



Site Description

Lee Hot Springs

(updated 2012)

Geologic setting: The junction of the Blow Sand Mountains, White Throne Mountains, and Desert Mountains results in complex geology, cut by multiple northeast-striking, southeast dipping normal faults, and crosscut by northwest-striking dextral faults. From Hinz et al. (2008), “geologic and geophysical data suggest that these normal and dextral faults comprise a right step or small pull-apart, in a northwest-striking dextral shear zone of the Walker Lane. The geothermal reservoir is hosted in shallow basement rocks, and fluid flow is controlled by the northeast-striking normal faults with greatest displacement.” A detailed geologic map of the area is available at <http://www.nbmgs.unr.edu/dox/of106.pdf>, by Hinz, Faulds, and Oppliger (2010).

Geothermal features:

Lee Hot Springs, Allen Springs: Lee Hot Springs and Allen Springs are located in this structural domain. The spring systems have consistently high geothermometer values, ranging from 160 to 178°C for cation (Mg-corrected) and quartz calculations.

Lee Hot Springs are in the NW¼ Sec. 34, T16N, R29E. In the past these springs may have been called Allen's Hot Springs (Miller and others, 1953), though Allen Springs are shown on USGS topographic maps 0.5 km northwest of Lee Hot Springs. Miller (1978) reported a 26°C temperature for Allen Springs, and UNR staff measured 24°C in 2002. The area is often called Lee-Allen Hot Springs. Sinter deposits are found at both Allen Springs and Lee Hot Springs (Miller, 1978).

The geothermal system at Lee-Allen Hot Springs was concealed, though sinter deposits suggested hot water at depth. Russell (1885) found no evidence of geothermal waters in 1885, but hot water flowed from hand-dug road construction pits ca. 1912, and again from a 10” artesian well in 1932 (Miller, 1978). In fact the well hit boiling water and steam, and was subject to frequent geysering. Twelve shallow wells drilled by Ted Ax in the 1950s to 1970s encountered hot water, and either flowed or geysered (Miller, 1978). In 1978 Oxy Geothermal Inc. drilled an exploratory well, the Federal No. 72-33(K) to 919 m in NW¼ NW¼ Sec. 34, T16N, R29E (Garside and Schilling, 1979, Appendix 2).



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The hottest flow is from a 17-m deep well drilled through siliceous sinter. Temperatures range from 88°C to boiling (Mariner and others, 1974; Glancy and Katzer, 1975), with a measured temperature of 96°C in July 2002. Another well 50 m west flows at 31.6°C. The Na-K-Ca geothermometers of both wells were found to be 178°C (2002 UNR sampling), similar to that estimated by Mariner and others (1974) of 162°C and 173°C, using the silica and Na-K-Ca geothermometers, respectively.

During the late 1970s the Navy Geothermal Program Office drilled five 500-foot geothermal gradient wells south of Lee Hot Springs. Vulcan is currently conducting an exploration and development program in the area (<http://www.unr.edu/geothermal/explactivity.htm>).

Stinking Spring: Stinking Spring, a 28°C spring ~5 km south of Lee Hot Springs, has estimated reservoir temperatures ranging from 98°C (Ca-Na-K; Fournier, 1981) to 39°C (chalcedony; Fournier, 1981).

Leasing information: During the late 1970s the Navy Geothermal Program Office drilled five 500-foot geothermal gradient wells south of Lee Hot Springs. Gradient Resources (formerly Vulcan Power) holds leases on the area, also known as Lee Allen Hot Springs. There was no news on the property in 2010.

Bibliography: