The Gonzales-New Orleans aquifer is the primary source of fresh groundwater in the area surrounding New Orleans in southeastern Louisiana. In 1992, a total of 33 million gallons per day was withdrawn from the Gonzales-New Orleans aquifer in Jefferson and Orleans Parishes. Of the total, about 56 percent was used for power generation, 28 percent for industrial use, 8 percent for public supply, and the remaining 8 percent for domestic use and general irrigation (Lovelace, 1981, p. 47, 57).

To assess the potential for ground-water development in the area and to plan for the protection of the resource, additional information was needed about the effects of withdrawals on ground-water flow and the potentiometric surfaces in the Gonzales-New Orleans aquifer. Water level changes in wells completed in the aquifer are being monitored and changes in the configuration of the potentiometric surface are being evaluated by the U.S. Geological Survey, in cooperation with the Louisiana Department of Transportation and Development.

This report presents data and maps that illustrate the potentiometric surface during spring 1993, and water-level changes during 1985-92 for the Gonzales-New Orleans aquifer in southeastern Louisiana. A hydrograph of water levels in a selected well completed in the aquifer also is presented. Water-level data are on file at the U.S. Geological Survey office in Baton Rouge, Louisiana.

The maps in this report are useful for determining direction of ground-water flow, hydraulic gradients, and the effects of withdrawals on the ground-water system. The rate of ground-water flow can be estimated from the hydraulic gradient when the hydraulic conductivity of the aquifer is known.

**HYDROGEOLOGY**

The aquifers in the New Orleans area are composed of sediments of Holocene and Pleistocene age deposited in fluvial, deltaic, and near-shore marine environments. This complex sedimentary sequence dips north and thins to the south, and generally becomes finer grained, and contains more silt and sand down dip. The hydrogeologic correlation for aquifers in the New Orleans area is described in Roll (1966, p. 7) and Louise (1972, p. 13) and are shown in figure 1.

**Table 1.** Water level data used to construct the potentiometric surface map of the Gonzales-New Orleans aquifer in southeastern Louisiana, spring 1993.

- **Figure 3.** Extent, thickness, recharge area, and downdip limit of freshwater for the Gonzales-New Orleans aquifer.

- **Figure 4.** Extent of ground-water movement.