UTAH HOT SPRING AND ALLAN PLANT COMPANY GREENHOUSES

Robert Blackett
Utah Geological Survey
Cedar City, UT

John W. Lund
Geo-Heat Center

Remain of one of the cisterns used for hot water collection for the resort (Bob Blackett).

BACKGROUND

Utah Hot Springs issue from several orifices in Pleistocene valley fill sediments at the western edge of the Pleasant View spur, or salient, about 300 ft (90 m) west of U.S. 89 on the Box Elder-Weber County line. Utah hot springs is within an urban-industrial setting adjacent to a utility corridor, highway, and Interstate 15. The springs were used for a time at a now-defunct resort, and are currently used to heat a small commercial greenhouse operation. The maximum temperature reported is 145°F (63°C); although, temperatures reported in most studies ranged between 135°F and 137°F (57°C and 58.5°C) (Murphy and Gwynn, 1979). Minor geothermal exploration was conducted in the early 1980s, but the resource is poorly defined. Although the area is industrial, large-scale development could be problematic due to the number of listed sensitive plant and animal species (10) possibly in the area. Small-scale geothermal power development, however, would likely blend well with other uses. Zoning restrictions in this "urban-fringe" area could impede some types of future development (Blackett, et al., 2004).

GEOLOGY

Utah Hot Springs are situated nearly due west of the boundary between the Weber and Brigham City segments of the Wasatch fault, where Personius (1990) describes surficial deposits and structural geology along these two fault segments. His work shows that at least three Holocene faults on the west flank of the Pleasant View spur postdate Bonneville Lake cycle (between 30 and 10 ka) deposits and trend roughly at right angles to the Brigham City segment of the Wasatch Fault. The three faults are marked by 10-16-ft (3-5-m) high scarps formed in Bonneville-Lake-cycle lacustrine gravels. The northernmost scarp also appears to cut Holocene fluvial and lacustrine deposits near the hot springs. He also notes that the springs appear localized at the intersection of this young fault and an older buried fault, described by Davis (1985), that flanks the west side of the spur.

Total dissolved solids content of Utah Hot Springs water ranges between 18,900 and 25,200 mg/L, consisting mainly of sodium chloride. In addition to the high salinity, the water contains 3 to 5 mg/L dissolved iron that oxidizes and precipitates when the water is aerated. The iron compounds have reportedly led to scale buildup in piping and heat exchangers within the greenhouses. Felmlee and Cadigan (1978) have reported that the water also contains measurable quantities of radium (66 μμg/L) and uranium (0.04 μg/L). Cole (1983) included Utah Hot Springs as part of a geothermal-geochemical research project, and suggested that the hot spring discharge fluids appear to have circulated to depths in excess of 3 mile (5 km), thermally equilibrating with reservoir rock at temperatures above 392ºF (200ºC).

UTILIZATION

The hot springs were on the Hensley/Salt Lake Cutoff emigrant trail used in the 1850s. At the turn of the century, a resort with a geothermally heat pool was built. Special trains were run from Salt Lake City and Ogden to the resort while it was in use. The resort was torn down about 1970; however two cisterns remain, that were used to collect the spring water. The springs presently flow under the railroad and across a gentle slope. They are deep red from the iron oxide that has precipitated from the water Water, at a rate of about 100 gpm (6.3 L/s) is collected at this point for the greenhouses run by Allan Plant Company. A total of 24 double plastic covered greenhouses are heated with the geothermal water. These greenhouses, covering about 52,000 ft^2 or 1.19 acres (0.48 ha) are used to raise bedding plants (mainly geraniums) and poinsettias, which are sold wholesale to garden centers throughout northern Utah. Approximately 300,000 flats of bedding plants and 8,000 poinsettias are sold annually.

Water enters the greenhouses at about 135°F (57°C) and supplies heat to the plants through PVC pipes under the tables, and then exits around 90°F (32°C). This radiant heat keeps the greenhouses at the desired 60 to 65°F (16 to 18°C), and heat is required year around, as in the summer, heat is needed for the seed propagation sand beds. Because of the high iron content in the water, special fittings are provided at intervals to the bottom of the heating pipes. These are flushed out with a hose three or four times a year.

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Interior of a greenhouse with the PVC heating pipes under the benches.

Spring water with iron precipitations -- greenhouses in background.