QUARTZ PROPERTY

1. Name of property Balm Creek Gold Mining Company -
   Operating company (or individual)
   Address
   Location of property T 7 S, R 43 E, Sec. - 32 & 33
   Acreage of holdings

2. History of property, past and recent:

Mr. Arthur
Elm St.
329 ~~Chase~~

3. History of production:

4. Development: Number of levels, lengths of drifts and cross-cuts, raises, etc.:

5. General description and equipment on hand, topography, country rocks, elevation, timber, water, snow fall, climate, power, etc.
   Rhyolitic (?) country rock - Slide & Balm Creeks two major converging fault planes - Mine located in "keystone" between - highly & very completely shattered. Main faults E-W - minor faulting trends NW SE. Connection between Poorman Group & Balm Creek near thru Slide creek.

6. Geology - General and local. Ore geology - type of deposit, i.e., vein, mineralised zone, bed; contact relations, attitude and orientation, vein minerals, gangue, type of mineralisation, alteration, enrichment, etc.
   Thoughts (a) Section map would show relation of fault system. Probably a small subsidence area or graben.
   (b) Area to east & west undeveloped and as near as I could find out is unprospected. Same area as McIntyre group. However - no great faulting is in evidence. Good ground to prospect.

7. Metallurgy - nature of ore, hard or soft, free-milling, base, direct shipping, etc. Kind of mill and equipment in use or planned, current daily tonnage of ore or concentrates, approximate value, freight rates to smelter, etc.
   (c)

8. Remarks - economics: High or low cost, principal drawbacks, reasons for success or failure, apparent life of operation based on apparent quantity of ore available. Closed - week of Dec. 18, 1937

M I N I N G R E P O R T

O N T H E

O R E G O N C O P P E R C O.

B A K E R, O R E.

For -

Kidder Peabody & Co.
New York, N.Y.

Mitchell, Hutchins & Co.
Chicago, Ill.

By -

Felix Edgar Wormser
Mining Engineer
25 West 43rd St.
New York, N.Y.

TABLE OF CONTENTS

SUMMARY

The low grade copper mines of the Oregon Copper Co. are situated in eastern Oregon, about 27.5 miles from the town of Baker, and comprise upwards of 2,000 acres of mineral land. There is a railroad within 8 miles of the property. Mining operations at present are confined to two branches -- the Poorman and Balm Creek branches -- about 1,800 feet apart. Over 7,000 feet of underground development has been done on the properties of the company in exploring a series of fissure veins in which the ore is found.

The Balm Creek, or westerly branch, has the best looking discoveries of copper ore, but mining in both branches is still at a shallow depth and the mines can only be considered as being in the prospect stage. Production from the property amounts to 120 tons of copper ore which was shipped to a local smelter in 1923.

The many samples which I took in the company's mines show the average ore to be very low grade copper-gold ore occurring in a quartz-barite gangue. The ore is an intimate mixture of pyrite (iron sulphide) and chalcopyrite (copper-iron sulphide) carrying a small amount of gold and silver. In the best portions of the property the ore will average 1.14 percent copper, 0.05 oz. gold and 0.21 oz. of silver per ton. In general, it runs much lower than this and is exceedingly variable in tenor.

An immense orebody would be needed to make the mining and treatment of such low-grade copper ore profitable. I doubt whether the character of ore deposit represented by the Poorman and Balm Creek mines (a series of roughly parallel fissure veins) can furnish the great uniform tonnage required to make a commercial proposition. The mines do not show this tonnage at present. The successful low-grade copper mines -- the so-called "porphyries" -- are deposits of an entirely different nature, being of broad lateral extent and of moderate depth.

Only a very small amount of ore has been technically blocked out, although there are numereus places where there is indication of ore on one or two sides.

The Oregon Copper enterprise, while a thoroughly justifiable mining venture, is emphatically speculative, with the chances of making a success dependent upon the possible future discovery of a large tonnage of fairly uniform copper or copper-gold ore at depth. Work has been planned to test the Balm Creek mine at a depth of 750 feet below the collar of the Balm Creek Shaft, or 600 ft. below the present depth of operations. My suggestion would be to await the outcome of this work, even at the risk of having to pay a much higher sum for participation in the enterprise later on; or dropping interest in it altogether. Only work at depth will demonstrate the possibilities of the property. Even though a large body of ore may be found the problem of financing the costly construction of a suitable concentrator and other equipment would still have to be faced. The property at the time of my examination was not in such visible shape that success can be predicted.

Location

The mining operations of the Oregon Copper Co. are centered in the foothills of the Eagle Cap range of northeastern Oregon, near the confluence of two creeks — Balm and Slide — which drain into the Powder River Valley (see map). The mines are readily reached by auto road from Baker, on the main line of the Union Pacific railroad. Baker is the commercial headquarters of the region. The road is 27.5 miles long, and crosses the Powder River Valley to a place known as Keating, in easy grades. From Baker to Keating, the road is in good condition, but from Keating to the mine, a distance of 6.5 miles, the road is poor but may be repaired without prohibitive expense. The country traversed is thinly settled and cultivated, being semi-arid land of the sage-brush type common throughout the west. The elevation of the property is 3,700 ft. above sea level.

History and Shipments

The Oregon Copper Co. is incorporated in the State of Oregon for 10,000,000 shares of $0.50 each, a capitalization of $5,000,000. It is an amalgamation of four mining companies — the Balm Creek Copper Co., the Goose Creek Copper Co., the Mother Lode Mining Co. and the Spokane Syndicate. To the mineral holdings of these companies have been added a miscellaneous lot of mineral claims bringing the aggregate number of claims held up to a total of 136.

Prior to the formation of the Oregon Copper Co., a small amount of ore was shipped from the Poorman mine of the Company. I am informed by Mr. Arthur, Resident Manager, that this amounted to 120 tons, all of which was shipped, in 1923, to the Sumpter Valley Smelter while that plant was in operation. The ore is said to have assayed from 2.4 to 3.6% copper and $1.09 in gold and silver, and was shipped to the smelter as part of the result of required assessment work on the property. The shipments were partly the product of sorting.

Climate and Vegetation

The climate is well suited for all-year-round mining operations. Snowfall is light and the winters are short. Vegetation in this semi-arid region consists mainly of sagebrush. On the northern boundary of the property there is some scattered timber but cannot be considered a resource on any of the company's holdings. Timber may be conveniently obtained, however, from the Whitman National Forest just to the north of the company's property, at favorable prices. From this supply the company is now drawing its timber for mining and fuel purposes.

Transportation

Although the only means of transporting ore from the Mother Lode belt at present is by truck over the wagon road to Baker, 27.5 miles distant, this condition can be greatly improved by building a road eight miles long to the terminus of a lumber railroad branching off the

Union Pacific main line at Telocaset (see plate 1). I am told that the lumber company operating this railroad plans to extend it ultimately to within two miles of the Oregon Copper property, in order to cut additional tracts of timber. Cheap transportation is essential in the successful working of any low grade copper mine.

Property Held

The Oregon Copper Co. holds mineral claims over an irregular area about 25,000 ft. long and 4,500 ft. wide. (see plate 2) Title to these claims is valid so long as $100 worth of assessment work is done on each of these claims per year. This work may be concentrated on one claim provided the work is a common improvement for them all. A complete list of the property held follows:

All underground mineral rights underlying and appertenant to Lots 1 and 2 and the Southeast quarter of the northwest quarter of Section 31, Township 7, South, Range 43 East, W. M., in Baker County, Oregon.

Mineral claims as follows:

A.C.W. No. 1
A.C.W. No. 2
" " 3
" " 4
" " 5
" " 6
John A
Eli
Baker
Mary Evelyn No. 1
" " " 2
" " " 3
Ibex
Chadsey
Bing No. 1
" " 2
" " 3
" " 4
" " 5
Dawes
Cliff No. 1
" " 2
Summit No. 1
" " 2
Prophyry No. 1
" " 2
Gladding No. 1
" " 2
Banker
Lucky Jim No. 1

Oregon No. 1
" " 2
" " 3
" " 4
" " 5
" " 6
" " 7
" " 8
" " 9
" " 10
" " 11
" " 12
" " 13
" " 14
" " 15
" " 16
" " 17
" " 18
" " 19
" " 20
" " 21
" " 22
" " 23
" " 24
" " 25
" " 26
" " 27
" " 28
Bud
Copper Queen Fraction

Mohawk
Coolage
Coolage Fraction
Lutessie
Big Four
Portland No. 1
" " 2
Jessie
Emily
Oregon
Mabel
Lucky Bill No. 1
Lucky Bill No. 2
Ethel
Molly Gibson
Van No. 1
" " 2
Mack no. 1
" " 2
" " 3
" " 4
" " 5
" " 6
" " 7
" " 8
Mack Fraction
Mack No. 9
" " 10
" " 11
" " 12

Lucky Jim No. 2
" " " 3
Copper Crown No. 1
" " " 2
" " " 3
" " " 4
" " " 5
" " " 6
" " " 7
Copper Crown Fraction
Copper Creek No. 1
" " " 2
" " " 3
" " " 4
" " " 5
" " " 6
" " " 7
" " " 8
" " " 9

Copper King
Copper King Ext.
Copper Blossom
" " No. 1
" " No. 2
Copper Blossom Fraction
Star No. 1
" " 2
" " 3
" " 4
" " 5
Morning Glory
Copper Ridge
Copper Ridge No. 1

Mack No. 13
" " 14
" " 15
" " 16
" " 17
" " 18
" " 19
" " 20
" " 21
" " 22
" " 23
" " 24

Mining Operations of the Company

There are two separate mines now being operated by the Company. They are known as the Poorman mine and the Balm Creek mine, and are situated on the west and east forks of Balm Creek, respectively. The East fork of Balm Creek is known locally as Slide Creek (see Plates 1 and 2). The two mines are separated from each other by a ridge, the divide between the two forks of Balm Creek, and are 1800 ft. apart.

In the early stages of mining work both mines were opened by tunnels, but, owing to the fact that the slope of the country around the mines is only moderate, it became necessary to resort to shafts in order to gain increased depth.

The Poorman mine was developed on the east side of Slide Creek. At a lower elevation about 1/8 mile distant, and on the west side of Slide Creek, a long tunnel known as the Gilkison tunnel was driven to explore the ridge between Balm and Slide Creeks (see photo).

The Balm Creek operations are the most recent and contain some of the best showing on the property.

Underground Development.

A great amount of underground exploration has been done on both the Poorman and the Balm Creek mines of the Company. It totals approximately 7,000 ft. (see Plate 3). Operations at the Poorman mine are confined to three horizons, the topmost being an adit (tunnel), almost on the same level with the collar of the Poorman shaft. The two lower horizons are levels extending from the Poorman shaft, which is a two-compartment affair, 8 x 4.5 ft. in the clear, and 294 ft. deep. The first level is at a depth of 144 ft. below the collar of the shaft; the second is 150 ft. lower. Two raises connect No. 1 Adit and the first shaft level.

Development at Balm Creek is also confined to three horizons, the two upper being adits and known respectively as Balm Creek No. 1 and Balm Creek no. 2 Adits. The portal of Balm Creek No. 1 Adit is 84 ft. lower than the collar of the Poorman shaft. This adit connects with the Gilkison tunnel through a short 8 ft. raise leading out to Slide Creek. No. 2 Adit is 52 ft. lower than No. 1 and 18.5 ft. below the collar of the vertical Balm Creek shaft, which is located close by. Only one level has been cut in the Balm Creek shaft (8 x 5 ft. and two compartments) and it is 150 ft. lower than the collar of the shaft. It is planned to sink this shaft for 600 ft. further.

Geology

The rocks in which the Mother Lode ores are found are a series of Triassic volcanic flows. Underground development shows that the ore occurs in a sheared zone, that is, a belt of rocks which have been crushed and sheared by faulting, or the slipping of one rock mass upon another. Quartz veins carrying the copper-gold ore have infiltrated into this sheared zone and replaced it in large part. These veins outcrop at various points on the

surface as they are more resistant to erosion than the softer country rock. The veins are roughly parallel with one another. The ore occurs in shoots (mineralized areas) in the veins, with barren areas in between. The veins have been subjected to much squeezing, which has caused lenses of hard ore to form, separated by softer portions. Barite (sulphate of barium) is found in the gangue or waste matter in the ore, but is of no commercial value, being too impure. The ore is mainly valuable for its content of copper, gold and silver. Pyrite (iron sulphide) and chalcopyrite (copper iron sulphide) are the principal metallic minerals found in the ore, but some galena (lead sulphide) and sphalerite (zinc sulphide) have also been detected. The gold occurs locked up both in the pyrite and chalcopyrite. The ore may be classified as a low grade copper-gold ore.

The country rocks near the surface are so thoroughly altered, owing to oxidation by surface waters and atmospheric conditions, that they are not readily distinguished in the upper levels of the mines of the Company. They appear to be fine-grained acidic rocks, andesite and rhyolites perhaps, and may be termed, roughly, greenstones, owing to the coloration given them by their alteration products.

A thick mantle of soil covers the country side and obscures the surface features, making it difficult to correlate the rock structure and veins on both portions of the property.

The vein outcrops were the first points of mineral discovery. They are invariably weathered and rusty appearing, the valuable and easily soluble minerals having been leached. Only rarely is there visible evidence of mineralization in the outcrop. The outcrops strike about N. 70 W. and dip steeply south. Trenches have been cut on the outcrops in some places, and in others short shafts have been sunk. The greatest amount of surface work on the outcrops has taken place on the Balm Creek side of the operations where some 240 ft. of trenching has been done. Six veins have been identified, and work has been done underground on four of them.

Secondary Enrichment.

Owing to the action of surface rain water and melting snow carrying oxygen, the valuable metallic constituents of the veins on the Mother Lode property have been leached and oxidized, leaving only part of the more resistant gold behind. The pyrite and chalcopyrite has been readily dissolved, leaving as evidence some iron oxides (hematite and limonite). Copper in the chalcopyrite has been dissolved and reprecipitated at depth, the depth depending principally on the ground water level. This action is known as secondary enrichment, and is often the means of forming a zone of especially rich copper ore at a moderate depth below the surface.

In the Mother Lode operations, I did not observe any extensive area of secondary enrichment, although I did detect some chalcocite (copper sulphide) of secondary precipitation on several levels. The ore found in the Balm Creek operations, particularly in the shaft level is primary

ore, and on the mining of this class of ore the fate of the enterprise will depend.

The Ore

The ore is an intimate mixture of pyrite and chalcopyrite carrying small variable amounts of gold and silver, in a gangue of quartz and barite. Although the character of the ore would not be expected to change much in a depth of 100 ft., the workings on the Balm Creek, and for that matter on the Poorman mines, are at such a comparatively shallow depth that there is apt to be a change in the proportion of pyrite to chalcopyrite in the ore. The present ratio may be altered so that the amount of copper may decrease, so that the pyrite may be the dominant mineral at depth. Frequent determinations at various depths and locations should be made to ascertain whether the pyrite or the chalcopyrite carry the gold and silver metals.

Genesis of the Ore

The veins of the Mother Lode region appear to have a close relation to the igneous intrusion of granite (Sparta granite) found a short distance from the property. Hot magmatic emanations from this granite intrusions penetrated a sheared zone in the country rock, replacing it with quartz and barite carrying the copper, gold and iron minerals. Petrographic work by Mr. E. J. Colony on the ore has shown that there were several events, geologically speaking, in the formation of the ores. They are as follows:

a. Fracturing of the country rock and establishments of a shear zone.

b. Mineralization of this zone with vein quartz and pyrite.

c. Fracturing and crushing of both vein quartz and pyrite.

d. Healing and mineralization of the fractured quartz pyrite vein matter with (1) carbonate, (2) later quartz, (3) chalcopyrite and possibly (4) a little later pyrite.

Barite came last in the mineralization and the chalcopyrite in part replaces the pyrite.

Sampling

A total of 134 samples was taken by me. Of this total, nine samples were cut in the trenches on the Balm Creek outcrops; 85 in the Balm Creek workings, and 40 in the Poorman operations. The location of each sample (numbered consecutively from 1 to 134 inclusive) is shown on the Assay Maps accompanying this report — Plates 4 and 5.

The samples were sometimes cut vertically on both walls, and sometimes on one wall where the other wall was apparently barren. Frequently they were taken horizontally or inclined. In every case an effort was made to take a cut across the formation and to take a uniformly heavy cut through-

heavy cut throughout its entire length.

The samples in the Balm Creek trenches consisted of cuts across the vein which has a maximum width of 118 ft., as indicated on the sketch map accompanying.

The samples averaged 50 lb. in weight, as sacked underground, and were taken on the surface to be coned and quartered. As shipped to Messrs. R. H. Officer & Co., of Salt Lake City, they averaged 5.3 lb. in weight.

All cutting of the samples and reduction of their bulk was done under my personal observation and direction.

Poorman Branch

The first streak of ore in the Poorman No. 1 Adit begins at a point about 240 ft. from the portal and continues for a length of 225 ft. The average of the samples taken in this showing of ore on both sides of the adit and in the short crosscuts from it, shows 0.93 copper, traces of gold, and 0.10 oz. of silver per ton. This is too low grade to be profitably mined under present conditions. In a small stope at the head of the raise leading to the level below, the ore averages 1.50 percent copper, no gold, and 0.10 oz. silver per ton. This is the point from which shipments were made to the smelter in 1923. The ore here is exceedingly tough and hard. The raise was sampled at three places but showed only very low grade ore. (see Plate 4). The ore occurs mainly near the top of the raise and averages 0.87% copper, traces of gold and 0.33 oz. of silver.

The first level in the Poorman shaft is 150 ft. below the No. 1 Adit immediately above it. Here also the ore occurs as a narrow band along the drift (see Plate 4) and averages 0.67 percent copper, no gold and 0.10 oz. of silver per ton. A sample, which I took across the red vein for 14 ft., assayed 0.85 percent copper, no gold and 0.20 oz. of silver. There are only a few places where the ore is rich enough in metallic content to justify mining.

An ore exposure in the drift to the west of the shaft station assayed 0.43 percent copper, a trace of gold, and 0.10 oz. of silver. This grade of ore cannot be handled successfully today.

The second level in the Poorman shaft was flooded at the time of my visit and was not available for inspection.

Balm Creek Mine

Operations at the Balm Creek branch have had for their object the development of the barite vein which outcrops on the ridge between Balm and Slide Creeks. The outcrop of the vein has been trenched and shows a width in one trench of over 110 ft. and varying amounts of gold -- from 0.02 oz. to 0.58 oz. per ton ($0.40 to $11.60). (See Assay Map, Plate 5)

The Balm Creek Adit No. 1, which connects with the Gilkison Tunnel through a short raise shows some copper ore averaging 1.327 percent copper, 0.027 oz. gold and a negligible amount of silver per ton, about 175 ft. distant from the portal of the Adit. The ore seems to occur here in a lense, almost directly below the trenches referred to above. Farther on (90 ft.) more ore has been found averaging 0.84 percent copper and 0.03 oz. of gold. This ore is too low grade to handle. Elsewhere in the Gilkison tunnel the ore is also very low grade. (See Plate 5).

Balm Creek Adit No. 2 is 52 ft. lower in elevation than Balm Creek Adit No. 1. At a point about 430 ft. from the portal a narrow shoot of ore has been encountered averaging 0.95 percent copper and 0.02 oz. of gold per ton along 160 ft. and for a varying width up to 50 ft. The remainder of the ore on this level is too low grade to be considered commercially.

The Balm Creek shaft is 150 ft. deep and the first level is 131 ft. below Balm Creek Adit No. 2. The ore disclosed by drifting and crosscutting on this level is the best in appearance and grade of any of the property, but the pay streaks or profitably workable portions are about 25 ft. wide and separated by bands of much lower grade ore. The average of samples taken by me in ore on this level shows 1.14 percent copper, 0.05 oz. gold and 0.21 oz. silver per ton. This is low grade copper ore sweetened by the presence of the gold and silver which contribute about $1.10 to its gross value. No accurate tonnage estimate of the ore on this level can be made yet because no work has been done to show the extent of the ore between this level and the Balm Creek No. 2 Adit above. A strongly marked fault cuts off the ore abruptly in the diagonal crosscut driven through the ore. The ore has not been picked up beyond the fault.

Present Equipment

Poorman Branch

Surface shaft equipment consists of a small steam-driven hoist of 22 HP. capable of lifting a load of 2500 lb. at a speed of 150 ft. per min. Steam is furnished by a wood-fired 80 hp. H.R.T. boiler. Compressed air is supplied by a 360 cu. ft. per min. Sullivan single-cylinder air-compressor belt driven by a 75 hp. Foos distillate engine.

A duplex steam pump of ample capacity — 200 gals. per min. — keeps the mine unwatered down to the 125 ft. level. There is a plentiful supply of drill steel and four air drills in working order. Sharpening equipment consists of a Sullivan air sharpener.

The equipment is suitable only for small scale working and is nicely suited for present exploration.

Balm Creek Branch

Equipment here is designed purely for prospecting and consists of a 34-ft. head frame from which is suspended a 500-lb. ore bucket on a

3/4-in. wire rope hoisted by a Sullivan turbinair hoist. Compressed air is received through a pipe line laid over the hill from the Poorman surface plant. Sullivan air drills of the light jackhammer type are used in shaft sinking drifting and other underground work. A small gas engine-driven centrifugal fan supplies air for underground purposes. With this equipment the Balm Creek shaft was sunk to its present depth of 150 ft.

Labor

Labor is plentiful in the district and comprises various nationalities. Miners receive $4.50 to $5.00 per day and are charged $1.25 per day board at the company's boarding house.

Power

For large scale operations it will be necessary to obtain a source of cheap power. By building a line 22 miles long to tap the branch transmission line of the Idaho Power Company to Cornucopia (see Plate 1) a source of cheap electric power can be readily procured.

Water Supply

An adequate water supply is needed for both mining and milling, and living uses. Unfortunately, Balm Creek and its tributaries furnish too small a supply of water in the summer for other than operations on a very small scale. This supply will have to be augmented by that from some neighboring stream, most likely by that of Goose Creek which is the next creek to the east of Slide Creek and Balm Creek proper. Although the water right to Goose Creek is held by some farmers, I understand that an arrangement, or an outright purchase, can be made with these parties to insure the diversion of a sufficient supply of water for milling and other uses.

Diamond Drilling

Diamond drilling under contract has been done on the Poorman Branch of the property. Five holes were drilled at points indicated on Plate 3, to explore the red and leached vein at depth. However, owing to the soft character of the ground penetrated, the diamond drill core recovery amounted, on the average, only to about 30 percent of the total footage drilled. None of the holes have shown any large quantities of commercial ore although yielding valuable information about the character of the ground penetrated.

At the time this diamond drilling work was planned the promising discoveries in the 1st level of the Balm Creek shaft had not been made,

which is a better area to drill than the Poorman branch.

Concentration of the Ore

The ore is readily amenable to wet methods of gravity and flotation concentration, and this phase of the problem of mining and treating the Oregon Copper ore should offer no difficulties. The ore will crush well and the metallic particles, pyrite and chalcopyrite can be separated from the gangue as easily as is done in numerous other similar deposits. But it is far too early in the venture to consider the erection of suitable milling facilities.

Market for the Product

The natural outlet for any copper concentrates produced by the Oregon Copper Co. would be shipment to the copper smelters at Tacoma, Washington, or Salt Lake City, Utah. Settlement by the smelters for the copper content of the ore at Salt Lake City would be based on the New York price for electrolytic copper and might be somewhat as follows:

Assay of the ore in copper, less 1%, pay for remainder at Engineering and Mining Journal quotation less 3 cents per lb.

On top of this there is a treatment charge of $4.00 to $7.50 per ton of concentrates depending upon the price of copper.

Gold is paid for at the rate of $19.00 per oz. and silver at the New York quotation of 1.0 oz. or over for 95% of the silver content of the ore.

An important factor deserving of consideration in appraising the prospects of the Oregon Copper venture is the probable future price of copper. For several years the price of copper has been at a low level compared with the general commodity price level, owing to the immense output of low grade copper mines in the United States, South America and Africa. The new additions to the world's supply of copper made by mining companies in South America and Africa, especially, have swelled the output. The supply of copper has kept in advance of the demand. This situation bids fair to continue for several years, or until the demand for copper has grown.

The Oregon Copper venture should be able to produce copper profitably when the copper market is around 13 cents per lb. or it will not be able to compete with other copper mining enterprises and may suffer costly periods of enforced idleness.

COPY OF CERTIFICATE OF ASSAY

R. H. Officer & Co.

Salt Lake City, Utah

Mr. F. E. Wormser,
25 West 43rd Street
New York City

March 10, 1927

No.	Gold oz.	Silver oz.	Copper %	No.	Gold oz.	Silver oz.	Copper %
1	Trace	0.10	0.25	65	Trace	0.20	0.17
2	"	0.10	0.28	66	"	0.30	1.20
3	0.02	0.08	0.46	67	0.02	0.28	1.70
4	0.04	0.16	0.74	68	0.02	0.28	0.80
5	0.02	0.18	0.79	69	0.02	0.18	0.75
6	0.02	0.08	1.32	70	0.015	0.20	0.80
7	0.02	0.08	1.17	71	Trace	0.20	0.62
8	Trace	0.20	0.90	72	0.015	0.30	2.19
9	0.01	0.09	0.84	73	0.16	0.24	1.77
10	0.03	0.17	1.10	74	0.08	0.20	1.60
11	0.01	0.20	1.10	75	Trace	0.20	0.12
12	0.01	0.10	1.05	76	"	Trace	Trace
13	0.03	0.17	0.70	77	0.10	0.20	2.19
14	0.03	0.07	0.74	78	0.01	0.10	0.10
15	0.03	0.17	1.20	79	Trace	0.10	0.08
16	0.03	0.07	1.10	80	0.01	0.10	0.55
17	None	0.10	0.25	81	0.08	0.10	1.27
18	None	0.10	0.22	82	0.10	0.20	1.20
19	Trace	0.10	1.00	83	0.08	0.22	1.37
20	"	Trace	0.20	84	None	0.10	0.12
21	0.01	"	1.62	85	"	Trace	1.94
22	0.02	"	0.55	86	"	0.10	0.77
23	None	"	0.15	87	"	0.10	0.65
24	0.10	"	0.35	88	"	0.10	0.75
25	0.005	"	0.87	89	"	0.10	0.65
26	0.10	0.10	2.14	90	"	0.10	0.75
27	0.02	0.10	1.84	91	"	0.10	1.75
28	0.04	0.16	2.14	92	"	Trace	0.20
29	0.005	Trace	0.10	93	"	"	0.62
30	0.14	0.06	0.95	94	"	0.10	1.45
31	None	Trace	0.05	95	"	0.20	3.14
32	0.12	0.18	2.47	96	"	0.10	0.80
33	0.005	0.20	0.50	97	Trace	0.10	1.40
34	0.005	Trace	0.05	98	"	0.70	1.00
35	None	0.10	0.25	99	None	0.20	0.20
36	"	0.10	0.15	100	"	0.10	0.15
37	0.02	0.08	0.10	101	"	Trace	Trace
38	0.005	Trace	0.30	102	"	"	0.10
39	None	"	0.10	103	"	0.10	0.10
40	Trace	0.10	0.60	104	"	0.10	0.32
41	None	0.10	0.60	105	"	Trace	0.05
42	0.005	0.10	0.85	106	"	0.10	1.40
43	Trace	Trace	1.00	107	"	Trace	0.40

No.	Gold oz.	Silver oz.	Copper %	No.	Gold oz.	Silver oz.	Copper %
44	0.005	0.10	0.80	108	None	0.10	0.32
45	0.06	Trace	1.10	109	"	0.10	0.22
46	0.08	"	2.49	110	"	0.10	0.12
47	0.07	"	1.50	111	"	0.20	0.10
48	0.10	0.10	2.29	112	Trace	0.10	0.82
49	0.01	0.10	0.12	113	None	0.10	1.45
50	Trace	Trace	0.50	114	"	0.10	1.15
51	0.01	"	0.35	115	"	0.20	2.09
52	0.02	0.18	0.55	116	"	0.20	1.55
53	0.06	0.44	2.29	117	"	0.10	2.39
54	0.02	0.18	0.55	118	"	0.20	0.85
55	0.02	Trace	0.60	119	"	0.30	4.69
56	0.02	0.08	0.60	120	Trace	0.10	0.50
57	0.02	0.08	0.55	121	"	0.10	0.70
58	0.02	0.18	0.90	122	None	0.10	0.12
59	None	0.10	0.05	123	"	0.10	0.08
60	"	0.20	1.80	124	0.03	0.07	2.16
61	0.005	0.10	0.15	125	0.02	0.18	0.95
62	None	Trace	Trace				
63	Trace	0.10	0.20				
64	0.02	0.18	0.50				

No.	Gold oz.	Silver oz.	Copper %
Mt-1	0.06	0.14	Trace
MT-2	0.09	0.21	None
MT-3	0.08	0.32	None
MT-4	0.58	0.42	None
ET	0.18	0.32	Trace
EST	0.06	0.24	None
WT	0.02	0.28	None
WWT	0.025	0.18	None
SQ.TR	0.025	0.18	None

Respectfully submitted,

R. H. Officer & Company

By: A. E. Jensens,
Laboratory Director

A BRIEF GEOLOGICAL REPORT ON THE MAIN STRUCTURAL FEATURES OF THE MOTHER LODE PROPERTY

General Situation and Topography

This part of the subject will not be entered into as both general situation and topographic features have been adequately covered in previous reports and need not be repeated.

Geology

Sedimentary Rocks

The oldest rocks exposed in the camp are locally known as slates and consist of a series of what might be termed aque-igneous sediments or rather metamorphosed sediments, as they are highly altered. They are composed in part of land derived material intermixed and interbedded with fine volcanic tuffs and sills and occasional lenses of impure limestone. The name slates is technically a misnomer although it is about as good a field name as could be applied to these rocks.

These rocks, which are undoubtedly of great thickness, occur in medium thin beds from a few inches to two or three feet in thickness and have no regularity in strike or dip, but tend more towards flat, rather than steeply pitching folds.

They are almost identical in appearance and seem to be in the same geological horizon, as a similar series of rocks which occur at Homestead, Oregon, and on Cuddy Mountain, Idaho. In the former place, there are found fossil brachiopods of the genus productus which have been classed as of Permian age.* Some fragmentary fossils found in this same series on Cuddy Mountain were tentatively classed, by the United States Geological Survey, as of late Carboniferous age. Near the Bayhorse mine on the Snake River, in a similar appearing series of rocks, the writer found a fragment of productus shell. I am inclined to think that the sedimentary rocks at the Mother Lode are of Permian or late Carboniferous Age from their general similarity to rocks of this age which occur in neighboring localities and which have been definitely classified by fossil evidence.

These sediments have been intruded by a number of irregular dikes and are also covered to a considerable extent by volcanic flows and soil so that they now occur in a somewhat scattered and fragmentary manner throughout the camp.

Igneous Rocks

Intrusives.

No thin section studies have been made of the rocks collected up to the time of writing and the following material is based on hand specimen determination only and is rather too qualitative in character to be considered as exact data.

* Dr. F. B. Laney, University of Idaho. Personal Communication.

Outside of a few late basaltic dikes the intrusive rocks appear to fall into three principal groups:

First, a somewhat basic crystalline rock, possessing no visible quartz but a considerable quantity of feldspar and ferro-magnesian minerals, and which has been classified in the field as a diorite. This rock occurs in the form of irregular dikes or stocks and its largest area is in the vicinity of the junction of Balm and Slide Creeks. It forms a knoll between the forks of these two creeks and is well exposed on the hillside to the west of Balm Creek and along the wagon road leading to the Balm Creek shaft, where it can be seen underlying the slates. There are a number of small areas of this rock occuring in the camp but this is by far the largest.

The second intrusive type, which occurs in the camp, is a quartz porphyry or rhyolite. This is a normal quartz rhyolite in which the quartz phenocrysts vary in size from place to place and in some cases are almost entirely lacking. The rock very commonly weathers to a brown or reddish tint on account of the pyrite, which is included in it. The largest area of this rock exposed is below the junction of Balm and Slide Creeks. At this place it forms well marked bluffs and has evidently been displaced by a fault. Another large area of quartz porphyry is exposed on Balm Creek a short distance above the shaft. Being a fairly hard rock it has resulted in somewhat narrower canyon, with steep walls at the point where it has been cut by the creek. A small outcrop of a similar rock occurs to the east of the Poorman tunnel and there is undoubtedly a considrable area of similar rocks on Slide Creek above the cook house, but these were not investigated to any extent.

A third class of intrusives has been termed in the field andesite porphyry. These are usually grey colored rocks of typical porphyritic texture and which occasionally show quartz phenocrysts. Accompanying the sedimentary series, generally known as slates, there are certain distinct flows or sheets of andesitic rock. In addition to this, there are somewhat similar looking andesite intrusives which are much later than the andesites of the sedimentary series. The most important of these, from an economic point of view, is a porphyry that might be termed the ore bearing porphyry. This rock occurs on the hill east of the Balm Creek shaft and has been exposed in all of the Balm Creek workings down to the 150 foot level and seems to play an important role in the formation of the Balm Creek orebody. This rock has a dark groundmass and contains a large number of small angular phenocrysts of feldspar and an occasional but rather rare crystal of quartz. It is undoubtedly an andesite but must not be confused with the interbedded andesitic flows or sills of the sedimentary series. The writer is convinced that the same rock occurs on the hill west of Balm Creek near the head of the small gulch as it is identical in structure and general appearance to the ore bearing porphyry on the east side of Balm Creek. This particular outcrop of porphyry will be mentioned again under the head of faulting.

Another intrusive rock is a light colored dike which is about fifteen feet wide and has been cut in the crosscut from the shaft on the 150 foot level. This dike occured in the shaft until cut off by the big fault at about 350 feet. A similar rock is seen in the Gilkison tunnel near Slide Creek. This dike is almost impossible to classify without a thin section and it apparently has no economic importance but, on account of its size and very definite character, it

might prove helpful later on in the solution of faulting problems should any arise. There are a few basaltic dikes which were the original channels up which the basaltic flows of the region traveled on their way to the surface. So far as could be seen, not more than two or, at the most, three of these dikes have been disclosed in the Gilkison tunnel and the Balm Creek workings. They are, in fact, of very minor importance and should not cause any particular disturbance as they have in some other camps where they are much more plentiful. In addition to the intrusives, there are some scattered remnants of what was at one time an extensive sheet of rhyolite. This material is commonly stained a red color due to the weathering of included pyrite and is sometimes mistaken for the gossanized outcrops of the veins.

The basalt flows occur on practically all the surrounding hills and accordingly obscure the older rocks and have added to the difficulties of geological interpretation.

The Balm Creek Orebody

The Balm Creek orebody is the largest orebody discovered in any of the Company's ground up to the present and shows on the surface as a large iron-stained area carrying several dollars in gold and accompanied by exposures of porphyry and considerable barite in places. This orebody has been exposed in two tunnels from the Balm Creek side and in the 150 foot level from the Balm Creek shaft. Its full dimensions have never been accurately outlined by the development work on any level but the accompanying map shows there dimensions as far as the workings have determined them. In discussing this orebody, and also in the depiction upon the map, the writer is referring to a mineralized area which varies considerably in its gold, silver and copper content. This mineralized area in this report is considered a geological unit and no attempt has been made to outline or determine the extent or cause of ore shoots in this mineralized area. Wherever the tunnel walls showed considerable exudations of copper sulphate and were thereby distinctly marked with blue streaks, showing the prescence of copper, that vicinity was considered to be in ore and so termed regardless of its assay value.

It might be stated in general that mineralization in this locality and in the district as a whole is confined largely to what might be termed shear zones in the slates and andesites. These shear zones strike through the country in a general E-W direction not, as a rule, departing more than 45 degrees from this. The veins on the Oregon Copper Company ground appear to occur in these shear zones and the mineralization is concentrated on E-W slips in these so-called shear zones. There are a number of these which extend through the camp ranging all the way from about N-W S-E to a little north of east and invariably dipping to the south and southwest at angles from 40 to 60 degrees. The Poorman workings as described by Dr. Lindgren contain several veins which are, in the writer's opinion, related to these shear zones. In the Gilkison tunnel, two of these shear zones have been exposed, one which might be termed the Balm Creek shear zone and the other the North vein or shear zone. My description will be confined to the Balm Creek shear zone, as the North vein does not enter into the origin of the Balm Creek orebody. This Balm Creek shear zone can be followed on

the surface by means of float and occasional rare outcrops from the hill above the Balm Creek shaft in an easterly direction below the big basalt slide and it is probably identical with the mineralized area that shows on the hill on the east side of Slide Creek above the Boarding House. This shear zone was cut by the Gilkison tunnel and the tunnel then follows the shear zone, which contains a little ore, in a westerly direction. This carried it to a point which is almost under the big gossan outcrop that has been exposed on the surface by trenches. This shear zone in the vicinity of this big gossan outcrop apparently cuts through the porphyry dike, which was mentioned under the head of intrusives. In this neighborhood, the shear zone expands into a large mineralized area where it is cut at an angle of about 45 degrees by a northwest fault. This fault was described in my previous report and shows on the surface in the saddle between Slide and Balm Creek in both the Balm Creek side of the Gilkison tunnel and the Balm Creek adit and was also cut by the shaft at a point 350 feet below the surface. This fault is quite different in its character to the shear zones which run in a northwesterly direction, and consists of a mass of crushed material accompanied by a large amount of clay over a width of about 30 feet. In my letter of June 23, to Mr. Castleton, I make a statement that I believe this fault was the cause of the Balm Creek orebody. At the present time I am not so sure of this. It is possible that the Balm Creek shear zone formed the large orebody, which has been exposed in various workings and shows on the surface, on account of the fact that it cut through the previously mentioned porphyry dike and that the dike was more easily replacable by the mineralizing solutions than the slate.

This, therefore, opens a second alternative, neither of which can definitely be proved at the present time. The first of these is, that the ore is formed in the Balm Creek shear zone at the junction where a series of northwest fractures accompanied this major fault. The other alternative is that the ore formed in the Balm Creek shear zone where it cut the porphyry and the orebody was later cut by this big northwest fault. My latest studies have led me to believe that this last alternative is more likely to be correct than the first. The reasons for my belief are based upon the fact that, where this orebody is exposed on the Balm Creek adit and on the 150 foot level, fragments of what might be termed drag ore are found in the crushed mass of the fault. In addition to this, fragments of copper bearing ore were found below the fault in the shaft. The principal object of the work was to determine if possible the downward extension of this orebody from what data was obtainable in the upper workings.

On looking at the map, it can be readily seen that the big fault cuts the ore along a line which rakes downward to the southwest. As the shaft has passed through the fault, the main part of this fault now lies to the south of the shaft. Judging from the trend of this orebody, between the Balm Creek adit and the 150 foot level, it should be found in a southeasterly direction from the shaft, by following along the footwall side of the fault. The direction of the present tunnel from the 432 foot level is too much to the east and not enough to the south to cut the point where this orebody will most likely occur. If this tunnel is swung to a course

of about south 15 degrees east, it should strike the hanging wall of the fault in a distance between 125 and 140 feet from the present face and will probably encounter ore before reaching the fault. This belief is based on the supposition that the line of contact between the fault and the orebody remains essentially the same in direction as it does in the upper levels. If any other faulting has occured, this supposition may not prove true.

Faulting the Orebody

There is evidence of some faulting in the orebody outside of the big northwest fault which cuts it off. On the Gilkison tunnel a northeast fault is encountered at the point where the tunnel makes a circular bend to the right and comes back into the main tunnel again. This same fault appears in the Balm Creek adit and a very similar looking crushed zone on the 150 foot level shows at a point which corresponds almost exactly with the projected dip of this fault to this level. This fault, which strikes northeast and dips northwest between 35 and 40 degrees, is apparently a normal fault and on the fault the hanging wall side has slipped downward bringing different widths of orebody into sharp contact with one another. This fault discloses a very strong probability that the orebody widens downwards as, on the footwall side of the fault, the orebody is wider on the Balm Creek adit than it is on the hanging wall side. This fault is not serious in its effect upon the orebody but has simply cut across it and one part of the orebody has slid on the other part.

In the crosscut running south, from the 150 foot level, the ore is cut off sharply b y an E-W slip which dips north from 60 to 75 degrees. Whether this is merely a local slip of no importance or whether it is a fault, which may displace the orebody, cannot be stated from this one exposure. Steps should be taken to discover whether this fault occurs further to the east and whether it cuts the orebody abruptly in that direction also. If such is the case, it might cause more difficulty in locating the orebody on the 432 foot level. It, therefore, would seem advisable to continue the small crosscut which has been driven to the south from near the face of the main tunnel on the 150 foot level to find out the character of this slip or fault at this point, which is approximately 100 feet east of the long crosscut. After completing this, the main tunnel should be driven east and the limits of this orebody determined on this level, which has not been done up to this time. This would add some information which might be of considerable help in locating the orebodies on the 432 feet level. These are the only two recommendations the writer has to make in regard to development.

The first, as outlined, is to continue the present easterly drift on the 432 foot level in a direction which should not depart from the south more than 15 degrees to the east. This will involve an almost right angle turn from where it leaves the main crosscut from the shaft. If this is done, it seems more than likely that ore, possibly drag, will be encountered at a distance not to exceed 130 feet from the present face of the tunnel. The other development recommended is the running of this

south crosscut on the 150 foot level and the extension of the east drift to determine the limits of the orebody on this level.

Possibilities of the Extension of This Orebody on the W Side of Fault

As the big fault apparently cuts this large orebody completely off, the question naturally arises as to where this orebody might lie on the other side of the fault. The orebody occurs in an E-W shear zone which dips southward anywhere from 35 to 50 degrees. The fault runs almost northwest, i. e., N. 45 to 50 degrees west and dips southwest an average angle of about 45 or 50 degrees. If this is a normal fault, i. e., if the hanging wall side has slipped down in relation to the footwall side it should carry this E-W shear zone to the northwest an indeterminable distance. An examination of the surface tends to support the belief that this is the case. The North vein, which is exposed in the Gilkison tunnel and which was not examined by the writer on account of bad air in that place, is reported to be a shear zone of at least 20 feet in width containing a considerable amount of pyrite. An exposure of what is undoubtedly this vein occurs on the east side of Balm Creek north of the shaft and under the big basalt slide. On the west side of Balm Creek and about 300 feet up the creek, a prospect tunnel has been driven into the hill and showed a wide crushed zone of shearing, which is mostly oxidized but shows no trace of copper and, apparently, was originally pyrite. The natural inference which is, of course, based upon very little evidence is that this is the north vein which has been moved about 300 feet to the northwest by the fault. If this is true, then the Balm Creek orebody should have been moved approximately the same amount and in the same direction and its continuation might be expected to lie on the west side of Balm Creek about 300 feet north of the shaft house. A further confirmation of this theory is based upon the presence of a porphyry outcrop at the head of the gulch on the west side of Balm Creek which is identical in structure and appearance to the ore bearing porphyry on the East side of Balm Creek. If this theory is correct, therefore, it might be well at some future time to run a series of trenches in this locality through the thick soil covering, which mantles the hill slope, as so important a body of mineral as the Balm Creek orebody is worth an effort spent in endeavoring to locate its continuation on the other side of the fault. If, the northwest fault has had a local effect upon the E-W shear zone it has caused the formation of orebodies at the junction of these shear zones with said fault, then it is possible that at the intersections of other parallel shear zones with this fault, that orebodies might occur. This is mentioned as a possibility that might be worth investigating at some future time.

IN CONCLUSION, I might add that from evidence obtained in the upper workings, there should be no great difficulty in finding the orebody on the four hundred and thirty two foot level to the southeast of the shaft, provided, of course, that no further faulting has occurred to displace the orebody from its normal course.

All the evidence obtainable points to the conclusion that there is no reason to expect any diminution of values in the deposit on this level compared with the one hundred and fifty foot level. The possibilities for discovering massive gold-bearing chalcopyrite at this depth are decidedly favorable when the ore zone is successfully located.

Signed D. C. Livingston
Baker, Oregon, Aug. 19, 1927

COPY OF LETTER FROM JOHN ARTHUR TO STOCKHOLDERS

Baker, Oregon
January 11, 1938

Mr. John Doe
Aberdeen, Washington

Dear Mr. Doe:

As there has been so many letters and inquiries regarding the Balm Creek Gold Mining Company, a general letter is necessary for it would take too much time and it would be impossible to cover the subject in full to each individual letter or inquiry, and at that, this letter is only a general statement.

A gentleman remarked at the stockholders meeting held in Portland, Oregon on December 9, 1937 that it had been a long time since a statement had been sent to the stockholders, and that gentleman was correct, even though we could offer good excuses.

After the difficult task of de-watering and taking up caves had been accomplished, we started mining and in going a few feet on good ore faces these would break up and leave us in waste. The operation was about breaking even until we came into what looked like a very solid ore body which was from 15 to 20 feet in width and assayed better than $20.00 per ton in gold. At the same time we opened other faces over 4 feet in width that assayed better than $300.00 per ton in gold. It was about this time that our directors visited the mine and inspected these faces. The $20.00 face was over 15 feet in width and showed along the stope for about 40 feet, with ore still on both ends.

The above naturally made it appear that the body would continue to the surface Glory hole, a height of 400 feet in un-mined ground with high grade on both ends between the Glory hole and our stope. It also appeared as though it would extend both east and west for a considerable distance. The Glory hole had just shipped 1,022 tons of crude, un-milled ore that netted from the smelter after deductions for smelting and railroad transportation the sum of $39,061.33. This value was for gold only as in this particular surface ore there was no copper. This showing looked like a million dollars to anyone. We were producing for a few months from $17,000.00 to $25,000.00 every thirty days. These figures are net smelter returns after deductions for smelting and railroad transportation. However, in stoping upwards, the ore abruptly came up against a blank wall of talc from 20 to 40 feet thick, which is the fault or slide which moved and crushed as well as cut off the ore.

The reason that no report was made was that after seeing these faces, and inspecting the ground themselves, the directors thought that the company would very shortly be able to pay a substantial dividend and at the same time enclose a report and so they said that a report could wait for a short time and then when every stockholder received the report with enclosed dividend check they would understand the slight delay, then our ore cut off as mentioned above.

These director

These directors saw with their own eyes, they saw smelter returns from the crude ore shipments, and believed, as well as everyone who did see, and backed up their faith and belief by purchasing stock that was offered on the open market.

Stop and think. Near the surface we mined crude shipping ore, and 400 feet deeper we had an apparent solid body of good ore that should have extended to the surface. In face the lower ore body was much better than the surface ores as 577 tons, shipped without milling, netted from the smelter after deductions for smelting and railroad transportation $35,048.80 . This was mostly gold values as this lower ore only averaged about $10.00 per ton in copper. THESE WERE NOT POCKETS, but parts of a former large ore body which has been at one time in place. Later mechanical earth movements displaced and broke up the ore body into large fragments. There is, with the many geological reports, ample evidence to positively prove this deduction.

In fact the ore below the big fault, or gouge which cut it off, looked so strong and permanent , that it appeared advisable to install a secondary grinding unit in the mill and the necessary machinery to increase our tonnage, as we found the gold ore in these lower levels extremely hard and they took very fine grinding to liberate the valuable material from the waste gangue. This cut our capacity in the mill and the directors felt so sanguine that they advanced a large sum of money to put in the additional mill equipment.

About the time we completed the secondary mill unit the unforseen happened,---our ore cut off. This was not apparent anywhere, as an old raise did not disclose it for there was and is ore in this old raise. The raise is on the west end of the break and a few feet east the ore breaks up. The major tonnage will exist on the east side, but a big earth movement cut us off from this as will be mentioned later.

We realized that development was necessary to open the ore both above the big break that was in evidence as well as below the fifty level, in the hopes that at least the deeper work would find undisturbed ore. This latter looked promising as we had already proved ore 80 feet below where it has been formerly found. Again our directors furnished a large sum of money to pump the mine out to deeper levels, and they, as well as I, were confident that a large gold mine existed there, if it could be found away from the slides or land movements which mixed the ore with the wall rock. However, ill luck seemed to follow us, as after driving drifts and crosscuts 400 feet we encountered the vein which was approximately 40 feet in width. This showed copper streaks and was bunchy and then the gold streak was found to be only bunches and streaks. These assayed from $14.00 to over $30.00 per ton in gold. This did prove that we had the gold channel and that it still continued down, even if broken to a point where mining in this deeper development was not warranted.

We did, by prospecting above the big fault between the 150 and 450 levels, open up some good gold ore. We could have mined this with the ore around and west of the old raise; however, having opened up the big gouge fault, air was let in and with the resulting swelling and settling and surface water coming in the whole country commenced to move thus creating cracks to the surface. This movement closed our raises and outlets for ore which we expected to remove. Nothing could hold it. Another safe entry could have been made to this ore, but it would have required much expense and delay. This would eventually have been done; but, after finding the vein still broken where we had pumped the water out, the camel's back was broken, and this thoroughly discouraged all of us. There was no use to try further unless we were financed for several months.

I will endeavor to explain just what happened to cause the Balm Creek ore body to be crushed. The two creeks, Slide creek on which the Doorman shaft is located and Balm creek on which the mill is situated, are simply two large and nearly parallel faults which run through the country for miles. When the faults were created, which was millions of years after the Balm Creek ore had been formed, there naturally was dynamic action enough to break the ground for miles, to cause the tongue left between the two creeks to move and re-adjust itself by settling down. The vein was a fissure that ran across the faults and had a gouge on the foot wall where the ground broke and slipped down. This crushed and mixed everything other than the hard sections which withstood the shock. It was on these large fragments that we mined. This broken condition may extend very deep.

We still have bodys of copper ore in the mine levels up to 50 feet in width; however, these carry only about $3.00 per ton in gold and are hardly payable with the now higher costs and with the market price of copper becoming lower. To make it more plain to the stockholders, we have a large copper vein, and within this vein or on one wall or the other, there occurs an Andesite Dyke which was thrust up in the copper vein. This dyke intrusion opened a channel for the later gold solutions to come up and create on either side of the dyke, gold ore from a few feet to twenty feet in width. We have proved gold values from the Gilkison tunnel to the Balm Creek works, about 1,000 feet in length, but this is also in the broken zone. There is no question that a large gold mine did exist before the break, and will exist when found away from the break.

No one can blame the directors or anyone for we had one of the best showings in the country but came across some of nature's hidden sabotage. Everyone should extend a vote of thanks to Mr. Frank Phillips who was instrumental in interesting a good many of his friends who proved to be loyal sports in trying to get this vein beyond the broken zone.

As the development undertaken and the trying to hold the land slide conditions within the mine were very expensive as well as being cut off from our ore in the faulty zones, we became envolved in debt. If we had encountered the ore in place many times this debt would have menat nothing. We were like the fellow with the bear by the tail, we had to hold on to prove or disprove for we had gone so far that no one would have been satisfied if the work were not pushed to our objective. We went, and it is sad that we are because of the

un-looked for conditions.

As no one was in a position to put up more money, and all could not be called together nor could any special security be given to anyone who might have gone farther, we have been compelled to cease operations. We have at this date pulled most of the equipment from the mine which is now flooding. The move we are now taking is to dispose of any equipment we can in order to pay the labor and the other debts. These labor and supply debts at the time of ceasing operations amounted to approximately $18,000.00. In addition to this there are some notes for borrowed finances which will be mentioned later.

Now that you have heard the story in this letter, what is the answer? Has any of the stockholders a plan? Certainly any plan would mean the raising of some money and possibly it is incumbant on me to, in this letter, state what prospects, possibilities or prospective values the property has in other directions both east and west in apparently un-broken territory; therefore, I think it best to do so.

The fissure or fracture in which the Balm Creek ore body existed is many miles long, therefore, it does not seem reasonable, or good sense, to think the Balm Creek ore body is the only ore shoot on this long fissure, and personally, I am sure there are many of them. In fact we have Nine veins, but the Balm Creek was the best looking vein carrying gold, as the others are mostly copper values. Prominent geologists predict that development under some of the surfaces might show copper bodys up to several hundred feet in width.

If the top covering of late lava flows and deep soil did not cover this vein both east and west from the Balm Creek and Slide Creek Gulch, then, undoubtedly outcrops of high grade gold ore would be exposed. The only reason that the Balm Creek ore body was found, was because the gulches were cut down deep enough to remove the overburden and left the ore exposed sticking out of the ground.

West of the Balm Creek workings across the creek there is found good grade gold ore in the surface debris which is possibly broken from the underlying ore bodys, and there are some outcrops a little North of where the Balm Creek Gold body should pass through, which check with other veins north of the Balm Creek vein. These latter outcrops have some gold, but are mostly of the copper character like the Poorman vein. It is very possible that if shallow tunnels and trenches were run to get below the surface debris, on the west side of Balm Creek, that ore bodys would be found.

There is on this West side, on the south, or hanging wall territory of where the gold vein should pass through, a large area of slate, which is perfect formation for gold, and in fact, the general formation where seen is the most likely for large gold bodys of any in this section. Two or three hundred feet in depth can be secured by tunnels on this West side, and a small crew of about four men tunneling and trenching would in a few months undoubtedly prove or disprove the existence of profitable veins in this section, or vicinity prospected. The Balm Creek vein positively is the one called the Poorman South vein in the Poorman workings 2,000 feet east of where we mined, as the South vein has both gold and silver,

and is similar in character, thus is this Balm Creek vein is ever found away from the breaks on the West side, then no doubt this would warrant going deep enough to get below the faults, and running under the Balm Creek and other workings for a long ore body. There is still a lot of ore in the Balm Creek workings, but the moving ground takes too much timbering, and then cannot be held successfully, to make mining profitable at this time with higher costs.

There was produced, in shipping ores and concentrates during the production period from June,1935 to January 1,1938, the following:

8,108.848 ounces of gold 1,047,015 pounds of copper having a gross metal market value of:	$405,000.44
Deduct the difference between the market value of the metal and the smelter payment price:	63,216.67
Smelter Gross value:	$341,783.77
Deduct the smelting and railroad transportation charges:	71,327.07
Net returns from the smelter:	$270,455.70
Deduct the 10% royalty paid to Hamilton F. Corbett, the owner of the property,on the purchase price of the mine:	27,045.57
Net left for production and other marketing costs:	$243,410.13
Deduct the charges for trucking to Baker, transferring to the railroad cars, and sampling:	18,443.18
Net left for payment of production costs:	$224,966.95

This net amount which is left for production expenses represents only 55% of the gross value of the product at metal market prices.

With the de-watering,taking up caves, development,and mill building mining and milling, we have expended in Baker County alone over $400,000.00

It is regrettable that we will have to dispose of equipment in order to pay the debts now outstanding for only a fraction of their value is realized on a forced sale of this kind when the cost of new equipment is considered as well as the installation. Because of the various disappointments, I do not know what to suggest nor am I able to try,as many years of lost time as well as large personal losses leaves me no choice other than to try to liquidate and pay all of our obligations. It is my hopes that at sometime,I will be able to recover my personal losses and the losses of those who cannot afford to lose what they have apparently lost, unless an effort was made and ore bodys were opened in solid ground.

Signed

QUARTZ PROPERTY

1. Name of property Mother Lode Mine
   Operating company (or individual) Balm Creek Gold Mining Company - Baker, Ore
   Address —
   Location of property
   Acreage of holdings — Group - 2000 acres with 9 separate showings.

2. History of property, past and recent:

   President - Mr. J. R. Dodson Portland
   Asst Pres & G. Mgr. - John Andrus
   Secretary - H. L. Phillips Portland.
   Oregon Corporation.

3. History of production:

4. Development: Number of levels, lengths of drifts and cross-cuts, raises, etc.:
   Main Workings: Balm Creek Side - 6 levels - 3 miles altogether (raises, drifts, x-cuts)

5. General description and equipment on hand, topography, country rocks, elevation, timber, water, snow fall, climate, power, etc. Elev. 3480 - 3330' at mine (Balm Creek)
   Andesite brought gold ore in.

6. Geology - General and local. Ore geology - type of deposit, i.e., vein, mineralized zone, bed; contact relations, attitude and orientation, vein minerals, gangue, type of mineralization, alteration, enrichment, etc.
   Shearing series in all Triassic flows - greenstone - fissures - E W - 70° S - ore replacement of wall rock (various greenstones - copper-) Gold from later siliceous extensions.
   L. C. Dilcus - Structural geologist - -
   chalcopyrite carries the gold.
   (Cubinite - 18% Cu instead of 32% chalcopyrite) Poorman side

7. Metallurgy - nature of ore, hard or soft, free-milling, base, direct shipping, etc. Kind of mill and equipment in use or planned, current daily tonnage of ore or concentrates, approximate value, freight rates to smelter, etc.
   Sulphides - 9% Cu - $80 ore - recovery - need to grind finer for Au - (- 230 mesh. at present) - jaw crusher - to rolls 1½" - - elevator to fine ore bin - belt feeder (automatic) - 6 x 6 - Ellis Chalmers ball mill (13000 # balls) - - 5 x 18 Dorr type classifier - unit cell (90 mesh) - - Denver Equip. Fahrenwald - 6 x 18 Dorr type classifier in closed circuit with 5 x 8 Tube mill - Denver Engr. Works - to Denver Equip - 5 x 8 conditioner - to 8 cell Denver Eq. Flotation machine - cleaners on first 2 or 3 cells - - concentrates to 8 x 20 Thickener (Dorr) - pumped

8. Remarks - economics: High or low cost, principal drawbacks, reasons for success or failure, apparent life of operation based on apparent quantity of ore available.
   mill Cap - 100 tons
   with Diaphragm pump (2") to Oliver type filter - 9 x 6 - 12 to 14% moisture to Louden dryer - 6 x 20 - - down to 5% moisture - elevated to loading bin (100 tons) (20 tons/24 hrs) - - shipped in bulk to Baker to Tacoma.
   Heads - $9.00 - - $4-5 cost mining & milling Conc. - 6-8
   $4.00 flat rate at smelter - no penalties - - RR - $4 to $8/ton.

BALM CREEK GOLD MINING CO.

KEATING DISTRICT:

Is 25 miles northeast from its shipping point, Baker, Oregon, on the Union Pacific and Old Oregon Trail. First located 40 years ago and was known as the Poorman. It consists of a group of 120 unpatented claims, recorded in Baker County. Located in a hilly area, the country rock is greenstone, rhyolite hanging walls of greenstone, rhyolite foot; vein strata bearing east and west; width 10 feet to 100 feet, length 3 miles. Minerals are gold, copper and silver; assays at $6 low to $100 high per ton. Water is ample, pumped from the mine; power is purchased from Eastern Oregon Light and Power Company and a 120-horse Deisel engine; timber from government and private owned lands near mine; operating with an average of 55 men employed. Equipped with flotation, 90 tons per day plant; shop, ore cars, track, hoists, compressors, machine drills and a power plant complete in every way. Developed by 15,000 feet of tunnels; two shafts of 500 feet and 700 feet deep, respectively. General history of property: Was formerly the Oregon Copper and later organized as the Balm Creek Gold Mining Company. Was considered mostly copper; however, the gold-copper ores are now being mined. Gold is the major value. This is a new gold district and if this mine continues to produce, other properties should start in due time. Manager is John Arthur, Keating, Oregon. (Prescott--6/1/37).

EAGLE Ck.
WALLOWA R.
GREENSTONE

(SEE BALM CREEK GOLD MINING CO.

The Poorman Group.—The Poorman claims are situated in Secs. 32 and 33, T. 7 S., R. 43 E., between Balm and Goose creeks, on a small stream known as Slide creek, which flows through the property into Balm creek.

The topography represents a partially eroded basaltic plateau and is characterized by small streams whose branches head into comparatively short gulches. In this immediate vicinity the basalt caps only the higher ridges and is not of very great thickness.

The country rock is for the most part a dense altered greenstone, somewhat brecciated and cut by quartz-calcite gash veins. In some parts it is very siliceous, which may be due to the more acidic composition of the original rock or as is more probable to secondary silicification as a vital or contributing factor. On account of the obscuring effect of alteration not much can be said about the original character of these rocks. It is probable, however, that they were trachytes and andesites. For instance one specimen taken from the outcrop shows a light-colored dense rock cut by gash veins of pyrite. In thin section it is seen that the groundmass is a confused indeterminable mass of alteration minerals consisting chiefly of chlorite and sericite. Apparently the rock before alteration had a texture approaching closely that of a glass. It can also be seen in the thin section that pyrite is associated with quartz in the veinlets.

The mineralization is in a shear zone having a strike of about N. 65° W., a dip of from 40° to 60° to the south and is from 150 to 300 feet in width. On the surface the red stain of iron oxide is very noticeable, and occasionally there are stringers of hematite from one

WALLOWA R.
GREENSTONE
COPPER

to two inches in thickness. Pyrite was found on and near the surface associated with quartz in gash veins. At a depth of one to two hundred feet chalcopyrite is the chief ore mineral. Many large sized blocks that have been taken from the development drift and crosscuts have had enough chalcopyrite in gash veins to contain 7 per cent copper. These richer portions may in fact be considered as a type of quartz vein. This is well illustrated by a specimen from a silicified zone. Chalcopyrite is in the form of gash veins. The rock is intensely silicified and appears to have suffered a brecciation since the silicification, as is shown by the fact that the cavities are partially filled with minute quartz crystals intermingled with chalcopyrite. In thin section it is seen that the main mass consists of interlocking quartz grains impregnated with chalcopyrite, and also cut by gash veins of chalcopyrite. In these veins some chlorite is associated with the chalcopyrite.

Not enough development work in crosscutting has been done to find out the extent of the deposit. The similarity between this region and the silicified flows of the Iron Dike mine in the Snake river region is quite striking, and it may be that future development work upon these fractured zones may reveal some similar high-grade portions.

It seems probable that this brecciated zone in the old greenstones made an excellent opportunity for the replacing action of hot ascending silica solutions which carried their metallic content, although a

WALLOWA ?
COPPER BELT

certain portion may have been leached from the greenstones. The excess of silica and the presence of gold would indicate other sources besides that of andesitic or basaltic lava.

After the silicification and impregnation of pyrite and chalcopyrite the zone was fractured again and probably a further concentration of the copper took place by circulating or perhaps even descending waters.

The specimens clearly show a brecciation after the silicification, and it is not unreasonable to suppose that where this fracturing is most pronounced there might be found deposits of richer ore.

One noteworthy fact in this connection is the scarcity of copper on the surface. It may have been that meteoric waters have leached the copper from the upper part of the mineralized zone redepositing it again at depth and leaving on the surface iron oxide and a certain amount of unoxidized pyrite.

Other claims which belong to this greenstone area are those located upon upper Goose creek, the next tributary of Powder river east of Balm creek. H. C. Thomas and H. W. Forster have claims about three miles south of Sanger, near this stream. The country rock is a dense greenstone, in places slightly brecciated and cut by small irregular quartz veins which contain small amounts of galena, zinc blende and chalcopyrite.

C. C. Cox, of Baker, has two groups of claims in this region. One group is located about three miles south of Sanger on Goose creek, and the other three miles still farther south on Sawmill gulch, a tributary of Goose creek. The country rock in both places is a dense greenstone. At the upper claims there are small lenticular veins which contain chalcopyrite. At the lower claims the country rock is cut by small gash veins of quartz and pyrite. They also contain some epidote and chalcopyrite.

There has been in previous years a great deal of activity in this greenstone area in prospecting for copper, but in the last few years the work has been almost entirely confined to the required assessment work and much ground has been abandoned.

STATE OF OREGON
DEPARTMENT OF COMMERCE
CORPORATION DIVISION
201 LABOR AND INDUSTRIES BUILDING
SALEM, OREGON 97310

October 6, 1964

Mr. Ralph S. Mason
Mining Engineer
1069 State Office Bldg.
Portland, Oregon

In reply to your request, our records show the following corporate or assumed business name(ABN) information, (closest name(s) of record given, if not identical to one requested:

CORRECT LEGAL NAME State and Standing*	CORP. or ABN	Date Incorporated, Qualified(CORP) or Registered(ABN)	Registered Agent & Office(CORP) Parties of Interest(ABN)

OREGON COPPER COMPANY

Washington Corporation 4-15-1919
Revoked 1-13-1922

Officers are from last report filed 4-15-1919

Pres.—B. F. Cantonwine, Walla Walla, Washington
Sec. —J. F. Shadduck , Walla Walla, Washington
Vice Pres.—G. W. Gibson, Walla Walla, Washington

OREGON COPPER COMPANY

Oregon Corporation 8-10-1906
Dissolved by governor 1-7-1911

Officers are according to last Annual Report filed 7-25-1910

Pres.—J. M. Keith, Ashland, Oregon
Sec. —A. E. Shepard, Ashland, Oregon
Treas.-T. W. Hill, Ashland, Oregon

OREGON COPPER COMPANY

Oregon Corporation 6-23-1926
Dissolved by governor 1-7-1935 Officers on next page.

We have no record of the names of stockholders, current directors, business address or the value of stock or assets. ABN information prior to July 1, 1964, must be obtained from the county or counties involved.

***G/S--Means good standing**
Del.-Means delinquent and year(s)
(This pertains to corporations)

HAL:dk

C-ABN-1
8-64

Frank J. Healy
CORPORATION COMMISSIONER

Harold A. Lewis
ASSISTANT COMMISSIONER

OREGON COPPER COMPANY

Of icers are according to last Annual Report filed 7-27-1933

Pres.--John Arthur, Sumpter, Oregon
Sec.--Robert N. Munly, 84 W. Park St., Portland, Oregon
Treas.-None elected

These factors—irregular and discontinuous openings in the country rock and shifting passages of solutions during the mineralization—have produced mineralized bodies of so great irregularity that they are among the most difficult kinds in which to estimate reserves. The presence or absence of a body of ore on one level is no justification for the belief that on the next level below ore will be either present or absent, for the bodies are likely to pinch out abruptly or come in abruptly in any direction.

Weathering has led to the production of siliceous cappings, with some calcite and limonite. The sulphides have been altered by oxidation to malachite, azurite, native copper, cuprite, tenorite, chrysocolla, jarosite, and "limonite." Supergene enrichment has produced small amounts of bornite and chalcocite.

PROSPECTS

OREGON COPPER CO.

The most active prospecting in the area during the summer of 1929 was going forward at the Oregon Copper Co.'s property, on Balm and Slide Creeks, in sec. 32, T. 7 S., R. 43 E. The company holds a very large block of claims at this locality, extending eastward to Goose Creek. Prospecting for copper has been carried on intermittently at the site for over 30 years, but the first development on a large scale was begun about 1924. The property has been known at various time as the Gilkeson, the Poorman, and the Mother Lode but has been in the hands of the Oregon Copper Co. since 1926. A few small shipments were made to the Sumpter Valley smelter in 1923 as test lots, but no commercial production has been reported.

The property is readily accessible from Baker, distant 26 miles by good road. The hills near the workings are bare, but abundant timber suitable for mining purposes is found only 2 or 3 miles to the north. Water in sufficient quantity for use in mining is readily available from Balm Creek. Electric power lines of the Eastern Oregon Power & Light Co. extend to the property.

The property is developed by two shafts and three tunnels, with numerous subsidiary levels, raises, and crosscuts. The workings accessible in 1929 (pls. 2 and 3) aggregated more than 13,000 feet. Those on Slide Creek, called the Poorman workings (pl. 3), included a tunnel about 1,400 feet long, with several crosscuts and raises, and a shaft 420 feet deep, from which two levels were turned, one at 136 and the other at 289 feet below the collar. The upper of these levels, known as the Poorman No. 2, consists of about 2,300 feet of drifts and crosscuts; the lower, or Poorman No. 3, about 650 feet. Only a moderate amount of water was being pumped from this shaft, and sinking was going forward at the time of the survey.

The Balm Creek workings (pl. 2) include two tunnels, the upper connecting by a short raise to the Gilkeson tunnel, which enters the hill from the Slide Creek side, and a shaft, which was 700 feet deep at the time of this survey. The levels turned included Nos. 3 to 6, at 150, 244, 434, and 578 feet below the shaft collar. The No. 5 intermediate level, 84 feet above the No. 5, and the No. 6 intermediate, 72 feet above the No. 6, had not been cut through to the shaft. The No. 1 or upper tunnel is 48 feet higher than the shaft collar, and the No. 2 tunnel is 19 feet below it.

The No. 1 tunnel and the connecting Gilkeson tunnel had about 2,200 feet of accessible workings, the No. 2 tunnel about 1,200 feet, the No. 3 level about 1,200 feet, the No. 5 intermediate about 550 feet, and the No. 5 about 2,400 feet. No. 5 level was being vigorously advanced eastward to cut beneath the Poorman workings and connect with the Poorman shaft. This connection has been completed since the survey. A southern crosscut was also being driven. The lower levels of the shaft were inaccessible because of the strong flow of water, which was barely controlled by the pumps available at that time. Additional pumps were being installed, and sinking was to be resumed.

The workings of the Oregon Copper Co. are all in the Permian greenstone series. In the neighborhood of the property the Permian greenstones beneath the basalt rim rock are poorly exposed because of the creep of the soil and of talus from outcrops higher on the hills. Accordingly it is difficult to work out the structure in detail. Only two localities were found near the workings where the attitude of the rocks could be convincingly determined. These were both in road cuts near the confluence of Slide and Balm Creeks, where siliceous tuff members were found to strike slightly north of west and to dip 50°–70° N.

The great bulk of the greenstone series as exposed in and near the workings is composed of keratophyre, spilite, and quartz keratophyre, which, though much metamorphosed and silicified, have preserved their original texture in many places. From this original texture it may be determined that some of these rocks were originally diabasic, but most of them have the texture of rhyolites or andesites. Some volcanic breccia members were also seen.

In addition to these highly sheared and incipiently schistose rocks there are somewhat less broken members, which also, however, are greatly chloritized and contain albitic feldspars. Some of these are perhaps dikes in the old lava and pyroclastic deposits. A few rather fresh basaltic dikes occur, possibly referable to the Columbia River lava.

Intensive study was given to the local stratigraphy of the greenstone series, in the hope that characteristic members could be

recognized and the structure determined accordingly; but the rocks have been so greatly affected by shearing and hydrothermal metamorphism that any distinctive features they may have had are no longer recognizible in hand specimens. For example, highly quartzose rocks resembling rhyolites or quartz keratophyres and almost or quite indistinguishable from each other in hand specimens have been shown by microscopic study to have diverse origins. Some are clearly true quartz-bearing volcanic rocks, others are the vuggy silicified products of originally quartz-free lavas, and still others are silicified tuffs. Near the most highly mineralized portions of the workings sericitization of the feldspars has occurred, with the production of chalky-looking feldspars and very obscure texture. Other factors unfavorable to the successful deciphering of the stratigraphy are the very scanty surface exposures and the innumerable chlorite seams with which the rock is intersected, so that fresh exposures of the rocks are difficult to obtain, even underground. The only statement, therefore, that can be made with assurance respecting the structure is that all the observations are consistent with the inference that the greenstones form a steeply northward-dipping fold of east-west strike, cut by a number of steeply dipping strike faults and faults that make acute angles with the strike. The most prominent faults, however, appear to strike between N. 50° W. and N. 80° W. South and southwest dips are most common on the more prominent shear surfaces, although northward-dipping breaks are by no means rare. Many of the faults are of premineral age, as is shown by the impregnation of their walls with pyrite, chalcopyrite, and quartz; others appear to be postmineral. In the postmineral group the most prominent in the Balm Creek workings is a fault or zone of branching faults that lies just south of the most intensely mineralized part of the rock cut by the workings and is exposed on all the levels; but neither the direction nor the amount of movement along it could be determined with certainty. The fault is probably downthrown on the south, however. It strikes west to N. 70° W. and dips steeply south.

The mineralization of which evidence has so far been found in the workings appears to have taken place as irregular impregnation and replacement of the lozenge-shaped blocks in highly fissured and sheared ground. The mineralized masses appear, in general, to be elongated a little north of west, roughly parallel to the strike of the formation and the most prominent fractures, but in detail they are exceedingly irregular.

The principal mineralized mass so far found is in the Balm Creek workings. Here there is a body regarded by the management as ore, which is about 160 feet long and about 30 feet in maximum width on the No. 1 tunnel level, 110 by 90 feet on the No. 2 level,

170 by 60 feet on the No. 3 level, and 150 by 80 feet on the No. 5 intermediate level. It was not found on the No. 5 level, although it is probably represented there by horses in the large fault above described. This body is represented by a very wide baritic gossan zone on the surface but is much narrower in depth. It pitches rather gently to the east between the No. 1 and No. 2 tunnel levels, but from the No. 2 level down it has a southwestward pitch. This pitch is somewhat less steep than that of the prominent fault zone mentioned above, so that the ore body appears to terminate against the fault or be cut off by it between the No. 5 and No. 5 intermediate levels. A little mineralized rock has been found on the No. 5 level at the foot of the raise to the No. 5 intermediate. This is probably a dragged block in the fault.

Within this mineralized body the distribution of the metals is very irregular. Little copper is present on the upper levels, what was formerly there having been leached out. However, oxidation has not seriously affected the minerals at lower levels, and here too the distribution of gold and copper is erratic. Most of the material is highly silicified and carries sporadically distributed specks and veinlets of chalcopyrite and pyrite. The gold and chalcopyrite do not appear to be closely associated, as grab samples show wide variations in gold content although running about the same in copper.

The best mineralization appears to have occurred in the ground cut by the No. 5 intermediate level. Here veinlets of chalcopyrite and pyrite as much as 2 feet long and an inch or two wide are rather common, and the disseminated sulphides are also unusually plentiful. A grab sample of some of the best-appearing material yielded over 11 per cent of copper and $6.80 in gold to the ton. The sporadic distribution of the metals here is well illustrated by a comparison of samples taken by four different men over essentially the same width on this level. The assays of these samples, according to Mr. John Arthur, ranged between $10.14 and $54.46 a ton, computed on a basis of $20 an ounce for gold and 14 cents a pound for copper. It seems probable that the lower figure would be much closer to the value of the minable material than the higher.

Many other mineralized bodies occur in the workings, but none of them approach this in size. Similarly, in the Poorman workings (pl. 3) there are several areas where considerable mineralization has occurred, notably along two west-northwestward-trending fissures on both the No. 1 and No. 2 levels. They do not approach in size the Balm Creek bodies, being only about 30 feet in maximum width and probably less than 10 feet in average width.

The mineralogy of the deposits is simple. Pyrite and chalcopyrite are essentially the only primary metallic minerals. The gangue is dominantly quartz, with some sericite, ankerite, calcite, chalcedony,

and barite. It is possible that some of the plentiful epidote and chlorite was deposited at the same time as the ore minerals, but for the most part they were formed earlier. Weathering on the upper two levels of the Balm Creek mine and in the shallower parts of the Poorman No. 1 level has resulted in the leaching out of some of the sulphides and the production of a superficial zone of siliceous material containing a little gold, as well as jarosite, "limonite," malachite, chrysocolla, and a little azurite. Barite persists in the gossan zone. A little chalcocite occurs below the leached capping, but no marked zone of chalcocite enrichment was exposed in any of the workings. No signs of oxidation were seen below the No. 3 level in the Balm Creek workings, and only slight oxidation is seen on the No. 2 Poorman level. None has occurred on lower levels at either place.

CLOVER CREEK COPPER CO.

The property of the Clover Creek Copper Co. is on Clover Creek in sec. 35, T. 7 S., R. 42 E., and comprises a large block of claims. The temporary buildings of the camp are also on Clover Creek.

The property is easily reached from Baker, about 25 miles distant, by a good road. There is an electric power line to the property. A moderate amount of water but enough for prospecting is available from Clover Creek. Abundant timber for use in mining is to be found within 3 or 4 miles to the north.

Prospecting for copper has been carried on for a number of years in the valley of Clover Creek in the west-central part of sec. 35. For some years the claims were held, together with those of the present Oregon Copper Co., by the Mother Lode Copper Co. In 1928 they were taken over by the Clover Creek Copper Co.

The developments in the west-central part of sec. 35 at the time of this survey included a considerable number of shallow trenches and a caved tunnel reported to be 400 feet long. A headframe had been erected, and preparations were being made for a shaft on the west side of Clover Creek near this old prospect tunnel. Another tunnel half a mile to the south, near the south line of the section, was being driven northeastward and was about 1,300 feet long in August, 1929. (See fig. 2.)

All the claims of the Clover Creek Copper Co. are in the Permian greenstone series, which consists, here as elsewhere, of interbedded quartzose and nonquartzose keratophyre and spilite flows and pyroclastic rocks, with a very few small lenses of limestone. The attitude of the rocks is uncertain at the south end of the property, but just north of the old caved tunnel on Clover Creek tuffaceous members strike eastward and dip steeply to each side of the vertical. The rocks appear to form an isoclinally folded series.

BLANK B—ANNUAL REPORT

This report must be properly executed and filed with the Corporation Commissioner on or before July 1, 1933, in order to entitle a corporation mining for any of the precious metals, coal, or prospecting or operating for oil, or operating an oil well, to pay a license fee of only $10. If not so filed, such corporation must pay the same license fees as are required to be paid by other corporations for gain.—Section 25-244, Oregon Code 1930.

ANNUAL REPORT TO THE CORPORATION DEPARTMENT

FOR THE YEAR ENDING JUNE 30, ~~1933~~ 1936

Of BAKER COPPER COMPANY
(Give legal name in full)

a corporation organized and existing under and pursuant to the laws of the State of Oregon.

The location of its principal office is at No. ~~201 Sommer Bldg.~~ *Street, in the city of* ~~Baker~~, *in the state of* ~~Oregon~~

The names and addresses of principal officers, with the postoffice address of each are as follows:

NAMES	OFFICE	BUSINESS ADDRESS
E.F.Cartier Van Dissel	President	~~316 Symons Bldg., Spokane, Wash.~~
John C. Semple	Secretary	2770 Montgomery Drive SW.,Portland, Ore.
E.F.Cartier Van Dissel	Treasurer	~~316 Symons Bldg., Spokane, Wash.~~

The date of the annual election of officers is 2d Tuesday in July

The date of the annual election of directors is do

	Common With Par Value	Common No Par Value	Preferred
Amount of authorized capital stock	$ 1,000,000	Shares	$
Number of shares of authorized capital stock	1,000,000		
Par value of each share	$ 1.00	xxxxxx	$
Amount of capital stock subscribed	$ 1,000,000	Shares	$
Amount of capital stock issued	$ 600,300.00	Shares	$
Amount of capital stock paid up	$	Shares	$
Price at which no par value stock issued	xxxxxx	$	xxxxxx

State amount of capital, represented by stock of no par value, with which the corporation began business . . . . . $

Total amount of its properties in Oregon (name of claims, lodes, or placers)

160 acres. We are the owner of the Vandevanter ranch in Baker County, Oregon, described as the SE¼ of Section 34, Township 7 S., Range 42 E. W.M.

The location of its properties north of Baker City

The amount of work done thereon and improvements made thereon since the time of filing last report none

The amount of output or products of the mines or wells of such corporation from January 1, 1932, to December 31, 1932, inclusive, none

The value of output or products of the mines or wells of such corporation from January 1, 1932, to December 31, 1932, $ none

IN WITNESS WHEREOF, I, E. F. Cartier Van Dissel *of said corporation, have signed this report, this* 25th *day of* May, *A. D. 193*6

[CORPORATE SEAL]

(Signed) E. F. Cartier Van Dissel

STATE OF OREGON,
County of } *ss.*

I, ... *being first duly sworn, depose and say, upon oath, that I am* ..... *of the foregoing corporation; that said corporation is not engaged in or transacting any other business except that of locating, prospecting, developing or operating mines for any of the precious metals, coal, or prospecting or operating for oil, or operating an oil well; that the value of the output or products of the mines or wells of said corporation from January 1, 1932,*

Mother Lode

BLANK A—ANNUAL REPORT—Domestic Corporations. **Schedule of License Fees on Back of Report**

ANNUAL REPORT TO THE CORPORATION DEPARTMENT

FOR THE YEAR ENDING JUNE 30, 1936

Of BALM CREEK GOLD MINING COMPANY
(Give legal name in full)

a corporation organized and existing under and pursuant to the laws of the State of Oregon.

The location of its principal office is at No. Butler Bldg., 8th *Street, in the city of* Oregon City, *in the state of* Oregon

The names and addresses of principal officers, with the postoffice address of each, are as follows:

NAMES	OFFICE	BUSINESS ADDRESS
J. R. Dodson	President	Jantzen Center, Portland, Oregon
L. A. Henderson	Secretary	Butler Bldg., Oregon City, Ore.
do	Treasurer	do

The date of the annual election of officers is April 15th

The date of the annual election of directors is do

	Common With Par Value	Common No Par Value	Preferred
Amount of authorized capital stock	$ 150,000	Shares	$
Number of shares of authorized capital stock	6,000		
Par value of each share	$ 25.	xxxxxx	$
Amount of capital stock subscribed	$ 132,075.	Shares	$
Amount of capital stock issued	$ 132,075	Shares	$
Amount of capital stock paid up	$ 132,075	Shares	$
Price at which no par value stock issued	xxxxxx	$	xxxxxx

State amount of capital, represented by stock of no par value, with which the corporation began business . . . . . $

IN WITNESS WHEREOF, I, L. A. Henderson, Secretary-Treasurer, *of said corporation, have signed this report, this* 30th *day of* June, *A. D. 193*6.

[CORPORATE SEAL]

(signed) L. A. Henderson

STATE OF OREGON,
County of } *ss.*

I, ... *of the above and foregoing named corporation, being first duly sworn, depose and say, upon oath, that the foregoing report is a full, true and correct statement of the matters therein contained, according to the best of my information, knowledge and belief.*

.....

Balm Creek Gold Mining Co.	Mother Lode Oregon Copper Poorman	Gold - Copper	
NAME	OLD NAMES	PRINCIPAL ORE	MINOR MINERALS

7 S	43 E	32-33
T	R	S

Baker ..... COUNTY

Eagle Creek ..... AREA

Moderate ..... ELEVATION

..... ROAD OR HIGHWAY

About 30 mi. Baker ..... DISTANCE TO SHIPPING POINT

PUBLISHED REFERENCES

Lindgren 01:732
Lorain 38:29
Gilluly 31:24-28
Gilluly 37:114
Parks & Swartley 16:181
Swartley 14:121
Oregon Metal Mines Handbook 14-A, pg 43

MISCELLANEOUS RECORDS

PRESENT LEGAL OWNER (S) .....

.....

.....

.....

Address .....

.....

.....

.....

OPERATOR .....

.....

Name of claims	Area	Pat.	Unpat.

Name of claims	Area	Pat.	Unpat.

EQUIPMENT ON PROPERTY

MI-21

DEPARTMENTAL RECORDS on file in	P'land	G.P.	Baker
REPORTS			
Report from Mining Journal Pink Sheet, Phoenix, Aris. Aug. 25, 1943	x		
All of the following data is in a special folder in the map cabinet			x

Reports

1. Copies of a series of articles on the "Eastern Oregon Copper Belt" made by Dean Milnor Roberts of University of Washington for the Mother Lode Copper Mining Co. - as printed in quotes in the Baker Herald, Sept 12, 13. Included here is a follow-up newspaper article describing prospect findings predicted by Roberts, Oct. 2, 1924.

2. Address by Dr. Herschall Parker, Columbia University to the Baker Chamber of Commerce. This is absolute drivel of the rottenest sort and concludes with the statement that "enough work has already been done to prove that this intermediate zone of mineralization may prove to be one of the greatest and richest in the history of mining." March 1925.

3. Extracts from a Geological Report on "Ten Miles of Eastern Oregon Copper Belt" by Waldemar Lindgren, 1925. This is a 29 page report written in Lindgren's typically thorough and systematic style.

4. Investment Information on the Oregon Copper Co. - as written up in the Oregon Voter, July 10, 1926.

5. Report to the Stockholders of the Oregon Copper Company, Mother Lode Copper Co., Goose Creek Copper Co., and Balm Creek Copper Company - by the Oregon Copper Company management - Nov. 29, 1926.

6. Oregon Copper Company Advertisement in the Oregon's Business magazine. Nov. 1927, April 1928, June 1928. These are full 2 page illustrated adds featuring quoted comments of many noted engineers.

7. Progress Report, Oregon Copper Company, Dec. 1928.

8. Northwestern Porphyry Copper Prospects. Reprint of a Phoenix Arizona "Mining Journal" article by Robert Bell, 1930.

9. Report to the Stockholders, Balm Creek Gold Mining Company, Aug. 15, 1935.

10. Copy of letter from John Arthur to stockholders, Jan. 11, 1938.

11. Hendryx's Press clipping album - Vol VI for 1925 to 1928.

12. Assorted pictures of various phases of the above operations.

(Historical Society)			

Palm Creek Gold Mining Co. ✓ | | Gold - Copper |
NAME | OLD NAMES | PRINCIPAL ORE | MINOR MINERALS

T7S | R43E | Sec.32-33
T | R | S

.....Baker..... COUNTY

.....Eagle Creek..... AREA

.....moderate..... ELEVATION

..... ROAD OR HIGHWAY

.....about 30 mi. Baker.... DISTANCE TO SHIPPING POINT

PUBLISHED REFERENCES

Lindgren 01:732
Lorain 38:29
Gilluly 31:24-28
Gilluly 37:114
Parks & Swartley 16:181
Swartley 14:121
Ore. Metal Mines Handbook 14A pg43

MISCELLANEOUS RECORDS

PRESENT LEGAL OWNER (S) ....J. Arthur..... Address ....Baker, Ore.....

.....

.....

.....

OPERATOR .....

Name of claims	Area	Pat.	Unpat.
Inc. Poorman, Mother Lode, Oregon Copper,			
Goose Creek Prop.			

Name of claims	Area	Pat.	Unpat.

EQUIPMENT ON PROPERTY

Poorman Copper Co. **refer Balm Creek Gold Mining Co.**

NAME | OLD NAMES | PRINCIPAL ORE | MINOR MINERALS

7 S T | **43 E** R | **32 - 33** S

PUBLISHED REFERENCES

Baker ..... COUNTY

Eagle Creek ..... AREA

..... ELEVATION

..... ROAD OR HIGHWAY

..... DISTANCE TO SHIPPING POINT

MISCELLANEOUS RECORDS

PRESENT LEGAL OWNER (S) .....

.....

.....

.....

Address .....

.....

.....

.....

OPERATOR .....

.....

Name of claims	Area	Pat.	Unpat.

Name of claims	Area	Pat.	Unpat.

EQUIPMENT ON PROPERTY

Mother Lode Copper Co. refer Bala Creek Gold Mining Co

NAME | OLD NAMES | PRINCIPAL ORE | MINOR MINERALS

7 S | 43 E | 32 - 33

T | R | S

PUBLISHED REFERENCES

Baker ..... COUNTY

Eagle Creek ..... AREA

..... ELEVATION

..... ROAD OR HIGHWAY

..... DISTANCE TO SHIPPING POINT

MISCELLANEOUS RECORDS

PRESENT LEGAL OWNER (S) ..... Address .....

.....

.....

.....

OPERATOR .....

Name of claims	Area	Pat.	Unpat.

Name of claims	Area	Pat.	Unpat.

EQUIPMENT ON PROPERTY

Goose Creek Copper Co **refer Bain Creek Gold Mining Co.**

NAME | OLD NAMES | PRINCIPAL ORE | MINOR MINERALS

7 S T | **43 E** R | **32 - 33** S

PUBLISHED REFERENCES

Baker ..... COUNTY

Eagle Creek ..... AREA

..... ELEVATION

MISCELLANEOUS RECORDS

..... ROAD OR HIGHWAY

..... DISTANCE TO SHIPPING POINT

PRESENT LEGAL OWNER (S) ..... Address .....

....

....

....

OPERATOR ....

Name of claims	Area	Pat.	Unpat.

Name of claims	Area	Pat.	Unpat.

EQUIPMENT ON PROPERTY

Oregon Copper Co. refer Balm Creek Gold Mining Co.

NAME | OLD NAMES | PRINCIPAL ORE | MINOR MINERALS

7 S	43 E	32 - 33
T	R	S

PUBLISHED REFERENCES

Baker ..... COUNTY

Eagle Creek ..... AREA

..... ELEVATION

MISCELLANEOUS RECORDS

..... ROAD OR HIGHWAY

..... DISTANCE TO SHIPPING POINT

PRESENT LEGAL OWNER (S) ..... Address .....

....

....

....

OPERATOR ....

Name of claims	Area	Pat.	Unpat.	Name of claims	Area	Pat.	Unpat.

EQUIPMENT ON PROPERTY