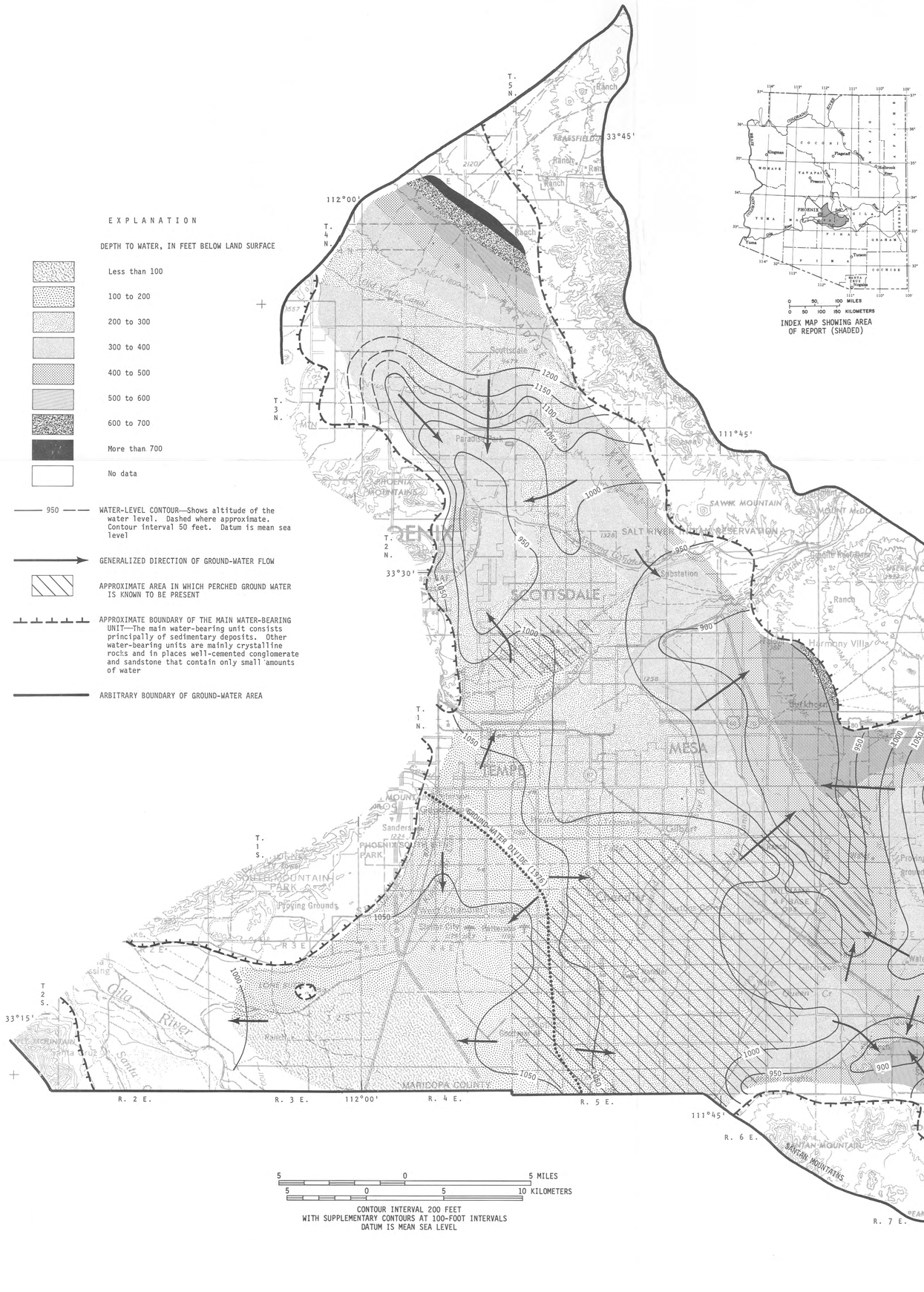
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
ARIZONA WATER COMMISSION

WATER-RESOURCES INVESTIGATIONS 78-61
OPEN-FILE REPORT (SHEET 1 OF 2)
DEPTH TO WATER AND ALTITUDE OF THE WATER LEVEL



INDEX MAP SHOWING AREA OF REPORT (SHADED)

In the eastern part of the Salt River Valley area, sedimentary deposits form the main water-bearing unit and consist mainly of unconsolidated and weakly consolidated clay, silt, sand, and gravel. The unit ranges in thickness from a few tens of feet near the mountains to more than 1,200 ft in the central part of the area (Cooley, 1973). The unit may yield from several hundred to a few thousand gallons per minute of water to wells. Crystalline rocks, which consist mainly of schist, gneiss, granite, and felsic to mafic volcanic rocks, are present in the mountains that border the main water-bearing unit. Well-cemented conglomerate and sandstone may be present in places. The crystalline rocks, conglomerate, and sandstone may yield no water or may yield as much as a few tens of gallons per minute of water to wells.

In 1976 about 1.68 million acre-ft of ground water was pumped from the eastern and western parts of the Salt River Valley area (Babcock, 1977). About 90 percent of the water was used for irrigation and 10 percent for municipal and industrial uses. Since 1923, more than 73 million acre-ft of water has been pumped from the Salt River Valley area (see table, sheet 2). The long-term ground-water withdrawal has resulted in a general decline in water levels in the eastern part of the Salt River Valley area. Since 1923, water levels have declined more than 400 ft near the Santan Mountains, 350 ft east of Mesa, 300 ft near Scottsdale, and less than 50 ft in the extreme northern part of the area. Most of the decline has occurred since the 1940's, when intense ground-water development began.

Detailed information on the chemical quality of the ground water in the eastern part of the Salt River Valley area is given by Osterkamp (1974) and Kister (1974). The dissolved-solids concentrations in ground water range from less than 500 to more than 3,000 mg/L (milligrams per liter). Most ground water that contains more than 1,000 mg/L of dissolved solids is west of R. 6 E. and south of T. 1 N. Elsewhere in the area, most ground water contains less than 1,000 mg/L of dissolved solids. Water that contains more than 500 mg/L of dissolved solids is not preferred for use as a public supply (U.S. Public Health Service, 1962), but water that contains as much as 3,000 mg/L has been used for irrigation of salt-tolerant crops on well-drained soil (Kister, 1974). The fluoride concentrations in the ground water range from 0.3 to 2.0 mg/L and generally are less than 1.0 mg/L. The recommended average optimum fluoride concentration for a water supply differs according to the annual average maximum daily air temperature (U.S. Public Health Service, 1962). In the eastern part of the Salt River Valley area the annual average maximum daily air temperature is about 85°F, and the optimum fluoride concentration in drinking water is 0.7 mg/L. The presence of concentrations greater than 1.4 mg/L is grounds for rejection of the water for public supply. In a small area near Buckhorn and in the southern part of T. 2 S., Rs. 2 and 3 E., ground water contains more than 1.4 mg/L of fluoride.

The hydrologic data on which these maps are based are available, for the most part, in computer-printout form for consultation at the Arizona Water Commission, 222 North Central Avenue, Suite 800, Phoenix, and at U.S. Geological Survey offices in: Federal Building, 301 West Congress Street, Tucson, and Valley Center, Suite 1880, Phoenix. Material from which copies can be made at private expense is available at the Tucson and Phoenix offices of the U.S. Geological Survey.

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CONVERSION FACTORS

For use of those readers who may prefer to use metric units rather than U.S. customary units, the conversion factors for the terms used in this report are listed below:

Multiply U.S. customary unit	By	To obtain metric unit
foot (ft)	0.3048	meter (m)
acre-foot (acre-ft)	.001233	cubic hectometer (hm^3)

BASE FROM U.S. GEOLOGICAL SURVEY
MESA 1:250,000, 1954-69 AND
PHOENIX 1:250,000, 1954-69

DEPTH TO WATER AND ALTITUDE OF THE WATER LEVEL, 1976

MAPS SHOWING GROUND-WATER CONDITIONS IN THE EASTERN PART OF THE SALT RIVER VALLEY AREA, MARICOPA AND PINAL COUNTIES, ARIZONA—1976

By

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