

History of the Copper Basin Mine, Custer County, Idaho

Victoria E. Mitchell

Staff Report 99-1
August 1999

Idaho Geological Survey
Morrill Hall, Third Floor
University of Idaho
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INTRODUCTORY NOTE

This report was prepared under a cooperative agreement with the U.S. Forest Service, Region IV, as part of a project to identify and describe inactive and abandoned mines in the state of Idaho. Work on this project included preparing detailed histories of mines in Region IV that had significant recorded production. The information in this report is taken from published and unpublished sources in the Idaho Geological Survey's mineral property files. Unless otherwise noted, most mine production data are drawn from the U.S. Geological Survey's (USGS) annual volumes on *Mineral Resources of the United States* (1882-1923) and the equivalent volumes produced by the U.S. Bureau of Mines (USBM) (*Mineral Resources of the United States*, 1924-1931, and *Minerals Yearbook*, 1932 to the present). Information on underground workings and mine equipment is generally from the annual reports of the Idaho Inspector of Mines (IMIR), published from 1899 to 1979. After 1974, the Mine Inspector's office was known as the Mine Safety Bureau, a section of the Idaho Department of Labor and Industrial Services. Detailed accounts of mine operations are mostly drawn from the annual reports prepared by the companies for the State Inspector of Mines; these reports were required by law, and the information contained in them formed the basis of the Mine Inspector's annual reports. Reports of recent developments are taken from the Idaho Geological Survey's (IGS) annual reports on mining and minerals in Idaho (from 1984 to present) or from similar reports produced by the Survey's predecessor, the Idaho Bureau of Mines and Geology (IBMG) from 1975 to 1984. Other published sources are referenced in the text. A complete bibliography is included at the end of the report. Where direct quotations are taken from source materials, the original spelling and grammar are preserved.

History of the Copper Basin Mine, Custer County, Idaho

Victoria E. Mitchell¹

The Copper Basin Mine was discovered in October 1888 by A.B. Reed and R.M. Davidson. The mine is in the Copper Basin mining district in the southeastern part of Copper Basin (a broad depression at the head of the East Fork of Big Lost River) between 7,800 and 9,500 feet above sea level (Figures 1 and 2). The mine is a replacement deposit in Paleozoic quartzite and calcareous slate and shale (either the Copper Basin Formation or the White Knob Limestone), commonly though not always in association with aplite dikes (Figure 3). The ore occurs in tabular bodies and irregular pods that are partly controlled by bedding. The main ore minerals are chrysocolla, azurite, and malachite (McHugh and others, 1991).

The property was worked intermittently between 1888 and 1912. In that period, the owners spent about \$65,000 to develop their claims and produced \$40,000-\$45,000 of ore, mostly from copper oxides containing 5-6 percent copper, 10-12 ounces of silver a ton, and \$3 in gold (about 0.15 ounce) a ton (Umpleby, 1917). (See Table 1 for companies and individuals operating at the mine.) A 30-ton smelter, originally at Galena where it was built to smelt lead ores, was moved to Copper Basin in 1900. The smelter made a short run in 1901, but its operation was not successful, leaving large amounts of copper in the slag. Also, it was more economical to haul the ores to the railroad and ship them to an outside smelter than it was to bring coke and sulfide ores to the local smelter and haul the matte out. The wagon road from the mine to Mackay was 60 miles long; a more direct route of 18 miles was very steep in places and suitable only for light traffic (Umpleby, 1917).

The 1903 IMIR described the mine as making a "monster mineral display at the surface, including huge gossan iron cropping containing fair values in copper,

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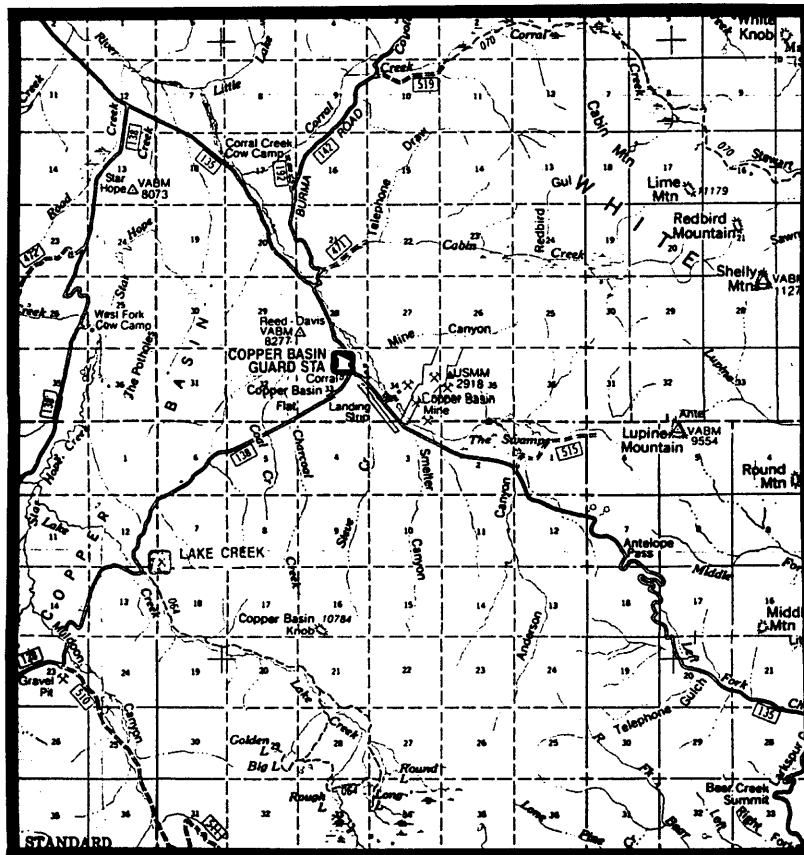


Figure 1. Location map of the Copper Basin Mine and vicinity, Custer County, Idaho (U.S. Forest Service Challis National Forest map, scale $\frac{3}{8}$ inches = 1 mile).

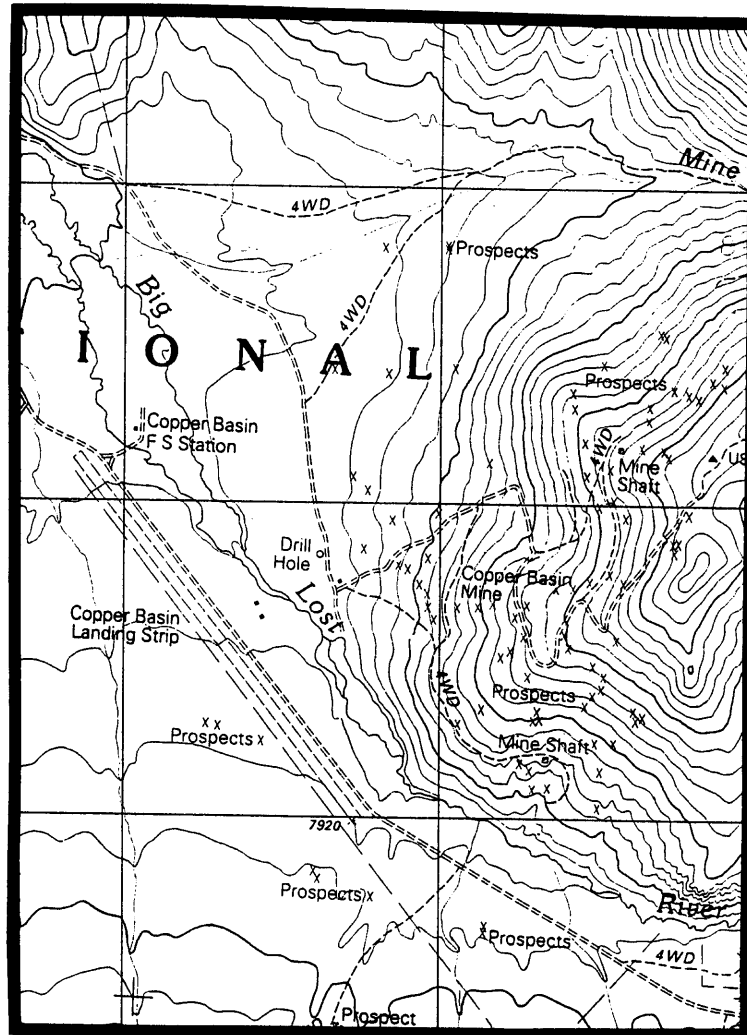


Figure 2. Topographic map of the Copper Basin Mine area (U.S. Geological Survey Copper Basin Knob 7.5-minute topographic map).



Figure 3. Geology of the Copper Basin Mine and vicinity, Custer County, Idaho. Mcb, Mcbd, Mcbu = Mississippian Copper Basin Formation; Mw = Mississippian White Knob Limestone; TKi = intrusive complex of the Pioneer Mountains; Tqm = Tertiary quartz monzonite; Tcv, Tca = Eocene Challis Volcanics; Qg = Pleistocene glacial deposits; Qtg = Pleistocene terrace gravels; Qpl = Pleistocene lake deposits; Qal = Quaternary alluvium. Heavy lines are faults (Rember and Bennett, 1979).

Table 1. Individuals and companies operating at the Copper Basin Mine.

Company Name	Officer	Date Incorporated	Charter Forfeited	Year(s) at Mine
A.B. Reed and R.M. Davidson (locators)	---	---	---	1888- ?
W.H. Plummer and associates	---	---	---	1906-?
Copper Basin Mining Co.	H.W. Wheeler, President	October 23, 1916	Dec. 2, 1918	1916-1918
Copper Basin Consolidated Mines Corporation	George L. Judd, President	Oct. 4, 1937	1940	1937-1940
Utah International	1	1	1	exploration: 1981
Westgold	1	1	1	exploration: 1988

¹Information not available in IGS's files.

gold and silver," and stated that it was considered the "second best copper property in the Lost River drainage" (p. 55). The ore deposits were compared favorably to those of the Empire Mine, both in character and extent.

The mine was bonded to W.H. Plummer of Spokane, Washington, and his associates (from St. Louis, Missouri) in 1906 for \$100,000. The new operator put a force of men to work on the property and planned extensive development.

Some ore was shipped in 1912. The following year, rich segregations of high-grade copper ore, associated with large bodies of iron oxide, were found on the Reed and Davidson property. The mine shipped oxidized copper ore in 1915.

In 1916, the mine was taken over by the Copper Basin Mining Co., which was reported to be controlled by interests associated with the Empire Copper Company. The mine was actively developed and shipped "a number of cars of crude ore of excellent value" (1916 IMIR, p. 30). The Mine Inspector continued, "The Copper Basin deposits produce some of the finest oxide and copper carbonate minerals found in the northwest. These ores, of a decidedly rich secondary nature, should result in some handsome bodies of high grade sulphide mineral when the permanent water horizon is reached, as they are associated with big gossen outcrops" (1916 IMIR, p. 30).

Ore shipments for 1917 were much smaller than in 1916, and the company

worked on a large, newly discovered body of low-grade sulfide ore. The 1917 IMIR contained the following description of the property (p. 68-70):

At Copper Basin near the head of the East Fork of Lost River, the Copper Basin Mining Company is operating and developing a deposit of copper ore that exhibits somewhat similar geologic conditions to the ore occurrence on the Empire property. At this point a mineralized zone, several hundred feet wide, traverses a rather low mountain spur near the border of a broad, open, grassy basin 10 miles in diameter. The formation consists, in cross-sections, of a series of highly silicified limestone and soft lime shale beds, bordering the buried crest of a body of granite porphyry that is known to be 700 or 800 feet broad, by a cross-cut tunnel section, but shows no conspicuous outcrop.

The strike of the zone is nearly north and south. On the western border of this main igneous mass a glory hole quarry has been opened at the surface and tapped at a depth of 60 feet by a cross-cut tunnel that exhibits an ore body 30 by 60 feet in dimension, from which several thousand tons of mineral have been shipped crude, obtaining an average value of about 5 per cent copper in the form of copper oxide and carbonate with a strong mixture of magnetic iron.

On the east side of the big porphyry zone the main copper bearing zone exists. This is several hundred feet wide and carries a series of vertical fissures and one thick dike of black diabase rock with numerous shallow surface developments and manifestations of copper carbonate and red oxide mineral. The principal opening is a vertical shaft, 100 feet deep, started on a surface manifestation of red oxide ore in a hard silicious gangue that has afforded several square set stopes and crude ore shipments amounting to over 1,000 tons, ranging in value from 5 to 15 per cent copper.

A drift along this fissure at the 100-foot level encountered a series of 15-degree flat dipping beds of soft, black lime shale quite uniformly mineralized with a dissemination of pyrite and chalcopyrite, in which a stope has been opened and the entire product shipped crude, and has maximum dimensions of 40 by 30 by 60 feet. The total length of this body of mineral is demonstrated to be 120 feet in the drift. The stoping value of this opening averaged 3 per cent copper. The gangue is friable and disintegrates rapidly on exposure to the air, and with its bright, live sulphide contents, presents an attractive material for ordinary concentrating methods. Another vertical ore-bearing contact fissure traverses the zone a few hundred feet east of this sulphide ore body, and is the probable source of the sulphide mineral here exhibited that has replaced the soluble lime shale after the manner of mineralization common to the Park City lead, silver and copper ore deposits.

... The Copper Basin Company installed a new 500[-cubic]-foot compressor and was pushing a long cross-cut tunnel at the time of the writer's visit in October. This tunnel had attained a length of 800 feet and is designed to bisect the entire zone at a maximum depth of 700 feet, from which drifts on the several interesting ore courses manifested at the surface can be extended and the permanency and importance of the several promising surface deposits of high grade copper minerals can be determined.

In 1918, lessees working the Copper Basin Mine discovered some "handsome" bodies of carbonate ore and shipped several carloads carrying up to 10 percent copper. The mine also produced in 1919.

In 1937, the Copper Basin Consolidated Mines Corporation was organized to

operate the mine. According to the company, total development was about 725 feet, consisting of one 95-foot shaft and 630 feet of tunnels, cross-cuts, and drifts. The mine had two tunnels, and the No. 1 tunnel was 380 feet long. The company sank the shaft 95 feet and did 50 feet of development work on the tunnels during 1938. Some ore was shipped during the year.

Copper Basin Consolidated did 500 feet of development work in 1939; the company's report indicates that some of this work was done on the Copper Basin and some on the adjoining Warner-Anderson property, which the company also held under lease and bond. The company forfeited its charter in 1940.

About 430 tons of copper ore was shipped from the Copper Basin dump in 1953. Several exploration projects were conducted in the Copper Basin area in the 1980s. For example, the property was drilled by Utah International in 1981 and by Westgold in 1988.

U.S. Geological Survey records show that an application was made to the Defense Mineral Exploration Administration for a loan on the property. The application was later withdrawn.

Total development on the property was about 3,000 feet of underground workings, including five adits and a 265-foot shaft. Umpleby (1919) described the Parallel tunnel, near the base of the hill where the mine was located, as about 500 feet long. A 400-foot tunnel was located above the Parallel. The shaft, near the top of the hill, was vertical for the first 120 feet and inclined for the rest of its length. It was inaccessible at the time of Umpleby's visit, but according to his sources, it had levels at 50, 100, and 180 feet below the collar and represented about 900 feet of workings. Figures 4 and 5 show the mine as it appeared in 1994 when it was visited by an Idaho Geological Survey geologist as part of a program to evaluate inactive and abandoned mines in southern Idaho.

Ross (1930) credited the mine with producing about \$230,000 in silver, gold, and lead between 1888 and 1930. Between 1912 and 1953 mined tonnage was 6,211 tons of ore and 262 tons of reprocessed slag. This material yielded 103 ounces of gold, 18,347 ounces of silver, 725,843 pounds of copper, and 2,662 pounds of lead.



Figure 4. Open shaft at the Copper Basin Mine, 1994 (photograph by Falma J. Moye, Idaho Geological Survey).



Figure 5. Open pit workings at the Copper Basin Mine, 1994 (photograph by Falma J. Moye, Idaho Geological Survey).

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