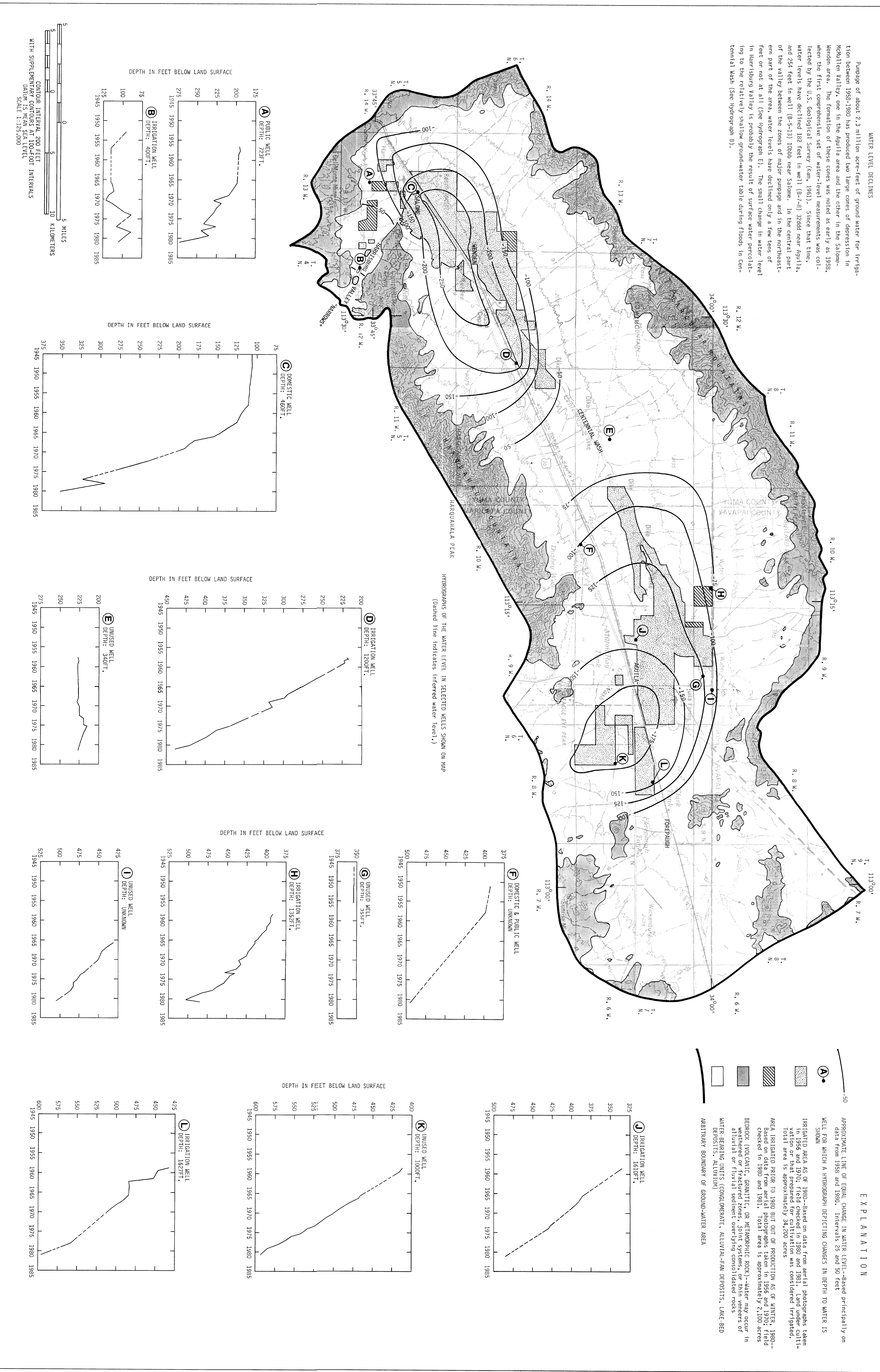


WATER LEVEL DECLINES

Pumpage of about 2.3 million acre-feet of ground water for irrigation between 1958-1980 has produced two large cones of depression in the McAllen Valley, one in the Aguila area and the other in the Salome-Menden area. The formation of these cones was noted as early as 1958, when the first comprehensive set of water-level measurements was collected by the U.S. Geological Survey (Kerr, 1961). Since that time, water levels have declined 182 feet in well (8-7-43) 2000 near Aguila, and 254 feet in well (8-5-13) 1000 near Salome. In the central part of the valley between the zones of major pumpage and in the northeastern part of the area, water levels have declined only a few tens of feet or not at all (See Hydrograph E). The small change in water level in Harriburg Valley is probably the result of surface water percolating to the relatively shallow ground-water table during floods in Central Valley Wash (See Hydrograph B).



BASE FROM U. S. GEOLOGICAL SURVEY
PROSPECT, AZ 1954, REV. 1970, 1:250,000
PRESPECT, AZ 1954, REV. 1969, 1:250,000

CHANGE IN WATER LEVEL, 1958-1980, IRRIGATED AREA, AND HYDROGRAPHS OF THE WATER LEVEL IN SELECTED WELLS
MAPS SHOWING GROUND-WATER CONDITIONS IN THE MCALLEN VALLEY AREA
MARICOPA, YAVAPAI AND YUMA COUNTIES, ARIZONA--1981

by
M. H. Rennie

EXPLANATION

APPROXIMATE LINE OF EQUAL CHANGE IN WATER LEVEL--based principally on data from 1958 and 1980. Intervals: 25 and 50 feet

WELL FOR WHICH A HYDROGRAPH DEPICTING CHANGES IN DEPTH TO WATER IS SHOWN

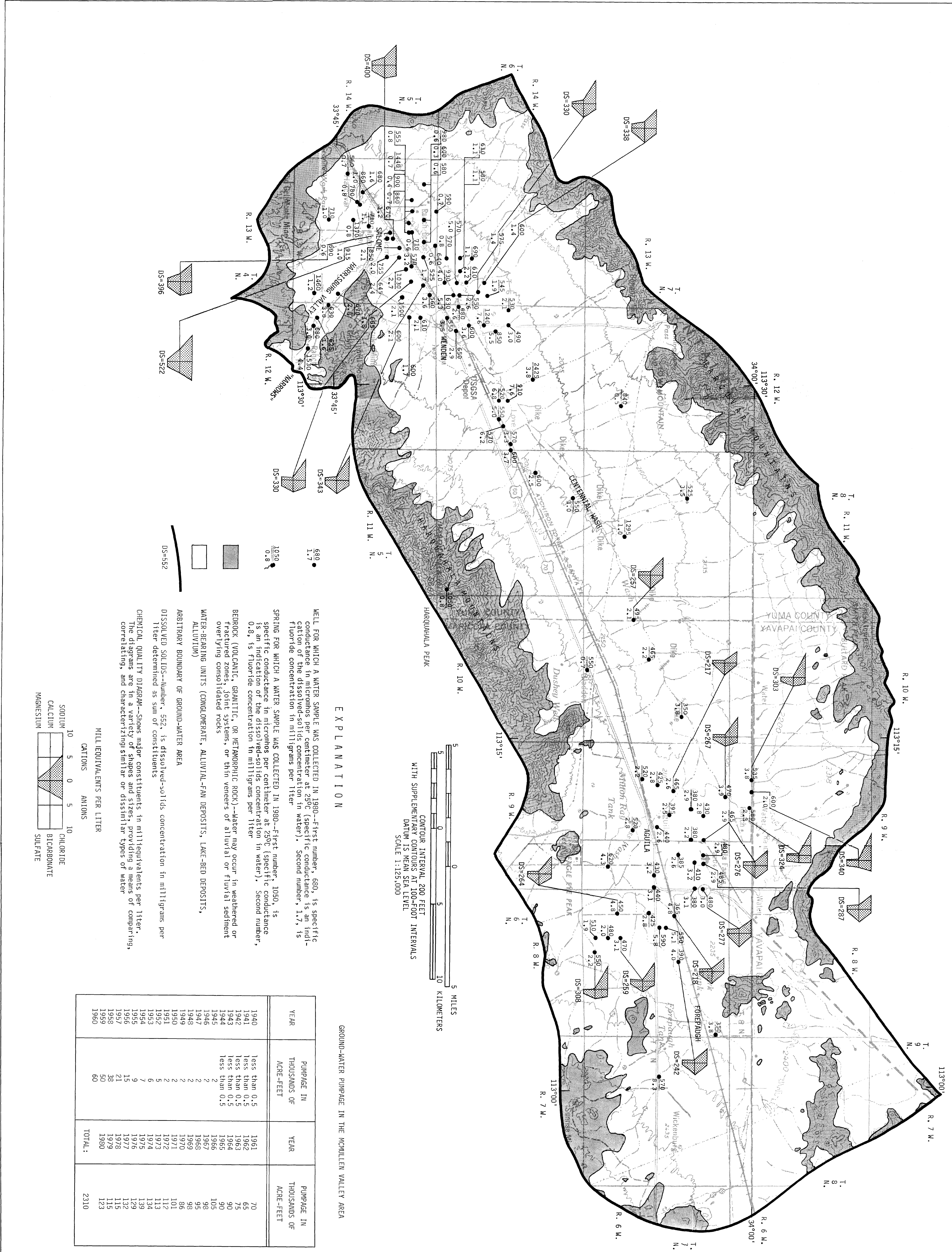
IRRIGATED AREA AS OF 1980--based on data from aerial photographs taken in 1956 and 1970; field checked in 1980 and 1981. Land under cultivation or that prepared for cultivation was considered irrigated. Total area is approximately 34,500 acres

AREA IRRIGATED PRIOR TO 1980 BUT OUT OF PRODUCTION AS OF WINTER, 1980--checked in 1980 and 1981. Total area is approximately 2,100 acres

BERROCK (VOLCANIC, GRANITIC, OR METAMORPHIC ROCK)--water may occur in weathered or fractured zones, joint systems, or thin veneers of alluvial or fluvial sediment overlying consolidated rocks

WATER-BEARING UNITS (CONGLOMERATE, ALUVIAL-FAN DEPOSITS, LAKE-BED DEPOSITS, ALLUVIUM)

ARBITRARY BOUNDARY OF GROUND-WATER AREA



GROUND-WATER PUMPAGE IN THE MCQUILLEN VALLEY AREA

YEAR	PUMPAGE IN THOUSANDS OF ACRE-FEET	YEAR	PUMPAGE IN THOUSANDS OF ACRE-FEET
1940	less than 0.5	1961	70
1941	less than 0.5	1962	75
1942	less than 0.5	1963	75
1943	less than 0.5	1964	90
1944	less than 0.5	1965	90
1945	2	1966	105
1946	2	1967	98
1947	2	1968	98
1948	2	1969	86
1949	2	1970	101
1950	2	1971	112
1951	2	1972	113
1952	2	1973	133
1953	6	1974	139
1954	7	1975	129
1955	15	1976	132
1956	15	1977	115
1957	31	1978	115
1958	31	1979	123
1959	50	1980	123
1960	60	TOTAL:	2310

EXPLANATION

WELL FOR WHICH A WATER SAMPLE WAS COLLECTED IN 1960--first number, 680, is specific conductance in micromhos per centimeter at 25°C (specific conductance is an indication of the dissolved-solids concentration in water); second number, 1.7, is fluoride concentration in milligrams per liter.

SPRING FOR WHICH A WATER SAMPLE WAS COLLECTED IN 1960--first number, 1050, is specific conductance in micromhos per centimeter at 25°C (specific conductance is an indication of the dissolved-solids concentration in water); second number, 0.8, is fluoride concentration in milligrams per liter.

BERROCK (VOLCANIC, GRANITIC, OR METAMORPHIC ROCKS)--water may occur in weathered or fractured rocks, or in veins of siliceous or fluviatile sediment overlying consolidated rocks.

WATER-BEARING UNITS (CONGLOMERATE, ALLUVIAL-FAN DEPOSITS, LAKE-BED DEPOSITS, ALLUVIUM)

ARBITRARY BOUNDARY OF GROUND-WATER AREA

DISSOLVED SOLIDS--number, 552, is dissolved-solids concentration in milligrams per liter determined as sum of constituents.

CHEMICAL QUALITY DIAGRAM--shows major constituents in milliequivalents per liter. The diagrams are in a variety of shapes and sizes, providing a means of comparing, correlating, and characterizing similar or dissimilar types of water.

MILLIEQUIVALENTS PER LITER

CATIONS ANIONS

SODIUM
CALCIUM
MAGNESIUM

CHLORIDE
BICARBONATE
SULFATE

SELECTED REFERENCES

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WATER QUALITY

In McQuillen Valley ground water is generally of good quality for most uses. The dissolved-solids concentrations obtained from chemical analyses of water from wells tested vary from 217 to 522 mg/L. The specific conductance values from additional wells, however, indicate that dissolved-solids concentrations in water from some wells are more than 800 mg/L, and in one well, is greater than 1,400 mg/L. The dissolved-solids concentrations may be approximated by multiplying the specific conductance by 0.6, which is the approximate ratio of dissolved solids to specific conductance. The maximum contaminant level for dissolved solids is 500 mg/L, as proposed in the secondary drinking-water standards of the U.S. Environmental Protection Agency (1977b, p. 17146) in accordance with the provisions of the Safe Drinking Water Act (Public Law 93-523). All but 18 of the 111 samples tested were at or below this limit.

Fluoride concentrations in water samples from wells in McQuillen Valley range from 0.3 to 8.3 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 annual average maximum daily air temperature in the valley is about 63°F and, therefore, the maximum contaminant level for fluoride is 1.4 mg/L. Water from 83 of 111 wells sampled had fluoride levels in excess of the maximum contaminant level. Waters that have low fluoride concentrations are mostly from wells west and north of Salome. This difference in water quality may indicate a separate source of low fluoride concentration water flowing southeast from the Harcarwar Mountains toward Salome.

MAPS SHOWING GROUND-WATER CONDITIONS IN THE MCQUILLEN VALLEY AREA
MARICOPA, YAVAPAI AND YUMA COUNTIES, ARIZONA--1981

DATE FROM U.S. GEOLOGICAL SURVEY
PHOTOGRAPH, AZ 1954, REV. 1970 1:250,000
PROBECOM, AZ 1954, REV. 1970 1:250,000

by
W. H. Rensick