



Site Description

Gabbs Valley

(updated 2012)

Geologic setting: Gabbs, a town in eastern Gabbs Valley, was settled during World War II to mine and mill magnesium. Basic, Inc. (later C.E. Basic) took over the facilities in 1948 (Geothermal Development Associates, 1981). Extensive information on the mineralogy and geology of Gabbs and the Paradise Range is available in Cleveland (1963, 1964), Dockery (1982), Humphrey et al. (1958), John et al. (1988), Lee (1962), Martin and Willard (1956), Meinwald (1982), Mitchell (1991), Oldow and Lallement (1993, 1994), Ridgley and Hardyman (1993), Schilling (1967), Stewart et al. (1999), Thomason (1986), Vitaliano (1947, 1963, 1966, 1970, 1971) and Weaver (1982).

Geothermal features:

Eastern Gabbs Valley

Gabbs: Gabbs abuts the Paradise Range, which hosts a complex assortment of minerals including magnesite. Both north and south Gabbs are situated within Quaternary alluvium one-half mile from the range front. Temperatures range from 21 to 68.3°C in many municipal wells (Eakin, 1962b). The thermal wells are located in a north-trending zone 8 km long (Sec. 28, T13N, R36E, and Secs. 22, 27, 28, 33, T12N, R36E), which roughly traces the Paradise Range-front fault.

In 1981, the Nevada Department of Energy contracted with Geothermal Development Associates (GDA) to prepare for geothermal utilization in Gabbs. GDA estimated the Na-K-Ca geothermometer at 76-85°C (Pillsbury, Geothermal Development Associates, 1981), and Mariner calculated 53°C (Mariner et al., 1982, p. 47). C.E. Basic, the magnesite mill operator, used hot wells as a source of process heat ca. 1986 (Geothermal Resources Council Bulletin, 1986) but more recently, water has been cooled before use at the mill.

Several thermal wells were sampled by UNR staff in 2008 (Penfield et al., 2012). The first, a cooling tower, is located along Water Street in western Gabbs (117.93019 W, 38.87039 N; NAD83). Hot water cascades through a 20 ft tall metal cooling tower and exits at ~ 45°C, significantly cooler than the 70°C source water. Steam is visible from town on cool days, and carries a strong sulfur smell. Geothermometer values are moderate, at 77.6°C (Na-Ca-K) and 88.0°C (chalcedony).



Site Description

The Gabbs community picnic area was sampled at the northernmost handpump, the warmest of three in the park (117.93112 W, 38.85724 N; NAD83). A local reported that well water heats the swimming pool in summer. Geothermometer values are moderate, at 56.0°C (Na-Ca-K) and 77.5°C (chalcedony). This site is 200m north of the Gabbs athletic field well, which is reportedly 51.7 °C, but not accessible during the UNR visit (locked shed).

A 21.4°C water truck refill well was also sampled 3 km north of Gabbs, near the Sierra Magnesite Mine turn-off (117.92318 W, 38.89547 N; NAD83). Geothermometer values are low, at 49.0°C (Na-Ca-K) and 39.7°C (chalcedony).

Gene Sawyer Well: Brooks Ranch, located ~15km N of Gabbs on State Route 361, is reported to have a hot well. The owners were willing for a sample to be collected in April 2006, but recent storms had cut power to the well.

Holly Well: This well is located at the mouth of Lodi Valley, ~5.5 miles NNE of Gabbs along the road to Lodi Valley. It served as the industrial water source for Gabbs during the 1940's. Holly well is located 3 miles east of Hwy 361, north of Gabbs, but was not sampled - too cold (13.1°C). The well was originally developed for a horse corral, but the area is currently abandoned.

Kelly Well: The original location of Kelly Well has been destroyed. A nearby modular house may have a replacement well, but UNR samplers did not investigate further.

Central Gabbs Valley

Rawhide Hot Springs: The highest spring temperatures in Mineral County are found at Wedell Springs in the SW¼ Sec. 7, T12N, R34E. These springs are called Rawhide Hot Spring on the Walker Lake 30'x60' Quadrangle map. They consist of two main springs with temperatures of 53.9-62.2°C (Eakin, 1962a). The site is surrounded by junk, but the hot spring pools are free of debris. Rawhide Hot Springs are near a range-bounding fault along western Fissure Ridge and Monte Cristo Mountains (Kleinhampl and Ziony, 1985).

Schrader (1947, p. 146) reported that excellent water for domestic and other purposes was hauled to the mining camp of Rawhide, about 22 km west of these springs. A hot well is indicated on USGS 7.5' maps seven kilometers north of Rawhide Hot Springs (SW¼ SW¼ Sec. 17, T13N, R34E). The site had been developed with a holding tank and water trough, but was abandoned by April 2006. The well is ~2 km west of the range-front Fissure Ridge–Monte Cristo Mountains fault.



Site Description

The southernmost orifice at Rawhide Hot Springs is also referred to as Wedell Spring #1 in literature. UNR sampled the pond's hottest point, 56°C, beneath a white/orange algal mat. The spring has an estimated 10L/min recharge (the hot springs were improved with piping and cement tubs, which enabled samplers to displace 1L and measure the refill time). Location coordinates are 118.19617 W, 38.91937 N (NAD83). Geothermometer values are high, at 134.1°C (Na-K-Ca-Mg) and 160.8°C (quartz).

Diamond A Ranch, Gabbs Valley Ranch: The ranches have multiple irrigation wells, ~25-30km southwest of Gabbs. Peter Vikre (2000, pers. comm.) reported well temperatures up to 26°C. Access was denied to UNR samplers in April 2006.

Leasing information: An 18,500 acre property, leased by Geoglobal Energy LLC, hosts a blind geothermal system discovered and delineated in the 1970's. The site is ~8 km east of Rawhide Hot Springs, near Lower Phillips Well. A variety of geophysical surveys, including gravity, magnetic, magnetotelluric, time-domain electromagnetic (TDEM), Schlumberger soundings and micro-seismic surveys, as well as TG drilling, were performed. Geoglobal plans or has performed geochemistry, LIDAR, and structural mapping. A rough heat-in-place estimate of 20MW has been calculated for the property.

Western Gabbs Valley

Car Frame Windmill area: Shallow temperature surveys, led by Chris Kratt of Desert Research Institute, have identified a subsurface anomaly covering ___ km² near Car Frame Windmill. The windmill itself is non-operational, with no historical data available for temperature or chemistry. Hot water was encountered in mineral exploration holes near T11N, R32E.

Deadhorse Wells: Water from Dead Horse Wells is reported to be hot (Miller et al., 1953). This area is ~16 km west of Rawhide Hot Springs and 7 km southwest of Rawhide, in Sec. 21, T12N, R32E. UNR staff found Dead Horse Wells destroyed, but measured a well 100m east at 16.8°C.

Pipeline Well: UNR technicians sampled a 21.3°C well on the western margin of Gabbs Valley, 5 miles SE of the Rawhide mine site. The well pump registered 100 psi at the time of sampling, with water flowing 0.5 L/min into a cattail-filled pond. There were no characteristic rocks nearby, only alluvium and sage. Location coordinates are 118.33943 W, 38.96697 N (NAD83). Geothermometer values are moderate, at 87.2°C (Na-Ca-K) and 92.9°C (chalcedony).



Site Description

Murphys Well: Murphys Well is a mine adit with stagnant, 11.0°C water 6 m below ground level. The site could not be sampled.

Leasing information: ORMAT received drilling permits in first quarter 2010 for a property near Car Frame Windmill, southwestern Gabbs Valley.

Northern Gabbs Valley

Quartz Mountain, Kaiser Mine: The Quartz Mountain area, 20 km north of Gabbs and 5 km west of Hwy 361, is a ghost town. Both Kaiser wells are out of commission: the road to #1 is overgrown and the aqueduct from #2 has been destroyed. Extensive alteration and chalcedonic spring sinter has been reported in talus, though this could be middle Miocene in nature.

Leasing information: RAM Power has leased the Quartz Mountain property on the boundary of Nye and Mineral counties, 20 km north of Gabbs. No information is available on this project, which no longer appears on the Company website.

Bibliography:

Eakin, T.E., 1962a, Ground-Water Appraisal of Diamond Valley, Eureka and Elko Counties, Nevada: Nevada Department Conservation and National Resources, Ground-Water Resources-Reconnaissance Series Report 6, 60 p.

Eakin, T.E., 1962b, Ground-Water Appraisal of Gabbs Valley, Mineral and Nye Counties, Nevada: Nevada Department Conservation and National Resources, Ground-Water Resources-Reconnaissance Series Report 9, 27 p.

Geothermal Development Associates, 1981, A Preliminary Plan for the Development of Geothermal Energy in the Town of Gabbs, Nevada: Department of Energy Publication, 95 p.

Geothermal Resources Council, 1986, BLM Approves Dixie Valley Power Plant: Geothermal Resources Council Bulletin, v. 15, no. 11, p. 27.



Site Description

Kleinhampl, F.J. and Ziony, J.I., 1985, *Geology of northern Nye County, Nevada*, University of Nevada, Reno, 172 p.

Mariner, R.H., Brook, C.A., Reed, M.J., Bliss, J.D., Rapport, A.L., and Lieb, R.J., 1983, *Low-Temperature Geothermal Resources in the Western United States*, in Reed, M.J., (Editor), *Assessment of Low-Temperature Geothermal Resources of the United States—1982*, U.S. Circular 892, p. 31-50.

Penfield, R., Zehner, R., and Shevenell, L., 2012, *Great Basin Groundwater Geochemical Database*, Nevada Bureau of Mines and Geology Open File Report 12-XX, University of Nevada, Reno.

Geothermal Development Associates, 1981, *A Preliminary Plan for the Development of Geothermal Energy in the Town of Gabbs, Nevada*: Department of Energy Publication, 95 p.

Vikre, P., 2000, pers. comm