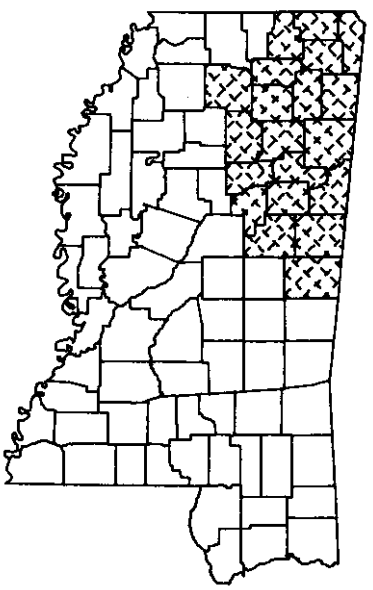
POTENTIOMETRIC MAP OF THE GORDO AQUIFER IN NORTHEASTERN MISSISSIPPI FALL AND WINTER, 1992

by

Patricia A. Phillips and James H. Hoffmann

OLWR HYDROLOGIC MAP 93-4



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 93-4, entitled "Potentiometric Map of the Gordo Aquifer in Northeastern Mississippi, Fall and Winter, 1992" by Patricia A. Phillips and James H. Hoffmann.

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

CONTENTS

POTENTIOMETRIC MAP OF THE GORDO AQUIFER IN NORTHEASTERN MISSISSIPPI, FALL AND WINTER, 1992

INTRODUCTION

This potentiometric map of the Gordo aquifer is one of a series of maps prepared by the Mississippi Department of Environmental Quality, Office of Land and Water Resources, delineating the potentiometric surfaces of the fresh-water aquifers in Mississippi at five-year intervals for the purpose of documenting changes in water levels in these aquifers. It should be noted that water levels may be highly variable seasonally or even daily, and 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 (Darden, 1984; Goldsmith, 1990; Wasson, 1980). This map is based on water-level measurements made in 211 wells during the fall and winter of 1992.

Records of water wells screened in the Gordo aquifer were evaluated to determine which wells had previously had water-level measurements taken by this office and the U. S. Geological Survey. These wells were plotted on U. S. Geological Survey 7.5 Minute Series Topographic maps to enable field personnel to locate each well. While in the field, the locations and the land surface altitudes were verified and corrected as necessary. The measuring point and the height of the measuring point above land surface were noted. These sites were entered into a GIS data base that was used to generate base maps for this study. Water levels were measured using either a steel tape or an electric tape. Each measurement was recorded and at least one additional measurement was made to verify the validity of the first measurement.

ACKNOWLEDGEMENTS

In the course of the field investigation, S. W. Bryant, L. A. May, D. L. Hardin, J. E. Everett, P. E. Grantham, S. P. Jennings, L. Stewart, and A. J. Warner were of great assistance in the collection of water-level data used in this study. E. H. Boswell made many helpful suggestions and reviewed the report.

HYDROGEOLOGY

The Gordo Formation is a part of the Tuscaloosa Group of Upper Cretaceous age and includes the Gordo and Coker Formations. The Gordo is overlapped by the McShan and Eutaw Formations and is underlain by Paleozoic rocks in the north and by the Coker Formation to the south (Boswell, 1978). Sediments of the Gordo Formation crop out in Mississippi in an irregular belt from the Tennessee line into Tishomingo County, hugging the Mississippi-Alabama border southward to Monroe County where it swings southeastward into Alabama. From the outcrop area, the formation dips into the subsurface to the west and southwest in Mississippi. The Gordo

is composed of sediments ranging from an upper unit composed mostly of clay and fine sand to a lower unit in which coarse quartz sand and chert gravel predominate. This lower unit comprises the Gordo aquifer. The Gordo Formation is less than 30 feet thick in Prentiss County and thickens to about 400 feet in Oktibbeha and Kemper Counties (Boswell, 1963, p.45-47). In general, the Gordo Formation thins to the north and northwest so that it is no longer present in the subsurface north of a line from southeastern Alcorn County to northwestern Prentiss County through central Union County into central Lafayette County.

Recharge to the Gordo aquifer is primarily by precipitation on the outcrop. Water moves southwestward in the subsurface from the outcrop areas (Boswell, 1978). The Gordo aquifer is generally hydraulically isolated by clay beds from recharge into or out of the aquifer. However, in some areas this separation is poor and the Gordo water levels may be influenced from above by the McShan Formation or from the Coker Formation below (Wasson, 1960).

AQUIFER DEVELOPMENT AND GROUND-WATER USE

The Gordo aquifer is a source of freshwater for many public water supplies and industries and for numerous domestic and farm wells in several counties in northeastern Mississippi. (See Plate 1).

In the past, the Gordo aquifer was not used extensively. The shallower Eutaw-McShan aquifer produced enough water for most of the needs of the public and industries in the area, generally without treatment. The increase in population and industrial expansion in the area in the past fifty years has resulted in higher demands for water. The Gordo aquifer is capable of yielding greater quantities of water than the Eutaw-McShan in most of the study area. In the western and southern parts of the area, some water-supply wells screened in the Gordo produce water in excess of 500 mg/l total dissolved solids. In these areas, shallower aquifers may contain poorer quality water or may not be capable of yielding sufficient quantities of water to meet the demand. In the eastern part of the area, water from the Gordo aquifer requires treatment for some uses because of high iron concentrations (Goldsmith, 1990).

Stephenson, Logan, and Waring (1928) discussed the development of the Gordo aquifer from the mid-nineteenth century to the early twentieth century. Water for domestic and farm use was supplied by springs and shallow wells in Monroe, Itawamba, and Tishomingo Counties where the Gordo Formation crops out.

One of the earliest wells which produced from the Gordo aquifer was drilled in 1850 near Aberdeen in Monroe County. The well was drilled to a depth of 371 feet and flowed 15 gallons per minute. In Clay, Lee, Lowndes, and Monroe Counties, most of the earliest wells drilled to the Gordo flowed, producing up to 40 gallons per minute. In Brooksville, in Noxubee County, a well drilled in 1911 produced water from the Gordo aquifer from a depth of 1187 feet. Shallow Gordo wells were also drilled in Tishomingo County in the early 1900's.

In 1985, slightly more than 43 million gallons of water per day was pumped from the Gordo aquifer for public and industrial use (Goldsmith, 1990). Since that time, Tupelo, in Lee County, has switched to a surface water source and a large industrial user in Monroe County has greatly curtailed its water use. To offset this decline in use, both Booneville, in Prentiss County,

and West Point, in Clay County, are now pumping from the Gordo aquifer in addition to the Eutaw-McShan aquifer. The Gordo aquifer is currently a source of water for many towns in northeastern Mississippi, including Calhoun City, Fulton, Amory, Starkville, and Belmont, as well as many rural public water systems. The Gordo aquifer also supplies water to many industries, especially in Lowndes and Monroe Counties.

WATER LEVELS

Recharge to the Gordo aquifer is primarily by precipitation on the outcrop where permeable units are exposed at the surface. Water levels in or near the outcrop area have shown very little long-term change. The potentiometric surface of the outcrop area is strongly affected by topography and discharge to streams (Wasson, 1980).

In the areas to the west of the outcrop, the Gordo aquifer is under artesian conditions and water moves in a westward and southwestward direction. Water levels in these areas are influenced by withdrawals in areas of heavy usage and through discharge in the valley of the Tombigbee River (See Plate 1).

A comparison of 1992 water-level measurements with previous measurements in the same wells reveals that there has been a general decline in water levels in the downdip areas of the Gordo aquifer (Table 1, Figures 1-5). The annual rate of decline is no more than 1 to 3 feet per year in the majority of the wells. In a few wells, water levels have been rising. In Tupelo, which is now using the Tombigbee River as its source of water, water levels have shown a dramatic recovery.

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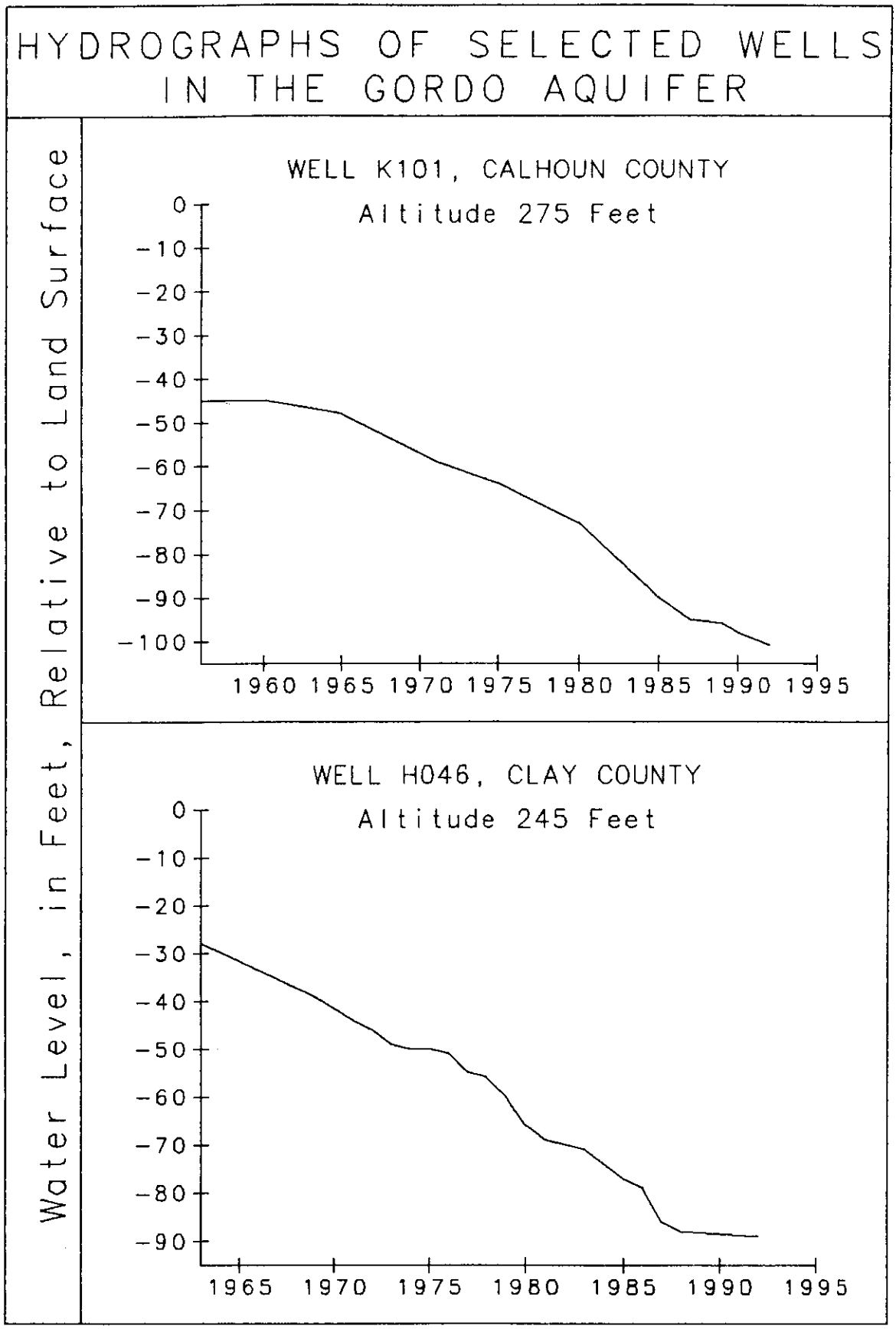
HYDROGRAPHS OF SELECTED WELLS IN THE GORDO AQUIFER
Water Level, in Feet, Relative to Land Surface
WELL K101, CALHOUN COUNTY
Altitude 275 Feet
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
1960 1965 1970 1975 1980 1985 1990 1995
WELL H046, CLAY COUNTY
Altitude 245 Feet
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
1965 1970 1975 1980 1985 1990 1995

FIGURE 1

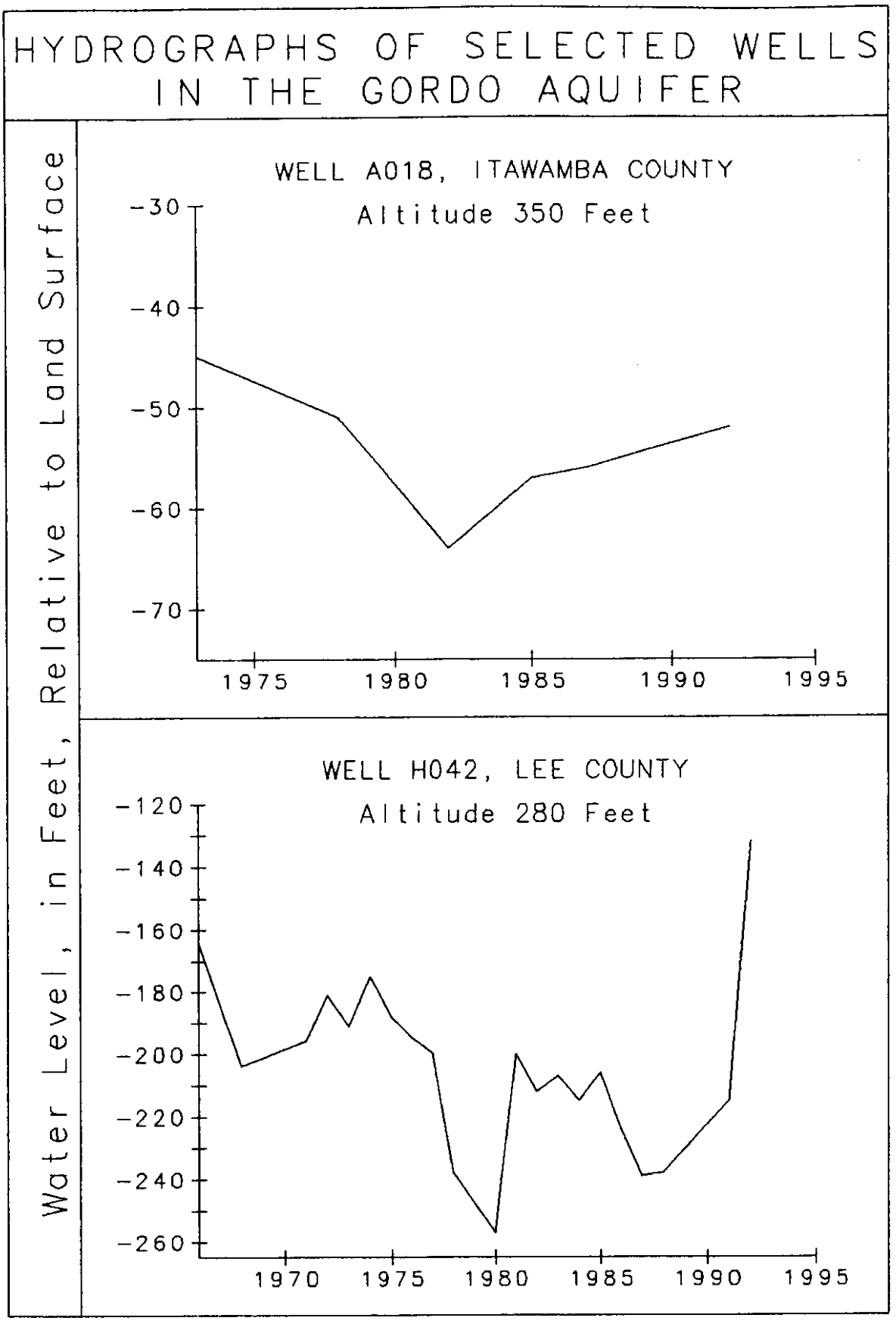
HYDROGRAPHS OF SELECTED WELLS IN THE GORDO AQUIFER
Water Level, in Feet, Relative to Land Surface
WELL A018, ITAWAMBA COUNTY
Altitude 350 Feet
-30
-40
-50
-60
-70
1975
1980
1985
1990
1995
WELL H042, LEE COUNTY
Altitude 280 Feet
-120
-140
-160
-180
-200
-220
-240
-260
1970
1975
1980
1985
1990
1995

FIGURE 2

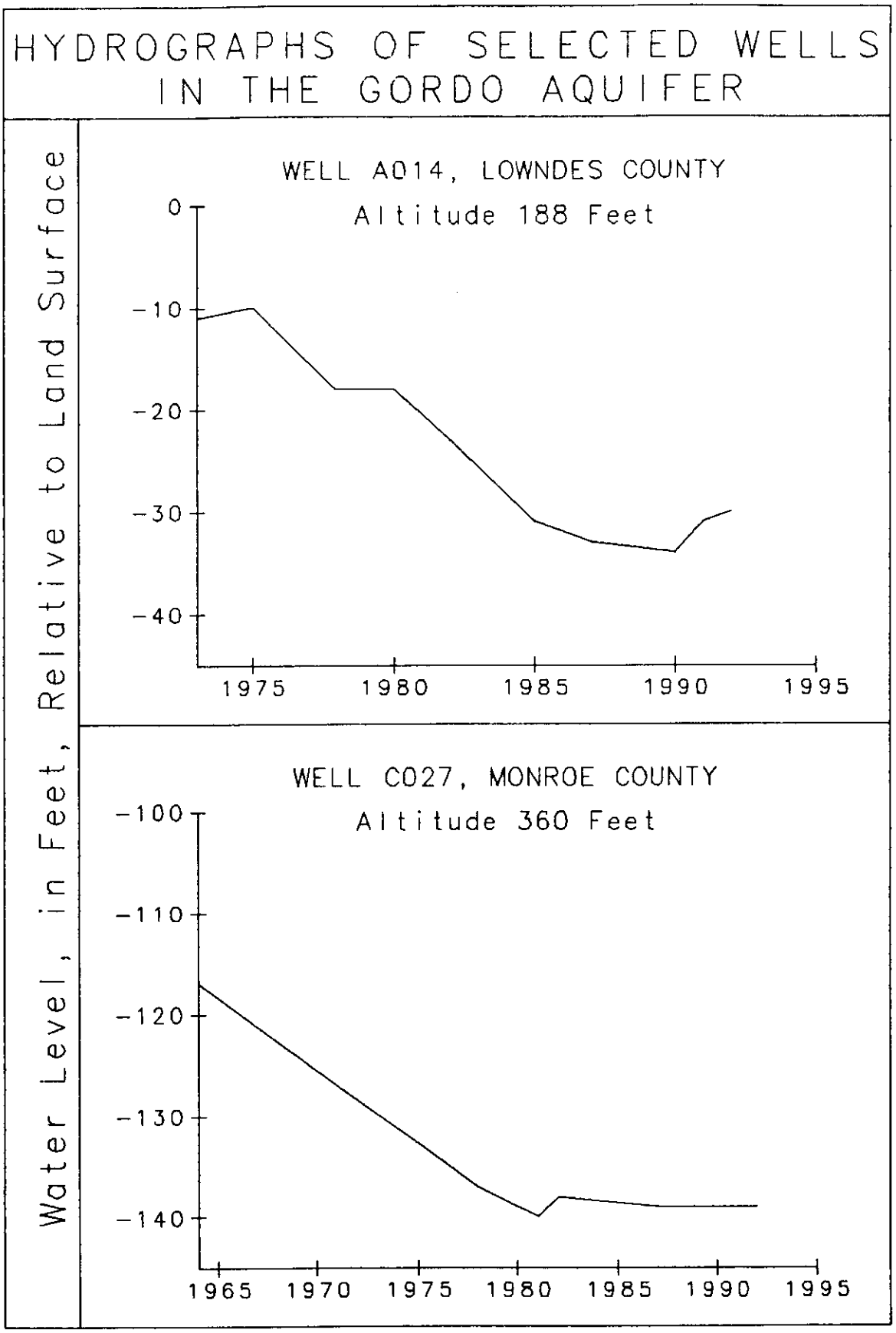
HYDROGRAPHS OF SELECTED WELLS IN THE GORDO AQUIFER
Water Level, in Feet, Relative to Land Surface
WELL A014, LOWNDES COUNTY
Altitude 188 Feet
0
-10
-20
-30
-40
1975
1980
1985
1990
1995
WELL C027, MONROE COUNTY
Altitude 360 Feet
-100
-110
-120
-130
-140
1965
1970
1975
1980
1985
1990
1995

FIGURE 3

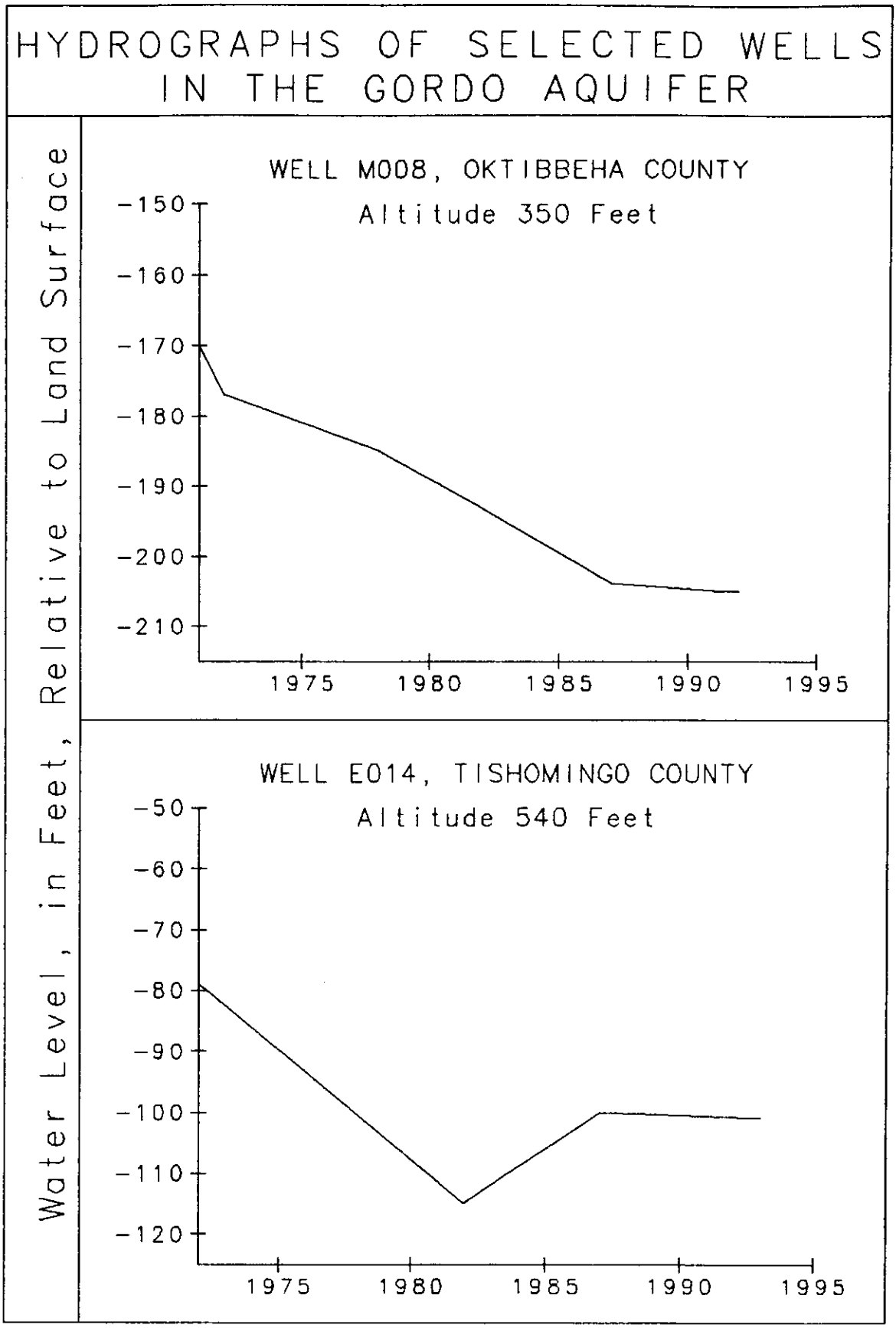
HYDROGRAPHS OF SELECTED WELLS IN THE GORDO AQUIFER
Water Level, in Feet, Relative to Land Surface
WELL M008, OKTIBBEHA COUNTY
Altitude 350 Feet
-150
-160
-170
-180
-190
-200
-210
1975
1980
1985
1990
1995
WELL E014, TISHOMINGO COUNTY
Altitude 540 Feet
-50
-60
-70
-80
-90
-100
-110
-120
1975
1980
1985
1990
1995

FIGURE 4

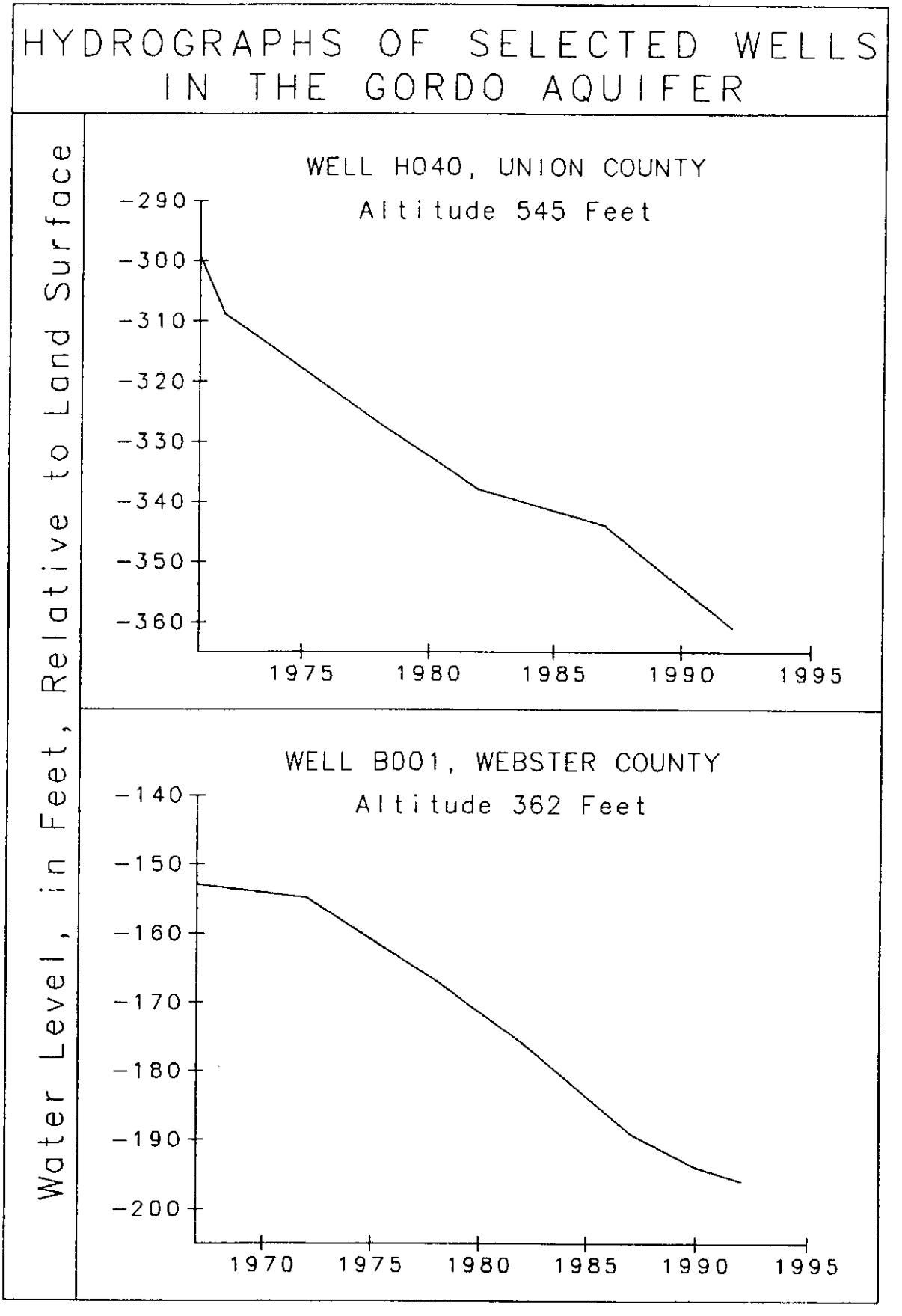
HYDROGRAPHS OF SELECTED WELLS IN THE GORDO AQUIFER
Water Level, in Feet, Relative to Land Surface
WELL H040, UNION COUNTY
Altitude 545 Feet
-290
-300
-310
-320
-330
-340
-350
-360
1975
1980
1985
1990
1995
WELL B001, WEBSTER COUNTY
Altitude 362 Feet
-140
-150
-160
-170
-180
-190
-200
1970
1975
1980
1985
1990
1995

FIGURE 5

TABLE 1: WATER LEVEL RECORDS OF WELLS SCREENED IN THE GORDO 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
CALHOUN	B021	530	257.85	272.15	332.00 (1981)	+ 5.44
	C024	410	182.57	227.43	200.00 (1978)	- 1.96
	D002	310	165.76	144.24	123.00 (1978)	- 1.52
	D004	342	168.52	173.48	129.20 (1971)	- 2.11
	E009	345	165.50	179.50	177.86 (1991)	- 1.64
	E010	495	169.83	325.17	300.00 (1968)	- 1.05
	H005	360	178.90	181.10	164.00 (1979)	- 1.32
	H012	360	177.90	182.10	176.00 (1984)	- 0.76
	K013	293	184.02	108.98	85.00 (1976)	- 1.50
	K014	296	175.70	120.30	104.00 (1982)	- 1.63
	K015	343	163.66	179.34	165.00 (1984)	- 1.79
	K016	290	174.82	115.18	121.00 (1989)	+ 1.94
	K017	275	168.91	106.09	----.--------	----.-----
	K101	275	173.58	101.42	44.50 (1955)	- 1.54
	L010	278	169.86	108.14	92.00 (1977)	- 1.08
	N028	330	172.33	157.67	110.00 (1964)	- 1.70
	O008	390	161.24	228.76	195.00 (1978)	- 2.41
	O011	445	180.63	264.37	268.60 (1988)	+ 1.06
CHICKASAW	A024	375	150.80	224.20	195.00 (1978)	- 2.09
CLAY	C023	340	163.33	176.67	152.00 (1978)	- 1.76
	D018	295	166.36	128.64	99.00 (1960)	- 0.93
	F030	325	173.53	151.47	120.00 (1974)	- 1.75
	H013	245	163.88	81.12	28.66 (1962)	- 1.75
	H046	245	156.24	88.76	28.95 (1963)	- 2.06
	H154	255	141.45	113.55	75.00 (1978)	- 2.75
	H155	257	142.90	114.10	78.00 (1978)	- 2.58
	K041	185	153.17	31.83	31.00 (1986)	- 0.14
ITAWAMBA	A018	350	297.66	52.34	45.00 (1973)	- 0.39
	C010	570	470.96	99.04	110.45 (1987)	+ 2.28

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
ITAWAMBA (con't)						
	E005	325	325.31	- 0.31	- 1.77 (1972)	- 0.07
	F004	535	388.06	146.94	151.00 (1978)	+ 0.29
	G026	313	268.85	44.15	41.55 (1987)	- 0.52
	G030	360	264.96	95.04	88.00 (1972)	- 0.35
	G047	380	275.42	104.58	99.00 (1968)	- 0.23
	G053	290	267.62	22.38	10.00 (1970)	- 0.56
	H013	370	270.87	99.13	95.00 (1977)	- 0.28
	K039	273	263.09	9.91	8.64 (1972)	- 0.06
	M005	420	334.91	85.09	85.00 (1971)	- 0.01
KEMPER	J003	252	172.45	79.55	60.00 (1955)	- 0.53
LEE	B022	405	250.20	154.80	102.00 (1967)	- 2.11
	E014	340	223.80	116.20	55.00 (1963)	- 2.11
	G043	325	127.65	197.35	230.94 (1978)	+ 2.40
	H038	325	183.90	141.10	74.00 (1966)	- 2.58
	H042	280	147.75	132.25	203.60 (1968)	+ 2.97
	L019	276	169.05	106.95	227.14 (1978)	+ 8.59
	L089	377	179.95	197.05	208.97 (1987)	+ 2.38
	L108	293	134.25	158.75	211.00 (1981)	+ 4.75
	O014	260	194.80	65.20	35.30 (1962)	- 1.00
LOWNDES	A009	206	164.93	41.07	39.00 (1991)	- 2.07
	A010	207	163.58	43.42	31.00 (1978)	- 0.89
	A011	205	157.60	47.40	43.59 (1991)	- 3.81
	A014	188	158.38	29.62	10.73 (1973)	- 0.99
	B030	335	192.76	142.24	-----.---------	-----.-----
	B046	333	196.55	136.45	128.00 (1979)	- 0.65
	B053	325	185.61	139.39	-----.---------	-----.-----
	B054	335	201.36	133.64	-----.---------	-----.-----
	C030	210	190.10	19.90	12.24 (1960)	- 0.24
	C062	260	151.58	108.42	84.00 (1965)	- 0.90
	C116	290	139.07	150.93	131.00 (1974)	- 1.11
	C117	310	142.13	167.87	178.40 (1978)	+ 0.75
	C136	210	165.18	44.82	51.19 (1991)	+ 6.37
	E018	255	148.94	106.06	108.12 (1991)	+ 2.06

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)	F013	165	134.20	30.80	- 6.00 (1957)	- 1.05
	F016	168	159.55	8.45	- 7.00 (1948)	- 0.35
	F066	220	151.23	68.77	86.00 (1978)	+ 1.23
	G019	165	146.81	18.19	41.75 (1982)	+ 2.36
	G077	180	169.09	10.91	4.00 (1971)	- 0.33
	G125	165	158.87	6.13	8.20 (1991)	+ 2.07
	G140	174	160.45	13.55	43.00 (1973)	+ 1.55
	G187	160	154.37	5.63	12.67 (1991)	+ 7.04
	G196	175	148.25	26.75	40.05 (1991)	+ 13.30
	G210	180	174.33	5.67	-----.---------	-----.-----
	G700	178	176.92	1.08	-----.---------	-----.-----
	G701	178	179.91	- 1.91	-----.---------	-----.-----
	H014	304	185.91	118.09	105.00 (1965)	- 0.48
	H016	314	188.89	125.11	105.00 (1968)	- 0.84
	H037	290	168.59	121.41	119.93 (1991)	- 1.48
	H038	268	172.55	95.45	104.49 (1991)	+ 9.04
	H041	306	189.69	116.31	116.00 (1991)	- 0.31
	J002	240	146.53	93.47	70.00 (1974)	- 1.30
	K029	240	157.58	82.42	84.00 (1976)	+ 0.10
	L002	178	153.53	24.47	36.00 (1956)	+ 0.32
	L003	176	152.89	23.11	34.00 (1956)	+ 0.30
	L004	175	152.31	22.69	85.00 (1963)	+ 2.15
	L006	175	154.65	20.35	12.00 (1954)	- 0.22
	L017	178	153.88	24.12	91.85 (1978)	+ 4.84
	L034	170	146.43	23.57	94.20 (1978)	+ 5.05
	L035	175	152.05	22.95	140.00 (1958)	+ 3.44
	N041	305	149.87	155.13	168.00 (1984)	+ 1.61
	N042	291	146.98	144.02	145.80 (1991)	+ 1.78
	O034	225	154.45	70.55	47.00 (1980)	- 1.96
	O038	230	160.84	69.16	50.00 (1985)	- 2.74
	P022	225	153.98	71.02	----.---------	-----.-----
MONROE	B071	376	216.40	159.60	-----.---------	-----.-----
	C003	235	208.25	26.75	26.60 (1978)	- 0.01
	C008	235	196.75	38.25	4.00 (1954)	- 0.90
	C027	360	221.40	138.60	117.18 (1964)	- 0.77
	C074	240	200.10	39.90	23.00 (1974)	- 0.94

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
MONROE (con't)	C075	210	190.60	19.40	6.00 (1974)	- 0.74
	C084	365	232.25	132.75	84.00 (1984)	- 6.09
	C114	240	200.10	39.90	39.00 (1986)	- 0.15
	C116	235	196.15	38.85	39.00 (1991)	+ 0.15
	D022	265	244.00	21.00	17.70 (1978)	- 0.26
	D026	325	296.53	28.47	24.00 (1975)	- 0.26
	D027	325	294.90	30.10	26.00 (1975)	- 0.24
	D029	330	299.30	30.70	30.00 (1981)	- 0.06
	D031	263	240.80	22.20	38.00 (1980)	+ 1.32
	D033	253	235.58	17.42	15.00 (1985)	- 0.36
	E006	300	290.37	9.63	10.50 (1987)	+ 0.17
	J010	290	272.80	17.20	19.00 (1967)	+ 0.07
	J023	442	231.50	210.50	200.00 (1979)	- 0.81
	J024	422	229.60	192.40	191.00 (1987)	- 0.28
	L022	195	192.15	2.85	3.67 (1956)	+ 0.02
	M002	240	233.68	6.32	16.30 (1988)	+ 2.50
	N014	330	272.00	58.00	58.00 (1986)	0.00
	P026	264	159.18	104.82	100.00 (1964)	- 0.17
	P028	280	159.64	120.36	83.00 (1968)	- 1.56
	P078	197	177.60	19.40	19.00 (1985)	- 0.06
	Q018	216	145.58	70.42	26.00 (1964)	- 1.59
	Q030	215	90.57	124.43	41.60 (1963)	- 2.86
	Q042	230	124.20	105.80	68.00 (1969)	- 1.64
	Q056	210	123.96	86.04	64.00 (1974)	- 1.22
	Q070	215	118.62	96.38	79.00 (1973)	- 0.91
	Q073	215	125.80	89.20	76.00 (1974)	- 0.73
NOXUBEE	A010	250	155.25	94.75	46.00 (1963)	- 1.68
	D011	262	147.03	114.97	70.00 (1951)	- 1.10
	D017	262	133.75	128.25	56.00 (1969)	- 3.14
	D032	267	149.82	117.18	116.60 (1991)	- 0.58
	D033	255	146.60	108.40	109.00 (1991)	+ 0.60
	D034	225	154.89	70.11	73.00 (1988)	+ 0.72
	E003	155	156.57	- 1.57	- 20.00 (1955)	- 0.50
	E034	158	157.23	0.77	6.00 (1987)	+ 1.05
	K010	227	152.06	74.94	80.00 (1982)	+ 0.51
	P007	204	181.73	22.27	31.00 (1979)	+ 0.67

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
OKTIBBEHA	A007	465	172.01	292.99	232.00 (1960)	- 1.91
	A008	520	169.03	350.97	335.00 (1977)	- 1.06
	A009	480	163.87	316.13	277.00 (1974)	- 2.17
	A011	506	174.19	331.81	318.00 (1980)	- 1.15
	A012	455	196.52	258.48	262.00 (1981)	+ 0.32
	B012	295	163.02	131.98	105.75 (1978)	- 1.87
	B013	310	164.04	145.96	120.63 (1978)	- 1.81
	B015	383	159.25	223.75	198.44 (1978)	- 1.81
	B016	294	163.66	130.34	105.00 (1978)	- 1.81
	C024	340	145.69	194.31	158.00 (1973)	- 1.91
	C026	280	146.60	133.40	107.00 (1978)	- 1.89
	C027	350	154.33	195.67	183.00 (1977)	- 0.85
	D016	292	146.48	145.52	84.00 (1959)	- 1.86
	D042	263	144.54	118.46	92.00 (1977)	- 1.76
	D046	312	149.10	162.90	124.00 (1972)	- 1.95
	D060	275	148.42	126.58	123.00 (1988)	- 0.90
	D062	272	141.89	130.11	129.30 (1988)	- 0.20
	E012	465	167.98	297.02	274.43 (1978)	- 1.61
	F022	308	158.68	149.32	124.35 (1978)	- 1.78
	F023	323	160.35	162.65	147.55 (1990)	- 7.55
	F024	325	155.42	169.58	144.00 (1977)	- 1.71
	F029	320	165.84	154.16	130.00 (1978)	- 1.73
	F030	320	161.61	158.39	144.00 (1981)	- 1.31
	G011	310	148.33	161.67	132.00 (1975)	- 1.75
	G012	280	154.15	125.85	100.00 (1976)	- 1.62
	G018	370	122.83	247.17	227.28 (1978)	- 1.42
	G020	380	123.29	256.71	234.00 (1982)	- 2.27
	G021	360	152.44	207.56	185.12 (1978)	- 1.60
	G027	339	142.45	196.55	137.00 (1963)	- 2.05
	G031	290	158.09	131.91	97.52 (1976)	- 2.15
	G034	292	143.87	148.13	116.55 (1978)	- 2.26
	G035	322	154.66	167.34	131.20 (1970)	- 1.64
	G039	350	144.40	205.60	195.00 (1983)	- 1.18
	G043	328	144.32	183.68	182.50 (1990)	- 0.59
	H015	291	169.84	121.16	76.00 (1965)	- 1.67
	H016	325	143.97	181.03	156.00 (1978)	- 1.79
	H017	355	120.62	234.38	207.40 (1978)	- 1.93

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OKTIBBEHA (con't)						
	H022	325	145.97	179.03	155.00 (1982)	- 2.40
	H023	305	161.55	143.45	142.00 (1987)	- 0.29
	J005	340	153.82	186.18	135.00 (1963)	- 1.76
	J009	350	153.58	196.42	160.80 (1964)	- 1.27
	J011	410	151.54	258.46	245.00 (1982)	- 1.35
	K007	330	161.15	168.85	142.30 (1978)	- 1.90
	K009	372	163.87	208.13	207.00 (1987)	- 0.23
	M003	310	148.67	161.33	140.24 (1978)	- 1.51
	M008	350	144.94	205.06	170.00 (1971)	- 1.67
	M011	340	146.59	193.41	180.00 (1978)	- 0.96
PONTOTOC	A013	400	159.50	240.50	190.00 (1972)	- 2.53
PRENTISS	A064	518	307.80	210.20	210.00 (1980)	- 0.02
	B059	500	313.90	186.10	-----.--------	-----.-----
	D030	510	413.35	96.65	82.00 (1978)	- 1.05
	D038	580	353.50	226.50	182.00 (1981)	- 4.05
	F062	510	293.25	216.75	198.00 (1984)	- 2.34
	F064	510	325.70	184.30	179.00 (1987)	- 1.06
	L090	405	313.22	91.78	88.00 (1978)	- 0.27
	L092	370	304.40	65.60	66.00 (1986)	+ 0.07
	M021	472	315.01	156.99	137.00 (1972)	- 1.00
TISHOMINGO	A020	500	443.55	56.45	58.00 (1985)	+ 0.22
	A021	500	443.70	56.30	58.00 (1985)	+ 0.24
	D040	485	416.70	68.30	22.81 (1972)	- 2.28
	E014	540	441.95	98.05	79.09 (1972)	- 0.95
	E015	540	475.00	65.00	51.08 (1972)	- 0.70
	G004	585	489.40	95.60	129.87 (1972)	+ 1.71
	G015	610	510.60	99.40	95.32 (1972)	- 0.20
	G017	565	516.75	48.25	42.32 (1972)	- 0.30
	J018	473	438.00	35.00	21.00 (1972)	- 0.70
	L002	578	480.15	97.85	99.20 (1982)	+ 0.14
	L011	570	529.50	40.50	79.26 (1976)	+ 2.42
	L014	626	526.20	99.80	88.00 (1976)	- 0.74
	L027	556	531.88	24.12	27.74 (1973)	+ 0.19

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TISHOMINGO (con't)						
	L045	625	513.00	112.00	103.00 (1980)	- 0.75
	L047	556	520.11	35.89	33.00 (1980)	- 0.24
UNION	H040	545	184.25	360.75	309.00 (1972)	- 2.59
WEBSTER	B001	362	165.76	196.24	154.80 (1972)	- 2.07
	D007	525	175.60	349.40	339.00 (1983)	- 1.16
	E003	320	168.03	151.97	101.30 (1964)	- 1.81
	K004	450	169.22	280.78	257.40 (1978)	- 1.67

POTENTIOMETRIC MAP OF THE GORDO AQUIFER IN NORTHEASTERN MISSISSIPPI FALL AND WINTER, 1992

by

Patricia A. Phillips and James H. Hoffmann

EXPLANATION

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

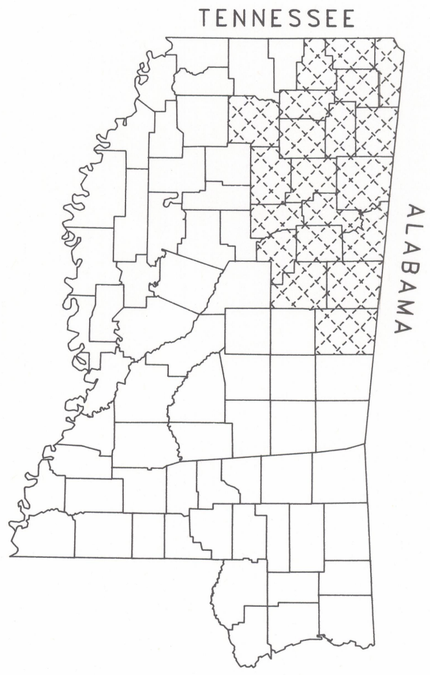
OUTCROP AREA OF THE GORDO FORMATION IN MISSISSIPPI

A046 — OBSERVATION WELL AND NUMBER

SCALE 1:450000

5 0 5 10 15 20

MILES



Location of Study Area