

History of the Boulder Mines Group, Custer County, Idaho

Victoria E. Mitchell

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Idaho Geological Survey
Morrill Hall, Third Floor
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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 The information in this report is from a number of published and unpublished sources in the Idaho Geological Survey's mineral property files. Where not otherwise noted, most of the mine production data is 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 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, for the most part, 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 the developments in 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 even in cases where they do not conform to currently accepted usage.

History of the Boulder Mines Group, Blaine County, Idaho

Victoria E. Mitchell¹

The Boulder mines consist of the Golden Glow and Boulder Consolidated groups, which are adjoining claim blocks in Boulder Basin near the northern boundary of Blaine County (Figure 1). The mines are located in the Warm Spring mining district on the west side of the cirque at the head of Boulder Creek and are at elevations ranging between 8,000 and 10,000 feet (Figure 2). The major workings are on patented ground, with a complex and divided ownership that has existed for most of the history of the claims (Figure 3; Van Noy and others, 1986; Ratchford, 1989).

The Golden Glow group was first located in 1879 and relocated in 1882 (Umpleby, 1915). The present group (consisting of the Ophir, Bazouk, Louisa, Ohio, and Sunrise claims) was patented between 1883 and 1892. The Golden Glow Mining Company also held easement rights on the Trapper, Tip Top, and Sullivan claims, which were patented in 1891 (Van Noy and others, 1986). In 1912, the Boulder Group consisted of twenty-three unpatented claims surrounding the Golden Glow claims and extending down slope to the creek (Umpleby, 1915). The present group, which is only half of the earlier claim block, was patented in 1929. These claims include the Champion, Revenue, Climax, Mint, Mascot, Triumph, Calamine,

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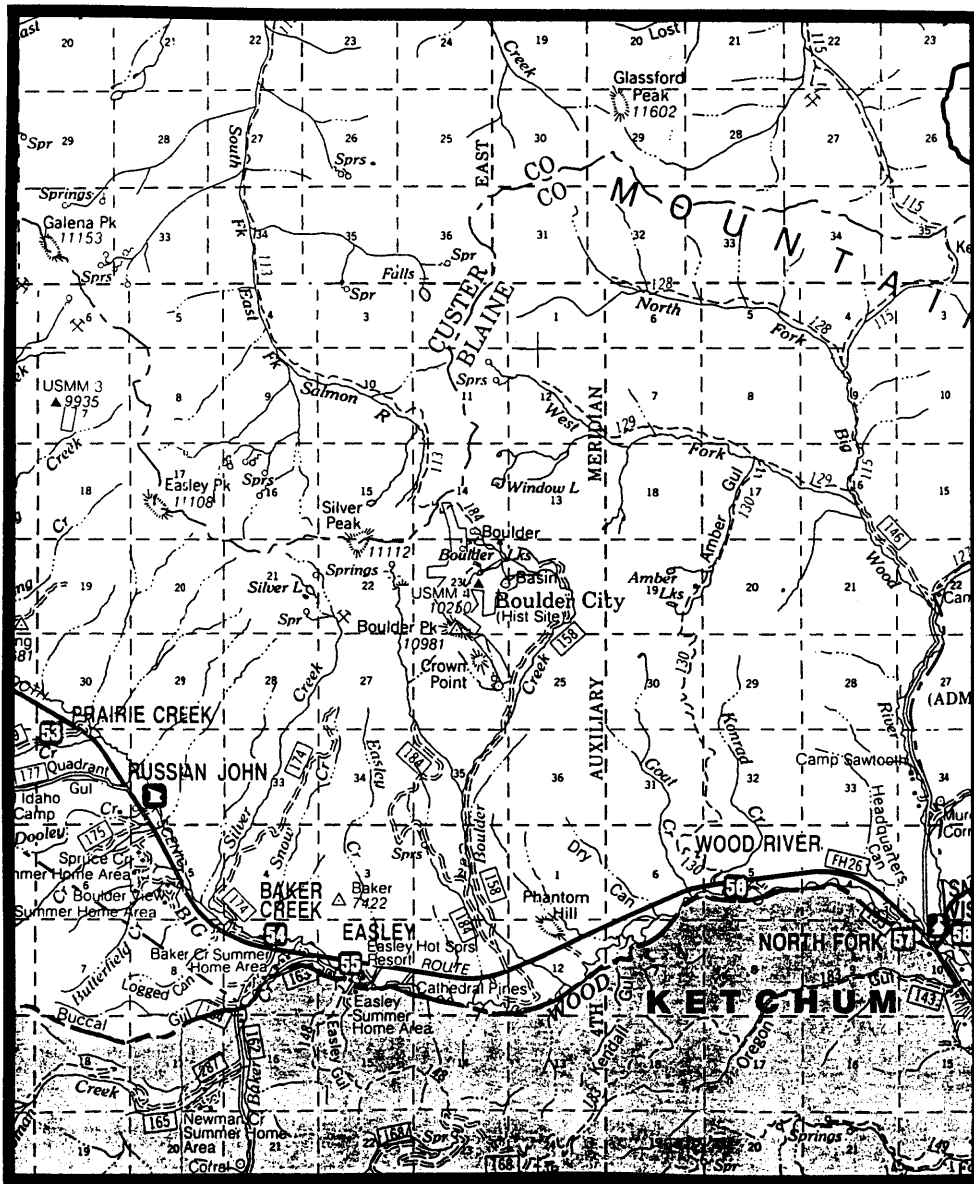


Figure 1. Location of the Boulder Mines Group and vicinity, Blaine County, Idaho (U.S. Forest Service Sawtooth National Forest map, scale 1/2 inch = 1 mile).

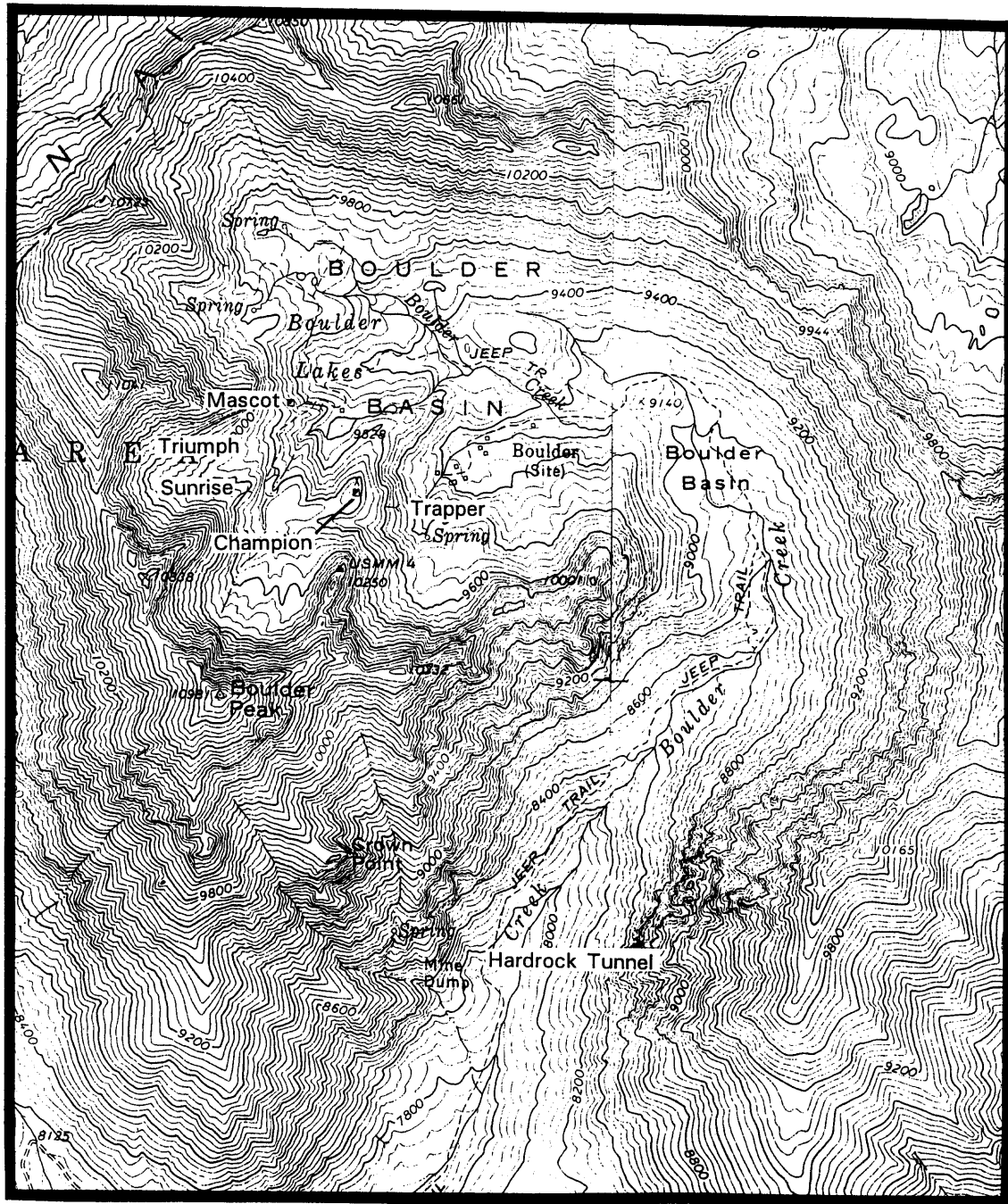


Figure 2. Topographic map of the Boulder Mines Group and vicinity (U.S. Geological Survey Amber Lakes and Easley Hot Springs 7.5-minute topographic maps).

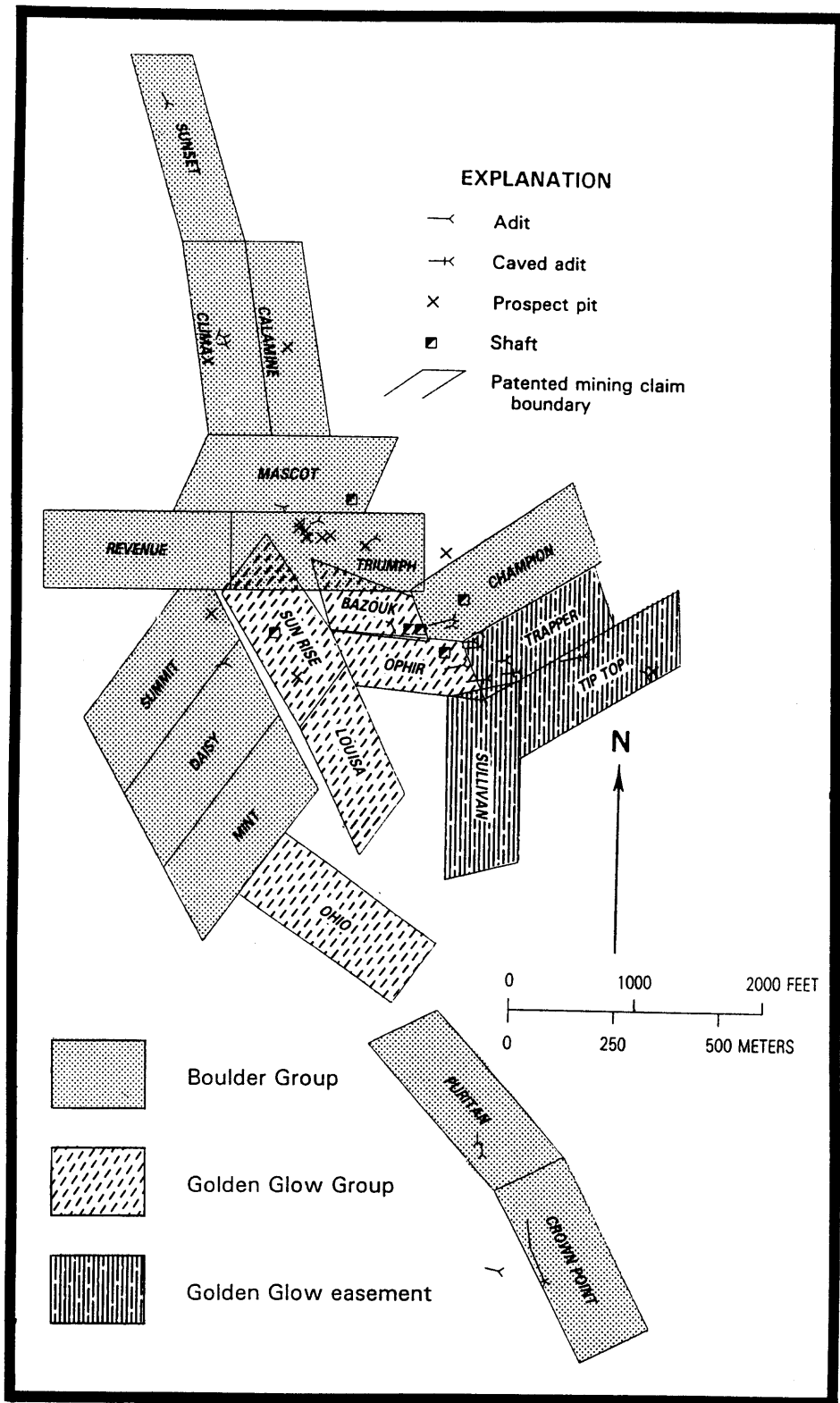


Figure 3. Claim map of the Boulder Mines Group, showing the location of the major workings (modified from Figure 100 in Van Noy and others, 1986).

Summit, Sunset, Daisy, Puritan, and Crown Point. Eleven unpatented claims were located adjacent to the Crown Point in 1935 (Van Noy and others, 1986). The Idaho Mine Inspector's reports and the U. S. Geological Survey's mineral resources reports are as likely to refer to these mines by the claim names as by the company names.

The mines are in massive quartzites of Unit 6 of the Wood River Formation (Figure 4; Ratchford, 1989). The ore occurs as sharply defined lenses, pods, and stringers which are distributed randomly throughout gouge-filled shear zones. The veins were emplaced both as replacement and fissure-filling. Ore minerals include argentiferous galena, cerussite, sphalerite, malachite, chalcopyrite, tetrahedrite, and bornite (Van Noy and others, 1986). The mineralization is entirely of Eocene age; it is confined to faults and shear zones that cut, and are cut by, Eocene dike rocks (Ratchford, 1989).

The Golden Glow was actively worked between 1882 and 1892. No records exist of this production, but Umpleby (1915) estimated that the mine produced \$1 million during that period. Most of the ore produced from this area probably came from the Golden Glow claims. The Boulder Consolidated claims were worked intermittently from 1890 to the present, but little ore has been produced (Van Noy and others, 1986). (Table 1 lists the companies operating at the Boulder Basin mines.)

The 1906 IMIR had the following description of the Boulder Consolidated Group (p. 30):

It is a combination of several important claims recently consolidated that carry a variety of interesting deposits of high grade silver-lead mineral in a formation of limestones, slates and shales. The ore occurs as lenses of clean mineral, and also in large bodies of disseminated ore that will make fine concentrating material.

The position of the veins, striking as they do into such an abrupt and high mountain mass as the group covers, afford remarkable natural advantages for adit tunnel work by which method they are now being developed and the interception of the defined ore shoots shown at the surface in the progress of these tunnels should mean extensive backs of mineral and the development of a profitable mining enterprise.

In 1909 the Boulder Consolidated Company was driving a tunnel (apparently what is now called the Hardrock tunnel) toward the vein system from 3,000 feet below the surface outcrops of the veins. The IMIR noted that the danger of snow slides made it necessary to start the tunnel so far below the surface mineralization.

The Golden Glow Mining Co. shipped several carloads of ore in 1911. According to Umpleby (1915), 125 tons of ore shipped in 1911 contained 43-58 percent lead, 1-2 percent copper, 0.32-0.63 ounce of gold per ton, and 56-92 ounces of silver per ton. The company received \$15,000 from the sale of the ore. The mine had a small concentrating plant consisting of a crusher, rolls, and a jig.

According to the 1912 IMIR (p. 80):

At Boulder Creek, above Ketchum, the Golden Glow Mining Company have



Figure 4. Geologic map of the Boulder Basin and vicinity. Dm = Devonian Milligen Formation; Pwh, PPwe, Pww = Pennsylvanian and Permian Wood River Formation; Tdp, Tg, Tr, Td = Eocene intrusive rocks; Ta, Tda = Eocene dike rocks; Tcd, Tca, Tct = Eocene Challis Volcanics; Qm = glacial deposits; Qt = terrace gravels; Qa = alluvium (Worl and others, 1991).

Table 1. Companies and individuals working at the Boulder Basin mines.

Company Name	Officer	Date Incorporated	Charter Forfeited	Year(s) at Mine
Boulder Consolidated Mining Co., Ltd. ¹	Col. M.W. Wood, President	3	3	1906- ³
Boulder Creek Mines, Inc. ¹	Col. M.W. Wood, President	Nov. 25, 1912	1924	1912-1924
Golden Glow Mining Co. ²	Thomas Papworth, President	July 13, 1911	Dec. 2, 1918	1911-1917
Golden Glow Mining & Milling Co. ²	John D. Pope, President	July 31, 1918	Dec. 1, 1922	1918-1922
Golden Glow Consolidated Mining Co. ²	S.J. Hawkins, President	July 2, 1925	1927	1925-1927
Trapper Mining Co.	3	3	3	3
Tip Top Group Mining Co.	Sylvester Q. Cannon, President	July 17, 1930	Dec. 1, 1954	1930-1954
Boulder Basin Mines, Inc. ¹	J.A. Schultz, President-Manager	January 14, 1932	1938	1932-1938
Boulder Mines, Incorporated ¹	George C. Castle, President & Manager	October 14, 1949	Nov. 30, 1951	1949-1951
Ruth Halvorsen and George Castle ²	---	---	---	5
George Castle ¹	---	---	---	5
Church of Jesus Christ of Latter-Day Saints ⁴	3	3	3	5
Annette Castle ⁶	---	---	---	10
Ruth Halvorsen ⁷	---	---	---	10
E. Lee Schendler ⁸	---	---	---	10
Tip Top Mining Co. ⁹	3	3	<u>3</u>	10

¹Boulder Group.

²Golden Glow Group.

³Information not available in IGS's files.

(Table 1, continued)

- ⁴Owner of record in 1971-1972 of the Tip Top, Trapper, and Sullivan claims (Van Noy and others, 1986).
- ⁵Owner of record in 1971-1972 (Van Noy and others, 1986).
- ⁶Owner of record in 1988 of the Calamine, Climax, Daisy, Louisa, Mascot, Mint, Ohio, Revenue, Summit, Sunrise, and Sunset claims (Ratchford, 1989). These claims include parts of both the Golden Glow and Boulder Consolidated Groups.
- ⁷Owner of record in 1988 of the Bazouk and Ophir claims (Ratchford, 1989). These claims are part of the Golden Glow Group.
- ⁸Owner of record in 1988 of the Champion, Crown Point, Puritan, and Triumph claims (Ratchford, 1989). These claims are part of the Boulder Consolidated Group.
- ⁹Owner of record in 1988 of the Tip Top, Trapper, and Sullivan claims (Ratchford, 1989).
- ¹⁰Owner of record in 1988 (Ratchford, 1989).
-

been pushing development on an interesting group of claims carrying some shoots of rich smelting mineral.

One of these shoots is 140 feet long and one to eight feet wide, containing values from 30 to 70 per cent lead in the form of galena, with occasional splotches of gray copper ore.

Four carloads of crude hand-picked mineral shipped from this property in 1911 had an average sampling value of \$100.00 per ton, of which \$12.00 was in gold.

There is a total of 2,000 feet of tunnel work on the group, and a raise is now being made to intercept the main ore shoot at considerable depth below which it was worked in the upper tunnel, and some profitable shipments may be expected from this group in another year.

The Boulder Creek Mines incorporation in the same vicinity encountered a nice streak of high grade zinc ore in their long development tunnel during the year and additional drifting and cross-cutting are likely to disclose some profitable ore bodies, as the present ore discoveries give evidence of the permanency of the mineral to considerable depth.

Development at the Golden Glow in 1912 consisted of four tunnels and one shaft. (Table 2 shows development work, men employed, and companies operating at the mine, by year.) The tunnels were numbered consecutively from the lowest to the highest, were spaced about 110 feet apart, and were, respectively, 800, 390, 625, and 90 feet long. The shaft was above them and was about 125 feet deep (Umpleby, 1915). Umpleby described the deposits as follows (p. 242-243):

The mine contains one principal vein, which strikes in general N. 50° E. but locally turns abruptly east. The general dip is about 70° SE., but locally it is in the opposite direction, as between levels Nos. 2 and 3. The vein material is bordered by well-defined walls, to which the ore adheres firmly in most places. The space between the walls is locally filled in large part with sheeted and crushed wall rock; elsewhere with vein quartz. Three principal ore shoots have been worked. The largest shoot begins 191

Table 2. Development work, employment, and companies working at the Golden Glow Mine, by year.

Year	No. of Men employed	Tunnels (feet)	Sinking (feet)	Cross-cutting (feet)	Drifting (feet)	Raising (feet)	Operator
1912	12-15	400 ¹	100 ²	100 ³	---	---	Golden Glow Mining Co.
1913	10	475 ¹	---	450 ³	---	450	Golden Glow Mining Co.
1914	20	150 ¹	---	150 ³	---	---	Golden Glow Mining Co.
1918	⁴	100 ⁵	---	---	---	---	Golden Glow Mining & Milling Co.
1919	12	75 ¹	---	75 ³	---	---	Golden Glow Mining & Milling Co.
1920	20	100 ¹	---	100 ³	---	---	Golden Glow Mining & Milling Co.
1921	20	110 ¹	60 ²	50 ³	---	---	Golden Glow Mining & Milling Co.
1937	⁴	---	54	---	40	---	Boulder Basin Mines, Inc.

¹Figure is for total development work done during the year.

²Combined figure for sinking and raising.

³Combined figure for crosscutting and drifting.

⁴Number of men employed was not given.

⁵Combined figure for tunneling and drifting.

feet from portal No. 2 and continues for 100 feet. Sixty-five feet below this level it is 150 feet long, but 60 feet above the level the ends draw in until they are only 5 feet apart. This continues a short distance upwards and then the length again increases to 100 feet on level No. 3. Fifteen feet above this level the ore heads squarely against a smooth surface of quartzite. Above 300 feet west of this shoot, beyond a dike of granite porphyry, there is another, which, as developed, ranges from 10 to 100 feet in length, averaging 30 feet. It has been opened to a depth 50 feet below level No. 3 and continues from it to the surface, 125 feet above. Ninety feet west of this shoot is the "Cache shoot," which was worked by shaft to a depth of 125 feet. It contained ore said to have averaged 55 to 60 per cent in lead and 360 ounces in silver and 3 ounces in gold to the ton. The shoot was

from 10 inches to 2 feet wide and averaged about 90 feet long. In the other shoots the ore is of much lower grade, and in each the width of the vein is from 6 inches to 6 feet, averaging perhaps 20 to 24 inches.

Oxidation is almost complete down to level No. 3, where the ore is a porous quartz heavily stained with iron and manganese, containing lead carbonate in bunches and pockets. Below, the ore consists of galena and a little sphalerite, pyrite, and chalcopyrite in a quartz gangue, containing a little calcite and siderite. Proustite and stephanite are present locally in very small amounts.

In 1912, the Boulder Consolidated claim group surrounded the Golden Glow claims and extended downhill. At creek level, the company was driving a long crosscut (probably the Hardrock tunnel) into the mountain. At the time of Umpleby's visit, the tunnel was 1,000 feet long. It had intercepted stringers of pyrite accompanied by sphalerite in a few places, but had not found any orebodies of minable size. The main object in driving the tunnel was to reach the Golden Glow orebody 1,300 feet below the lowest levels in the Golden Glow mine (Umpleby, 1915).

The Golden Glow shipped ore, which was largely galena, in 1913. (Table 3 shows mine output from the Golden Glow Mine.) In 1918, a small force of men developed the mine all year and made several shipments of high grade lead-silver ore.

The property was sold by the Blaine County sheriff to Thomas Papworth on April 17, 1917, and was then sold to C.L. Fredericks of Helena, Montana, for \$37,512.55. Fredericks' people, organized as the Golden Glow Mining & Milling Co., took charge of the mine on July 1, 1918. In 1918, the Golden Glow Mining Co. did development work and shipped some high-grade ore. The company operated the Ophir and Bazouk claims for three months during 1919 and shipped several hundred tons of sulfide lead ore. According to the 1919 IMIR (p. 67):

At Boulder Creek, a tributary of the upper Wood River, the Golden Glow Mine was taken over during the year by some responsible and competent mining operators of Butte, Montant [sic]. This property has been operated intermittently for a number of years. In the hands of the present Company some intelligent development has been pushed that has demonstrated the existence of a decidedly meritorious deposit of very desirable clean silver-lead ore similar in character to that of the Independence Mine and 12 carloads of high grade, hand picked crude ore was shipped before the close of the year, at which date the output was said to have been increased to a carload a week and a big reserve of high grade milling ore developed which justifies the Company in considering the construction of a concentrating plant of 100 tons a day capacity that I am advised will be undertaken as soon as spring opens. This property now promises to afford a good supply of desirable smelting ore in the future.

There was a concentrator and a steam power plant on the property, but the new owners noted that they were out of date and not operating. A new 50 ton-per-day (tpd) mill was installed in the summer of 1920, and the mine shipped concentrates processed in the mill. In 1921, the Golden Glow shipped lead concentrate to Midvale,

Table 3. Mine output and economic data for the Golden Glow Mine for selected years, 1914-1921. Information is taken from company reports to the Idaho Inspector of Mines.

Year	Tons of ore	Average value per ton	Total mining cost per ton	Transport. and treatment costs per ton	Gold recovered (ounces)	Silver recovered (ounces)	Copper recovered (pounds)	Lead recovered (pounds)	Gross returns
1914	20/30 ¹	\$50.00	---	\$15.00	2	2	2	2	\$2,689.73 ³
1919	82 ⁴	\$100.00	---	\$26.00	2	2	2	2	\$6,902.09 ³
1920	672.14	\$89.75	\$8.98 ⁵	\$26.86	118.03	32,826.01	43,383	16,612	\$49,144.86
1921	228	\$107.00	\$30.00	\$43.00	90	12,224	129,378	7,138	\$14,447.88

¹Company reports mining 20 tons of ore but shipping 30 tons. Some of the material was ore which had been on the dump for "some years."

²Company report gives neither amount of metals recovered nor the percentage of the ore that the recovered metals represented.

³Number is amount received for sale of ore.

⁴Tonnage of ore shipped during the year.

⁵Number given is for "local treatment of ore."

Utah. The 1921 IMIR described the mine (p. 22) as "One of Blaine County's substantial producers, but through mismanagement and misdirection is badly involved in litigation." The mine also produced ore in 1922. At that time, total development on the mine was about 2,500 feet.

Development on the Boulder Creek Mines' property was 1,320 lineal feet, mostly on a single tunnel. (Table 4 lists the development work, men employed, and companies operating at the mine.) The company its equipment as including buildings, a machine shop, 1,400 feet of track, 2 cars, 1,400 feet of air pipe, an air fan, blacksmith tools, and a gasoline engine.

Golden Glow Consolidated Mining Co. was organized in 1925. The new company began active development at the mine and shipped some ore in the latter half of the year. In addition to the company claims, Golden Glow held the Trapper, Sullivan, and Tip Top claims by lease and option from the Trapper Mining Co. (Golden Glow apparently paid Trapper part, but not all, of the purchase price for these claims.) Mine equipment at that time included a 500-cubic-foot steam-driven compressor and a 50 tpd mill equipped with a crusher, jigs, rolls, and tables. Lack of capital forced the company to close down operations at the beginning of 1926.

Ore was shipped from the Tip Top in 1929. The Tip Top Mining Company was organized in 1930 and owned the Trapper, Sullivan, and Tip Top claims. The mine was idle in 1931, but the company allowed the owner of the Ophir Mine to use its tunnels to remove his ore. The claims were leased to J.A. Schultz (Boulder Basin Mines, Inc.) in 1932. Boulder Basin obtained leases on all the patented claims in the Boulder Basin area.

Lead ore was shipped from the Tip Top in 1933. In 1936, Schultz formed a partnership with a Canadian company to work the mine. The mine was reopened, and 94 feet of development work and some diamond drilling were done. However, the partnership was not a happy one. In Schultz's words (taken from the company's 1937 report to the Idaho Mines Inspector):

After forming partnership, the Canadians would not comply with Idaho laws as regards a foreign corp. in doing business here. They further broke State mining laws, refused to give men a bathhouse or change house, kept powder in where the men eat, refused to pipe water for drinking. Then stuck me with Diamond drill bill, refused to pay me, defaulted in property payments, now are trying to conspire to rob and defraud me of my interests in property, by trying to get the lease and then put me out. \$20,000.00 was spent and wasted last year. 54 feet of sinking and 40 ft of drifting was done. Approximately 10 diamond drill holes were put down, all shallow holes, all missed vein except one, due to their engineers rotten figuring. All told, a waste of money.

Total development was approximately 5,446 feet of workings. There was a small gas-driven compressor and "complete mining equipment" on the property. Development on the three Tip Top claims was about 2,575 feet in 1940.

Boulder Mines, Inc., was organized in late 1949. The new company controlled

Table 4. Development work, employment, and companies working at the Boulder Consolidated Mine, by year.

Year	No. of Men employed	Tunnels (feet)	Sinking (feet)	Cross-cutting (feet)	Drifting (feet)	Operator
1915	1	60				Boulder Creek Mines, Inc.
1916	3-4	250 ²	20 ⁴	230 ⁴		Boulder Creek Mines, Inc.
1921	1	30 ²		30 ⁴		Boulder Creek Mines, Inc.
1937	1	⁵	54		40	Boulder Basin Mines, Inc.
1950	3		55			Boulder Mines, Inc.

¹Number of men employed is not given.

²Number given is for total development during the year.

³Number given is combined figure for sinking and raising.

⁴Number given is combined figure for drifting and crosscutting.

⁵Development work also included ten shallow diamond drill holes.

fifteen patented claims in the Boulder Basin. During the first year, the company built roads, sampled the property, did surface stripping, and made open cuts. Some ore was shipped from the mine. Total development was given as approximately 2,300 feet of tunnels and 225 feet of shafts. The main tunnel was 1,300 feet long, and the principal shaft was 40 feet deep. Development on the three claims owned by the Tip Top Group Mining Co. (which were not part of Boulder Mines' holdings) was approximately 2,575 feet, including four tunnels, one inclined shaft, two raises, and seven drifts. The shaft was 35 feet deep, and the raises totaled 190 feet. There were 2,350 feet of tunnels, crosscuts, and drifts. The longest tunnel was 900 feet.

The U.S. Bureau of Mines examined the property in 1971 or 1972 and described the workings in detail (Figures 5 and 6). According to the report (Van Noy and others, 1986), most of the ore came from the Ophir and Trapper claims (Figures 3 and 7). These claims were developed by a shaft and four interconnected tunnels (Figure 8). The Cache Shaft was 125 feet deep, but was filled with water to within 40 feet of the collar. The uppermost, or Ophir, adit was 90 feet long and connected to Adit No. 1 by a 120-foot inclined winze with levels at 20-foot intervals that followed the main ore zone. Ore was stoped near the face of the tunnel, leaving an irregular (and inaccessible) opening about 120 feet long, 3 feet wide, and 120 feet deep. Adit

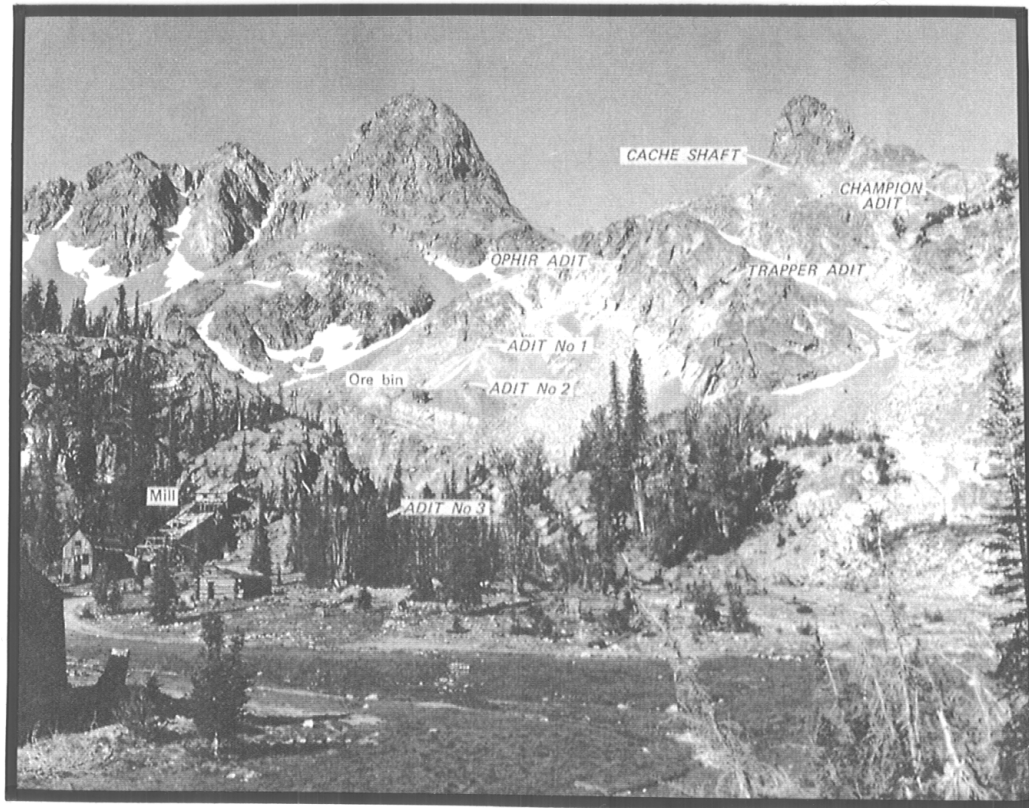


Figure 5. The Boulder Basin mining area, showing the locations of most of the mine workings (Figure 99 from Van Noy and others, 1986).

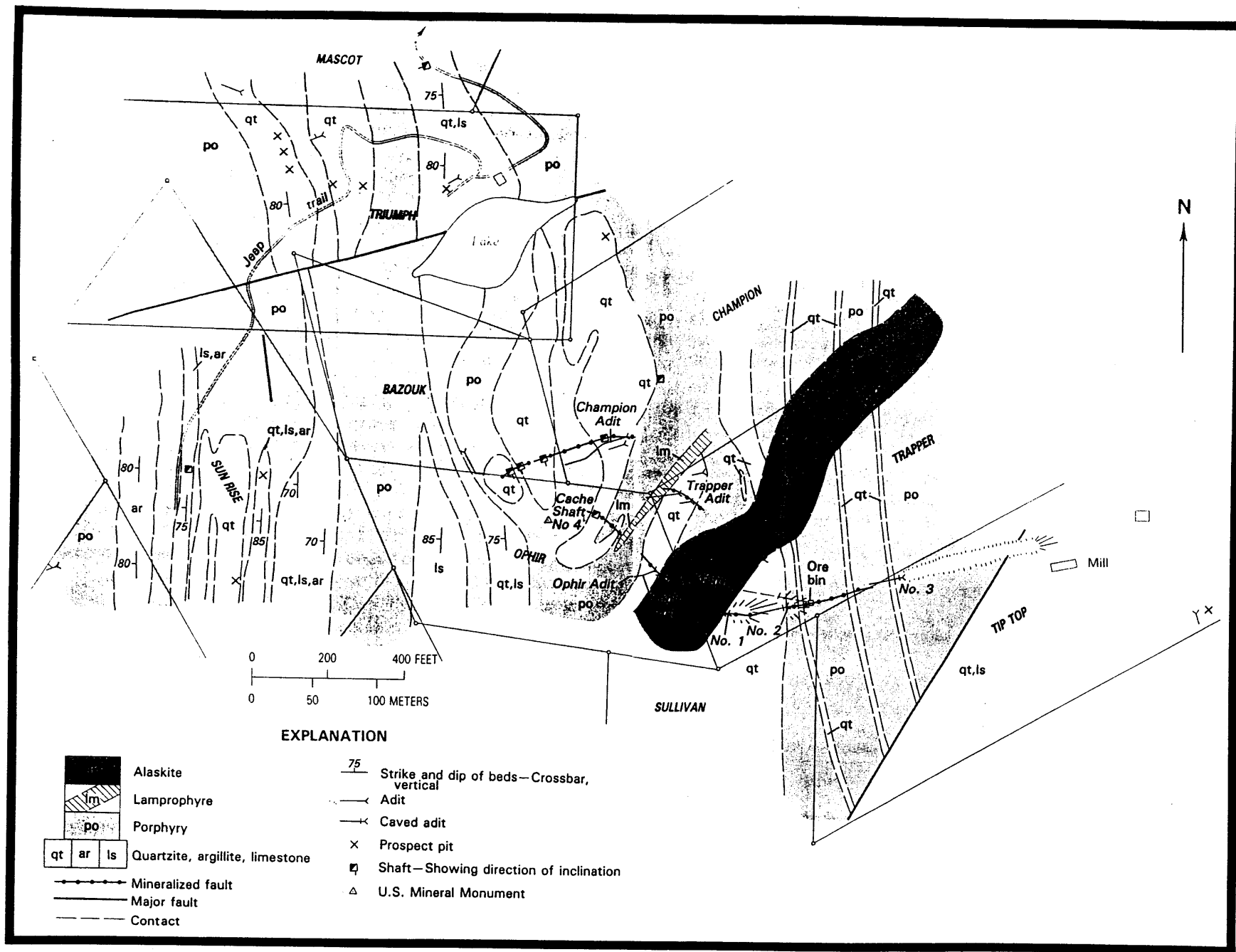


Figure 6. Main workings of the Boulder Mines Group (Figure 101 from Van Noy and others, 1986).

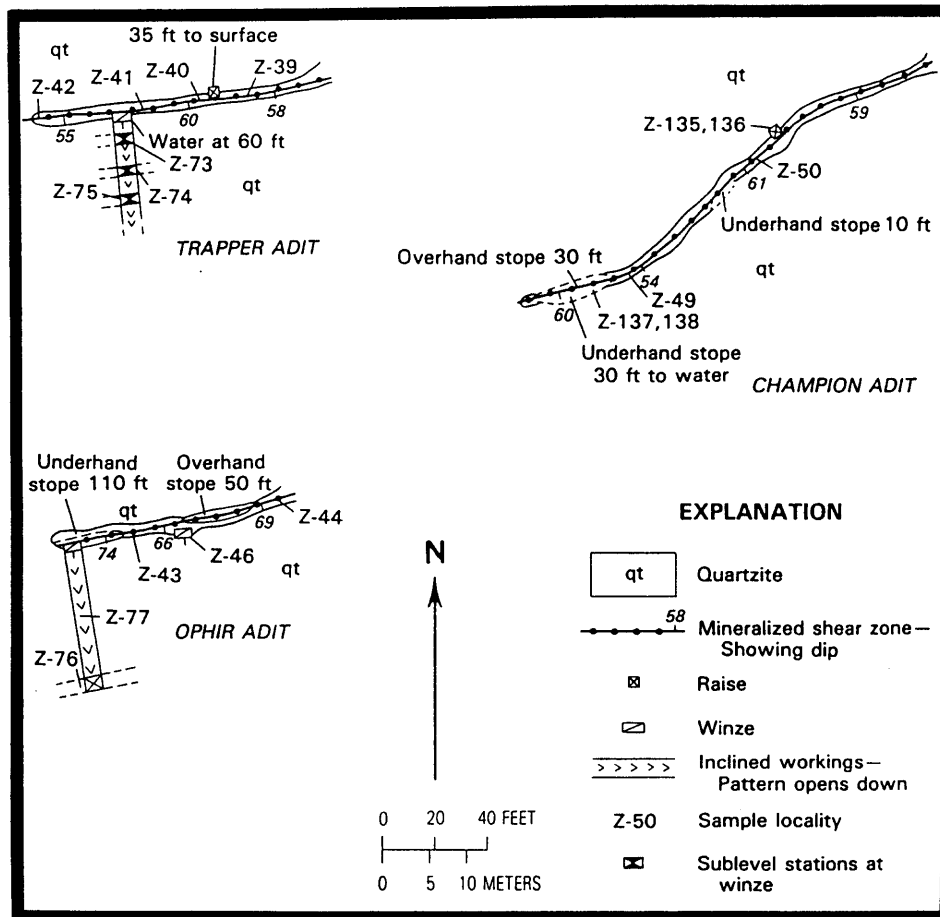


Figure 7. Maps of the Ophir, Champion, and Trapper adits of the Boulder Mines Group (Figure 103 from Van Noy and others, 1986).

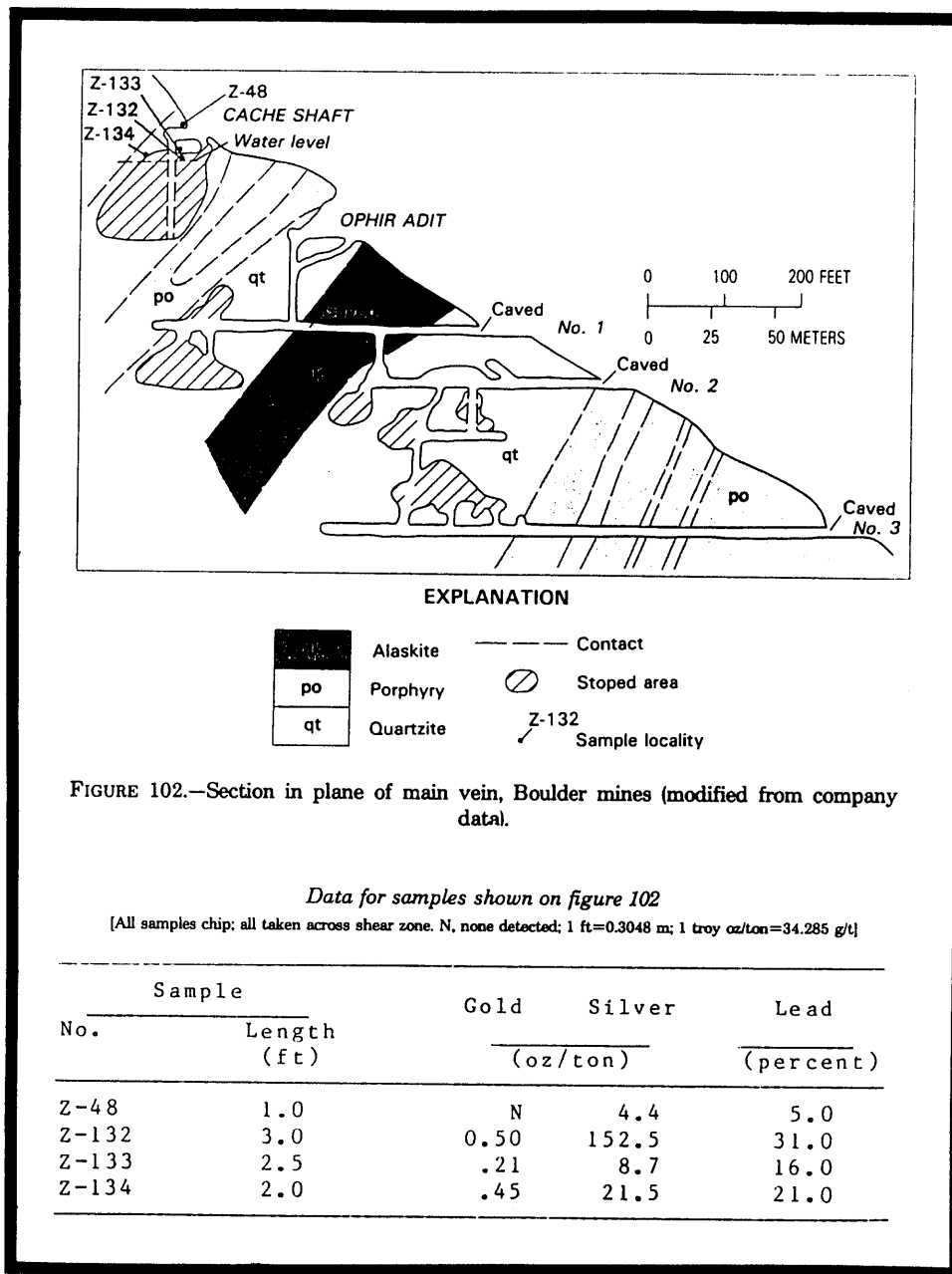


Figure 8. Cross-section in the plane of the main vein at the Boulder Mines Group. The information is modified from company data (Figure 102 from Van Noy and others, 1986).

No. 1 was connected to Adit No. 2 by a 60-foot winze. The portal to the No. 2 Adit was caved and internal access was unsafe, but company records indicated that it was 335 feet long and was connected to Adit No. 3 by several stopes and an intermediate level. The ore shoot on this level averaged 100 feet long, 2 feet wide, and 150 feet deep, and produced the largest amount of ore in the mine. Adit No. 3 was also inaccessible, but company records showed that it had 1,052 feet of drifts and cross-cuts and was used mainly as a haulage level.

A second group of workings, consisting of three adits and four shafts, was on the Bazouk and Champion claims. The main, or Champion, adit (Figures 7 and 9) was 180 feet long and was stoped in three places. The mineralized zone was also exposed in the three shafts and for about 440 feet in the adit west of the Champion adit. The adit and the westernmost shaft were accessible at the time of the USBM visit. A 45-foot intermediate level off the shaft explored the ore zone, and a winze off a 40-foot lateral connected to the adit 80 feet below. A 175-foot shaft was located northeast of the Champion adit.

A third group of workings exposed a mineralized shear zone for 115 feet along the Trapper adit (Figure 7) and 40 feet along a short, unnamed adit. Ore was mined from the Trapper adit. Two 25-foot adits, also on the Trapper claim, followed minor shear zones.

Other workings in the area included: a 40-foot adit, a 20-foot winze, and a 20-foot drift on the Triumph claim (Figure 10); a 12-foot adit on the Sunset claim; an inclined shaft and a 55-foot adit on the Mascot claim; a 20-foot adit with a 50-foot winze and a T-shaped adit on the Climax claim; a 10-foot shaft and two pits on the Sunrise claim; a pit on the Summit claim; a flooded, inclined adit southeast of the mill on the Tip Top claim; a 40-foot adit on the Sullivan claim; an adit on the Daisy claim; and two adits and a trench on the Puritan claim. A 1,000-foot adit, known as the Hardrock Tunnel (Figure 11), was driven from the Crown Point claim toward the main ore zone below the No. 3 adit, but was never completed. (This appears to be the tunnel driven by the Boulder Consolidated Company that was mentioned by Umpleby (1915).) Another adit west of the Hardrock adit extended 15 feet along another shear zone.

Van Noy and others (1986) estimated that the accessible parts of the Boulder mines have indicated and inferred reserves of about 4,000 tons of ore containing 0.05 ounce of gold and 21.7 ounces of silver per ton, 8.7 percent lead, and 1.5 percent zinc. An additional several thousand tons of potential lead and silver resources was believed to occur in the area.

Total recorded production for the mines in Boulder Basin between 1884 and 1949 is 7,790 tons of ore and 172 tons of old tailings. This material yielded 610 ounces of gold, 111,620 ounces of silver, 48,094 pounds of copper, and 1,308,067 pounds of lead. These figures do not reflect the \$1 million of ore that Umpleby (1915) believed was produced before 1900.



Figure 9. Adit (or slit) at the Champion Mine just southeast of the lake in Boulder Basin, 1994 (Idaho Geological Survey photograph by Earl H. Bennett).



Figure 10. Lake near the mines in Boulder Basin, 1994. The small hill in the right center of the picture contains two adits (Triumph Claim?), with another adit on the other side of the hill. A trail/road goes around this hill. Other adits and a shallow shaft are by the white spot, to the left of center (Idaho Geological Survey photograph by Earl H. Bennett).



Figure 11. Dump for the Hardrock tunnel on the Crown Point claim on the Boulder Basin road on Boulder Creek, 1994 (Idaho Geological Survey photograph by Earl H. Bennett).

References

- Idaho Geological Survey (IGS)/Idaho Bureau of Mines and Geology (IBMG) reports on Regional Developments in Minerals, Mining, and Energy in Idaho, 1975-1992.
- Idaho Geological Survey Mineral Property Files (includes copies of company reports to the Idaho Inspector of Mines).
- Idaho Inspector of Mines' Annual Reports (IMIR) on the Mining Industry of Idaho, 1899-1979.
- Ratchford, M.E., 1989, Geology of the Boulder Basin, Blaine and Custer counties, Idaho: University of Idaho M.S. thesis, 154 p.
- Umpleby, J.B., 1915, Ore deposits in the Sawtooth Quadrangle, Blaine and Custer counties, Idaho: U.S. Geological Survey Bulletin 580, p. 221-249.
- U.S. Geological Survey (USGS)/U.S. Bureau of Mines (USBM) Minerals Yearbook chapters for Idaho, 1893-1985.
- Van Noy, R.M., James Ridenour, N.T. Zilka, F.E. Federspiel, R.K. Evans, E.T. Tuchek, and A.B. McMahon, 1986, Economic appraisal of the eastern part of the Sawtooth National Recreation Area, Idaho: U.S. Geological Survey Bulletin 1545-E, p. 231-472.
- Worl, R.G., T.H. Kiilsgaard, E.H. Bennett, P.K. Link, R.S. Lewis, V.E. Mitchell, K.M. Johnson, and L.D. Snyder, 1991, Geologic map of the Hailey 1°x2° Quadrangle, Idaho: U.S. Geological Survey Open-File Report 91-340.