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MR 18-1

REPORT

On Williams-Luman Copper Mine at Depass, Wyoming
Lander, Wyoming, Nov. 26, 1918

To the Williams-Luman Mining Co.

Gentlemen, The following report on the Williams-Luman Mine, based on a personal examination of the property made October 16th to 26th 1918 personal interviews with miners and others employed about the property, and the records is respectfully submitted.

Claims, Location and Improvements

This group of four claims and two fractions is located in the north and east of Lysite Station on the Burlington Railroad. There is a shipping point, Shoening Siding, 12 miles south of the property, Lysite is the nearest Post Office. The mine is located on Copper Mountain on the easterly extremity of the Owl Creek Mountain Range. A good road runs from Lysite to the property, and the road to Shoening Siding is being completed. On this property there are ample buildings for housing employees, consisting of a two story Hotel building, annex, basement and four cottages. Water is piped to these buildings for domestic purposes. There is a small building inclosing Morse Ball Mill, and Card Concentrating table. One 15 HP Fairbanks Morse Gasoline engine, one 3 HP Fairbanks Morse Gasoline engine, and a storeroom attached. A crusher about 50 tons capacity, is on the property but not erected.

The mill building is admirably situated for handling the ore by gravity, being situated at the mouth of the ravine to the west and below the tunnel portal. There is also a substantial rock garage building

about 24 x 30, near the hotel. A frame barn that will care for about 17 horses, corrals and pasture fences are also on the property.

At the mine there are all the necessary buildings to take care of the machinery, consisting of blacksmith shop, well equipped machine shop, good change room and buildings enclosing compressor, with two Fairbanks Morse Gasoline engines.

Development.

The development consists of a cross cut tunnel about 575 feet long, intersecting the veins at a depth of 200 feet. From this connection there is a raise following the ore to the surface of the dip of the vein or lode which is slightly to the north. In this raise, the north vein shows an average of 5 feet in width, vein material being quartz, mineralized with copper carbonates, axurite, and malacite, also iron oxides, limonite and hematite, with copper glance and native copper.

The original discovery is reported to have been made at the top of the raise of Glory hole. At the bottom of this hole, which is 20 feet deep, there is drift running north easterly on the strike of the vein 72 feet. Twenty-five feet deeper or 45 feet from the surface, there are two drifts, one to the north-east 150 feet and one to the south-west 130 feet. These drifts follow the strike of the vein.

Commencing at the back of the tunnel up 25 feet there has been some work done to the south-west for a distance of about 40 feet.

On the north and east of the raise there has been about 90 feet of work done in drifting and about 20 feet of raise work. Twenty-five feet above points described or 50 feet above the tunnel there have been two drifts run, one to the north-east 30 feet, and one to the south-west 20 feet. North and east from the station, which is at the intersection of the tunnel with the vein a drift has been driven 80 feet. In a south-west course from the station there has been work done for 20 feet. Outside of the tunnel and raise, work described has been done recently. In addition there has been a station cut at the intersection from the vein in a southerly course to the south vein about 40 feet. A shaft has been sunk at this point which the writer learns is 610 feet deep, with stations, drifts and crosscuts, estimated work done about 11,000 feet. The writer was unable to examine this work owing to the shaft being filled with water. For a description of the work done there is attached a crude draft made by M.E. Connell, of Lenore, Wyoming, who was employed on and in charge of the greater part of this work.

Ores and Values

In the present mine there are two distinct veins which come together at the surface in the Glory hole or top raise. On the south vein there has been no work done between the tunnel level and the top of raise. From the Glory hole there has been some very rich ore shipped. On the tunnel level it shows some values, but the work done there was so small that no close examination was made of it. Nearly

all the work done below the tunnel level, I have been informed, was done on the second level which is said to have reached the North vein and good values were reported from that point.

In the North vein, the one examined, in the raise it is 5 feet wide, the vein material being quartz mineralized with copper carbonates, both azurite and malacite, also iron oxides, limonite and hematite, some copper glance and native copper.

Commencing at the Glory hole, which is 20 feet deep, the drift, running in a northeasterly direction on the strike of the vein 72 feet, was sampled its full length for an average width of 5 feet. Sample No. 1 carrying 2.32 per cent copper, Twenty-five feet deeper, or 45 feet from the surface there are two drifts, one to the north-east 150 feet, and one to the south-west 130 feet, showing the same mineralization as the one above. At the foot of the raise, which extends to the surface, there has been a lot of exploratory work done, showing some nice looking ore. Twenty-five feet above the tunnel on the south-west drift the ore runs five feet across. Samples No. 2 and 3 were taken from the back of this drift. Sample No. 2 being native copper in a schist two feet wide and carrying 3.10 per cent copper. Sample No. 3 composed of carbonates and chalcocites was taken along the drift for its entire length of 45 feet and a width of 3 feet and carried 2.02 per cent copper. The latter sample was taken from altered diorite. Similar conditions are

found in the drift on the north-east strike. This has been opened up for 90 feet. From the breast of the 90 foot workings a raise has been put up about 20 feet. Ore conditions are similar to those in the opposite course, showing both native and chalcite copper. Fifty feet above the tunnel there are two drifts, one to the north-east showing native copper, and chalcite in a vein 5 feet wide. The other drift, running to the south-west 20 feet, shows minerals similar to those above. A further examination of the raise was not made.

Commencing from the tunnel station in the north-east drift 72 feet from the station there are two feet of schist with native copper sampled for a distance of 8 feet. The vein matter here was about 12 feet wide. Sample No. 4 carrying 3.48 per cent copper, was taken at this point. In the south-west drift from the station a strong body of ore is exposed. It is composed of chalcite, calcopyrites and some iron pyrites. This was the first place where the copper and iron pyrites were exposed.

The vein on this drift was six feet wide and samples No. 5, 6, 7 were taken along it. Sample No. 6 which carried 1.30 per copper, was taken from the foot wall about one foot wide, to determine whether or not it carried metal besides its iron content. Sample no. 5 was taken from a width of five feet of the vein emitting the iron sulphides 1.6 per copper. Sample No. 7 was taken from the floor of the drift across the vein six feet in width and carried 3.46 per cent copper. The

showing at this point is good and indicates the permanancy of the ore.

Sulphide ores were found later 50 feet above the tunnel level and probably run still nearer the surface. The fill matter between the two veins is altered diorite.

The values in the ore are, as in every mine, uneven. It is very easy to secure in the Williams-Luman, quantities of ore which, when selected carry a very high grade of copper. The samples taken, however, were selected with a view of covering the entire vein, they were cut with great care, in quantities, and cut down. The entire vein is mineralized and the values taken from the samples are, if anything, below the average rather than above.

It is safe to say that the ore above the tunnel level will average at least 3 per cent copper. The writer has no hesitancy in saying that this grade of ore or better will be found below the tunnel level. From examinations made along the bottom of the tunnel where the vein is exposed the mineralization of the vein matter shows much stronger than above. Also reports obtained from different sources show that there is every reason to believe that better conditions are to be found below the tunnel level.

Gold Values.

Sample No. 3 taken at tunnel level, where the ore body is 12 feet wide, assayed \$2.80 in gold to the ton. Reports show that the gold values continue below. Thos. G. Smith the former superintendent,

reported that at the bottom of the shaft the ore carried \$1.50 to \$2.00 in gold. The smelter returns indicate that the gold is a factor to be considered in the development of the mine. The ore carries some silver, the smelter returns indicating that the ore runs from .30 to .80 ozs. to the ton.

Tonnage.

From actual measurements made at the time of the examination there was found to be blocked out and ready for mining 26,000 tons of ore in the mine above the tunnel level. This carries an average of 3 per cent copper, \$2.00 in gold, and about 30 to 80 cents in silver to the ton. There is ample reason to believe that three times that amount of ore blocked out, in addition, can be developed above tunnel level at small expense. On the ore dumps, rough measurement, there are about 2,000 tons of ore that carry about the same values.

Below the tunnel level on the north vein the tonnage has every indication of being vastly greater than above the level and it will carry similar or better values.

Mining costs.

With present equipment, the cost of mining will probably be excessive. Using it, the cost of taking out the ore will run probably to \$4.00 or \$5.00 per ton. This contemplates running the power drills with the present compressor, and using the gasoline engines. With electric power at a reasonable cost, the cost of mining may be cut to

\$2.00 per ton. Electric power, I understand, may be obtained at the Boysen Dam, 17 miles directly west of the mine.

Milling costs.

Every mine has its own individual problems. With power at a reasonable price, a 50 ton plant ought to handle the ore at a cost of \$1.00 to \$1.50 per ton. These figures being based on costs in plants similarly situated. The ore from the Williams-Luman will be easy to mill and there will be no difficulty in obtaining a high extraction.

Mining and Installation for milling.

Before a final decision is reached as to the kind of treatment to be installed, samples of ore must be submitted to different laboratories for testing. Of the different methods, smelting is probably out of the question because of its excessive cost and high maintenance. Flotation is a possibility as the costs of handling ores by flotation have been reduced materially in recent years. From my own experience and knowledge of copper milling, I should think fine crushing followed by leaching would prove satisfactory. No installation should be made, however, until thorough tests have been made, and the ore problems solved. Roughly, a flotation or leaching plant, 50 tons capacity, will cost around \$30,000.00. In time a 100 HP Power plant must be installed, or electric power secured from the outside. In addition, funds sufficient must be on hand for installation expense, replacement and

repair work, and operating expense until the returns begin to come in.

I have considered a 50 tone ore production and milling capacity as advisable, taking into consideration the cost of installation, supply of ore in sight and other factors. This capacity can be increased as necessity demands.

In conclusion I want to say that the Williams-Luman property can be put on a paying basis with competent management at a reasonable expense. It will stand a thorough investigation by anyone interested in copper properties. Some day, in my opinion, it will be one of the big copper producers of the country.

Respectfully submitted,

Herbert Bowdin

Thirteen different lots of ore were shipped from the Williams-Luman during the years 1917 and 1918, to the American Smelting and Refining Co. at Omaha. The original smelter runs were submitted to me. Below I have compiled an abstract of these returns as follows:

Date	Amt. Lbs.	Copper	Gold oz. ton	Silver ozs. ton	Gross Value	Net Smelter Returns
2-17-17	40,485	11.26	.07	.43	1,337.93	1,212.83
4-13-17	36,358	8.94	.09	-	899.94	797.38
5-2-17	28,343	8.90	1.05	.34	595.54	485.54
6-6-17	28,739	7.25	.11	.39	582.32	472.32
7-19-17	6,565	9.14	.11	.42	158.27	145.27
12-10-17	92,912	2.52	-	-	399.58	147.02
7-19-17	30,261	10.84	1.45	.60	894.23	784.22
12-11-17	783	49.50	-	-	79.25	79.25
2-8-18	80,488	2.62	-	-	359.80	150.30
2-6-18	85,410	2.30	-	.80	335.23	107.38
2-8-18	62,499	1.10	-	.40	none loss	167.12
7-27-18	21,484	3.40	-	-	134.50	36.37
7-27-18	21,268	.65	-	-	none	

From the gross returns the smelter deducted the freight, which ran around \$5.00 and \$6.00 per ton, and the treatment charges. The price paid by the smelter was around $3\frac{1}{2}$ cents less than the quotations. Only the net weights after the deduction of the tare are given.

