PREPARED IN COOPERATION WITH
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
AND LOCAL AGENCIES

INTRODUCTION

The configurations of the water table in the surficial aquifer and of the potentiometric surface of the Floridan aquifer, in parts of west-central Florida in the vicinity of well fields used for public supply, are shown on sheets 1 and 2, respectively. The areal maps encompass land areas of about 1,200 mi² and include parts of Hernando, Hillsborough, Manatee, Pinellas, and Pasco Counties. The maps are prepared semiannually by the U.S. Geological Survey in cooperation with the Southwest Florida Water Management District and local agencies. Water levels generally are lowest in May and highest in September; in contrast, pumpage is typically highest in May and lowest in September.

Water levels at 14 well-field areas are mapped: Cross Bar Ranch, Cypress Creek, Starkey, Pasco County, Eldridge-Wilde, Clearwater-Dunedin-Belleair, East Lake Road, Cosme, Section 21, Morris Bridge, Brandon, Riverview, Sun City, and Verna. The well fields supply water to urban and suburban areas of Hillsborough, Pasco, Pinellas, and Sarasota Counties.

The surficial aquifer generally consists of unconsolidated, fine-grained sediment as much as 80 feet thick. In most areas, the surficial aquifer is underlain by clay that forms a leaky confining layer separating the surficial aquifer from the underlying limestone and dolomite of the Floridan aquifer. In southern Hillsborough County and at the Verna well field in Sarasota County, confining beds separate the Floridan aquifer from overlying intermediate aquifers. The Floridan aquifer consists of limestone and dolomite beds that have an average thickness of about 1,000 feet.

SUMMARY OF CONDITIONS

Rainfall in the area during the 1981 dry season (October-May) was about 75 percent of the 1941-70 normal. The area had excessive rainfall in November and February and deficient rainfall in October, December, January, March, April, and May (table 1). Only a minor amount of rainfall was recorded in the area during April and May prior to the day water levels were measured in the well fields (May 18). Because of the very low rainfall during the 1980 wet season (June-September) and the 1981 dry season, public officials characterized the event as a severe drought and imposed mandatory restrictions on water use.

On May 18, 1981, the total pumpage from the well fields was 200.7 Mgal, 45.9 Mgal more than on May 12, 1980, and 61.0 Mgal more than on September 15, 1980, the last two times when the well fields were monitored (table 2). All well fields pumped more water on May 18 than on May 12 of the previous year.

Seasonal and year-to-year fluctuations of water levels in the surficial and Floridan aquifers for selected well-field wells are shown by hydrographs (sheet 2). The hydrographs show that, generally, the highest water levels occur in September following the rainy season, and the lowest levels occur in May at the end of the dry season.

Ground-water levels in the area were noticeably affected by the drought. Water levels in the surficial and Floridan aquifers in May 1981 were lower than in May and September 1980, and in most well fields, water levels declined to record or near record lows (table 2).

The water table in the surficial aquifer for May 1981 averaged more than 3 feet lower than levels measured in May 1980. The annual change of water levels ranged from decreases of more than 6 feet at the Section 21 well field to less than 1 foot at Eldridge-Wilde well field. Water levels were 1 to 7 feet lower in May 1981 than in September 1980.

The May 1981 potentiometric surface averaged about 7 feet lower than levels measured a year ago and ranged from a decrease of 19 feet at Sun City to a decrease of about 1 foot at the Clearwater well field. Potentiometric levels were about 2 to 12 feet lower in May 1981 than in September 1980, exceptions being the Riverview, Sun City, and Verna well fields. Levels at these well fields averaged 29 feet lower in May 1981 than in September 1980.

SELECTED REFERENCES

Yobbi, D. K., Mills, L. R., and Woodham, W. M., 1980, Ground-water levels in selected well fields and in west-central Florida, May 1980: U.S. Geological Survey Open-File Report 80-1001.

_____ 1980, Ground-water levels in selected well fields and in west-central Florida, September 1980: U.S. Geological Survey Open-File Report 81-77.

Table 1.—Monthly rainfall totals, October 1980-May 1981, and monthly normals, 1941-70 at selected stations in west-central Florida

[Monthly totals in inches]

Rainfall station and well-field identification symbol	Operating agency	October 1980	Normal 1941-70	November 1980	Normal 1941-70	December 1980	Normal 1941-70	January 1981	Normal 1941-70	February 1981	Normal 1941-70	March 1981	Normal 1941-70	April 1981	Normal 1941-70	May 1981	Normal 1941-70
St. Leo near Cross Bar Ranch (A)	NOAA[1/]	3.2	2.93	4.8	1.87	0.7	2.36	0.7	2.55	3.4	3.14	3.3	4.53	0.1	3.10	1.7	3.79
Cypress Creek (B)	USGS[2/]	3.6		3.4		0.5		0.7		3.3		3.4		0.0		1.7	
Starkey (C)	SWFWMD[3/]	1.7		5.4		0.6		0.8		4.1		3.9		0.1		0.8	
So. Pasco (D)	SWFWMD	0.7		2.4		0.3		0.6		4.5		3.4		0.0		1.2	
Eldridge-Wilde (E)	SWFWMD	1.6		3.8		0.3		0.7		5.0		3.3		0.0		1.5	
Dunedin (F)	USDA[4/]	1.2		5.7		0.8		0.5		7.5		1.9		0.0		1.1	
East Lake Road (G)	Pinellas County	1.7		4.6		1.0		0.9		3.7		3.7		0.0		1.6	
Cosme (H)	St. Petersburg	1.9	3.15	3.6	2.42	0.8	1.91	0.5	2.30	6.1	2.79	2.5	4.17	0.0	2.20	1.0	2.68
Section 21 (Lutz) (I)	SWFWMD	1.1		3.5		0.6		0.4		5.0		2.5		0.0		2.1	
Morris Bridge (J)	SWFWMD	2.0		4.9		0.5		0.7		5.8		2.4		0.0		1.9	
Valrico near Brandon (K)	USDA	0.4		4.1		0.6		0.5		5.2		1.3		0.0		0.9	
Riverview (L)	Hillsborough County	--		--		--		0.5		3.6		1.6		0.0		1.3	
Ruskin near Sun City (M)	NOAA	0.9	2.54	3.6	1.79	0.8	2.19	0.8	2.33	4.3	2.86	1.2	3.89	0.1	2.10	3.1	1.41
Verna (N)	Sarasota	0.3		3.3		0.5		0.3		5.7		1.7		0.0		2.5	
Monthly average of stations		1.6	2.87	4.1	2.03	0.6	2.15	0.6	2.39	4.8	2.93	2.6	4.20	0.0	2.47	1.6	2.63

1/ National Oceanic and Atmospheric Administration
2/ U.S. Geological Survey
3/ Southwest Florida Water Management District
4/ U.S. Department of Agriculture - Forest Service

Table 2.—Pumpage and water-level data at fourteen well fields in west-central Florida

Well field	Operating agency	Number of supply wells	Number of supply wells pumped on 5-18-81	Pumpage (Mgal) 5-12-80	9-15-80	5-18-81	Water table in the surficial aquifer above NGVD of 1929 (ft): Well No.	Year record began	Extremes for period of record prior to 1981: High (mo-yr)	Low (mo-yr)	5-12-80	9-15-80	5-18-81	Potentiometric surface of the Floridan aquifer above or below (-) NGVD of 1929 (ft): Well No.	Year record began	Extremes for period of record prior to 1981: High (mo-yr)	Low (mo-yr)	5-12-80	9-15-80	5-18-81
Cross Bar Ranch (A)[1/]	West Coast Regional Authority	17	6	8.8	11.7	18.2	8-1s	1976	53.2 (11-79)	44.6 (10-80)	47.7	44.9	dry	8-1d	1976	54.9 (11-79)	44.9 (11-80)	48.2	47.4	38.0
Cypress Creek (B)	West Coast Regional Authority	13	11	29.1	29.7	30.3	E-107s	1973	70.5 (7-76)	54.6 (5-80)	64.6	65.7	62.1	E-107d	1973	72.5 (9-76)	53.3 (5-80)	51.1	52.5	44.8
Starkey (C)	Pasco County	5	5	3.3	3.5	4.8	706s	1974	32.4 (9-76)	24.9 (7-75)	28.4	28.6	dry	10	1974	32.1 (10-75)	24.9 (7-77)	28.4	28.6	25.1
Pasco County (D)	St. Petersburg	8	6	13.5	12.0	17.3	E-105s	1973	59.2 (6-79)	52.2 (5-75)	56.3	55.6	52.7	E-105d	1973	52.1 (2-73)	52.8 (5-75)	42.7	43.2	35.2
Eldridge-Wilde (E)	Pinellas County	58	36	29.5	20.7	42.1	11s	1973	21.1 (9-74)	11.0 (5-74)	16.7	17.1	16.5	11d	1973	19.0 (8-79)	2.1 (6-73)	15.9	18.1	6.1
Clearwater-Dunedin-Belleair (F)	Clearwater-Dunedin-Belleair	52	37	14.1	12.1	15.6	34s	1975	62.9 (9-75)	57.8 (3-76)	--	--	--	665	1956	14.8 (9-59)	7.3 (3-56)	8.2	9.4	7.1
East Lake Road (G)	Pinellas County	8	4	6.0	2.0	2.1	9s	1976	17.1 (9-79)	11.8 (5-77)	14.3	13.6	12.2	9d	1976	16.6 (9-79)	12.0 (5-76)	14.4	14.6	11.2
Cosme (H)	St. Petersburg	23	6	9.2	7.9	10.4	10s	1972	49.4 (7-74)	41.8 (6-73)	46.1	46.2	43.1	11	1972	39.8 (9-79)	19.0 (5-73)	32.4	36.4	26.4
Section 21 (I)	St. Petersburg	7	2	11.0	7.1	7.2	21-13s	1972	51.1 (5-79)	34.3 (6-73)	50.0	49.1	43.7	21-13d	1930	50.9 (6-47)	34.0 (5-21)	37.1	41.2	32.4
Morris Bridge (J)	Tampa	20	14	15.0	16.7	26.0	34s	1972	39.0 (3-78)	30.8 (5-73)	33.0	34.4	27.1	34d	1972	35.9 (10-75)	22.7 (12-78)	26.3	28.9	20.3
Brandon (K)	Hillsborough County	25	20	8.0	4.8	12.1	901s	1976	40.4 (9-78)	21.4 (5-76)	23.8	25.0	20.2	T-1	1963	22.1 (9-65)	12.3 (5-77)	14.6	16.7	10.9
Riverview (L)	Hillsborough County	7	7	1.9	1.1	3.6	3s	1976	58.9 (9-77)	53.8 (5-76)	56.5	57.0	53.9	3d	1969	24.8 (3-69)	-8.1 (5-77)	--	12.9	-13.5
Sun City (M)	Hillsborough County	8	3	2.2	1.8	2.2	7s	1976	68.0 (9-77)	63.0 (5-76)	65.5	67.9	64.7	7d	1972	20.7 (9-79)	-14.6 (4-75)	-0.2	16.9	-18.8
Verna (N)	Sarasota	39	22	9.2	8.4	8.8	11-04s	1965	62.5 (9-73)	56.6 (5-75)	59.5	62.3	58.3	11-04d	1964	63.3 (4-64)	-14.4 (5-76)	1.3	13.2	-11.0
Total				154.8	139.7	200.7														

1/ Well-field identification symbol.

EXPLANATION

—60— WATER-TABLE CONTOUR--Shows altitude of water table, May 18-23. Contour interval 2, 5, 10, and 20 feet. Hachures indicate depressions. Datum is National Geodetic Vertical Datum of 1929 (NGVD). Some contours are highly generalized and are based on surface-drainage features in areas where water-table observations are not available

33 ● Idle
Echo ● Pumping — MUNICIPAL SUPPLY WELLS--Shows location and number or name of well

● 9d — OBSERVATION WELL--Shows location of well and water level in feet above or below NGVD. Well number, where shown, indicates hydrograph shown in this report

▲ — SURFACE-WATER GAGE--Shows location of surface-water gage and water level in feet above or below NGVD

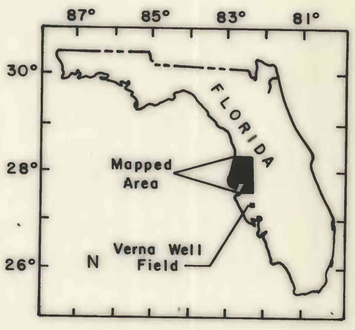
R= — WATER-LEVEL RECORDER--Shows location of water-level recorder

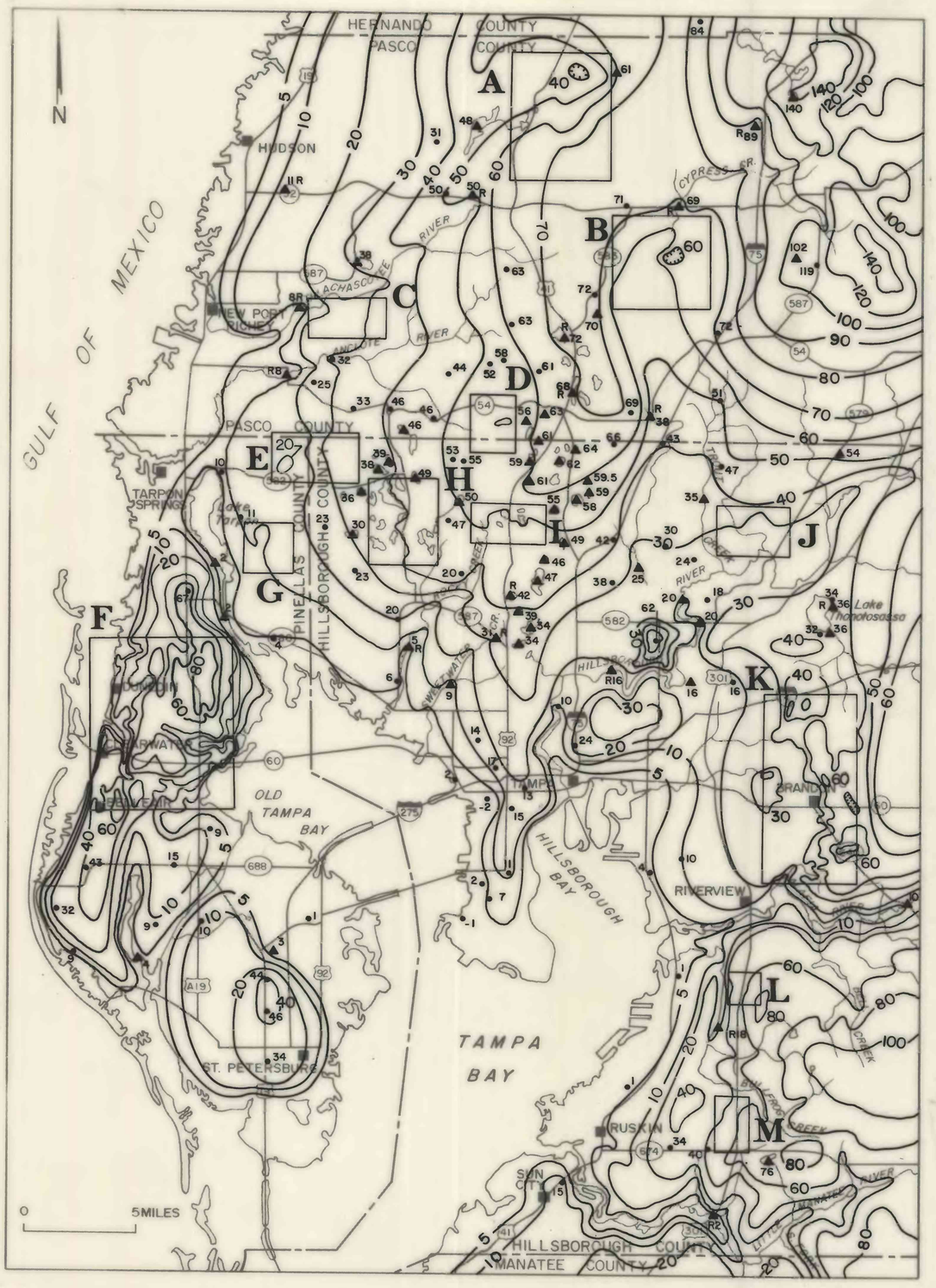
□ — WELL-FIELD BOUNDARY--Shows generalized boundary of well-field area

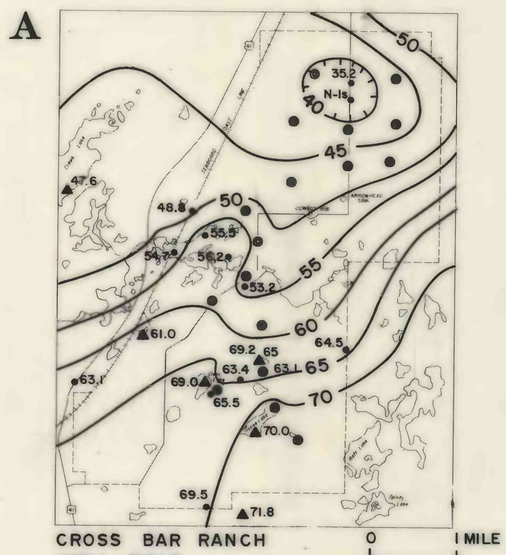
-------- — PROPERTY BOUNDARY--Shows boundary of property owned by operating agency

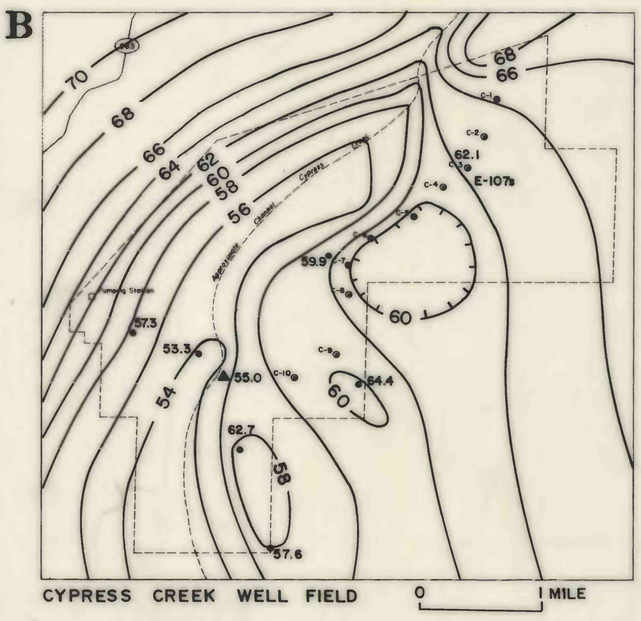
A — Well-field identification symbol

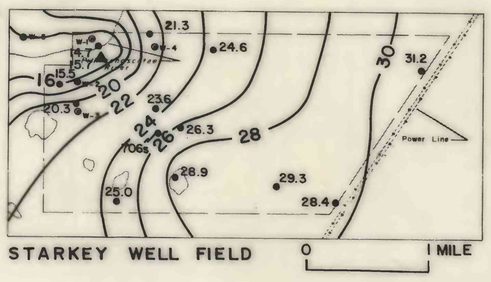
WATER TABLE IN THE SURFICIAL AQUIFER

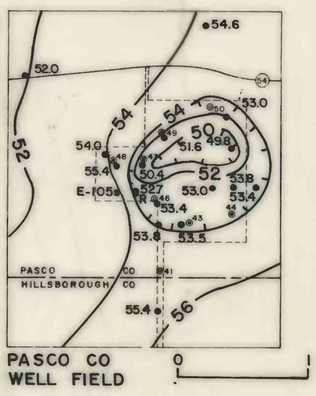


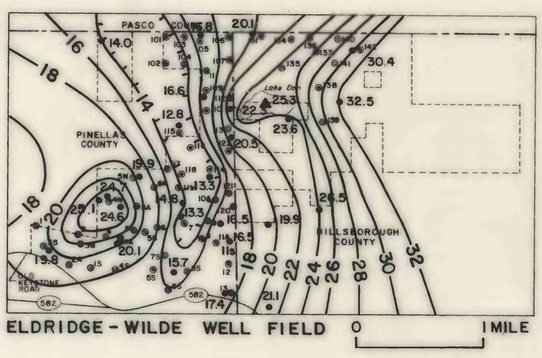


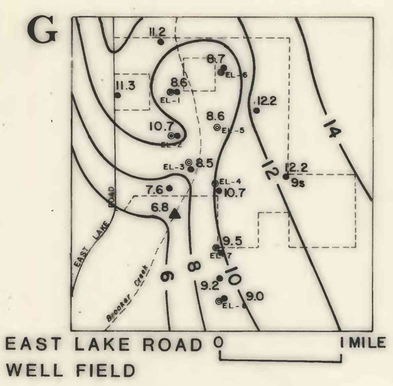


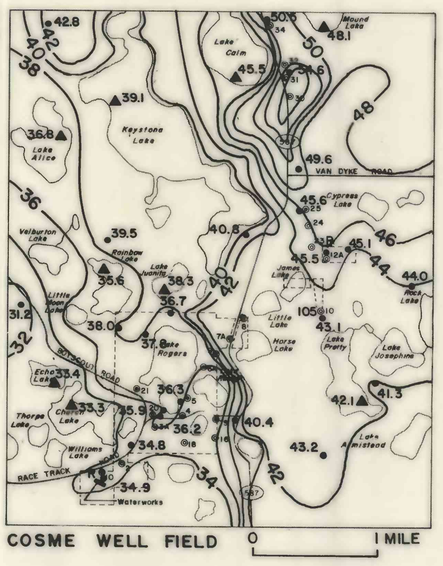


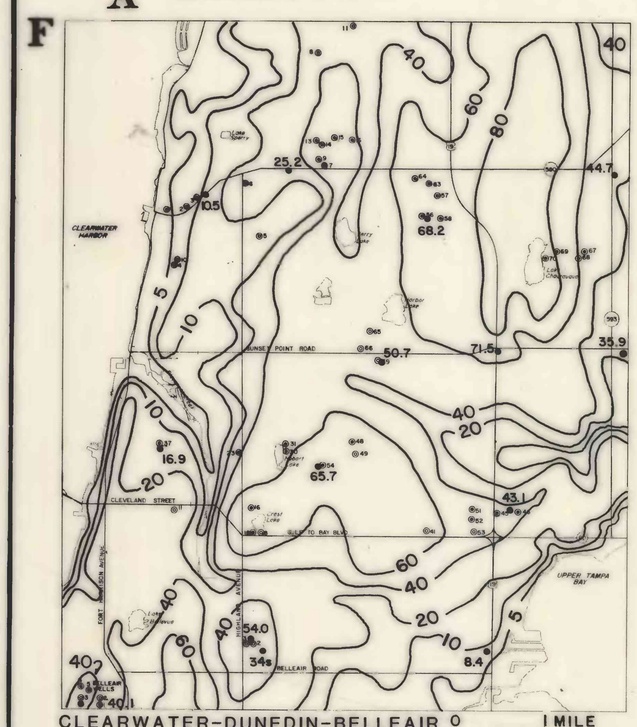


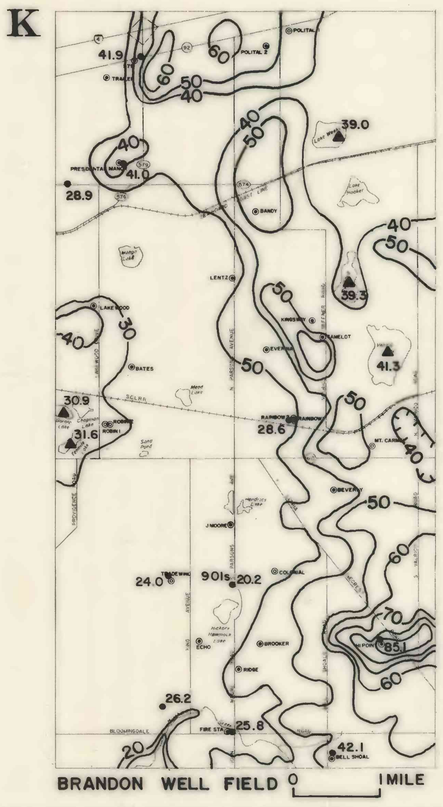


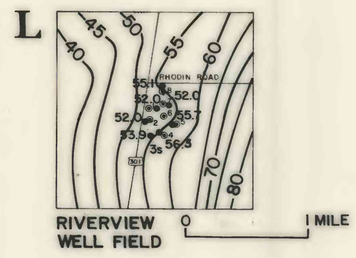


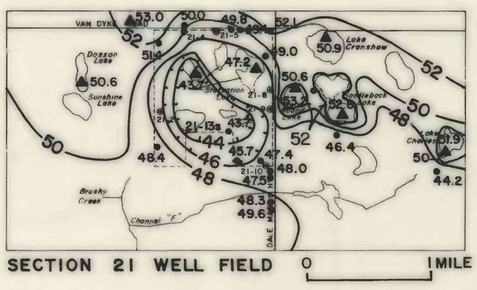


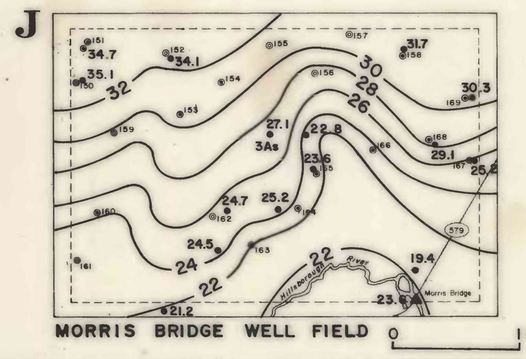


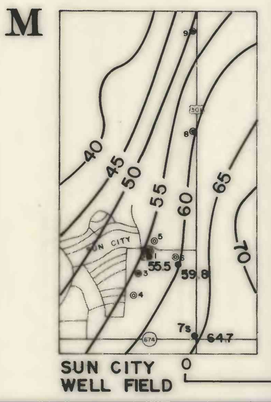


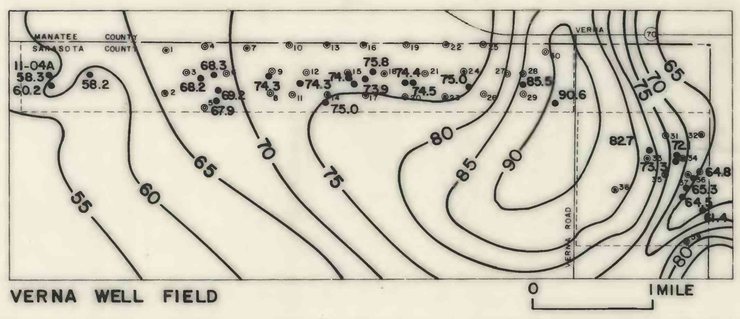












GROUND-WATER LEVELS IN SELECTED WELL FIELDS AND IN WEST-CENTRAL FLORIDA, MAY 1981

By

D.K. YOBBI and W.M. WOODHAM

1981