

POTENTIOMETRIC MAP OF THE COFFEE SAND AQUIFER  
IN NORTHEASTERN MISSISSIPPI,  
OCTOBER AND NOVEMBER 1978

This potentiometric map of the Coffee Sand aquifer is the fourth in a series of maps, prepared by the U.S. Geological Survey in cooperation with the Mississippi Department of Natural Resources, Bureau of Land and Water Resources, delineating the potentiometric surfaces of the major aquifers in Mississippi. The map is based on water-level measurements made in 50 wells during October and November 1978 and on water-surface altitudes determined at several points on streams that receive discharge from the aquifer in or near the outcrop area. The altitudes of the water surfaces in the streams were determined from topographic maps and were not field checked.

The Coffee Sand of Upper Cretaceous age crops out in Alcorn, Prentiss, Lee, and Tishomingo Counties and dips westward beneath the Demopolis Chalk. To the south in Lee County and in the subsurface of Pontotoc County and counties to the west, the Coffee Sand changes laterally into its more marine equivalents, the Mooreville Chalk and the lower part of the Demopolis Chalk. The Coffee Sand is composed of sand, clay, and irregular layers of sandstone. The sand commonly occurs in beds a few inches to several feet thick but in some places beds reach a thickness of 30 feet (Boswell, 1979).

The sand zones contain freshwater (less than 1,000 milligrams per liter of dissolved solids) in an area that extends about 40 miles west from the outcrop area (see index map and potentiometric map).

In the northern part of the area, the Coffee Sand averages about 250 feet thick and commonly includes one or more sandy zones that will yield moderate quantities of water to wells. The thickness and permeability of the beds of sand decrease from north to south, and south of Tupelo the Coffee Sand aquifer yields little water to wells.

Well depths in the outcrop area commonly are less than 200 feet deep. The Coffee Sand dips about 30 feet per mile to the west and one well in Lafayette County is 1,600 feet deep. Public and industrial supply wells commonly yield between 50 and 300 gallons per minute.

In the outcrop areas, the potentiometric surface is strongly affected by recharge from precipitation, topography, and drainage of the aquifer by streams. The potentiometric surface slopes generally to the west away from the area of outcrop and is mildly affected by moderate ground-water withdrawals in Tippah and Union Counties.

The top of the Coffee Sand aquifer is confined by the Demopolis Chalk, but at the base of the Coffee Sand some water probably moves downward into the underlying sand beds in the Eutaw Formation.

Historically, water levels in or near the outcrop of the Coffee Sand have shown little or no long-term changes. Well G3 in Alcorn County shows only 5 feet of decline between 1961 and 1978. In the downdip part of the aquifer water-level declines of 2 feet per year are common.

Additional information on the geohydrology of the Coffee Sand may be found in the following reports:

SELECTED REFERENCES

- Belt, W. E., and others, 1945, Geologic map of Mississippi: Mississippi Geological Society, Jackson, Mississippi.
- Roswell, E. H., 1963, Cretaceous aquifers of northeastern Mississippi: Mississippi Board of Water Commissioners Bulletin 63-10, 202 p.
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- Newcome, Roy, Jr., 1974, Water for industrial development in Benton, Lafayette, Marshall, Pontotoc, Tippah, and Union Counties, Mississippi: Mississippi Research and Development Center Bulletin, 73 p.
- Newcome, Roy, Jr., and Bettendorff, J. M., 1973, Water for industrial development in Calhoun, Chickasaw, Choctaw, Grenada, Montgomery, Webster, and Yalobusha Counties, Mississippi: Mississippi Research and Development Center Bulletin, 64 p.
- Wasson, B. E., and Tharpe, E. J., 1975, Water for industrial development in Alcorn, Itawamba, Prentiss, and Tishomingo Counties, Mississippi: Mississippi Research and Development Center Bulletin, 60 p.
- Wasson, B. E., and Thomson, F. H., 1970, Water resources of Lee County, Mississippi: U.S. Geological Survey Water-Supply Paper 1899-B, 63 p.

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