U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared in cooperation with the
LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

WATER-RESOURCES INVESTIGATIONS
REPORT 90-4183 (SHEET 2 OF 2)
SPARTA AQUIFER--WATER-LEVEL CHANGES

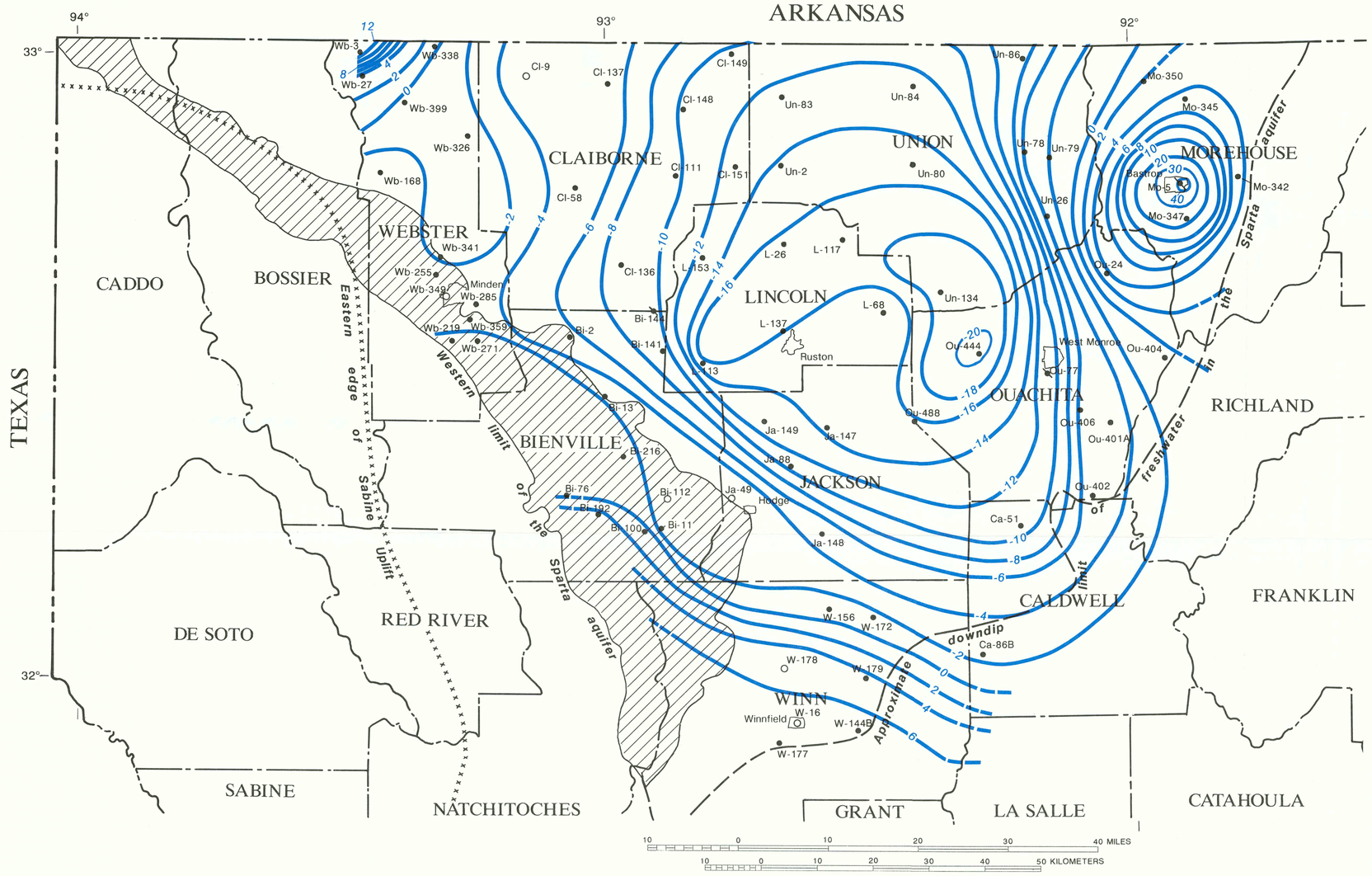

Figure 2.--Water-level changes in the Sparta aquifer from May 1980 to May 1989.

EXPLANATION

- APPROXIMATE RECHARGE AREA OF THE SPARTA AQUIFER
- 10 — LINE OF EQUAL WATER-LEVEL CHANGE--Dashed where approximately located. Interval variable in feet
- Un-26 — CONTROL POINT AND WELL NUMBER
- Bi-112 — OBSERVATION WELL AND WELL NUMBER
- Mo-5 — OBSERVATION WELL FOR WHICH HYDROGRAPH IS SHOWN

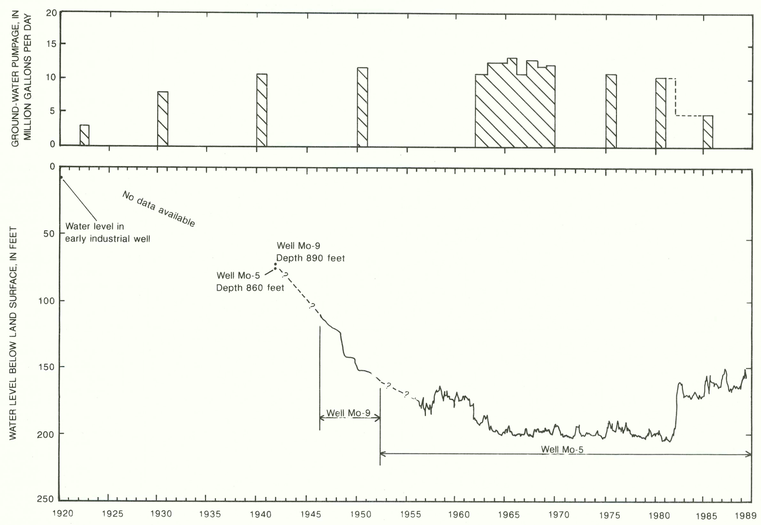

Figure 3.--Composite water level in wells at Bastrop (Morehouse Parish), and ground-water withdrawals from the Sparta aquifer at Bastrop.

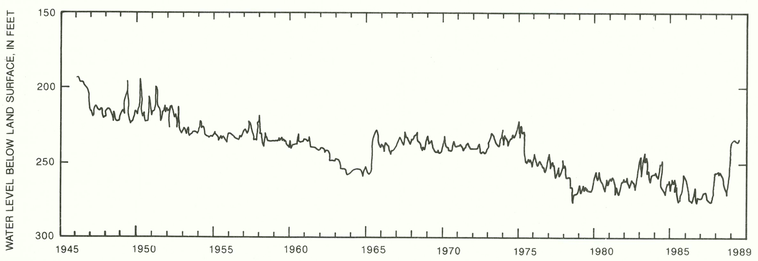

Figure 4.--Water level in well Ou-77, at West Monroe (Ouachita Parish).

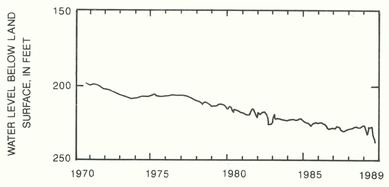

Figure 5.--Water level in well Bi-144, 15 miles WNW of Ruston (Bienville Parish)

WATER-LEVEL CHANGE MAP

A regional water-level change map of the Sparta aquifer shows general regional water-level changes from May 1980 to May 1989 (fig. 2). To construct the map, differences of water levels in wells measured in 1980 and 1989 were plotted, and lines of equal water-level change were drawn. A water-level change interval of 2 ft was used for most of the map. In areas where the water-level change was large, an interval of 10 ft was used.

Water levels have declined throughout most of the Sparta aquifer. The largest declines occurred in Ouachita, Union, and Lincoln Parishes. The maximum decline was almost 22 ft, about 7 mi west of West Monroe.

However, in Morehouse Parish water levels in wells rose as a result of reduced pumpage (fig. 3). The maximum recovery was about 40 ft at Bastrop. In parts of Winn and Webster Parishes, the water levels recovered from 6 to 12 ft in response to reduced local pumpage. Precipitation has a minimal effect on water levels in the Sparta aquifer, except within the recharge area.

Water-level changes in some wells such as Bi-112, Cl-9, Ja-49, Ou-77, Wb-349, W-16, and W-178 were due to withdrawals from nearby wells and were not used to prepare the change map.

The general trend of water levels in wells in the Sparta aquifer is indicated by three hydrographs of wells in Morehouse (wells Mo-5, Mo-9, and an early unnumbered industrial well), Ouachita (well Ou-77), and Bienville (well Bi-144) Parishes (figs. 3-5). The composite hydrograph of the three wells at Bastrop shows that the water levels in wells at this site declined 190 ft, from 1922 to 1965 (fig. 3). For the period 1965-81 the water levels in this well remained fairly stable. This change in trend was caused by a reduction in ground-water pumpage after a large ground-water user began using mostly surface water. In 1982, the water level rose approximately 40 ft, after another ground-water user ceased operation.

The hydrograph of well Ou-77 at West Monroe shows that from 1946 to 1988 water levels at this site declined at an average rate of approximately 1.5 ft/yr (fig. 4). Since December 1988, the water level locally has recovered about 20 ft because of the relocation of a nearby production well.

The hydrograph of well Bi-144 shows an average water-level decline of 1.5 ft/yr during 1970-89 (fig. 5). The well is about 15 mi west-northwest of Ruston.

LOUISIANA GROUND-WATER MAP NO. 3:
POTENTIOMETRIC SURFACE, 1989, AND WATER-LEVEL CHANGES, 1980-89, OF THE SPARTA AQUIFER IN NORTH-CENTRAL LOUISIANA

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1991

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
foot (ft)	0.3048	meter
foot per year (ft/yr)	0.3048	meter per year
mile (mi)	1.609	kilometer
million gallons per day (Mgal/d)	3,785	cubic meter per day

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)--a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

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