



## Site Description

### Steptoe Valley

(updated 2010)

#### Geologic setting:

#### Geothermal features:

**Campbell Ranch Springs** ([Map](#)): Numerous springs ranging from 14°C to 24°C occur along an alluvial fan parallel to the Egan Range (SW¼ Sec. 5, T19N, R63E). The estimated reservoir temperature for this group is 24°C, and the flow rate is 5110 L/min (Reed and others, 1982, p. 45,107). These springs have also been called the Campbell Springs or North Group Springs.

**Cherry Creek Hot Springs:** Cherry Creek (Young's) Hot Springs on the west side of Steptoe Valley (northern T23N, R63E) are the second-hottest springs in White Pine County. There are three small springs with temperatures of 86.7°C, 51.1°C, and 57.2°C, and a total flow of 16 L/min in August 1918 (Clark and others, 1920, p. 48, 49). By 1981 the flow rate was reported to be 13 L/min (Robinson and Pugsley, 1981, p. 29). UNR staff sampled the hot springs (Sec. 6, T23N, R63E) in June 2002. This area is a 15-20 m pond with three springs/seeps with maximum temperature of 60.5°C and visible gas discharge. Chalcedony geothermometers indicate subsurface temperatures of about 112°C. Small amounts of gas (CO<sub>2</sub>) escape from the springs; one is slightly radioactive (Davis, 1954, p. 21).

In 1980, industrial well W.H. Hunt Schellbourne No. 74-23 was drilled to a depth of 3358 m in Sec. 23, T22N, R63E, and in 1988 industrial well W.H. Hunt Schellbourne No. 37-23 was drilled to a depth of 1373 m (Barton and Purkey, 1993, p. 27). Robinson and Pugsley (1981, p. 29) estimated the reservoir temperature to be 90°C using the Na-K-Ca geothermometer. A 2560 m -deep exploratory oil well in Sec. 19, T24N, R64E (Shell Oil Co. Steptoe Unit No. 1) reported a maximum temperature of 151°C. This well is 11 km northwest of Cherry Creek Hot Springs.

Waring (1965, no. 96) erroneously reported that Schellbourne Hot Springs are "about 100 feet [30 m] from Cherry Creek Hot Springs," consist of two springs, have a temperature of 51°C and are used for bathing and irrigation. Some miles to the southeast are the Upper and Lower Schellbourne warm springs (see below).



## Site Description

***Collar and Elbow Spring:*** The Collar and Elbow Spring is at the north end of Steptoe Valley in Sec. 33, T26N, R65E. It had a temperature of 33.3°C and flow rate of 68 L/min. on August 2, 1918. It issues from an old lakebed and has formed a tufa mound (Clark and others, 1920, p. 44, 49). In 1982, Reed reported the temperature to be 22°C with an estimated reservoir temperature of 30°C (Reed and others, 1982, p. 45, 107).

***Ely Warm Springs, Lackawanna Hot Springs:*** Hot springs occur just north of Ely along the west edge of Steptoe Valley. The northernmost five springs in NE¼ Sec. 3, T16N, R63E are called the Lackawanna Hot Springs. They flow and have temperatures variously reported as 21°C and 32-35°C. The flow rate in 1981 was 511 L/m (Robinson and others, 1981, p. 31). Mariner and others (1982, p. 46). estimated the reservoir temperature to be 40°C. In 1966, the water was used in the Silver King Mines mill (Eakin and others, 1967; and Holmes, 1966, p. 21). The springs issue along a Quaternary fault (C. dePolo, unpubl. fault map, ca. 1990).

The Ely Warm Springs, to the south in Sec. 10, had a flow rate of 100 L/min and temperature of 29.4°C in April 1918, although later reports noted the discharge to be between 83-87 L/min (Robinson and others, 1981, p. 32; Reed and others, 1982, p. 45). There are no spring deposits, but tufa occurs nearby (Clark and others, 1920, p. 43, 46). In some cases the name "Ely Warm Springs" has been used for all the springs in this zone including the Lackawanna Springs.

***J Henroid Ranch:*** A 28.3°C spring (name unknown) with a flow rate of 1,700 L/min is reported on the eastern edge of Steptoe Valley (Sec. 31, T24N, R65E) (Snyder, 1963).

***McGill*** ([Map](#)): Near McGill, springs trace 8 km along the base of an alluvial slope paralleling the Duck Creek Mountains. The spring temperatures increase from north to south. Schoolhouse Spring at the north end of this zone, in the NW¼ SE¼ Sec. 3, T18N, R64E, had a temperature of 24.4°C and flow rate of 1,700 L/min on July 5, 1918 (Hardman and Miller, 1934).

The McGill Warm Springs at the south end of the zone range up to 29°C in temperature and flow 17,000 L/min (Clark and others, 1920). There are three main springs; a pool has been excavated at the largest. Several additional springs are covered by tailings from the huge Kennecott Copper Corp. mill. The water has been used in the mill and in a municipal swimming pool (Eakin and others, 1967). Reed estimated the reservoir temperature to be 29°C (Reed and others, 1982, p. 107).

***Monte Neva Hot Springs*** ([Map](#)): The Monte Neva (Melvin, Goodrich) Hot Springs ~24 km north of McGill, are by far the hottest in White Pine County (SW¼ Sec. 24, NW¼ Sec. 25, T21N, R63E). Stearns and others (1937, no. 98) reported a temperature of 89.4°C, but three other studies measured 79°C (Clark and others, 1920, p. 47; Mifflin, 1968; and Hose and Taylor, 1974). In June 2002, UNR



## Site Description

samplers measured the spring at 77.6°C, which flows from a 2.5-m terrace. Chalcedony geothermometers indicate reservoir temperatures near the discharge temperature.

Monte Neva Hot Springs consists of one main spring plus several smaller ones, all issuing from alluvium. The main spring flowed 2,366 L/min in 1917 (Clark and others, 1920, p. 47). A 6- to 12-m-high mound of travertine, covering about 5 hectares, has been built up. Some travertine from pools is anomalously radioactive (about 200 counts/sec above background; G. Dixon, oral commun., 1980). Considerable CO<sub>2</sub>(?) gas is escaping from the springs.

Magma Power Co. drilled a 123-m well at the springs in 1965. No steam was encountered: the maximum reported temperature was 88°C (Koenig, 1971), close to surface discharge temperatures. W.H. Hunt Company drilled a 1,373.4 m well in 1979 (Schellbourne No. 74-23) and encountered a maximum temperature of 90.5°C. W.H. Hunt company exploration continued into the early 1980s (Robinson and Pugsley, 1981, p. 27). Audiomagnetotelluric data for the geothermal area is reported in Long and Batzle (1976a).

**Schellbourne Springs:** There are two hot springs at Schellbourne Pass on the east flank of Steptoe Valley. Lower Schellbourne Warm Spring has a temperature of 25°C and issues from alluvium at the mouth of the canyon (Secs. 1, 2, T22N, R64E). Upper Schellbourne Spring has a temperature of 23°C; it is near or on a fault in SE¼ NW¼ Sec. 8, T22N, R65E. Both flowed at >2000 L/min in 1966 (Mifflin, 1968). In 1982, Reed reported both a surface and an estimated reservoir temperature of 25°C, with a flow of 1700 L/min (Reed and others, p. 45, 107).

Leasing information: