

J. D. CALDON
MINERALOGIST
AND
CONSULTING MINING ENGINEER
233 CORONADO BUILDING
DENVER, COLORADO

Denver, Colorado, Nov. 20th, 1917.

To The President and
Board of Directors of
The Golden Sun Tunnel & Mining Company,
Denver, Colorado.

Gentlemen,-

At your request I have examined the properties belonging to your Company in the County of Gilpin, State of Colorado, and I take great pleasure in submitting to you for your perusal the enclosed report as a result of my findings.

Very respectfully,

A handwritten signature in cursive script, reading "J. D. Caldon". The signature is written in dark ink and is positioned below the typed name "Very respectfully,".

REPORT
ON THE
PROPERTIES
OF
THE GOLDEN SUN TUNNEL & MINING
COMPANY

LOCATION

These properties are located in the Pine Mining District, in the northern portion of Gilpin County, State of Colorado. The waters of South Boulder Creek flow through the north frontage of these properties, and the main line of The Denver and Salt Lake Railway also passes through a portion of the Company's patented ground.

The distance from the smelters at Denver is about forty-five miles to the north-west; Central City, the County-seat of Gilpin County, being about seven miles to the south; the Town of Tolland which is situated about two miles to the west, and the Town of Rollinsville, about three miles to the east, are supply points. From investigation on the ground, I find that the entrance of the main working tunnel is close to the north-west corner of Section 3, Township 2 South, Range 73 West of the 6th Principal Meridian.

ALTITUDE

About eight thousand seven hundred feet above sea-level on the dump at the mouth of the tunnel.

AREA

The Golden Sun Group of mining properties consist of a compact body of mining claims comprising or embracing about two hundred acres, with a drainage and transportation tunnel already driven through the center of the group a distance of twenty-seven hundred and fifty feet.

GEOLOGICAL FEATURES

The vicinity in which the above described properties are located consists of metamorphic and eruptive rocks. These formations bear hydro-mica schist, porphyritic andesite, altered granite or syenitic granite, labradorite, basalt, diorite, hornblende schist and monzonite, with auriferous quartz penetrated with iron pyrites and chalcopryite. Malachite, or carbonate of copper, permeate many of the rocks of this section. Geologically speaking these rocks are distinguished as follows:

HYDRO-MICA SCHIST:-

Found accompanying auriferous matter. Is a thin schistose rock, consisting of either chiefly hydrous mica or of mica with more or less quartz, with a surface nearly smooth and feeling greasy to the fingers.

ANDESITE (Porphyritic):-

Consists of oligoclase or andesite and hornblende, with often some orthoclase or sanidin, and biotite. Being porphyritic when containing crystals of porphyry. Eruptive rock.

SYENITIC GRANITE:-

Consists of quartz, feldspar and hornblende and is frequently termed "altered granite" and bears the name "porphyritic" when accompanied with crystals of porphyry.

LABRADORITE:-

A lime-soda feldspar, containing little silica, and is generally auriferous and found in the selvage or gouge of a vein showing eruptive matter.

BASALT:-

An eruptive rock, similar to diorite in structure, color and variety but containing, in addition to labradorite and pyroxene, crysolite in disseminated grains.

DIORITE:-

Is a dark speckled, greenish gray rock consisting of a crystalline aggregate of clinic, or soda-lime feldspar and hornblende, and is generally found in copper bearing sections.

HORNBLLENDE SCHIST:-

A greenish colored rock having a coarse to fine crystalline-granular texture and occurs as a metamorphic as well as an eruptive rock.

MONZONITE:-

An eruptive rock having a composition of lime and magnesia, also silica.

There are three dykes traversing these properties, they are well defined and consist mostly of porphyritic andesite.

On that portion of the properties sloping to the south-east, I find for a considerable distance evidences of the overflows feeding the placers to the east and south-east with auriferous matter. The veins of the properties have a trend west 20° north, and east 20° south; these veins are known as the fissure veins, while the stratified veins have a north-easterly and south-westerly course. The shoots of ore dip to the south-west and have a regular appearance with well defined walls.

The geological conditions existing on your properties are very creditable. However, I find in the driving of the tunnel you have cut some sixteen veins at right angles but the veins were cut underneath the ore shoots.

DEVELOPMENT

VEIN NO. 1

About two hundred feet from the portal of the tunnel, I find Vein No. 1. This vein shows three well defined crevices running north-east and south-west and dips north-west 45 degrees. The main ore body of this vein is overhead and to the west. The vein is irregular where cut and carries considerable gangue mixed with country rock.

VEIN NO. 2

This vein was encountered about two hundred and forty-three feet from the portal of the tunnel and shows a fine crevice in blanket form, but badly disturbed, it dips to an angle of from sixteen to twenty degrees to the north-west. A station on this lode was driven seventy-five feet eastward without results.

VEIN NO. 3

This vein was cross-cut three hundred and twelve feet from the mouth of the main tunnel. A drift has been driven to the west one hundred and sixty feet. The crevice appears regular with a good hanging wall. The strike of the vein is east and west but somewhat disturbed. The vein is at least fifteen feet in width, the matrix of the vein is filled with gangue and foreign matter. The ore shoots of the vein are overhead.

VEIN NO. 4

Not stripped in the bore.

VEIN NO. 5

At a distance of four hundred and fifty feet from the portal of the tunnel, I encountered this vein. This is a stratified vein running north-east and south-west, but badly disturbed; it dips to the northwest to an angle of 35°, and the crevice shows considerable oxidized matter, and on the foot wall I find a mass of native copper precipitated from infiltration, showing that there is quite a large body of ore above. The ore shoot of this vein is fully fifteen to twenty feet overhead. The crevice, or vein matter, is at least twenty-five feet in width and bears numerous stringers, or feeders, which have enriched the same. The character of the ore is an iron sulphide and chalcopyrite.

VEIN NO. 6

This vein I encountered in the main tunnel about six hundred feet from the portal. It is a well defined fissure with a course, east 20° north, with a slight dip to the north. To the east a drift has been driven some thirty-five feet and shows the crevice matter from six to ten inches in thickness. To the west a drift has been driven about sixty feet; however, the vein is more regular, thoroughly in place and at least four feet in width between well defined walls, which consist of porphyritic syenite. The vein carries a selvage on each wall of labradorite and albite and well mineralized with iron pyrite. On the foot wall I find a streak of good ore from four to six inches in width, is a quartz sulphide bearing chalcopyrite. At this point we are about six hundred and fifty feet from the surface on dip of the vein with the ground rising to the south-west. By continuing this drift to the west I am of the opinion you will encounter a fine shoot of ore dipping to the north-west.

VEINS NOS. 7 & 8

Not stripped in the bore.

VEIN NO. 9

This vein I encountered about one thousand feet from the portal of the tunnel, it is a stratified lode running north-east and south-west. At the intersection of the vein and main tunnel, cut at right angles, the measures are badly disturbed. The crevice matter is fully twenty-five feet in width; nothing definite can be said, however, of the measures at this point until such time as a drift is made to the west.

VEINS NOS. 10 & 11

Not faced in the main bore.

VEIN NO. 12

About twelve hundred feet from the portal of the tunnel this vein was encountered. A drift driven one hundred and ten feet to the north-east followed crevice matter from six to eighteen inches in width; the walls consist of porphyritic syenite and the gangue of labradorite highly mineralized with iron sulphide and some chalcopyrite. At this point I find a disturbance caused by a dyke of porphyritic andesite and an intersection with Vein No. 13. At this point we are about one thousand feet below the surface on a 57° dip of the vein.

VEIN NO. 13

About twenty feet back of Vein No. 12, I find this vein; a station driven to the south-west some forty feet shows this crevice to be similar to Vein No. 12; the vein is regular and bears a slight disturbance from the dyke to the west. This dyke has evidences of cutting this stratified lode and we will, as we advance the drift to the south-west, find the same thrown more to the south-west, and another ore shoot will be encountered.

VEIN NO. 14

About fifteen hundred feet from the portal of the tunnel this vein was cross-cut; its course is east and west and dips to the north to an angle of 70°; it is a true fissure vein from two to three feet in width and between well defined walls of porphyritic syenite; the crevice matter is well in place and carries a selvage of labradorite and albite.

A drift driven one hundred and ten feet to the east on this vein shows near its face several large slabs of ore that have slipped down from the ore shoot overhead. The ore is a magnetic pyrite carrying auriferous matter.

A drift driven several hundred feet to the west from the main bore, shows the vein somewhat irregular and carrying in the crevice considerable galenite and iron pyrite. However, I was unable to reach the face of this drift by reason of a slide, but I am of the opinion, if this drift was cleaned out another shoot of ore would be found of galenite and iron pyrite suitable for concentration.

From the outcrop on the surface to the tunnel level below at this point is about one thousand feet.

VEIN NO. 16

This vein was cut about twenty-four hundred feet in the main tunnel, and badly disturbed by a porphyritic andesite dyke.

VEIN NO. 17

Cut about twenty-seven hundred feet in the tunnel, at this point the anticline seems to dip to the south and all formations and country rock are badly disturbed, to the breast of the main bore.

All the veins cut by the main bore, mentioned under "Development", were encountered from five hundred to twelve hundred and fifty feet from grass roots, or in other words from the apex of the mountain, and I must say that the work done has been carried on in a minerlike manner.

RECOMMENDATIONS

I would recommend drifting on Vein No. 5 to the south-west to a point where it will assume more regularity by the stringers merging, and then upraise on same.

On Vein No. 6, I would advise extending the drift to the west, chambered off and an upraise made on the ore shoot. As the ore is a chalcopryrite I have no doubt, this vein, as well as Vein No. 5, will carry some of the highest grade ore ever found, or will be found in the tunnel. In addition to the chalcopryrite these veins are permeated with native copper precipitated from the ore shoots above.

Then again, these veins being close to the portal of the tunnel, under the present conditions when labor is scarce, will mean considerable in reducing mining operations and will furnish sufficient ore to keep your mill running night and day for some time to come. I have great confidence in Veins 5 & 6.

I would recommend that an upraise be made at the junction of Veins 12 & 13, as I feel that you will encounter a very fine and large body of ore. You have in this shoot of ore sufficient mill dirt to keep your mill running steadily for some time to come, but I am also of the opinion as you upraise to the main ore shoot you will open a large and high grade body of sulphide ore. My reason for so stating this, is due to the fact that the samples taken very closely resemble the sulphide ore of the Transvaal in South Africa; being a free magnetic sulphide is well adapted to concentration and flotation.

I would also recommend an upraise on the ore body on Vein No. 14 to the east, and also that portion of the drift to the west that I could not examine on account of the cave, cleaned out.

The work that I have above recommended on Veins 12, 13 & 14 is to be considered after the consummation of the work on Veins 5 & 6.

I would further recommend that your Company, at the earliest possible date, have the Colorado Power Company extend its electric power line to the portal of your tunnel, this line is now about one mile distant from your mill and with the installation of electricity I am confident you will find it superior to your present system of power equipment, and much cheaper than your present method.

MILL AND OTHER BUILDINGS

A large and commodious power plant erected to the left of the tunnel entrance contains a 12 x 16 air compressor, which furnishes air for the machine drills, a 60 H. P. boiler and engine, 100 electric light plant complete, an exhaust fan, connected with an eight-inch galvanized piping, which extends throughout the underground workings to draw out the foul air.

To the rear of the power plant I find a supply house containing a full equipment of tools for the mine, machine shop, etc.

To the right of the entrance to the tunnel is located the blacksmith shop, machine shop and carpenter shop combined.

The first unit of the new concentrator has a daily capacity of fifty tons, and so constructed that it can be added to at a small expense.

The machinery consists of a 7 x 10 Blake Crusher, 4 x 6 Grizzly, Ore Gate, Plunger Ore Feeder, and one set 14 x 27 McFarlane Rolls, two sets King Screens, 100 tons capacity, one King Sizer Tank, two elevators, one set regrind 12 x 20 McFarlane Rolls, two No. 5 Wilfley Concentrating Tables, two 6 foot Frue Vanners, one 40 H. P. Nagle Engine, one 6 H. P. Upright Engine, also ore bins with a capacity of 140 tons.

The mill is so situated that the ore can be dumped direct from the mine car into the top of the mill, and the ore can be handled automatically.

In addition to the above buildings, I find a one and a half story log building (boarding house), two frame houses and one log cabin for miners' use, one oil house, two stone powder houses, one for storage and one for thawing purposes, wagon shed, barn, etc. I also find a pump house situated at the Creek, containing a 3 1/2 x 6 Goulds Triplex Plunger Pump, which supplies water to the four large tanks above the mill building.

I also find a tramway from the mouth of the tunnel running out into the timber, which is used for transporting timbers as needed in the mine.

GENERAL REMARKS

As I have above stated, your properties are situated in the Pine Mining District of Gilpin County and contain many mines of more than ordinary reputation.

To the north we have the celebrated Caribou Mine, which has produced up to a million dollars; to the south is the Perigo, and still farther to the south is the Bob Tail Gregory, which has also produced up into millions; to the south-east is the Camp of Gilpin. Bordering on the Camp of Gilpin to the north-west is the Gamble Placer ground, or Gulch, in which is located the Rollins Placer. This Gulch is 3 1/2 miles in length and 300 feet wide and it is estimated contains 2,620,570 yards valued at \$1.50 per yard, or a total value of \$3,938,550.00.

Still farther to the north-west from the Camp of Gilpin and closer to the properties belonging to your Company, I find Moon Gulch. It is estimated that this Gulch contains 1,250,000 cubic yards having an estimated value of thirty cents per yard, or \$375,000.00.

Still closer to your properties, and more to the east, is Leslie Gulch. The measures on the eastern portion of your properties have been disturbed and the washings have fed this Gulch and has formed what is known as the Wave Placer.

The topography of this section shows that the Golden Sun Mountain has been disturbed to the south-east and the washings therefrom have formed these great placers.

CONCLUSIONS

As a summary of my findings, I will say, that you have a property of great merit and a property that can be made a producing mine by following out the instructions contained in the foregoing report. You have the indications for one of the largest producers of this section, and all that is needed is to set to work along the lines stated. I wish to emphasize what I have already stated with reference to the future work on the properties; for the present push the work on Veins 5 & 6 and later, after conditions have changed, proceed with the work in what I consider the great mineral zones of the properties, known as Veins 12, 13 & 14, as I am of the opinion that by drifting, stoping, etc., you will produce sufficient ore to keep your mill operating for years to come.

I will state, briefly, that you have one of the best mills of the district, and one which is a great credit to the properties in its future operations.

Accompanying this report you will find a map showing the northern portion of Gilpin County, known as the Pine Mining District. Gilpin County bears the reputation of being one of the greatest gold producing counties of the State of Colorado and is known as the "Little Kingdom of Gilpin."

Respectfully submitted,



Mineralogist and Consulting
Mining Engineer.

PROF. CALDON'S REFERENCES

AMERICAN:

The Bradstreet or Dunn Mercantile Agencies.

Also Letters on file in Company office.

ENGLISH:

Capt. R. E. Palmer.....Oakland Park, Newdigate, Surrey, England

David Currie, Esq., Lake & Currie, 3 Gt. Winchester St., London

W. T. Bennett, Esq.....1 Queen Victoria St., London

F. D. Frost, Esq., Oate Frost Bros.....11 London St., E. C.

E. A. Foster, Esq.....6 Gt. St. Halena, London, E. C.

J. F. Pigott, Esq.....Savage Club, Adelphia Terrace, London

MEXICAN:

Sr. Gonzalo Estrando..Ex-Sec'y. of Mineral Dept. City of Mexico

Sr. C. E. Gonzalez....Ex-Secretary of State, Republic of Mexico

SOUTH AFRICAN:

Hon. Henry Green.....Kimberly, South Africa

Hon. J. B. Robinson.....Johannesburg, South Africa

Hon. Henry Tucker.....Johannesburg, South Africa

Thirteen years association with Cecil Rhodes and Barney Barnato, in South Africa.