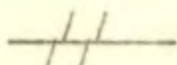


The State of Wyoming,
Office of State Geologist,
Cheyenne.A REPORT
ON
THE STRONG MINE,
LESLIE, ALBANY COUNTY, WYOMING.

LOCATION AND EXTENT.

The property known as the Swigart-Baker Group or the "Strong Mine" is situated in Section 4, Township 16 North, Range 71 West and Section 32, Township 17 North, Range 71 West, at Leslie Post Office, near the head of Horse Creek, in the eastern part of Albany County, Wyoming.

It consists of sixteen claims, as follows:-

Leslie,	Strong No. 3,	Granite,
Laura,	Marsh,	Farmen,
Albany,	Boston,	Copper,
Eveline,	Strong,	Swigart,
Strong No. 2,	Jean,	Wedge,
		Granite Extension.

These claims comprise about 270 acres, lying in one compact block of ground, as shown on the maps of the Company.

TITLE AND OWNERSHIP.

These claims are held by location and discovery under the laws of the United States and the State of Wyoming and United States patent on this ground has been applied for and survey notes are now in the hands of the Surveyor General of Wyoming.

The "Swigart-Baker" Group, as the property was formerly known, was located in October, 1898 and has been in practically continuous development ever since.

It is now owned by the Strong Copper Mining Company of Laramie, Wyoming, originated under the laws of the State of Wyoming and capitalized at \$1,000,000.00, divided into 1,000,000 shares, par value of \$1.00 each.

Of this stock 500,000 shares were paid for the purchase of the property and the balance placed in the treasury of the Company for development purposes, and there still remains about 200,000 shares yet unsold ~~in this state~~, according to statement received from the Treasurer of the Company.

The officers for the year 1907 are as follows:-

E. E. Corthell,	President,	Laramie, Wyo.
E. P. Baker,	Vice President,	Leslie, Wyo.
I. R. Swigart,	Secretary, Treasurer and General Manager.	Leslie, Wyo.

GENERAL GEOLOGY.

The Strong is situated on the east side of the range of mountains that extends north and south along the Laramie-Albany County line and which is known as the Laramie Hills.

The general formation of this range consists of a core of granites flanked on either side by the succeeding sedimentary formations limestones, shales, sandstones, etc. The granite is usually of a reddish feldspathic variety, but grey granite is noted and these are both found to contain numerous dykes, ledges and bands of gneiss, schist, diorite, gabbro and other dyke rocks, and it is here noted that the mineral showings

in this range are all found to occur in intimate connection with these dykes or ledges.

These showings vary in different parts of the Hills, but uniformly show copper ores with well defined surface indications and the trend or direction of the veins or ledges, as well as that of the dykes, etc. vary locally in the different camps of this range.

GEOLOGY AT THE STRONG.

The Horse Creek Valley, where the Strong is situated, shows the overlying limestone at the head of the valley, but this is missing in the valley below and nothing but the granite and dyke rocks are to be found in the Strong vicinity.

The granite is the usual red granite of this range, rather coarse grained and showing small veins and stringers of quartz throughout its mass, but the principal mineral showings are associated with the dykes. Here these dykes are principally gabbro and diorite, often much altered and weathered and showing extensive evidence of fracturing in the formations, both in the adjacent granites and in the dykes proper.

The fractured and fissured condition is the result of a number of movements in the formations, which have left the original dykes and granites and the later quartz veins much crushed and broken and provided a place for the copper and other minerals to be deposited.

The surface of the group is usually covered with a granitic wash or gravel in common with a great deal of the upper Horse Creek country but the dykes and ledges which form the principal surface showing on the Strong Group may readily be followed by outcrops along their course.

The surface showing usually consists of quartz and oxidised iron, showing both as masses of brown limonite and hematite (red and brown) and staining the adjacent quartz and dyke rocks, the usual rusty brown color of iron oxides.

With this iron stain is also copper, both as stains of blue and green copper carbonates (azurite and malachite) and some scales of native copper as well as partly oxidised copper sulphides, similar to those found in the deeper workings of the mine.

The principal showing at present worked is noted on the Strong Claim at the site of the main shaft and work confined to the showings of these workings.

O R E S .

The ores noted at the Strong are copper sulphide ores suitable for concentration and smelting.

In the upper level the usual oxidised forms of copper are noted, malachite and azurite, the green and blue carbonates being the most common, and associated with them are chrysocolla, silicate of copper, cuprite, red oxide of copper, some native or metallic copper and small amounts of the rarer copper minerals, but these are unimportant.

The chief ores of the mine are chalcopyrite and bornite, copper-iron sulphides and with these is found copper glance or chalcocite, a black hard sulphide of copper which furnishes the "specimen ore" of the mine, running as high as 70% copper in selected samples.

With the copper values are found gold and silver values in varying quantity, the new work on the 350 level showing an increase in value, and the presence of molybdenum and lead is noted but is not important.

These ores and including materials or gangue as discussed in detail in paragraphs relating to the showings on the different levels.

WORKINGS.

The development consists of the following:

Main Shaft,	346 feet.	March 9th, 1907.
Drifts, 100' level.	43 "	"
150' "	207 "	"
250' "	411 "	"
350' "	65 "	"
Crosscuts,	321 "	"
Winze,	<u>5. "</u>	"
Total development,	1398 "	"

At present these workings are being daily increased by driving the new 350 Level north on the ore, crosscutting west on the south side of the shaft, 350 level and a drift south from the shaft, 350 level, on the southern continuation of the ore now shown in the north drift.

MAIN SHAFT.

This was sunk on the Strong Claim as a double compartment shaft, following the dip of the ore and shows ore for nearly its whole depth, and the various drifts and levels run at the different intervals above noted under the head of "Workings".

The ore at the surface showed six feet wide and at a depth of fifty feet showed fourteen feet wide in a crosscut ~~on~~ the east side of the shaft. It is believed that the vein in this crosscut dips east of the shaft and will be picked up by a crosscut that should be run east from one of the lower levels, but so far, this crosscut has not been run; it should be done at the earliest opportunity.

A quartz vein carrying copper continued down the shaft, showing a varying width, to a point below the 150 level, where the vein changed from a slight easterly dip to a stronger westerly dip and the shaft continued in a mineralised gabbro to the present depth.

The mineral showing in this gabbro is copper and iron sulphides, occurring in spots and streaks scattered throughout the mass and quartz vein in the gabbro.

^{large} No tests have been made as to the grade of this material, but from numerous assays made it is evident that a great portion would be available for concentration with other ores of the mine. At present this ore is only considered as indicating the ~~extent~~ extent of the mineralisation in connection with the more developed ore bodies of the mine, but is becoming important as ~~it is~~ further developed and shown up.

THE 100 LEVEL.

On this level, which is 45 feet long, the quartz ore impregnated with copper sulphides extends the whole length and shows in the floor, roof and sides of the drift and also in the present face.

At a point 27 feet from the shaft, a winze was sunk five feet deep and shows the same ore as in the drift. The width of the ore shown at the floor of the drift, where the winze was sunk is 7 feet 9 inches.

A five foot crosscut was run into the gabbro on the east side of the drift, at 13 feet from the shaft, showing the gabbro in the face and quartz ore on the sides of the cross cut.

Some high grade ore has been taken out of this level and the winze near the south end, but the mass of the body shown is considered concentrating ore and is evidently part of a large body of ore that has not been fully opened up by the present drift.

On this level considerable oxidized ore is noted in connection with the usual sulphides above mentioned, but the greater percent is sulphide ore suitable for concentration.

THE 150 LEVEL.

This level, like the others, has been run on the ore. Its length over all is 207 feet along the vein north and south. On the south side of the shaft, the drift is 181 feet long and in ore of a concentrating grade for a length of 110 feet, the remainder being a crushed and broken quartz and gabbro, showing a mineralized condition similar to the present shaft material and is evidently the usual ground between ore shoots.

A cross cut has been run on the east side of the drift for a length of eleven feet at a point 63 feet from the shaft and at 50 feet further east cross cuts on either side followed a fault or fissure line running diagonally across the ground of the ore shown in the main drift.

The material in these cross cuts shows a crushed and fractured condition, showing smooth "slickensides" indicating considerable movement in the formation adjacent to the ores of the drift. These cross cuts were driven for exploration purposes and not on the ore.

The ores here show the copper sulphides in quartz and gabbro and a width (as far as developed) of from one to nine feet, the narrow streaks showing some very rich ore and the wide bodies, rich streaks through the mass of low grade copper sulphide ore.

THE 350 LEVEL.

with the new ore shown on the 350 level,

This level is the most important showing at present made in the mine, showing as it does that the ore values are not confined to the

surface sheets, that there are sheets of ore not shown in the surface outcrops and that the size of vein and grade of ore has not diminished but rather increased with depth, all of which have an important bearing on all consideration for the future of the mine.

Drifts have been run north and south of the shaft for a total distance of ⁴¹¹411 feet and ore shown in both drifts, but the main ore showing has been made in the easterly drift on the south side of the shaft.

This drift extends south for a distance of ¹⁸⁸188 feet from a cross cut at a point 25 feet south of the shaft where a showing of ore indicated that a vein had crossed the general course or trend of the ore in the upper levels and the drifts run as above noted. This drift cut into rich glance and bornite ore and continued in the same for a distance of 125 feet.

The ore shows in bottom, top, ~~ENE~~ sides and face of the drift and the grade is the same for the whole length of 125 feet, the vein being a crushed quartz showing copper glance, bornite and chalcopyrite and is evidently of a high concentrating grade, though no tests of large amounts have been made on this material, specimens show very high values.

At a point 63 feet south of the shaft, a cross cut was run west for a distance of 36 feet and showed about ten feet of good concentrating ore and 19 feet over all of mineralized material carrying copper values that is suitable for concentration, but of lower grade than the first ten feet.

The drift continued south on the same quartz-bornite-glance ore, the full width of the drift, to a point 155 feet from the shaft and here ran into a cross vein running diagonally across the trend of the main drift; the latter continued as a cross cut across and through this cross vein to the present face, showing about 30 feet of milling ore.

The values in this ore show as bunches, streaks and masses of copper-iron pyrites scattered through the fractured dyke rocks associated with the quartz stringers and bunches noted therein and showing in the richer portions a condition similar to the ore of the main drift.

Drifts east and west along the course of this ore have been started, but at this writing have not progressed far enough to show up its extent.

It is also noted that small spots of sulphides show at a point at the present face in the close grained gabbro-diorite and further development south should be taken up later.

The first drift run on this level was too far west and went along beside the ore on the west side. Some ore was encountered here on the east side of this latter drift and indicates the extent of the mineralization confirmed by the crosscut above noted.

A drift has been run on this same vein on the west side of the drift south from the shaft and connects with a cross cut west from the north drift. As stated in the shaft description, the ore followed ^{ed} down dipped away from the shaft line to the west and the shaft was sunk from that point down without regard to walls or vein. It is evident from conditions noted on this level that some movement or intrusion took place at this point and that the ore followed in the upper shaft and levels varied from its regular dip and course, and also, that the south-east drift above noted has again opened up this ore and has determined the course to be followed on this and lower levels.

On the north side of the shaft, drifts have run on a showing of ore, for a length of 197 feet. At a point 13 feet north, a crosscut was run east 33 feet to cut the gabbro contact. At a point 20 feet north a cross cut was run 45 feet west to cut the ore shown in shaft above, but

showed only small stringers of quartz and ore at this point.

At a point 119 feet from the shaft a crosscut showed a well defined body of ore about ten feet wide and the drift was cut back double width for a distance of 17 feet showing the ore in floor, roof and side.

The drift has continued for 87 feet beyond the crosscut and showed more or less ore all the way but no attempt was made to keep on the ore above noted. At 66 feet north of the crosscut, a second crosscut was made west, in a body of reddish felsitic material and showed a fine body of milling ore. Here the pyrites of copper shows in the sides and roof of the crosscut for a width of about fifteen feet, the gangue being evidently a replacement of coarse granite with quartz and the sulphides of copper and iron.

Assays for gold and silver show higher values in this north drift than in any other place in the mine and a very careful study of this fact should be made, with tests on a large scale of all the ore.

350 LEVEL.

At present this is the lowest level of the Strong and the deepest working of any mine in the Laramie Hills.

As before noted, the shaft was sunk from the 359 level to the 350 level in the gabbro; numerous samples of this material assayed showed values in gold and silver and small stringers of copper sulphides were cut from time to time during the progress of this shaft work, as well as showings of the same minerals in small spots throughout the gabbro but no large ore body was cut.

At 350 feet depth, a station was put in and drifts run north and south; at a point just south of the shaft, a small stringer of ore was cut and showed a diagonal course across the drift, narrowing down to a seam on the southeast side but much wider at the northwest side.

Crosscuts were started west on each side of the shaft and the north crosscut soon cut into the ore first noted on the south drift. This ore is about four feet wide at this point and a drift has been run for a distance of twenty feet north at this writing and the ore indicates a continuance and greater width. The ore is similar to the large shoot on the 250 level, being quartz with streaks and spots of copper glance and other sulphides throughout the mass; a ten inch streak on the east wall is highgrade, and the whole drift face a good grade of milling ore.

The south crosscut has not yet cut into ore but should be continued through the gabbro for prospecting purposes and is most important at this point. A drift on the streak southeast from the shaft is important and should open up a similar body to that now being opened in the north.

P R O B A B L E O R E.

The different levels have not yet been connected by raises of the ore to establish the full extent of the ore and admit of mill samples to determine its exact commercial value, but enough has been done already to thoroughly demonstrate beyond a reasonable doubt, that the Strong contains a great body of ore and that it is of commercial concentrating grade.

A careful inspection of the showings made indicates that the average width of the ore is at least five feet, and, taking this as a basis of calculation with the length of ore opened up on the different levels, especially the new ore on the 350 level, it is evident that this shows an amount of ore that fully justifies the further active development of the mine and immediate erection of a plant to concentrate these ores to a profitable shipping basis.

The ore indicates that such works should concentrate from four to eight tons of ore into one ton of concentrates and this, with the gold and silver values shown in the tests made, shows a good grade of concentrates, that may be shipped at a profit.

All records of tests are in the hands of the secretary and copies may be had on application to him.

EQUIPMENT.

The present equipment consists of

- 1-40 H.P. Tubular Boiler.
- 1-25 H.P. H. & B. Hoist.
- 1 Exhaust Fan.
- 1 Blacksmith outfit.
- 1-12" X 12" Herwalk Air Compressor.
- 1-36" X 8' Steel Air Receiver.
- 3-2 1/2" Air Drills.
- 1-5' X 7' Weed Tank.
- 1-7' Cameron Pump.

This is used in connection with the usual mine tool and pipe equipment, cable, cars, buckets, etc. for the necessary operation of the mine.

Steam for this work is furnished from the above boiler for the present, but this should be properly built in and enclosed so as to avoid any waste of fuel or steam that may be used to advantage in the mining work, and a larger boiler added at convenience.

The present mine water does not require a pump, being handled by buckets but it is likely that such a pump may be required at any time and has been provided, against contingencies that may arise.

The buildings consist of the following:-

- 1 Shaft house, 26' X 50'
- 1 Boarding house 20' X 66' 3 stories.
- 1 Bunk house 20' X 40' L to boarding house.
- 1 Barn 16' X 24' with L 14' X 24'

These latter are at the Creek, below the shaft, on two lots in block # 1 in the townsite of Leslie and owned by the Strong C.M.Co.

The present shaft is in good order for prospecting work and will answer all purposes until a steady production is called for, but at that time it is recommended that it be straightened up and put in

thorough first class shape for rapid hoisting by being properly timbered from top to bottom, to prevent any possible accidents from falling rock, and proper guard ~~boards~~ rails etc. placed at all stations or working places.

C O N C E N T R A T O R .

A concentrator is recommended for the ores at this mine. As has been already started, these ores are suited to a concentrating-smelting processes, and it is considered that the showings now made fully warrent the erection of a plant as early as practicable in the Spring of 1907.

The progress made during the year of 1906, when for a greater portion of the time hand work was used before the present compressor and drills were installed, has shown conclusively that a vigorous campaign on the ore showings now made will put the mine in a shape to produce at least 100 tons per day and that milling plant of this capacity, capable of being enlarged, should be built at the above time.

The plant required consists of storage bins at shaft and mill, connected by overhead rope tramway equiped with necessary buckets, landing devices etc. at either end to receive and deliver the ore automatically, and driven by power from the mill engine.

The mill should consists of crushers, jigs, rolls, screens and concentrating tables, with special attention paid to the saving and handling of the slime or fines that escape the tables.

Power to be furnished by boiler and engine set conveniently at the mill and provided with shafting, bolting, etc. conveniently placed for present and future needs when the proposed plant is enlarged.

It is recommended that the details of this mill be worked out on the working plans as soon as possible and necessary experiments made.

to determine practically the machinery best adapted for these ores regardless of apparent suitability or "interested" advice.

M I L L S I T E .

At a point on Horse Creek below and east of the present boarding houses, (~~see sketch on map~~) there is a prominent outcrop of granite on the north side of the Creek that forms an ideal site for a milling plant, and this is recommended as the mill location, as it provides all necessary conditions for foundation, fall, etc. at a minimum distance from the shaft, (~~see sketch on map~~) about 1500 feet, is accessible from all sides and the entire creek may be conducted into the mill tanks with a ditch of not to exceed a length (estimated) of 2500 feet and obtain all the fall necessary for milling purposes, or pumped to the tanks at the mill site and avoid a ditch.

This site is not on the Strong Group of Claims, but on patented land adjoining, belonging to Dr. E. R. Swigart, who has personally assured the writer that he will deed a proper sized mill site to the Strong Copper Mining Company, upon erection of a mill.

Below this site the ground is covered by the Strong Group, (~~see sketch on map~~) and provides sites for a proper series of settling ponds for the mill tailings, which are necessary to prevent pollution of Horse Creek below the works and thus avoid all future trouble with those interested in the stream, either for fishing or irrigation purposes.

W A T E R, T I M B E R A N D F U E L .

Horse Creek flows through the property and water rights for milling purposes may be obtained on application to the State Engineer of Wyoming, under whose jurisdiction all waters are placed by the laws of the State of Wyoming.

This stream provides all water necessary for a milling plant and by storage reservoirs above and pumping back from settling tanks, a large plant may be taken care of, aside from the water from the mine, which will form an important item.

~~(supplement)~~

There is no timber on the Strong group suitable for mining purposes, but in the vicinity there is the usual pine timber, which is used for fuel and rough mine timbers.

For extensive building or mining work, lumber may be had in car load lots at the usual trade prices in Cheyenne or Laramie. The nearest delivery station is Horse Creek, ten miles distant, on the Cheyenne-Orin Junction Branch of the Colorado and Southern R. R.

This station is the natural outlet for the Strong, as it is a down hill pull to the station over what can be made a first class mountain road with small expense, and with the mill once producing steadily the question of hauling will be readily settled as it will provide a lead for the teams both ways, concentrates down to the Railroad (the heaviest loads) and coal and other supplies, lumber etc. back to the mine.

Contracts for hauling to Horse Creek or to Laramie may readily be made as soon as a steady production and the most economical route determined.

C O N C L U S I O N S .

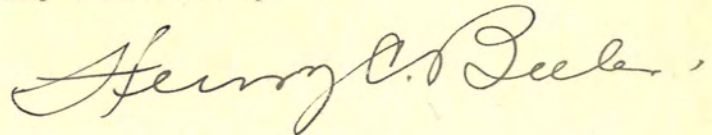
The Strong Mine is considered a first class development proposition, which certainly justifies the fullest development of its contained ores and the erection of a plant to treat these ores, on the lines indicated in the foregoing report.

There is every reason to believe that the ores now cut into are only a small part of the ores of this mine and that deeper workings following the ores, will develop a much greater amount of ore of equal grade; the recent work on the 350 level has already partially realized this.

To this end it is recommended that the 350 Level be pushed to new, and along the present ore, as rapidly as possible, that the present shaft be continued and at 100 feet below the 350 level, that another level be run and further sinking considered, as well as a crosscut east on the 350 level to open up at that depth, the ores which certainly exist east of the present workings.

At the same time, lateral development on the ore is necessary, with raises and crosscuts to fully determine these present ores, their full extent, value and relation to each other and new ores, as in the light of this work the future development of the mine may be planned and as the success of the past year has demonstrated, there is every assurance that the Strong Mine will come a great producer.

Respectfully Submitted,

A handwritten signature in cursive script, reading "Henry C. Beck".

State Geologist.

Date of Examination.

March 8th & 9th, 1907.