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Item 6

MT. HOPE DISTRICT

The Mt. Hope mining district is located on the southeast side of Mt. Hope in T22N, R51 and 52E, 21 miles northwest of Eureka. Access to the area is along good dirt roads west of Nevada Highway 20, north of U.S. Highway 50.

Lead and zinc were first discovered in the area in 1870 by Basque sheepherders. The main workings at the Mt. Hope Mine were opened by Thomas Wren in 1886 with subsequent shafts sunk in 1890. No additional activity was recorded until 1928 when the U.S. Smelting, Refining and Mining Co. sank additional shafts and crosscuts for a total of over 8,000 feet of underground workings. After the 1943 flooding of the mine, the Callaghan Pb-Zn Corp. leased Mt. Hope from Universal Exploration Co., a subsidiary of U.S. Steel Corp., from 1943-1947 and produced 250 tons per day of zinc concentrate, \$10,000 per month of cadmium, and for each 50 tons of concentrate, 120 ounces of silver (Forsman, 1951). Production ceased for 10 years following the 1947 fire in the power house, Phillips Petroleum drilled the area in 1970-71, but no development was indicated. Exxon Minerals Co., a division of Exxon Corp., began drilling at Mt. Hope in 1978 and the discovery of a molybdenum porphyry deposit was announced by them in 1981. Over 450 million tons of ore with grades ranging between 0.13 to 0.32%  $\text{MoS}_2$  have been reported. As of this data there has been no recorded production from Exxon's discovery. The total production of zinc, lead, gold, silver, and copper from the district has been more than \$1.3 million.

Situated between the southern ends of the Roberts Mountains and the Sulphur Springs Range, Mt. Hope, a prominent local geographical landmark, is a rhyolite porphyry plug which intruded the siliceous Ordovician Vinini Formation. The Vinini Formation, which locally forms the upper plate of the Roberts Thrust, had been carried over Paleozoic carbonates by the thrust fault and subsequently overlain by the clastic transitional sequence of the Permian Garden Valley Formation. Outliers of Devonian Nevada Formation outcrop on the west side of the

J. Tingley + P. Smith (1982) Mineral Inventory of Eureka  
Shoshone Resource Area: BSMG OFR 82-10-83-3/83-4

district. Within the Vinini Formation are three distinct thrust plates, with the base of the lowest plate being the Roberts Thrust (Walker, 1962). Within each thrust plate, the beds of the Vinini are tightly folded on a small scale. Where the thrust plate is exposed, it is marked by a pronounced 30-40 foot wide breccia zone (Merriam and Anderson, 1942). The Paleozoic rocks have been faulted and intruded by the 36 m.y. old (Oligocene) rhyolite porphyry of Mt. Hope (Walker, 1962, Silberman and McKee, 1971). The exposed porphyry is an iron stained, vuggy, fine crystalline, white groundmass with smokey quartz and pale cream-colored sanidine phenocrysts (Walker, 1962, Missallati, 1973).

The earlier Pb-Zn ore occurrences were disseminated sulfide deposits, bedded veins and replacement sulfide deposits, and as irregular veins and replacement sulfide deposits, and as irregular veins and replacement sulfide deposits. The ore zones only occur in well developed skarns and are structurally controlled by low angle thrust faults, high angle fissures, fractures and fault zones, irregular contact of the sediments with the intrusive, and bedding planes, (Missallati, 1973). The principal ore minerals include marmatite, sphalerite, galena, with occurrences of pyrrhotite, chalcopyrite, and minor gold and silver. The gangue minerals include calcite, garnet, tremolite, and diopside. The ore minerals grade from low to high temperature and the skarn assemblages and ore textures suggest a formational temperature from 200°-600°C (Missallati, 1973).

The recent activity at the Mt. Hope Mine possibly resulted from the data obtained from drill hole #15, drilled by Phillips Petroleum in 1970-71. The hole was drilled through an ignimbrite unit in the southeast corner of an igneous complex. At the 1292-foot level a veined rhyolite porphyry was encountered and at the 1504-foot level, a low grade, but continuous molybdenum-mineralized zone. This mineralization continued from 464 feet to the bottom of the drill hole at 1908 feet. The zonal pattern of mineralization in the veined porphyry was zinc, at the top, copper, in the middle, and at depth, molybdenum (Missallati, 1973).

Based on their drilling and mapping, Exxon geologists describe five pulses of intrusive activity at Mount Hope. The molybdenum zone that has been defined by drilling has the form of two overlapping inverted teacups. Each teacup would represent a molybdenum rich halo around a central intrusive porphyry mass. In the area of overlap, the two molybdenum halos form a zone of enriched values which may define an orebody.

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