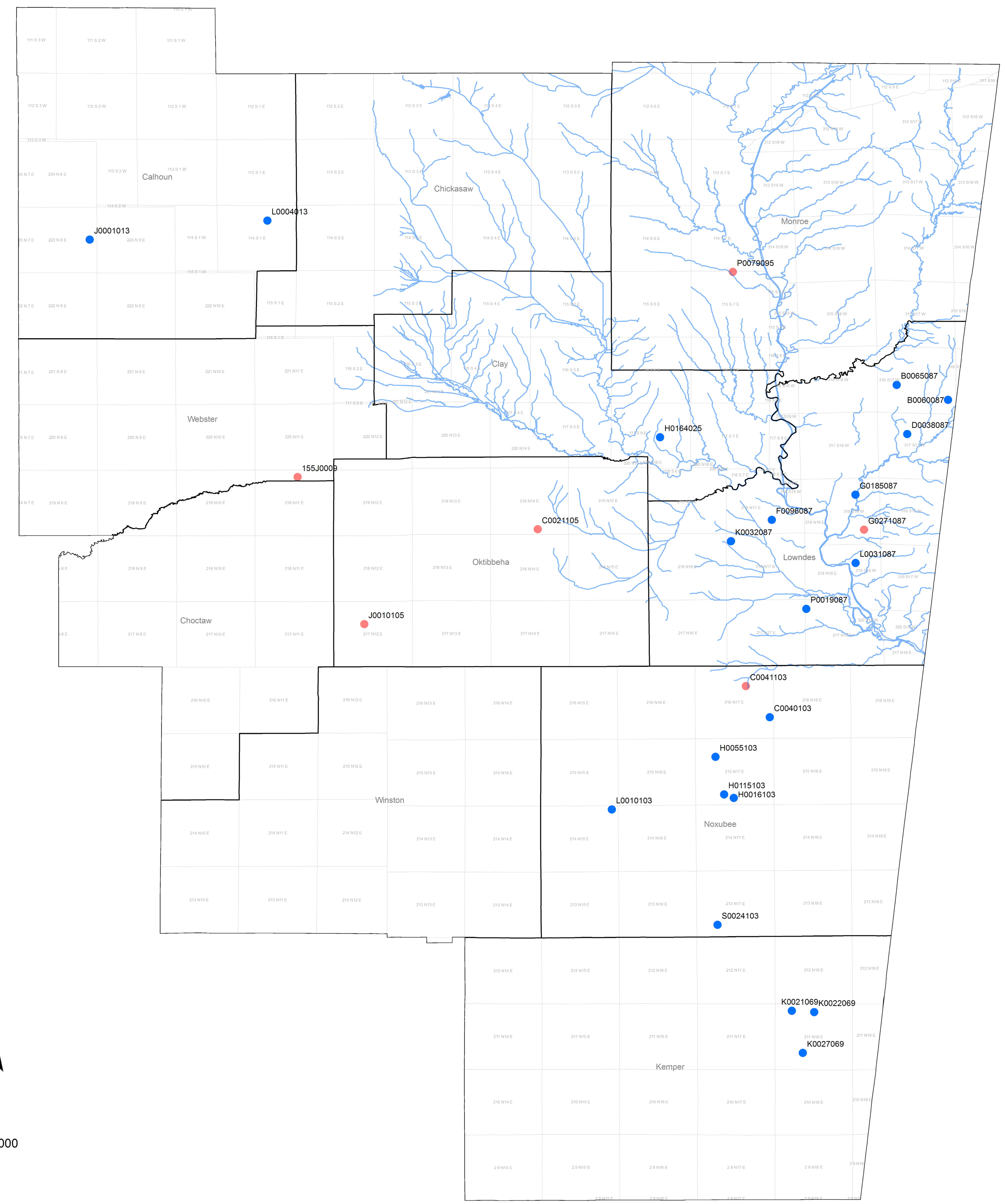
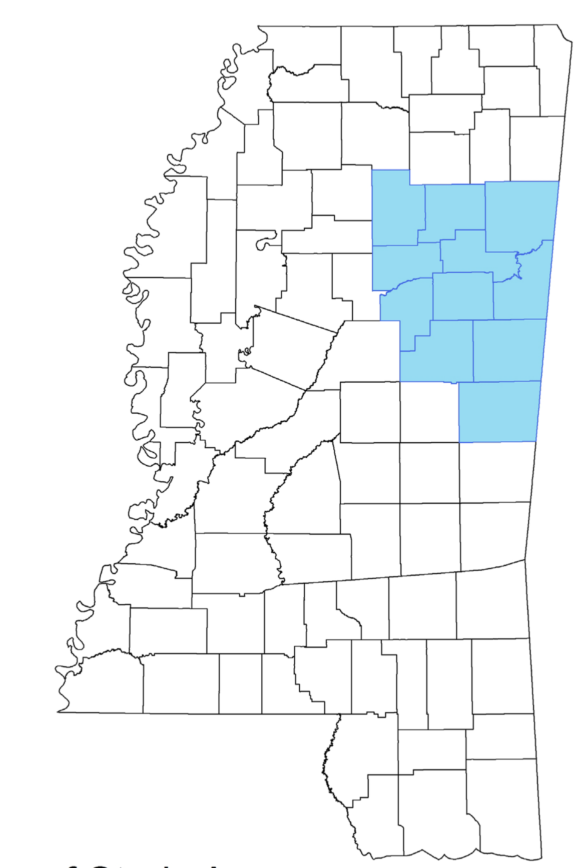
OLWR Hydrologic Map 11-6

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF LAND AND WATER RESOURCES

WATER LEVEL ELEVATIONS IN THE COKER AQUIFER AND MASSIVE SAND AQUIFER IN NORTHEASTERN MISSISSIPPI 2010 TO 2011

John V. Banks, RPG
June, 2011





Location of Study Area

Legend

- Massive Sand Observation Well (blue)
- Coker Observation Well (red)

N

1:425,000

0 3 6 12 18 24 Miles

Massive Sand Aquifer				
County	Well Number	Head Value in Feet Relative to MSL	Owner	Date Measured
CALHOUN	J0001013	162.50	BIG CREEK WA	2/23/2011
CALHOUN	L0004013	159.05	VARDAMAN, TOWN OF	2/23/2011
CLAY	H0164025	155.70	WEST POINT, CITY OF	3/3/2011
KEMPER	K0021069	162.50	SCOOBA, TOWN OF	1/28/2010
KEMPER	K0022069	168.05	PORTERVILLE WA	1/28/2010
KEMPER	K0027069	160.40	PORTERVILLE WA	1/28/2010
LOWNDES	B0060087	186.71	RONNIE JONES	1/27/2011
LOWNDES	B0065087	195.00	CALEDONIA, TOWN OF	11/9/2010
LOWNDES	D0038087	197.12	EAST LOWNDES WA	11/9/2010
LOWNDES	F0096087	142.92	PRAIRIE LAND WA	10/27/2010
LOWNDES	G0185087	157.83	COLUMBUS, CITY OF	11/9/2010
LOWNDES	K0032087	145.49	GOLDEN TRI IND. PARK	10/27/2010
LOWNDES	L0031087	156.96	AKZO NOBEL, INC.	11/4/2010
LOWNDES	P0019087	142.40	WEYERHAEUSER	10/27/2010
NOXUBEE	C0040103	161.01	MILLER, HARVEY	3/23/2010
NOXUBEE	H0016103	184.10	MACON, CITY OF	4/15/2010
NOXUBEE	H0055103	162.58	BARGE FORREST PROD.	5/4/2010
NOXUBEE	H0115103	160.07	MACON, CITY OF	4/15/2010
NOXUBEE	L0010103	161.98	MASHULAVILLE WA	5/4/2010
NOXUBEE	S0024103	159.95	US NAVY	5/4/2010
Coker Aquifer				
County	Well Number	Head Value in Feet Relative to MSL	Owner	Date Measured
LOWNDES	G0271087	96.38	COLUMBUS, CITY OF	11/9/2010
MONROE	P0079095	196.00	GEORGIA GULF	10/12/2010
NOXUBEE	C0041103	138.85	BLACK BELT EXP. STATION	4/15/2010
OKTIBBEHA	C0021105	139.20	STARKVILLE, CITY OF	5/6/2010
OKTIBBEHA	J0010105	154.85	STURGIS, TOWN OF	5/6/2010
WEBSTER	J0009155	147.23	MATHISTON, TOWN OF	1/27/2011

Basic Overview and Proper Uses of Potentiometric Maps

Groundwater occurs under unconfined and confined conditions in aquifers. In cases where water only partially fills an aquifer, the water surface is free to rise and fall, and the water is unconfined. Wells that are screened in unconfined aquifers are water-table wells, and the water level in them indicates the position of the water table in the surrounding aquifer. Water levels in wells in unconfined aquifers are subject to the influences of topography, geology, and climate that are highly localized and site-specific. Any attempt to accurately depict the surface of the zone of saturation in an unconfined aquifer beyond a very limited area would require such a large number of control points as to be impractical. In cases where water completely fills an aquifer that is overlain by a confining bed so that the water is under pressure greater than atmospheric pressure, the aquifer is confined.

Wells that are screened in confined aquifers are artesian wells, and the water level in such wells will stand at some height above the top of the aquifer but will not necessarily rise above land surface. The static water levels in tightly cased wells screened in confined aquifer represent the level of the potentiometric surface of the aquifer.

A Potentiometric map of a confined aquifer is a depiction of the pressure in the aquifer. This pressure is measured by the height to which water from a given aquifer rises above the top of the aquifer. Such a map is of value to anyone who is interested in the development of water supplies. A potentiometric map can be utilized in conjunction with land surface altitude to estimate the minimum depth necessary for a pump to be installed in a well to produced water at a given location. By comparing the potentiometric surface with the altitude of the top of the aquifer, available drawdown can be estimated at a given location. Analysis of the configuration of equipotential contours (lines of equal water-level altitude) can be useful in determining areas of recharge and discharge, general directions of groundwater flow, and areas of significant drawdown in response to large withdrawals of water. The general direction of groundwater flow is perpendicular to the contours in the direction of decreasing hydraulic heads. A potentiometric map is not a depiction of depth-to-water and should not be utilized for such a purpose.

The potentiometric map is based upon limited water-level data and is not intended to be a substitute for site-specific information. The map is intended to provide a generalized regional description of water levels. One limitation in application of this map is related to the degree to which water levels measured in the wells represent true static water levels. Most of the water-level measurements were from active production wells. Although some pumps may have been turned off for several hours or days prior to measurement of water levels, most pumps were turned off for as little as fifteen minutes to two hours to allow water levels to recover from pumping levels. Furthermore, pumping from nearby wells may have continued, thus influencing water levels at the measured well. A second limitation is related to the complexity of the configuration of the water-bearing sand bodies that comprise a major aquifer system. More than one sand bed may be present within the interval that is considered to constitute a particular aquifer. These sand beds may be vertically separated by beds of clay, resulting in hydraulic isolation and different static water levels for the individual sands within the aquifer at a specific location; however, they may be hydraulically interconnected on a scale covering a larger area. As a result, a well screened in a sand bed other than that from which data was collected for this report could have water levels different that those indicated on the map.