DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

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

OPEN-FILE REPORT 82-867
SHEET 1 OF 2

WATER TABLE IN THE SURFICIAL AQUIFER

INTRODUCTION

The configuration of the water table in the surficial aquifer and the configuration of the potentiometric surface of the Floridan aquifer in 14 well fields and vicinity in west-central Florida are shown on sheets 1 and 2, respectively. The mapped areas encompass a total land area of about 1,700 mi^2 and include parts of Hernando, Hillsborough, Manatee, Pasco, Pinellas, and Sarasota Counties. The maps are prepared semiannually by the U.S. Geological Survey in cooperation with the Southwest Florida Water Management District and local governmental agencies. Water levels are generally lowest in May and highest in September; in contrast, pumpage is typically highest in May and lowest in September.

Water levels are mapped for the following well-field areas: 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 that is as much as 80 feet in thickness. In most areas, the surficial aquifer is underlain by clay that forms a leaky confining layer and that separates the surficial aquifer from the underlying Floridan aquifer. In southern Hillsborough County and at the Verna well field in Sarasota County, confining beds also 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 1982 dry season (October 1981 to May 1982) was about 122 percent of the 1941-70 normal. During the 1982 dry season, the area had above normal rainfall in December, January, March, April, and May and below normal rainfall in October, November, and February (table 1). Although May 1982 had an abundance of rainfall, most of the rainfall occurred after the water-level data collection date, May 10, 1982. All water-level data within the well fields were collected on May 10 and water-level data outside the well-field areas were collected from May 10 to 14.

On May 10, 1982, the total pumpage from the well fields was 181.1 Mgal: 19.6 Mgal less than on May 18, 1981, and 40.8 Mgal more than on September 21, 1981 (table 2). The May 18, 1981 pumpage was greater because of severe drouth conditions during the 1981 dry season (October 1980 to May 1981). Although total May 10, 1982 pumpage was less than May 18, 1981, six well fields, Starkey, Eldridge-Wilde, Section 21, Riverview, Sun City, and Verna pumped more water on May 10, 1982 than on May 18, 1981. Pumpage ranged from 0.1 to 3.9 Mgal more. Pumpage for the remaining eight well fields on May 10, 1982 ranged from 0.3 to 7.0 Mgal less than on May 18, 1981.

Seasonal and year-to-year fluctuations of water levels in the surficial and Floridan aquifers for selected well-field wells are shown by hydrographs on sheet 2. In May 1982, ground-water levels in the surficial and Floridan aquifers were generally lower than in September 1981. Water levels measured in May 1982 were generally higher than in May 1981. An extended drouth occurred in the spring of 1981. Above normal rainfall from December 1981 through April 1982, with the exception of February 1982, occurred in the well-field areas. This and reduced pumpage contributed to comparably higher water levels in May 1982 than in May 1981.

The water table of the surficial aquifer in May 1982 averaged almost 2 feet higher than levels measured in May 1981 and about 2 feet lower than September 1981 levels. Water levels ranged from 0.3 foot higher to 3.2 feet lower in May 1982 than in September 1981. The May 1981 to May 1982 change of water levels ranged from a decrease of 1.9 feet at Section 21 well field to an increase of 5.7 feet at the Morris Bridge well field.

Potentiometric levels of the Floridan aquifer in May 1982 in 10 well fields were about 9 feet lower than those in September 1981. Water levels at the well fields were lower in May 1982 than in September 1981, except in two well fields, Cross Bar Ranch and Cypress Creek, levels were 0.6 and 5.7 feet higher, respectively. Potentiometric levels in 12 well fields in May 1982 were about 6 feet higher than levels measured in May 1981 and ranged from a decline of 1.6 feet at the Eldridge-Wilde well field to a rise of 15.3 feet at the Sun City well field.

SELECTED REFERENCES

Yobbi, D. K., and Barr, G. L., 1982, Ground-water levels in selected well fields and in west-central Florida, September 1981: U.S. Geological Survey Open-File Report 82-261.

Yobbi, D. K., and Woodham, W. M., 1981, Ground-water levels in selected well fields and in west-central Florida, May 1981: U.S. Geological Survey Open-File Report 81-1106.

Table 1.--Monthly rainfall totals, May 1981-May 1982, and monthly normals, 1941-70, at selected stations in west-central Florida
[Monthly totals in inches]

Rainfall station and well-field identification number	Operating agency	May 1981	Normal (1941-70)	June 1981	Normal (1941-70)	July 1981	Normal (1941-70)	August 1981	Normal (1941-70)	September 1981	Normal (1941-70)	October 1981	Normal (1941-70)	November 1981	Normal (1941-70)	December 1981	Normal (1941-70)	January 1982	Normal (1941-70)	February 1982	Normal (1941-70)	March 1982	Normal (1941-70)	April 1982	Normal (1941-70)	May 1982	Normal (1941-70)
St. Leo near Cross Bar Ranch (A)	NOAA[1/]	1.7	3.79	10.4	8.02	8.4	8.68	11.2	8.55	4.1	7.03	2.2	2.93	1.6	1.87	7.4	2.96	6.1	2.55	4.5	3.14	6.2	4.53	2.8	3.10	7.4	3.79
Cypress Creek (B)	USGS[2/]	1.7		10.8		9.9		10.5		7.4		1.2		1.0		6.7		3.9		2.7		----		2.8		4.2	
Starkey (C)	SWFWMD[3/]	Å		7.2		5.4		10.0		2.6		.4		1.2		7.9		3.2		2.6		5.9		2.9		7.0	
South Pasco (D)	SWFWMD	1.2		7.9		7.6		7.9		4.2		.4		1.0		6.2		3.3		2.0		5.9		2.8		5.5	
Eldridge-Wilde (E)	SWFWMD	1.5		9.7		3.8		8.9		4.3		.2		1.3		5.2		2.8		1.3		5.4		2.8		6.0	
Dunedin (F)	USGS[2/]	1.1		4.0		.6		12.1		5.3		.7		.8		4.9		2.5		2.0		6.8		5.1		4.0	
East Lake Road (G)	Pinellas County	1.6		10.8		8.0		----		----		.2		2.4		----		----		2.6		5.6		----		----	
Cosme (H)	St. Petersburg	1.0	2.68	6.8	6.66	7.1	9.95	12.2	9.78	5.7	6.54	.1	3.15	1.1	2.42	4.4	1.91	2.2	2.30	1.5	2.79	5.8	4.17	5.1	2.20	5.3	2.68
Section 21 (I)	SWFWMD	2.1		6.1		6.4		13.8		4.8		.8		.8		.7		2.9		1.3		5.8		3.4		3.4	
Morris Bridge (J)	SWFWMD	1.9		----		8.5		12.8		10.4		2.1		1.0		1.6		3.0		2.7		----		6.1		5.9	
Valrico near Brandon (K)	USDA	.9		6.7		8.2		12.8		12.8		2.7		.8		3.3		2.5		5.6		6.0		3.4		5.5	
Riverview (L)	Hillsborough County	1.3		4.4		5.6		8.0		4.5		.2		.5		1.9		2.0		----		5.7		2.5		5.5	
Ruskin near Sun City (M)	NOAA	3.1	1.41	8.9	6.49	6.0	8.43	11.9	8.00	7.0	6.35	.5	2.54	.8	1.79	2.2	2.19	1.9	2.33	1.8	2.86	6.1	3.89	3.7	2.10	5.9	1.61
Verna (N)	Sarasota	2.5		7.6		9.0		14.5		5.7		.9		1.5		1.5		1.2		3.3		6.4		4.5		3.3	
Monthly average of stations		1.6	2.63	7.8	7.06	6.8	9.02	11.3	8.78	6.1	6.64	.9	2.87	1.1	2.03	3.99	2.15	3.0	2.39	2.5	2.93	6.0	4.20	3.7	2.47	5.3	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 and well-field identification letter	Operating agency	Number of supply wells	Number of supply wells pumping at time of monitoring 5-10-82	Pumpage (Mgal) 5-18-81	9-21-81	5-10-82	Water table in the surficial aquifer above or below NGVD of 1929 (ft): Well no.	Year record began	Extremes for period of record prior to 1982: High (mo-yr)	Low (mo-yr)	5-18-81	9-21-81	5-10-82	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 1982: High (mo-yr)	Low (mo-yr)	5-18-81	9-21-81	5-10-82
Cross Bar Ranch (A)	West Coast Regional Water Supply Authority	17	3	18.2	15.0	13.3	B-3s	1978	58.3 (9-79)	48.8 (9-81)	48.8	49.1	50.2	B-1d	1976	34.9 (11-79)	44.9 (11-80)	38.0	40.4	41.0
Cypress Creek (B)	West Coast Regional Water Supply Authority	13	11	30.3	29.2	30.0	B-107s	1973	70.5 (7-74)	62.1 (5-81)	62.1	66.5	65.4	B-107d	1973	72.3 (9-74)	64.8 (5-81)	64.8	67.9	53.6
Starkey (C)	Pasco County	5	5	4.8	3.0	4.9	706s	1974	32.4 (9-74)	24.9 (7-75)	dry	25.9	26.1	10	1974	32.1 (10-75)	24.9 (7-77)	25.1	26.1	26.1
Pasco County (D)	St. Petersburg	8	4	17.3	9.5	12.2	B-105s	1973	39.2 (9-79)	32.2 (5-75)	32.7	36.6	34.8	B-105d	1973	32.1 (2-75)	30.8 (5-75)	35.2	44.9	41.6
Eldridge-Wilde (E)	Pinellas County	58	44	42.1	17.8	44.4	11e	1973	21.1 (9-74)	11.0 (5-74)	16.5	19.5	15.8	11d	1973	19.0 (8-79)	2.1 (6-73)	6.1	16.1	4.5
Clearwater-Dunedin-Belleair (F)	Clearwater-Dunedin-Belleair	54	38	15.4	10.5	8.4	3m	1981	36.5 (9-81)	34.0 (5-81)	34.0	36.5	35.2	665	1954	14.8 (9-59)	7.3 (5-56)	7.1	9.8	8.2
East Lake Road (G)	Pinellas County	8	0	2.1	0.0	0.0	9s	1976	17.1 (5-79)	11.8 (5-77)	12.2	16.3	13.9	9d	1976	10.6 (9-79)	11.2 (5-81)	11.2	15.7	--
Cosme (H)	St. Petersburg	23	9	10.4	7.2	9.9	10s	1972	19.4 (5-74)	11.8 (6-73)	13.1	17.1	15.0	11d	1972	29.8 (9-79)	24.6 (5-73)	26.6	34.9	29.3
Section 21 (I)	St. Petersburg	7	3	7.2	7.6	11.1	21-113s	1972	51.1 (5-79)	44.3 (6-73)	43.7	44.8	41.8	21-113d	1930	50.5 (9-67)	24.0 (5-73)	32.4	40.5	34.2
Morris Bridge (J)	Tampa	20	10	26.0	24.6	19.7	3As	1972	39.0 (5-79)	27.1 (5-81)	27.1	34.8	32.8	3Ad	1972	35.9 (10-75)	20.1 (5-81)	20.3	27.6	25.1
Brandon (K)	Hillsborough County	25	20	12.1	5.8	11.8	901s	1976	30.4 (9-76)	20.2 (5-81)	20.2	26.9	24s6	T-1	1963	22.1 (9-63)	10.9 (5-81)	10.9	18.2	14.8
Riverview (L)	Hillsborough County	7	6	3.6	1.4	3.7	3m	1976	39.0 (9-81)	33.8 (5-76)	33.9	39.0	35.8	3d	1969	24.8 (3-69)	-13.5 (5-81)	-13.5	12.0	-2.1
Sun City (M)	Hillsborough County	8	5	2.2	0.5	2.3	7e	1976	68.0 (9-77)	63.0 (5-76)	64.7	67.5	65.7	7d	1972	20.7 (9-79)	-18.8 (5-81)	-18.8	18.0	-3.5
Verna (N)	Sarasota	39	20	8.8	8.2	9.2	11-04A	1965	62.3 (9-73)	56.8 (5-75)	58.3	62.1	59.7	10-08	1964	43.3 (4-64)	-14.4 (5-76)	-11.8	17.5	-2.1
Total				200.7	140.3	181.1														

EXPLANATION

—20— WATER-TABLE CONTOUR--Shows altitude of water table, May 10-14. 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-level measurements are not available.

67 / 68 MUNICIPAL SUPPLY WELLS--Shows location and number or name of well. Open symbol indicates well was idle. Solid symbol indicates well was pumped during monitoring.

3s • 55.2 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.

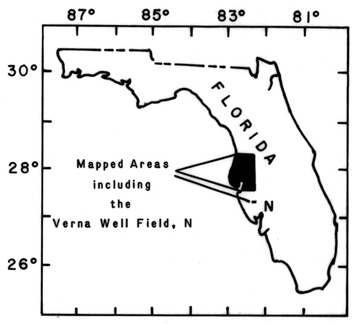
▲ 24.4 SURFACE-WATER GAGE--Shows location of surface-water gage and water level in feet above NGVD.

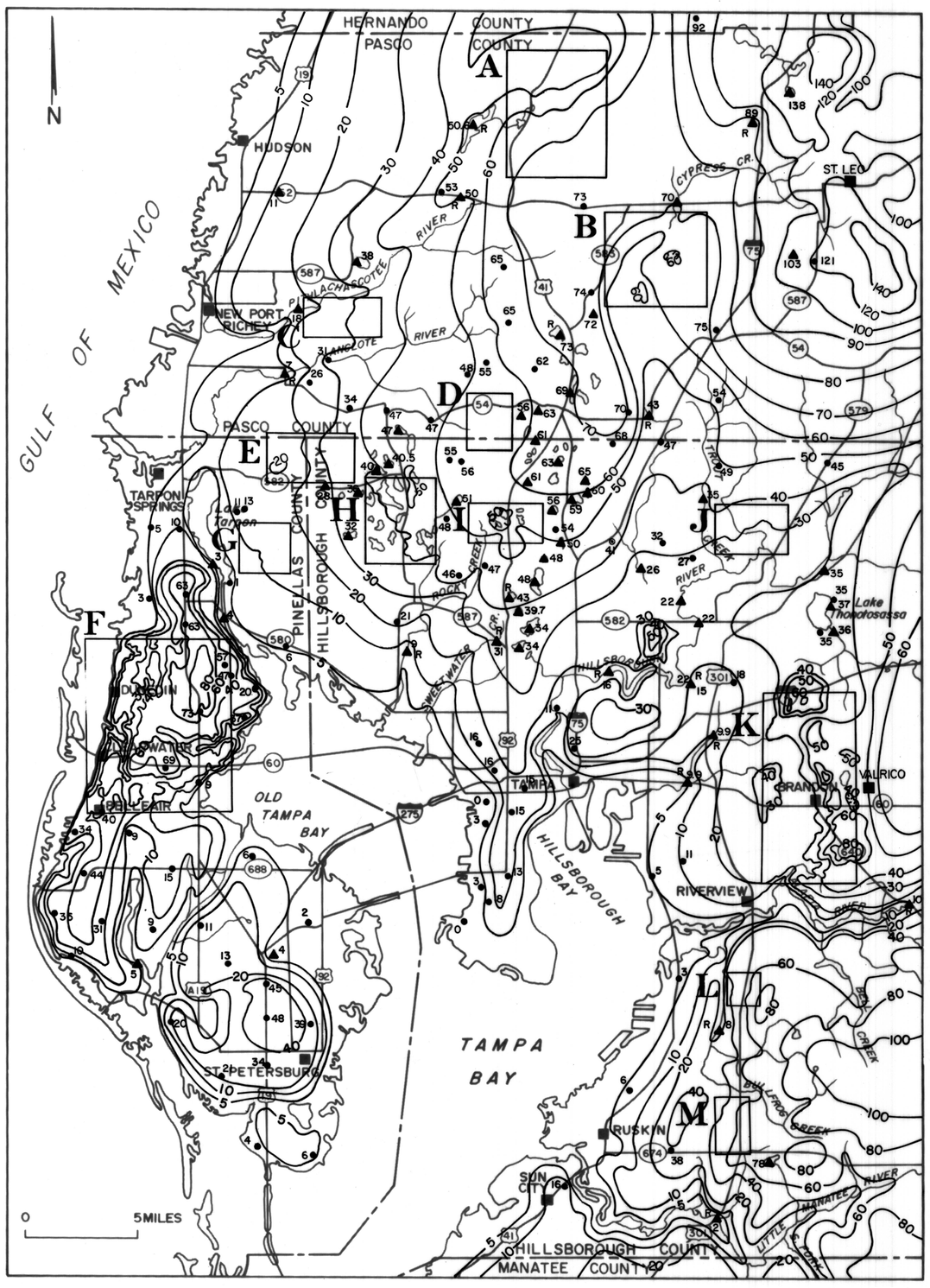
R WATER-LEVEL RECORDER--Shows location of water-level recorder.

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

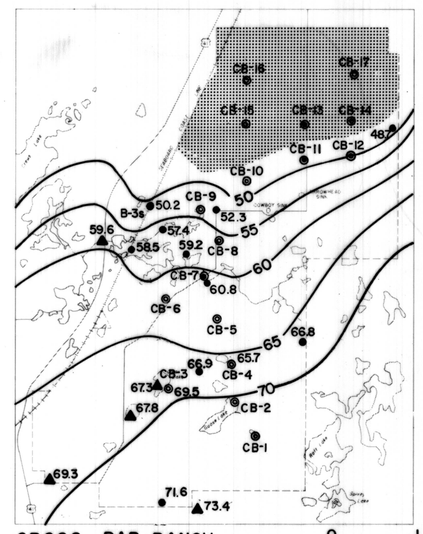
PROPERTY BOUNDARY--Shows boundary of property owned by operating agency.

F Well-field identification letter.





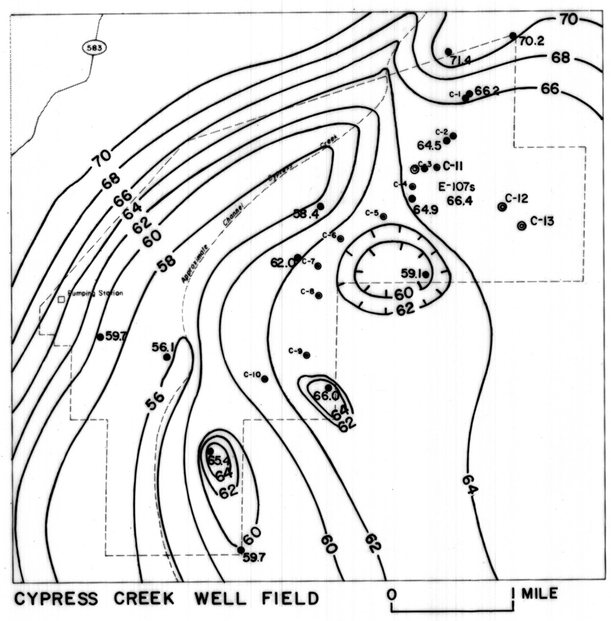
A



CROSS BAR RANCH WELL FIELD 0 1 MILE

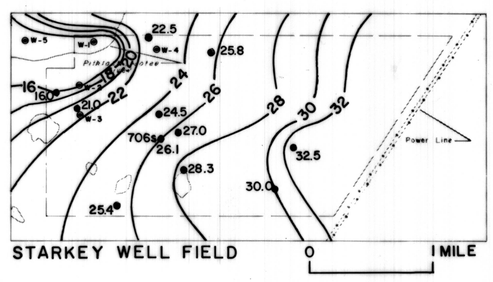
(▦ Generalized area of well field where surficial aquifer is absent)

B



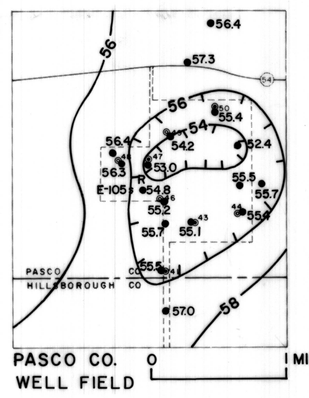
CYPRESS CREEK WELL FIELD 0 1 MILE

C



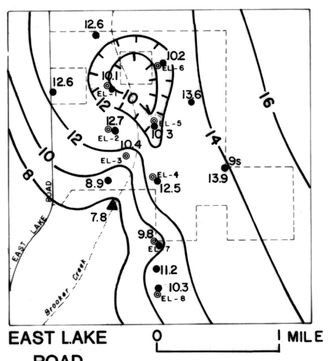
STARKEY WELL FIELD 0 1 MILE

D



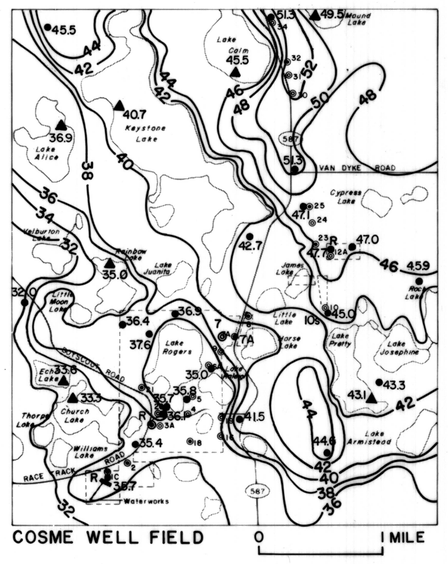
PASCO CO. WELL FIELD 0 1 MILE

G



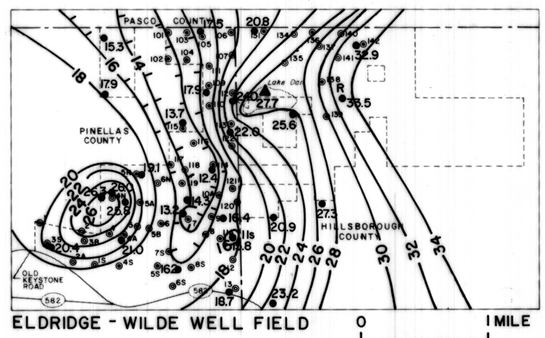
EAST LAKE ROAD WELL FIELD 0 1 MILE

H



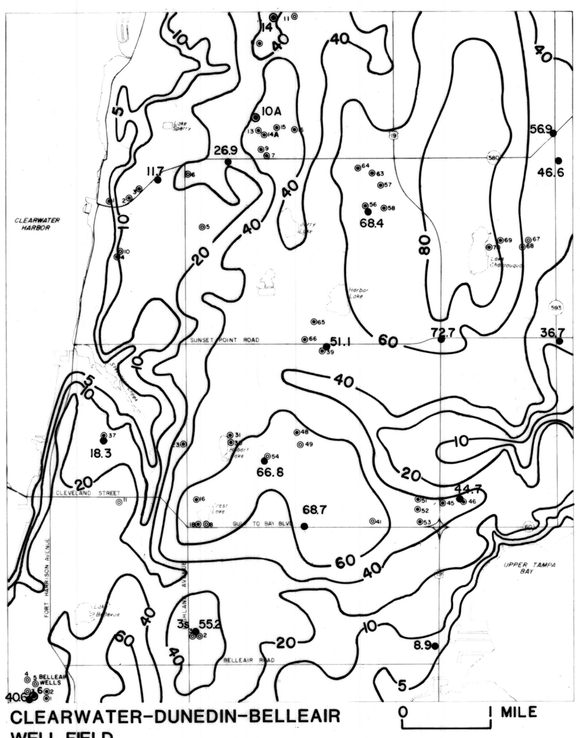
COSME WELL FIELD 0 1 MILE

E



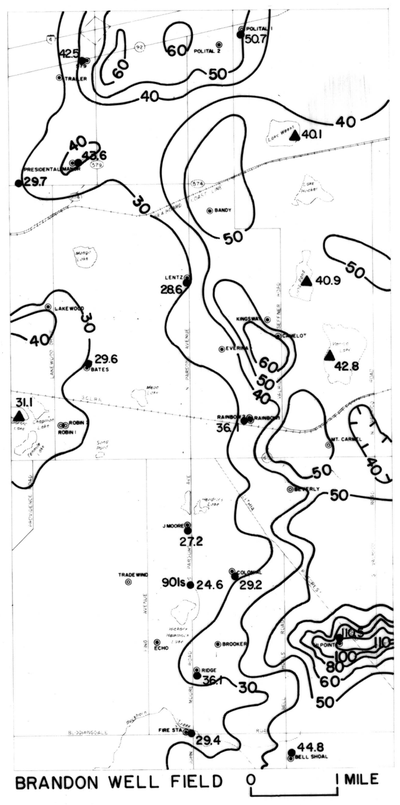
ELDRIDGE - WILDE WELL FIELD 0 1 MILE

F



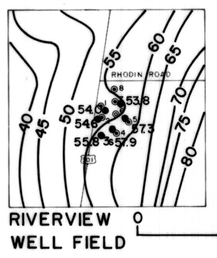
CLEARWATER-DUNEDIN-BELLEAIR WELL FIELD 0 1 MILE

K



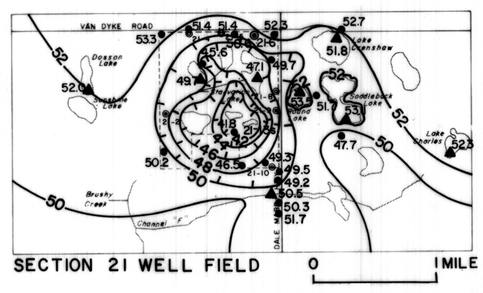
BRANDON WELL FIELD 0 1 MILE

L



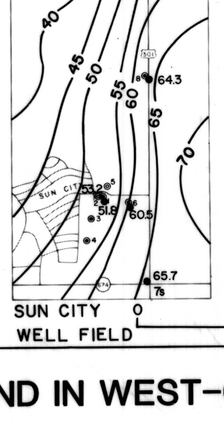
RIVERVIEW WELL FIELD 0 1 MILE

I



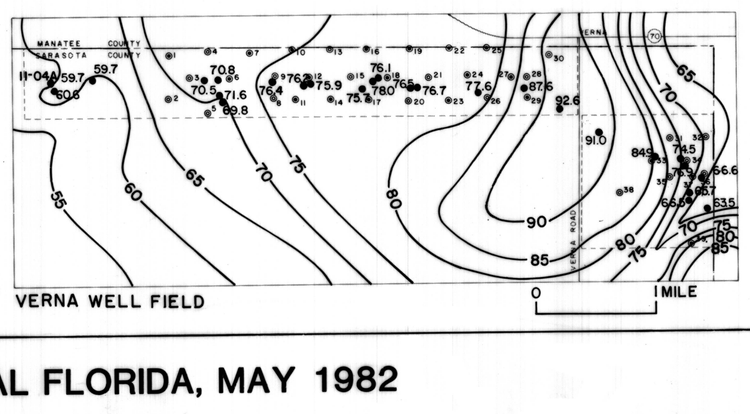
SECTION 21 WELL FIELD 0 1 MILE

M



SUN CITY WELL FIELD 0 1 MILE

N



VERNA WELL FIELD 0 1 MILE

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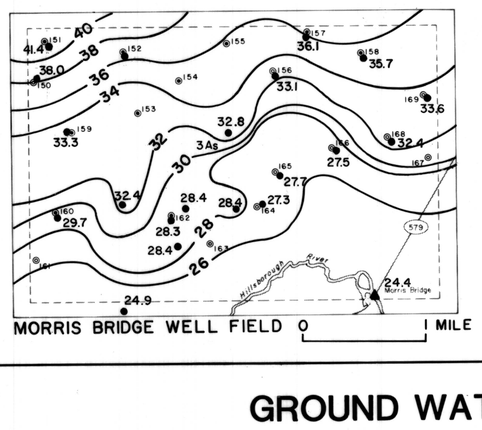

MORRIS BRIDGE WELL FIELD 0 1 MILE

GROUND WATER LEVELS IN SELECTED WELL FIELDS AND IN WEST-CENTRAL FLORIDA, MAY 1982

By

G.L. BARR

1982