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324
Item 6

Black Horse Tungsten Mine

Geology

by R. M. Smith, June 14, 1952

The area is underlain by sedimentary rocks of probable Cambrian age which have been highly folded and complexly faulted. In the mine area interbedded limestone, shale, and carbonaceous shale strike east and dip steeply north or are overturned. The rocks are cut by many faults; most prominent is an east striking set that nearly parallels the bedding, and one other fault, the post mineral (?) Black Horse fault, which strikes N.25° E. and dips 60° SE.

Ore Deposits

Tungsten ore occurs in small shoots and lenses in quartz-calcite veins 1 to 3 feet wide in thin-bedded carbonaceous limy shale. At least three veins occur on the property; a gold-bearing vein with a small showing of scheelite reported to be at the bottom of a 100 foot shaft, the Black Horse tungsten vein, and an unnamed vein on the 50 foot level of the Black mine 50 feet south of the main vein (fig. 2). Only the Black Horse tungsten vein has yielded ore in commercial quantities.

The Black Horse vein is in a fault zone which strikes east and dips steeply south. It is locally 9 feet wide but averages about 2 feet in width. It contains lenticular masses of quartz which average about a foot in width.

The ore mineral is scheelite, which is essentially free of molybdenum, and it occurs as disseminated specks and as concentrations of as much as 2½ percent WO_3 in the quartz. Ore was mined to a depth of 100 feet. Only the highest grade parts of the vein were mined, and total production is reported to be 630.5 tons of ore estimated to contain 1410 units, of which 35 percent or 403 units were recovered. The average grade was about 2.2 percent WO3.

Exploration on the 120 foot level, 20 feet below the 100 level stopes, disclosed little or no high grade ore. Grade on the 120 level may average 0.50 percent WO_3. Samples cut by Bureau of Mines engineers on the 120 level on the best ore average 1.57 percent WO_3 across a width of 1.2 feet.

On the 120 level the vein is cut off by the Black Horse fault; the faulted continuation of the vein is not exposed either at the surface or underground, and the amount of displacement along the fault is not known.

Ore Reserves

There are a few tons of measured ore averaging 0.5 percent WO_3 in the blocks above the existing levels. A total of 1,700 tons of indicated ore averaging 0.5 percent WO_3 is estimated to be in the block above the 120 level (fig. 3). If the vein is persistent to the east of the workings, about 1200 tons may be inferred to be in the triangular block 170 feet long, 160 feet high, and 1.0 feet thick, above the proposed 200 foot level. An additional 900 tons of ore averaging 0.5 percent WO3 may be inferred to be above the proposed 300 foot level above the Black Horse fault. The block is 130 feet long, 85 feet high, and 1.0 feet thick. Total reserves are 3800 tons containing 1900 units of WO_3. Of this total, perhaps 85