

CLARK COUNTY (continued)

warmer water probably represents a deeper source area, and may be useful in determining areas of maximum ground-water discharge from deep aquifers or faults. An exploration well (the Joe W. Brown Wilson—Government No. 1) was drilled for oil in 1957 in C NW/4 NW/4 S24, T21S,R61E and encountered hot water. The well was plugged below 6,050 feet and converted to a hot (137°F) artesian water well. The hot water entry point was approximately 5,210 feet, in the Permian Kaibab Limestone (Schilling and Garside, 1968). Waters similar to this could be the source for warm springs and wells in the Las Vegas Valley.

Other warm springs and wells in Clark County

Seven additional warm springs or spring areas have been reported in Clark County, mainly in its northern half. Several springs are found in Arizona and Nevada along the Black Canyon part of the Colorado River east of Boulder City (S32,T22S,R65E; S5,8,21,T23S,R65E) with temperatures of 78° to 145°F. Rogers Springs are the next warmest with temperatures up to 86°F, and the springs at the Virgin River Narrows reportedly range from 75° to 80°F. Indian Springs (79°F), White Rock Spring (78°F), Brown's Spring (75°F), and Ash Creek Spring (72°F) are somewhat cooler. Warm-water wells in Clark County range from 70° to 88°F and are 60 to 825 feet deep.

DOUGLAS COUNTY

Walley's (Genoa) Hot Springs [45]

Walley's Hot Springs are about 2.5 miles south of Genoa on the west edge of Carson Valley (S21 and 22, T13N, R19E). The springs are named for David Walley, who built a large hotel and spa on the site in 1862. The resort had 40 bedrooms and, for a time, a physician in attendance. Later, the hotel was partly destroyed by fire, and completely demolished in 1929–1930 (Dangberg, 1972). At present, Ed and Helen Johnson have a bar and dining room in their home on the site of the old hotel. The Johnsons provided the authors with copies of the U. S. Steel Corp. maps and well logs from geothermal investigations done there in 1962 and 1963.

The hot springs themselves occur over an area of several acres, and range in temperature from 136° to 160°F (Waring, 1965). The flow of the springs has been estimated at 600 gpm (Lamke and Moore, 1965). The springs are along the trace of a major fault (fig. 17), which forms the edge of the Carson Range in this area for at least 12 miles (Moore, 1969). This fault has had recent movement, although the plainly visible scarp has been in existence since before 1854. Lawson (1912) has measured the recent displacement on this fault at 44 feet at Walley's Hot Springs, and believed it to represent movement from a single earthquake. The springs flow from a salient on a topographic low which occurs here along the trace of the fault.

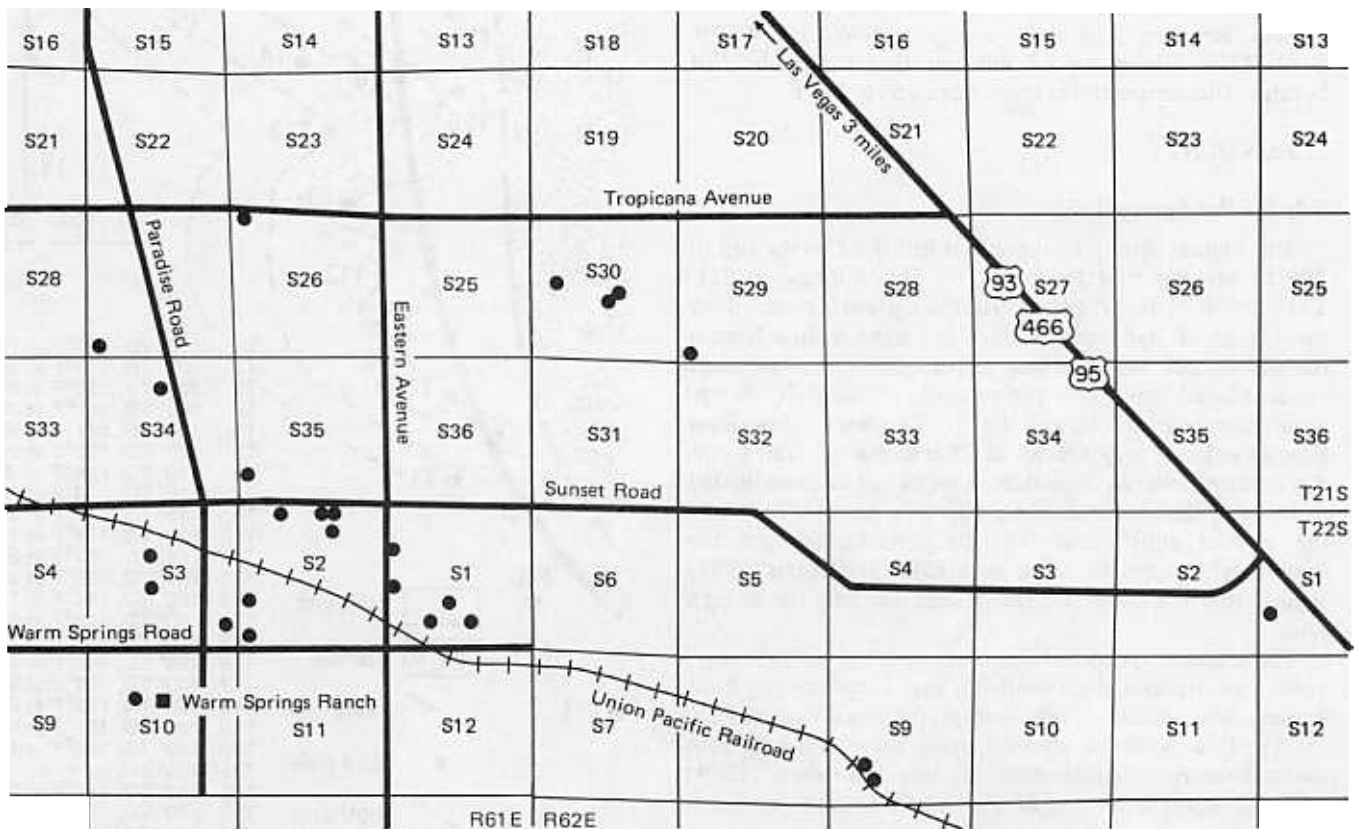


FIGURE 16. Selected thermal water wells in south Las Vegas Valley (wells shown have temperatures greater than or equal to 70°F after adjustment for a geothermal gradient effect of 1°F per 75 feet of well depth).

DOUGLAS COUNTY (continued)

In 1962 and 1963, Columbia Iron Mining Co., subsidiary of U. S. Steel Corp. explored the hot springs area for geothermal energy. They drilled 26 shallow holes to determine the area of maximum water temperature. These were 100 to 200 feet deep, and encountered temperatures up to 181°F (see fig. 18). Two deeper wells were also drilled in the area (fig. 19). Mariner and others (1974) have estimated the reservoir temperature at 185°F from a Na-Ca-K geothermometer.

Saratoga Hot Spring [44]

A hot spring is present in the SE/4 SE/4 SW/4 S21, T14N, R20E near the west side of Hot Springs Mountain on the eastern margin of Hot Springs Valley (Glancy and Katzer, 1975). The reported temperature is 122°F.

Hobo Hot Springs [42]

Several hot springs in C S/2 S23, T14N, R19E occur over a quarter of a square mile area. These springs are named Hobo Hot Springs on the Genoa 7½-minute quadrangle, but the Reno 1:250,000 topographic map shows Hobo Hot Springs to be 1.5 miles to the northeast of another group of hot springs (see the following description). Glancy and Katzer (1975) report Hobo Hot Springs in SE/4 SE/4 S23, T14N, R19E with a temperature of 114°F.

Unnamed springs, Carson Valley [43]

Water analyses and temperatures have been reported by the Center for Water Resources Research, University of Nevada, Reno on four warm springs in NW/4 NW/4 S19, T14N, R20E. These are 1.5 miles northeast of Hobo Hot Springs. The temperatures range from 76° to 90°F.

ELKO COUNTY

Sulphur Hot Springs [83]

The highest spring temperatures in Elko County (up to 205°F) are reported from Sulphur Hot Springs, in S11, T31N, R59E in Ruby Valley. They are probably named for their odor of hydrogen sulfide. The springs flow from a roughly circular sinter mound about 1,500 feet in diameter on an alluvial apron near the east side of the Ruby Mountains (Olmsted and others, 1975). The water flows into Stonier Lake. A major Basin and Range normal fault forms the contact between consolidated rocks and unconsolidated deposits at the mountain front (fig. 20). Another fault cuts the alluvial units about half the distance between the mountain front and the hot springs. Eakin and others (1951) suggest that the thermal spring waters probably rise along a fault.

The siliceous spring sinter consists of white- to light-gray, earthy, amorphous silica (probably opal) deposited by both present and ancestral hot springs (Olmsted and others, 1975). This extensive area of sinter suggests a high geothermal reservoir temperature. Mariner and others (1974) analyzed water from one of the hottest overflowing pools

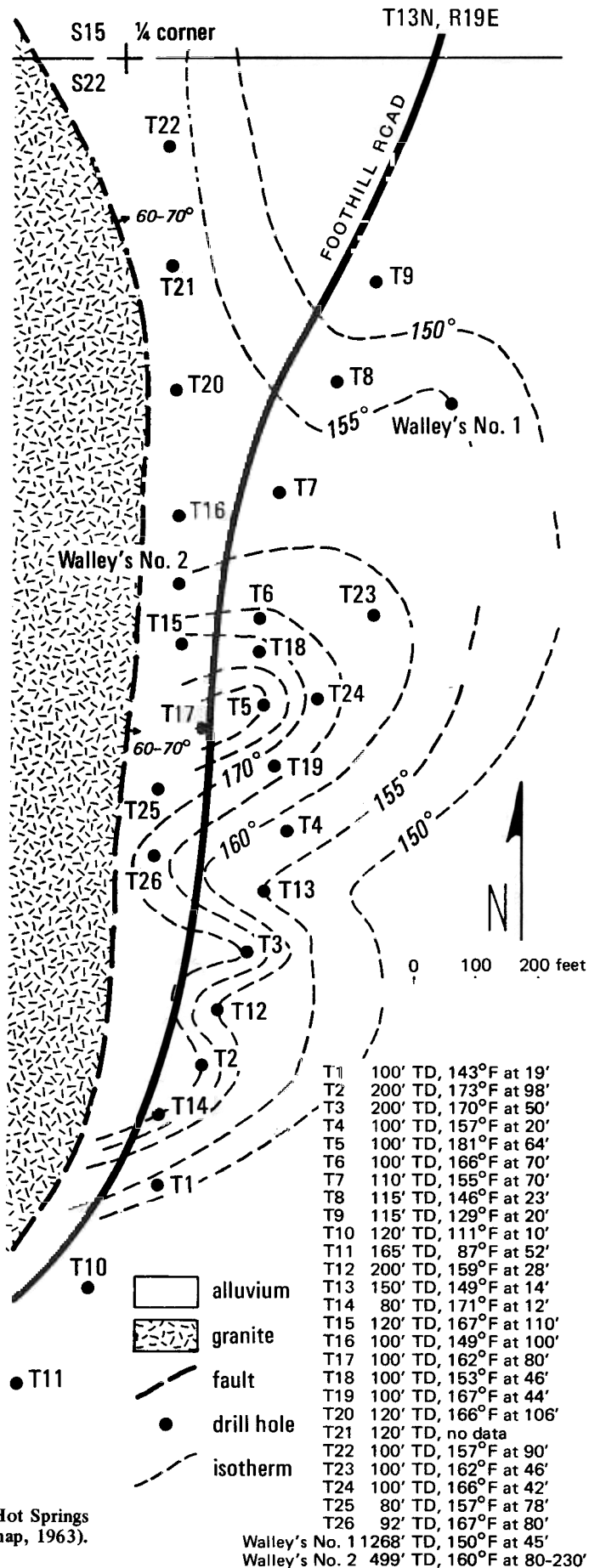


FIGURE 17. Isothermal contour map of the Walley's Hot Springs area, Douglas County (modified from U. S. Steel Co. map, 1963).