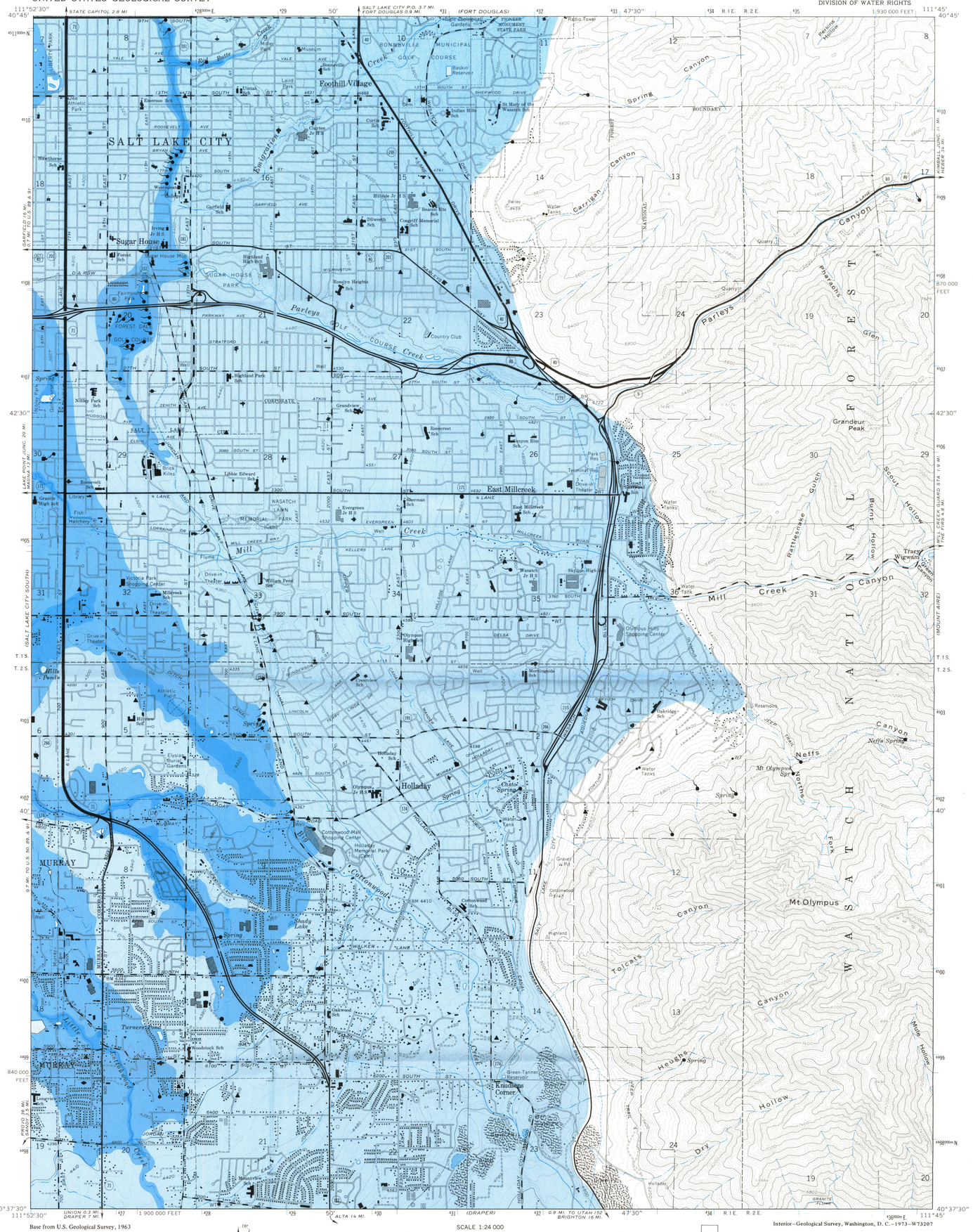
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
UTAH DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER RIGHTS

FOLIO OF THE
SUGAR HOUSE QUADRANGLE, UTAH
MAP I-766-I



EXPLANATION

Depth to water below land surface, in feet

- 0-3
- 3-10
- More than 10
- Bedrock or no data

- Observation well – H-Hydrograph in this report
- Spring
- Excavation, trench, or road cut examined for shallow water

DISCUSSION

The depth to ground water in shallow aquifers in the Sugar House quadrangle ranges from zero in areas of springs and seeps to more than 10 feet beneath most of the area as shown on the map. The depth to water differs from place to place because of irregular topography, and the varying capability of different rock materials to transmit water. Ground water also occurs under unconfined and confined conditions in deep aquifers beneath the Sugar House quadrangle, as shown by the block diagram and as described by Hely, Mower, and Harr (1971a, p. 107-111).

Depth to water in the shallow aquifers fluctuates as water is recharged to or discharged from the aquifers. The highest annual level in the shallow aquifers usually is reached sometime between April and August, in response to recharge from snow melt and applied irrigation water; lowest annual levels usually occur in February or March, following the winter season when irrigation applications are minimal. An example of seasonal water-level fluctuations in wells that tap the shallow unconfined aquifer is shown by the hydrograph. The time of occurrence of the highest or lowest water levels in a given well may vary by a few months from one year to another.

During any given year, water levels may fluctuate as much as 10 feet in areas of large withdrawals, such as near well fields, or in areas distant from points of natural discharge. Fluctuations near springs and seeps, however, may be negligible. The depths to water shown on the map represent the highest levels observed during 1963-72, and these levels are the highest that may be expected during most years.

Recharge to the shallow aquifers occurs by the downward movement of water from surface sources, such as streams, irrigation applications, sewage systems, and precipitation, and by upward leakage from the deep confined aquifer over broad areas where the potentiometric surface is above the water table of the shallow aquifer.

If water is prevented by beds of clayey material from percolating downward to the water table, saturated zones may form above the clayey beds. At places, such perched zones may be separated from underlying saturated beds by many feet of unsaturated material. Water discharges from perched zones by slow drainage through the poorly permeable clayey supporting beds, or at springs and seeps where the edges of the supporting beds are exposed by faulting or erosion.

Most perched zones never drain completely. They become larger during periods of recharge, and smaller during periods of little or no recharge. There are small local perched zones, not documented in detail, that discharge water to the land surface within the map areas where the depth to water is shown as more than 3 feet. The points of discharge from these perched zones are shown on the map by spring symbols.

In addition to springs, water may be discharged from the shallow aquifers by evaporation and transpiration by plants in areas where the water table is near the land surface, by pumpage from wells, and by lateral movement out of the area.

The areas of various depth-to-water intervals in the Sugar House quadrangle were determined using water-level data from about 20 shallow wells (six in the map area), numerous observations of water levels in excavations, or depths of excavations, and the topography of the area. The data were collected largely during 1963-72. The configuration and altitude of the shallow water table were established by water levels observed at many points. These were compared with the land-surface altitude as shown by the topographic contours shown on the map, and the areas of various ranges of depths to water were delineated.

The selected references that follow contain other information about the shallow unconfined ground water in this and adjacent parts of Jordan Valley, Utah. The data reports and releases contain, among other types of basic data, water-level measurements for the period 1931-70. The interpretive reports contain discussions of various aspects of the occurrence of ground water, water-level fluctuations, and related subjects. Ground-water terms used in this report have been defined by Lohman and others, 1972.

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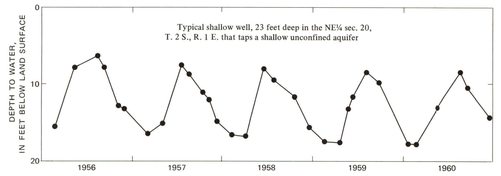
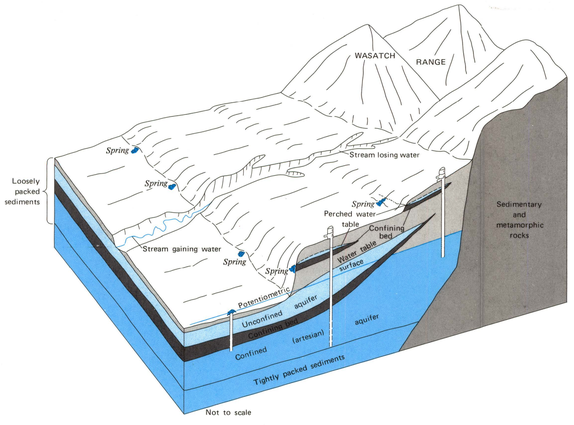
_____1972b, Surficial geologic map of the Sugar House quadrangle, Salt Lake County, Utah: U.S. Geol. Survey Misc. Geol. Inv. Map I-766-A.

_____1972c, Map showing relative age of faults in the Sugar House quadrangle, Salt Lake County, Utah: U.S. Geol. Survey Misc. Inv. Map I-766-B.



HYDROGRAPH SHOWING TYPICAL WATER-LEVEL FLUCTUATIONS IN THE SHALLOW UNCONFINED AQUIFERS



BLOCK DIAGRAM SHOWING TYPICAL OCCURENCE OF AQUIFERS BENEATH THE SUGAR HOUSE QUADRANGLE (MODIFIED FROM HELY, MOWER, AND HARR, 1971a, FIG. 57.)

Base from U.S. Geological Survey, 1963
Photorevision as of 1969
10,000-foot grid based on Utah coordinate system, central zone
1,000-meter Universal Transverse Mercator grid ticks, zone 12, shown in blue

APPROXIMATE MEAN DECLINATION, 1973

SCALE 1:24 000
1 ½ 0 1 MILE
1 .5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

UTAH
QUADRANGLE LOCATION

Interior–Geological Survey, Washington, D. C.–1973–W73207

MAP SHOWING MINIMUM DEPTH TO WATER IN SHALLOW AQUIFERS (1963–72) IN THE SUGAR HOUSE QUADRANGLE, SALT LAKE COUNTY, UTAH

By
R. W. Mower and Richard Van Horn

1973

For sale by U.S. Geological Survey, price 75 cents