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## Report on Bellshazar mining property

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Report  
On  
Bellshazar Mining Property

By  
Matthew Vincent Quinn

A  
THESIS  
submitted to the faculty of the  
SCHOOL OF MINES AND METALLURGY OF

THE  
UNIVERSITY OF MISSOURI  
in partial fulfillment of the work required for the  
DEGREE OF  
MINING ENGINEER

1914

Approved by *C. P. Forbes*  
*Professor of Mining.*

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## DESCRIPTION OF THE DISTRICT.

The property of the Belshazzar Gold Mine is located in the Granite Creek Mining District of Boise County, State of Idaho. This district forms the northern boundary of the famous Boise Basin which has produced over two hundred million in placer gold. The Belshazzar property is about three and a half miles from the town of Quartzburg and about four miles from the town of Placerville. A good wagon road connects the property with both towns. Two roads connect Quartzburg with Boise (the capital of the state) One by way of Placerville, Centerville and Idaho City (about 52 miles) and which is the stage route, supplying the daily mail and passenger service to the district. The other, by way of Harris and Shafer Creeks, is the shorter route (about 38 miles) and the one most used for freighting into the district. Both roads are kept in the best condition and can be traveled at all seasons of the year. Freight rates into the district from Boise are about one cent per pound. The importance of the district has been doubly enhanced by the construction of the Idaho Northern Railroad and by the assurance of the

completion of a railroad, during 1914, directly into the district, by the Barber Lumber Company; The former passes within 12 miles and the latter within 7 miles of the property. Good wagon roads lead from the property to both. This will serve to materially lessen the freight rates into the district and to quadruple its accessibility. This section is well supplied with all needed timbers for mining and the mountain streams furnish abundant water for milling purposes. The electric power line of the Boston and Idaho Company extends throughout the district, affording all necessary power for mining, milling and lighting uses. For eight months in the year the climate is agreeable and varies little from the southern locations of the same altitude. The remaining four months, i. e. from December to March, are not severe, and mining and milling can be carried on throughout the year, without inconvenience. Communication with Boise and all Eastern and Western points is established by means of the lines of the Mountain States Telephone Company. Banks in Idaho City and Boise facilitate all financial operations.

This district, which is about twenty miles long and three miles wide, is traversed by numerous lodes or ledges among which the most prominent is the famous Gold Hill lode upon which practically all the active and promising mines are located; viz: The Golden Age property is situated on the northeast end of the lode and which is equipped with a modern ten stamp mill in active operation; The Gold Coin property on which active development is being prosecuted; The Gold Hill property which is equipped with twenty stamps, Lane mill, and modern cyanide plant, and which is also in active operation; this property has a production to its credit estimated at about six million dollars; The Last Chance property which is equipped with a six foot chillian mill and cyanide plant and also in active operation; The Amigo property which is equipped with a five foot Huntington Mill and cyanide plant; The Belshazzar property which is equipped with an obsolete ten stamp mill, also the machinery of a new modern ten stamp mill; The Mountain Chief property which is equipped with a five stamp mill in active operation.

This property is a continuation of the Belshazzar. The Mountain Chief produced over sixty thousand dollars(\$60000) in 1913.Plans are under way to increase the capacity of the mill to a one hundred (100) ton plant and also install a modern all slime cyanide process;and finally the Ebenezer property from which over a hundred thousand (100000) dollars has been taken from one chimney alone.

Capital is becoming interested and active operations extend throughout the belt.This district bids fair to take its place among the best in the state,and a good substantial boom is in progress at this writing.

## GEOLOGY OF THE DISTRICT.

The general geological structure consists of Archean Granites, Granite-Gneisses, <sup>and</sup> Diorites, intersected by dykes of Porphyritic Andesites. The lodes or veins are generally altered feldspathic porphyries impregnated with stringers of quartz and iron pyrites and <sup>it</sup>marcasite. They run in a north-east and south-westerly direction and have a dip generally to the south. They are cut in places by porphyry dykes, forming occasionally immense chimneys of ore as instanced in the Pioneer claim of the Gold Hill property and the Ebenezer property.

The veins in the northern end of the district carry Lead, Zinc, and a small percentage of Copper. Lead occurring as a carbonate and sulphide, zinc as a sulphide and copper as a carbonate and a sulphide. The center of the district carries Antimony and Bismuth both in the form of a sulphide. The Antimony is always associated with rich stringers of gold bearing quartz. The southern end of the district carries all the above mentioned metals. The veins are mostly all contact veins.



## THE BELSHAZZAR MINING PROPERTY.

This property is located on the south-western end of this district and consists of the following full claims;The Belshazzar,Bellflower,Hidden Treasure and Venus.All laws governing the location and acquisition of this mining property have been complied with.No question of title can arise as long as the annual work is performed and which has been done up to and including the year 1914. The two most valuable claims upon which most of the development work has been done;Viz;The Belshazzar and Centennial,have been surveyed for patent and approved by the United States Surveyor-General. The Belshazzar vein extends throughout the Belshazzar,Bellflower and Venus claims and has been exposed by placer operations on the Belshazzar claim for a distance of over two hundred(200)feet The Centennial vein which parallels the Belshazzar vein,traverses the Centennial and Hidden Treasure claims and it also has been exposed on the Centennial claim for a distance of nearly six hundred(600)feet by placering.Over sixty thousand (60000)dollars has been taken by these operations.

These veins have a north-east and south-west strike and the Belshazzar has a dip to the south of about thirty five degrees as shown by the present development, while the Centennial has a dip of about sixty degrees to the South. These veins are only three hundred (300) feet apart on the surface and considering the difference in dip of the two veins of about twenty-five (25) degrees, it is reasonable to suppose that with depth they will unite, forming an immense body of ore. The vein filling is composed chiefly of a white altered feldspathic porphyry impregnated with sulphides of iron and stringers of quartz. These stringers of quartz and sulphides frequently extend into the neighboring porphyries for large areas, enriching them to such an extent that they can be profitably mined.

Besides the surface workings showing the apex, the Belshazzar vein is developed by three drifts: upper, middle and lower. The upper drift has been driven for its entire distance of six hundred feet (600) on the vein. It has over it about two hundred feet (200) of stoping ground. The ledge as developed in this drift shows an average width of about three feet, the assay values of which would run in the neighborhood of ten dollars.

A very small amount of this ground has been stoped. The ore in this drift is entirely free milling. This drift is connected with the middle drift by winze and shute through which the ore is delivered to the tramway bin. The middle drift is about six hundred and fifty feet(650) long and opens up the vein for a distance of about four hundred and fifty feet(450) the balance ,or two hundred feet(200) being a cross cut to the vein. The vein in this drift has about the same average width as the one above .The depth between these two drifts following the slope of the vein is about one hundred feet(100). The ore above this drift has been stoped to some extent. About one thousand (1000)tons were taken out of there and washed in sluices, producing over five thousand(\$5000)dollars by this method. Mill runs from this drift have plated over six dollars per ton, the ore being only partially free milling. This would show an assay value of about twelve dollars per ton. One mill run of about eighty tons taken from this drift plated better than seventeen dollars per ton. There still remains a large amount of stoping ground between this drift and the upper one.

The lower drift is in about five hundred and fifty feet(550) two hundred feet of this being a cross cut to the vein.The remaining three hundred and fifty feet(350) have been driven on the vein,which in this drift is better defined than in the upper two. It has an average width of about three feet.Assays taken along the vein in this drift show a continuous ore chute of over two hundred feet(200) in length, values ranging all the way from eight to one hundred dollars,giving an average of the whole chute of about eighteen dollars per ton.High grade specimen rock has been found in this drift.The ore is only partially free milling,and will concentrate at about fourteen into one,giving a high grade concentrate.These assays further show that this drift has cut through the apex of what will undoubtedly prove on further development to be an ore chute of exceptional richness.The upper drift can be driven three hundred feet(300) further before coming to the end line on the south-west,the middle one,four hundred feet(400) and the lower one five hundred,(500) feet.By extending these drifts to the said end line,they will open and develop large quantities of valuable ore.

A mill run of thirty(30) days duration under our personal observation, on ore taken from the middle and lower drifts , showing an assay value of nine, (\$9) dollars per ton, extracted by plate amalgamation four dollars and fifty cents(\$4.50) per ton, or an extraction of fifty per cent of the values by this method alone.

Experiments upon the tailings by the cyanide process gave an extraction of ninety per cent, or a total extraction of the entire ore of ninety five per cent. This test was made upon the ordinary run of mine ore and under practical mining operations. The Centennial vein, besides its surface workings , showing the apex, has been developed by a prospect shaft, one hundred and thirty feet(130) deep. A drift two hundred feet long was run from the south-west end line, on the vein and connected with the shaft. This drift was afterwards extended in a north-easterly direction one hundred(100) feet on the vein, at which point a fifty foot raise was made to connect with a location drift above. At the face of this three hundred foot drift and in the raise, and ore body was encountered. In this raise , ore was stoped for a width of four feet and showed an assay value

of thirty-four dollars(\$34.00)in gold and ninty-nine ounces in silver.Surface ore along the apex of this claim plated sixty-four dollars(64.00) per ton.These workings through neglect have become partially closed and it will take considerable work to re-open them. However the results aa given can be easily verified.

But very little development work has been done on the Hidden Treasure claim,simply some open cuts to show continuity or presence of the vein.Work is being prosecuted at the present time at the junction of the Venus and the Bellflower claims,by a drift which at present is in about one hundred and forty five feet(145)This is a cross cut drift driven to cut the Belshazzar and Centennial veins.This drift will give an approximate depth of stoping ground on these veins of at least nine hundred (900)feet.The three upper drifts are practically on top of the hill and ore from which is brought to the mill by a seventeen hundred(1700)foot tramway.The expense of tramming the ore from these upper drifts will be eliminated when the drift on the Bellflower and Venus claims cut these veins for drifts can then be started

on both and run for a linear distance of three thousand (3000) feet. This as stated above will give a block of stoping ground of not less than nine hundred (900) feet over each drift. This immense amount of stoping ground would be sufficient to run a twenty stamp mill for many years to come. It would also obviate sinking with all its attendant expenses of pumping, hoisting etc. Besides which it would enable operators of the property to handle their ores cheaper than any other company or companies operating in this section. The Belshazzar property is equipped with its own boarding house, bunk house, barn, assay office, three blacksmith shops, saw mill, and ten stamp mill (stamp mill, however, is in poor condition and fit only for making test runs) besides the machinery for a new modern complete ten stamp mill. Somewhat over six hundred cords (600) of seasoned wood should also be included in the above. A splendid stream of water flows from the property and which is amply sufficient to furnish all water needed for milling purposes. Telephone line connects the property with Quartzburg, Placerville and Boise. The camp is ideally situated for mining and milling purposes. Mining timbers are available in ample quantities.

*Par.*

*repeat*

Electric power can be brought to the property by building a power line of about two and one half miles( $2\frac{1}{2}$ )With proper equipment installed ore can be mined and milled for a price not to exceed two and one half dollars( $2\frac{1}{2}$ ) per ton.With good common sense used in its development and practical handling and operating this property,in our estimation,should prove one of the best,if not the very best in the entire district.The opportunities to make a good property at a comparatively little expense is better here than at any other place in this section.



The following are the samples taken from the different drifts; Samples taken at ten foot intervals beginning at the face of each drift

Upper Drift

No	Width of vein	Au. Oz.	Ag. Oz.	Value
1	2 ft.	.96		19.84
2	4	.26		5.37
3	1	2.48		51.26
4	1½	1.82		37.72
5	5	.24		4.96
6	2	1.12		23.15
7	4	.64		13.23
8	3	.48		9.92
9	3	.42		8.68
10	5	.18		3.72
11	3	.45		9.30
12	3½	.40		8.27
13	6	.20		4.13
14	6	.20		4.13
15	6	.20		4.13
16	6	.20		4.13
17	4½	.32		6.61
18	4	.48		9.92
19	4	.50		10.33
20	3½	.60		12.40

21	4	.36	7.44
22	4	.40	8.27
23	3	.52	10.75
24	$2\frac{1}{2}$	.68	14.05
25	$3\frac{1}{2}$	.40	8.27

Middle Drift

1	4	.20	4.13
2	4	.20	4.13
3	$3\frac{1}{2}$	.32	6.61
4	3	.40	8.27
5	3	.42	8.68
6	$2\frac{1}{2}$	.48	9.92
7	$2\frac{1}{2}$	.50	10.33
8	3	.42	8.68
9	$3\frac{1}{2}$	.32	6.61
10	4	.20	4.13
11	5	.20	4.13
12	$4\frac{1}{2}$	.26	5.37
13	$4\frac{1}{2}$	.28	5.79
14	4	.32	6.61
15	$3\frac{1}{2}$	.36	7.44
16	$3\frac{1}{2}$	.30	6.21

17	4	.33		6.82
18	4½	.16		3.30
19	4½	.23		4.75
20	4½	.26		5.37
21	4	.32		6.61
22	2½	.40		8.27
23	2½	.43		8.89
24	2	.68		14.05
25	2	.48		9.92
26	2½	.80		16.53
27	2½	1.40		28.94
28	2	1.64		34.00
29	2	2.20		45.47
30	2	1.60		33.07

**Lower Drift**

1	2½	.40	1.48	9.13
2	3	.60		12.40
3	3	.90	2.30	19.82
4	2½	.84	1.16	17.94
5	3½	.40	2.00	9.27

6	$3\frac{1}{2}$	.40	2.00	9.27
7	3	.56	8.00-	14.57
8	$2\frac{1}{2}$	1.52	25.08	44.96
9	$2\frac{1}{2}$	.72	33.32	32.87
10	2	2.90	7.26	62.96
11	2	3.02	32.98	80.22
12	1	6.04	21.82	143.06
13	$1\frac{1}{2}$	4.40	10.00	95.94
14	1	4.72	10.00	102.56
15	$1\frac{1}{2}$	2.48	12.00	57.36
16	$1\frac{1}{2}$	2.48	10.00	56.26
17	2	1.04	11.58	27.65
18	$2\frac{1}{2}$	1.00	5.00	21.17
19	$2\frac{1}{2}$	.80	1.32	18.24
20	$2\frac{1}{2}$	.52	1.00	11.25
21	3	.40	1.48	9.13
22	3	.60		12.40
23	$2\frac{1}{2}$	.90	2.30	18.82
24	2	.84	.16	17.24
25	$3\frac{1}{2}$	.40		8.27