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White Pine Co. Smith general
Item 69

4 Homewood Place
Menlo Park, California

May 17, 1954

Memorandum

To: H. C. Miller

From: R. M. Smith

Subject: DMEA 3217 (Tungsten), Cleve Creek Mines, Inc.
Kolchek Tungsten Mine, White Pine County, Nevada

As the application for Government assistance ~~has been~~ was withdrawn by the applicant before the property was accessible for the engineer's field examination, a joint report will not be prepared. The following paragraphs are the geologist's appraisal of the application.

GEOLOGY

The rocks in the area of the Kolchek mine are limestone, shale and quartzite of Lower and Middle Cambrian age that are tilted westward, cut by faults in several systems and intruded by quartz diorite(?) porphyry dikes.

The sedimentary rocks have been subdivided into six formations. Listed in order of youngest to oldest, they are:

	Thickness in feet
Blue and grey limestone, undifferentiated, Cambrian	---
Davidson limestone	400
Chisholm shale and limestone	210
Lyndon (Prince) limestone	225
Pioche shale and limestone	300
Prospect Mountain quartzite	Base not exposed

The Davidson formation consists of gray and blue massive limestone. The Chisholm formation consists of an upper massive shale and a lower thin bedded shale separated by a limestone unit about 50 feet thick. Tungsten ore discovered in 1953 was found in this unit. The Prince limestone consists of white and blue massive limestone. The Picche formation is a dark, siliceous, micaceous shale containing a limestone bed 6 to 12 feet thick (CM bed) near its base, and also a layer of quartzite immediately below the limestone. In the mine area the CM bed has been considerably altered and mineralized with iron oxide and calcium carbonate minerals. The Prospect Mountain quartzite contains interbedded shales near the top.

The quartz porphyry is highly weathered; it does not form outcrops in the mine area but has been exposed in cuts and trenches where it occurs as quartz grains in clay. The extent of its surface exposure is largely inferred.

The sedimentary rocks are displaced by 3 sets of normal faults: one strikes northerly and dips 70° west, the second strikes northerly and dips 70° east, and the third strikes westerly and dips steeply south. Displacement along most of the faults is of the order of a few tens of feet, but along the Rambo fault, one of the first set, displacement is estimated to be as much as 600 or 700 feet. Faults belonging to the second set are commonly mineralized with quartz and iron minerals.

ORE DEPOSITS

The ore bodies at the Kolchek property are two kinds, gold and silver-bearing quartz veins located in the Cash mine, and scheelite-bearing carbonate and quartz veins, and replacement bodies in a zone that is parallel to and in the footwall of the Kolchek fault. The gold-silver ores are low grade and were mined partly because a premium was available for their high silica content. Although they occur in the same mineralized zone, they were in general mined in different stopes from the tungsten ores. The tungsten ore bodies are quartz veins, quartz carbonate veins, and replacement bodies along fracture zones in limestone north of the Kolchek fault. The ore shoots range from 5 to 20 feet in length, are as much as 10 feet wide, and has been mined to a depth of only a few feet. Two ore bodies have been mined in shallow workings--the Cash ore body, which yielded about 458 tons of ore averaging about 0.81 percent WO_3, and the 1953 ore body (see fig. 2) which yielded 32 tons of ore averaging 3.15 percent WO_3. A sample taken by the examining geologist at the 1953 cut across 1.5 feet of quartz was assayed by the U. S. Bureau of Mines and contained 15.0 percent WO_3.

Scheelite, the only tungsten mineral that was seen, occurs disseminated in quartz and quartz-carbonate veins and veinlets replacing the limestone in and near fractures.

The ore bodies appear to be controlled by both the north-striking faults and the east-striking Kolchek fault. It could not be determined whether the east-dipping or the west-dipping faults were more effective in localizing the channelways of the tungsten-bearing solutions. For a distance of several hundred feet on each side of the Kolchek fault, the CM bed has been mineralized with small quartz seams and iron oxide. No tungsten ore has been found in the CM bed in this area. Iron oxide mineralization along the Kolchek fault and along the north-striking faults suggests that these faults are pre-mineral, although gouge, which also occurs along them, indicates that there is post-mineral movement along them as well. To date the only tungsten production from workings in the CM bed is at the Mt. Wheeler mine (IMEA 2082) where low grade tungsten ore bodies occur in the bed below surface exposures which are completely devoid of tungsten minerals. These ore bodies are in part replacement of limestone. For that reason ore bodies in the CM bed below the Cash mine are inferred to be tungsten replacement ore bodies and not gold-silver ore bodies.

The nearby Rambo prospect--about a half mile north of the Cash mine--is reported to have produced 25 tons of scheelite ore. Here the scheelite occurs in a quartz vein in quartzite immediately adjacent to the Rambo fault.

ORE RESERVES

Except for a few tons below the 1953 workings, there are no measured ore reserves at the Kolchek property. A few hundred tons of ore may be inferred down the dip of the Chisholm limestone below the 1953 workings, but no estimate of tonnage is made (see fig. 3). Although no tonnage calculation can be made for the CM bed at depth, it is reasonable to infer several thousand tons of ore that may average as much as 3 percent WO_3.

PROPOSED EXPLORATION

The applicant has proposed to explore the mineralized zone in the Cash mine area at its intersection with the CM bed at a depth of about 800 feet below the Cash mine. He proposes to explore this intersection by an adit and has proposed two sites--an original proposal at an altitude of 7850 and an alternate proposal at an altitude of 7700 feet.

In the original proposal, the 1200-foot adit collared in Prospect Mountain quartzite would be driven south about 400 feet to cut the CM bed and then be turned to follow the strike of the bed until the Kolchek fault was cut. At this point, the face of the adit would be about 200 feet east of the downward projection of the mineralized zone at the Cash mine, and a winze 300 feet deep would be required down the dip of the CM bed to reach the mineralized zone.

This adit would explore about 800 feet along the strike-length of the CM bed, but as the tungsten ore is known to occur only near the Kolchek fault and as the CM bed is more intensely altered near the Kolchek fault, presumably there would be little expectation of finding ore nearer the portal of the adit.

The alternate proposal would require a 1500-foot adit collared on the southeast slope, east of the Cash mine at an altitude 150 feet lower than that of the original proposal, and no winze would be required. The face of the adit would cut the CM bed at the projected intersection of the Kolchek fault with north-striking faults which may limit the mineralized area (see fig. 3). This proposal has the advantage of a longer working season at less operating expense and also it cuts the ore zone at a point 200 feet closer to the mineralized zone than the original proposal. Each proposal is estimated to cost $112,829 and to require 14 months to complete. These proposals were discussed with the operator, who prefers to explore by the alternate proposal.

The operator also plans additional surface exploration on Company account by leasing the 1953 pit and the Rambo prospect.

Both proposals appear to be sound, but the costs are high. It is recommended that the alternate proposal be set up on a unit basis allowing 100 feet of drift to explore along the strike of the bed.