DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
ARIZONA WATER COMMISSION

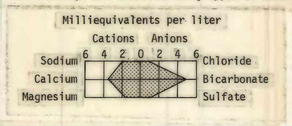
WATER-RESOURCES INVESTIGATIONS
OPEN-FILE REPORT 80-584
SHEET 2 OF 2
SPECIFIC CONDUCTANCE AND
FLUORIDE CONCENTRATION

EXPLANATION

850 / 2.8 — WELL FROM WHICH WATER SAMPLE WAS COLLECTED IN 1977-78—Upper number, 850, is specific conductance in micromhos per centimeter at 25°C (specific conductance is an indication of the dissolved-solids concentration in water). Lower number, 2.8, is fluoride concentration in milligrams per liter

639 / 0.3 — SPRING FROM WHICH WATER SAMPLE WAS COLLECTED IN 1977-78—Upper number, 639, is specific conductance in micromhos per centimeter at 25°C (specific conductance is an indication of the dissolved-solids concentration in water). Lower number, 0.3, is fluoride concentration in milligrams per liter

CHEMICAL-QUALITY DIAGRAM—Shows major chemical constituents in milliequivalents per liter. The diagrams are in a variety of shapes and sizes, which provides a means of comparing, correlating, and characterizing types of water



DS=406 — DISSOLVED SOLIDS—Number, 406, is dissolved solids in milligrams per liter

APPROXIMATE BOUNDARY OF THE MAIN WATER-BEARING UNIT—The main water-bearing unit is the alluvial deposits, which consist of gravel, sand, silt, and clay. Other water-bearing units are mainly crystalline and consolidated sedimentary rocks that yield small amounts of water where fractured

ARBITRARY BOUNDARY OF GROUND-WATER AREA

In the Hassayampa area the dissolved-solids concentrations in ground water sampled ranged from about 150 to 1,400 mg/L (milligrams per liter), and most water contained less than 500 mg/L. The specific conductance of water, values for which are shown on the map, reflects the concentration of ions in solution and is an indication of the dissolved-solids concentration in the water. The dissolved-solids values may be estimated by multiplying the specific conductance by 0.6. The maximum contaminant level for dissolved solids in public water supplies is 500 mg/L, as proposed in the secondary drinking-water regulations of the U.S. Environmental Protection Agency (1977b, p. 17146) in accordance with provisions of the Safe Drinking Water Act (Public Law 93-523). The U.S. Environmental Protection Agency (1977a, b) has established national regulations and guidelines for the quality of water provided by public water systems. The regulations are either primary or secondary. Primary drinking-water regulations govern contaminants in drinking water that have been shown to affect human health. Secondary drinking-water regulations apply to contaminants that affect esthetic quality. The primary regulations are enforceable either by the Environmental Protection Agency or by the States; in contrast, the secondary regulations are not Federally enforceable. The secondary regulations are intended as guidelines for the States. The regulations express limits as "maximum contaminant levels," where contaminant means any physical, chemical, biological, or radiological substance or matter in water.

In the central part of the area, ground water generally contains calcium and bicarbonate as the major ions. Near the Hassayampa River southeast of Wickenburg, however, a water sample from one well contained large concentrations of sodium, magnesium, chloride, and sulfate and the largest dissolved-solids concentration of any water sampled. The well owner reported that the water became salty in March 1978 after the Hassayampa River flooded. On December 26, 1977, the specific conductance was 460 micromhos per centimeter at 25°C, and on April 25, 1978, the specific conductance was 2,400 micromhos per centimeter at 25°C. Data are not available to determine whether the chemical quality of the water from other wells near the Hassayampa River was affected by the flood. In the southern part of the area the water generally has a predominance of sodium and bicarbonate.

In the Hassayampa area the fluoride concentrations measured in ground water were 0 to 4.0 mg/L, but most water samples contained less than 1.5 mg/L. The maximum contaminant level for fluoride in public water supplies differs according to the annual average maximum daily air temperature (Bureau of Water Quality Control, 1978, p. 6). The amount of water consumed by humans, and therefore the amount of fluoride ingested, increases as air temperatures increase; as a result, the maximum contaminant level for fluoride decreases as air temperatures increase. In the northeastern part of the area, where the annual average maximum daily air temperature is 66°F and the maximum contaminant level for fluoride is 1.8 mg/L, fluoride concentrations in the water sampled ranged from 0.2 to 1.6 mg/L. In the central part, where the annual average maximum daily air temperature is 77°F and the maximum contaminant level is 1.6 mg/L, fluoride concentrations ranged from 0 to 3.7 mg/L. In the southern part, where the annual average maximum daily air temperature is 83°F and the maximum contaminant level is 1.4 mg/L, fluoride concentrations ranged from 0 to 4.0 mg/L. Water samples from several wells in the Date Creek Mountains north of Congress, near Wickenburg, and in the Hassayampa Plain and from one well in the Wickenburg Mountains contained more than the maximum contaminant level for fluoride.

5 0 5 MILES
5 0 5 10 KILOMETERS

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

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

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MAPS SHOWING GROUND-WATER CONDITIONS IN THE HASSAYAMPA AREA, MARICOPA AND YAVAPAI COUNTIES, ARIZONA—1978

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