Site Description

Battle Mountain

(updated 2010)

Geologic setting: A major fault, the Dewitt thrust, passes through Battle Mountain. During the Antler orogeny, the fault emplaced the Cambrian Harmony Formation over the Ordovician Valmy Formation (Roberts, 1951). Most ore deposits at Battle Mountain occur in the Harmony Formation, and consist of copper, lead, silver, and gold (Willden, 1964). The lode trends along northwest and northeast mineralized fault zones.

The Battle Mountain geothermal region includes the City of Battle Mountain, the namesake mountain 16 km west of the city, and Stony Point Hot Springs 10 km east-northeast of the city. The City of Battle Mountain lies south of the Humboldt River, in a fluvial deposition plain. The mountain is composed of Paleozoic silicics and volcanics, unconformably overlain by the Antler Sequence. Stony Point Hot Springs are hosted in an Ordovician-era outcrop of siliceous and volcanic material, overlain by Miocene-era basalt flows and rhyolitic intrusives (Stewart et al., 1977).

Geothermal features: Fifteen gradient holes were drilled within Reese River Valley between Battle Mountain, the Sheep Creek Range, and the Shoshone Range. Gradients averaged 74±10°C/km, excluding three anomalous values. Gradients on Battle Mountain's eastern flank are lower, at 32±2°C/km (Blackwell and Richards, 2010).

The Geotherm Database gives data for the municipal water tower well in Battle Mountain (Scott and Barker, 1962). The well's measured temperature is 23.3ºC, with geothermometers of 78ºC (Ca-Na-K, Mg-corrected; Fournier, 1981) and 101ºC (chalcedony; Fournier, 1981). In 2008, a UNR sampling team measured cold temperatures in springs and wells south of the city. There was insufficient time, however, for a thorough investigation of irrigation wells NNE of Battle Mountain, between Battle Mountain and Stony Point Hot Springs (Penfield et al., 2011).

Stony Point Hot Springs: Two hot springs on the Stony Point 7.5-minute Quadrangle map (T32N, R46E, Sec. 6) measured warm in 1964 (Bradberry and Associates, 1964; see Garside and Schilling, 1979, no. 149). The springs were cold in 2001, but they are adjacent to an impounded part of Rock Creek and may be masked by cold surface water (Alan Ramelli, written commun., 2002).

Site Description

Leasing information:

N/A

Bibliography:

Blackwell, D. and Richards, M., 2010 (ongoing), SMU Geothermal Lab Geothermal Data Files, Southern Methodist University Geothermal Laboratory, Dallas, Texas, [http://www.smu.edu/geothermal/georesou/nevada.htm].

Bradberry, C. E. and Associates, 1964, Mineral inventory of lands bordering the Western Pacific Railroad Company: Western Pacific Railroad Co., Los Altos, CA.

Garside, L. J., and Schilling, J. H., 1979, Thermal waters of Nevada, Nevada Bureau of Mines and Geology Bulletin 91, 163 p.

Penfield, R., Zehner, R., and Shevenell, L., 2010 (in prep), *Great Basin Groundwater Geochemical Database*, Nevada Bureau of Mines and Geology Open File Report 10-XX, University of Nevada, Reno.

Ramelli, A., 2002, written communication.

Roberts, R.J., 1951, Geology of the Antler Peak quadrangle, Nevada: U.S. Geological Survey Map GQ-10.

Scott, R. C., and Barker, F. B., 1962, Data on uranium and radium in ground water in the United States: U.S. Geological Survey Professional Paper 426, 115 p.

Stewart, J.H., McKee, E.H, and Stager, H.K., 1977, Geology and mineral deposits of Lander County, Nevada, Nevada Bureau of Mines and Geology Bulletin 88, University of Nevada, Reno, 106 p.

Willden, R., 1964, Geology and mineral deposits of Humboldt County, Nevada, Nevada Bureau of Mines and Geology Bulletin 59.