



## Site Description

### Granite Range

(updated 2010)

**Geologic setting:** The Leadville Mining District is located in the Granite Range, 20 km northwest of Fly Ranch. The region produced more lead and silver than any other in Washoe County, despite idling since 1941. The Leadville ore deposits are found within andesite flows and associated dacite porphyry intrusives of the Oligocene-age South Willow Formation (Bonham and Papke, 1969). The South Willow Formation is unconformably overlain by the Miocene Canyon Rhyolite sequence to the north and west (Bonham et al., 1985).

Warm Springs Canyon is comprised of Canyon Rhyolite sequence, with oxidized iron-rich domes and welded ash flows. The ash fines to the north toward Grass Valley Ranch.

See Bonham, 1969 NBMG Bull 70 p. 59 for description of Granite Range geology.

### Geothermal features:

**Fox Mountain:** Chevron Resources drilled a 1200 m temperature-gradient hole at Fox Mountain (Richards and Blackwell, 2002; SMU; Sass and others, 1999), 16 km northwest of the Fly Ranch geothermal area. The drill hole had a near-linear gradient of 70 °C/km, with a maximum temperature of 218.7°C (GeothermEx, 2004). Location: 41.02°N, 119.56°W.

In July 2007, UNR staff sampled Potato Patch Spring on the SE flank of Fox Mountain. The area had a 1 x 4m source stream, with two ponds extending 100m downslope. Samplers dug out the stream head, saw upflow in several zones and sampled directly from the auger tube. The sampled water was cold (8.8°C) and unscented. Location coordinates in NAD83 are 41.01087 N, 119.54667 W. Sample chemistry has not been returned.

In the valley NE of Fox Mountain, spring waters were tested for temperature and left unsampled. A cold spring at 41.03271 N, 119.54156 W was 7.0°C, and 75 Dollar Spring at 41.04195 N, 119.53447 W was 10.2°C. The latter spring was dry at its source, but sampleable at a flowing wellhead.

**Leadville Mining District:** Reconnaissance sampling was recommended by Mark Coolbaugh based on NBMG Map 151 (Geothermal Potential Map, 2005) and the absence of samples throughout the Leadville area. Chicken Spring is dry at the surface, though an artesian well flows into a cattle



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trough 200m NE (13.4°C). The spring appears to originate along faulted rhyolite tuff. Location coordinates are 41.10305 N, 119.38714 W (NAD83). Geothermometer values are low, at 52.2°C (Na-K-Ca-Mg) and 52.2°C (chalcedony).

A second Leadville area sample was taken 2 miles north of the Leadville mines near Willow Creek, in a cow-trampled mud seep. The refill rate for a 1 L displacement within the sampling tube was 0.5 liters per minute. Location coordinates are 41.12116 N, 119.42351 W. Geothermometer values are moderate, at 58.2°C (Na-Ca-K) and 90.2°C (chalcedony). The pool emitted a slight sulfur smell, and was covered with grasses, algae, and small worms. A second seep 100m north likewise had a faint sulfur smell.

**Warm Springs Canyon:** This 13.2°C site is reportedly a warm spring, the namesake for Warm Spring Canyon. UNR staff captured the flow of a 1 x 1m gravel seep covered with green leafy plants, and let the silty water flow 20 minutes until clear. The outflow zone extends 50m downslope. Geothermometer values are moderate, at 71.7°C (Na-Ca-K) and 93.9°C (chalcedony). The other water source in the valley is a 12.4°C artesian well, which fills a cattle trough. The canyon walls are composed of red rhyolite tuff.

**Grass Valley Ranch:** The Grass Valley Ranch / Grass Valley Reservoir area exhibits a mild thermal anomaly at Ferdaline Spring (19.8°C, sampled July 2007). The area lies six miles north of Fox Mountain and six miles west of the Leadville District. To sample, a borehole tube was inserted into a 0.5m deep side channel, and left flowing for several hours. The 30 x 40m pond is characterized by non-sulfurous bubbles and tall reeds. Sample chemistry has not been returned.

### Leasing information:

N/A

### Bibliography:

Bonham, H.F., and Papke, K.G., 1969, Geology and mineral deposits of Washoe and Storey Counties, Nevada, Nevada Bureau of Mines and Geology Bulletin 70, 140 p.



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Bonham, H.F., Jr., Garside, L.J., Jones, R.B., Papke, K.G., Quade, J., and Tingley, J.V., 1985, A mineral inventory of the Paradise-Denio and Sonoma-Gerlach Resource Areas, Winnemucca District, Nevada, Nevada Bureau of Mines and Geology Open File Report 85-3, 473 p.