DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
ARIZONA WATER COMMISSION

WATER-RESOURCES INVESTIGATIONS
OPEN-FILE REPORT 79-1537
SHEET 1 OF 3
DEPTH TO WATER, ALTITUDE OF THE
WATER LEVEL, AND WELL DEPTH

CONVERSION FACTORS

For readers who may prefer to use metric units rather than inch-pound units, the conversion factors for the terms used in this report are listed below:

Multiply inch-pound unit	By	To obtain metric unit
foot (ft)	0.3048	meter (m)
square mile (mi^2)	2.590	square kilometer (km^2)
acre-foot (acre-ft)	0.001233	cubic hectometer (hm^3)

SELECTED REFERENCES

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Brown, S. G., 1976, Preliminary maps showing ground-water resources in the lower Colorado River region, Arizona, Nevada, New Mexico, and Utah: U.S. Geological Survey Hydrologic Investigations Atlas HA-542, 3 sheets.

Bureau of Water Quality Control, 1978, Drinking water regulations for the State of Arizona: Arizona Department of Health Services duplicated report, 39 p.

National Academy of Sciences and National Academy of Engineering, 1973 [1974], Water quality criteria, 1972: U.S. Environmental Protection Agency Report, EPA-R3-73-033, 594 p.

U.S. Environmental Protection Agency, 1976 [1978], Quality criteria for water: U.S. Environmental Protection Agency Publication, 256 p.

_____1977a, National interim primary drinking water regulations: U.S. Environmental Protection Agency Report, EPA-570/9-76-003, 159 p.

_____1977b, National secondary drinking water regulations: Federal Register, v. 42, no. 62, March 31, 1977, p. 17143-17147.

Weist, W. G., Jr., 1965, Geohydrology of the Dateland-Hyder area, Maricopa and Yuma Counties, Arizona: Arizona State Land Department Water-Resources Report 23, 46 p.

Wilson, E. D., 1960, Geologic map of Yuma County, Arizona: Arizona Bureau of Mines map, scale 1:375,000.

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EXPLANATION

DEPTH TO WATER, IN FEET BELOW LAND SURFACE

- Less than 100
- 100 to 200
- 200 to 300
- More than 300
- Insufficient data

420 — WATER-LEVEL CONTOUR—Shows approximate altitude of the water level as of 1978. Dashed where inferred. Contour interval 20 feet. Datum is mean sea level

77 / 424 / 140 — WELL IN WHICH DEPTH TO WATER WAS MEASURED IN 1978—Upper number, 77, is depth to water in feet below land surface (U, unable to measure depth to water at time of field inspection). Middle number, 424, is altitude of the water level in feet above mean sea level. Lower number, 140, is reported depth of well in feet

APPROXIMATE BOUNDARY OF THE MAIN WATER-BEARING UNIT—The main water-bearing unit is the valley-fill deposits, which consist mainly of clay, silt, sand, gravel, and weakly consolidated mudstone and sandstone. The volcanic rocks and bedrock may yield small amounts of water to wells in fractured zones. Queried where uncertain

GENERALIZED DIRECTION OF GROUND-WATER FLOW

ARBITRARY BOUNDARY OF GROUND-WATER AREA

The Gila River drainage from Painted Rock Dam to Texas Hill area includes about 3,000 mi^2 in southwestern Arizona. Ground-water development has taken place only in the northern part of the area, and only that part is included in this report. The southwestward-flowing Gila River drains the 1,900-mi^2 northern part of the area.

Valley-fill deposits, which consist mainly of clay, silt, sand, gravel, and weakly consolidated mudstone and sandstone, constitute the main water-bearing unit in the northern part of the area. The other units—volcanic rocks and bedrock—may yield small amounts of water to wells in fractured zones. Weist (1965, p. 11) divided the valley-fill deposits into upper, middle, and lower units in most of the area. The upper unit, which is 200 to 380 ft thick, consists mostly of sand and gravel; some clay, silt, and mudstone are mixed or interbedded in the unit. The middle unit, which is 250 to 750 ft thick, consists of clay, silt, mudstone, and some thin beds of sandstone and gravel. The lower unit extends from the base of the middle unit to bedrock and consists of coarse sand, sandstone, gravel, and weakly indurated conglomerate. The lower unit is more strongly cemented than the other units. In places the valley-fill deposits are interbedded with the volcanic rocks. Water in the valley-fill deposits is under water-table conditions except where it is confined by the volcanic rocks or by thick beds of clay and is under artesian conditions, which may explain the large differences in water levels in wells in a few areas.

Volcanic rocks are the dominant rock type in the mountains and in Sentinel Plain. Bedrock is exposed only in parts of the Kofa, Gila Bend, Tank, and Palomas Mountains and in the Aztec Hills. Wells in Sentinel Plain may obtain water from the volcanic rocks. A well in sec. 32, T. 6 S., R. 9 W., was drilled to a depth of 1,030 ft; in 1973 the depth to water was 203 ft below the land surface (sheet 1). Wells in the Kofa Mountains and Cemetery Ridge may obtain water from fractured zones in the bedrock. Yield data are not available for the wells.

The direction of ground-water movement in the valley-fill deposits has been altered by the withdrawal of ground water. In 1964, ground-water movement was from the north and southeast toward the Gila River and thence downstream (Weist, 1965, p. 12 and fig. 4). Water-level contours for 1978 indicate that the ground water moves from near Hyder northward to the cone of depression in Hyder Valley and southward to the cone of depression north of the Aztec Hills. The deepest part of the cone in Hyder Valley is adjacent to Turtleback Mountain, which may form a barrier to ground-water movement.

In the northern part of the Gila River drainage from Painted Rock Dam to Texas Hill area, ground water is used mainly for irrigation. Since 1967, the estimated ground-water pumpage has exceeded 100,000 acre-ft per year, and in 1977 the ground-water pumpage was 210,000 acre-ft. During the periods 1965-77 and 1973-77, ground-water pumpage was 1,736,000 and 890,000 acre-ft, respectively; although ground-water withdrawals resulted in water-level declines in most of the developed part of the area during the periods, water-level rises occurred in a small area adjacent to the Gila River on the west edge of T. 6 S., R. 12 W. (sheet 2). The rises in water level probably are attributable to flow in the Gila River and perhaps to some return of irrigation water to the ground-water reservoir. Greater-than-average flow occurred in the Gila River below Painted Rock Dam in 1966 and 1973 (sheet 2).

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; Valley Center, Suite 1880, Phoenix; and 1940 South Third Avenue, Yuma. Material from which copies can be made at private expense is available at the Tucson, Phoenix, and Yuma offices of the U.S. Geological Survey.

5 0 5 MILES
5 0 5 10 KILOMETERS

TOPOGRAPHIC CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100-FOOT INTERVALS
DATUM IS MEAN SEA LEVEL

INDEX MAP SHOWING AREA OF REPORT (SHADED)

BASE FROM U.S. GEOLOGICAL SURVEY
AJO 1:250,000, 1953,
PHOENIX 1:250,000, 1954-69, AND
SALTON SEA 1:250,000, 1959

DEPTH TO WATER, ALTITUDE OF THE WATER LEVEL, AND WELL DEPTH

MAPS SHOWING GROUND-WATER CONDITIONS IN THE NORTHERN PART OF THE GILA RIVER DRAINAGE FROM PAINTED ROCK DAM TO TEXAS HILL AREA, MARICOPA, PIMA, AND YUMA COUNTIES, ARIZONA—1978

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