Site Description

Buena Vista Valley

(updated 2010)

Geologic setting: Buena Vista Valley hosts pockets of hydrothermally-derived manganese within the Havallah sequence, south of Kyle Hot Springs (Whitebred and Sorenson, 1980). Similar deposits in Pumpernickel Valley may have formed from submarine thermal vents (Bonham et al., 1985).

Ten kilometers southeast of Kyle Hot Springs, the East Range contains Oligocene granodiorite with significant base metal concentrations. A thrust fault within French Boy Canyon hosts lead-zinc-copper sulfide veins (Johnson, 1977), and Jasperoid Peak 3.5 km northwest holds massive copper sulfides (Whitebred and Sorenson, 1980).

Igneous intrusives line the southern East Range: among them, a Triassic granite, an Oligocene intrusive, and felsic porphyritic dikes. The dikes are associated with propylitic alteration and chalcopyrite-molbdenite mineralization (Johnson, 1977).

Geothermal features:

Kyle Hot Springs: Kyle Hot Springs are located in Secs. 1, 12, T29N, R36E ~2 km west of a range-front fault that cross-cuts alluvium (Stewart and Carlson, 1976b). The springs and spring deposits are clearly associated with several intersecting sets of faults (figure). North-trending faults seem to be the principal conduits for thermal water (D.C. Noble, written commun., 1974).

The area has been used in the past as a health resort by people from Lovelock and other communities (Loeltz and Phoenix, 1955, p. 30-31). The spring area consists of a circular pool 2 m in diameter which has little if any visible discharge. The maximum temperature has been variously reported as 70.5°C (Loeltz and Phoenix, 1955), 77°C (Mariner and others, 1974) and 95.6°C (Sanders and Miles, 1974). A low mound of siliceous sinter about 137 m in diameter is present, and siliceous sinter and sulfur are presently being deposited. The odor of H_2S is noticeable. Spring deposits 1.1 km southeast of the present Kyle Hot Springs also contain considerable amounts of siliceous sinter (D.C. Noble, written commun., 1974).

Wollenberg (1974b) reported that the pools are anomalously radioactive (250 to 500 µR/hr). Mariner and others (1974) reported that the spring deposits are mostly travertine with a trace of disseminated silica, and they estimate the thermal-aquifer temperature to be 171-194°C by use of the silica and

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Na-K-Ca geothermometers. Wollenberg and others (1977) reported that the springs are presently depositing $CaCO_3$.

In 1993 hot water (79°C) and oil were encountered in a gold-exploration drill hole about 1.6 km south of the hot springs (in SW¼ Sec. 12, T27N, R52E) (Schalla and others, 1994). McMannes and others (1981) summarized geophysical, geochemical, and gradient-hole drilling in the area.

Leasing information:

New York Canyon: Steam was reported to issue from a development drill hole at the New York kaolin deposit in 1963. The drill hole is about 43 m deep, and is located in the vicinity of SW¼ Sec. 1, T25N, R35E. The kaolin deposit is of the shallow, hot-springs type and contains irregular bodies of' associated siliceous sinter. The sinter is exposed at the surface and was encountered during drilling (K. Papke, personal commun., 1977). The sinter and thermal water occur near the mountain front along a fault scarp that cuts the alluvium. This fault is probably part of a young basin-and-range fault shown by Stewart and Carlson (1978) cutting the alluvium in southern Buena Vista Valley. A temperature gradient drill hole (Phillips Petroleum Co. (BV ST No. 1) reported 74.6ºC at 360 m (GeothermEx, 2004, Log NEW00).

Leasing information: At least three companies conducted geothermal exploration at New York Canyon during the late 1970s and early 1980s, possibly drawn by a steaming 140 foot well drilled in 1963. Areas of intense alteration and leaching are associated with deposition of silica and other minerals, and soil geochemical surveys identified strong structurally controlled anomalies.

Gradient Resources (formerly Vulcan Power) currently leases a block at New York Canyon. TGP Development Company also received a $14m DOE grant to demonstrate commercial EGS techniques. Neither project has further news as of 2010.

Magma Energy leases the 11,156 acre Panther Canyon property ~6 km SE of Leach Hot Springs. Exploration by the USGS, Lawrence Berkeley Labs, Aminoil USA, and Sun Oil Company performed TG drilling, geophysical, geochemical, and geological surveys. Geophysical data included gravity, ground magnetics, magnetotelluric, standard resistivity, bipole-dipole, dipole-dipole resistivity, P-wave delay, microearthquake behavior, seismic ground noise, and active seismic refraction and reflection. 58 TG holes were drilled in the vicinity of Panther Canyon; bottom hole temperatures reached 94°C. No geochemical data on fluids is available. Magma reports a 34 MW inferred resource on the property. No known work completed recently on the property.

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Bibliography:

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