

R E P O R T
ON
AZTEC MINING OPERATIONS

MAXWELL LAND GRANT COMPANY

Raton, N. M.

By
F. C. Bowman
January 8th, 1926

January 8th, 1926.

J. van Houten, Esq.,
Vice President Board of Trustees,
Maxwell Land Grant Company
Raton, New Mexico.

Dear Sir:-

During my visit to the Aztec Mines, January 2nd to 7th I was strongly impressed with several things which must result in seriously effecting the earnings of the present operators, The Rosita Gold Mining and Milling Company, and consequently the owners, The Maxwell Land Grant Company.

The most important and outstanding of these is the lack of competent management, which is at present in the hands of men who have very little knowledge of mining or milling operations. Naturally the final result can only be one thing; much smaller earnings than should be and a greater depreciation to the property.

As might be expected all records are very incomplete and it is therefore difficult to estimate with any degree of accuracy just what has been done in the past year in the way of development, however it is quite evident that no systematic plan has been followed out and therefore much of the work done in search for ore has been a loss. I estimate that between 700 and 1000 feet of drifting and raising has been done during the past year but probably at least one half of this has been in a territory very questionable for ore. It is safe to say that a large part of this work never would have been done, had the management been in competent hands. Had this work been properly directed it is quite certain that it would have resulted in greater earnings for the "Maxwell Company".

For the past few months mining operations have been entirely under the direction and control of Joaquin Archuleta, a Mexican who has

been employed at the property, at intervals, for several years, and no doubt has a keen insight of the ores of this property but does not have the judgement necessary for the efficient direction of operations on a property of this kind. Much of the labor employed is incompetent and in several places two men were seen doing one man's work. One very noticeable example was two men employed to load cars underground and tram them with a mule to the surface ore bin where a third man was employed to dump them into the ore bin, all of which work could easily be done by one good man. Nine miners and four shovelers are employed underground to furnish an average of 23 tons per day.

Sampling has been sadly neglected with the result that a large percentage of the rock going to the mill has carried very little value. A very marked example of this is shown by the following samples taken from stope 139-40, from which considerable rock was being milled;

Sample #1 80¢, sample #2 60¢, sample #3 20¢, sample #4 40¢, sample #5 10¢, sample #6 trace. These samples varied from a few inches to five feet in width and were representative samples of the rock being broken for the mill. I called the attention of Archuleto to these results and he took the following samples; #1342 - \$4.00, #1343 - \$1.60, 1353 - Trace, 1354 - 80¢. It does not take an experienced mining man to see that such rock should never be broken, and if it is broken through oversight, should never find its way to the mill. The faces in this stope were large and easily broken and it is quite evident that the rock from this stope was "sweetened" with the high grade ore from stope #150-60 to keep up the mill tonnage. the result is a great loss, of labor, powder, power, and gold carried away with the tailings, to the Rosita Company, and a loss in royalty to the Maxwell Company, by the reduction of the ore value going to the mill.

As an example of the saving or increased profits that would result to both companies by an elimination of the waste the following estimate is made. I believe that it is safe to say that one third of the rock going to the mill has been waste and on the basis of eliminating this waste by careful mining and sorting it is estimated that the Rosita Company would save in labor, power and supplies at least \$35.00 per day, and the Maxwell Company would receive an additional \$17.70 per day in royalties, in other words both companies would profit about equally.

The ore supply at present of any value is coming from the 150-60 stope shown on the accompanying map in red. This ore is mined from a small vein running up into the sandstone over the regular contact ore. It has a pitch of 40 to 50 degrees and a strike of about 40 degrees N.W. This vein has been mined for about 70 feet along the dip and about 60 feet along its strike and while the high grade streak only runs from a fraction of an inch to about six inches in width, the following samples indicate its high value; #7 - width 0.3' - value \$159.20, #9 - width 0.75' - value \$459.80, #11 - width 0.6' - value \$1371.60, In many cases the quartzite where it is well shattered will run up to \$15 and \$20 for a width of two to three feet, making a good working width. It is quite probable that most of the gold recovered in the mill during the past 60 days has come from this stope. This vein though small seems to be very persistent and I believe that it will extend both laterally as well as upward for considerable distance. I have estimated that it is about 200 feet along the dip of the vein to the surface, so if the vein and value continue upward for even a part of this distance it will offer a new source of ore supply that will greatly increase the production of the mine.

Careful examination and sampling of other parts of the mine may uncover other similar veins just as productive. It may also throw

some additional light on the source of the ore and enable a more systematic development of other ore bodies. A study of the maps showing the old workings shows that the ore bodies so far mined have occurred in channels practically parallel and continuous over a distance of several hundred feet and it is a significant fact that the course or strike of this vein in the sand stone seems to correspond with the general strike of the contact ore bodies. Between #4 level and #1 level is a large block of unexplored ground. Between these two levels is #2 and #3 levels which are only a few hundred feet in length and from all the information I can gather produced considerable ore but this work was discontinued at the time high grade ore was discovered in #4 level and the work was never resumed. These workings are now badly caved so that I could only examine them in a few places and did not do any sampling, however Mr. Gorman, who was assaying for the mine at the time this work was done, reports that #15 to #20 ore was being mined at that time, and from the ore I saw I should judge that his statement is correct. The character of the ore is very similar to that in the 150-60 stope. I also saw a small vein, running off from the contact, which looked similar to that in 150-60 stope. Arakuleta advised me that gouge in this would pan considerable free gold. All of these facts lead me to believe that this is just the end of an extensive ore chute extending through the unexplored ground between #4 and #1 tunnels and parallel to the ore chute above #4 level. With this in mind it would seem that the most logical point for development at the present time is in #2 and #3 levels. I would at least advise the driving of one of these levels ahead far enough to gain access to the old stope so that the faces can be examined. From what I saw of these workings the ground does not seem to be as heavy as in #4 level and I do not believe that it will be badly caved farther away from the surface influence.

With the exception of a space between Stations 32 and 35, the main drifts of #4 level are in good repair. Between the points mentioned several sets should be replaced at once or the main haulage way is liable to be blocked at any time. The ground is not heavy but the timbers are giving away from dry rot. Where the raises from #1 level connect with #4 the ground is badly caved and it would seem advisable to catch this ground up if for no other reason than to insure a supply of air in case work is extended between #1 and #4 levels.

As far as I can find, there is no up-to-date working map of the mine. It is very important that a survey should be made of all accessible workings as this may result in a large saving in case future extensions are planned and some of these workings have caved in the mean time. It would be well to note the geology in these workings too as such information may be almost invaluable at some future time. Those operating the mine should be required to keep a complete and up-to-date working map of the mine as this is very essential to its economical operation.

Milling operations on this ore are simple and while the present saving is fair, I don't consider it is what it should be. The present system of hand sampling is not dependable and should be replaced by some form of automatic sampling, both for your own protection and those leasing the property. From the information available I have checked the ore milled between Nov. 20th and Dec. 22nd.

A total of 773 tons were delivered to the mill or an average of 23.4 tons per day. Assuming that the same tonnage was milled the average heads would be \$14.63 per ton or a total value of \$11309.00. The average plate tails for the same period is \$5.15 and total \$3980.95. The difference or the bullion recovered is \$7328.05 while the actual bullion as I have it is \$7289.84 which is a very close check. The assays from the concentrates indicated a saving of \$977.85 which if correct would indicate a total saving of 73.5%. However this

saving should be increased as from all the information I can get, no clean up has been made of the gold which must accumulate to some extent in the Lane Mills and especially as the ore from 150-60 stope contains considerable coarse gold that would remain in these mills for some time. The head sample is taken from the lip of these mills and therefore does not give the true value of the ore going into the mill. The gold should be cleaned from these mills at least every thirty days when running on the class of ore that is now being delivered to the mill. The present mill man, a Mr. Hammel, I believe understands his business and is dependable and I believe goes as far as he can towards improvements under present conditions, however there is room for considerable improvement.

As far as I can learn, no tests ever have been made to determine the economical size for grinding. The assays from the table tails and middlings indicate that the grinding is finer than necessary, however I would not make this as a positive statement without more complete information. The average table tails for the period considered as shown by the information is \$3.88, however I do not believe that this is the commercially economical limit. Careful tests should be made to determine this point for I believe that the value in these tails may be greatly reduced with very little additional operating expense. I would suggest a reconcentration of the present concentrates and also tests by pan amalgamation. This may result in an economical treatment at the plants and eliminate shipping and smelter treatment.

The indicated power consumption for the ore treated is excessive and I believe can be materially reduced. Advantage should be taken of the exhaust from the oil engines for heating the mill which I believe would eliminate the necessity of fuel for heating.

Stamps would be more economical for grinding a small tonnage such as it seems certain can only be expected from this mine and would be

labor and power if a bin is provided at the mill to dump the tram car from the mine into and have the crusher set below this bin and then elevate the ore from the crusher to the present bin. This would enable the tram to deliver the ore to the mill in a few hours and the crusher in turn would only need to be operated a few hours instead of a continuous operation of both for eight hours as at present. By making the above changes it would be possible to reduce the mill crew by at least three.

To continue operations successfully will necessitate the practice of economy on all sides and the careful expenditure of sufficient money in development work to insure a continuous supply of profitable ore for the mill at all times. In line with this it is imperative that the entire operations be under the directions of an experienced and competent manager. A plan for additional development work should be put into operation at the earliest possible moment as the present ore supply is not certain. The only way this supply can be assured is by having several workings producing at the same time. I consider the possibilities for the development of profitable ore bodies below #4 level are good and a careful study of the geology and ore conditions will result in the discovery of other ore bodies above #4 level such as is now being mined in stope 150-60. A fund of at least \$5,000.00 should be provided for this work now and then an additional 15% of the net profits set aside to continue such work. It may be necessary for the first six months to divert a much larger percentage of the profits into development until ore reserves are built up. It is of the utmost importance that some provision should be made at once for such work.

Very truly yours,

(Signed) F. C. Bowman,

2060 Dahlia St.
Denver, Colo.

Mining Engineer.