EDWARDS UNDERGROUND WATER DISTRICT

1619 Tower Life Building
San Antonio, Texas

BULLETIN 12

RECORDS OF PRECIPITATION, AQUIFER HEAD, AND GROUND-WATER RECHARGE TO THE EDWARDS AND ASSOCIATED LIMESTONES SAN ANTONIO AREA, TEXAS, 1965

Compiled by

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Prepared in cooperation with the Geological Survey,
United States Department of the Interior,
the Texas Water Development Board, and
the City of San Antonio

October 1966

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The Edwards and associated limestones, the principal aquifer in the San Antonio area, has been the subject of numerous geologic and hydrologic reports. Records of precipitation, water levels, and estimates of recharge to the aquifer during 1965 are summarized in this report, which is one of three basic-data reports published yearly by the Edwards Underground Water District. The gathering of these records (and data) is part of the continuing hydrologic investigation by the U. S. Geological Survey in cooperation with the Edwards Underground Water District, the Texas Water Development Board, and the city of San Antonio.

Table 1 shows the annual precipitation at selected stations throughout the San Antonio area for 1965 and the annual average for each of these stations. Rainfall was slightly above average in the western part of the area to moderately heavy in the eastern part of the area.

Table 1.--Precipitation, in inches, at selected stations in the San Antonio area, Texas, 1965.

Station	Precipitation	Long-term mean
Brackettville	21.48	20.56 (76 years)
Uvalde	26.21	24.14 (64 years)
Sabinal	29.41	25.51 (47 years)
Hondo	30.80	28.42 (62 years)
San Antonio	36.65	27.66 (89 years)
Boerne	42.41	32.26 (71 years)
New Braunfels	45.16	31.19 (72 years)
San Marcos	45.00	33.12 (65 years)

The recorded high and low water levels during 1965 in five selected key wells are shown in table 2. In 1965, the water levels fluctuated above the midpoint between the record high and low levels which are also shown in table 2. Because of the above-average rainfall in 1965, the aquifer head in the eastern part of the aquifer increased to levels generally higher than those of 1962 and 1963 (Garza, 1963, p. 4; Garza, 1964, p. 3).

Recharge to the Edwards and associated limestones is chiefly from streams that lose most of their base flow and a part of their flood flow as they cross the Balcones fault zone on the outcrop of the aquifer. The recharge is estimated from records of continuous discharge at gaging stations located above and below the infiltration areas in each of most of the streams. The monthly mean discharges at the gaging stations during October-December 1965 are shown in table 3. Streamflow records for January-September 1965 have been published by the U. S. Geological Survey (U. S. Department of the Interior, Geological Survey, Water Resources Division, 1965).

Table 2.--Annual recorded high and low water levels (feet above mean sea level) in key wells tapping the Edwards and associated limestones. San Antonio area, Texas, 1965.

Well	High	Low	Record High	Record Low	Period of Record
H-5-1 (Uvalde County)	865.9	860.4	878.5 (11-22-61)	811.0 (4-13-57)	1929-32, 1934-65
J-1-82 (Medina County)	689.6	666.7	710.3 (2-27-61)	622.3 (8-18-56)	1950-65
*J-17 (Bexar County)	675.1	645.6	** 685.5 (6-26-35)	** 612.5 (8-17-56)	***1932-65
G-49 (Comal County)	626.6	623.4	627.3 (2-19-61)	613.3 (8-21-56)	1948-65
H-23 (Hays County)	590.1	573.4	593.6 (5-12-58)	542.2 (7-12-56)	1937-65

* Replaces well 26 and reflects almost the same water level (feet above mean sea level). The water-level data shown is a composite record of wells 26 and J-17.

** Record High and Low for well 26.

*** Composite record - wells 26 and J-17.

Table 3.--Monthly mean discharge, in cubic feet per second, at stream-gaging stations in the San Antonio area, October-December 1965.

(Figures rounded to nearest cubic foot per second)

Station	1965 Oct.	Nov.	Dec.
West Nueces River near Brackettville	0	0	0
Nueces River at Laguna	56	65	85
Nueces River below Uvalde	14	13	14
Leona River spring flow near Uvalde	0	0	1/
Dry Frio River near Reagan Wells	11	10	23
Frio River at Concan	49	56	65
Frio River below Dry Frio River near Uvalde	0	0	0
Sabinal River near Sabinal	55	28	42
Sabinal River at Sabinal	23	3	1
Seco Creek at Miller Ranch near Utopia	29	8	28
Seco Creek near D'Hanis	15	0	0
Hondo Creek near Tarpley	68	10	43
Hondo Creek near Hondo	40	0	1
Medina River near Pipe Creek	99	46	89
Medina River near Riomedina	14	16	26
San Antonio River at San Antonio	19	16	31
Cibolo Creek near Bulverde	55	0	2/
Cibolo Creek at Selma	71	0	80
Guadalupe River at Comfort	64	60	85
Guadalupe River near Spring Branch	183	115	258
Guadalupe River above Comal River at New Braunfels	206	229	289
Comal River at New Braunfels	271	265	367
Blanco River at Wimberley	141	102	365
Blanco River near Kyle	120	86	365
San Marcos River spring flow at San Marcos	145	135	197

1/ Less than 0.5

2/ Station discontinued

Table 4 shows the recharge in each basin of the San Antonio area for 1965 and the average annual recharge for the period 1934-64. The recharge estimates for 1934-64 were taken from an open-file report (to be published by the Texas Water Development Board) on the 1960-64 studies of the Edwards and associated limestones by Sergio Garza. The basic methods employed by Petitt and George (1956) and by Garza (1962; open-file report) were used for estimating the 1965 recharge, which was well above the annual average. During 1965, the basin areas of Cibolo and Dry Comal Creeks received over 18 percent of the total recharge, and nearly 38 percent of this total took place during the May-June floods.

Table 4.--Estimated recharge, in thousands of acre-feet, to the Edwards and associated limestones, San Antonio area, Texas, 1965.

Basin	1965	1934-64 Average
Nueces and West Nueces Rivers	97.9	92.1
Frio and Dry Frio Rivers	83.0	79.5
Sabinal River	23.2	31.2
Medina Lake	54.6	50.6
Cibolo and Dry Comal Creeks	115.3	89.8
Blanco River and adjacent area	66.7	30.6
Area between Sabinal and Medina Rivers	104.0	67.5
Area between Cibolo Creek and Medina River	78.8	56.2
TOTALS	623.5	497.5

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