGS and Edwards Aquifer Authority, 2001.
a Includes estimates from Atascosa County discharge by Edwards Aquifer users.
b Includes estimates from Guadalupe County discharge by Edwards Aquifer users.
Differences may occur due to rounding.
*In 1995 the USGS revised the method of calculating domestic/livestock pumpage, which significantly decreased the estimate for

In 2001, the Authority and USGS estimated discharge from the Edwards Aquifer. Prior to 1997, the USGS determined the total amount of irrigated acreage from county tax rolls, which have remained relatively constant over recent years. County soil and water conservation districts provided estimates of irrigation "duties" for selected crop types. The USGS multiplied these duties by amounts of irrigated acreage by crop type as provided by the U.S. Department of Agriculture (USDA), thereby determining an estimate of irrigation uses from the Edwards Aquifer.

In 1997, the Authority initiated the Edwards Aquifer Well Metering Program, which requires meters for all municipal, industrial, and irrigation wells in the Edwards Aquifer. Since 1998, the Authority has utilized well pumpage data from the Well Metering Program to estimate well discharge. The availability of direct pumpage data has significantly improved the discharge estimating process.

7.0 GROUNDWATER QUALITY

7.1 Water Quality Data from Edwards Aquifer Wells

The Authority, in cooperation with the USGS and TWDB, has conducted a systematic program of water quality data collection since 1968. Through this cooperative effort, the Authority has maintained a network of groundwater and surface water monitoring sites for gathering water quality data across the Edwards Aquifer area. Analyses of these data have been used by the Authority to assess aquifer water quality. A general listing of the parameters, their drinking water standards, and typical concentrations in the Edwards Aquifer are listed in **Table 7.1**. The water quality data collected in 2001 are included in **Appendix C**.

In 2001, the Authority in cooperation with the USGS, TWDB, and San Antonio Water System (SAWS) collected water quality samples from 73 wells, five spring groups, and nine streams. Multiple orifices were sampled at Comal, Hueco, and San Marcos springs. The locations of these monitoring sites are shown in **Figures 7.1, 7.1a, 7.1b, and 7.1c**. These samples were analyzed in the field for selected water quality parameters and in the laboratory for inorganic and organic chemical constituents. The field analyses included temperature, pH, conductivity, and alkalinity. In general, all water samples were analyzed in the laboratory for common major ions, minor elements (metals), total dissolved solids (TDS), hardness, and nutrients. Water samples collected from 16 wells, five springs, and nine stream locations were also analyzed for pesticides and herbicides. Water samples collected from 15 wells and four springs were also analyzed for volatile organic compounds (VOCs). Semivolatile organic compounds were included in the analyses for well AY-68-30-801 at Randolph Air Force Base.

The Authority compares the water analyses to the following federal and state water quality standards to determine if any concentrations exceed health-based levels.

Primary Drinking Water Standards – These standards are enforceable and are often referred to as the maximum contaminant levels (MCL) or primary drinking water standards. The MCL for a contaminant is the maximum permissible level in water that is delivered to any user of a public water system. MCLs protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in public water systems. The primary standards are indicated on **Table 7.1**.

Secondary Drinking Water Standards – These standards are non-enforceable and are set for contaminants that may affect the aesthetic qualities of drinking water, such as odor or appearance. **Table 7.2** is a list of the current secondary standards. Concentrations of the secondary standards listed on **Table 7.2** are generally not exceeded in the freshwater portion of the Edwards Aquifer, although concentrations of total dissolved solids (TDS), fluoride, and iron occasionally exceed their secondary standards in samples from the saline water zone.

Summary of Analytical Results – Groundwater samples were analyzed by a contract laboratory for the following metals: aluminum, antimony, arsenic, barium, beryllium, boron, bromide, cadmium, calcium, chromium, cobalt, copper, iron, lead, lithium, magnesium, manganese, molybdenum, nickel, potassium, selenium, silica, , silver, sodium, strontium, thallium, vanadium, zinc, and mercury. Samples from several wells, primarily freshwater/saline water interface monitoring wells, contained detectable metal concentrations. One sample, collected from well LR-01-813A, contained lead at 0.022 mg/L, which exceeds its maximum contaminant level (MCL) of 0.015 mg/L. The arsenic concentration of 0.2 mg/L in the sample collected from well LR-67-01-814A exceeded its MCL of 0.05 mg/L. Both wells are completed

in saline groundwater in the transect across the freshwater/saline water interface near San Marcos (see Section 7.2). Eleven groundwater samples contained thallium at concentrations above its MCL of 0.002 mg/L. Some of the wells are in saline water transects, while the others reflect the background concentrations of thallium.

Water samples from six freshwater/saline water interface monitoring wells in Hays County contained fluoride concentrations above its MCL of 4.0 mg/L. Water samples from several other wells, primarily freshwater/saline water interface monitoring wells, contained fluoride above the secondary drinking water standard of 2.0 mg/L.

Laboratory analyses indicated that 71 wells in Hays, Comal, Bexar, Medina, and Uvalde counties contained detectable nitrate concentrations. Only one of the nitrate concentrations, 20.3 mg/L in a sample from well TD-69-31-603 in Medina County, exceeded the nitrate MCL of 10 mg/L. The source of the nitrate in TD-69-31-603 is believed to be a localized source. In general, other high nitrate concentrations were detected in wells in the Uvalde area (YP-69-51-120 at 8.92 mg/L and YP-69-50-501 at 8.45 mg/L). The Authority is studying historical nitrate concentrations to identify trends that may indicate contamination source or source(s).

Few samples contained organic compounds. Water samples collected from 17 wells were analyzed for pesticides and herbicides, and none were detected. Water samples from 19 wells were also analyzed for volatile organic compounds (VOCs). Two samples contained detectable concentrations of tetrachloroethene (PCE): 7.6 µg/L in well YP-69-51-114, which is located in the City of Uvalde area, and 0.57 µg/L in AY-68-29-414, which is located in Bexar County. The MCL for tetrachloroethene (PCE) is 5 µg/L. The source of the tetrachloroethene in Uvalde was an industrial dry cleaning operation destroyed by fire in 1979, and tetrachloroethene has been detected in that well in the past. The TNRCC is addressing the Uvalde area contamination in the Edwards Aquifer with the responsible party. The Authority and TNRCC are investigating the source of the tetrachloroethene in Bexar County. Two samples contained acetone, which is attributed to contamination in the laboratory environment (lab contamination). Two semivolatile organic compounds, biphenyl and bis (2-ethylhexyl) phthalate, were detected, both due to lab contamination.

The presence of organic chemicals indicates the vulnerability of the Edwards Aquifer to surface activities. Spills of chemicals such as tetrachloroethene can infiltrate to the aquifer with little or no filtration.

The Authority continues its programs to protect the generally excellent water quality of the aquifer through investigating groundwater contamination and identifying and analyzing anomalous data from the Authority's aquifer-wide sampling program.

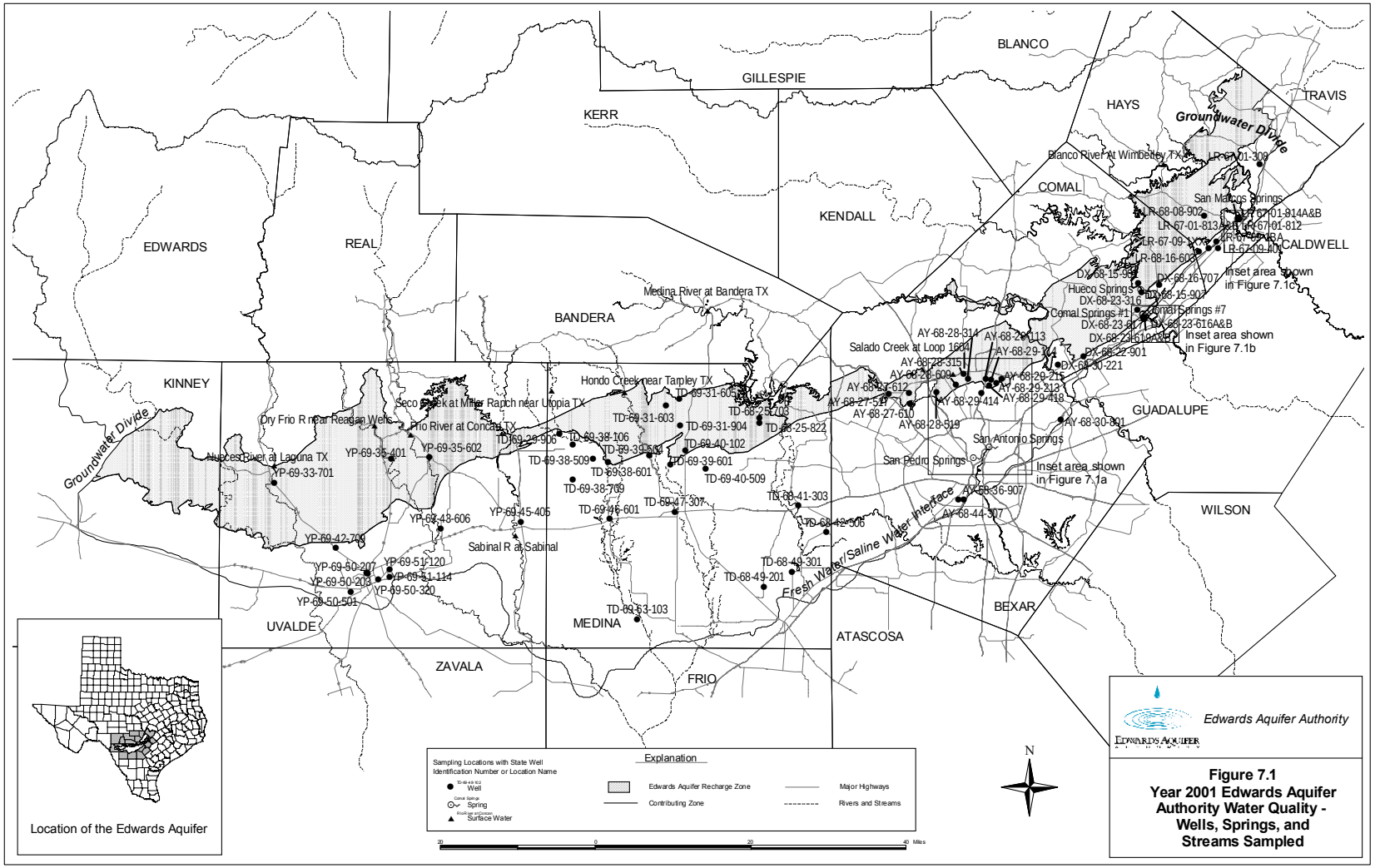


Figure 7.1
Year 2001 Edwards Aquifer Authority Water Quality - Wells, Springs, and Streams Sampled

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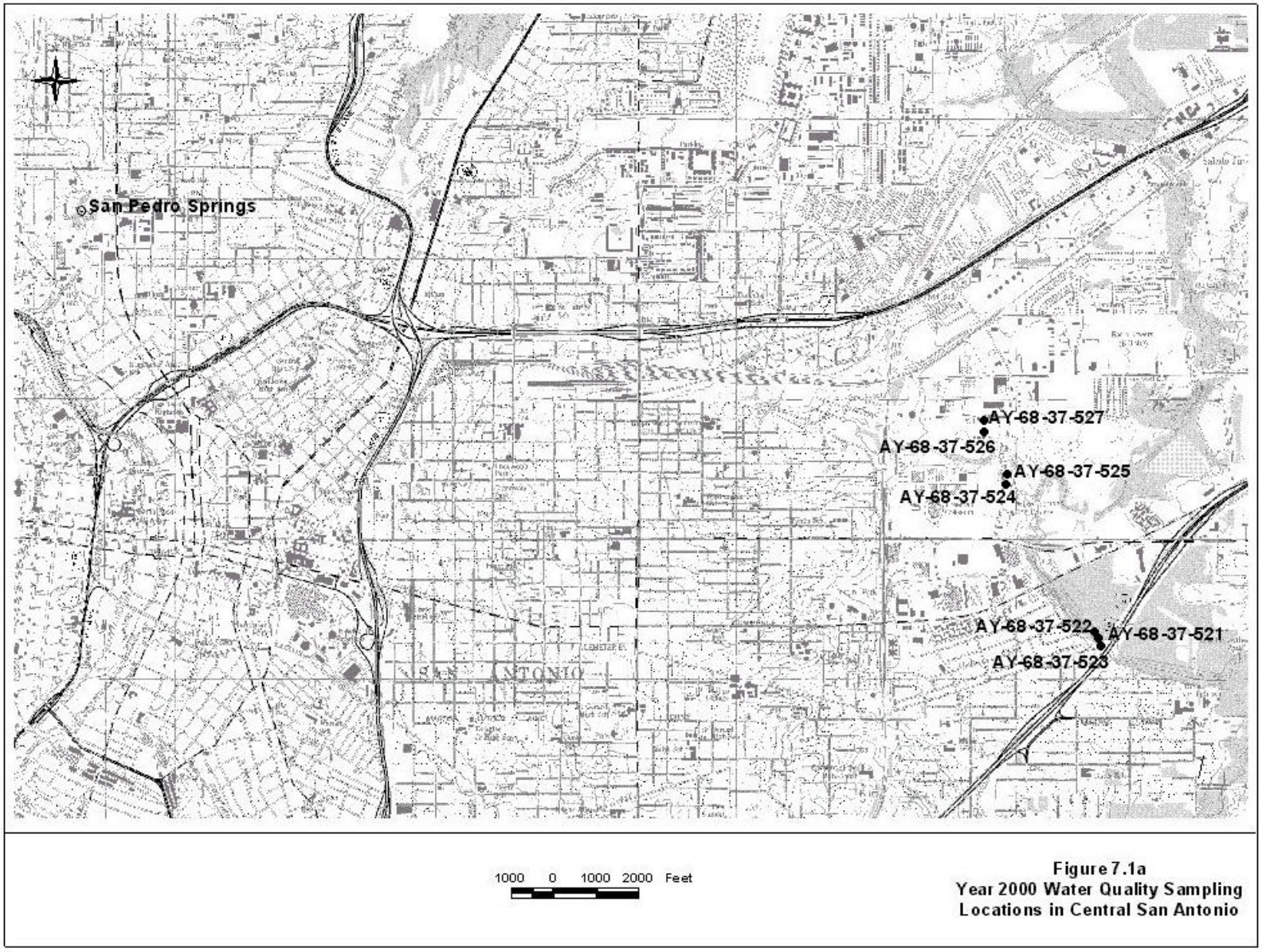


Figure 7.1a
Year 2000 Water Quality Sampling Locations in Central San Antonio

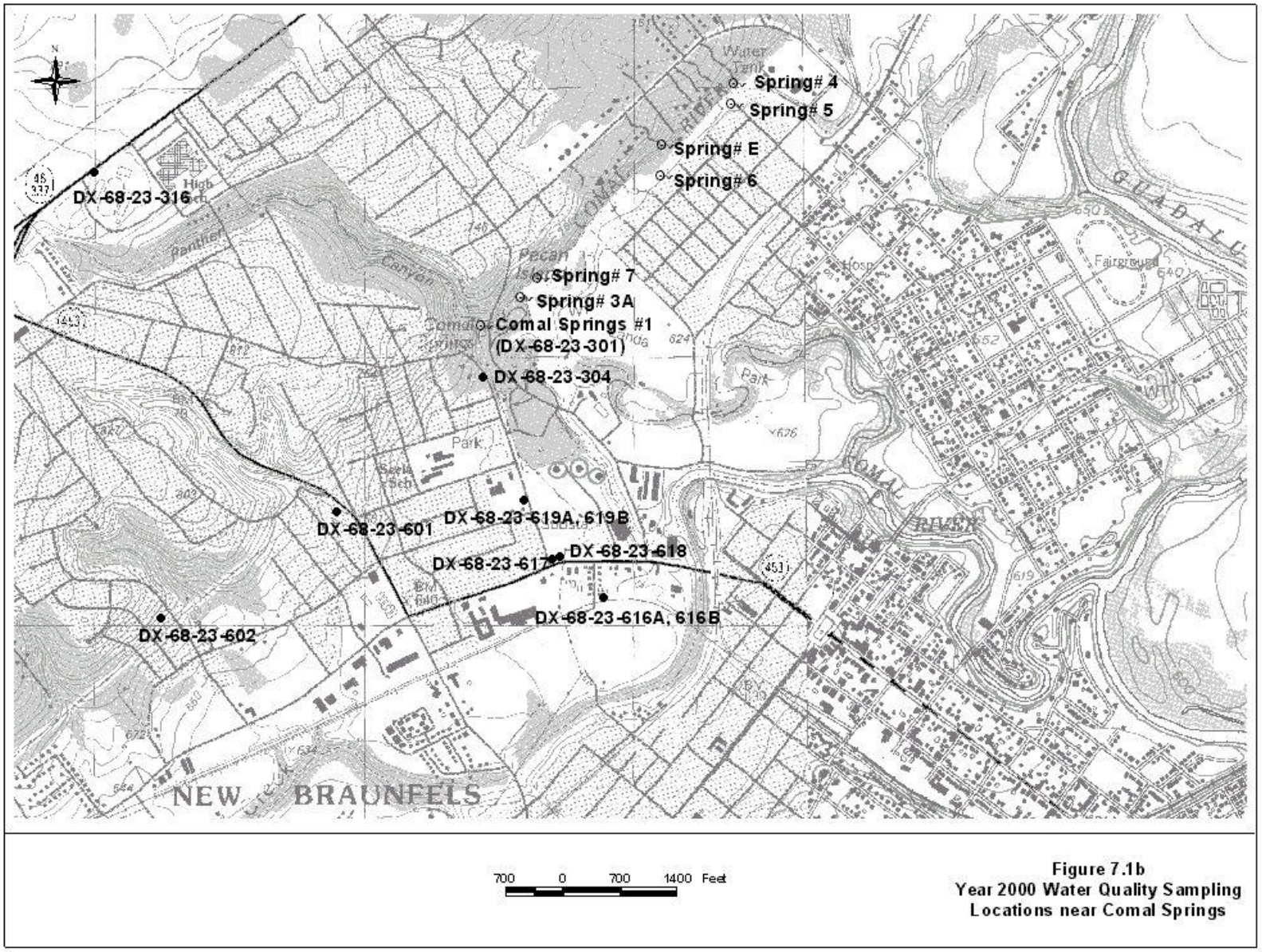


Figure 7.1b
Year 2000 Water Quality Sampling Locations near Comal Springs

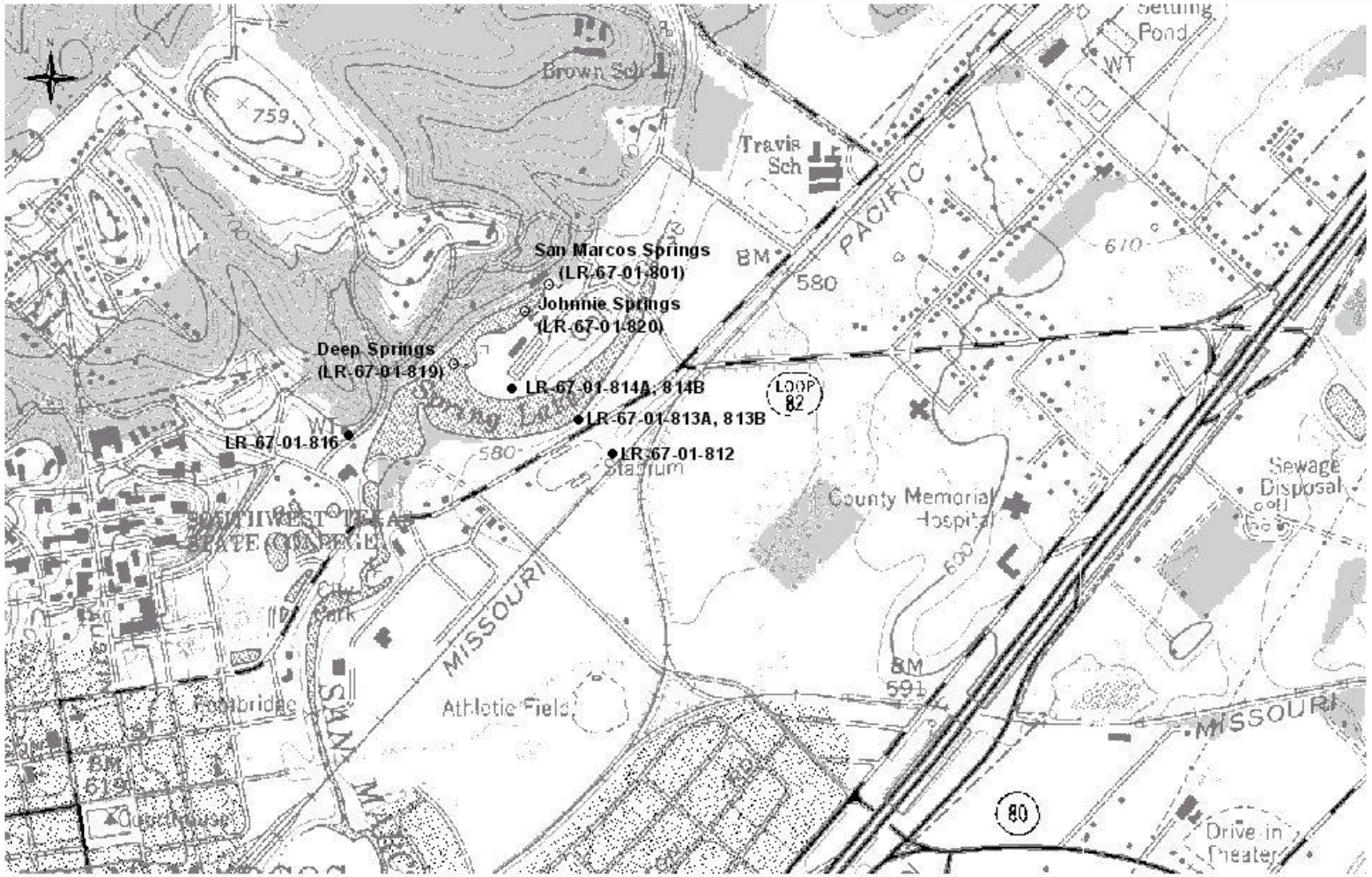


Figure 7.1c
Year 2000 Water Quality Sampling Locations near San Marcos Springs

Table 7.1 Comparison of drinking water quality standards to range of concentrations from water quality results, 2001.

Parameter	Current Maximum Contaminant Levels or Secondary Standards	Range of Concentrations Detected in 2001	Typical Range of Concentrations for the Freshwater Edwards Aquifer
Laboratory Parameters:			
pH	6.5-8.5*	6.46-8.08	6.5-8.0
Alkalinity (mg/L)	NE	176-354	200-250
Color	15 color units*	NA	NA
Conductivity(µS/cm)	NE	412-1,478	300-500
Corrosivity	Non-corrosive*	NA	NA
Hardness (mg/L)	NE	198-4200	250-300
Non-carbonate Hardness (mg/L)	NE	NA	20-50
Dissolved Solids (mg/L)	500*	198-11,888	250-450
Total Organic Carbon (mg/L)	NE	NA	1-5
Major Ions:			
Calcium (Ca) (mg/L)	NE	51.2-924	80-120
Magnesium (Mg) (mg/L)	NE	2-465	10-20
Sodium (Na) (mg/L)	NE	3.9-1,740	3-10
Potassium (K) (mg/L)	NE	0.4-83	1-2
Bicarbonate (HCO_3) (mg/L)	NE	NA	250-400
Carbonate (CO_3) (mg/L)	NE	NA	0
Sulfate (SO_4) (mg/L)	250*	5-2,633	10-30
Chloride (Cl) (mg/L)	250*	5-4,299	10-30
Fluoride (F) (mg/L)	4	0.07-5.35	0.1-0.5
Silica (SiO_2) (mg/L)	NE	4.4-18	10-20
Nutrients:			
Nitrate + nitrite as N (mg/L)	10	0.01-20.3	ND-3.0
Total Phosphorus(mg/L)	NE	0.01-0.06	ND-0.1
Microbiological Parameters:	NE		
Total Coliform (cols/100ml)	10,000 (raw water for drinking-water supplies)	0	0-5,000
Fecal Coliform (cols/100ml)	2,000 (raw water for drinking-water supplies)	0	0-150
Fecal Streptococci (cols/100ml)	NE	0	0-100
Metals:			
Aluminum (Al) (mg/L)	0.05-0.2	<0.004-0.00818	ND-210
Antimony (Sb) (mg/L)	0.006	<0.01-0.0051	ND–1.18
Arsenic (As) (mg/L)	0.05	<0.002-0.2	ND-2
Barium (Ba) (mg/L)	2	<0.01-0.16	ND-100
Beryllium (Be) (mg/L)	0.004	<0.001	ND
Cadmium (Cd) (mg/L)	0.005	<0.001	ND-1
Chromium (Cr) (mg/L)	0.1	<0.001	ND-15
Copper (Cu) (mg/L)	1**	<0.01-0.02	ND-40
Iron (Fe) (mg/L)	0.3*	<0.003-0.86	ND-500
Lead (Pb) (mg/L)	0.015**	<0.001-0.022	ND-10
Manganese (Mn) (mg/L)	0.05*	<0.001-0.0094	ND-50
Mercury (Hg) (mg/L)	0.002	<0.002	ND-1.5
Nickel (Ni) (mg/L)	0.1a	<0.001-0.00778	ND-4
Selenium (Se) (mg/L)	0.05	<0.003-0.022	ND
Silver (Ag) (mg/L)	0.183a	<0.001	ND
Thallium (Tl) (mg/L)	0.002	<0.001-0.019	ND-0.005
Zinc (Zn) (mg/L)	5*	<0.004-1.3	ND-2,000
Pesticides:			
Aldrin (µg/L)	0.005a	<0.0002	ND
Atrazine (µg/L)	3	<0.001	ND
Chlordane (µg/L)	2	<0.05	ND
DDD (µg/L)	0.355a	<0.001	ND
DDE (µg/L)	0.25a	<0.001	ND
DDT (µg/L)	0.25a	<0.001	ND
Endrin (µg/L)	2	<0.0005	ND
Halowax (µg/L)	NE	ND	ND
Heptachlor (µg/L)	0.4	<0.0005	ND
Heptachlor epoxide (µg/L)	0.2	<0.005	ND
Lindane (µg/L)	0.2	<0.0005	ND
Mirex (µg/L)	NE	<0.005	ND

(Table 7.1 continued)

Parameter	Current Maximum Contaminant Levels or Secondary Standards	Range of Concentrations Detected in 2001	Typical Range of Concentrations for the Freshwater Edwards Aquifer
Pesticides (cont'd):			
Diazinon (µg/L)	NE	<0.005	ND
Ethion (µg/L)	NE	<0.01	ND
Malathion (µg/L)	NE	<0.005	ND
Methyl Parathion (µg/L)	NE	<0.05	ND
Methyl Trithion (µg/L)	NE	NA	ND
Parathion (µg/L)	NE	<0.01	ND
Trithion (µg/L)	NE	<0.002	ND
PCB (µg/L)	0.5	<0.5	ND
Endosulfan (µg/L)	1.8a	<0.001	ND
Ethyl Trithion (µg/L)	NE	NA	ND
Perthane (µg/L)	NE	<0.01	ND
Toxaphene (µg/L)	3	<0.2	ND
Herbicides:			
2, 4-D (µg/L)	70	<0.002-0.028	ND
2, 4, 5-T (µg/L)	0.365a	0.028s	ND
2, 4, 5-TP (Silvex) (µg/L)	50	<0.001	ND
Volatile organic compounds:			
Acetone (µg/L)	3,650a	<20	ND
Acrolein (µg/L)	730a	<20	ND
Acrylonitrite (µg/L)	0.158a	<20	ND
Benzene (µg/L)	5	<1	ND
Bromoform (µg/L)	100a	<2	ND
2-Butanone (µg/L)	NE	<20	ND
Carbon disulfide (µg/L)	3,650a	<1	ND
Chlorobenzene (µg/L)	100	<1	ND
Chloroform (µg/L)	100a	<1	ND
Chloromethane (µg/L)	NE	<2	ND
1,2 Dichlorobenzene (µg/L)	600	<2	ND
1,3 Dichlorobenzene (µg/L)	75	<1	ND
1,2 Dichloroethane (µg/L)	5	<1	ND
2-Hexanone (µg/L)	NE	<5	ND
4-Methyl-2-pentanone (µg/L)	NE	<2	ND
1,1,1-Trichloroethane (µg/L)	200	<1	ND
1,1,2-Trichloroethane (µg/L)	5	<2	ND
1,2-Dichloroethane (µg/L)	5	<1	ND
1,2-Dichloropropane (µg/L)	5	<1	ND
1,1-Dichloroethylene (µg/L)	7	<1	ND
1,2,4-Trichlorobenzene (µg/L)	70	<1	ND
Carbon Tetrachloride (µg/L)	5	<1	ND
cis-1,2-Dichloroethylene (µg/L)	70	<1	ND
Ethylbenzene (µg/L)	700	<1	ND
Methylene Chloride (µg/L)	5	<2	ND
o-Dichlorobenzene (µg/L)	600	NA	ND
Naphthalene (µg/L)	NE	<1s	ND
2-Methylnaphthalene (µg/L)	NE	<1s	ND
para-Dichlorobenzene (µg/L)	75	NA	ND
Styrene (µg/L)	100	<1	ND
Tetrachloroethane (µg/L)	5	NA	ND
Tetrachloroethene (µg/L)	5	<1-7.6	ND

(Table 7.1 continued)

Parameter	Current Maximum Contaminant Levels or Secondary Standards	Range of Concentrations Detected in 2001	Typical Range of Concentrations for the Freshwater Edwards Aquifer
Volatile organic compounds: (cont'd):			
Toluene (µg/L)	1,000	<1	ND
trans-1,2-Dichloroethylene (µg/L)	100	<1	ND
Trichloroethene (µg/L)	5	<1	ND
Vinyl Chloride (µg/L)	2	<1	ND
Xylenes, total (µg/L)	10,000	<1	ND
Semivolatile organic compounds:			
Pentachlorophenol (µg/L)	1	<0.01-0.019s	ND

Data source: EPA maximum contaminant levels, 40 CFR, Part 141, 2001.
a Risk-based maximum contaminant level listed in 30 TAC Chapter 335, Subchapter S dated 7-20-2000.
NE indicates no established maximum contaminant level or secondary standard.
* Secondary drinking water standards (40 CFR, Part 143, 2001).
**"Copper and lead are regulated by a Treatment Technique action level. The action level, which triggers public water systems into taking treatment steps if exceeded in more than 10% of tap samples, which is 1.3 mg/L for copper, and for lead is 0.015 mg/L.
ND indicates not detectable
NA = not analyzed
s = stream sample

Table 7.2 Secondary drinking-water standards.

Parameter	Current Secondary Drinking Water Standard (mg/L)
Aluminum	0.05-0.2
Chloride	250
Color	15 color units
Copper	1.0
Corrosivity	Non-corrosive
Fluoride	2.0
Iron	0.3
Manganese	0.05
pH	6.5-8.5
Silver	0.10
Sulfate	250
Total Dissolved Solids (TDS)	500
Zinc	5

Data source: EPA, 40 CFR, Part 143, 2001.
The range of concentrations detected for these parameters in the Edwards Aquifer is included on **Table 7.1**. Color and corrosivity are not analyzed.

7.2 Freshwater/Saline-Water Interface Studies

The freshwater/saline-water interface of the Edwards Aquifer is a regional boundary between the fresh and saline portion of the aquifer and is defined by a mapped iso-concentration line representing 1,000 mg/L of total dissolved solids (TDS). Groundwater is commonly classified according to TDS concentrations, as shown in **Table 7.3**.

Table 7.3 Classification of groundwater quality based on total dissolved solids.

Description	TDS Concentration (mg/L)
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

Source: Winslow and Kister, 1956.

The interface varies both laterally and vertically in portions of the aquifer. Locally this line is referred to as the freshwater/saline-water interface, or "bad-water line," which defines the farthest downdip extent of potable water (Pavilicek and others, 1987). The freshwater/saline-water interface is shown in **Figures 3.1 and 7.1**. Water quality concerns related to the position and stability of the freshwater/saline-water interface have been expressed by some researchers. The limited water quality data collected during and since the drought of record in the 1950s is inconclusive as to whether encroachment of saline water is likely.

South and southeast of the interface, water from the aquifer is slightly to moderately saline and contains moderate to large concentrations of dissolved chloride and sulfate. The interface varies both laterally and vertically, as determined in several wells near the boundary. Water from some wells north of the interface, and from all wells south of the interface contains dissolved hydrogen sulfide gas. In most wells along the interface, freshwater has been encountered in the upper portion and saline water in the lower portion of the Edwards Aquifer (Groschen, 1993; Reeves, 1971). Other wells along the interface have encountered the opposite vertical distribution, with saline-water zones overlying freshwater zones, particularly in the southern area of Medina County (J.R. Waugh, oral communication, 1997).

In 1985, the former Edwards Underground Water District (EUWD) in cooperation with the USGS, TWDB and SAWS initiated a research study of the freshwater/saline-water interface. A series of seven wells were drilled in the San Antonio area that transects the freshwater/saline-water interface to detect changes in water quality as the hydraulic head in the aquifer changes. This program was implemented in response to the concern that increased aquifer withdrawals might result in encroachment of saline-water into the aquifer's freshwater zone. As part of the Authority's ongoing water quality program, monthly and other periodic samples were collected and analyzed. Other samples are collected when certain spring-discharge criteria are met.

The possibility of saline-water encroachment and subsequent deterioration of water quality in the aquifer led to the construction of two additional water quality monitor well transects across the freshwater/saline-water interface. The monitor wells were drilled and tested by the Authority with the cooperation of local entities. These transects are located in the New Braunfels and San Marcos areas (Poteet and others, 1992). Water quality in these transect wells has been relatively uniform with no significant changes since the program began. Since 1997, SAWS, working with the USGS, TWDB, and the Authority, has

continued to install transects of freshwater/saline-water interface monitoring wells. These transects include:

- Kyle Transect (installed in 1998)
- East Uvalde "Knippa Gap" Transect (installed in 1999)
- "Tri-County" (Bexar-Comal- Guadalupe) Transect (installed 2000)
- Hays – Fish Hatchery Transect (2001)

During the studies conducted to date (1986 to present), the data indicate that changes in the aquifer water levels have little effect on the water quality in wells that are directly adjacent to the freshwater/saline-water interface.

7.3 Surface Water Quality Data from Streams and Springs in the Edwards Aquifer Area

Surface water quality data is collected within the catchment area at USGS gauging stations upstream of the Edwards Aquifer Recharge Zone (EARZ). The surface water data collection sites are located within eight major stream basins that flow across and contribute significant groundwater recharge to the Edwards Aquifer within the EARZ in the San Antonio region. These include from west to east, the Nueces River, Dry Frio River, Frio River, Sabinal River, Seco Creek, Hondo Creek, Medina River, and Blanco River. Data from these sites can be used as a base level to evaluate the quality of water recharging the aquifer and the sensitivity of water quality to land use changes in various areas of the Edwards Aquifer region. Locations of the data collection sites are illustrated in **Figure 7.1**. Laboratory analyses of the samples collected in 2001 are presented in **Appendix C**. Organic compounds were detected in two of the samples, which will be discussed below. No other direct evidence of surface water contamination was seen.

In 2001, eight stream and six spring locations were analyzed for pesticides and herbicides, first in April and later in November. One herbicide, 2,4,5-T, also known as 2,4,5-trichlorophenoxyacetic acid, was detected at 0.028 mg/L in the sample from the Hondo Creek at Tarpley on November 29, 2001. It was not detected in the previous sample collected on April 19, 2001. No other pesticides or herbicides were detected in any other samples. EPA banned 2,4,5-T in 1985, although its detection indicates that it still may be in use in the Hondo Creek drainage basin. Former trade names include Farmco Fence Rider, Line Rider, Weeddone, and Trioxine. Although there is no established surface water concentration limit, the media-specific concentration established by TNRCC is 0.365 mg/L, about 10 times higher than the concentration in the creek. The Authority will continue to collect samples from Hondo Creek to monitor for the presence of herbicides and pesticides.

One semivolatile organic compound (SVOC), pentachlorophenol, was detected at 0.019 µg/L in the sample from Seco Creek at Miller Ranch collected on November 29, 2001. It was not detected in the sample from April 19, 2001. The concentration is below its MCL of 0.001 mg/L (1 µg/L). Pentachlorophenol is a wood preservative that is commonly used for treating utility poles, railroad ties, and fence posts.

Water samples from San Pedro, San Antonio, Comal, and San Marcos springs were analyzed for VOCs and SVOCs, and none were detected.

The presence of the organic chemicals indicates that surface activities can affect the water quality of streams that recharge the Edwards Aquifer. The Authority will continue to monitor water quality at the streams that cross the recharge zone.

8.0 SUMMARY

This report presents the results of the Authority's Edwards Aquifer Data Collection Program for calendar year 2001. During 2001, the Authority in cooperation with the USGS, TWDB, and SAWS collected a wide variety of data regarding the Edwards Aquifer including water levels, water quality samples, precipitation measurements, and stream and spring discharges.

Precipitation in the Edwards Aquifer region was generally above normal in 2001, especially in the spring and fall. Rainfall was 10 to 20 percent above normal in San Antonio, San Marcos, New Braunfels, Uvalde, and Hondo. Measurements from the Authority's Real Time Data Network indicated that the areas that received the highest rainfall were in southern Kendall and northern Bexar counties, while the least rainfall occurred in central Uvalde County.

The above-normal precipitation caused water levels to rise in the spring and fall in most parts of the aquifer. Water levels generally exceeded average levels in the Authority's index wells in San Antonio, Hondo, and Uvalde. Water levels ranged from 2 to almost 20 feet above average. During the summer, there was sufficient rainfall to recharge the aquifer and reduce demand, which moderated the typical seasonal decline of water levels for that time of year. Consequently, the Authority did not institute water use restrictions during the summer of 2001.

Total recharge to the Edwards Aquifer was 1,069,400 acre-feet in 2001, approximately 50 percent above average. The lowest annual recharge to the aquifer was 43,700 acre-feet in 1956, and the highest annual recharge to the aquifer was 2,486,000 acre-feet in 1992. Recharge was above average in all basins except the Frio and Dry Frio rivers, which were slightly below average. Compared to the period of record (1934-2001), recharge was higher than 2001 during only 13 other years.

Discharge from the Edwards Aquifer through springs and wells totaled 897,200 acre-feet, which also exceeded average values. The lowest annual discharge through wells and springs was 388,800 acre-feet in 1955, and the highest annual discharge was 1,130,000 acre-feet in 1992. However, municipal pumping at 245,900 acre-feet and irrigation pumping at 79,000 acre-feet, were below average compared to the last 10 years. The above-normal rainfall reduced demand for both irrigators and municipal water systems. Similarly, the higher than average water levels generated correspondingly higher springflows. Spring discharge from the aquifer in 2001 was estimated to be 529,448 acre-feet or 59 percent of the total discharge.

In 2001, the Authority and cooperating entities collected water quality samples from 73 wells, five spring groups, and nine streams. Multiple orifices were sampled at Comal, Hueco, and San Marcos springs. The water samples were analyzed for major ions, metals, TDS, hardness, and nutrients. Concentrations of major constituents are relatively uniform throughout the freshwater parts of the Edwards Aquifer. The freshwater portion of the aquifer consistently yields very hard, calcium bicarbonate water with low TDS and few detectable metals. It is generally of such high quality that it usually only requires chlorination to meet public drinking water standards. Saline water from the Edwards Aquifer contains more than 1,000 mg/L of TDS, which is largely made up of major anions and cations. In addition, samples from the saline water areas contained occasional detectable metals such as arsenic, thallium, strontium, copper, and lead at concentrations less than their MCLs. Samples from two wells in the freshwater/saline water transect in San Marcos contained arsenic (LR-67-01-814A) and lead (LR-01-813A) concentrations above their MCLs. It is not unusual for

fluoride to be detected above its secondary water quality standard in Edwards Aquifer saline water. Like groundwater from the freshwater areas, water from springs and streams also contain low concentrations of TDS and few detectable metals.

The water quality analyses also revealed organic chemicals in samples from two wells and two streams. Tetrachloroethene was detected at 7.6 µg/L in the sample from well YP-69-51-114 in Uvalde County. The source is an industrial dry cleaning operation that was destroyed by fire in 1979. The drinking water standard (MCL) for tetrachloroethene, also known as perchloroethylene (PCE), is 5 µg/L. Tetrachloroethene has been detected in this well and other wells in Uvalde since 1983, and the TNRCC has an agreed order with the responsible party for investigation and cleanup. Tetrachloroethene also was detected at 0.57 µg/L in the sample from well AY-68-29-414 in Bexar County. The Authority and TNRCC are investigating the source. The herbicide, 2,4,5-T, was detected at 0.028 mg/L in the sample from the Hondo Creek at Tarpley on November 29, 2001. EPA banned this herbicide in 1970. Finally, pentachlorophenol was detected at 0.019 µg/L in the sample from Seco Creek at Miller Ranch collected on November 29, 2001. Pentachlorophenol is a wood preservative for utility poles, railroad ties, and other materials. Except for the tetrachloroethene detected in the Uvalde well, the concentrations of the organic compounds are below established levels for drinking water standards. The Authority will continue to monitor these locations to assess long-term data trends and investigate possible sources of the contaminants.

Nitrate concentrations ranged from less than 0.01 mg/L to 4 mg/L in samples from most wells and streams in the Edwards Aquifer region. The concentration in only one sample (TD-69-31-603) exceeded the MCL (10 mg/L); the Authority is studying the trends of nitrate concentrations for evidence of contamination sources in the aquifer.

The Authority continues its programs to protect the generally excellent water quality of the aquifer through investigating groundwater contamination and identifying and analyzing anomalous data from the Authority's aquifer-wide sampling program.

9.0 DEFINITIONS

Technical terms and abbreviations used in this report are defined as follows:

Acre-foot (ac-ft) — The quantity of water required to cover one acre to a depth of one foot, equivalent to 43,560 ft^3 (cubic feet), about 325,851 gal (gallons), or 1,233 m^3(cubic meters).

Aquifer — A body of rock that contains sufficient saturated permeable material to conduct groundwater and to yield economically significant quantities of groundwater to wells and springs.

Artesian well — A well tapping confined groundwater. Water in the well rises above the level of the confined water-bearing strata under artesian pressure but does not necessarily reach the land surface.

Artesian Zone — An area where the water level from a confined aquifer stands above the top of the strata in which the aquifer is located.

Bacteria — Microscopic unicellular organisms, typically spherical, rod-like, or spiral and threadlike in shape, often clumped in colonies. Some bacteria are pathogenic (causing disease), while others perform an essential role in nature in the recycling of materials (measured in colonies/100 ml).

Conductivity — A measure of the ease with which an electrical current can be caused to flow through an aqueous solution under the influence of an applied electric field. Expressed as the algebraic reciprocal of electrical resistance (measured in microSiemens per centimeter (µS/cm) at ambient temperature). Generally, in water, the greater the total dissolved solids content, the greater the value of conductivity. See also Specific conductance.

Confined aquifer — An artesian aquifer or an aquifer bound above and below by impermeable strata, or by strata with lower permeability than the aquifer itself.

Discharge — The volume of water that passes a given point within a given period of time.

Drainage Area — The area or watershed where runoff from precipitation flows downgradient to the recharge zone of the Edwards Aquifer. Also known as the "Texas Hill Country."

Drainage basin — An area bounded by a divide and occupied by a drainage system. It consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Edwards Underground Water District (EUWD)	The regional governmental entity that preceded the Edwards Aquifer Authority.
Edwards Aquifer Authority (EAA or Authority)	The regional governmental entity established by the Texas Legislature in 1993 to "manage, preserve, and protect the Edwards Aquifer."
Freshwater/saline-water interface	The interface or area that separates total dissolved solids (TDS) values less than 1,000 mg/L (freshwater) from TDS values greater than 1,000 mg/L (saline-water). Commonly referred to as the "bad water line."
Gauging station	A particular site that systematically collects hydrologic data such as streamflow, springflow or precipitation.
Groundwater divide	A ridge or mound in the water table or potentiometric surface from which the groundwater moves away in both directions.
Micrograms per liter (µg/L)	A unit for expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. 1,000 micrograms per liter are equal to 1 milligram per liter.
Milligrams per liter (mg/L)	A unit for expressing the concentration of chemical constituents in solution as mass (milligrams) of solute per unit volume (liter) of water. 1,000 milligrams per liter are equal to 1 gram per liter.
Potentiometric surface	An imaginary surface representing the total head of groundwater and defined by the level to which water will rise in a well. Under confined conditions, the water level will rise above the producing aquifer.
Real Time Data	Instantaneous or near-instantaneous information used to monitor a current condition such as precipitation, stream flow, spring discharge, etc.
Recharge	The process involved in absorption and addition of water to the zone of saturation.
Recharge Zone	The area in which water infiltrates into the ground and eventually reaches the zone of saturation in one or more aquifers.
Semivolatile organic compounds (SVOC)	Class of naturally occurring and synthetic organic compounds such as polynuclear aromatic hydrocarbons and chlorinated hydrocarbons and pesticides; typically analyzed with gas chromatograph/mass spectrometers.

Specific conductance	A measure of the ability of an aqueous solution to conduct an electrical current. Specific conductance is the given value of conductivity adjusted to a standard temperature of 25°C. Expressed in microsiemens per centimeter (µS/cm). See also Conductivity.
Ten-year floating average	The calculated mean of the current year plus the previous nine years in a graph.
Total Dissolved Solids (TDS)	The concentration of dissolved minerals in water, usually expressed in units of milligrams per liter (mg/L).
Transect wells	A group of Edwards Aquifer monitoring wells positioned in a linear transect to monitor for changes in water quality along the freshwater/saline-water interface.
Unconfined aquifer	An aquifer, or a portion of an aquifer, with a water table and containing groundwater that is not under pressure beneath relatively impermeable rocks.
Underflow	The movement of water flowing beneath the land surface within the bed or alluvial plain of a surface stream.
Volatile organic compounds VOC)	Class of naturally occurring and synthetic organic compounds with boiling points below 200°C, typically analyzed with gas chromatograph/mass spectrometers; includes solvents such as trichloroethene, tetrachloroethene, and carbon tetrachloride.
Water table	The interface between the zone of saturation and the zone of aeration, where the surface pressure of unconfined groundwater is equal to the atmospheric pressure. The water table is also known as the piezometric surface.
Water level observation well	A water well used to measure the water level or potentiometric surface of water-bearing strata such as the Edwards Aquifer, Leona Gravel Aquifer, and Lower Glen Rose (Trinity) Aquifer.
Zone of aeration	The subsurface zone where the voids and pore spaces are filled with water under less pressure than that of the atmosphere and air.
Zone of saturation	The subsurface zone in which all voids and pore spaces are filled with water under pressure greater than that of the atmosphere.

10.0 REFERENCES

Bader, R. W., Walthour, S. D., and Waugh, J.R., 1993, Edwards Aquifer hydrogeologic status report for 1992: Edwards Underground Water District Report 93-05, 71 p.

Edwards Aquifer Authority, 2001 Open Data Files.

Groschen, G.E., 1993, Estimation of recharge by the U.S. Geological Survey, from Texas sections joint spring meeting and Texas hydrology roundup, Austin, Texas, (USA), April, 16, 1993, Jennings, Marshall E., (ed.), in Proceedings: Texas sections joint spring meeting and Texas hydrology roundup, American Institute of Hydrology, 4 p.

Hem, J.D., 1992, Study and interpretation of the chemical characteristics of natural water, third edition, U.S. Geological Survey Water-Supply Paper 2254, 263 p.

Pavilicek, D.J., Small, T.A., and Rettmann, P.L., 1987, Hydrogeologic data from a study of the freshwater zone/saline-water zone interface in the Edwards Aquifer, San Antonio Region, Texas: U.S. Geological Survey Open-File Report 87-389, 108 p.

Poteet, D., Collier, H., and Maclay, R.W., 1992, Investigation of the fresh/saline-water interface in the Edwards Aquifer in New Braunfels and San Marcos, Texas: San Antonio, Texas, Edwards Underground Water District Report 92-02, 182 p.

Puente, C., 1978, Method of estimating natural recharge to the Edwards Aquifer in the San Antonio area, Texas: U.S. Geological Survey Water-Resources Investigations Report 78-10, 38 p.

Reeves, R.D., 1971 Results of test drilling at the San Marcos Fish Hatchery, Texas: U.S. Geological Survey Open-File Report, 11 p.

Schultz, A.L., 1992, Using geophysical logs in the Edwards Aquifer to estimate water quality along the freshwater/saline-water interface (Uvalde to San Antonio, Texas): Edwards Underground Water District Report 92-03, 47 p.

Schultz, A.L., 1993, Defining the Edwards Aquifer freshwater/saline-water interface with geophysical logs and measured data (San Antonio to Kyle, Texas): Edwards Underground Water District Report 93-06, 81 p.

Schultz, A.L., 1994, 1994 Review and update of the position of the Edwards Aquifer freshwater/saline-water interface from Uvalde to Kyle, Texas: Edwards Underground Water District Report 94-05, 31 p.

Texas Natural Resources Conservation Commission (TNRCC), 2000, 30 TAC Chapter 335, Subchapter S - Industrial Solid Waste and Municipal Hazardous Waste, July 2000.

United States Department of Commerce, 1970-1994, Climatological Data, Texas, Annual Summary: National Oceanic and Atmospheric Administration (NOAA), v 75-97, no. 13.

United States Department of Commerce, 2002, Climatological Data Monthly summaries: National Oceanic and Atmospheric Administration (NOAA), http://www.srh.noaa.gov/ewx/html/Climate.htm

United States Environmental Protection Agency, 2001, Maximum contaminant levels (subpart of part 141, National primary drinking water regulations): U.S. Code of Federal Regulations, Title 40, parts 100-149.

United States Environmental Protection Agency, 2001, National primary and secondary drinking water regulations; synthetic organic compounds and inorganic chemicals (section 141.32 – lead and copper public notifications): U.S. Code of Federal Regulations, Title 40, parts 100-149.

United States Environmental Protection Agency, 2001, Secondary drinking water standards (part 143, National secondary drinking water regulations): U.S. Code of Federal Regulations, Title 40, parts 100-149.

United States Geological Survey, 1996, Basic data collection joint funding agreement with Edwards Aquifer Authority for Fiscal Year 1995-1996: Authority open files.

Walthour, S.D., Waugh, J.R., and Sutton, C.M., 1994, Edwards Aquifer hydrogeologic report for 1993: Edwards Underground Water District Report 94-04, 178 p.

Walthour, S.D., Waugh, J.R., and O'Connor, J., 1995, Edwards Aquifer hydrogeologic report for 1994: Edwards Underground Water District Report 95-07, 124 p.

Waugh, J.R., 1993, South Medina County observation well report: Edwards Underground Water District Report 93-11, 10 p.

Weather Modification, Inc., 2001, Edwards Aquifer Precipitation Enhancement Program – Final Report 2001 – A program designed for seeding of convective clouds with glaciogenic nuclei to augment precipitation for the Edwards Aquifer Region, Weather Modification, Inc., Fargo, ND, 76 p.

Winslow, A.G., and Kister, L.R., 1956, Saline-water resources of Texas: U.S. Geological Survey Water-Supply Paper 1365, 105 p.

APPENDIX A – Year 2001 Water Level Data for Selected Wells

Table A-1 City of Uvalde index well (YP-69-50-302) daily high water levels (in feet above msl), 2001.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	873.4	874.9	875.7	876.5	876.3	875.9	872.7	873.1	873.8	874.7	874.8	875.6
2	873.4	874.9	875.7	876.5	876.2	875.8	872.9	873.1	873.9	874.8	874.8	875.7
3	873.5	875.0	875.8	876.5	876.2	875.7	873.0	873.1	873.9	874.8	874.8	875.8
4	873.5	875.0	875.8	876.6	876.1	875.6	873.1	873.2	873.9	874.8	874.7	875.8
5	873.6	875.0	875.8	876.6	876.1	875.5	873.1	873.2	874.0	874.8	874.7	875.9
6	873.7	875.1	875.8	876.7	876.2	875.3	873.2	873.1	874.1	874.8	874.7	876.0
7	873.7	875.1	875.9	876.7	876.3	875.2	873.2	873.1	874.2	874.8	874.6	876.0
8	873.7	875.2	875.9	876.7	876.3	875.0	873.3	873.1	874.2	874.8	874.6	876.1
9	873.8	875.2	875.9	876.7	876.3	874.8	873.3	873.1	874.2	874.8	874.6	876.1
10	873.9	875.2	876.0	876.7	876.4	874.7	873.3	873.1	874.2	874.8	874.7	876.2
11	873.9	875.2	876.0	876.7	876.4	874.6	873.3	873.1	874.3	874.9	874.7	876.3
12	874.0	875.3	876.0	876.7	876.4	874.5	873.4	873.1	874.3	874.9	874.7	876.3
13	874.0	875.3	876.0	876.6	876.4	874.4	873.4	873.0	874.3	874.9	874.7	876.4
14	874.1	875.3	876.1	876.6	876.4	874.3	873.4	873.0	874.3	874.9	874.7	876.5
15	874.2	875.4	876.1	876.6	876.3	874.2	873.4	873.0	874.3	875.0	874.8	876.5
16	874.3	875.4	876.1	876.6	876.3	874.0	873.4	873.0	874.4	874.9	874.8	876.6
17	874.3	875.4	876.1	876.6	876.2	873.8	873.4	873.0	874.4	874.9	874.9	876.6
18	874.3	875.4	876.2	876.7	876.1	873.7	873.4	873.1	874.4	875.0	874.9	876.7
19	874.3	875.5	876.2	876.7	876.0	873.6	873.3	873.1	874.4	875.0	874.9	876.7
20	874.4	875.5	876.2	876.7	876.0	873.4	873.3	873.1	874.4	874.9	875.0	876.7
21	874.4	875.5	876.3	876.7	876.0	873.3	873.4	873.1	874.4	874.9	875.1	876.8
22	874.5	875.5	876.3	876.7	875.9	873.3	873.4	873.1	874.5	874.9	875.2	876.9
23	874.5	875.6	876.3	876.7	875.8	873.2	873.3	873.0	874.6	874.9	875.2	876.9
24	874.6	875.6	876.3	876.7	875.8	873.2	873.3	873.0	874.7	874.9	875.2	876.9
25	874.6	875.6	876.3	876.7	875.8	873.2	873.2	873.0	874.7	874.9	875.3	877.0
26	874.7	875.7	876.4	876.7	875.8	873.2	873.2	873.1	874.7	874.8	875.4	877.0
27	874.7	875.7	876.4	876.6	875.9	873.0	873.2	873.4	874.7	874.8	875.4	877.1
28	874.8	875.7	876.4	876.5	875.9	872.9	873.2	873.4	874.7	874.8	875.4	877.1
29	874.8		876.4	876.4	875.9	872.8	873.1	873.5	874.7	874.8	875.5	877.1
30	874.9		876.5	876.4	875.9	872.7	873.1	873.6	874.7	874.8	875.6	877.1
31	874.9		876.5		875.9		873.1	873.7		874.8		877.2

Table A-2 City of Hondo index well (TD-69-47-306) daily high water levels (in feet above msl), 2001.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	722.4	727.2	728.4	731.6	731.8	715.3	710.5	705.8	712.9	720.7	722.3	731.7
2	722.3	727.1	728.6	731.8	731.7	714.4	711.4	705.6	714.4	720.8	722.0	732.0
3	722.4	727.4	728.8	731.8	731.4	713.7	712.2	705.6	715.6	720.8	721.7	732.4
4	722.6	727.5	728.7	731.7	731.2	713.4	712.5	705.3	716.5	721.2	721.5	732.7
5	722.6	727.6	728.6	731.6	731.7	711.5	712.9	705.5	717.4	721.5	721.5	732.8
6	722.7	727.7	728.8	731.5	732.0	710.1	713.0	705.8	719.4	721.5	721.5	733.0
7	722.7	727.8	728.9	731.2	732.4	708.4	712.6	705.1	720.8	721.2	721.4	733.2
8	722.3	727.8	729.2	731.1	732.8	708.1	713.0	704.5	721.8	720.9	721.4	733.3
9	722.3	727.7	729.1	731.2	733.5	708.6	713.0	704.8	722.2	721.0	721.2	733.7
10	722.5	727.4	729.4	730.8	734.0	709.2	712.8	705.0	722.7	721.1	721.1	734.1
11	722.9	727.5	729.6	730.7	734.3	708.8	712.5	704.6	722.9	721.2	721.2	734.5
12	723.4	727.6	729.5	730.2	734.3	706.6	712.0	704.5	723.3	721.5	721.7	734.7
13	723.9	727.8	729.4	730.0	734.4	705.0	711.3	704.5	723.4	722.2	721.8	734.9
14	724.3	727.9	729.6	730.2	734.5	704.3	711.2	704.3	723.5	722.9	721.8	735.1
15	724.6	728.0	729.7	730.1	734.5	705.0	711.1	704.0	723.5	723.3	722.5	735.3
16	724.9	728.0	729.7	730.1	733.8	705.1	711.0	704.0	723.5	723.5	724.1	735.4
17	725.1	727.7	729.9	729.8	733.5	N/A	710.5	703.8	723.5	723.8	725.8	735.3
18	725.4	728.0	730.2	729.7	732.6	706.3	710.0	703.6	723.3	724.0	726.9	735.5
19	725.4	728.2	730.4	729.9	731.1	705.8	709.5	704.2	723.1	724.1	727.8	735.4
20	725.7	728.2	730.6	729.7	730.2	705.4	708.9	704.5	722.5	723.8	728.7	735.4
21	725.9	728.3	730.8	729.1	729.1	704.7	708.6	704.2	722.1	723.7	729.5	735.7
22	726.1	728.1	731.1	728.7	726.2	704.8	708.3	704.3	721.9	723.6	730.1	735.8
23	726.4	728.3	731.1	729.0	724.2	705.0	708.1	704.1	722.1	723.5	730.7	735.7
24	726.4	728.5	731.0	730.0	722.2	707.1	707.7	703.8	722.3	723.4	730.6	735.6
25	726.5	728.1	730.9	730.6	723.1	707.9	707.6	703.5	722.0	722.8	731.0	735.7
26	726.7	728.1	730.9	731.1	723.0	708.0	707.6	703.1	721.9	722.2	731.2	735.7
27	726.9	728.2	731.1	731.4	722.1	707.9	707.1	704.6	722.0	722.2	731.3	735.7
28	727.1	728.3	731.4	731.7	721.3	708.5	706.6	706.2	721.6	722.3	731.4	735.7
29	727.2		731.5	731.8	719.6	709.2	706.7	707.4	721.5	722.1	731.6	735.7
30	727.3		731.4	731.8	717.6	709.6	706.7	708.8	721.2	722.0	731.7	735.5
31	727.1		731.4		716.4		706.3	710.9		722.3		735.4

"N/D" indicates no data available.

Table A-3 City of Castroville well (TD-68-41-301) daily high water levels (in feet above msl), 2001.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	701.5	705.8	706.8	N/D	N/D	N/D	689.2	N/D	N/D	700.3	701.3	710.1
2	701.5	705.9	707.3	N/D	N/D	N/D	690.1	N/D	N/D	700.2	701.0	710.2
3	701.5	706.2	707.3	N/D	N/D	N/D	690.8	N/D	N/D	700.1	700.8	710.5
4	701.7	706.4	707.5	N/D	N/D	N/D	691.1	N/D	N/D	700.2	700.7	710.8
5	701.8	706.4	706.9	N/D	N/D	N/D	691.3	N/D	N/D	700.4	700.5	710.9
6	701.8	706.6	707.1	N/D	N/D	N/D	691.3	N/D	N/D	700.4	700.5	711.1
7	701.9	706.6	707.2	N/D	N/D	N/D	691.2	N/D	N/D	700.4	700.4	711.3
8	701.6	706.6	N/D	N/D	N/D	N/D	691.0	N/D	N/D	700.1	700.4	712.1
9	701.6	706.7	N/D	N/D	N/D	N/D	691.0	N/D	N/D	700.0	700.4	711.6
10	705.7	706.3	N/D	N/D	N/D	N/D	690.9	N/D	N/D	700.0	700.6	712.0
11	702.1	706.4	N/D	N/D	N/D	N/D	690.7	N/D	N/D	700.1	700.7	712.4
12	702.6	706.5	N/D	N/D	N/D	N/D	690.2	N/D	N/D	701.7	700.8	712.6
13	703.1	706.5	N/D	N/D	N/D	N/D	689.8	N/D	N/D	702.7	700.9	712.7
14	703.4	706.6	N/D	N/D	N/D	N/D	689.3	N/D	N/D	701.5	701.2	712.9
15	703.7	706.7	N/D	N/D	N/D	N/D	689.0	N/D	N/D	702.0	700.3	713.1
16	704.0	707.4	N/D	N/D	N/D	N/D	689.0	N/D	N/D	702.2	700.3	713.2
17	704.7	706.3	N/D	N/D	N/D	N/D	688.7	N/D	N/D	702.6	700.3	713.1
18	704.6	706.5	N/D	N/D	N/D	N/D	688.3	N/D	N/D	702.9	700.8	713.3
19	704.6	706.7	N/D	N/D	N/D	N/D	688.0	N/D	701.5	702.9	704.5	713.2
20	704.7	706.8	N/D	N/D	N/D	N/D	687.6	N/D	701.4	702.8	707.1	713.1
21	704.8	706.8	N/D	N/D	N/D	N/D	687.3	N/D	701.1	702.7	707.8	713.3
22	704.9	706.7	N/D	N/D	N/D	N/D	686.9	N/D	702.1	702.6	708.5	713.4
23	705.1	707.0	N/D	N/D	N/D	N/D	686.3	N/D	700.9	702.5	709.0	713.3
24	705.3	707.0	N/D	N/D	N/D	N/D	685.9	N/D	701.1	702.5	709.0	713.2
25	705.6	706.7	N/D	N/D	N/D	N/D	N/D	N/D	701.1	701.9	709.1	713.3
26	705.8	706.6	N/D	N/D	N/D	N/D	N/D	N/D	701.1	701.5	709.4	713.3
27	705.7	706.7	N/D	N/D	N/D	N/D	N/D	N/D	701.1	701.4	709.4	713.4
28	705.9	706.7	N/D	N/D	N/D	688.0	N/D	N/D	701.0	701.5	709.5	713.1
29	705.9		N/D	N/D	N/D	688.5	N/D	N/D	700.8	701.2	709.6	712.7
30	706.0		N/D	N/D	N/D	688.5	N/D	N/D	700.6	701.0	709.7	711.8
31	705.6		N/D		N/D		N/D	N/D		701.2		712.2

Table A-4 Bexar County index well J-17 (AY-68-37-203) daily high water levels (in feet above msl), 2001.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	676.7	680.4	680.0	681.9	681.0	673.2	666.8	655.8	669.2	675.0	675.3	682.6
2	676.6	680.4	680.0	681.7	680.8	673.1	667.2	655.5	670.6	674.8	674.9	682.7
3	676.4	680.5	680.3	681.6	680.7	671.9	667.6	655.1	671.2	674.6	675.0	682.8
4	676.4	680.7	680.5	681.4	680.7	671.2	667.8	655.8	671.7	674.7	675.0	683.1
5	676.5	680.5	680.3	681.5	681.2	670.7	667.7	655.8	672.5	674.7	674.7	683.2
6	676.5	680.5	680.5	681.4	681.8	670.0	667.1	655.2	673.6	675.0	674.6	683.2
7	676.6	680.4	680.5	681.3	682.0	669.3	666.8	654.4	674.7	674.8	674.6	683.3
8	676.4	680.4	680.6	681.2	682.3	668.7	666.6	654.1	675.5	674.5	674.4	683.5
9	676.4	680.4	680.5	680.8	682.6	669.1	665.9	654.0	676.0	674.3	674.7	683.9
10	676.6	680.4	680.7	680.5	682.8	668.9	665.3	653.6	676.2	674.3	675.3	684.1
11	677.4	680.4	680.8	680.3	682.8	667.7	664.8	654.1	676.2	674.3	675.6	684.3
12	677.8	680.3	680.8	680.2	682.8	666.9	664.3	654.0	676.3	674.5	675.4	684.5
13	678.4	680.4	680.8	680.0	682.8	665.8	663.9	653.1	676.3	676.0	675.3	684.7
14	678.7	680.2	680.8	680.1	682.7	664.7	663.5	652.9	676.2	676.8	675.4	684.7
15	678.8	680.2	681.1	679.9	682.5	664.9	663.2	653.0	676.3	677.0	676.4	684.9
16	678.8	680.1	681.2	679.7	682.2	666.6	662.4	652.8	676.3	676.9	678.9	685.3
17	678.9	680.2	681.3	679.4	681.7	667.0	661.8	653.6	676.0	677.1	680.0	685.2
18	679.0	680.4	681.7	679.3	681.2	666.1	661.3	653.4	675.8	677.1	680.7	685.4
19	679.2	680.4	681.5	679.1	680.9	665.5	661.0	653.4	675.5	676.9	681.2	685.3
20	679.5	680.2	681.7	679.1	680.7	664.9	660.6	654.0	675.3	677.0	681.4	685.3
21	679.6	680.2	681.8	679.0	680.0	664.3	660.6	654.0	674.9	676.8	681.8	685.2
22	679.6	680.0	681.8	678.7	679.5	663.9	660.6	653.8	675.0	676.7	682.1	685.4
23	679.7	680.2	681.6	678.9	678.8	663.9	659.2	653.5	675.5	676.4	682.4	685.3
24	679.8	680.4	681.9	679.9	677.9	666.0	658.5	652.9	675.6	676.2	682.5	685.3
25	679.8	680.2	682.0	680.3	677.3	666.9	658.1	653.0	675.7	675.8	682.6	685.3
26	679.8	680.0	681.7	680.7	677.0	666.8	658.0	653.2	675.7	675.6	682.4	685.2
27	679.9	679.9	681.7	681.1	676.4	666.6	657.5	654.9	675.7	675.6	682.3	685.2
28	680.1	679.8	681.8	681.2	675.7	666.5	657.7	656.7	675.6	675.6	682.2	685.0
29	680.2		682.0	681.2	674.7	666.4	657.5	659.5	675.5	675.4	682.4	685.0
30	680.5		681.9	681.0	673.8	666.6	657.0	663.3	675.3	675.1	682.4	684.9
31	680.3		682.0		673.3		656.3	666.6		675.3		684.9

"N/D" indicates no data available.

Table A-5 Landa Park well (DX-68-23-302) daily high water levels (in feet above msl), 2001.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	626.8	627.3	627.4	627.6	627.5	627.2	626.7	625.1	625.7	626.8	626.9	627.7
2	626.8	627.3	627.4	627.6	627.5	627.2	626.4	625.1	626.0	626.8	626.9	627.8
3	626.8	627.3	627.4	627.6	627.5	627.1	626.3	625.0	626.0	626.8	626.9	627.8
4	626.8	627.3	627.4	627.6	627.5	627.1	626.3	625.0	626.0	626.8	626.9	627.8
5	626.8	627.3	627.4	627.6	627.5	627.0	626.3	625.0	626.0	626.8	626.9	627.8
6	626.8	627.4	627.4	627.6	627.6	626.9	626.3	624.9	626.2	626.8	626.9	627.9
7	626.8	627.4	627.4	627.6	627.6	626.9	626.3	624.9	626.3	626.8	626.9	627.9
8	626.8	627.4	627.4	627.6	627.6	626.8	626.3	624.9	626.3	626.8	626.8	627.9
9	626.8	627.4	627.4	627.6	627.6	626.8	626.2	624.8	626.4	626.8	626.8	627.9
10	627.2	627.4	627.4	627.5	627.6	626.8	626.2	624.8	626.5	626.8	626.8	628.0
11	627.0	627.4	627.5	627.5	627.6	626.7	626.2	624.7	626.5	626.8	626.9	628.2
12	627.0	627.4	627.5	627.5	627.6	626.7	626.1	624.7	626.5	626.8	626.9	628.1
13	627.0	627.4	627.5	627.5	627.7	626.6	626.0	624.7	626.6	627.3	626.9	628.1
14	627.0	627.4	627.5	627.5	627.7	626.5	626.0	624.7	626.6	626.9	626.9	628.1
15	627.0	627.4	627.5	627.5	627.6	626.5	625.9	624.6	626.6	627.0	626.9	628.3
16	627.0	627.4	627.5	627.5	627.6	626.5	625.9	624.6	626.6	627.0	627.3	628.3
17	627.1	627.4	627.5	627.5	627.6	626.5	625.9	624.6	626.6	627.0	627.3	628.2
18	627.1	627.4	627.5	627.4	627.6	626.5	625.8	624.6	626.7	627.0	627.4	628.3
19	627.1	627.4	627.5	627.4	627.6	626.5	625.8	624.6	626.7	627.0	627.5	628.2
20	627.1	627.4	627.5	627.4	627.6	626.4	625.7	624.6	626.7	627.0	627.5	628.2
21	627.2	627.4	627.5	627.4	627.8	626.3	625.7	624.6	626.7	627.0	627.5	628.3
22	627.2	627.4	627.5	627.4	627.6	626.2	625.7	624.6	626.7	627.0	627.6	628.3
23	627.2	627.4	627.5	627.8	627.5	626.2	625.6	624.6	626.7	627.0	627.6	628.3
24	627.2	627.4	627.6	627.4	627.5	626.3	625.5	624.5	626.7	627.0	627.6	628.3
25	627.2	627.4	627.6	627.4	627.5	626.3	625.4	624.5	626.7	627.0	627.7	628.3
26	627.2	627.4	627.6	627.5	627.4	626.3	625.4	624.5	626.8	626.9	627.7	628.3
27	627.2	627.4	627.6	627.5	627.4	626.3	625.4	624.5	626.8	626.9	627.7	628.3
28	627.3	627.4	627.6	627.5	627.4	626.3	625.3	624.6	626.8	626.9	N/D	628.3
29	627.3		627.6	627.5	627.3	626.2	625.3	624.9	626.8	626.9	N/D	628.3
30	627.3		627.6	627.5	627.3	626.2	625.3	625.4	626.8	626.9	627.7	628.3
31	627.3		627.6		627.2		625.2	625.4		626.9		628.3

Table A-6 Knispel well (LR 67-01-809) daily high water levels (in feet above msl), 2001.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	N/D	N/D	N/D	579.5	579.2	578.7	578.2	577.5	578.4	577.73	N/D	580.86
2	N/D	N/D	N/D	579.5	579.2	578.7	578.2	577.5	578.5	577.71	N/D	580.97
3	N/D	N/D	N/D	579.5	579.2	578.6	578.3	577.5	578.5	577.67	N/D	581.12
4	N/D	N/D	N/D	579.5	579.1	578.6	578.2	577.4	578.5	577.64	N/D	581.21
5	N/D	N/D	N/D	579.5	579.2	578.6	578.1	577.4	578.6	577.62	N/D	581.22
6	N/D	N/D	N/D	579.5	579.2	578.5	578.1	577.4	578.6	577.57	N/D	581.26
7	N/D	N/D	N/D	579.5	579.4	578.5	578.1	577.4	578.6	577.56	N/D	581.28
8	N/D	N/D	579.2	579.4	579.4	578.4	578.0	577.3	578.6	577.55	577.25	581.4
9	N/D	N/D	579.2	579.4	579.4	578.4	578.0	577.3	578.6	577.51	577.25	581.53
10	N/D	N/D	579.2	579.4	579.4	578.4	578.0	577.3	578.6	577.5	577.24	N/D
11	N/D	N/D	579.2	579.4	579.4	578.4	578.0	577.2	578.6	577.47	577.21	N/D
12	N/D	N/D	579.3	579.3	579.3	578.4	578.0	577.2	578.5	577.47	577.21	N/D
13	N/D	N/D	579.3	579.3	579.3	578.3	577.9	577.1	578.5	577.51	577.75	N/D
14	N/D	N/D	579.4	579.3	579.2	578.3	577.9	577.1	578.5	577.57	578.68	N/D
15	N/D	N/D	579.5	579.3	579.2	578.3	577.9	577.1	578.4	577.61	579.39	N/D
16	N/D	N/D	579.5	579.3	579.2	578.3	577.8	577.0	578.4	577.6	578.92	N/D
17	N/D	N/D	579.5	579.2	579.1	578.3	577.8	577.0	578.4	577.63	578.8	N/D
18	N/D	N/D	579.5	579.2	579.1	578.3	577.8	577.0	578.4	577.64	579.33	N/D
19	N/D	N/D	579.5	579.2	579.1	578.3	577.8	577.0	578.3	577.62	580.05	N/D
20	N/D	N/D	579.6	579.2	579.1	578.3	577.8	577.0	578.2	577.6	580.5	N/D
21	N/D	N/D	579.6	579.1	579.0	578.3	577.7	577.0	578.1	577.58	580.53	N/D
22	N/D	N/D	579.6	579.1	579.0	578.3	577.7	577.0	578.0	577.56	580.53	N/D
23	N/D	N/D	579.6	579.3	578.9	578.3	577.7	576.9	578.0	577.54	580.52	N/D
24	N/D	N/D	579.6	579.3	578.9	578.3	577.7	576.9	578.0	577.52	580.54	N/D
25	N/D	N/D	579.5	579.3	578.9	578.3	577.7	576.9	577.9	577.48	580.55	N/D
26	N/D	N/D	579.5	579.3	578.9	578.2	577.6	576.9	577.9	577.47	580.55	N/D
27	N/D	N/D	579.5	579.3	578.8	578.2	577.6	576.8	577.9	577.46	580.53	N/D
28	N/D	N/D	579.6	579.2	578.8	578.2	577.6	576.8	577.9	577.46	580.7	581.9
29	N/D		579.6	579.2	578.8	578.1	577.6	576.9	577.8	577.44	580.81	582.11
30	N/D		579.6	579.2	578.7	578.1	577.6	577.0	577.8	577.42	580.85	582.27
31	N/D		579.5		578.7		577.5	577.7		577.42		582.42

"N/D" indicates no data available. Measurements after October 1, 2001 are provisional.

APPENDIX B – Year 2001 Hydrographs for Index Wells and Springs

Figure B-1. Bexar County Index Well (AY-68-37-203 (J-17))
Hydrograph of Groundwater Elevation vs. Precipitation at San Antonio Intl. Airport

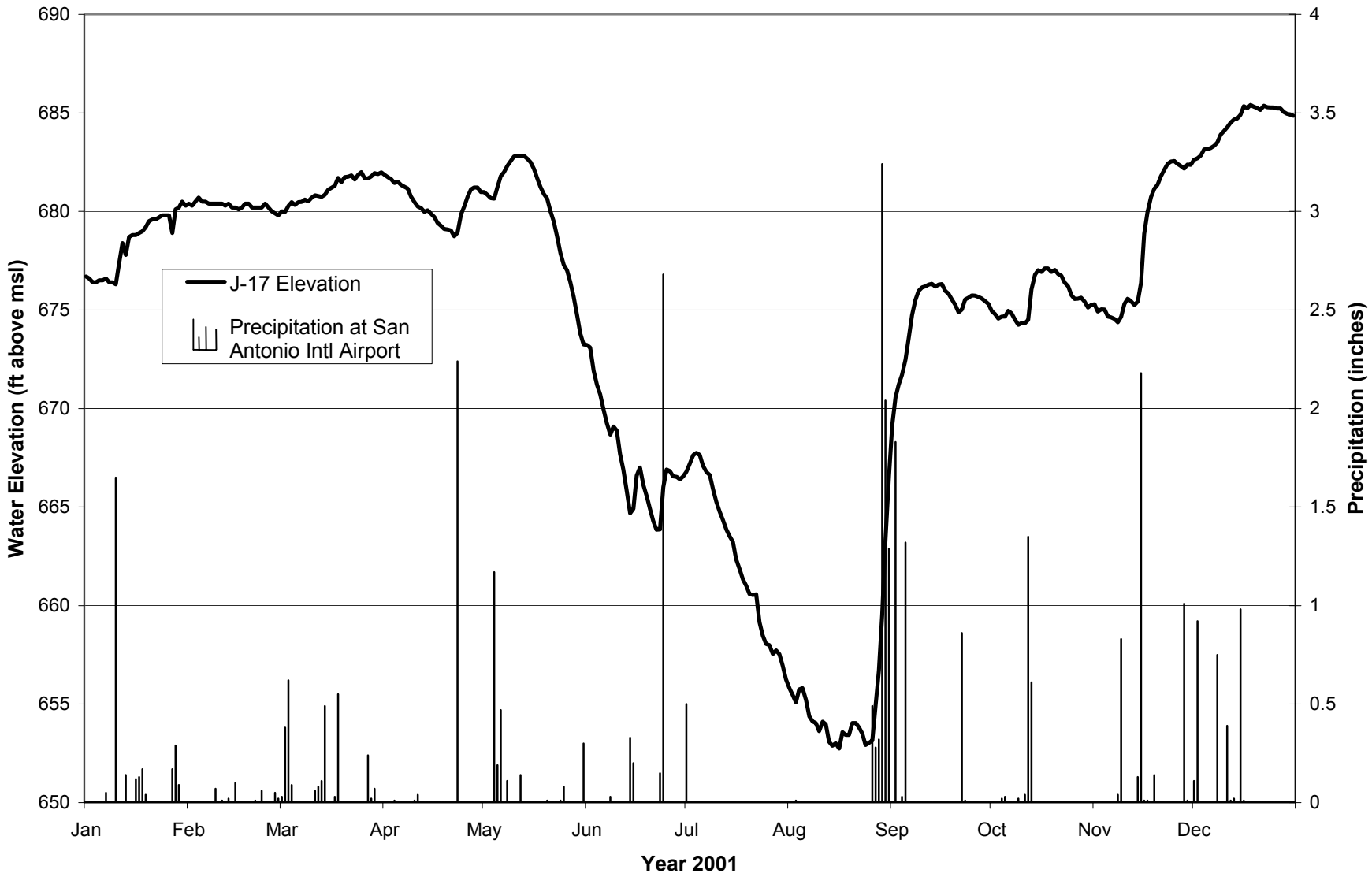


Figure B-2. City of Hondo Index Well (TD-69-47-306)
Hydrograph of Groundwater Elevation vs. Precipitation at Hondo

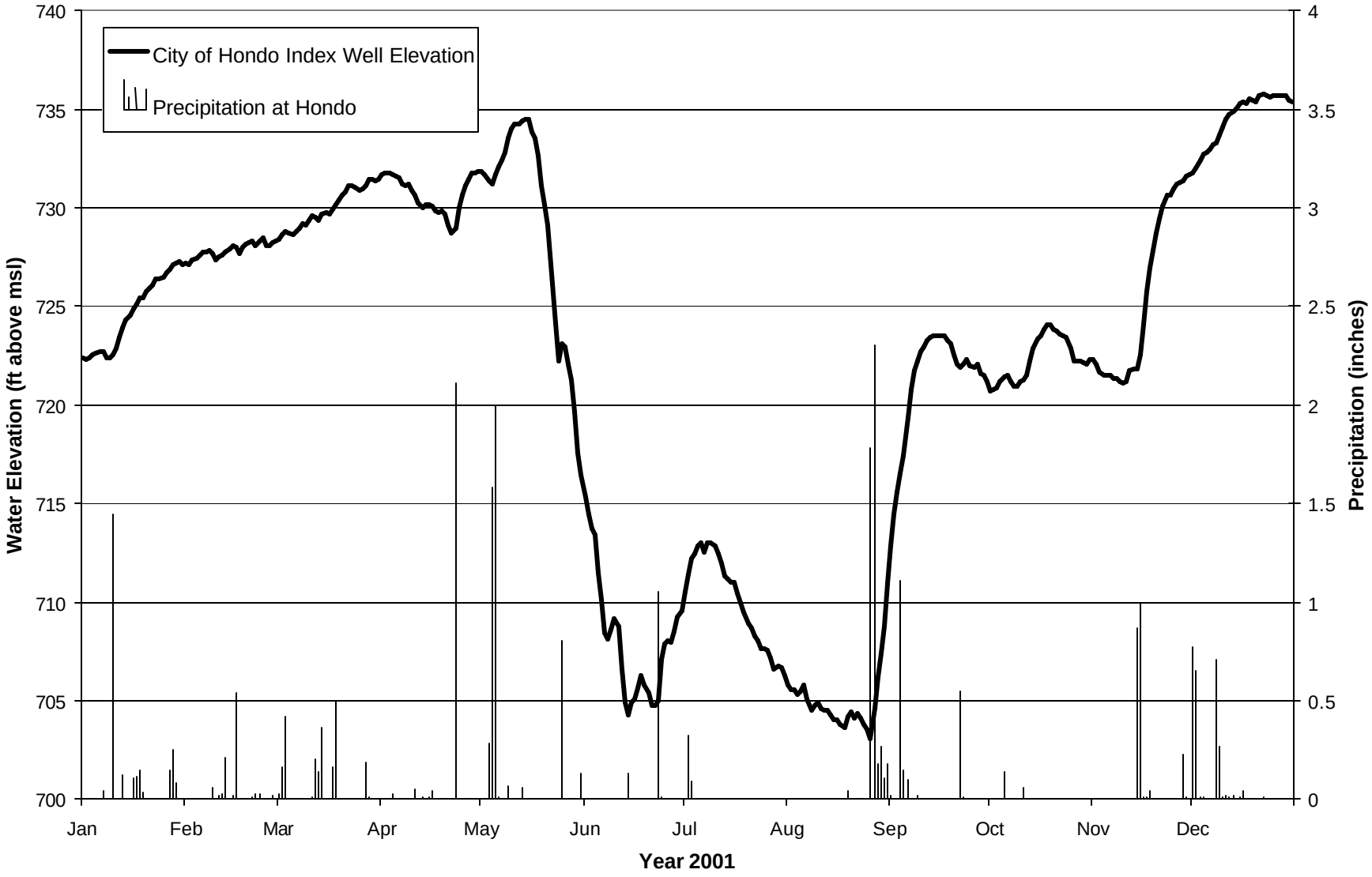


Figure B-3. City of Uvalde Index Well (YP-69-50-302 (J-27))
Hydrograph of Groundwater Elevation vs. Precipitation at Uvalde

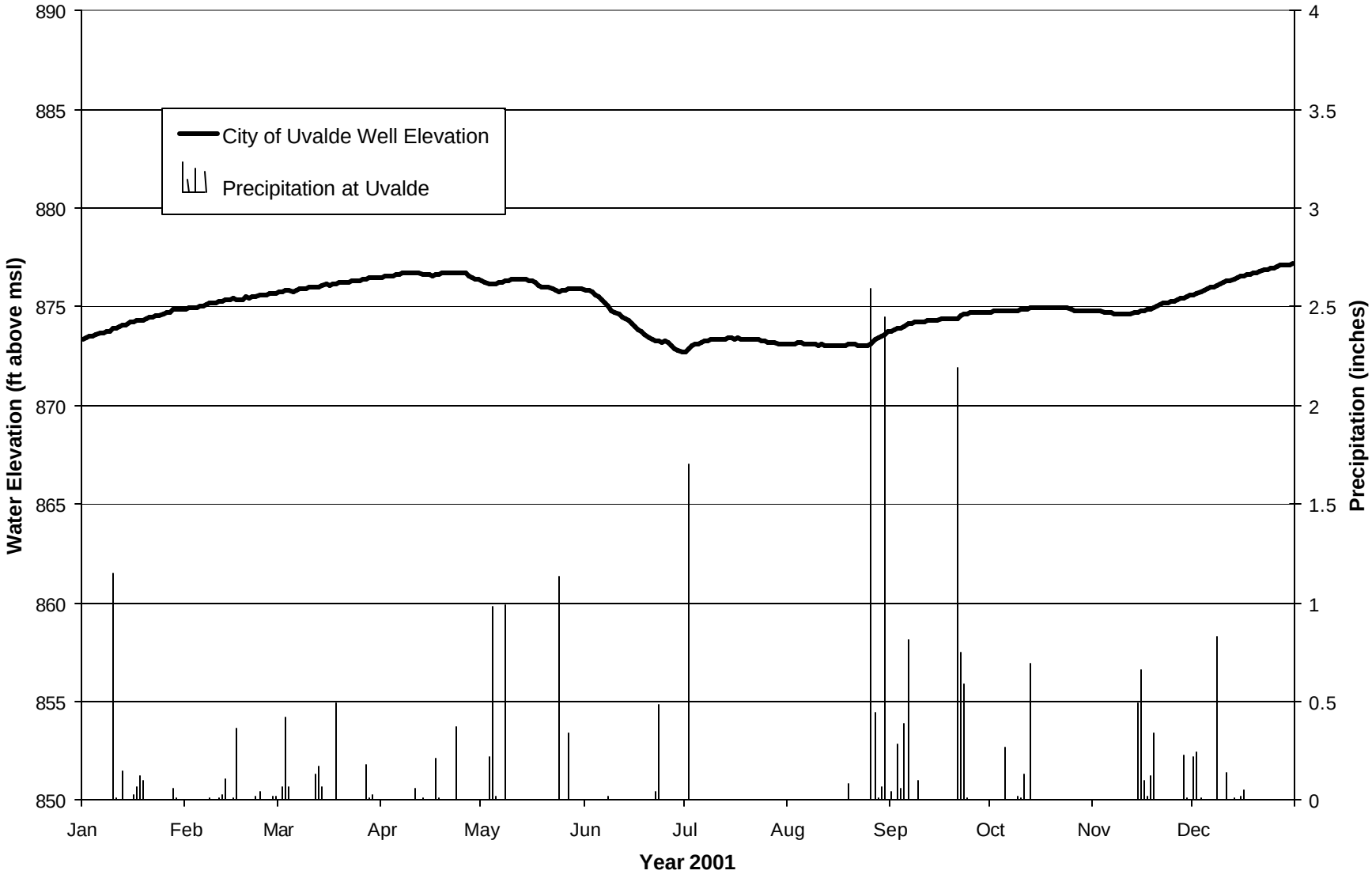


Figure B-4. Comal Springflow
Hydrograph of Springflow vs. Precipitation at San Antonio Intl. Airport

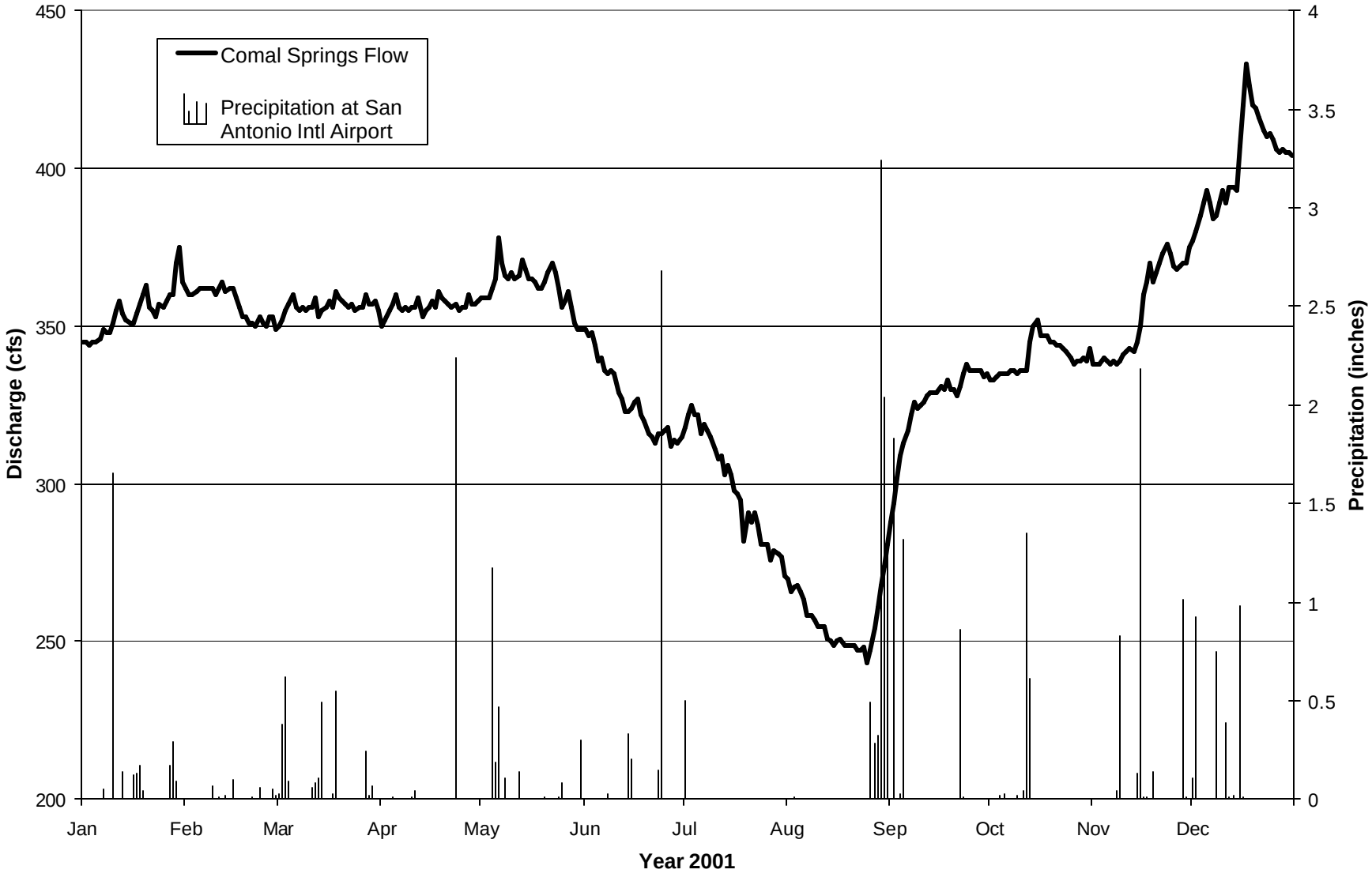
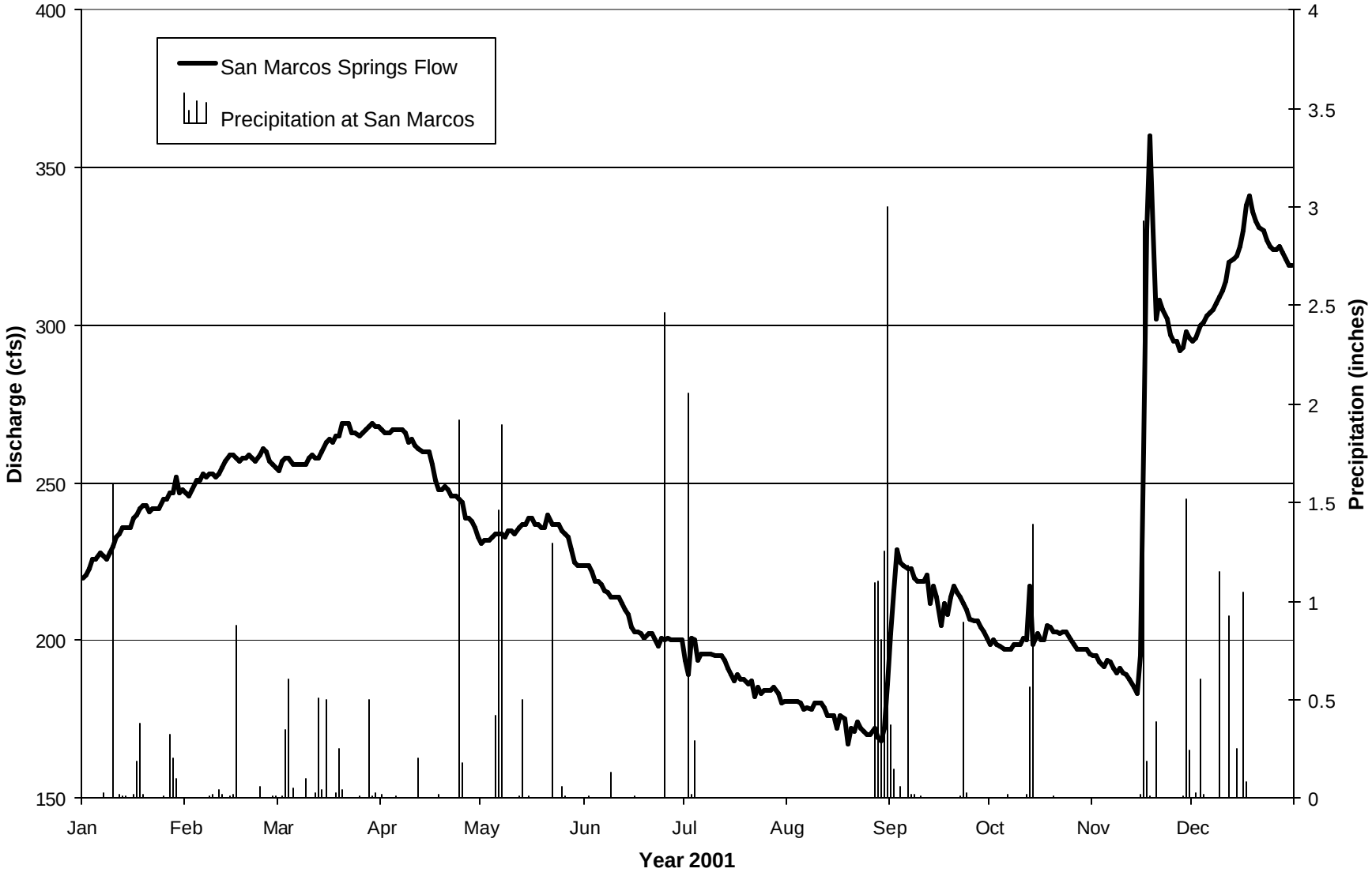


Figure B-5. San Marcos Springflow
Hydrograph of Springflow vs. Precipitation at San Marcos



APPENDIX C – Year 2001 Water Quality Data

Table C-1 Field measurements collected while sampling water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Date Sampled	Time Sampled	Well Depth (ft)	Pump or Flow Period (min)	Flow Rate (gpm)	Water Temp (ºC)	Field Conductivity (µS/cm)	Specific Conductance (µS/cm)	Field Alkalinity (mg/L)	Total Alkalinity (mg/L)	Field pH (std units)	Hardness, as $CaCO_3$ (mg/L)
Bexar													
	AY-68-27-517	5/10/01	16:30	299	75	3	22.7	551	500	188	232	7.12	239
	AY-68-27-610	5/31/01	14:10	240	70	4	23.2	659	600	278	270	6.83	315
	AY-68-27-612	6/4/01	13:00	260	130	2.5	23.82	674	510	246	252	6.74	262
	AY-68-28-314	5/15/01	16:45	240	145	3	23.6	703	650	272	324	6.75	204
	AY-68-28-315	10/25/01	14:00	280	50	3.5	23.3	596	NA	NA	294	6.80	305
	AY-68-28-519	6/6/01	14:35	280	85	4	23.6	641	500	296	308	6.74	340
	AY-68-28-609	5/30/01	14:25	281	80	4	23.0	542	500	188	252	6.95	255
	AY-68-29-113	11/6/01	14:30	241	75	3.5	24.1	675	NA	272	325	6.68	340
	AY-68-29-114	5/23/01	12:05	201	60	4	23.6	683	1800	236	260	6.79	335
	AY-68-29-213	6/4/01	15:25	222	45	3.5	24.1	692	650	312	319	6.84	340
	AY-68-29-215	5/22/01	12:30	181	75	3.5	23.8	551	410	198	204	6.96	213
	AY-68-29-418	5/21/01	14:00	181	60	3.5	23.7	711	700	230	300	6.73	312
	AY-68-30-801	8/8/01	10:55	750	POA	NR	27.1	547	NA	NA	NA	7.15	NA
	AY-68-36-907	11/14/01	11:15	1616	145	NR	26.7	506	NA	178	203	7.11	248
	AY-68-44-307	11/14/01	10:08	1423	25	NR	27.6	532	NA	176	200	7.09	260
	AY-69-29-414	11/19/01	13:40	NR	NR	NR	22.8	620	NA	292	280	6.88	322
Comal													
	*DX-68-15-907	8/9/01	11:50	180	POA	NR	21.6	614	614	286	NA	6.89	316
	*DX-68-16-707	8/14/01	10:01	400	181	NR	22.0	575	575	176	NA	6.97	305
	*DX-68-22-901	8/9/01	14:10	255	POA	NR	22.2	513	513	244	NA	7.01	272
	DX-68-23-316	12/19/01	13:55	350	95	3.5	23.7	566	NA	232	270	7.07	301
S	DX-68-23-616A	11/7/01	14:25	576	55	NR	25.2	2850	NA	248	275	6.99	806
S	DX-68-23-616B	11/7/01	14:25	738	55	NR	26.0	1691	NA	202	228	7.14	505
S	DX-68-23-617	11/7/01	16:30	917	48	NR	24.4	24.4	NA	206	230	7.38	263
S	DX-68-23-618	11/7/01	16:30	660	53	NR	25.4	639	NA	178	206	7.37	276
S	DX-68-23-619A	11/7/01	11:35	652	50	NR	25.5	537	NA	186	205	7.28	252
S	*DX-68-23-619B	8/7/01	14:22	787	82	NR	26.3	559	559	228	NA	7.26	282
S	DX-68-23-619B	11/7/01	11:35	787	55	NR	26.0	557	NA	208	229	7.27	259
	DX-68-30-221	9/7/01	11:13	140	73	NR	22.6	583	500	238	238	6.92	320
	LR-67-09-1BA	7/11/01	10:40	NR	70	NR	23.3	718	690	246	256	7.00	340
Hays													
	LR-68-16-603	7/11/01	14:10	230	25	NR	22.8	609	550	242	252	7.05	300
	LR-67-09-1XX	7/11/01	11:40	NR	15	NR	22.7	664	600	246	256	6.98	330

*Data provided by the TWDB or USGS
NR = not recorded
POA = Pump in continuous operation prior to sampling
S = Freshwater/Saline water Transect monitoring well

NA = not analyzed
** = bicarbonate concentration

Table C-1 Field measurements collected while sampling water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Date Sampled	Time Sampled	Well Depth (ft)	Pump or Flow Period (min)	Flow Rate (gpm)	Water Temp (ºC)	Field Conductivity (µS/cm)	Specific Conductance (µS/cm)	Field Alkalinity (mg/L)	Total Alkalinity (mg/L)	Field pH (std units)	Hardness, as $CaCO_3$ (mg/L)
Hays	LR-67-01-308	12/19/01	11:40	765	200	NR	24.4	699	NA	178	229	7.15	319
S	LR-67-01-812	9/6/01	17:05	543	60	NR	24.6	1478	12600	354	325	6.5	4300
S	LR-67-01-813A	9/6/01	14:45	564	60	NR	25	1476	13000	348	330	6.49	4300
S	LR-67-01-813B	9/6/01	14:55	699	70	NR	25.5	1473	12900	354	330	6.49	4400
S	LR 67-01-814A	9/6/01	11:20	556	60	NR	25.2	1476	13000	354	320	6.46	4300
S	LR-67-01-814B	9/6/01	11:30	726	70	NR	26	1466	13000	354	325	6.47	4400
	LR-67-09-401	1/27/01	14:25	1030	304	60	26.3	10.28	9500	NR	260	6.89	2820
	LR-68-08-902	11/20/01	12:15	335	NR	315	22.2	494	NA	232	230	7.02	249
Medina													
	*TD-68-25-703	7/31/01	10:55	425	55	NR	21.9	444	444	190	226**	7.1	213
	*TD-68-25-822	12/29/01	14:00	NR	POA	NR	22.94	440	440	216.6	216	6.94	221
	*TD-68-41-303	8/8/01	13:57	717	POA	NR	23.9	497	497	204	251**	7.22	242
	*TD-68-42-506	8/13/01	15:40	1445	POA	NR	25.7	494	494	204	245**	7.2	241
	*TD-68-49-201	12/18/01	11:25	2700	55	NR	27.5	509	509	196	196	7.15	226
	*TD-68-49-301	7/18/01	15:07	2550	POA	NR	33.1	473	473	200	281**	7.16	231
	*TD-69-29-906	12/11/01	14:40	NR	POA	NR	21.9	489	489	220.6	221	6.89	243
	*TD-69-31-603	12/12/01	9:30	300	NR	NR	17.6	625	625	179.7	180	7.16	253
	*TD-69-31-605	12/19/01	11:00	NR	30	10.3	22.5	445	445	241.5	242	6.66	222
	*TD-69-31-904	12/29/01	11:20	NR	POA	9.1	18.63	458	458	206.2	206	7.13	231
	*TD-69-38-106	12/11/01	12:10	NR	27	5.3	22.5	412	412	196.8	197	7.01	207
	*TD-69-38-509	12/29/01	11:00	210	60	3.5	20.7	431	431	205.2	205	7.12	225
	*TD-69-38-601	12/20/01	15:50	538	70	3.5	23.3	444	444	192	192	7.11	214
	*TD-69-38-709	12/31/01	14:00	210	POA	7.6	18.37	434	434	198.5	119	7.04	219
	*TD-69-39-504	12/18/01	14:50	653	83	NR	23	455	455	202	202	7.11	215
	*TD-69-39-601	7/31/01	13:45	360	POA	NR	23.1	476	476	230	270**	7.03	233
	*TD-69-40-102	12/20/01	12:30	559	80	NR	23.8	500	500	236	236	6.86	237
	*TD-69-40-509	12/31/01	15:55	210	60	3.5	24.3	469	469	196	196	7.43	225
	*TD-69-46-601	8/2/01	13:20	1289	260	NR	23.7	473	473	212	253**	7.18	227
	*TD-69-47-307	7/19/01	14:59	1600	POA	NR	27.9	462	462	204	245**	7.21	235
	TD-69-63-103	11/13/01	14:25	3406	130	150	43.7	558	NA	160	NA	7	253
Uvalde													
	*YP-69-33-701	12/14/01	12:35	NR	POA	NR	23.1	429	429	186	186	7.25	197
	*YP-69-35-401	7/9/01	13:40	NR	POA	NR	23.1	500	500	236	276**	7.1	252
	*YP-69-35-602	10/22/01	14:05	237	80	NR	23.1	438	438	192	192	7.19	219

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Table C-1 Field measurements collected while sampling water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Date Sampled	Time Sampled	Well Depth (ft)	Pump or Flow Period (min)	Flow Rate (gpm)	Water Temp (ºC)	Field Conductivity (µS/cm)	Specific Conductance (µS/cm)	Field Alkalinity (mg/L)	Total Alkalinity (mg/L)	Field pH (std units)	Hardness, as $CaCO_3$ (mg/L)
Uvalde	*YP-69-42-709	5/4/01	14:25	706.3	85	NR	23.7	482	482	188	233**	7.13	211
	*YP-69-43-606	10/16/01	12:10	698	30	NR	23.5	510	510	208	208	7.49	240
	*YP-69-45-405	7/13/01	13:45	1211	POA	NR	22.7	475	475	218	254**	7.24	228
	*YP-69-50-203	5/1/01	13:30	525	150	1800	23.2	543	543	218	253**	7.07	239
	*YP-69-50-207	5/1/01	11:40	265	POA	333.3	23.2	589	589	190	261**	6.88	256
	*YP-69-50-320	5/1/01	14:30	637	60	1000	23.2	586	586	230	278**	7.01	259
	*YP-69-50-501	10/17/01	12:28	600	68	NR	22.6	1115	1115	228	228	6.93	440
	YP-69-51-114	7/5/01	15:45	565	POA	NR	35.4	881	850	240	256	6.82	352
	*YP-69-51-120	8/15/01	12:36	400	POA	NR	25.4	966	966	246	299**	6.86	389

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NR = not recorded
POA = Pump in continuous operation prior to sampling
S = Freshwater/Saline water Transect monitoring well

NA = not analyzed
** = bicarbonate concentration

Table C-2 Analytical data for major ions in water from wells completed in the Edwards Aquifer, 2001.

County	State well number	Date sampled	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Chloride, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Silica, dissolved (mg/L)	Total dissolved solids (mg/L)
Bexar	AY-68-27-517	5/10/01	88	15	8	<1	23	21	0.14	5.2	332
	AY-68-27-610	5/31/01	112	13	10	2	15	20	0.15	5.14	392
	AY-68-27-612	6/4/01	104	10	8	2	20	12	0.16	4.89	350
	AY-68-28-314	5/15/01	137	5	7	<1	21	9	0.08	6.7	384
	AY-68-28-315	10/25/01	117	3.2B	3.9B J L	1.7B L	9.0	7.0	<1	7.1L	395
	AY-68-28-519	6/6/01	133	3	4	2	15	10	0.07	5.63	348
	AY-68-28-609	5/30/01	107	4	5	2	16	8	0.09	5.74	348
	AY-68-29-113	11/6/01	122	8.6	8.3J	1.2B	16.2J	13.4J	0.25B	5.6	382
	AY-68-29-114	5/23/01	115	15	9	2	47	11	0.14	5.65	410
	AY-68-29-213	6/4/01	115	19	7	2	22	10	0.1	5.48	396
	AY-68-29-215	5/22/01	87	16	4	1	15	13	0.15	5	324
	AY-68-29-414	11/19/01	109	12	10.8	1.2B J	18.4J	14.9J	0.27B	5.4	390J
	AY-68-29-418	5/21/01	127	11	11	1	32	17	0.12	5.8	444
	AY-68-30-801	8/8/01	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-36-907	11/14/01	70.3	17.6	10.3	1.2B	23.4J	24.4J	0.35B	5	316
	AY-68-44-307	11/14/01	72.9	18.9	11.7	1.3B	26J	36.4J	0.42B	5.1	303
Comal	DX 68-23-316	12/19/01	100	12.5	5.6J	1.2B J L	10.7J	13.2J	0.28B	4.4	318
	*DX-68-15-907	8/9/01	103	14	9	1.4	18	21	0.2	14	353
	*DX-68-16-707	8/14/01	94	17	7	1.2	12	15	0.1	13	332
	*DX-68-22-901	8/9/01	89	13	6	1	10	10	0.1	12	294
S	DX-68-23-616A	11/7/01	158	100	310	24.3	474	481J	3.6	5.8	1790
S	DX-68-23-616B	11/7/01	98.9	62.6	147	12.1	242	241J	3.3	5.7	1070
S	DX-68-23-617	11/7/01	58.9	28.1	9.4	1.8B	14.4J	38.9J	0.90B	5.4	335
S	DX-68-23-618	11/7/01	55.0	33.8	26.7	2.9B	42.5J	59.6J	2.5	5.6	371
S	DX-68-23-619A	11/7/01	51.2	30.2	13.6	1.7B	21.6J	43.9J	2.2	5.4	313
S	*DX-68-23-619B	8/7/01	62	27	11	1.4	18	48	1.4	14	332
S	DX-68-23-619B	11/7/01	60.7	26.0	10.4	1.3B	16.9J	47.6J	1.4	5.2	339
	DX-68-30-221	9/7/01	96	12	9	2	19	16	0.18	4.86	352
Hays	LR-67-09-401	1/27/01	660	320	1176	64	2900	1900	4.08	7	7762

B = estimated result between the method detection limit and the reporting limit

H = sample was analyzed after the holding time had expired; concentration is estimated.

J = method blank contamination. The associated method blank contains the target analyte at a reportable level.

Table C-2 Analytical data for major ions in water from wells completed in the Edwards Aquifer, 2001.

County	State well number	Date sampled	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Chloride, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Silica, dissolved (mg/L)	Total dissolved solids (mg/L)
	LR-67-09-1BA	7/11/01	99	20	26	1	50	50	0.33	5.6	452
	LR 67-01-308	12/19/01	64.5	38.4	10.7J	1.9B J	12.4J	121H	3.5	5.2	450
S	LR-67-01-812	9/6/01	924	459	1705	81	4299	2633	5.23	6.11	11,884
S	LR-67-01-813A	9/6/01	907	465	1705	81	4299	2594	5.35	6.28	11,888
S	LR-67-01-813B	9/6/01	882	450	1710	81	4199	2595	5.3	6.21	11,760
S	LR 67-01-814A	9/6/01	900	456	1740	83	4299	2522	5.24	5.73	11,676
S	LR-67-01-814B	9/6/01	906	453	1740	82	4199	2554	5.32	5.67	11,792
	LR-68-08-902	11/20/01	81.4	11.1	8.0	0.81B J	16.3J	5.4J	0.21B	5.4	315J
Hays	LR-68-16-603	7/11/01	95	16	14	1	77	32	0.21	5.48	324
	LR-67-09-1XX	7/11/01	98	17	19	2	35	36	0.28	5.6	376
Medina	*TD-68-25-703	7/31/01	71	9	6	1	10	34	0.1	11	255
	*TD-68-25-822	12/29/01	84	3	4	0.4	7	5	0.1	13	251
	*TD-68-41-303	8/8/01	71	16	11	1.2	22	17	0.2	14	284
	*TD-68-42-506	8/13/01	69	17	10	1.2	25	14	0.2	13	280
	*TD-68-49-201	12/18/01	65	15	11	1.2	26	17	0.2	14	281
	*TD-68-49-301	7/18/01	58	19	9	1.1	18	24	0.5	14	270
	*TD-69-29-906	12/11/01	80	11	6	1.2	9	27	0.2	15	285
	*TD-69-31-603	12/12/01	98	2	8	0.7	29	5	0.1	13	253
	*TD-69-31-605	12/19/01	85	3	4	0.6	5	5	0.1	14	253
	*TD-69-31-904	12/29/01	73	12	6	0.8	9	23	0.1	12	263
	*TD-69-38-106	12/11/01	69	8	6	1.3	9	13	0.1	15	244
	*TD-69-38-509	12/29/01	73	11	6	1.1	9	16	0.1	14	258
	*TD-69-38-601	12/20/01	67	11	5	1	8	17	0.1	13	247
	*TD-69-38-709	12/31/01	66	13	5	0.9	9	15	0.1	13	252
	*TD-69-39-504	12/18/01	73	8	6	1.2	9	14	0.1	14	215
	*TD-69-39-601	7/31/01	77	10	7	1	11	11	0.1	13	268
	*TD-69-40-102	12/20/01	83	7	5	1.2	7	8	0.1	16	278
	*TD-69-40-509	12/31/01	75	9	4	1.2	6	25	0.2	13	257
	*TD-69-46-601	8/2/01	68	14	7	1.2	14	18	0.2	13	266

B = estimated result between the method detection limit and the reporting limit
H = sample was analyzed after the holding time had expired; concentration is estimated.
J = method blank contamination. The associated method blank contains the target analyte at a reportable level.

Table C-2 Analytical data for major ions in water from wells completed in the Edwards Aquifer, 2001.

County	State well number	Date sampled	Calcium, dissolved (mg/L)	Magnesium, dissolved (mg/L)	Sodium, dissolved (mg/L)	Potassium, dissolved (mg/L)	Chloride, dissolved (mg/L)	Sulfate, dissolved (mg/L)	Fluoride, dissolved (mg/L)	Silica, dissolved (mg/L)	Total dissolved solids (mg/L)
	*TD-69-47-307	7/19/01	69	16	8	1.3	14	17	0.2	12	265
	TD-69-63-103	11/13/01	62.5	23.6	10.4	1.4B	15.7J	90.7J	1.2	8.3	382
Uvalde	*YP-69-33-701	12/14/01	58	13	8	1.1	11	12	0.1	16	197
	*YP-69-35-401	7/9/01	74	17	7	0.7	12	9	0.1	9	280
	*YP-69-35-602	10/22/01	58	18	6	0.9	12	12	0.1	15	249
	*YP-69-42-709	5/4/01	68	10	14	0.6	23	12	0.1	12	266
	*YP-69-43-606	10/16/01	79	10	12	0.9	26	13	0.1	15	293
	*YP-69-45-405	7/13/01	69	14	7	1.1	12	19	0.2	13	267
	*YP-69-50-203	5/1/01	80	10	15	0.7	31	16	0.1	13	301
	*YP-69-50-207	5/1/01	88	9	17	0.8	36	23	0.1	13	329
	*YP-69-50-320	5/1/01	88	10	16	0.7	34	18	0.1	13	327
	*YP-69-50-501	10/17/01	150	16	56	1.2	160	64	0.1	18	643
	YP-69-51-114	7/5/01	128	14	40	1	90	53	0.7	7.42	496
	*YP-69-51-120	8/15/01	NA	16	40	NA	NA	71	1.5	NA	530

B = estimated result between the method detection limit and the reporting limit
H = sample was analyzed after the holding time had expired; concentration is estimated.
J = method blank contamination. The associated method blank contains the target analyte at a reportable level.

Table C-3 Analytical data for metals in water from wells completed in the Edwards Aquifer, 2001.

County	Client ID	Collected	Aluminum dissolved (mg/L)	Antimony dissolved (mg/L)	Arsenic dissolved (mg/L)	Barium dissolved (mg/L)	Beryllium dissolved (mg/L)	Boron dissolved (mg/L)	Bromide dissolved (mg/L)	Cadmium dissolved (mg/L)
Bexar	AY-68-27-517	5/10/01	<0.04	NA	0.004	0.03	NA	NA	NA	<0.001
	AY-68-27-610	5/31/01	<0.04	NA	<0.002	0.03	NA	NA	NA	<0.001
	AY-68-27-612	6/4/01	<0.04	NA	<0.002	0.04	NA	NA	NA	<0.001
	AY-68-28-314	5/15/01	<0.04	NA	0.006	0.07	NA	NA	NA	<0.001
	AY-68-28-315	10/25/01	NA	<0.01	<0.01	0.035	<0.002	NA	NA	<0.002
	AY-68-28-519	6/6/01	<0.04	NA	0.006	0.04	NA	NA	NA	<0.001
	AY-68-28-609	5/30/01	<0.04	NA	<0.002	0.04	NA	NA	NA	<0.001
	AY-68-29-113	11/6/01	NA	<0.01	0.0031B	0.095	<0.002	NA	NA	<0.002
	AY-68-29-114	5/23/01	<0.04	NA	<0.002	0.05	NA	NA	NA	<0.001
	AY-68-29-213	6/4/01	<0.04	NA	<0.002	0.04	NA	NA	NA	<0.001
	AY-68-29-215	5/22/01	<0.04	NA	0.004	0.03	NA	NA	NA	<0.001
	AY-68-29-414	11/19/01	NA	<0.01	<0.01	0.04	<0.002	NA	NA	<0.002
	AY-68-29-418	5/21/01	<0.04	NA	<0.002	0.04	NA	NA	NA	<0.001
	AY-68-30-801	8/8/01	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-36-907	11/14/01	NA	<0.01	<0.01	0.097	<0.002	NA	NA	<0.002
	AY-68-44-307	11/14/01	NA	<0.01	<0.01	0.13	<0.002	NA	NA	<0.002
Comal	DX 68-23-316	12/19/01	NA	<0.01	<0.01	0.033	<0.002	NA	NA	<0.002
	*DX-68-15-907	8/9/01	<0.004	<0.001	<0.002	0.0377	<0.001	<0.051	0.126	<0.001
	*DX-68-16-707	8/14/01	<0.004	<0.001	<0.002	0.0347	<0.001	<0.051	0.0868	<0.001
	*DX-68-22-901	8/9/01	<0.004	<0.001	<0.002	0.0293	<0.001	<0.051	0.0594	<0.001
S	DX-68-23-616A	11/7/01	NA	0.0051B	<0.01	0.023	<0.002	NA	NA	<0.002
S	DX-68-23-616B	11/7/01	NA	<0.01	<0.01	0.026	<0.002	NA	NA	<0.002
S	DX-68-23-617	11/7/01	NA	<0.01	<0.01	0.13	<0.002	NA	NA	<0.002
S	DX-68-23-618	11/7/01	NA	<0.01	<0.01	0.032	<0.002	NA	NA	<0.002
S	DX-68-23-619A	11/7/01	NA	<0.01	<0.01	0.046	<0.002	NA	NA	<0.002
S	*DX-68-23-619B	8/7/01	<0.004	<0.001	<0.002	0.122	<0.001	<0.051	0.0741	<0.001
S	DX-68-23-619B	11/7/01	NA	<0.01	<0.01	0.12	<0.002	NA	NA	<0.002
	DX-68-30-221	9/7/01	<0.04	NA	<0.002	0.01	NA	NA	NA	<0.001
Hays	LR-68-16-603	7/11/01	<0.04	NA	0.003	0.04	NA	NA	NA	<0.001
	LR-67-09-1XX	7/11/01	<0.04	NA	0.002	0.04	NA	NA	NA	<0.001
	LR-67-09-401	1/27/01	<0.04	NA	0.005	0.03	NA	NA	NA	<0.001

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NA = not analyzed
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Table C-3 Analytical data for metals in water from wells completed in the Edwards Aquifer, 2001.

County	Client ID	Collected	Aluminum dissolved (mg/L)	Antimony dissolved (mg/L)	Arsenic dissolved (mg/L)	Barium dissolved (mg/L)	Beryllium dissolved (mg/L)	Boron dissolved (mg/L)	Bromide dissolved (mg/L)	Cadmium dissolved (mg/L)
	LR-67-09-1BA	7/11/01	<0.04	NA	<0.002	0.04	NA	NA	NA	<0.001
	LR 67-01-308	12/19/01	NA	<0.01	<0.01	0.052	<0.002	NA	NA	<0.002
S	LR-67-01-812	9/6/01	<0.04	NA	0.005	<0.01	NA	NA	NA	<0.001
S	LR-67-01-813A	9/6/01	<0.04	NA	0.004	<0.01	NA	NA	NA	<0.001
S	LR-67-01-813B	9/6/01	<0.04	NA	0.005	<0.01	NA	NA	NA	<0.001
S	LR 67-01-814A	9/6/01	<0.04	NA	0.2	NA	NA	NA	NA	<0.001
S	LR-67-01-814B	9/6/01	<0.04	NA	<0.002	0.01	NA	NA	NA	<0.001
	LR-68-08-902	11/20/01	NA	<0.01	<0.01	0.028	<0.002	NA	NA	<0.002
Medina	*TD-68-25-703	7/31/01	<0.004	<0.001	<0.002	0.0282	<0.001	<0.05	0.117	<0.001
	*TD-68-25-822	12/29/01	<0.004	<0.001	<0.002	0.0288	<0.001	<0.051	0.0628	<0.001
	*TD-68-41-303	8/8/01	<0.004	<0.001	<0.002	0.0478	<0.001	<0.051	0.139	<0.01
	*TD-68-42-506	8/13/01	<0.004	<0.001	<0.002	0.0714	<0.001	<0.051	0.124	<0.001
	*TD-68-49-201	12/18/01	<0.004	<0.001	<0.002	0.111	<0.001	<0.051	0.0227	<0.001
	*TD-68-49-301	7/18/01	<0.004	<0.001	<0.002	0.16	<0.001	<0.05	0.091	<0.001
	*TD-69-29-906	12/11/01	<0.004	<0.001	<0.002	0.0318	<0.001	<0.051	0.0603	<0.001
	*TD-69-31-603	12/12/01	<0.004	<0.001	<0.002	0.041	<0.001	<0.051	0.0821	<0.001
	*TD-69-31-605	12/19/01	<0.004	<0.001	<0.002	0.0338	<0.001	<0.051	0.0219	<0.001
	*TD-69-31-904	12/29/01	<0.004	<0.001	<0.002	0.0284	<0.001	<0.051	0.0684	<0.001
	*TD-69-38-106	12/11/01	<0.004	<0.001	<0.002	0.0283	<0.001	<0.051	0.0207	<0.001
	*TD-69-38-509	12/29/01	<0.004	<0.001	<0.002	0.027	<0.001	<0.051	0.0318	<0.001
	*TD-69-38-601	12/20/01	<0.004	<0.001	<0.002	0.027	<0.001	<0.051	0.0232	<0.001
	*TD-69-38-709	12/31/01	<0.004	<0.001	<0.002	0.0415	<0.001	<0.051	0.0404	<0.001
	*TD-69-39-504	12/18/01	<0.004	<0.001	<0.002	0.0272	<0.001	<0.051	0.0323	<0.001
	*TD-69-39-601	7/31/01	<0.004	<0.001	<0.002	0.0297	<0.01	<0.05	0.0697	<0.001
	*TD-69-40-102	12/20/01	<0.004	<0.001	<0.002	0.0336	<0.001	<0.051	0.0587	<0.001
	*TD-69-40-509	12/31/01	0.00818	<0.001	<0.002	0.0245	<0.001	<0.051	0.0275	<0.001
	*TD-69-46-601	8/2/01	<0.004	<0.001	<0.002	0.0352	<0.001	<0.05	0.0965	<0.001
	*TD-69-47-307	7/19/01	<0.004	<0.001	<0.002	0.0438	<0.001	<0.05	0.042	<0.001
	TD-69-63-103	11/13/01	NA	<0.01	0.0033B	0.11	<0.002	NA	NA	<0.002
Uvalde	*YP-69-33-701	12/14/01	<0.004	<0.001	<0.002	0.0404	<0.001	<0.051	0.0748	<0.001
	*YP-69-35-401	7/9/01	<0.004	<0.001	<0.002	0.0458	<0.001	<0.05	0.0876	<0.001

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Table C-3 Analytical data for metals in water from wells completed in the Edwards Aquifer, 2001.

County	Client ID	Collected	Aluminum dissolved (mg/L)	Antimony dissolved (mg/L)	Arsenic dissolved (mg/L)	Barium dissolved (mg/L)	Beryllium dissolved (mg/L)	Boron dissolved (mg/L)	Bromide dissolved (mg/L)	Cadmium dissolved (mg/L)
	*YP-69-35-602	10/22/01	<0.004	<0.001	<0.002	0.0329	<0.001	<0.051	0.036	<0.001
	*YP-69-42-709	5/4/01	<0.004	<0.001	<0.002	0.039	<0.001	0.0615	0.141	<0.001
	*YP-69-43-606	10/16/01	<0.004	<0.001	<0.002	0.046	<0.001	<0.051	0.127	<0.001
	*YP-69-45-405	7/13/01	<0.004	<0.001	<0.002	0.0388	<0.001	<0.05	0.12	<0.001
	*YP-69-50-203	5/1/01	<0.004	<0.001	<0.002	0.0442	<0.001	0.0609	0.167	<0.001
	*YP-69-50-207	5/1/01	<0.004	<0.001	<0.002	0.0556	<0.001	0.0672	0.161	<0.001
	*YP-69-50-320	5/1/01	<0.004	<0.001	<0.002	0.0493	<0.001	0.0603	0.102	<0.001
	*YP-69-50-501	10/17/01	<0.004	<0.001	<0.002	0.088	<0.001	0.166	1.0	<0.001
	YP-69-51-114	7/5/01	<0.04	NA	0.005	0.1	NA	NA	NA	<0.001
	*YP-69-51-120	8/15/01	0.00584	<0.001	NA	0.0921	NA	0.0084	0.288	<0.001

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Table C-3 Analytical data for metals in water from wells completed in the Edwards Aquifer, 2001.

County	Client ID	Collected	Chromium dissolved (mg/L)	Cobalt dissolved (mg/L)	Copper dissolved (mg/L)	Iron dissolved (mg/L)	Lead dissolved (mg/L)	Lithium dissolved (mg/L)	Manganese dissolved (mg/L)	Mercury dissolved (mg/L)
Bexar	AY-68-27-517	5/10/01	<0.002	NA	<0.001	0.008	<0.002	NA	<0.002	<0.002
	AY-68-27-610	5/31/01	<0.002	NA	<0.001	<0.003	<0.002	NA	<0.002	<0.002
	AY-68-27-612	6/4/01	<0.002	NA	<0.001	0.01	<0.002	NA	<0.002	<0.002
	AY-68-28-314	5/15/01	<0.001	NA	<0.001	<0.003	<0.002	NA	<0.002	<0.002
	AY-68-28-315	10/25/01	<0.005	NA	<0.02	<0.1	<0.003	NA	0.0012B	<0.0002
	AY-68-28-519	6/6/01	<0.002	NA	<0.001	<0.003	<0.002	NA	<0.002	<0.002
	AY-68-28-609	5/30/01	<0.002	NA	0.001	<0.003	<0.002	NA	<0.002	<0.002
	AY-68-29-113	11/6/01	<0.005	NA	<0.02	<0.1	<0.003	NA	<0.01	<0.0002
	AY-68-29-114	5/23/01	<0.002	NA	<0.001	<0.003	<0.002	NA	<0.002	<0.002
	AY-68-29-213	6/4/01	<0.002	NA	<0.001	<0.003	<0.002	NA	<0.002	<0.002
	AY-68-29-215	5/22/01	<0.002	NA	0.001	0.005	<0.002	NA	<0.002	<0.002
	AY-68-29-414	11/19/01	<0.005	NA	0.0025B	<0.1	0.0026B	NA	<0.01	<0.0002
	AY-68-29-418	5/21/01	<0.002	NA	<0.001	<0.003	<0.002	NA	<0.002	<0.002
	AY-68-30-801	8/8/01	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-36-907	11/14/01	<0.005	NA	<0.02	<0.1	<0.003	NA	<0.01	<0.0002
	AY-68-44-307	11/14/01	<0.005	NA	<0.02	<0.1	<0.003	NA	<0.01	<0.0002
Comal	DX 68-23-316	12/19/01	<0.005	NA	<0.02	<0.1	<0.003	NA	<0.01	<0.0002
	*DX-68-15-907	8/9/01	<0.001	<0.001	0.00106	<0.051	<0.001	0.00372	<0.001	NA
	*DX-68-16-707	8/14/01	<0.001	<0.001	0.00386	<0.051	<0.001	0.0037	<0.001	NA
	*DX-68-22-901	8/9/01	<0.001	<0.001	0.00179	<0.051	0.00136	0.00261	<0.001	NA
S	DX-68-23-616A	11/7/01	<0.005	NA	<0.02	<0.1	<0.003	NA	0.0035B	<0.0002
S	DX-68-23-616B	11/7/01	<0.005	NA	<0.02	<0.1	<0.003	NA	0.0023B	<0.0002
S	DX-68-23-617	11/7/01	<0.005	NA	<0.02	<0.1	<0.003	NA	0.0023B	<0.0002
S	DX-68-23-618	11/7/01	<0.005	NA	<0.02	<0.1	<0.003	NA	<0.01	<0.0002
S	DX-68-23-619A	11/7/01	<0.005	NA	<0.02	<0.1	<0.003	NA	0.0025B	<0.0002
S	*DX-68-23-619B	8/7/01	<0.001	<0.001	<0.001	<0.051	<0.001	0.0115	0.00115	NA
S	DX-68-23-619B	11/7/01	<0.005	NA	<0.02	<0.1	<0.003	NA	<0.01	<0.0002
	DX-68-30-221	9/7/01	<0.002	NA	0.004	0.009	<0.002	NA	<0.002	<0.002
Hays	LR-68-16-603	7/11/01	<0.002	NA	0.002	<0.003	<0.002	NA	<0.002	<0.002
	LR-67-09-1XX	7/11/01	<0.002	NA	0.002	0.328	<0.002	NA	<0.002	<0.002

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Table C-3 Analytical data for metals in water from wells completed in the Edwards Aquifer, 2001.

County	Client ID	Collected	Chromium dissolved (mg/L)	Cobalt dissolved (mg/L)	Copper dissolved (mg/L)	Iron dissolved (mg/L)	Lead dissolved (mg/L)	Lithium dissolved (mg/L)	Manganese dissolved (mg/L)	Mercury dissolved (mg/L)
	LR-67-09-401	1/27/01	<0.002	NA	<0.001	0.025	<0.002	NA	0.011	<0.002
	LR-67-09-1BA	7/11/01	<0.002	NA	0.001	<0.003	<0.002	NA	<0.002	<0.002
	LR 67-01-308	12/19/01	<0.005	NA	0.0082B	<0.1	0.0028B	NA	<0.01	<0.0002
S	LR-67-01-812	9/6/01	<0.002	NA	0.012	<0.003	<0.002	NA	0.004	<0.002
S	LR-67-01-813A	9/6/01	<0.002	NA	0.001	0.007	0.022	NA	0.009	<0.002
S	LR-67-01-813B	9/6/01	<0.002	NA	<0.001	0.007	<0.002	NA	0.004	<0.002
S	LR 67-01-814A	9/6/01	<0.002	NA	<0.001	<0.003	<0.002	NA	0.002	<0.002
S	LR-67-01-814B	9/6/01	<0.002	NA	<0.001	0.003	<0.002	NA	0.004	<0.002
	LR-68-08-902	11/20/01	<0.005	NA	<0.02	<0.1	0.0024B	NA	<0.01	<0.0002
Medina	*TD-68-25-703	7/31/01	<0.001	<0.001	0.00319	<0.05	<0.001	<0.002	<0.001	NA
	*TD-68-25-822	12/29/01	0.00588	<0.001	0.00376	<0.051	0.0071	<0.002	<0.001	NA
	*TD-68-41-303	8/8/01	<0.001	<0.001	<0.001	<0.051	<0.001	0.00459	<0.001	NA
	*TD-68-42-506	8/13/01	<0.001	<0.001	0.00201	<0.051	<0.001	0.0037	<0.001	NA
	*TD-68-49-201	12/18/01	0.00125	<0.001	0.00431	<0.051	<0.001	0.00462	<0.001	NA
	*TD-68-49-301	7/18/01	<0.001	<0.001	0.00305	<0.05	0.0018	0.00395	<0.001	NA
	*TD-69-29-906	12/11/01	0.00101	<0.001	0.00155	<0.051	<0.001	0.00288	<0.001	NA
	*TD-69-31-603	12/12/01	<0.001	<0.001	0.00349	<0.051	<0.001	<0.002	<0.001	NA
	*TD-69-31-605	12/19/01	0.00523	<0.001	0.00309	<0.051	<0.001	<0.002	<0.001	NA
	*TD-69-31-904	12/29/01	0.00529	<0.001	0.00108	<0.051	<0.001	0.00251	<0.001	NA
	*TD-69-38-106	12/11/01	<0.001	<0.001	<0.001	<0.051	<0.001	0.00235	<0.001	NA
	*TD-69-38-509	12/29/01	0.00498	<0.001	0.00596	<0.051	<0.001	0.00359	<0.001	NA
	*TD-69-38-601	12/20/01	<0.001	<0.001	<0.001	0.0622	<0.001	0.00236	0.00162	NA
	*TD-69-38-709	12/31/01	0.00433	<0.001	0.00368	<0.051	<0.001	0.00219	<0.001	NA
	*TD-69-39-504	12/18/01	0.00122	<0.001	<0.001	<0.051	<0.001	0.00227	<0.001	NA
	*TD-69-39-601	7/31/01	<0.001	<0.001	<0.002	<0.05	0.0017	0.00241	<0.001	NA
	*TD-69-40-102	12/20/01	<0.001	<0.001	<0.001	<0.051	<0.001	0.00241	<0.001	NA
	*TD-69-40-509	12/31/01	0.00395	<0.001	<0.001	<0.051	<0.001	0.00397	<0.001	NA
	*TD-69-46-601	8/2/01	<0.001	<0.001	0.00465	<0.05	<0.001	0.00313	<0.001	NA
	*TD-69-47-307	7/19/01	<0.001	<0.001	<0.002	<0.05	0.00189	0.0028	<0.001	NA
	TD-69-63-103	11/13/01	<0.005	NA	<0.02	0.86	<0.003	NA	0.0094B	<0.0002

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Table C-3 Analytical data for metals in water from wells completed in the Edwards Aquifer, 2001.

County	Client ID	Collected	Chromium dissolved (mg/L)	Cobalt dissolved (mg/L)	Copper dissolved (mg/L)	Iron dissolved (mg/L)	Lead dissolved (mg/L)	Lithium dissolved (mg/L)	Manganese dissolved (mg/L)	Mercury dissolved (mg/L)
Uvalde	*YP-69-33-701	12/14/01	0.00114	<0.001	0.00104	<0.051	<0.001	0.00281	<0.001	NA
	*YP-69-35-401	7/9/01	0.0014	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	NA
	*YP-69-35-602	10/22/01	<0.001	<0.001	<0.001	<0.051	<0.001	<0.002	<0.001	NA
	*YP-69-42-709	5/4/01	<0.001	<0.001	<0.002	0.051	<0.001	0.00249	<0.001	NA
	*YP-69-43-606	10/16/01	<0.001	<0.001	0.00263	<0.051	<0.001	<0.002	<0.001	NA
	*YP-69-45-405	7/13/01	<0.001	<0.001	<0.002	<0.05	<0.001	0.00259	<0.001	NA
	*YP-69-50-203	5/1/01	<0.001	<0.001	0.0027	0.051	<0.001	0.00275	<0.001	NA
	*YP-69-50-207	5/1/01	<0.001	<0.001	<0.001	0.051	0.00156	0.00304	<0.001	NA
	*YP-69-50-320	5/1/01	<0.001	<0.001	0.00345	0.051	0.0012	0.00302	<0.001	NA
	*YP-69-50-501	10/17/01	<0.001	<0.001	0.00316	<0.051	0.00217	0.00508	<0.001	NA
	YP-69-51-114	7/5/01	<0.002	NA	0.02	0.019	<0.002	NA	<0.002	<0.002
	*YP-69-51-120	8/15/01	NA	<0.001	NA	<0.051	<0.001	0.0109	<0.001	NA

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Table C-3 Analytical data for metals in water from wells completed in the Edwards Aquifer, 2001.

County	Client ID	Collected	Molybdenum dissolved (mg/L)	Nickel dissolved (mg/L)	Selenium dissolved (mg/L)	Silver dissolved (mg/L)	Strontium dissolved (mg/L)	Thallium dissolved (mg/L)	Zinc dissolved (mg/L)
Bexar	AY-68-27-517	5/10/01	NA	NA	<0.003	<0.001	0.27	NA	<0.01
	AY-68-27-610	5/31/01	NA	NA	<0.003	<0.001	0.332	NA	<0.01
	AY-68-27-612	6/4/01	NA	NA	<0.003	<0.001	0.24	NA	<0.01
	AY-68-28-314	5/15/01	NA	NA	<0.003	<0.001	0.096	NA	<0.01
	AY-68-28-315	10/25/01	NA	<0.005	0.0032B	<0.005	0.065	0.01J	<0.02
	AY-68-28-519	6/6/01	NA	NA	<0.003	<0.001	0.066	NA	0.17
	AY-68-28-609	5/30/01	NA	NA	<0.003	<0.001	0.093	NA	0.05
	AY-68-29-113	11/6/01	NA	<0.005	0.0092	<0.005	0.12	0.0099B J	<0.02
	AY-68-29-114	5/23/01	NA	NA	<0.003	<0.001	0.138	NA	<0.01
	AY-68-29-213	6/4/01	NA	NA	<0.003	<0.001	0.157	NA	<0.01
	AY-68-29-215	5/22/01	NA	NA	<0.003	<0.001	0.217	NA	<0.01
	AY-68-29-414	11/19/01	NA	<0.005	<0.005	<0.005	0.22	<0.01	0.0059B
	AY-68-29-418	5/21/01	NA	NA	<0.003	<0.001	0.126	NA	<0.01
	AY-68-30-801	8/8/01	NA	NA	NA	NA	NA	NA	NA
	AY-68-36-907	11/14/01	NA	<0.005	0.003B	<0.005	1.6	0.0054B	0.0027B
	AY-68-44-307	11/14/01	NA	<0.005	0.0038B	<0.005	1.8	0.0063B	0.0042B
Comal	DX 68-23-316	12/19/01	NA	<0.005	0.015	<0.005	0.17	<0.01	<0.02
	*DX-68-15-907	8/9/01	<0.001	0.00273	<0.004	NA	0.323	<0.001	<0.004
	*DX-68-16-707	8/14/01	<0.001	0.00243	<0.004	NA	0.403	<0.001	0.00457
	*DX-68-22-901	8/9/01	<0.001	0.00227	<0.004	NA	0.166	<0.001	<0.004
S	DX-68-23-616A	11/7/01	NA	<0.005	0.014	<0.005	11.6	0.012	<0.02
S	DX-68-23-616B	11/7/01	NA	<0.005	0.017	<0.005	32	0.019	<0.02
S	DX-68-23-617	11/7/01	NA	<0.005	0.0048B	<0.005	9.5	0.0075B	0.014B
S	DX-68-23-618	11/7/01	NA	<0.005	0.01	<0.005	2.6	0.0076B	<0.02
S	DX-68-23-619A	11/7/01	NA	<0.005	0.0056	<0.005	3	0.0068B	0.0019B
S	*DX-68-23-619B	8/7/01	0.0091	0.00239	<0.004	NA	16.2	<0.001	0.00801
S	DX-68-23-619B	11/7/01	NA	<0.005	0.0029B	<0.005	16.3	0.015	0.0034B
	DX-68-30-221	9/7/01	NA	NA	<0.003	<0.001	0.84	NA	0.01
Hays	LR-68-16-603	7/11/01	NA	NA	<0.003	<0.001	0.594	NA	<0.01

*Data provided by TWDB
B = estimated result between the method detection limit and the reporting limit.
J = method blank contamination. The associated method blank contains the target analyte at a reportable level.

NA = not analyzed
S = Freshwater/Saline water Transect monitoring well

Table C-3 Analytical data for metals in water from wells completed in the Edwards Aquifer, 2001.

County	Client ID	Collected	Molybdenum dissolved (mg/L)	Nickel dissolved (mg/L)	Selenium dissolved (mg/L)	Silver dissolved (mg/L)	Strontium dissolved (mg/L)	Thallium dissolved (mg/L)	Zinc dissolved (mg/L)
	LR-67-09-1XX	7/11/01	NA	NA	<0.003	<0.001	0.746	NA	<0.01
	LR-67-09-401	1/27/01	NA	NA	0.003	NA	17.02	NA	0.08
	LR-67-09-1BA	7/11/01	NA	NA	<0.003	<0.001	0.642	NA	<0.01
	LR 67-01-308	12/19/01	NA	<0.005	0.022	<0.005	36.8	<0.01	<0.02
S	LR-67-01-812	9/6/01	NA	NA	0.006	<0.001	16.5	NA	0.01
S	LR-67-01-813A	9/6/01	NA	NA	0.004	<0.001	18.1	NA	<0.01
S	LR-67-01-813B	9/6/01	NA	NA	0.007	<0.001	15.8	NA	<0.01
S	LR 67-01-814A	9/6/01	NA	NA	0.006	<0.001	18.4	NA	0.18
S	LR-67-01-814B	9/6/01	NA	NA	<0.003	<0.001	17.6	NA	0.01
	LR-68-08-902	11/20/01	NA	<0.005	0.011	<0.005	0.16	<0.01	0.0099B
Medina	*TD-68-25-703	7/31/01	<0.001	0.00262	<0.004	NA	0.246	<0.001	0.0389
	*TD-68-25-822	12/29/01	<0.001	0.00229	<0.004	NA	0.0923	<0.001	1.3
	*TD-68-41-303	8/8/01	<0.001	0.00179	<0.004	NA	0.536	<0.001	<0.004
	*TD-68-42-506	8/13/01	<0.001	0.00175	<0.004	NA	1.26	<0.001	<0.004
	*TD-68-49-201	12/18/01	<0.001	0.00163	<0.004	NA	2.11	<0.001	0.00439
	*TD-68-49-301	7/18/01	0.00843	0.00226	<0.004	NA	6.08	<0.001	<0.004
	*TD-69-29-906	12/11/01	<0.001	0.00201	<0.004	NA	0.429	<0.001	0.00671
	*TD-69-31-603	12/12/01	<0.001	0.00255	<0.004	NA	0.0766	<0.001	0.0581
	*TD-69-31-605	12/19/01	<0.001	0.00213	<0.004	NA	0.0852	<0.001	0.00559
	*TD-69-31-904	12/29/01	<0.001	0.00189	<0.004	NA	0.29	<0.001	0.0818
	*TD-69-38-106	12/11/01	<0.001	0.0017	<0.004	NA	0.225	<0.001	0.122
	*TD-69-38-509	12/29/01	<0.001	0.00241	<0.004	NA	0.262	<0.001	0.00607
	*TD-69-38-601	12/20/01	<0.001	0.00177	<0.004	NA	0.236	<0.001	<0.004
	*TD-69-38-709	12/31/01	<0.001	0.00114	<0.004	NA	0.25	<0.001	0.0628
	*TD-69-39-504	12/18/01	<0.001	0.00188	<0.004	NA	0.223	<0.001	<0.004
	*TD-69-39-601	7/31/01	<0.001	0.003	<0.004	NA	0.218	<0.001	0.307
	*TD-69-40-102	12/20/01	<0.001	0.00216	<0.004	NA	0.144	<0.001	<0.004
	*TD-69-40-509	12/31/01	0.00689	0.00275	<0.004	NA	0.304	<0.001	<0.004
	*TD-69-46-601	8/2/01	<0.001	0.00245	<0.004	NA	0.333	<0.001	0.00512
	*TD-69-47-307	7/19/01	<0.001	0.00339	<0.004	NA	0.32	<0.001	0.00508

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B = estimated result between the method detection limit and the reporting limit.
J = method blank contamination. The associated method blank contains the target analyte at a reportable level.

NA = not analyzed
S = Freshwater/Saline water Transect monitoring well

Table C-3 Analytical data for metals in water from wells completed in the Edwards Aquifer, 2001.

County	Client ID	Collected	Molybdenum dissolved (mg/L)	Nickel dissolved (mg/L)	Selenium dissolved (mg/L)	Silver dissolved (mg/L)	Strontium dissolved (mg/L)	Thallium dissolved (mg/L)	Zinc dissolved (mg/L)
	TD-69-63-103	11/13/01	NA	<0.005	0.0074	<0.005	24	0.016	<0.02
Uvalde	*YP-69-33-701	12/14/01	<0.001	0.00144	<0.004	NA	0.225	<0.001	0.0349
	*YP-69-35-401	7/9/01	<0.001	0.00131	<0.004	NA	0.275	<0.001	0.00417
	*YP-69-35-602	10/22/01	<0.001	0.00221	<0.004	NA	0.564	<0.001	<0.004
	*YP-69-42-709	5/4/01	<0.001	<0.001	<0.004	NA	0.23	<0.001	<0.004
	*YP-69-43-606	10/16/01	<0.001	0.00276	<0.004	NA	0.405	<0.001	<0.004
	*YP-69-45-405	7/13/01	<0.001	0.0017	<0.004	NA	0.302	<0.001	0.0042
	*YP-69-50-203	5/1/01	<0.001	<0.001	0.004	NA	0.268	<0.001	0.004
	*YP-69-50-207	5/1/01	<0.001	0.00108	0.004	NA	0.378	<0.001	0.00596
	*YP-69-50-320	5/1/01	<0.001	<0.001	<0.004	NA	0.287	<0.001	<0.004
	*YP-69-50-501	10/17/01	<0.001	0.00538	<0.004	NA	0.569	<0.001	0.00885
	YP-69-51-114	7/5/01	NA	NA	<0.003	<0.001	3.22	NA	0.36
	*YP-69-51-120	8/15/01	NA	NA	NA	NA	5.57	NA	NA

*Data provided by TWDB
B = estimated result between the method detection limit and the reporting limit.
J = method blank contamination. The associated method blank contains the target analyte at a reportable level.

NA = not analyzed
S = Freshwater/Saline water Transect monitoring well

Table C-4 Analytical data for nutrients in water from wells completed in the Edwards Aquifer, 2001.

County	Client ID	Collected	Nitrate+ Nitrite as N (mg/L)	Nitrite as N (mg/L)	Ammonia as N (mg/L)	Kjeldahl as N (mg/L)	Total Phosphorus (mg/L)
Bexar	AY-68-27-517	5/10/01	1.89	<0.005	NA	NA	0.02
	AY-68-27-610	5/31/01	3.21	<0.005	NA	NA	0.02
	AY-68-27-612	6/4/01	2.63	<0.005	NA	NA	0.03
	AY-68-28-314	5/15/01	2.16	<0.005	NA	NA	0.05
	AY-68-28-315	10/25/01	1.1	NA	NA	NA	0.048
	AY-68-28-519	6/6/01	0.51	<0.005	NA	NA	0.02
	AY-68-28-609	5/30/01	1.03	0.008	NA	NA	0.02
	AY-68-29-113	11/6/01	0.94	NA	NA	NA	0.048
	AY-68-29-114	5/23/01	NA	<0.005	NA	NA	0.03
	AY-68-29-213	6/4/01	1.81	<0.005	NA	NA	0.03
	AY-68-29-215	5/22/01	2.57	<0.005	NA	NA	0.01
	AY-68-29-414	11/19/01	2	NA	NA	NA	NA
	AY-68-29-418	5/21/01	0.01	0.005	NA	NA	0.03
	AY-68-30-801	8/8/01	NA	NA	NA	NA	NA
	AY-68-36-907	11/14/01	1.7	NA	NA	NA	NA
	AY-68-44-307	11/14/01	1.2	NA	NA	NA	NA
Comal	DX 68-23-316	12/19/01	1.4	NA	NA	NA	NA
	*DX-68-15-907	8/9/01	1.12	NA	NA	NA	NA
	*DX-68-16-707	8/14/01	1.71	NA	NA	NA	NA
	*DX-68-22-901	8/9/01	1.73	NA	NA	NA	NA
S	DX-68-23-616A	11/7/01	0.027	NA	NA	NA	0.035
S	DX-68-23-616B	11/7/01	0.055	NA	NA	NA	0.035
S	DX-68-23-617	11/7/01	0.59	NA	NA	NA	0.035
S	DX-68-23-618	11/7/01	0.080	NA	NA	NA	0.035
S	DX-68-23-619A	11/7/01	0.033	NA	NA	NA	0.035
S	*DX-68-23-619B	8/7/01	0.0629	NA	NA	NA	NA
S	DX-68-23-619B	11/7/01	0.13	NA	NA	NA	0.035
	DX-68-30-221	9/7/01	5.48	<0.005	<0.03	<0.1	0.04
Hays	LR-68-16-603	7/11/01	1.84	<0.005	NA	NA	0.02
	LR-67-09-1XX	7/11/01	2.5	<0.005	NA	NA	0.01
	LR-67-09-401	1/27/01	<0.01	NA	NA	NA	NA
	LR-67-09-1BA	7/11/01	2.28	<0.005	NA	NA	<0.01
	LR 67-01-308	12/19/01	0.018	NA	NA	NA	NA
S	LR-67-01-812	9/6/01	<0.2	NA	6.6	7.56	<0.02
S	LR-67-01-813A	9/6/01	<0.2	NA	7.3	8.96	0.06
S	LR-67-01-813B	9/6/01	<0.2	NA	6.9	7.56	<0.02
S	LR 67-01-814A	9/6/01	<0.2	NA	6.9	8.12	<0.02
S	LR-67-01-814B	9/6/01	<0.2	NA	7.3	7.56	<0.02
	LR-68-08-902	11/20/01	0.80	NA	NA	NA	NA
Medina	*TD-68-25-703	7/31/01	0.503	NA	NA	NA	NA
	*TD-68-25-822	12/29/01	0.943	NA	NA	NA	NA

*Data provided by TWDB
B = estimated result between the method detection limit and the reporting limit.
S = Freshwater/Saline water Transect monitoring well
J = method blank contamination. The associated method blank contains the target analyte at a reportable level.
NA = not analyzed

Table C-4 Analytical data for nutrients in water from wells completed in the Edwards Aquifer, 2001.

County	Client ID	Collected	Nitrate+ Nitrite as N (mg/L)	Nitrite as N (mg/L)	Ammonia as N (mg/L)	Kjeldahl as N (mg/L)	Total Phosphorus (mg/L)
	*TD-68-41-303	8/8/01	2.11	NA	NA	NA	NA
	*TD-68-42-506	8/13/01	2.15	NA	NA	NA	NA
	*TD-68-49-201	12/18/01	2.45	NA	NA	NA	NA
	*TD-68-49-301	7/18/01	1.49	NA	NA	NA	NA
	*TD-69-29-906	12/11/01	1.36	NA	NA	NA	NA
	*TD-69-31-603	12/12/01	20.3	NA	NA	NA	NA
	*TD-69-31-605	12/19/01	1.53	NA	NA	NA	NA
	*TD-69-31-904	12/29/01	0.745	NA	NA	NA	NA
	*TD-69-38-106	12/11/01	1.68	NA	NA	NA	NA
	*TD-69-38-509	12/29/01	1.42	NA	NA	NA	NA
	*TD-69-38-601	12/20/01	1.17	NA	NA	NA	NA
	*TD-69-38-709	12/31/01	1.33	NA	NA	NA	NA
	*TD-69-39-504	12/18/01	1.93	NA	NA	NA	NA
	*TD-69-39-601	7/31/01	1.44	NA	NA	NA	NA
	*TD-69-40-102	12/20/01	1.82	NA	NA	NA	NA
	*TD-69-40-509	12/31/01	1.3	NA	NA	NA	NA
	*TD-69-46-601	8/2/01	1.52	NA	NA	NA	NA
	*TD-69-47-307	7/19/01	1.74	NA	NA	NA	NA
	TD-69-63-103	11/13/01	0.12	NA	NA	NA	NA
Uvalde	*YP-69-33-701	12/14/01	1.98	NA	NA	NA	NA
	*YP-69-35-401	7/9/01	3.49	NA	NA	NA	NA
	*YP-69-35-602	10/22/01	1.61	NA	NA	NA	NA
	*YP-69-42-709	5/4/01	2.53	NA	NA	NA	NA
	*YP-69-43-606	10/16/01	2.93	NA	NA	NA	NA
	*YP-69-45-405	7/13/01	1.65	NA	NA	NA	NA
	*YP-69-50-203	5/1/01	2.56	NA	NA	NA	NA
	*YP-69-50-207	5/1/01	3.14	NA	NA	NA	NA
	*YP-69-50-320	5/1/01	2.61	NA	NA	NA	NA
	*YP-69-50-501	10/17/01	8.45	NA	NA	NA	NA
	YP-69-51-114	7/5/01	0.01	0.005	NA	NA	<0.01
	*YP-69-51-120	8/15/01	4.33	<0.005	NA	NA	NA

*Data provided by TWDB
B = estimated result between the method detection limit and the reporting limit.
S = Freshwater/Saline water Transect monitoring well
J = method blank contamination. The associated method blank contains the target analyte at a reportable level.
NA = not analyzed

Table C-5 Analytical data for pesticides and herbicides in water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Date Sampled	2,4,5-TP (Silvex) (µg/L)	2,4,5-T (µg/L)	2,4-DB (µg/L)	2,4-D (µg/L)	4,4'-DDD (µg/L)	4,4'-DDE (µg/L)	4,4'-DDT (µg/L)	Alachlor (µg/L)	Aldicarb Sulfoxide (µg/L)	Aldicarb (µg/L)
Bexar	AY-68-27-517	5/10/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
	AY-68-27-610	5/31/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
	AY-68-27-612	6/4/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
	AY-68-28-314	5/15/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
	AY-68-28-519	6/6/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
	AY-68-28-609	5/30/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
	AY-68-29-114	5/23/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
	AY-68-29-213	6/4/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
	AY-68-29-215	5/22/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
	AY-68-29-414	11/19/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
	AY-68-29-418	5/21/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
	AY-68-30-801	8/8/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-36-907	11/14/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
Comal	DX 68-23-316	12/19/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
	DX-68-16-707	8/14/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
	DX-68-23-619B	8/7/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uvalde	YP-69-51-114	7/5/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05

County	State Well Number	Date Sampled	Aldrin µg/L)	alpha BHC (µg/L)	alpha Chlordane (µg/L)	Aroclor 1016 (µg/L)	Aroclor 1221 (µg/L)	Aroclor 1232 (µg/L)	Aroclor 1242 (µg/L)	Aroclor 1248 (µg/L)	Aroclor 1254 (µg/L)	Aroclor 1260 (µg/L)
Bexar	AY-68-27-517	5/10/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-27-610	5/31/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-27-612	6/4/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-28-314	5/15/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-28-519	6/6/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-28-609	5/30/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-29-114	5/23/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-29-213	6/4/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-29-215	5/22/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-29-414	11/19/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
	AY-68-29-418	5/21/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-30-801	8/8/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-36-907	11/14/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
Comal	DX 68-23-316	12/19/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
	DX-68-16-707	8/14/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
	DX-68-23-619B	8/7/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uvalde	YP-69-51-114	7/5/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA

*Data provided by TWDB

NA = not analyzed

J = estimated concentration between the method detection limit and the reporting limit.

S = Freshwater/Saline water Transect monitoring well

B = method blank contamination. The associated method blank contains the target analyte at a reportable level.

Table C-5 Analytical data for pesticides and herbicides in water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Date Sampled	Atrazine (µg/L)	Azinphos-methyl (µg/L)	beta BHC (µg/L)	Carbofuran (µg/L)	Chlordane (µg/L)	Chlorpyrifos (µg/L)	Coumaphos (µg/L)	Dalapon (µg/L)	delta BHC (µg/L)
Bexar	AY-68-27-517	5/10/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
	AY-68-27-610	5/31/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
	AY-68-27-612	6/4/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
	AY-68-28-314	5/15/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
	AY-68-28-519	6/6/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
	AY-68-28-609	5/30/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
	AY-68-29-114	5/23/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
	AY-68-29-213	6/4/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
	AY-68-29-215	5/22/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
	AY-68-29-414	11/19/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
	AY-68-29-418	5/21/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
	AY-68-30-801	8/8/01	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-36-907	11/14/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
Comal	DX 68-23-316	12/19/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
	DX-68-16-707	8/14/01	<0.001	NA	NA	<0.01	<0.05	NA	NA	<0.05	NA
	DX-68-23-619B	8/7/01	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uvalde	YP-69-51-114	7/5/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA

County	State Well Number	Date Sampled	Demeton (total) (µg/L)	Diazinon (µg/L)	Dicamba (µg/L)	Dichlorprop (µg/L)	Dichlorvos (µg/L)	Dieldrin (µg/L)	Dimethoate (µg/L)	Dinoseb (µg/L)	Disulfoton (µg/L)	Endosulfan II (µg/L)
Bexar	AY-68-27-517	5/10/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
	AY-68-27-610	5/31/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
	AY-68-27-612	6/4/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
	AY-68-28-314	5/15/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
	AY-68-28-519	6/6/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
	AY-68-28-609	5/30/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
	AY-68-29-114	5/23/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
	AY-68-29-213	6/4/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
	AY-68-29-215	5/22/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
	AY-68-29-414	11/19/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
	AY-68-29-418	5/21/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
	AY-68-30-801	8/8/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-36-907	11/14/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
Comal	DX 68-23-316	12/19/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
	DX-68-16-707	8/14/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
	DX-68-23-619B	8/7/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uvalde	YP-69-51-114	7/5/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001

*Data provided by TWDB

NA = not analyzed

J = estimated concentration between the method detection limit and the reporting limit.

S = Freshwater/Saline water Transect monitoring well

B = method blank contamination. The associated method blank contains the target analyte at a reportable level.

Table C-5 Analytical data for pesticides and herbicides in water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Date Sampled	Endosulfan I (µg/L)	Endosulfan sulfate (µg/L)	Endrin Aldehyde (µg/L)	Endrin ketone (µg/L)	Endrin (µg/L)	Ethion (µg/L)	Ethoprop (µg/L)	Ethyl parathion (µg/L)	Famphur (µg/L)	Fensulfo-thion (µg/L)
Bexar	AY-68-27-517	5/10/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
	AY-68-27-610	5/31/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
	AY-68-27-612	6/4/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
	AY-68-28-314	5/15/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
	AY-68-28-519	6/6/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
	AY-68-28-609	5/30/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
	AY-68-29-114	5/23/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
	AY-68-29-213	6/4/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
	AY-68-29-215	5/22/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
	AY-68-29-414	11/19/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
	AY-68-29-418	5/21/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
	AY-68-30-801	8/8/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-36-907	11/14/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
Comal	DX 68-23-316	12/19/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
	DX-68-16-707	8/14/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
	DX-68-23-619B	8/7/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uvalde	YP-69-51-114	7/5/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA

County	State Well Number	Date Sampled	Fenthion (µg/L)	gamma BHC (Lindane) (µg/L)	gamma-Chlordane (µg/L)	Heptachlor epoxide (µg/L)	Heptachlor (µg/L)	Hexachloro benzene (µg/L)	Hexachloro cyclopenta-diene (µg/L)	Malathion (µg/L)	MCPA (µg/L)	MCPP (µg/L)
Bexar	AY-68-27-517	5/10/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
	AY-68-27-610	5/31/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
	AY-68-27-612	6/4/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
	AY-68-28-314	5/15/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
	AY-68-28-519	6/6/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
	AY-68-28-609	5/30/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
	AY-68-29-114	5/23/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
	AY-68-29-213	6/4/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
	AY-68-29-215	5/22/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
	AY-68-29-414	11/19/01	<0.5	<0.05	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
	AY-68-29-418	5/21/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
	AY-68-30-801	8/8/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-36-907	11/14/01	<0.5	<0.05	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
Comal	DX 68-23-316	12/19/01	<0.5	<0.05	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
	DX-68-16-707	8/14/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
	DX-68-23-619B	8/7/01	NA	NA	NA	NA	NA	<10	<10	NA	NA	NA
Uvalde	YP-69-51-114	7/5/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA

*Data provided by TWDB

J = estimated concentration between the method detection limit and the reporting limit.

B = method blank contamination. The associated method blank contains the target analyte at a reportable level.

NA = not analyzed

S = Freshwater/Saline water Transect monitoring well

Table C-5 Analytical data for pesticides and herbicides in water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Date Sampled	Merphos (µg/L)	Methoxy-chlor (µg/L)	Methyl parathion (µg/L)	Mevinphos (µg/L)	Mirex (µg/L)	o,o,o-Triethyl phosphorothioate (µg/L)	Oxymyl (µg/L)	Parathion (µg/L)	Perthane (µg/L)	Phorate (µg/L)
Bexar	AY-68-27-517	5/10/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.01	NA
	AY-68-27-610	5/31/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.01	NA
	AY-68-27-612	6/4/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.01	NA
	AY-68-28-314	5/15/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.01	NA
	AY-68-28-519	6/6/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.01	NA
	AY-68-28-609	5/30/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.01	NA
	AY-68-29-114	5/23/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.01	NA
	AY-68-29-213	6/4/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.01	NA
	AY-68-29-215	5/22/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.01	NA
	AY-68-29-414	11/19/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	NA	<0.5
	AY-68-29-418	5/21/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.01	NA
	AY-68-30-801	8/8/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-36-907	11/14/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	NA	<0.5
Comal	DX 68-23-316	12/19/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	NA	<0.5
	DX-68-16-707	8/14/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.01	NA
	DX-68-23-619B	8/7/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uvalde	YP-69-51-114	7/5/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.01	NA

County	State Well Number	Date Sampled	Pichloram (µg/L)	Polychlori-nated Naphthalenes (µg/L)	Ronnel (µg/L)	Simazine (µg/L)	Sulfotepp (µg/L)	Tetrachlor vinphos (µg/L)	Thionazin (µg/L)	Tokuthion (µg/L)	Toxaphene (µg/L)	Trichloro-nate (µg/L)	Trithion (µg/L)
Bexar	AY-68-27-517	5/10/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
	AY-68-27-610	5/31/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
	AY-68-27-612	6/4/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
	AY-68-28-314	5/15/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
	AY-68-28-519	6/6/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
	AY-68-28-609	5/30/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
	AY-68-29-114	5/23/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
	AY-68-29-213	6/4/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
	AY-68-29-215	5/22/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
	AY-68-29-414	11/19/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
	AY-68-29-418	5/21/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
	AY-68-30-801	8/8/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	AY-68-36-907	11/14/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
Comal	DX 68-23-316	12/19/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
	DX-68-16-707	8/14/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
	DX-68-23-619B	8/7/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uvalde	YP-69-51-114	7/5/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002

*Data provided by TWDB

J = estimated concentration between the method detection limit and the reporting limit.

B = method blank contamination. The associated method blank contains the target analyte at a reportable level.

NA = not analyzed

S = Freshwater/Saline water Transect monitoring well

Table C-6 Analytical data for volatile organic compounds in water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Sample Date	1,1,1,2-Tetrachloroethane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloro-1,2,2-trifluoroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	1,1-Dichloroethene (µg/L)	1,2,3-Trichloropropane (µg/L)	1,2,4-Trichlorobenzene (µg/L)
Bexar	AY-68-27-517	5/10/01	<1	<1	<2	NA	<1	<1	<1	<1	NA
	AY-68-27-610	5/31/01	<1	<1	<2	NA	<1	<1	<1	<1	NA
	AY-68-27-612	6/4/01	<1	<1	<2	NA	<1	<1	<1	<1	NA
	AY-68-28-314	5/15/01	<1	<1	<2	NA	<1	<1	<1	<1	NA
	AY-68-28-519	6/6/01	<1	<1	<2	NA	<1	<1	<1	<1	NA
	AY-68-28-609	5/30/01	<1	<1	<2	NA	<1	<1	<1	<1	NA
	AY-68-29-114	5/23/01	<1	<1	<2	NA	<1	<1	<1	<1	NA
	AY-68-29-213	6/4/01	<1	<1	<2	NA	<1	<1	<1	<1	NA
	AY-68-29-215	5/22/01	<1	<1	<2	NA	<1	<1	<1	<1	NA
	AY-68-29-414	11/19/01	NA	<1	<1	<1	<1	<1	<1	NA	<1
	AY-68-29-418	5/21/01	<1	<1	<2	NA	<1	<1	<1	<1	NA
	AY-68-30-801	8/8/01	<5	<5	<5	NA	<5	<5	<5	<5	<5
	AY-68-36-907	11/14/01	NA	<1	<1	<1	<1	<1	<1	NA	<1
	AY-68-44-307	11/14/01	NA	<1	<1	<1	<1	<1	<1	NA	<1
Comal	DX 68-23-316	12/19/01	NA	NA	NA	NA	NA	NA	NA	NA	NA
	DX-68-23-619B	8/7/01	NA	NA	NA	NA	NA	NA	NA	NA	<10
Uvalde	YP-69-51-114	7/5/01	<1	<1	<2	NA	<1	<1	<1	<1	NA

*Data provided by TWDB
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.

NA = not analyzed
S = Freshwater/Saline water Transect monitoring well

Table C-6 Analytical data for volatile organic compounds in water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Sample Date	1,2,4-Trimethyl-benzene (µg/L)	1,2-Dibromo-3-chloro-propane (µg/L)	1,2-Dibromo-ethane (µg/L)	1,2-Dichloro-benzene (µg/L)	1,2-Dichloro-ethane (µg/L)	1,2-Dichloro-propane (µg/L)	1,2-Dicloro-propane (µg/L)	1,3,5-Trimethyl-benzene (µg/L)	1,3-Dichloro-benzene (µg/L)
Bexar	AY-68-27-517	5/10/01	<1	NA	<1	<1	<1	NA	<1	<1	<1
	AY-68-27-610	5/31/01	<1	NA	<1	<1	<1	NA	<1	<1	<1
	AY-68-27-612	6/4/01	<1	NA	<1	<1	<1	NA	<1	<1	<1
	AY-68-28-314	5/15/01	<1	NA	<1	<1	<1	NA	<1	<1	<1
	AY-68-28-519	6/6/01	<1	NA	<1	<1	<1	NA	<1	<1	<1
	AY-68-28-609	5/30/01	<1	NA	<1	<1	<1	NA	<1	<1	<1
	AY-68-29-114	5/23/01	<1	NA	<1	<1	<1	NA	<1	<1	<1
	AY-68-29-213	6/4/01	<1	NA	<1	<1	<1	NA	<1	<1	<1
	AY-68-29-215	5/22/01	<1	NA	<1	<1	<1	NA	<1	<1	<1
	AY-68-29-414	11/19/01	NA	<2	<1	<1	<1	<1	NA	NA	<1
	AY-68-29-418	5/21/01	<1	NA	<1	<1	<1	NA	<1	<1	<1
	AY-68-30-801	8/8/01	<5	NA	<5	<5	<5	NA	<5	NA	<5
	AY-68-36-907	11/14/01	NA	<2	<1	<1	<1	<1	NA	NA	<1
	AY-68-44-307	11/14/01	NA	<2	<1	<1	<1	<1	NA	NA	<1
Comal	DX 68-23-316	12/19/01	NA	NA	NA	NA	NA	NA	NA	NA	NA
	DX-68-23-619B	8/7/01	NA	NA	NA	<10	NA	NA	NA	NA	<10
Uvalde	YP-69-51-114	7/5/01	<1	NA	<1	<1	<1	NA	<1	<1	<1

*Data provided by TWDB

J = estimated concentration between the method detection limit and the reporting limit.

B = method blank contamination. The associated method blank contains the target analyte at a reportable level.

NA = not analyzed

S = Freshwater/Saline water Transect monitoring well

Table C-6 Analytical data for volatile organic compounds in water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Sample Date	1,4-Dichloro-benzene (µg/L)	2-Butanone (µg/L)	2-Chloro-toluene (µg/L)	2-Hexanone (µg/L)	4-Chloro-toluene (µg/L)	4-Methyl-2-pentanone (µg/L)	Acetone (µg/L)	Allyl chloride (µg/L)	Benzene (µg/L)
Bexar	AY-68-27-517	5/10/01	<1	<20	NA	<5	NA	NA	<20	NA	<1
	AY-68-27-610	5/31/01	<1	<20	NA	<5	NA	NA	<20	NA	<1
	AY-68-27-612	6/4/01	<1	<20	NA	<5	NA	NA	<20	NA	<1
	AY-68-28-314	5/15/01	<1	<20	NA	<5	NA	NA	<20	NA	<1
	AY-68-28-519	6/6/01	<1	<20	NA	<5	NA	NA	<20	NA	<1
	AY-68-28-609	5/30/01	<1	<20	NA	<5	NA	NA	<20	NA	<1
	AY-68-29-114	5/23/01	<1	<20	NA	<5	NA	NA	<20	NA	<1
	AY-68-29-213	6/4/01	<1	<20	NA	<5	NA	NA	<20	NA	<1
	AY-68-29-215	5/22/01	<1	<20	NA	<5	NA	NA	<20	NA	<1
	AY-68-29-414	11/19/01	<1	<5	NA	<5	NA	<5	3.6J	NA	<1
	AY-68-29-418	5/21/01	<1	<20	NA	<5	NA	NA	<20	NA	<1
	AY-68-30-801	8/8/01	<5	<10	<5	<10	<5	<10	<10	<5	<5
	AY-68-36-907	11/14/01	<1	<5	NA	<5	NA	<5	2J	NA	<1
	AY-68-44-307	11/14/01	<1	<5	NA	<5	NA	<5	<10	NA	<1
Comal	DX 68-23-316	12/19/01	NA	NA	NA	NA	NA	NA	NA	NA	NA
	DX-68-23-619B	8/7/01	<10	NA	NA	NA	NA	NA	NA	NA	NA
Uvalde	YP-69-51-114	7/5/01	<1	<20	NA	<5	NA	NA	<20	NA	<1

*Data provided by TWDB
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.

NA = not analyzed
S = Freshwater/Saline water Transect monitoring well

Table C-6 Analytical data for volatile organic compounds in water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Sample Date	Bromo-benzene (µg/L)	Bromo-chloro-methane (µg/L)	Bromo-dichloro-methane (µg/L)	Bromoform (µg/L)	Bromo-methane (µg/L)	Carbon disulfide (µg/L)	Carbon tetra-chloride (µg/L)	Chloro-benzene (µg/L)	Chloro-ethane (µg/L)
Bexar	AY-68-27-517	5/10/01	<1	NA	<1	<2	<2	<1	<1	<1	<2
	AY-68-27-610	5/31/01	<1	NA	<1	<2	<2	<1	<1	<1	<2
	AY-68-27-612	6/4/01	<1	NA	<1	<2	<2	<1	<1	<1	<2
	AY-68-28-314	5/15/01	<1	NA	<1	<2	<2	<1	<1	<1	<2
	AY-68-28-519	6/6/01	<1	NA	<1	<2	<2	<1	<1	<1	<2
	AY-68-28-609	5/30/01	<1	NA	<1	<2	<2	<1	<1	<1	<2
	AY-68-29-114	5/23/01	<1	NA	<1	<2	<2	<1	<1	<1	<2
	AY-68-29-213	6/4/01	<1	NA	<1	<2	<2	<1	<1	<1	<2
	AY-68-29-215	5/22/01	<1	NA	<1	<2	<2	<1	<1	<1	<2
	AY-68-29-414	11/19/01	NA	<1	<1	<1	<2	<1	<1	<1	<2
	AY-68-29-418	5/21/01	<1	NA	<1	<2	<2	<1	<1	<1	<2
	AY-68-30-801	8/8/01	<5	NA	<5	<5	<5	<5	<5	<5	<5
	AY-68-36-907	11/14/01	NA	<1	<1	<1	<2	<1	<1	<1	<2
	AY-68-44-307	11/14/01	NA	<1	<1	<1	<2	<1	<1	<1	<2
Comal	DX 68-23-316	12/19/01	NA	NA	NA	NA	NA	NA	NA	NA	NA
	DX-68-23-619B	8/7/01	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uvalde	YP-69-51-114	7/5/01	<1	NA	<1	<2	<2	<1	<1	<1	<2

*Data provided by TWDB

J = estimated concentration between the method detection limit and the reporting limit.

B = method blank contamination. The associated method blank contains the target analyte at a reportable level.

NA = not analyzed

S = Freshwater/Saline water Transect monitoring well

Table C-6 Analytical data for volatile organic compounds in water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Sample Date	Chloroform (µg/L)	Chloro-methane (µg/L)	cis-1,2-Dichloro-ethene (µg/L)	cis-1,2-Dichloro-propene (µg/L)	cis-1,3-Dichloro-propane (µg/L)	cis-1,3-Dichloro-propene (µg/L)	Cyclo-hexane (µg/L)	Dibromo-chloro-methane (µg/L)	Dibromo-methane (µg/L)
Bexar	AY-68-27-517	5/10/01	<1	<2	<1	<1	<1	NA	NA	<1	<1
	AY-68-27-610	5/31/01	<1	<2	<1	<1	<1	NA	NA	<1	<1
	AY-68-27-612	6/4/01	<1	<2	<1	<1	<1	NA	NA	<1	<1
	AY-68-28-314	5/15/01	<1	<2	<1	<1	<1	NA	NA	<1	<1
	AY-68-28-519	6/6/01	<1	<2	<1	<1	<1	NA	NA	<1	<1
	AY-68-28-609	5/30/01	<1	<2	<1	<1	<1	NA	NA	<1	<1
	AY-68-29-114	5/23/01	<1	<2	<1	<1	<1	NA	NA	<1	<1
	AY-68-29-213	6/4/01	<1	<2	<1	<1	<1	NA	NA	<1	<1
	AY-68-29-215	5/22/01	<1	<2	<1	<1	<1	NA	NA	<1	<1
	AY-68-29-414	11/19/01	<1	<2	<0.5	NA	NA	<1	<2	<1	NA
	AY-68-29-418	5/21/01	<1	<2	<1	<1	<1	NA	NA	<1	<1
	AY-68-30-801	8/8/01	<5	<5	<5	NA	NA	<5	NA	<5	<5
	AY-68-36-907	11/14/01	<1	<2	<0.5	NA	NA	<1	<2	<1	NA
	AY-68-44-307	11/14/01	<1	<2	<0.5	NA	NA	<1	<2	<1	NA
Comal	DX 68-23-316	12/19/01	NA	NA	NA	NA	NA	NA	NA	NA	NA
	DX-68-23-619B	8/7/01	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uvalde	YP-69-51-114	7/5/01	<1	<2	<1	<1	<1	NA	NA	<1	<1

*Data provided by TWDB
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.

NA = not analyzed
S = Freshwater/Saline water Transect monitoring well

Table C-6 Analytical data for volatile organic compounds in water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Sample Date	Dichloro-difluoro-methane (µg/L)	Ethyl benzene (µg/L)	Hexa-chloro-butadiene (µg/L)	Iodo-methane (µg/L)	iso-propyl-benzene (µg/L)	Iso-propyl toluene (µg/L)	Isopropyl-benzene (µg/L)
Bexar	AY-68-27-517	5/10/01	<2	<1	NA	NA	<1	<1	NA
	AY-68-27-610	5/31/01	<2	<1	NA	NA	<1	<1	NA
	AY-68-27-612	6/4/01	<2	<1	NA	NA	<1	<1	NA
	AY-68-28-314	5/15/01	<2	<1	NA	NA	<1	<1	NA
	AY-68-28-519	6/6/01	<2	<1	NA	NA	<1	<1	NA
	AY-68-28-609	5/30/01	<2	<1	NA	NA	<1	<1	NA
	AY-68-29-114	5/23/01	<2	<1	NA	NA	<1	<1	NA
	AY-68-29-213	6/4/01	<2	<1	NA	NA	<1	<1	NA
	AY-68-29-215	5/22/01	<2	<1	NA	NA	<1	<1	NA
	AY-68-29-414	11/19/01	<2	<1	NA	NA	NA	NA	<1
	AY-68-29-418	5/21/01	<2	<1	NA	NA	<1	<1	NA
	AY-68-30-801	8/8/01	<5	<5	<5	<5	<5	NA	NA
	AY-68-36-907	11/14/01	<2	<1	NA	NA	NA	NA	<1
	AY-68-44-307	11/14/01	<2	<1	NA	NA	NA	NA	<1
Comal	DX 68-23-316	12/19/01	NA	NA	NA	NA	NA	NA	NA
	DX-68-23-619B	8/7/01	NA	NA	NA	NA	NA	NA	NA
Uvalde	YP-69-51-114	7/5/01	<2	<1	NA	NA	<1	<1	NA

*Data provided by TWDB
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.

NA = not analyzed
S = Freshwater/Saline water Transect monitoring well

Table C-6 Analytical data for volatile organic compounds in water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Sample Date	Methylene chloride (µg/L)	MTBE (µg/L)	n-butyl-benzene (µg/L)	n-propyl-benzene (µg/L)	Naphtha-lene (µg/L)	m,p-Xylenes (µg/L)	o-Xylene (µg/L)	Xylenes (total) (µg/L)	sec-butyl-benzene (µg/L)
Bexar	AY-68-27-517	5/10/01	<2	<5	<1	<1	<2	<1	<1	NA	<1
	AY-68-27-610	5/31/01	<2	<5	<1	<1	<2	<1	<1	NA	<1
	AY-68-27-612	6/4/01	<2	<5	<1	<1	<2	<1	<1	NA	<1
	AY-68-28-314	5/15/01	<2	<5	<1	<1	<2	<1	<1	NA	<1
	AY-68-28-519	6/6/01	<2	<5	<1	<1	<2	<1	<1	NA	<1
	AY-68-28-609	5/30/01	<2	<5	<1	<1	<2	<1	<1	NA	<1
	AY-68-29-114	5/23/01	<2	<5	<1	<1	<2	<1	<1	NA	<1
	AY-68-29-213	6/4/01	<2	<5	<1	<1	<2	<1	<1	NA	<1
	AY-68-29-215	5/22/01	<2	<5	<1	<1	<2	<1	<1	NA	<1
	AY-68-29-414	11/19/01	<1	<1	NA	NA	NA	NA	NA	<2	NA
	AY-68-29-418	5/21/01	<2	<5	<1	<1	<2	<1	<1	NA	<1
	AY-68-30-801	8/8/01	<5	NA	<5	<5	<8	NA	NA	NA	<5
	AY-68-36-907	11/14/01	<1	<1	NA	NA	NA	NA	NA	<2	NA
	AY-68-44-307	11/14/01	<1	<1	NA	NA	NA	NA	NA	<2	NA
Comal	DX 68-23-316	12/19/01	NA	NA	NA	NA	NA	NA	NA	NA	NA
	DX-68-23-619B	8/7/01	NA	NA	NA	NA	<10	NA	NA	NA	NA
Uvalde	YP-69-51-114	7/5/01	<2	<5	<1	<1	<2	<1	<1	NA	<1

*Data provided by TWDB
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.

NA = not analyzed
S = Freshwater/Saline water Transect monitoring well

Table C-6 Analytical data for volatile organic compounds in water from wells completed in the Edwards Aquifer, 2001.

County	State Well Number	Sample Date	Styrene (µg/L)	tert-butlybenzene (µg/L)	Tetrachloro-ethene (µg/L)	Toluene (µg/L)	trans-1,2-Dichloro-ethene (µg/L)	Trans-1,2-Dichloro-propene (µg/L)	Trans-1,3-Dichloro-propene (µg/L)	Trichloro-ethene (µg/L)	Trichloro-fluoro-methane (µg/L)	Vinyl chloride (µg/L)
Bexar	AY-68-27-517	5/10/01	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2
	AY-68-27-610	5/31/01	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2
	AY-68-27-612	6/4/01	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2
	AY-68-28-314	5/15/01	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2
	AY-68-28-519	6/6/01	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2
	AY-68-28-609	5/30/01	<1	<1	<1	<1	<1	<1	NA	<1	<1	<2
	AY-68-29-114	5/23/01	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2
	AY-68-29-213	6/4/01	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2
	AY-68-29-215	5/22/01	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2
	AY-68-29-414	11/19/01	<1	NA	0.57J	<1	<0.5	NA	<1	<1	<2	<2
	AY-68-29-418	5/21/01	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2
	AY-68-30-801	8/8/01	<5	<5	<5	<5	<5	NA	<5	<5	<5	<5
	AY-68-36-907	11/14/01	<1	NA	<1	<1	<0.5	NA	<1	<1	<2	<2
	AY-68-44-307	11/14/01	<1	NA	<1	<1	<0.5	NA	<1	<1	<2	<2
Comal	DX 68-23-316	12/19/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	DX-68-23-619B	8/7/01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uvalde	YP-69-51-114	7/5/01	<1	<1	7.6	<1	<1	<1	<1	<1	<1	<2

*Data provided by TWDB
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.

NA = not analyzed
S = Freshwater/Saline water Transect monitoring well

Table C-7 Analytical data for semivolatile organic compounds in water from wells completed in the Edwards Aquifer, 2001.

County:	Bexar	Bexar	Comal
State Well Number	AY-68-29-414	AY-68-36-907	DX 68-23-316
Sample Date	11/19/01	11/14/01	12/19/01
2,4,5-Trichlorophenol (µg/L)	<20	<20	<20
2,4,6-Trichlorophenol (µg/L)	<10	<10	<10
2,4-Dichlorophenol (µg/L)	<10	<10	<10
2,4-Dimethylphenol (µg/L)	<10	<10	<10
2,4-Dinitrophenol (µg/L)	<50	<50	<50
2,4-Dinitrotoluene (µg/L)	<10	<10	<10
2,6-Dinitrotoluene (µg/L)	<10	<10	<10
2-Chloro-naphthalene (µg/L)	<10	<10	<10
2-Chlorophenol (µg/L)	<10	<10	<10
2-Methylnaphthalene (µg/L)	<10	<10	<10
2-Methylphenol (µg/L)	<10	<10	<10
2-Nitroaniline (µg/L)	<50	<50	<50
2-Nitrophenol (µg/L)	<10	<10	<10
3,3'-Dichlorobenzidine (µg/L)	<50	<50	<50
3-Nitroaniline (µg/L)	<50	<50	<50
4,6-Dinitro-2-methylphenol (µg/L)	<50	<50	<50
4-Bromophenyl phenyl ether (µg/L)	<10	<10	<10
4-Chloro-3-methylphenol (µg/L)	<10	<10	<10
4-Chloroaniline (µg/L)	<10	<10	<10
4-Chlorophenyl phenyl ether (µg/L)	<10	<10	<10
4-Methylphenol (µg/L)	<10	<10	<10
4-Nitroaniline (µg/L)	<50	<50	<50
4-Nitrophenol (µg/L)	<50	<50	<50
Acenaphthene (µg/L)	<10	<10	<10
Acenaphthylene (µg/L)	<10	<10	<10
Acetophenone (µg/L)	<10	<10	<10
Anthracene (µg/L)	<10	<10	<10
Benzo(a)anthracene (µg/L)	<10	<10	<10
Benzo(a)pyrene (µg/L)	<10	<10	<10
Benzo(b)fluoranthene (µg/L)	<10	<10	<10
Benzo(ghi)perylene (µg/L)	<10	<10	<10
Benzo(k)fluoranthene (µg/L)	<10	<10	<10
Biphenyl (µg/L)	4.1J B	4.1J B	<10
bis(2-Chloro-1-methylethyl) ether (µg/L)	<10	<10	<10
bis(2-Chloroethoxy)methane (µg/L)	<10	<10	<10
bis(2-Chloroethyl) ether (µg/L)	<10	<10	<10
bis(2-Ethylhexyl) phthalate (µg/L)	6.8J	<10	<10
Butyl benzyl phthalate (µg/L)	<10	<10	<10
Carbazole (µg/L)	<10	<10	<10
Chrysene (µg/L)	<10	<10	<10
Di-n-butyl phthalate (µg/L)	<10	<10	<10
Di-n-octyl phthalate (µg/L)	<10	<10	<10
Dibenz(a,h)anthracene (µg/L)	<10	<10	<10
Dibenzofuran (µg/L)	<10	<10	<10
Diethyl phthalate (µg/L)	<10	<10	<10
Dimethyl phthalate (µg/L)	<10	<10	<10
Fluoranthene (µg/L)	<10	<10	<10
Fluorene (µg/L)	<10	<10	<10
Hexachlorobenzene (µg/L)	<10	<10	<10
Hexachlorobutadiene (µg/L)	<10	<10	<10
Hexachlorocyclopentadiene (µg/L)	<50	<50	<50
Hexachloroethane (µg/L)	<10	<10	<10
Indeno(1,2,3-cd)pyrene (µg/L)	<10	<10	<10
Isophorone (µg/L)	<10	<10	<10
N-Nitrosodi-n-propylamine (µg/L)	<10	<10	<10

*Data provided by TWDB
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
NA = not analyzed
S = Freshwater/Saline water Transect monitoring well

Table C-7 Analytical data for semivolatile organic compounds in water from wells completed in the Edwards Aquifer, 2001.

County:	**Bexar**	**Bexar**	**Comal**
State Well Number	**AY-68-29-414**	**AY-68-36-907**	**DX 68-23-316**
Sample Date	**11/19/01**	**11/14/01**	**12/19/01**
N-Nitrosodiphenylamine (µg/L)	<10	<10	<10
Naphthalene (µg/L)	<10	<10	<10
Nitrobenzene (µg/L)	<10	<10	<10
Pentachlorophenol (µg/L)	<50	<50	<50
Phenanthrene (µg/L)	<10	<10	<10
Phenol (µg/L)	<10	<10	<10
Pronamide (µg/L)	<20	<20	<20
Pyrene (µg/L)	<10	<10	<10

*Data provided by TWDB
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
NA = not analyzed
S = Freshwater/Saline water Transect monitoring well

Table C-8 Field measurements collected while sampling water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	Time Sampled	Water Temp (ºC)	Conductivity, field (µS/cm)	Alkalinity, field (mg/L)	pH, field (SU)	Oxygen, dissolved (mg/L)	Hardness, total (mg/L)
Blanco River @ Wimberley	4/24/01	11:45	19.7	452	166	8.05	7.94	220
Blanco River @ Wimberley	12/4/01	13:05	18.2	520	220	7.86	7.57	269
Dry Frio River @ Reagan Wells	4/18/01	10:00	19.5	387	128	8.00	7.22	186
Dry Frio River @ Reagan Wells	11/28/01	10:10	13.6	432	166	7.94	7.68	223
Frio River @ Concan	4/18/01	11:30	18.7	424	152	8.05	7.83	206
Frio River @ Concan	11/28/01	11:30	13.9	437	174	8.23	8.37	229
Hondo Creek @ Tarpley	4/19/01	13:15	18.0	476	194	8.06	8.38	228
Hondo Creek @ Tarpley	11/29/01	12:35	7.63	459	188	7.63	9.55	239
Medina River @ Bandera	4/23/01	13:20	20.3	494	146	8.00	7.25	244
Medina River @ Bandera	11/30/01	12:45	11.3	543	192	8.20	8.78	287
Nueces River @ Laguna	4/17/01	13:20	20.4	418	164	7.98	7.61	208
Nueces River @ Laguna	11/27/01	15:10	18.8	427	150	7.95	6.97	218
Sabinal River @ Sabinal	4/19/01	14:30	19.6	467	156	8.08	8.09	222
Sabinal River @ Sabinal	11/28/01	14:45	13.9	494	198	7.96	8.40	257
Salado Creek @ Loop 1604N.	9/4/01	13:30	25.2	242	108	7.72	6.06	130
Seco Creek @ Miller Ranch	4/19/01	11:30	17.6	439	138	8.08	8.07	204
Seco Creek @ Miller Ranch	11/29/01	10:30	7.9	450	156	7.56	9.87	233

Table C-8 Field measurements collected while sampling water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	Time Sampled	Water Temp (ºC)	Conductivity, field (µS/cm)	Alkalinity, field (mg/L)	pH, field (SU)	Oxygen, dissolved (mg/L)	Hardness, total (mg/L)
Comal Springs #1 (DX-68-23-301)	2/1/01	14:40	23.1	543	190	7.18	4.65	268
Comal Springs #1	7/16/01	14:20	23.2	540	236	6.99	NA	263
Comal Springs #1	12/6/01	15:00	23.2	551	198	6.92	4.60	275
Comal Springs #7	12/6/01	13:40	23.6	552	198	7.11	5.00	272
Hueco Springs A (dx-68-15-901)	2/1/01	12:20	19.9	606	248	7.03	5.56	288
Hueco Springs A	7/17/01	10:30	21.5	599	280	6.81	NA	311
Hueco Springs A	12/7/01	11:30	20.7	606	228	6.59	4.59	315
Hueco Springs B	2/1/01	11:30	19.9	606	222	6.9	5.46	288
Hueco Springs B	2/8/01	10:15	NA	NA	NA	NA	NA	NA
Hueco Springs B	12/7/01	10:20	20.7	603	228	6.5	4.47	318
San Antonio Springs	2/5/01	13:15	24	487	176	7.26	5.07	212
San Antonio Springs	12/6/01	9:15	24.1	492	170	6.93	5.24	244
San Marcos Deep Springs (LR-67-01-819)	2/7/01	13:45	22.2	599	222	7	4.62	276
San Marcos Springs Hotel (LR-67-01-801)	2/7/01	14:25	21.6	608	224	7.01	3.32	288
San Marcos Springs Hotel	12/10/01	12:30	21.5	6.02	214	6.73	3.24	300
San Pedro Springs	2/5/01	14:45	23.8	511	190	7.12	4.58	228
San Pedro Springs	12/5/01	13:40	23.9	528	190	6.72	4.41	258

Table C-9 Analytical data for major ions in water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	Calcium dissolved (mg/L)	Magnesium dissolved (mg/L)	Sodium dissolved (mg/L)	Potassium dissolved (mg/L)	Chloride dissolved (mg/L)	Sulfate dissolved (mg/L)	Fluoride dissolved (mg/L)	Silica dissolved (mg/L)	Total dissolved solids mg/L)
Blanco River @ Wimberley	4/24/01	68	13	5	1	18	26	0.039	3.78	272
Blanco River @ Wimberley	12/4/01	84.8	13.8	6.6	1.2B J	11.3J	19J	0.23B J	4.1	301J
Comal Springs #1	2/1/01	81	16	9	<1	28	19	0.29	5.3	310
Comal Springs #1	7/16/01	79	16	10	1.4	17	24	0.2	13	308
Comal Springs #1	12/6/01	83.9	15.8	9.8	1.3B J	16.1J	23.4J	0.33B	5.1	298
Comal Springs #7	12/6/01	81.8	16.5	10.3	1.4B J	17.6J	24.8J	0.31B	5.1	286
Dry Frio River @ Reagan Wells	4/18/01	56	13	4	<1	17	17	0.06	4.36	224
Dry Frio River @ Reagan Wells	11/28/01	69.2	12.1	5.4	0.69B J	9.8J	12.7J	0.18B J	5.6	250
Frio River @ Concan	4/18/01	60	14	5	<1	18	18	0.11	4.56	248
Frio River @ Concan	11/28/01	69.4	13.5	5.7	0.95B J	9.7J	12.5J	0.19B J	5.5	267
Hondo Creek @ Tarpley	4/19/01	79	10	6	<1	17	31	0.31	4.34	296
Hondo Creek @ Tarpley	11/29/01	80	9.5	5.7	1.2B J	9.3J	26.4J	0.23B J	4.5	246
Hueco Springs (Main)	2/1/01	108	10	8	<1	25	17	0.18	4.1	340
Hueco Springs (Main)	7/17/01	104	13	9	1.4	16	20	0.2	12	345
Hueco Springs (Main)	12/7/01	110	9.9	7.9	1.3B J	13.7J	18.3J	0.26B	4.3	322
Hueco Springs (Overflow)	2/1/01	108	10	8	<1	25	16	0.12	4.2	352
Hueco Springs (Overflow)	12/7/01	111	10	8	1.4B J	13.4J	18.4J	0.29B	4.3	329
Medina River @ Bandera	4/23/01	72	14	5	2	16	62	0.29	4.2	342
Medina River @ Bandera	11/30/01	85.9	17.7	6.1	1.1B J	9.8J	53.6J	0.24B J	4.6	316
Nueces River @ Laguna	4/17/01	58	14	6	<1	18	16	0.09	5.04	240
Nueces River @ Laguna	11/27/01	65.4	13.2	6.8	1B J	9.8J	12.6J	0.22B J	5.6	233
Sabinal River near Sabinal	4/19/01	72	13	6	<1	15	25	0.3	5.14	280
Sabinal River near Sabinal	11/28/01	80.7	13.6	6.6	1B J L	9.7J	23.5J	0.21B J	5.1	269
Salado Creek @ Loop 1604N.	9/4/01	46	3	2	3	5	4	0.35	4.15	216
San Antonio Springs	2/5/01	69	15	8	<1	27	16	0.19	4.8	272
San Antonio Springs	12/6/01	72.6	15.3	9.1	1.2B J	18.2J	17.1J	0.23B J	5	317
San Marcos Springs Hotel	2/7/01	91	19	10	1	26	33	0.18	4.4	336
San Marcos Springs Hotel	12/10/01	90	18.2	10.5	1.4B J L	18.7J	26J	0.3B	4.5	328
San Marcos Deep Springs	2/7/01	93	16	10	<1	25	28	0.12	4.9	330
San Pedro Springs	2/5/01	75	16	10	<1	26	18	0.24	5.3	296
San Pedro Springs	12/5/01	78.5	15	10.9	1.3B J	20.5J	22J	0.22B J	5.3	314
Seco Creek @ Miller Ranch	4/19/01	68	11	5	<1	15	35	0.19	4.78	280
Seco Creek @ Miller Ranch	11/29/01	73.9	11.8	5.6	0.91B J	9.7J	36.4J	0.21B J	4.6	245

*Data provided by TWDB

NA = not analyzed

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J = method blank contamination. The associated method blank contains the target analyte at a reportable level.

L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-10 Analytical data for metals in water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	Aluminum dissolved (mg/L)	Antimony dissolved (mg/L)	Arsenic dissolved (mg/L)	Barium dissolved (mg/L)	Beryllium dissolved (mg/L)	Boron dissolved (mg/L)	Bromide dissolved (mg/L)	Cadmium dissolved (mg/L)
Blanco River @ Wimberley	4/24/01	0.07	NA	<0.002	0.03	NA	NA	NA	<0.001
Blanco River @ Wimberley	12/4/01	NA	<0.01	0.0034B	0.029	<0.002	NA	NA	<0.002
Comal Springs #1	2/1/01	<0.04	NA	0.003	0.04	NA	NA	NA	<0.01
Comal Springs #1	7/16/01	<0.004	<0.001	<0.002	0.0518	<0.001	<0.05	0.144	<0.001
Comal Springs #1	12/6/01	NA	0.0044B	<0.01	0.046	<0.002	NA	NA	<0.002
Comal Springs #7	12/6/01	NA	<0.01	<0.01	0.052	<0.002	NA	NA	<0.002
Dry Frio River @ Reagan Wells	4/18/01	<0.04	NA	<0.002	0.04	NA	NA	NA	<0.001
Dry Frio River @ Reagan Wells	11/28/01	NA	<0.01	<0.01	0.039	<0.002	NA	NA	<0.002
Frio River @ Concan	4/18/01	<0.04	NA	<0.002	0.04	NA	NA	NA	<0.001
Frio River @ Concan	11/28/01	NA	<0.01	<0.01	0.032	<0.002	NA	NA	<0.002
Hondo Creek @ Tarpley	4/19/01	<0.04	NA	<0.002	0.03	NA	NA	NA	<0.001
Hondo Creek @ Tarpley	11/29/01	NA	<0.01	<0.01	0.026	<0.002	NA	NA	<0.002
Hueco Springs (Main)	2/1/01	0.06	NA	0.002	0.02	NA	NA	NA	<0.001
Hueco Springs (Main)	7/17/01	<0.004	<0.001	<0.002	0.0322	<0.001	<0.05	0.149	<0.001
Hueco Springs (Overflow)	2/1/01	0.07	NA	0.004	0.03	NA	NA	NA	<0.001
Hueco Springs (Overflow)	12/7/01	NA	0.0052B	<0.01	0.032	<0.002	NA	NA	<0.002
Medina River @ Bandera	4/23/01	0.11	NA	<0.002	0.03	NA	NA	NA	<0.001
Medina River @ Bandera	11/30/01	NA	<0.01	<0.01	0.03	<0.002	NA	NA	<0.002
Nueces River @ Laguna	4/17/01	<0.04	NA	<0.002	0.04	NA	NA	NA	<0.001
Nueces River @ Laguna	11/27/01	NA	<0.01	<0.01	0.041	<0.002	NA	NA	<0.002
Sabinal River near Sabinal	4/19/01	0.06	NA	<0.002	0.04	NA	NA	NA	<0.001
Sabinal River near Sabinal	11/28/01	NA	<0.01	<0.01	0.035	<0.002	NA	NA	<0.002
Salado Creek @ Loop 1604N.	9/4/01	0.17	NA	<0.002	0.02	NA	NA	NA	<0.001
San Antonio Springs	2/5/01	<0.04	NA	0.002	0.05	NA	NA	NA	<0.001
San Antonio Springs	12/6/01	NA	<0.01	<0.01	0.045	<0.002	NA	NA	<0.002
San Marcos Springs Hotel	2/7/01	<0.04	NA	0.003	0.04	NA	NA	NA	<0.001
San Marcos Springs Hotel	12/10/01	NA	<0.01	<0.01	0.032	<0.002	NA	NA	<0.002
San Marcos Deep Springs	2/7/01	<0.04	NA	0.002	0.04	NA	NA	NA	<0.001
San Pedro Springs	2/5/01	<0.04	NA	0.005	0.04	NA	NA	NA	<0.001
San Pedro Springs	12/5/01	NA	0.0032B	<0.01	0.047	<0.002	NA	NA	<0.002
Seco Creek @ Miller Ranch	4/19/01	<0.04	NA	<0.002	0.03	NA	NA	NA	<0.001
Seco Creek @ Miller Ranch	11/29/01	NA	<0.01	<0.01	0.028	0.0006B	NA	NA	<0.002

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L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-10 Analytical data for metals in water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Collected	Chromium dissolved (mg/L)	Cobalt dissolved (mg/L)	Copper dissolved (mg/L)	Iron dissolved (mg/L)	Lead dissolved (mg/L)	Lithium dissolved (mg/L)	Manganese dissolved (mg/L)	Mercury dissolved (mg/L)
Blanco River @ Wimberley	4/24/01	<0.002	NA	<0.001	<0.003	<0.002	NA	<0.002	<0.002
Blanco River @ Wimberley	12/4/01	<0.005	NA	<0.02	<0.1	<0.003	NA	0.0019B	<0.0002
Comal Springs #1	2/1/01	<0.002	NA	<0.001	0.007	0.006	NA	<0.002	<0.002
Comal Springs #1	7/16/01	<0.001	<0.001	<0.002	<0.05	<0.001	0.00533	<0.001	NA
Comal Springs #1	12/6/01	<0.005	NA	<0.02	<0.1	<0.003	NA	<0.01	<0.0002
Comal Springs #7	12/6/01	<0.005	NA	<0.02	<0.1	<0.003	NA	<0.01	<0.0002
Dry Frio River @ Reagan Wells	4/18/01	<0.002	NA	0.001	0.008	0.004	NA	<0.002	<0.002
Dry Frio River @ Reagan Wells	11/28/01	<0.005	NA	<0.02	<0.1	<0.003	NA	0.001B	<0.0002
Frio River @ Concan	4/18/01	<0.002	NA	0.002	<0.003	<0.002	NA	<0.002	<0.002
Frio River @ Concan	11/28/01	<0.005	NA	<0.02	<0.1	<0.003	NA	0.001B	<0.0002
Hondo Creek @ Tarpley	4/19/01	<0.002	NA	<0.001	0.003	<0.002	NA	<0.002	<0.002
Hondo Creek @ Tarpley	11/29/01	<0.005	NA	<0.02	<0.1	<0.003	NA	0.0047B	<0.0002
Hueco Springs (Main)	2/1/01	<0.002	NA	0.001	0.011	0.007	NA	<0.002	<0.002
Hueco Springs (Main)	7/17/01	<0.001	<0.001	<0.002	<0.05	<0.001	0.00258	<0.001	NA
Hueco Springs (Overflow)	2/1/01	<0.002	NA	<0.001	0.013	0.006	NA	<0.002	<0.002
Hueco Springs (Overflow)	12/7/01	<0.005	NA	<0.02	<0.1	<0.003	NA	<0.01	<0.0002
Medina River @ Bandera	4/23/01	<0.002	NA	<0.001	0.003	<0.002	NA	0.004	<0.002
Medina River @ Bandera	11/30/01	<0.005	NA	<0.02	<0.1	<0.003	NA	0.0023B	<0.0002
Nueces River @ Laguna	4/17/01	<0.002	NA	<0.001	<0.003	<0.002	NA	<0.002	<0.002
Nueces River @ Laguna	11/27/01	<0.005	NA	<0.02	<0.1	<0.003	NA	<0.01	<0.0002
Sabinal River near Sabinal	4/19/01	<0.002	NA	<0.001	<0.003	<0.002	NA	<0.002	<0.002
Sabinal River near Sabinal	11/28/01	<0.005	NA	<0.02	<0.1	<0.003	NA	0.0015B	<0.0002
Salado Creek @ Loop 1604N.	9/4/01	<0.002	NA	0.001	0.012	<0.002	NA	0.002	<0.002
San Antonio Springs	2/5/01	NA	NA	0.002	0.003	0.004	NA	<0.002	<0.002
San Antonio Springs	12/6/01	<0.005	NA	<0.02	<0.1	<0.003	NA	<0.01	<0.0002
San Marcos Springs Hotel	2/7/01	<0.002	NA	<0.001	<0.003	0.002	NA	<0.002	<0.002
San Marcos Springs Hotel	12/10/01	<0.005	NA	<0.02	<0.1	<0.003	NA	<0.01	<0.0002
San Marcos Deep Springs	2/7/01	<0.002	NA	<0.001	<0.003	0.002	NA	<0.002	<0.002
San Pedro Springs	2/5/01	<0.002	NA	<0.001	<0.003	0.003	NA	<0.002	<0.002
San Pedro Springs	12/5/01	<0.005	NA	<0.02	<0.1	<0.003	NA	<0.01	<0.0002
Seco Creek @ Miller Ranch	4/19/01	<0.002	NA	<0.001	<0.003	<0.002	NA	<0.002	<0.002
Seco Creek @ Miller Ranch	11/29/01	<0.005	NA	<0.02	<0.1	<0.003	NA	0.0011B	<0.0002

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Table C-10 Analytical data for metals in water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Collected	Molybdenum dissolved (mg/L)	Nickel dissolved (mg/L)	Selenium dissolved (mg/L)	Silver dissolved (mg/L)	Strontium dissolved (mg/L)	Thallium dissolved (mg/L)	Zinc dissolved (mg/L)
Blanco River @ Wimberley	4/24/01	NA	NA	0.004	<0.001	0.269	NA	0.01
Blanco River @ Wimberley	12/4/01	NA	<0.005	0.014	<0.005	0.26	<0.01	<0.02
Comal Springs #1	2/1/01	NA	NA	<0.003	<0.001	0.545	NA	0.04
Comal Springs #1	7/16/01	<0.001	0.00192	<0.004	NA	0.53	<0.001	<0.004
Comal Springs #1	12/6/01	NA	<0.005	0.013	<0.005	0.57	<0.01	<0.02
Comal Springs #7	12/6/01	NA	<0.005	0.0099	<0.005	0.66	<0.01	<0.02
Dry Frio River @ Reagan Wells	4/18/01	NA	NA	0.003	<0.001	0.34	NA	0.05
Dry Frio River @ Reagan Wells	11/28/01	NA	<0.005	0.011	<0.005	0.37	<0.01	<0.02
Frio River @ Concan	4/18/01	NA	NA	<0.003	<0.001	0.244	NA	0.02
Frio River @ Concan	11/28/01	NA	<0.005	0.0092	<0.005	0.24	<0.01	<0.02
Hondo Creek @ Tarpley	4/19/01	NA	NA	<0.003	<0.001	0.38	NA	<0.01
Hondo Creek @ Tarpley	11/29/01	NA	<0.005	0.01	<0.005	0.33	<0.01	<0.02
Hueco Springs (Main)	2/1/01	NA	NA	<0.003	<0.001	0.171	NA	0.03
Hueco Springs (Main)	7/17/01	<0.001	0.00379	<0.004	<0.005	0.299	<0.001	<0.004
Hueco Springs (Overflow)	2/1/01	NA	NA	<0.003	<0.001	0.163	NA	0.02
Hueco Springs (Overflow)	12/7/01	NA	<0.005	0.018	<0.005	0.2	<0.01	<0.02
Medina River @ Bandera	4/23/01	NA	NA	0.004	<0.001	0.628	NA	0.01
Medina River @ Bandera	11/30/01	NA	<0.005	0.013	<0.005	0.67	<0.01	<0.02
Nueces River @ Laguna	4/17/01	NA	NA	<0.003	<0.001	0.211	NA	0.02
Nueces River @ Laguna	11/27/01	NA	<0.005	0.011	<0.005	0.22	<0.01	<0.02
Sabinal River near Sabinal	4/19/01	NA	NA	<0.003	<0.001	0.319	NA	<0.01
Sabinal River near Sabinal	11/28/01	NA	<0.005	0.013	<0.005	0.34	<0.01	<0.02
Salado Creek @ Loop 1604N.	9/4/01	NA	NA	<0.003	<0.001	0.07	NA	0.02
San Antonio Springs	2/5/01	NA	NA	<0.003	<0.001	0.512	NA	0.03
San Antonio Springs	12/6/01	NA	<0.005	0.012	<0.005	0.53	<0.01	<0.02
San Marcos Springs Hotel	2/7/01	NA	NA	<0.003	<0.001	0.54	NA	0.02
San Marcos Springs Hotel	12/10/01	NA	<0.005	0.015	<0.005	0.52	<0.01	<0.02
San Marcos Deep Springs	2/7/01	NA	NA	<0.003	<0.001	0.496	NA	0.02
San Pedro Springs	2/5/01	NA	NA	<0.003	<0.001	0.541	NA	0.01
San Pedro Springs	12/5/01	NA	<0.005	0.014	<0.005	0.54	<0.01	<0.02
Seco Creek @ Miller Ranch	4/19/01	NA	NA	<0.003	<0.001	0.459	NA	<0.01
Seco Creek @ Miller Ranch	11/29/01	NA	<0.005	0.0092	<0.005	0.46	<0.01	<0.02

*Data provided by TWDB

NA = not analyzed

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J = method blank contamination. The associated method blank contains the target analyte at a reportable level.

L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C11 Analytical data for nutrients in water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	BOD5 (mg/L)	Nitrate-Nitrite (mg/L)	Nitrogen Ammonia (mg/L)	Nitrogen Kjeldahl (mg/L)	Nitrogen Nitrite (mg/L)	Total Phosphorus (mg/L)	Total Organic Carbon (mg/L)	Total Suspended Solids (mg/L)
Blanco River @ Wimberley	4/24/01	1	0.17	<0.1	<0.1	0.005	<0.01	2	8
Blanco River @ Wimberley	12/4/01	NA	0.75	NA	NA	NA	NA	2.1	<4
Comal Springs #1	2/1/01	NA	1.8	NA	NA	NA	0.02	NA	NA
Comal Springs #1	12/6/01	NA	1.9	NA	NA	NA	0.054	NA	<4
Comal Springs #7	12/6/01	NA	1.9	NA	NA	NA	0.053	NA	<4
Comal Springs #1	7/16/01	NA	2.2	NA	NA	NA	NA	NA	NA
Dry Frio River @ Reagan Wells	4/18/01	<1	0.13	<0.03	<0.1	<0.005	0.02	<1	<1
Dry Frio River @ Reagan Wells	11/28/01	NA	1.2	NA	NA	NA	NA	2.4	<4
Frio River @ Concan	4/18/01	<1	0.17	<0.03	<0.1	<0.005	0.01	<1	<1
Frio River @ Concan	11/28/01	NA	1.2	NA	NA	NA	NA	1.9	<4
Hondo Creek @ Tarpley	4/19/01	<1	0.15	<0.03	<0.1	<0.005	0.01	<1	1
Hondo Creek @ Tarpley	11/29/01	NA	0.48	NA	NA	NA	NA	2	<4
Hueco Springs (Main)	2/1/01	NA	1.43	NA	NA	NA	0.02	NA	NA
Hueco Springs (Main)	12/7/01	NA	1	NA	NA	NA	0.05	NA	6
Hueco Springs (Overflow)	2/1/01	NA	1.49	NA	NA	NA	<0.01	NA	NA
Hueco Springs (Overflow)	12/7/01	NA	1.2	NA	NA	NA	0.038	NA	5.6
Medina River @ Bandera	4/23/01	1	0.19	<0.1	<0.1	0.012	0.01	<1	41
Medina River @ Bandera	11/30/01	NA	0.56	NA	NA	NA	NA	1.6	<4
Nueces River @ Laguna	4/17/01	<1	0.22	<0.03	<0.1	<0.005	0.02	<1	<1
Nueces River @ Laguna	11/27/01	NA	1.5	NA	NA	NA	NA	2.2	<4
Sabinal River near Sabinal	4/19/01	<1	0.20	<0.03	0.28	<0.005	0.02	<1	1
Sabinal River near Sabinal	11/28/01	NA	0.55	NA	NA	NA	NA	1.6	<4
Salado Creek @ Loop 1604N.	9/4/01	1	0.03	<0.1	0.56	<0.005	0.03	11	7
San Antonio Springs	2/5/01	NA	2.1	NA	NA	NA	0.01	NA	NA
San Antonio Springs	12/6/01	NA	1.9	NA	NA	NA	0.048	NA	<4
San Marcos Springs Hotel	2/7/01	NA	1.32	NA	NA	NA	0.01	NA	NA
San Marcos Deep Springs	2/7/01	NA	1.91	NA	NA	NA	<0.01	NA	NA
San Marcos Springs Hotel	12/10/01	NA	1.1	NA	NA	NA	0.045	NA	<4
San Pedro Springs	2/5/01	NA	2.06	NA	NA	NA	0.02	NA	NA
San Pedro Springs	12/5/01	NA	2.4	NA	NA	NA	0.052	NA	<4
Seco Creek @ Miller Ranch	4/19/01	<1	0.10	<0.03	<0.1	<0.005	0.01	<1	1
Seco Creek @ Miller Ranch	11/29/01	NA	0.54	NA	NA	NA	NA	1.4	<4

*Data provided by TWDB

NA = not analyzed

B = estimated concentration between the method detection limit and the reporting limit.

J = method blank contamination. The associated method blank contains the target analyte at a reportable level.

L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-12 Analytical data for pesticides and herbicides in water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	2,4,5-TP (Silvex) (µg/L)	2,4,5-T (µg/L)	2,4-DB (µg/L)	2,4-D (µg/L)	4,4'-DDD (µg/L)	4,4'-DDE (µg/L)	4,4'-DDT (µg/L)	Alachlor (µg/L)	Aldicarb Sulfoxide (µg/L)	Aldicarb (µg/L)
Blanco River @ Wimberley	4/24/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
Blanco River @ Wimberley	12/4/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
Comal Springs #1	2/1/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
Comal Springs #1	12/6/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
Comal Springs #7	12/6/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
Dry Frio River @ Reagan Wells	4/18/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
Dry Frio River @ Reagan Wells	11/28/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
Frio River @ Concan	4/18/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
Frio River @ Concan	11/28/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
Hondo Creek @ Tarpley	4/19/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
Hondo Creek @ Tarpley	11/29/01	<0.1	0.028J	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
Hueco Springs (Main)	2/1/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
Hueco Springs (Main)	12/7/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
Hueco Springs (Overflow)	2/1/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
Hueco Springs (Overflow)	12/7/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
Medina River @ Bandera	4/23/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
Medina River @ Bandera	11/30/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
Nueces River @ Laguna	4/17/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
Nueces River @ Laguna	11/27/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
Sabinal River near Sabinal	4/19/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
Sabinal River near Sabinal	11/28/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
Salado Creek @ Loop 1604N.	9/4/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
San Antonio Springs	2/5/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
San Antonio Springs	12/6/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
San Marcos Springs Hotel	12/10/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
San Marcos Springs	2/7/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
San Marcos Deep Springs	2/7/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
San Pedro Springs	2/5/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
San Pedro Springs	12/5/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA
Seco Creek @ Miller Ranch	4/19/01	<0.001	<0.002	NA	<0.001	<0.001	<0.001	<0.001	<0.005	<0.02	<0.05
Seco Creek @ Miller Ranch	11/29/01	<0.1	<0.1	<0.7	<0.45	<0.05	<0.05	<0.05	NA	NA	NA

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-12 Analytical data for pesticides and herbicides in water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	Aldrin (µg/L)	alpha BHC (µg/L)	alpha Chlordane (µg/L)	Aroclor 1016 (µg/L)	Aroclor 1221 (µg/L)	Aroclor 1232 (µg/L)	Aroclor 1242 (µg/L)	Aroclor 1248 (µg/L)	Aroclor 1254 (µg/L)	Aroclor 1260 (µg/L)
Blanco River @ Wimberley	4/24/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blanco River @ Wimberley	12/4/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
Comal Springs #1	2/1/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Comal Springs #1	12/6/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
Comal Springs #7	12/6/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
Dry Frio River @ Reagan Wells	4/18/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dry Frio River @ Reagan Wells	11/28/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
Frio River @ Concan	4/18/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Frio River @ Concan	11/28/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
Hondo Creek @ Tarpley	4/19/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hondo Creek @ Tarpley	11/29/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
Hueco Springs (Main)	2/1/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hueco Springs (Main)	12/7/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
Hueco Springs (Overflow)	2/1/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hueco Springs (Overflow)	12/7/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
Medina River @ Bandera	4/23/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Medina River @ Bandera	11/30/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
Nueces River @ Laguna	4/17/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nueces River @ Laguna	11/27/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
Sabinal River near Sabinal	4/19/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sabinal River near Sabinal	11/28/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
Salado Creek @ Loop 1604N.	9/4/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
San Antonio Springs	2/5/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
San Antonio Springs	12/6/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
San Marcos Springs Hotel	12/10/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
San Marcos Springs	2/7/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
San Marcos Deep Springs	2/7/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
San Pedro Springs	2/5/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
San Pedro Springs	12/5/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1
Seco Creek @ Miller Ranch	4/19/01	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA
Seco Creek @ Miller Ranch	11/29/01	<0.05	<0.05	<0.05	<1	<1	<1	<1	<1	<1	<1

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-12 Analytical data for pesticides and herbicides in water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	Atrazine (µg/L)	Azinphos-methyl (µg/L)	beta BHC (µg/L)	Carbofuran (µg/L)	Chlordane (µg/L)	Chlorpyrifos (µg/L)	Coumaphos (µg/L)	Dalapon (µg/L)	delta BHC (µg/L)
Blanco River @ Wimberley	4/24/01	<0.001	NA	NA	<0.01	<0.05	NA	NA	<0.05	NA
Blanco River @ Wimberley	12/4/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
Comal Springs #1	2/1/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
Comal Springs #1	12/6/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
Comal Springs #7	12/6/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
Dry Frio River @ Reagan Wells	4/18/01	<0.001	NA	NA	<0.01	<0.05	NA	NA	<0.05	NA
Dry Frio River @ Reagan Wells	11/28/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
Frio River @ Concan	4/18/01	<0.001	NA	NA	<0.01	<0.05	NA	NA	<0.05	NA
Frio River @ Concan	11/28/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
Hondo Creek @ Tarpley	4/19/01	<0.001	NA	NA	<0.01	<0.05	NA	NA	<0.05	NA
Hondo Creek @ Tarpley	11/29/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
Hueco Springs (Main)	2/1/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
Hueco Springs (Main)	12/7/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
Hueco Springs (Overflow)	2/1/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
Hueco Springs (Overflow)	12/7/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
Medina River @ Bandera	4/23/01	<0.001	NA	NA	<0.01	<0.05	NA	NA	<0.05	NA
Medina River @ Bandera	11/30/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
Nueces River @ Laguna	4/17/01	<0.001	NA	NA	<0.01	<0.05	NA	NA	<0.05	NA
Nueces River @ Laguna	11/27/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
Sabinal River near Sabinal	4/19/01	<0.001	NA	NA	<0.01	<0.05	NA	NA	<0.05	NA
Sabinal River near Sabinal	11/28/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
Salado Creek @ Loop 1604N.	9/4/01	<0.001	NA	NA	<0.01	<0.05	NA	NA	<0.05	NA
San Antonio Springs	2/5/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
San Antonio Springs	12/6/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
San Marcos Springs Hotel	12/10/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
San Marcos Springs	2/7/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
San Marcos Deep Springs	2/7/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
San Pedro Springs	2/5/01	<0.001	NA	NA	<0.01	NA	NA	NA	<0.05	NA
San Pedro Springs	12/5/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05
Seco Creek @ Miller Ranch	4/19/01	<0.001	NA	NA	<0.01	<0.05	NA	NA	<0.05	NA
Seco Creek @ Miller Ranch	11/29/01	NA	<0.5	<0.05	NA	NA	<0.5	<0.5	<2	<0.05

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-12 Analytical data for pesticides and herbicides in water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	Demeton (total) (µg/L)	Diazinon (µg/L)	Dicamba (µg/L)	Dichlorprop (µg/L)	Dichlorvos (µg/L)	Dieldrin (µg/L)	Dimethoate (µg/L)	Dinoseb (µg/L)	Disulfoton (µg/L)	Endosulfan II (µg/L)
Blanco River @ Wimberley	4/24/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
Blanco River @ Wimberley	12/4/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
Comal Springs #1	2/1/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
Comal Springs #1	12/6/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
Comal Springs #7	12/6/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
Dry Frio River @ Reagan Wells	4/18/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
Dry Frio River @ Reagan Wells	11/28/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
Frio River @ Concan	4/18/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
Frio River @ Concan	11/28/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
Hondo Creek @ Tarpley	4/19/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
Hondo Creek @ Tarpley	11/29/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
Hueco Springs (Main)	2/1/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
Hueco Springs (Main)	12/7/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
Hueco Springs (Overflow)	2/1/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
Hueco Springs (Overflow)	12/7/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
Medina River @ Bandera	4/23/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
Medina River @ Bandera	11/30/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
Nueces River @ Laguna	4/17/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
Nueces River @ Laguna	11/27/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
Sabinal River near Sabinal	4/19/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
Sabinal River near Sabinal	11/28/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
Salado Creek @ Loop 1604N.	9/4/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
San Antonio Springs	2/5/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
San Antonio Springs	12/6/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
San Marcos Springs Hotel	12/10/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
San Marcos Springs	2/7/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
San Marcos Deep Springs	2/7/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
San Pedro Springs	2/5/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
San Pedro Springs	12/5/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05
Seco Creek @ Miller Ranch	4/19/01	NA	<0.005	NA	NA	NA	<0.0002	NA	<0.05	NA	<0.001
Seco Creek @ Miller Ranch	11/29/01	<0.5	<0.5	<0.15	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.05

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-12 Analytical data for pesticides and herbicides in water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	Endosulfan I (µg/L)	Endosulfan sulfate (µg/L)	Endrin Aldehyde (µg/L)	Endrin ketone (µg/L)	Endrin (µg/L)	Ethion (µg/L)	Ethoprop (µg/L)	Ethyl parathion (µg/L)	Famphur (µg/L)	Fensulfo-thion (µg/L)
Blanco River @ Wimberley	4/24/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
Blanco River @ Wimberley	12/4/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
Comal Springs #1	2/1/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
Comal Springs #1	12/6/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
Comal Springs #7	12/6/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
Dry Frio River @ Reagan Wells	4/18/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
Dry Frio River @ Reagan Wells	11/28/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
Frio River @ Concan	4/18/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
Frio River @ Concan	11/28/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
Hondo Creek @ Tarpley	4/19/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
Hondo Creek @ Tarpley	11/29/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
Hueco Springs (Main)	2/1/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
Hueco Springs (Main)	12/7/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
Hueco Springs (Overflow)	2/1/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
Hueco Springs (Overflow)	12/7/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
Medina River @ Bandera	4/23/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
Medina River @ Bandera	11/30/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
Nueces River @ Laguna	4/17/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
Nueces River @ Laguna	11/27/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
Sabinal River near Sabinal	4/19/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
Sabinal River near Sabinal	11/28/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
Salado Creek @ Loop 1604N.	9/4/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
San Antonio Springs	2/5/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
San Antonio Springs	12/6/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
San Marcos Springs Hotel	12/10/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
San Marcos Springs	2/7/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
San Marcos Deep Springs	2/7/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
San Pedro Springs	2/5/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
San Pedro Springs	12/5/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5
Seco Creek @ Miller Ranch	4/19/01	<0.001	NA	NA	NA	<0.0005	<0.01	NA	NA	NA	NA
Seco Creek @ Miller Ranch	11/29/01	<0.05	<0.05	<0.05	<0.05	<0.05	NA	<0.5	<0.5	<0.5	<0.5

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-12 Analytical data for pesticides and herbicides in water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	Fenthion (µg/L)	gamma BHC (Lindane) (µg/L)	gamma-Chlordane (µg/L)	Heptachlor epoxide (µg/L)	Heptachlor (µg/L)	Hexachlorobenzene (µg/L)	Hexachlorocyclopentadiene (µg/L)	Malathion (µg/L)	MCPA (µg/L)	MCPP (µg/L)
Blanco River @ Wimberley	4/24/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
Blanco River @ Wimberley	12/4/01	<0.5	<0.05	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
Comal Springs #1	2/1/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
Comal Springs #1	12/6/01	<0.5	<0.05	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
Comal Springs #7	12/6/01	<0.5	<0.05	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
Dry Frio River @ Reagan Wells	4/18/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
Dry Frio River @ Reagan Wells	11/28/01	<0.5	<0.05	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
Frio River @ Concan	4/18/01	NA	<0.0005	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
Frio River @ Concan	11/28/01	<0.5	<0.05	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
Hondo Creek @ Tarpley	4/19/01	NA	<0.0005	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
Hondo Creek @ Tarpley	11/29/01	<0.5	<0.05	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
Hueco Springs (Main)	2/1/01	NA	<0.0005	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
Hueco Springs (Main)	12/7/01	<0.5	<0.05	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
Hueco Springs (Overflow)	2/1/01	NA	<0.0005	<0.05	<0.05	<0.05	NA	NA	<0.5	54	<50
Hueco Springs (Overflow)	12/7/01	<0.5	<0.05	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
Medina River @ Bandera	4/23/01	NA	<0.0005	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
Medina River @ Bandera	11/30/01	<0.5	<0.05	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
Nueces River @ Laguna	4/17/01	NA	<0.0005	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
Nueces River @ Laguna	11/27/01	<0.5	<0.05	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
Sabinal River near Sabinal	4/19/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
Sabinal River near Sabinal	11/28/01	<0.5	<0.05	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
Salado Creek @ Loop 1604N.	9/4/01	NA	<0.0005	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
San Antonio Springs	2/5/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
San Antonio Springs	12/6/01	<0.5	<0.05	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
San Marcos Springs Hotel	12/10/01	<0.5	<0.05	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
San Marcos Springs	2/7/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
San Marcos Deep Springs	2/7/01	NA	<0.0005	NA	<0.005	<0.0005	<0.005	<0.005	<0.005	NA	NA
San Pedro Springs	2/5/01	NA	<0.0005	<0.05	<0.05	<0.05	NA	NA	<0.5	<50	<50
San Pedro Springs	12/5/01	<0.5	<0.05	NA	NA	NA	NA	NA	NA	NA	NA
Seco Creek @ Miller Ranch	4/19/01	NA	<0.0005	NA	NA	NA	NA	NA	NA	NA	NA
Seco Creek @ Miller Ranch	11/29/01	<0.5	<0.05	NA	NA	NA	NA	NA	NA	NA	NA

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-12 Analytical data for pesticides and herbicides in water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	Merphos (µg/L)	Methoxychlor (µg/L)	Methyl parathion (µg/L)	Mevinphos (µg/L)	Mirex (µg/L)	o,o,o-Triethyl phosphorothioate (µg/L)	Oxymyl (µg/L)	Parathion (µg/L)	Penta-chloro-phenol (µg/L)	Perthane (µg/L)	Phorate (µg/L)
Blanco River @ Wimberley	4/24/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
Blanco River @ Wimberley	12/4/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	<0.05	NA	<0.5
Comal Springs #1	2/1/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
Comal Springs #1	12/6/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	<0.05	NA	<0.5
Comal Springs #7	12/6/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	<0.05	NA	<0.5
Dry Frio River @ Reagan Wells	4/18/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
Dry Frio River @ Reagan Wells	11/28/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	<0.05	NA	<0.5
Frio River @ Concan	4/18/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
Frio River @ Concan	11/28/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	<0.05	NA	<0.5
Hondo Creek @ Tarpley	4/19/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
Hondo Creek @ Tarpley	11/29/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	<0.05	NA	<0.5
Hueco Springs (Main)	2/1/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
Hueco Springs (Main)	12/7/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	<0.05	NA	<0.5
Hueco Springs (Overflow)	2/1/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
Hueco Springs (Overflow)	12/7/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	<0.05	NA	<0.5
Medina River @ Bandera	4/23/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
Medina River @ Bandera	11/30/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	<0.05	NA	<0.5
Nueces River @ Laguna	4/17/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
Nueces River @ Laguna	11/27/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	<0.05	NA	<0.5
Sabinal River near Sabinal	4/19/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
Sabinal River near Sabinal	11/28/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	<0.05	NA	<0.5
Salado Creek @ Loop 1604N.	9/4/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
San Antonio Springs	2/5/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
San Antonio Springs	12/6/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	<0.05	NA	<0.5
San Marcos Springs Hotel	12/10/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	NA	NA	<0.5
San Marcos Springs	2/7/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
San Marcos Deep Springs	2/7/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
San Pedro Springs	2/5/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
San Pedro Springs	12/5/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	<0.05	NA	<0.5
Seco Creek @ Miller Ranch	4/19/01	NA	<0.05	<0.05	NA	<0.005	NA	<0.01	<0.01	<0.05	<0.01	NA
Seco Creek @ Miller Ranch	11/29/01	<0.5	<0.1	<0.5	<0.5	NA	<0.5	NA	NA	0.019J	NA	<0.5

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-12 Analytical data for pesticides and herbicides in water from streams crossing the Edwards Aquifer Recharge Zone and springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	Pichloram (µg/L)	Polychlorinated Napthalenes (µg/L)	Ronnel (µg/L)	Simazine (µg/L)	Sulfotepp (µg/L)	Tetrachlorvinphos (µg/L)	Thionazin (µg/L)	Tokuthion (µg/L)	Toxaphene (µg/L)	Trichloronate (µg/L)	Trithion (µg/L)
Blanco River @ Wimberley	4/24/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
Blanco River @ Wimberley	12/4/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
Comal Springs #1	2/1/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
Comal Springs #1	12/6/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
Comal Springs #7	12/6/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
Dry Frio River @ Reagan Wells	4/18/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
Dry Frio River @ Reagan Wells	11/28/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
Frio River @ Concan	4/18/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
Frio River @ Concan	11/28/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
Hondo Creek @ Tarpley	4/19/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
Hondo Creek @ Tarpley	11/29/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
Hueco Springs (Main)	2/1/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
Hueco Springs (Main)	12/7/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
Hueco Springs (Overflow)	2/1/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
Hueco Springs (Overflow)	12/7/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
Medina River @ Bandera	4/23/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
Medina River @ Bandera	11/30/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
Nueces River @ Laguna	4/17/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
Nueces River @ Laguna	11/27/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
Sabinal River near Sabinal	4/19/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
Sabinal River near Sabinal	11/28/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
Salado Creek @ Loop 1604N.	9/4/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
San Antonio Springs	2/5/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
San Antonio Springs	12/6/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
San Marcos Springs Hotel	12/10/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
San Marcos Springs	2/7/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
San Marcos Deep Springs	2/7/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
San Pedro Springs	2/5/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
San Pedro Springs	12/5/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA
Seco Creek @ Miller Ranch	4/19/01	<0.01	<0.01	NA	<0.01	NA	NA	NA	NA	<0.2	NA	<0.002
Seco Creek @ Miller Ranch	11/29/01	NA	NA	<0.5	NA	<0.5	<0.2	<0.5	<0.5	<2	<0.5	NA

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-13 Analytical data for volatile organic compounds in water from springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	1,1,1,2-Tetrachloroethane (µg/L)	1,1,1-Trichloroethane (µg/L)	1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloro-1,2,2-trifluoroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,1-Dichloroethane (µg/L)	1,1-Dichloroethene (µg/L)	1,2,3-Trichloropropane (µg/L)	1,2,4-Trichlorobenzene (µg/L)
Comal Springs #1	12/6/01	NA	<1	<1	<1	<1	<1	<1	NA	<1
Comal Springs #7	12/6/01	NA	<1	<1	<1	<1	<1	<1	NA	<1
Hueco Springs (Main)	12/7/01	NA	<1	<1	<1	<1	<1	<1	NA	<1
Hueco Springs (Overflow)	12/7/01	NA	<1	<1	<1	<1	<1	<1	NA	<1
San Antonio Springs	2/5/01	<1	<1	<2	NA	<1	<1	<1	<1	NA
San Antonio Springs	12/6/01	NA	<1	<1	<1	<1	<1	<1	NA	<1
San Marcos Deep Springs	2/7/01	<1	<1	<2	NA	<1	<1	<1	<1	NA
San Marcos Springs	2/7/01	<1	<1	<2	NA	<1	<1	<1	<1	NA
San Marcos Springs Hotel	12/10/01	NA	<1	<1	<1	<1	<1	<1	NA	<1
San Pedro Springs	2/5/01	<1	<1	<2	NA	<1	<1	<1	<1	NA
San Pedro Springs	12/5/01	NA	<1	<1	<1	<1	<1	<1	NA	<1

Station Name	Date Sampled	1,2,4-Trimethylbenzene (µg/L)	1,2-Dibromo-3-chloropropane (µg/L)	1,2-Dibromoethane (µg/L)	1,2-Dichlorobenzene (µg/L)	1,2-Dichloroethane (µg/L)	1,2-Dichloropropane (µg/L)	1,2-Dicloropropane (µg/L)	1,3,5-Trimethylbenzene (µg/L)	1,3-Dichlorobenzene (µg/L)
Comal Springs #1	12/6/01	NA	<2	<1	<1	<1	<1	NA	NA	<1
Comal Springs #7	12/6/01	NA	<2	<1	<1	<1	<1	NA	NA	<1
Hueco Springs (Main)	12/7/01	NA	<2	<1	<1	<1	<1	NA	NA	<1
Hueco Springs (Overflow)	12/7/01	NA	<2	<1	<1	<1	<1	NA	NA	<1
San Antonio Springs	2/5/01	<1	NA	<1	<1	<1	NA	<1	<1	<1
San Antonio Springs	12/6/01	NA	<2	<1	<1	<1	<1	NA	NA	<1
San Marcos Deep Springs	2/7/01	<1	NA	<1	<1	<1	NA	<1	<1	<1
San Marcos Springs	2/7/01	<1	NA	<1	<1	<1	NA	<1	<1	<1
San Marcos Springs Hotel	12/10/01	NA	<2	<1	<1	<1	<1	NA	NA	<1
San Pedro Springs	2/5/01	<1	NA	<1	<1	<1	NA	<1	<1	<1
San Pedro Springs	12/5/01	NA	<2	<1	<1	<1	<1	NA	NA	<1

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-13 Analytical data for volatile organic compounds in water from springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	2-Butanone (µg/L)	2-Chloro-toluene (µg/L)	2-Hexanone (µg/L)	4-Chloro-toluene (µg/L)	4-Methyl-2-pentanone (µg/L)	Acetone (µg/L)	Allyl chloride (µg/L)	Benzene (µg/L)	Bromo-benzene (µg/L)
Comal Springs #1	12/6/01	<5	NA	<5	NA	<5	<10	NA	<1	NA
Comal Springs #7	12/6/01	<5	NA	<5	NA	<5	<10	NA	<1	NA
Hueco Springs (Main)	12/7/01	<5	NA	<5	NA	<5	<10	NA	<1	NA
Hueco Springs (Overflow)	12/7/01	<5	NA	<5	NA	<5	<10	NA	<1	NA
San Antonio Springs	2/5/01	<20	NA	<5	NA	NA	<20	NA	<1	<1
San Antonio Springs	12/6/01	<5	NA	<5	NA	<5	<10	NA	<1	NA
San Marcos Deep Springs	2/7/01	<20	NA	<5	NA	NA	<20	NA	<1	<1
San Marcos Springs	2/7/01	<20	NA	<5	NA	NA	<20	NA	<1	<1
San Marcos Springs Hotel	12/10/01	<5	NA	<5	NA	<5	<10	NA	<1	NA
San Pedro Springs	2/5/01	<20	NA	<5	NA	NA	<20	NA	<1	<1
San Pedro Springs	12/5/01	<5	NA	<5	NA	<5	<10	NA	<1	NA

Station Name	Date Sampled	Bromochloro-methane (µg/L)	Bromo-dichloro-methane (µg/L)	Bromo-form (µg/L)	Bromo-methane (µg/L)	Carbon disulfide (µg/L)	Carbon tetra-chloride (µg/L)	Chloro-benzene (µg/L)	Chloro-ethane (µg/L)	Chloro-form (µg/L)
Comal Springs #1	12/6/01	<1	<1	<1	<2	<1	<1	<1	<2	<1
Comal Springs #7	12/6/01	<1	<1	<1	<2	<1	<1	<1	<2	<1
Hueco Springs (Main)	12/7/01	<1	<1	<1	<2	<1	<1	<1	<2	<1
Hueco Springs (Overflow)	12/7/01	<1	<1	<1	<2	<1	<1	<1	<2	<1
San Antonio Springs	2/5/01	NA	<1	<2	<2	<1	<1	<1	<2	<1
San Antonio Springs	12/6/01	<1	<1	<1	<2	<1	<1	<1	<2	<1
San Marcos Deep Springs	2/7/01	NA	<1	<2	<2	<1	<1	<1	<2	<1
San Marcos Springs	2/7/01	NA	<1	<2	<2	<1	<1	<1	<2	<1
San Marcos Springs Hotel	12/10/01	<1	<1	<1	<2	<1	<1	<1	<2	<1
San Pedro Springs	2/5/01	NA	<1	<2	<2	<1	<1	<1	<2	<1
San Pedro Springs	12/5/01	<1	<1	<1	<2	<1	<1	<1	<2	<1

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-13 Analytical data for volatile organic compounds in water from springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	Chloro-methane (µg/L)	cis-1,2-Dichloro-ethene (µg/L)	cis-1,2-Dichloro-propene (µg/L)	cis-1,3-Dichloro-propane (µg/L)	cis-1,3-Dichloro-propene (µg/L)	Cyclo-hexane (µg/L)	Dibromo-chloro-methane (µg/L)	Dibromo-methane (µg/L)	Dichloro-difluoro-methane (µg/L)
Comal Springs #1	12/6/01	<2	<0.5	NA	NA	<1	<2	<1	NA	<2
Comal Springs #7	12/6/01	<2	<0.5	NA	NA	<1	<2	<1	NA	<2
Hueco Springs (Main)	12/7/01	<2	<0.5	NA	NA	<1	<2	<1	NA	<2
Hueco Springs (Overflow)	12/7/01	<2	<0.5	NA	NA	<1	<2	<1	NA	<2
San Antonio Springs	2/5/01	<2	<1	<1	<1	NA	NA	<1	<1	<2
San Antonio Springs	12/6/01	<2	<0.5	NA	NA	<1	<2	<1	NA	<2
San Marcos Deep Springs	2/7/01	<2	<1	<1	<1	NA	NA	<1	<1	<2
San Marcos Springs	2/7/01	<2	<1	<1	<1	NA	NA	<1	<1	<2
San Marcos Springs Hotel	12/10/01	<2	<0.5	NA	NA	<1	<2	<1	NA	<2
San Pedro Springs	2/5/01	<2	<1	<1	<1	NA	NA	<1	<1	<2
San Pedro Springs	12/5/01	<2	<0.5	NA	NA	<1	<2	<1	NA	<2

Station Name	Date Sampled	Ethyl benzene (µg/L)	Ethyl-benzene (µg/L)	Isopropyl-toluene (µg/L)	Isopropyl-benzene (µg/L)	Methylene chloride (µg/L)	MTBE (µg/L)	n-butyl-benzene (µg/L)	n-propyl-benzene (µg/L)	Naphthalene (µg/L)
Comal Springs #1	12/6/01	NA	<1	NA	<1	<1	<1	NA	NA	NA
Comal Springs #7	12/6/01	NA	<1	NA	<1	<1	<1	NA	NA	NA
Hueco Springs (Main)	12/7/01	NA	<1	NA	<1	<1	<1	NA	NA	NA
Hueco Springs (Overflow)	12/7/01	NA	<1	NA	<1	<1	<1	NA	NA	NA
San Antonio Springs	2/5/01	<1	NA	<1	<1	<2	<5	<1	<1	<2
San Antonio Springs	12/6/01	NA	<1	NA	<1	<1	<1	NA	NA	NA
San Marcos Deep Springs	2/7/01	<1	NA	<1	<1	<2	<5	<1	<1	<2
San Marcos Springs	2/7/01	<1	NA	<1	<1	<2	<5	<1	<1	<2
San Marcos Springs Hotel	12/10/01	NA	<1	NA	<1	<1	<1	NA	NA	NA
San Pedro Springs	2/5/01	<1	NA	<1	<1	<2	<5	<1	<1	<2
San Pedro Springs	12/5/01	NA	<1	NA	<1	<1	<1	NA	NA	NA

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-13 Analytical data for volatile organic compounds in water from springs discharging from the Edwards Aquifer, 2001.

Station Name	Date Sampled	m,p-Xylenes (µg/L)	o-Xylene (µg/L)	Xylenes (total) (µg/L)	sec-butyl-benzene (µg/L)	Styrene (µg/L)	tert-butyl-benzene (µg/L)	Tetra-chloro-ethene (µg/L)	Toluene (µg/L)	trans-1,2-Dichloro-ethene (µg/L)
Comal Springs #1	12/6/01	NA	NA	<2	NA	<1	NA	<1	<1	<0.5
Comal Springs #7	12/6/01	NA	NA	<2	NA	<1	NA	<1	<1	<0.5
Hueco Springs (Main)	12/7/01	NA	NA	<2	NA	<1	NA	<1	<1	<0.5
Hueco Springs (Overflow)	12/7/01	NA	NA	<2	NA	<1	NA	<1	<1	<0.5
San Antonio Springs	2/5/01	<1	<1	NA	NA	<1	NA	<1	<1	<1
San Antonio Springs	12/6/01	NA	NA	<2	NA	<1	NA	<1	<1	<0.5
San Marcos Deep Springs	2/7/01	<1	<1	NA	NA	<1	NA	<1	<1	<1
San Marcos Springs	2/7/01	<1	<1	NA	NA	<1	NA	<1	<1	<1
San Marcos Springs Hotel	12/10/01	NA	NA	<2	NA	<1	NA	<1	<1	<0.5
San Pedro Springs	2/5/01	<1	<1	NA	NA	<1	NA	<1	<1	<1
San Pedro Springs	12/5/01	NA	NA	<2	NA	<1	NA	<1	<1	<0.5

Station Name	Date Sampled	trans-1,2-Dichloropropene (µg/L)	trans-1,3-Dichloropropene (µg/L)	Trichloro-ethene (µg/L)	Trichloro-fluoro-methane (µg/L)	Vinyl chloride (µg/L)
Comal Springs #1	12/6/01	NA	<1	<1	<2	<2
Comal Springs #7	12/6/01	NA	<1	<1	<2	<2
Hueco Springs (Main)	12/7/01	NA	<1	<1	<2	<2
Hueco Springs (Overflow)	12/7/01	NA	<1	<1	<2	<2
San Antonio Springs	2/5/01	<1	NA	<1	<1	<2
San Antonio Springs	12/6/01	NA	<1	<1	<2	<2
San Marcos Deep Springs	2/7/01	<1	NA	<1	<1	<2
San Marcos Springs	2/7/01	<1	NA	<1	<1	<2
San Marcos Springs Hotel	12/10/01	NA	<1	<1	<2	<2
San Pedro Springs	2/5/01	<1	NA	<1	<1	<2
San Pedro Springs	12/5/01	NA	<1	<1	<2	<2

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-14 Analytical data for semivolatile organic compounds in water from springs discharging from the Edwards Aquifer, 2001.

Station Name	Comal Springs #1	Comal Springs #7	Hueco Springs (Main)	Hueco Springs (Overflow)	San Antonio Springs	San Marcos Springs Hotel	San Pedro Springs
Date Sampled	**12/6/01**	**12/6/01**	**12/7/01**	**12/7/01**	**12/6/01**	**12/10/01**	**12/5/01**
2,4,5-Trichlorophenol (µg/L)	<20	<20	<20	<20	<20	<20	<20
2,4,6-Trichlorophenol (µg/L)	<10	<10	<10	<10	<10	<10	<10
2,4-Dichlorophenol (µg/L)	<10	<10	<10	<10	<10	<10	<10
2,4-Dimethylphenol (µg/L)	<10	<10	<10	<10	<10	<10	<10
2,4-Dinitrophenol (µg/L)	<50	<50	<50	<50	<50	<50	<50
2,4-Dinitrotoluene (µg/L)	<10	<10	<10	<10	<10	<10	<10
2,6-Dinitrotoluene (µg/L)	<10	<10	<10	<10	<10	<10	<10
2-Chloronaphthalene (µg/L)	<10	<10	<10	<10	<10	<10	<10
2-Chlorophenol (µg/L)	<10	<10	<10	<10	<10	<10	<10
2-Methylnaphthalene (µg/L)	<10	<10	<10	<10	<10	<10	<10
2-Methylphenol (µg/L)	<10	<10	<10	<10	<10	<10	<10
2-Nitroaniline (µg/L)	<50	<50	<50	<50	<50	<50	<50
2-Nitrophenol (µg/L)	<10	<10	<10	<10	<10	<10	<10
3,3'-Dichlorobenzidine (µg/L)	<50	<50	<50	<50	<50	<50	<50
3-Nitroaniline (µg/L)	<50	<50	<50	<50	<50	<50	<50
4,6-Dinitro-2-methylphenol (µg/L)	<50	<50	<50	<50	<50	<50	<50
4-Bromophenyl phenyl ether (µg/L)	<10	<10	<10	<10	<10	<10	<10
4-Chloro-3-methylphenol (µg/L)	<10	<10	<10	<10	<10	<10	<10
4-Chloroaniline (µg/L)	<10	<10	<10	<10	<10	<10	<10
4-Chlorophenyl phenyl ether (µg/L)	<10	<10	<10	<10	<10	<10	<10
4-Methylphenol (µg/L)	<10	<10	<10	<10	<10	<10	<10
4-Nitroaniline (µg/L)	<50	<50	<50	<50	<50	<50	<50
4-Nitrophenol (µg/L)	<50	<50	<50	<50	<50	<50	<50
Acenaphthene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Acenaphthylene (µg/L)	<10	<10	<10	<10	<10	<10	<10

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-14 Analytical data for semivolatile organic compounds in water from springs discharging from the Edwards Aquifer, 2001.

Station Name	Comal Springs #1	Comal Springs #7	Hueco Springs (Main)	Hueco Springs (Overflow)	San Antonio Springs	San Marcos Springs Hotel	San Pedro Springs
Date Sampled	**12/6/01**	**12/6/01**	**12/7/01**	**12/7/01**	**12/6/01**	**12/10/01**	**12/5/01**
Acetophenone (µg/L)	<10	<10	<10	<10	<10	<10	<10
Anthracene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Benzo(a)anthracene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Benzo(a)pyrene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Benzo(b)fluoranthene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Benzo(ghi)perylene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Benzo(k)fluoranthene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Biphenyl (µg/L)	<10	<10	<10	<10	<10	<10	<10
bis(2-Chloro-1-methylethyl) ether (µg/L)	<10	<10	<10	<10	<10	<10	<10
bis(2-Chloroethoxymethane (µg/L)	<10	<10	<10	<10	<10	<10	<10
bis(2-Chloroethyl) ether (µg/L)	<10	<10	<10	<10	<10	<10	<10
bis(2-Ethylhexyl) phthalate (µg/L)	<10	<10	<10	<10	<10	<10	<10
Butyl benzyl phthalate (µg/L)	<10	<10	<10	<10	<10	<10	<10
Carbazole (µg/L)	<10	<10	<10	<10	<10	<10	<10
Chrysene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Di-n-butyl phthalate (µg/L)	<10	<10	<10	<10	<10	<10	<10
Di-n-octyl phthalate (µg/L)	<10	<10	<10	<10	<10	<10	<10
Dibenz(a,h)anthracene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Dibenzofuran (µg/L)	<10	<10	<10	<10	<10	<10	<10
Diethyl phthalate (µg/L)	<10	<10	<10	<10	<10	<10	<10
Dimethyl phthalate (µg/L)	<10	<10	<10	<10	<10	<10	<10
Fluoranthene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Fluorene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Hexachlorobenzene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Hexachlorobutadiene (µg/L)	<10	<10	<10	<10	<10	<10	<10

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

Table C-14 Analytical data for semivolatile organic compounds in water from springs discharging from the Edwards Aquifer, 2001.

Station Name	Comal Springs #1	Comal Springs #7	Hueco Springs (Main)	Hueco Springs (Overflow)	San Antonio Springs	San Marcos Springs Hotel	San Pedro Springs
Date Sampled	**12/6/01**	**12/6/01**	**12/7/01**	**12/7/01**	**12/6/01**	**12/10/01**	**12/5/01**
Hexachlorocyclopenta-diene (µg/L)	<50	<50	<50	<50	<50	<50	<50
Hexachloroethane (µg/L)	<10	<10	<10	<10	<10	<10	<10
Indeno(1,2,3-cd)pyrene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Isophorone (µg/L)	<10	<10	<10	<10	<10	<10	<10
N-Nitrosodi-n-propylamine (µg/L)	<10	NA	<10	<10	<10	<10	<10
N-Nitrosodiphenylamine (µg/L)	<10	<10	<10	<10	<10	<10	<10
Naphthalene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Nitrobenzene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Pentachlorophenol (µg/L)	<50	<50	<50	<50	<50	<50	<50
Phenanthrene (µg/L)	<10	<10	<10	<10	<10	<10	<10
Phenol (µg/L)	<10	<10	<10	<10	<10	<10	<10
Pronamide (µg/L)	<20	<20	<20	<20	<20	<20	<20
Pyrene (µg/L)	<10	<10	<10	<10	<10	<10	<10

NA = not analyzed
J = estimated concentration between the method detection limit and the reporting limit.
B = method blank contamination. The associated method blank contains the target analyte at a reportable level.
L = serial dilution of a digestate in the analytical batch indicates that physical and chemical interferences are present.

APPENDIX D – Conversion Factors

Volume	**Equivalent Units**
1 cubic foot	7.48 gallons
	62.31 lbs. of water
1 acre-foot	43,560 cubic feet
	325,851 gallons
	Covers one acre of land (209 feet by 209 feet) one foot deep
1 million gallons	3.07 acre-feet

Flow Rate	
1 cubic foot per second (cfs)	448.80 gallons per minute
	646,272 gallons per day
	1.98 acre-feet per day
	19.4 million gallons per day
	59.50 acre-feet per month
	236 million gallons per year
	724 acre-feet per year
1 million gallons per day (mgd)	3.07 acre-feet per day
	1,120 acre-feet per year
1,000 gallons per minute (gpm)	2.23 cfs
	4.42 acre-feet per day

Cost	
10 cents per 1,000 gallons	$100 per 1 million gallons
	$32.59 per acre foot
0.61 cents per 1,000 gallons	$2.00 per acre foot
8.1 cents per 1,000 gallons	$26.50 per acre foot

Metric conversions	
1 acre	0.4 hectares
1 gallon	3.8 liters
1 cubic foot	0.28 cubic meters
1 cubic meter per second	448,830 gallons per minute
	26,293,000 gallons per hour