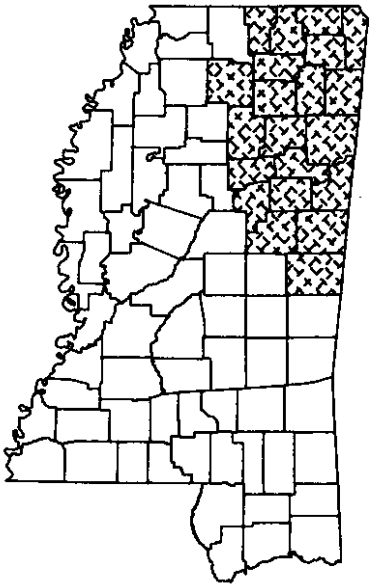
POTENTIOMETRIC MAP OF THE EUTAW-MCSHAN AQUIFER IN NORTHEASTERN MISSISSIPPI FALL AND WINTER, 1992

by

Jo F. Everett and Stephen P. Jennings

OLWR HYDROLOGIC MAP 93-3



MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

OFFICE OF LAND AND WATER RESOURCES

Charles T. Branch

Office Head

Jackson, Mississippi

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STATE OF MISSISSIPPI
DEPARTMENT OF ENVIRONMENTAL QUALITY
JAMES I. PALMER, JR.
EXECUTIVE DIRECTOR

LETTER OF TRANSMITTAL

Commission on Environmental Quality
of the State of Mississippi

To the Citizens of the State of Mississippi:

The Department of Environmental Quality, Office of Land and Water Resources, is pleased to transmit to you OLWR Map 93-3, entitled "Potentiometric Map of the Eutaw-McShan Aquifer in Northeastern Mississippi, Fall and Winter, 1992" by Jo F. Everett and Stephen P. Jennings.

The wise use of the ground-water resources of Mississippi is dependent upon the collection of water-level data. This report presents data and interpretations pertinent to that effort.

It is hoped that water-management agencies, municipalities, water associations, and the water development industry can utilize data from this report to the benefit of the citizens of the State of Mississippi.

Respectfully submitted,

R. B. (Dick) Flowers
Chairman

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POTENTIOMETRIC MAP OF THE EUTAW-MCSHAN AQUIFER

IN NORTHEASTERN MISSISSIPPI,

FALL AND WINTER, 1992

INTRODUCTION

This potentiometric map of the Eutaw-McShan aquifer is one of a series of maps prepared by the Mississippi Department of Environmental Quality, Office of Land and Water Resources. These maps delineate the potentiometric surfaces of the major fresh-water aquifers in Mississippi at five-year intervals for the purpose of documenting changes in water levels. It should be noted that water levels may be highly variable seasonally, or even daily; therefore, only long-term and regional trends should be interpreted from the data presented herein. This publication augments and updates water-level information previously published by the U. S. Geological Survey Water Resources Division in cooperation with the Mississippi Office of Land and Water Resources (Wasson, 1980; Darden, 1985; Goldsmith, 1991).

The potentiometric map is based on water-level measurements made in approximately 240 wells during the period from October, 1992 through January, 1993.

Records of water wells screened in the Eutaw-McShan aquifer were evaluated to select candidates for water-level measurements. Field trips were made during 1991 and 1992 to determine which wells actually could be measured and to plot accurate locations on U. S. Geological Survey 7.5 Minute Series Topographic Maps. The altitude of the land surface at each well was determined from the map, the measuring point on the well was described, and the height of the measuring point above land surface was noted. These plotted well locations were digitized and entered into the Geographic Information System (GIS) database used to generate base maps for this study. After collecting the field data, the altitude of the screened interval of each well was compared with the structural altitude of the top and base of the Eutaw-McShan aquifer to ensure that the well was screened in the correct aquifer. All water levels were below land surface and were measured using either a steel tape or electric tape.

ACKNOWLEDGEMENTS

In the course of the field investigations S. Bryant, D. L. Hardin, Jr., L. May, A. M. Moorman, and L. Stewart were of great assistance in the collection of water-level data. E. H. Boswell and J. H. Hoffmann made many helpful suggestions and reviewed the report. P. A. Phillips rendered great service in preparation of all the data for presentation in its final format through the use of a GIS database.

HYDROGEOLOGY

The Eutaw and McShan Formations (Upper Cretaceous) overlie the Tuscaloosa Group and are overlain by sediments of the Selma Group. The Eutaw and McShan Formations crop out

in the eastern part of the study area and dip to the west and southwest at about 30 feet per mile. The thickness of the Eutaw Formation, including the Tombigbee Sand Member in the uppermost part of the unit, is generally about 200 feet in most of the study area. The formation thins progressively northward and eventually pinches out in Benton and Marshall Counties (Boswell, 1963). The thickness of the underlying McShan Formation ranges from over 200 feet in the vicinity of Columbus to 50 feet in Itawamba County, and it eventually disappears along a line that extends from northern Tishomingo County southwestward into Union County (Boswell, 1963). The pinchout of the McShan occurs south of the northern limit of the Eutaw Formation.

The Eutaw and McShan Formations consist primarily of irregular and lenticular thin beds of fine to medium-grained glauconitic sands interbedded with clays. The Tombigbee Sand Member of the Eutaw Formation is generally a massive, fine-grained, glauconitic, and fossiliferous sand unit. The water-bearing sand beds of these formations constitute a single aquifer system in Mississippi because they are hydraulically interconnected on a regional scale. South of the latitude of southern Lee County, the Eutaw-McShan aquifer is generally hydraulically separated from the underlying Gordo (Tuscaloosa) aquifer by clay beds in the upper part of the Gordo; to the north, the clay beds are generally absent, and the Eutaw-McShan and Gordo aquifers are commonly hydraulically connected. The Eutaw-McShan aquifer is underlain by the Paleozoic aquifer in Alcorn, Tippah, Union, northwestern Prentiss, and northern Tishomingo Counties, north of the limit of occurrence of the Gordo Formation. In these areas there is probably good hydraulic connection between the Eutaw-McShan and Paleozoic aquifers. South of northern Lee County, the Eutaw-McShan aquifer is overlain by a significant interval of chalk and clay in the Selma Group that forms a confining unit. In the northern part of the study area the Coffee Sand aquifer directly overlies the Eutaw-McShan aquifer with varying degrees of hydraulic interconnection.

Transmissivity of the Eutaw-McShan is fair over most of the region, but poor to the northwest where the unit is thin and generally contains more clay beds. Transmissivities determined from aquifer tests range from 200 to 4,900 feet squared per day with a median value of approximately 1,000 feet squared per day; median hydraulic conductivity is about 13 feet per day (Boswell, 1977; Slack and Darden, 1991).

AQUIFER DEVELOPMENT AND GROUND-WATER USE

The Eutaw-McShan aquifer contains freshwater in an area of approximately 8,000 square miles in northeastern Mississippi. It is the most extensively utilized aquifer in that region because it is the shallowest source of good-quality water in a large part of the area. Well depths range from less than 100 feet in the outcrop areas to over 1,000 feet near the downdip limit of freshwater.

Total average daily pumpage in Mississippi from the Eutaw-McShan in 1980 for public water supply, industrial, domestic and farm use was about 27 million gallons per day (MGD) (Callahan, 1983). Tupelo was the largest pumping center at that time. The aquifer was extensively developed in the late nineteenth and early twentieth centuries with major pumping centers at Tupelo, West Point, Aberdeen, Starkville, New Albany, Booneville, Houston, and Okolona (Stephenson, Logan, and Waring, 1928). Subsequent developments led several

communities to utilize wells drilled to the underlying Gordo aquifer to take advantage of that aquifer's better quality water and higher yields. In addition, the City of Tupelo converted to a surface-water supply in 1991.

WATER LEVELS

Recharge to the Eutaw-McShan aquifer occurs primarily by infiltration of precipitation on permeable sandy units in the outcrop areas. In the outcrop areas ground water is commonly under water-table conditions, and water levels are strongly influenced by topography and by localized discharge into streams and springs. Water levels in and near the recharge areas of the Eutaw-McShan have shown little long-term change (Wasson, 1980). In the subsurface to the west and southwest of the outcrop areas, the Eutaw-McShan aquifer is under confined conditions, and water levels generally slope to the west and southwest. The potentiometric map (Plate 1) shows a general trough aligned parallel with the outcrop area that has significant depressions at major pumping centers such as West Point. East and northeast of the trough, the general movement of ground water is to the west and southwest. West and southwest of the trough, movement is generally to the east and northeast into the depression (Mallory, 1985).

Eutaw-McShan aquifer water levels have generally declined at a rate of one to two feet per year since records have been kept, but there has been considerable variation (Table 1 and Figures 1-7). The combination of relatively heavy pumpage in the region and the relatively low transmissivity values of the Eutaw-McShan has had considerable effect on the potentiometric surface (Wasson, 1980; Darden, 1985; Goldsmith, 1991). The most significant change in the current potentiometric map from the previously published interpretation (Goldsmith, 1991) is the rise in water levels that has occurred at Tupelo. As a result of the city's conversion to a surface-water source in September, 1991, water levels in Eutaw-McShan wells at Tupelo have risen an average of 98.8 feet (Figure 3). The largest cone of depression is now at West Point in Clay County. Smaller cones of depression are at Aberdeen, due to significant public water-supply and industrial pumpage, and at Pontotoc and New Albany. Smaller localized depressions result from pumpage at numerous rural water associations.

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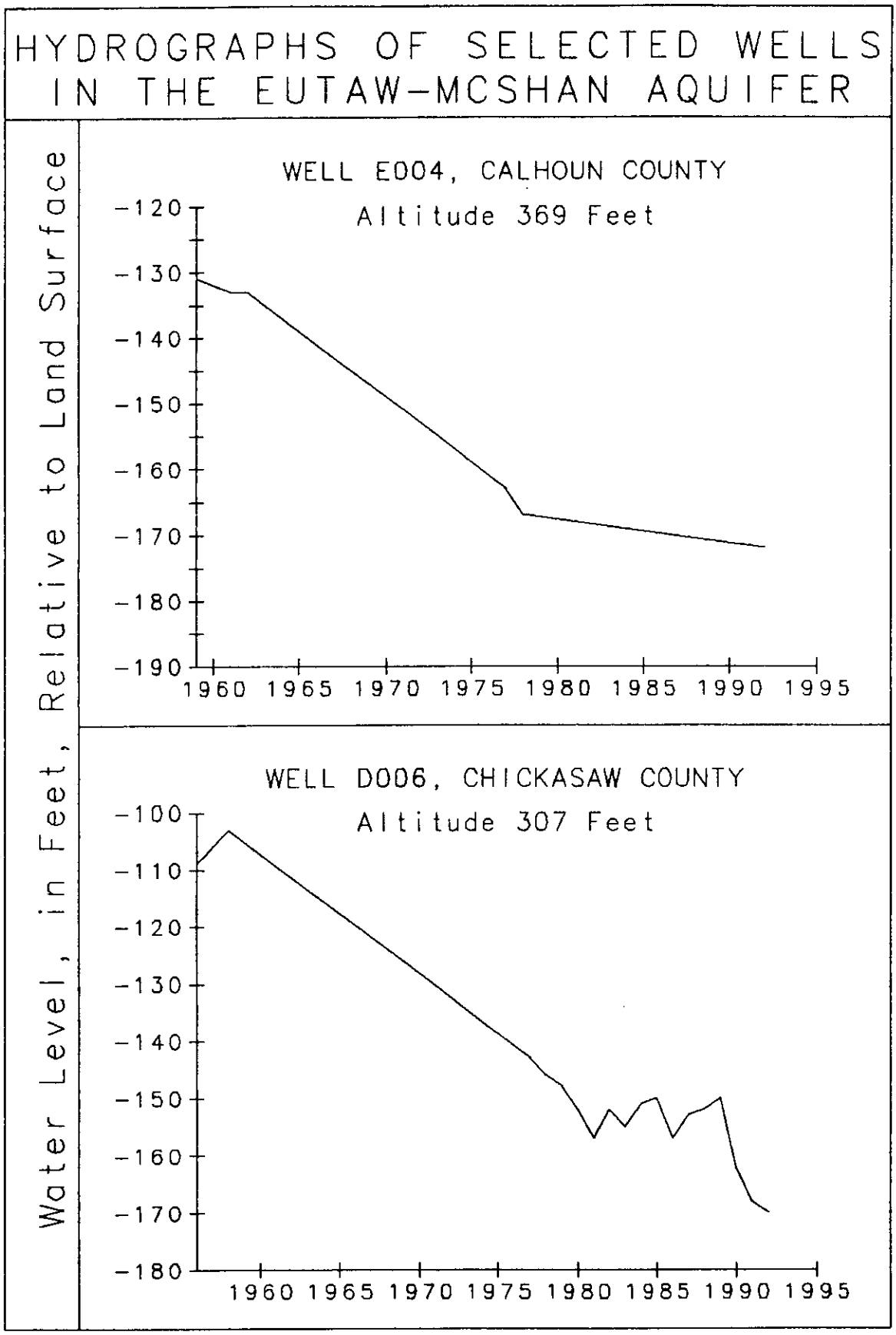
HYDROGRAPHS OF SELECTED WELLS IN THE EUTAW-MCSHAN AQUIFER
Water Level, in Feet, Relative to Land Surface
WELL E004, CALHOUN COUNTY
Altitude 369 Feet
-120
-130
-140
-150
-160
-170
-180
-190
1960 1965 1970 1975 1980 1985 1990 1995
WELL D006, CHICKASAW COUNTY
Altitude 307 Feet
-100
-110
-120
-130
-140
-150
-160
-170
-180
1960 1965 1970 1975 1980 1985 1990 1995

FIGURE 1

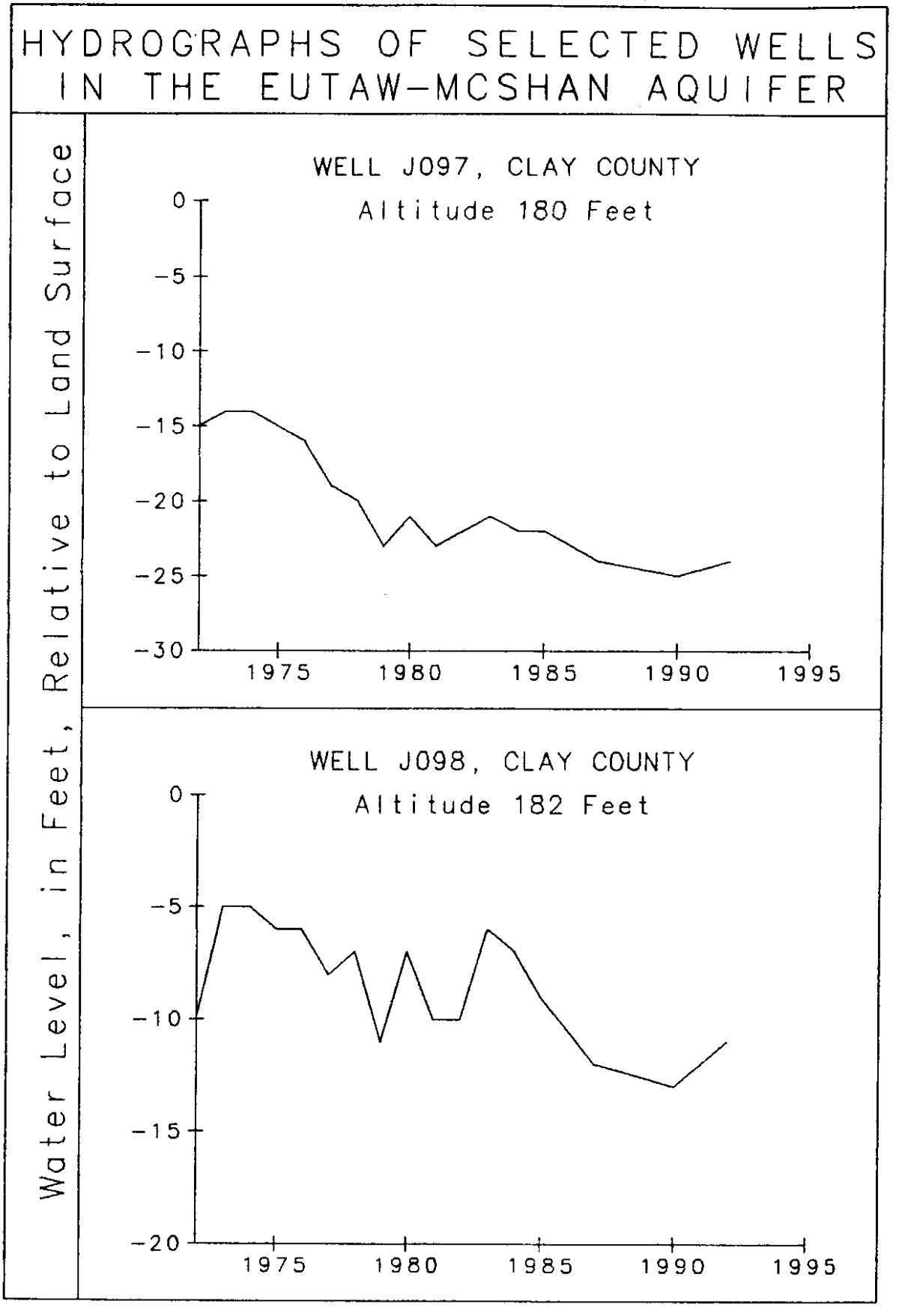
HYDROGRAPHS OF SELECTED WELLS IN THE EUTAW–MCSHAN AQUIFER
Water Level, in Feet, Relative to Land Surface
WELL J097, CLAY COUNTY
Altitude 180 Feet
0
-5
-10
-15
-20
-25
-30
1975
1980
1985
1990
1995
WELL J098, CLAY COUNTY
Altitude 182 Feet
0
-5
-10
-15
-20
1975
1980
1985
1990
1995

FIGURE 2

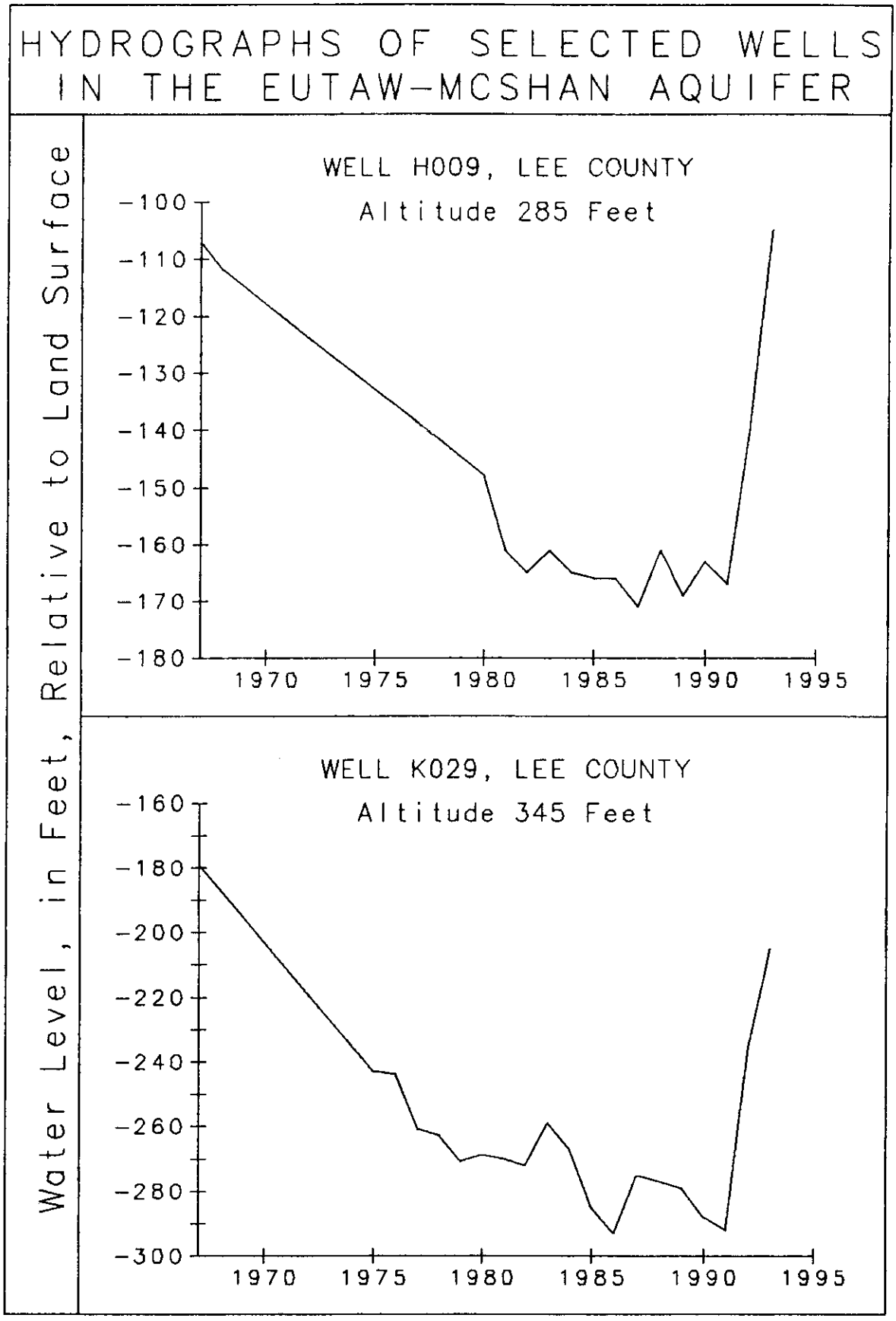
HYDROGRAPHS OF SELECTED WELLS IN THE EUTAW–MCSHAN AQUIFER
Water Level, in Feet, Relative to Land Surface
WELL H009, LEE COUNTY
Altitude 285 Feet
-100
-110
-120
-130
-140
-150
-160
-170
-180
1970
1975
1980
1985
1990
1995
WELL K029, LEE COUNTY
Altitude 345 Feet
-160
-180
-200
-220
-240
-260
-280
-300
1970
1975
1980
1985
1990
1995

FIGURE 3

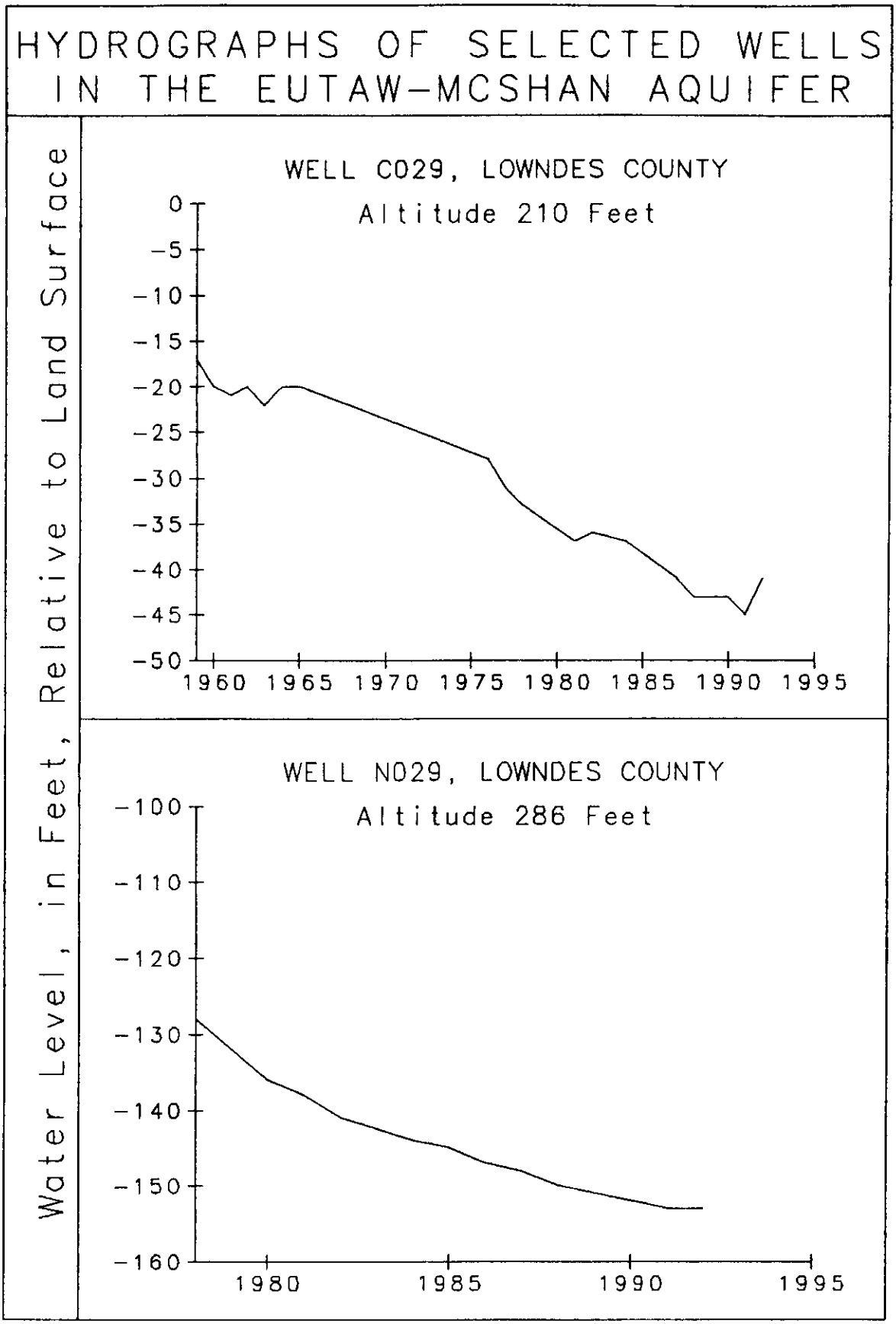
HYDROGRAPHS OF SELECTED WELLS IN THE EUTAW–MCSHAN AQUIFER
Water Level, in Feet, Relative to Land Surface
WELL C029, LOWNDES COUNTY
Altitude 210 Feet
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
1960 1965 1970 1975 1980 1985 1990 1995
WELL N029, LOWNDES COUNTY
Altitude 286 Feet
-100
-110
-120
-130
-140
-150
-160
1980 1985 1990 1995

FIGURE 4

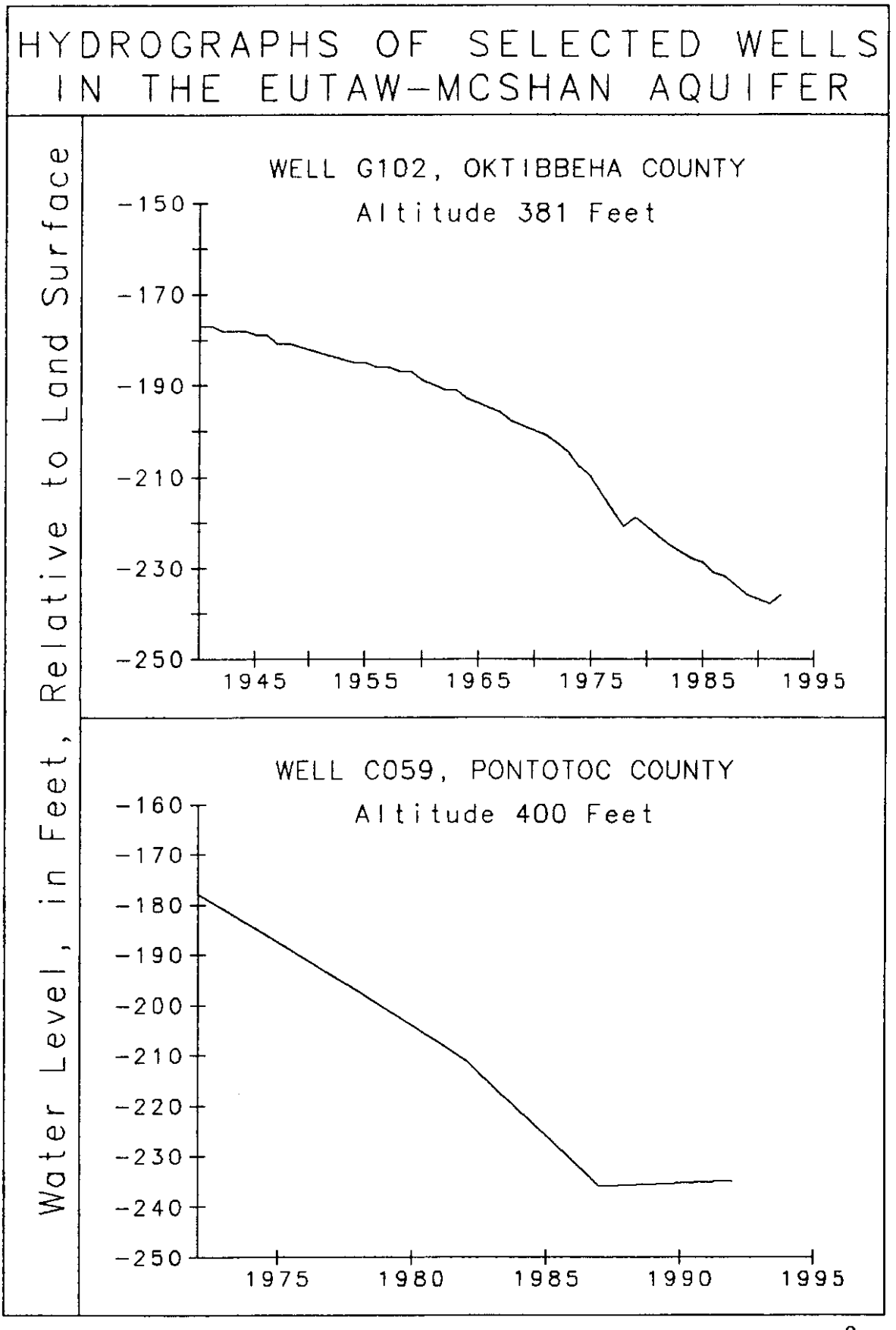
HYDROGRAPHS OF SELECTED WELLS IN THE EUTAW–MCSHAN AQUIFER
Water Level, in Feet, Relative to Land Surface
WELL G102, OKTIBBEHA COUNTY
Altitude 381 Feet
-150
-170
-190
-210
-230
-250
1945
1955
1965
1975
1985
1995
WELL C059, PONTOTOC COUNTY
Altitude 400 Feet
-160
-170
-180
-190
-200
-210
-220
-230
-240
-250
1975
1980
1985
1990
1995

FIGURE 5

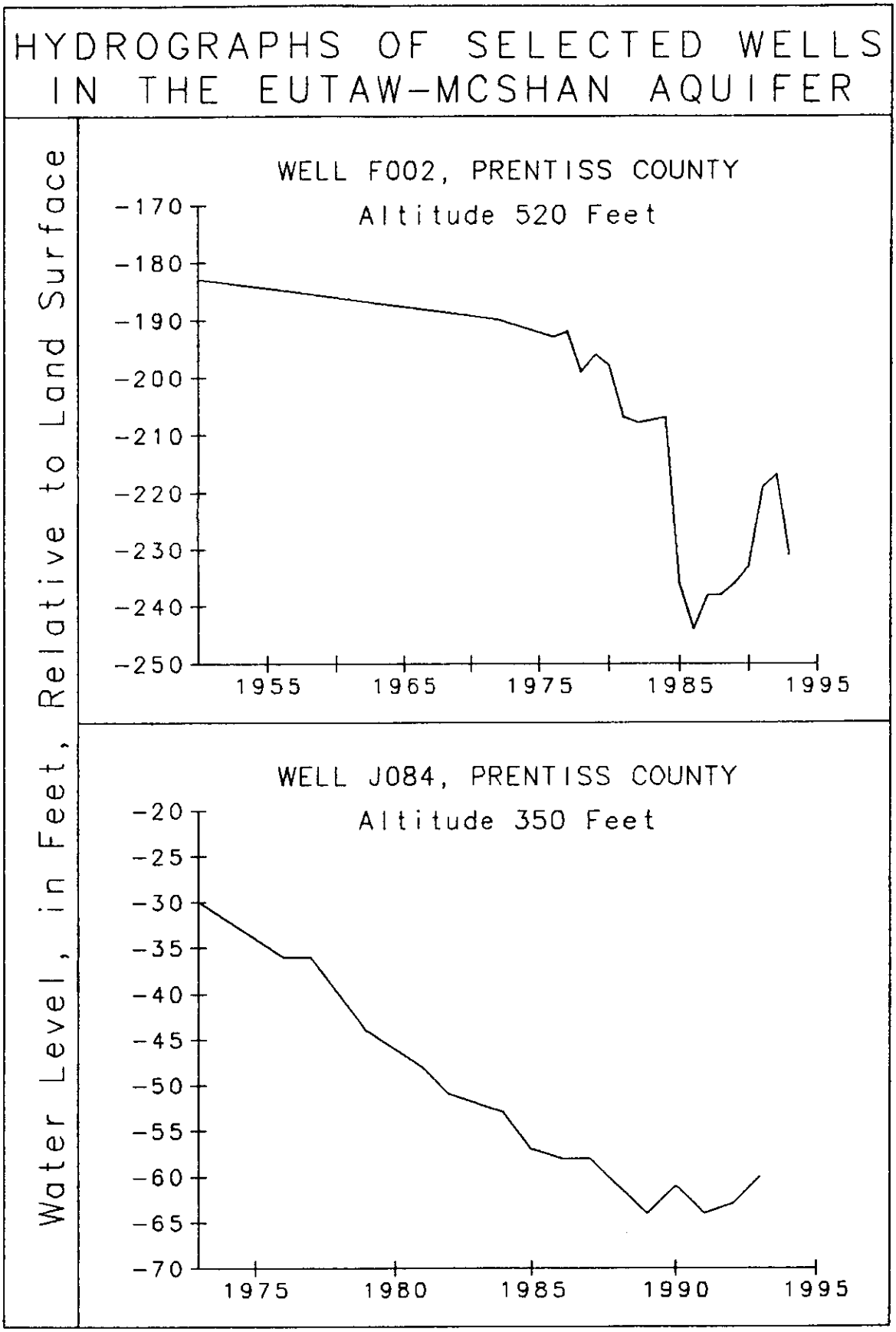
HYDROGRAPHS OF SELECTED WELLS IN THE EUTAW-MCSHAN AQUIFER
Water Level, in Feet, Relative to Land Surface
WELL F002, PRENTISS COUNTY
Altitude 520 Feet
-170
-180
-190
-200
-210
-220
-230
-240
-250
1955
1965
1975
1985
1995
WELL J084, PRENTISS COUNTY
Altitude 350 Feet
-20
-25
-30
-35
-40
-45
-50
-55
-60
-65
-70
1975
1980
1985
1990
1995

FIGURE 6

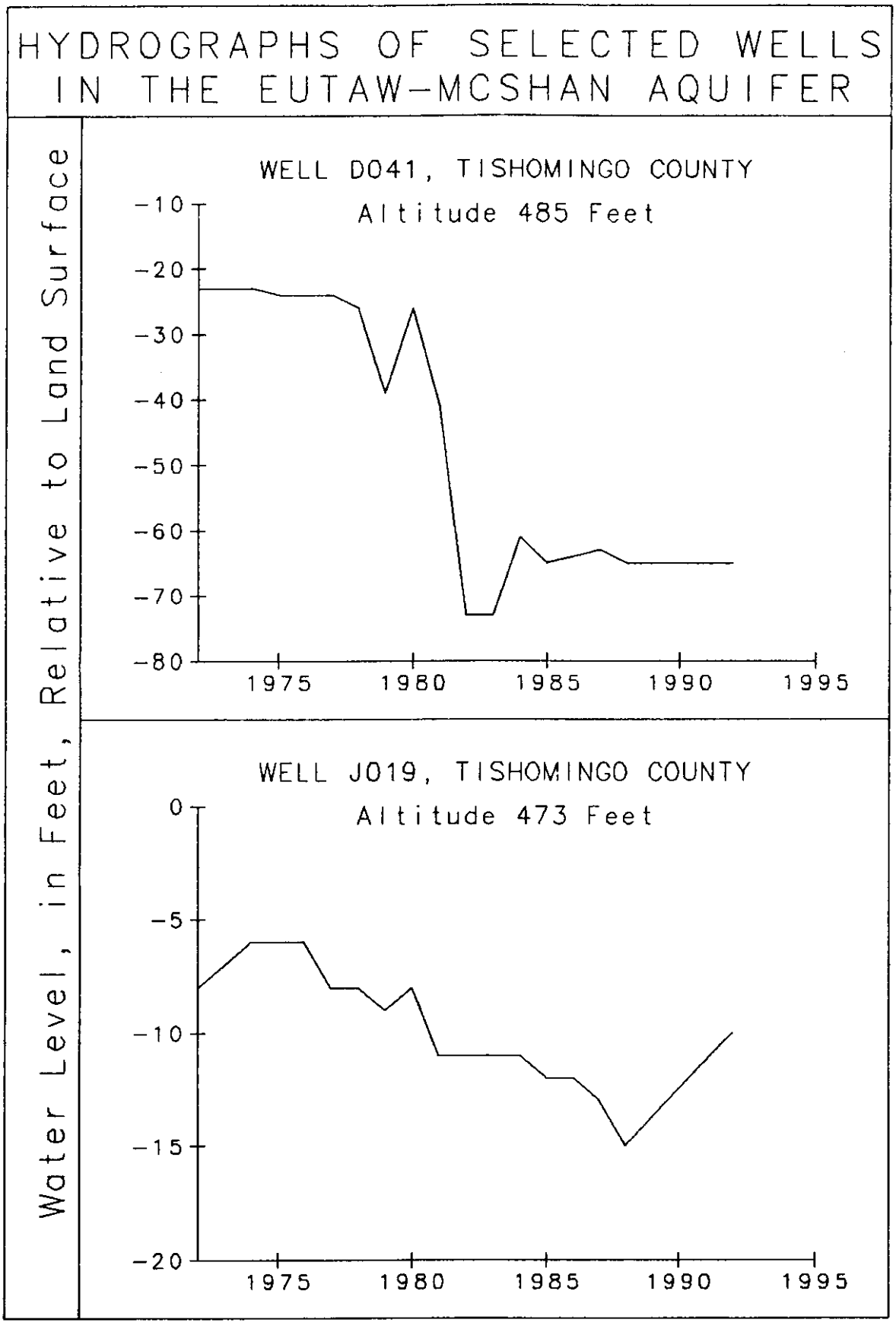
HYDROGRAPHS OF SELECTED WELLS IN THE EUTAW-MCSHAN AQUIFER
Water Level, in Feet, Relative to Land Surface
WELL D041, TISHOMINGO COUNTY
Altitude 485 Feet
-10
-20
-30
-40
-50
-60
-70
-80
1975
1980
1985
1990
1995
WELL J019, TISHOMINGO COUNTY
Altitude 473 Feet
0
-5
-10
-15
-20
1975
1980
1985
1990
1995

FIGURE 7

TABLE 1: WATER LEVEL RECORDS OF WELLS SCREENED IN THE EUTAW-MCSHAN AQUIFER

COUNTY	U.S.G.S. WELL NUMBER	ALTITUDE IN FEET RELATIVE TO MSL	1992 HEAD VALUES IN FEET RELATIVE TO MSL	1992 WATER LEVELS IN FEET RELATIVE TO LAND SURFACE	PREVIOUS WATER LEVELS IN FEET RELATIVE TO LAND SURFACE	AVERAGE CHANGE IN WATER LEVEL RISE (+) OR DECLINE (-) IN FEET PER YEAR
ALCORN	G102	455	281.93	173.07	172.00 (1972)	- 0.05
	K060	440	330.60	109.40	86.00 (1973)	- 1.23
CALHOUN	D005	370	171.24	198.76	172.00 (1978)	- 1.91
	D006	275	166.90	108.10	90.00 (1980)	- 1.51
	E004	369	171.62	197.38	130.83 (1959)	- 2.02
	E008	420	153.46	266.54	244.43 (1982)	- 2.21
	G003	380	158.77	221.23	212.80 (1982)	- 0.84
	G008	340	167.60	172.40	169.72 (1991)	- 1.80
	K002	255	166.60	88.40	55.00 (1954)	- 0.88
	L003	275	161.00	114.00	42.00 (1953)	- 1.85
	L005	278	163.63	114.37	50.00 (1950)	- 1.53
	L006	285	160.65	124.35	40.00 (1951)	- 2.06
	L008	310	160.99	149.01	98.00 (1966)	- 1.96
	O007	345	171.93	173.07	170.72 (1991)	- 1.57
CHICKASAW	B001	415	146.10	268.90	270.82 (1991)	+ 1.92
	B011	374	144.89	229.11	165.00 (1969)	- 2.79
	B025	384	137.24	246.76	168.00 (1967)	- 3.00
	B029	430	146.86	283.14	263.36 (1982)	- 1.98
	C022	365	148.54	216.46	166.00 (1971)	- 2.35
	D004	305	147.70	157.30	125.00 (1937)	- 0.59
	D006	307	137.16	169.84	143.16 (1977)	- 1.78
	D019	317	137.98	179.02	161.58 (1978)	- 1.25
	D026	404	140.40	263.60	--------.--------	-----.-----
	D059	340	135.33	204.67	203.20 (1991)	- 0.74
	E029	327	152.64	174.36	154.34 (1982)	- 2.00
	F019	398	142.67	255.33	185.00 (1965)	- 2.56
	F022	332	144.66	187.34	130.00 (1954)	- 1.49
	F025	337	155.71	181.29	140.00 (1972)	- 2.06
	F026	464	151.10	312.90	290.00 (1980)	- 1.83
	H038	314	143.62	170.38	135.00 (1971)	- 1.64
	J018	318	150.10	167.90	149.60 (1982)	- 1.83

COUNTY	U.S.G.S. WELL NUMBER	ALTITUDE IN FEET RELATIVE TO MSL	1992 HEAD VALUES IN FEET RELATIVE TO MSL	1992 WATER LEVELS IN FEET RELATIVE TO LAND SURFACE	PREVIOUS WATER LEVELS IN FEET RELATIVE TO LAND SURFACE	AVERAGE CHANGE IN WATER LEVEL RISE (+) OR DECLINE (-) IN FEET PER YEAR
CHICKASAW (con't)						
	KO46	345	143.68	201.32	100.00 (1970)	- 4.40
	K047	354	142.40	211.60	191.97 (1982)	- 1.96
	L022	310	81.87	228.13	150.00 (1969)	- 3.32
	L028	318	133.70	184.30	150.00 (1965)	- 1.27
	L030	310	144.00	166.00	157.75 (1987)	- 1.65
	M050	240	136.08	103.92	84.00 (1975)	- 1.14
	M053	272	135.58	136.42	118.00 (1981)	- 1.67
	N018	315	169.53	145.47	115.00 (1970)	- 1.39
	N022	335	146.50	188.50	172.40 (1982)	- 1.61
	N024	570	136.30	433.70	418.00 (1972)	- 0.79
	N027	467	156.37	310.63	280.00 (1978)	- 2.11
	O007	343	139.37	203.63	150.00 (1967)	- 2.15
	O008	364	139.51	224.49	216.08 (1987)	- 1.53
	O010	309	145.08	163.92	155.00 (1984)	- 1.12
CLAY	B044	272	123.49	148.51	145.56 (1987)	- 0.59
	B080	280	129.43	150.57	133.00 (1983)	- 1.95
	C013	310	142.38	167.62	125.00 (1957)	- 1.22
	C019	300	146.50	153.50	107.00 (1972)	- 2.27
	D017	335	140.66	194.34	118.00 (1959)	- 2.31
	D031	292	132.66	159.34	125.00 (1975)	- 1.96
	D032	282	134.19	147.81	134.00 (1988)	- 3.45
	E028	266	112.09	153.91	135.70 (1982)	- 1.82
	E031	235	104.39	130.61	111.00 (1982)	- 1.96
	F021	275	136.78	138.22	96.00 (1972)	- 2.06
	F023	305	139.19	165.81	100.00 (1970)	- 2.99
	F034	295	131.34	163.66	128.00 (1978)	- 2.46
	G016	245	108.95	136.05	110.00 (1976)	- 1.63
	G062	265	132.66	132.34	104.00 (1976)	- 1.77
	H032	203	87.68	115.32	43.97 (1964)	- 2.50
	H039	216	46.41	169.59	137.00 (1963)	- 1.12
	H045	202	45.17	156.83	144.00 (1971)	- 0.61

COUNTY	U.S.G.S. WELL NUMBER	ALTITUDE IN FEET RELATIVE TO MSL	1992 HEAD VALUES IN FEET RELATIVE TO MSL	1992 WATER LEVELS IN FEET RELATIVE TO LAND SURFACE	PREVIOUS WATER LEVELS IN FEET RELATIVE TO LAND SURFACE	AVERAGE CHANGE IN WATER LEVEL RISE (+) OR DECLINE (-) IN FEET PER YEAR
CLAY (con't)	H051	255	91.63	163.37	102.00 (1964)	- 2.19
	H138	248	44.53	203.47	177.00 (1974)	- 1.43
	H139	252	43.05	208.95	171.00 (1974)	- 2.05
	H140	253	63.17	189.83	153.00 (1974)	- 1.99
	H150	203	74.37	128.63	126.00 (1976)	- 0.16
	H158	202	99.82	102.18	105.00 (1981)	+ 0.25
	H159	260	79.01	180.99	---------.---------	-----.-----
	J035	250	144.18	105.82	100.20 (1976)	- 0.35
	J037	217	85.77	131.23	66.00 (1964)	- 2.29
	J068	218	50.26	167.74	102.00 (1972)	- 3.21
	J097	180	155.68	24.32	15.48 (1972)	- 0.43
	J098	182	170.62	11.38	10.00 (1972)	- 0.07
	J113	253	152.48	100.52	95.00 (1973)	- 0.29
	J114	217	159.18	57.82	50.00 (1973)	- 0.41
	J129	225	186.19	38.81	35.00 (1982)	- 0.38
	J138	250	102.97	147.03	142.00 (1985)	- 0.67
	J140	195	89.69	105.31	106.00 (1985)	+ 0.10
ITAWAMBA	G035	405	268.59	136.41	125.00 (1966)	- 0.44
	G069	360	249.35	110.65	109.23 (1982)	- 0.14
	H008	480	425.81	54.19	50.00 (1974)	- 0.23
	N024	290	274.48	15.52	15.00 (1971)	- 0.02
	O005	410	351.52	58.48	59.25 (1978)	+ 0.06
KEMPER	D014	220	149.70	70.30	65.00 (1970)	- 0.24
	K005	188	148.64	39.36	33.72 (1982)	- 0.56
LAFAYETTE	L005	330	168.23	161.77	---------.---------	-----.-----
LEE	B028	430	262.60	167.40	118.00 (1967)	- 1.94
	E022	305	199.90	105.10	60.00 (1963)	- 1.56
	G013	270	136.65	133.35	100.00 (1949)	- 0.78

COUNTY	U.S.G.S. WELL NUMBER	ALTITUDE IN FEET RELATIVE TO MSL	1992 HEAD VALUES IN FEET RELATIVE TO MSL	1992 WATER LEVELS IN FEET RELATIVE TO LAND SURFACE	PREVIOUS WATER LEVELS IN FEET RELATIVE TO LAND SURFACE	AVERAGE CHANGE IN WATER LEVEL RISE (+) OR DECLINE (-) IN FEET PER YEAR
LEE (Con't)	G058	280	140.25	139.75	171.00 (1971)	+ 1.49
	H009	285	165.90	119.10	35.00 (1947)	- 1.87
	H022	275	137.90	137.10	120.00 (1954)	- 0.45
	H033	315	175.90	139.10	117.00 (1973)	- 1.16
	H093	340	190.60	149.40	128.00 (1969)	- 0.93
	H105	310	166.20	143.80	149.00 (1945)	+ 0.11
	H114	375	228.40	146.60	146.00 (1979)	- 0.04
	K024	294	126.80	167.20	80.00 (1956)	- 2.42
	K029	345	123.40	221.60	178.60 (1967)	- 1.69
	K093	295	119.40	175.60	154.00 (1975)	- 1.27
	K095	325	125.95	199.05	259.00 (1981)	+ 5.45
	L002	255	127.60	127.40	83.00 (1952)	- 1.11
	L004	295	142.40	152.60	88.00 (1959)	- 1.96
	L041	270	130.90	139.10	74.00 (1966)	- 2.50
	L087	320	168.22	151.78	125.00 (1972)	- 1.31
	M027	395	225.60	169.40	166.80 (1978)	- 0.19
	N015	280	137.10	142.90	84.00 (1966)	- 2.27
	O015	260	169.50	90.50	20.00 (1956)	- 1.96
	O024	282	143.40	138.60	55.00 (1956)	- 2.32
	O054	257	138.35	118.65	108.00 (1976)	- 0.65
	O115	280	182.30	97.70	89.00 (1978)	- 0.62
LOWNDES	B040	282	253.75	28.25	28.86 (1982)	+ 0.06
	C029	210	168.56	41.44	17.00 (1959)	- 0.73
	C137	183	154.87	28.13	36.00 (1988)	+ 1.97
	D016	193	187.23	5.77	7.52 (1991)	+ 1.75
	E015	203	107.20	95.80	88.10 (1982)	- 0.77
	E025	250	125.42	124.58	121.14 (1982)	- 0.34
	E026	240	111.13	128.87	112.00 (1981)	- 1.53
	F037	224	137.24	86.76	58.00 (1971)	- 1.37
	F067	242	135.22	106.78	110.00 (1973)	+ 0.17
	F079	195	147.81	47.19	66.00 (1981)	+ 1.71
	F080	237	118.86	118.14	60.00 (1977)	- 3.88

COUNTY	U.S.G.S. WELL NUMBER	ALTITUDE IN FEET RELATIVE TO MSL	1992 HEAD VALUES IN FEET RELATIVE TO MSL	1992 WATER LEVELS IN FEET RELATIVE TO LAND SURFACE	PREVIOUS WATER LEVELS IN FEET RELATIVE TO LAND SURFACE	AVERAGE CHANGE IN WATER LEVEL RISE (+) OR DECLINE (-) IN FEET PER YEAR
LOWNDES (Con't)	F087	233	136.43	96.57	---------.---------	-----.-----
	G066	182	166.50	15.50	10.00 (1970)	- 0.25
	G186	165	151.65	13.35	8.00 (1979)	- 0.40
	G202	184	172.10	11.90	19.00 (1991)	+ 3.90
	G203	185	170.62	14.38	---------.---------	-----.-----
	G205	140	128.97	11.03	18.00 (1985)	+ 0.93
	H008	224	180.64	43.36	39.00 (1964)	- 0.15
	K025	195	139.10	55.90	46.00 (1978)	- 0.71
	K031	235	138.08	96.92	83.00 (1978)	- 0.99
	L025	180	160.25	19.75	---------.---------	-----.-----
	M032	210	172.18	37.82	38.00 (1972)	0.00
	N029	286	132.60	153.40	127.80 (1978)	- 1.83
	P003	215	139.02	75.98	---------.---------	-----.-----
	P006	152	139.85	12.15	---------.---------	-----.-----
MONROE	A028	332	174.25	157.75	151.00 (1978)	- 0.48
	A078	249	166.85	82.15	78.00 (1991)	- 2.77
	B067	293	262.10	30.90	43.05 (1978)	+ 0.87
	C080	210	196.85	13.15	7.00 (1975)	- 0.35
	D034	253	235.72	17.28	14.70 (1985)	- 0.34
	F067	315	165.81	149.19	141.00 (1982)	- 0.82
	G019	235	204.04	30.96	31.00 (1984)	0.00
	G022	250	173.58	76.42	70.00 (1967)	- 0.25
	K011	283	149.86	133.14	112.05 (1982)	- 2.11
	K014	297	145.35	151.65	138.00 (1975)	- 0.78
	K083	288	150.17	137.83	----------.---------	-----.-----
	L015	205	164.77	40.23	35.51 (1940)	- 0.09
	L017	205	161.11	43.89	46.22 (1982)	+ 0.23
	L019	206	156.29	49.71	---------.---------	-----.-----
	L020	233	146.08	86.92	63.11 (1963)	- 0.81
	L024	220	126.11	93.89	117.23 (1963)	+ 0.79
	L030	230	133.63	96.37	72.00 (1964)	- 0.87
	L031	220	137.90	82.10	70.00 (1976)	- 0.76

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MONROE (Con't)	L035	243	154.13	88.87	76.00 (1967)	- 0.50
	L099	241	171.68	69.32	68.70 (1989)	- 0.18
	O002	330	143.72	186.28	169.00 (1957)	- 0.49
	O003	310	139.47	170.53	114.00 (1942)	- 1.13
	O004	310	143.72	166.28	142.00 (1957)	- 0.69
	O005	320	144.76	175.24	128.00 (1957)	- 1.35
	O006	300	133.15	166.85	118.00 (1957)	- 1.40
	O007	300	139.25	160.75	98.00 (1942)	- 1.26
	O016	304	142.58	161.42	152.10 (1977)	- 0.60
	O026	265	128.38	136.62	70.00 (1969)	- 2.90
	O065	260	129.63	130.37	123.00 (1983)	- 0.78
	P022	218	114.57	103.43	98.78 (1982)	- 0.47
	P024	200	122.13	77.87	38.00 (1963)	- 1.35
	P030	240	130.85	109.15	75.00 (1969)	- 1.45
	Q076	220	204.80	15.20	11.00 (1977)	- 0.27
	Q093	210	198.76	11.24	6.00 (1984)	- 0.66
NOXUBEE	C017	250	171.86	78.14	70.00 (1962)	- 0.27
	C035	265	149.80	115.20	100.00 (1975)	- 0.87
	C042	270	145.23	124.77	127.00 (1986)	+ 0.34
	G003	218	154.32	63.68	25.00 (1955)	- 1.03
	H006	215	141.16	73.84	20.00 (1948)	- 1.22
	H053	247	148.32	98.68	110.00 (1988)	+ 2.83
	J015	246	138.14	107.86	---------.---------	-----.-----
	M013	245	183.98	61.02	60.00 (1965)	- 0.04
	N024	185	141.95	43.05	37.00 (1972)	- 0.30
	O020	208	140.70	67.30	48.00 (1971)	- 0.90
	P025	202	141.56	60.44	55.00 (1978)	- 0.39
	T001	200	143.80	56.20	28.00 (1955)	- 0.76
OKTIBBEHA	B011	311	153.00	158.00	11.00 (1958)	- 4.32
	C700	242	142.30	99.70	---------.---------	-----.-----
	D004	268	119.47	148.53	67.00 (1959)	- 2.47

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OKTIBBEHA (Con't)						
	D049	245	104.31	140.69	120.00 (1972)	- 1.03
	D700	255	120.96	134.04	---------.---------	-----.-----
	G102	381	144.79	236.21	177.06 (1940)	- 1.13
	J003	385	189.35	195.65	155.00 (1955)	- 1.10
	K001	320	177.57	142.43	127.20 (1982)	- 1.52
PONTOTOC	C059	400	164.69	235.31	178.00 (1972)	- 2.87
	C078	460	147.74	312.26	264.00 (1972)	- 2.41
	C085	570	178.80	391.20	375.00 (1975)	- 0.95
	C092	505	114.15	390.85	359.70 (1987)	- 5.66
	D019	395	159.32	235.68	155.00 (1967)	- 3.16
	E016	510	170.08	339.92	307.00 (1975)	- 1.94
	F057	385	150.62	234.38	223.00 (1986)	- 1.75
	G029	400	144.20	255.80	232.05 (1978)	- 1.70
	H025	375	142.08	232.92	211.89 (1978)	- 1.50
PRENTISS	B053	500	315.23	184.77	162.00 (1973)	- 1.20
	B057	535	319.40	215.60	195.00 (1976)	- 1.29
	D027	510	419.35	90.65	84.00 (1977)	- 0.44
	D028	510	433.62	76.38	30.00 (1977)	- 3.09
	D029	510	465.17	44.83	45.68 (1985)	+ 0.11
	F002	520	295.30	224.70	183.00 (1950)	- 0.99
	F059	545	306.20	238.80	227.00 (1981)	- 1.03
	J068	370	280.50	89.50	41.00 (1967)	- 1.94
	J084	350	284.90	65.10	29.50 (1973)	- 1.87
	J090	360	277.30	82.70	40.00 (1974)	- 2.37
	K086	358	283.90	74.10	50.00 (1975)	- 1.38
	L091	344	306.10	37.90	39.00 (1986)	+ 0.18
	L094	380	302.10	77.90	---------.---------	-----.-----
	M022	472	397.46	74.54	77.00 (1972)	+ 0.12
TISHOMINGO	A019	500	443.50	56.50	59.00 (1985)	+ 0.33
	B024	556	474.45	81.55	35.00 (1973)	- 2.45

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TISHOMINGO (Con't)						
	D041	485	420.55	64.45	22.97 (1972)	- 2.02
	D042	485	427.45	57.55	23.04 (1972)	- 1.68
	E016	540	484.00	56.00	47.44 (1972)	- 0.42
	G005	585	468.45	116.55	125.69 (1971)	+ 0.44
	G016	610	496.60	113.40	92.56 (1971)	- 0.99
	G018	565	523.13	41.87	38.96 (1971)	- 0.14
	G019	565	524.63	40.37	37.87 (1971)	- 0.12
	J019	473	462.85	10.15	7.54 (1972)	- 0.13
UNION	G073	434	185.08	248.92	233.00 (1983)	- 1.68
	H008	360	161.10	198.90	145.00 (1978)	- 3.85
	H030	380	155.13	224.87	183.00 (1978)	- 2.89
	J048	390	224.15	165.85	125.00 (1975)	- 2.40
	J049	391	257.30	133.70	141.00 (1987)	+ 1.33
	M031	412	180.30	231.70	201.00 (1978)	- 2.19
WEBSTER	D002	410	157.07	252.93	222.50 (1978)	- 2.17
	E001	380	248.42	131.58	120.00 (1953)	- 0.30
	K010	500	161.05	338.95	332.18 (1990)	- 3.39
	K007	462	166.60	295.40	265.00 (1962)	- 1.01

POTENTIOMETRIC MAP OF THE EUTAW-MCSHAN AQUIFER IN NORTHEASTERN MISSISSIPPI FALL AND WINTER, 1992

by

Jo F. Everett and Stephen P. Jennings

EXPLANATION

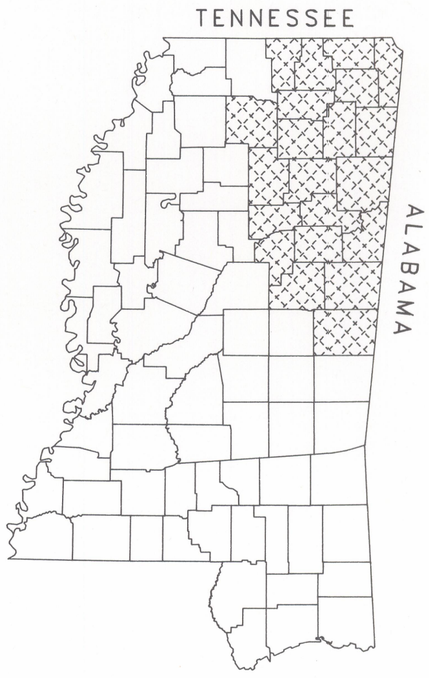
— 260 — POTENTIOMETRIC CONTOUR
Contour interval 20 feet
Datum is sea level.

OUTCROP AREA OF THE EUTAW & MCSHAN FORMATIONS IN MISSISSIPPI

A046 OBSERVATION WELL AND NUMBER

SCALE 1:450000

5 0 5 10 15 20
MILES



Location of Study Area