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Engineer's Report

Tarasca Gold Mining Company of Mexico

SUBMITTED AT THE

Annual Meeting of Stockholders

November 20, 1903

REPORT ON THE TARASCA GOLD MINES, SONORA, MEXICO.

To Mr. Hugo Reichenbach, President "TARASCA GOLD MINING COMPANY," San Francisco, California.

Dear Sir—I herewith submit my report on the TARASCA PROPERTIES in the State of Sonora, Mexico, as per request. Have made a careful examination of the mines and append the following data in regard to the present condition of the property.

The recommendations suggested are made after due deliberation, and from a practical basis. Predict for the mines a brilliant future.

Respectfully submitted,

Geo. A. Bethune

San Francisco, Cal., U.S.A., November 17, A. D. 1903.

Mining Engineer.

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LOCATION.

The property known as THE TARASCA GOLD MINING COMPANY'S MINES is located in the HERMOSILLO DISTRICT, STATE OF SONORA, REPUBLIC OF MEXICO, about twelve (12) miles N.W. of the town of TORRES, which is a junction of the SONORA & GUAYMAS R. R., which in turn is a branch line of the SOUTHERN PACIFIC R. R., connecting at BENSON, ARIZONA, U. S. A., with the main line.

The MINES are reached over good wagon road from Torres station.

HISTORY.

From the years 1783 to 1790 the TARASCA MINE was known as one of the famous gold and silver producers of the western hemisphere, according to history, and the traditions of the oldest inhabitants of the State of SONORA, and has afforded a rich harvest to the "gambucinos" until a few years ago. The "gambucinos" are prospectors who work over the rich ores left in the old abandoned mines, or stringers of ore considered by ancient mine owners as being of an inferior grade to work when compared with the rich ores that they then shipped. Many of the veins abandoned and considered of small value in those days make the "bonanzas" of today, and it is principally from these same veins that the steady output of the mineral product of SONORA is obtained at the present time.

From the amount of ore now on the dumps and in the old workings, also from the size of the stopes, there is unquestioned evidence that the MINE has already produced a great quantity of ore.

As compared with mining methods in practice today the work done in the TARASCA MINE in the past was merely surface work. From deductions and observations made I estimate the greatest ancient depth attained not to have exceeded one hundred twenty-five (125) feet. The mine under a later management was developed to a depth of about three hundred (300) feet, the workings being in ore which proved exceedingly rich. Another cave-in occurred, being responsible for the consequent closing of the mine.

Since coming under the present management the property has been put in good condition and, with proper management undoubtedly will become a steady producer, rivaling the principal mines in the district.

GEOLOGY.

The country rock adjacent to the TARASCA MINES is a coarse syenitic granite. East of the crest of hills in which the property is situated are found quartzites, andesites and quartz porphyry; to the west are seen andesitic porphyry, hornblendic granite and massive crystalline rock of similar composition. The character of these rocks is identical throughout the range and valley in which are situated the MINAS PRIETAS and other large producers.

AREA OF THE PROPERTY

The claims are five (5) in number, viz:

LA CARRENA (or TARASCA)—Embracing 6 pertencencias, or being 325x1,950 feet.

UBARBO—Embracing 5 pertencencias, or being 325x1,625 feet.

MINA DEL LLANO—Embracing 4 pertencencias, or being 325x650 feet.

LA MINIATURA—Embracing 3 pertencencias, or being 180x1,625 feet.

HERMOSILLO—Embracing 4 pertencencias, or being 325x650 feet.

Additional holdings under bond are the SAN ADORA, SONOITA, SAN JOSE, ZACATECAS and UBARBO EXTENSION.

COST OF MINING.

Estimating fifty (50) tons per day:

40 miners at.....	\$2.00 per day (Mexican money)	.....	\$ 80.00
5 carmen at	1.50 " " " "	.....	7.50
1 blacksmith at	2.50 " " " "	.....	2.50
2 engineers at	3.00 " " " "	.....	6.00
2 foremen at	8.00 " " " "	.....	16.00
3 cords wood at.....	7.00 " cord " "	.....	21.00
Candles, fuse, powder, tools, etc.	" " " "	.....	15.00

COST of raising 50 tons daily\$148.00

COST of mining per ton\$ 2.96

The future development of the mine will require less timbering because as depth is attained the ground becomes harder, and waste hitherto carried to the surface can be used to fill the old stopes.

TREATMENT OF ORE.

The treatment of ores at the MINAS PRIETAS PROPERTIES, whose ores are similar in character to the ores of the TARASCA MINES, has been successfully applied by the BOSS CONTINUOUS PROCESS, as high as 90 per cent. of the values being extracted. The BOSS PROCESS consists in using 950-lb. stamps in 5-stamp batteries, passing the ore from the stamps to a 5-ft. HUNTINGTON MILL, where it is reground; thence through an amalgamator where the gold and silver is extracted by quick silver; thence on to pans and settlers, and finally the tailings are collected on the tailing dump, to be re-treated if there are any values remaining,

The ore can be treated by leaching. (Known as the lixiviation process.) The improvements in this process result in the saving of a higher per cent. of silver than can be obtained from the amalgamation process, and the cost of the plant is less than where pans and settlers are used. Quick silver is an item of expense eliminated in this process. The chemicals required for lixiviation will not cost more than one-tenth of the quick silver alone.

When stamps are used the ore must be crushed to not less than 30-mesh, whereas in leaching coarse pulverization is desirable, much depending upon the roasting and the character of the ore. Should copper or lead occur in the ore either or both metals can be saved by this process.

The process consists in roasting the ores with common salt, then placing them in tanks, pouring over them a solution of hypo-sulphite of soda. This solution is in turn drawn off in precipitating tanks where the values are recovered in the sulphide of soda. Hypo-sulphite costs about three (3) cents per pound and quicksilver costs nearly fifty (50) cents per pound.

A 20-stamp mill can be erected for fifteen thousand dollars (\$15,000) gold. An approximate estimate for roasting and leaching plant with tanks, etc., and with an equal capacity, can be erected for about two-thirds that sum.

In either process the values can be recovered at a cost not exceeding six dollars (\$6) gold per ton.

MINES IN THE VICINITY.

Nearby are the mines of MINAS PRIETAS, including the Grand Central La Colorada and Cristone claims, which have been successfully worked during the past fifteen years.

Their output has aggregated \$245,000 per month for several years. Many years ago these mines were abandoned by their owners as being of little or no value. American capital acquired these properties, equipped and worked them with great success, and the mines today are known as some of the largest producers in the State of SONORA.

TIMBER.

There is plenty of timber for fuel close to the mines, but timber for shafting, gallows frames, and the erection of a mill will have to be procured from some outside point. Mesquite, iron wood and mountain oak are found in the neighborhood.

WATER.

At present there is only sufficient water on the property (at the LLANO MINE) for required power and domestic purposes.

This is, in my opinion, the one drawback to placing the property on an immediate profitable basis, by the erection of a mill to treat the ores. A large and more than sufficient supply of water for all treatment and milling purposes, however, is available at a distance of eight (8) miles from the MINES, and I would recommend that this water be secured and a PIPE LINE built at once to furnish water for this purpose. By the time the PIPE LINE is completed your mill can also be erected and ready for active operations. There is, beyond a question, sufficient ore on hand to justify the erection of a 20-stamp mill, at the time of my examination.

APPROXIMATE COST OF PIPE LINE.

PIPE, 4-inch, eight miles long, including freight.....	\$10,000
PUMP, 7½ cylinder, 6-inch stroke, 5-inch plunger, 70 gallons per minute under 11 lbs. pressure	270
BOILER, 10 H. P., steam connections, etc., feed pump, heater, etc.	700

TOTAL APPROXIMATE COST\$10,970

In laying the PIPE LINE the cost will be practically nominal, as the surface of the ground between source of water supply and the MINES is level, requiring but little grading.

VEINS AND PAY CHUTES.

The VEINS are essentially gold and silver and have a trend N.E. and S.W. with a dip to the W. All the veins, except the LLANO, have the same strike. The LLANO VEIN strike is N.W.

TARASCA VEIN (or LA CARRENA)—The operations on the surface of this property show a series of continuous open cuts from ten (10) to thirty (30) feet in width along the whole course of the vein for a distance of from six thousand (6,000) to seven thousand (7,000) feet. It was therefore impossible to determine the width of the outcrop, as all surface vein matter was extracted, but from the large amount of ore left on the dumps and evidences of old workings the vein matter must have been of considerable width. The matrix of this vein is an iron-stained quartz, carrying silver glance. On the dumps of LA CARRENA there are about five hundred (500) tons of ore that will average thirty dollars (\$30.00) gold and silver to the ton. Note assay and map.

UBARBO VEIN—This claim, which is the only one showing any recent work, except as heretofore mentioned, has a large outcrop of ore. On this claim the surface has been stripped in places for a distance of about six thousand (6,000) feet, the cuts being from ten (10) to thirty (30) feet in width. Near the center of the claim a two hundred (200) foot shaft has been sunk and timbered. From the bottom of this shaft a drift has been run one hundred ninety (190) feet south, and another drift three hundred seventy-three (373) feet north. Both of these drifts are in ore as shown on accompanying map. At the bottom of the shaft a crosscut has been driven three hundred fifty-eight (358) feet, with a view of tapping the LA CARRENA VEIN. At two hundred seventy-four feet in this crosscut a small stringer was encountered, on which a level was driven twenty-two (22) feet, and the ore widened to eighteen (18) inches. Assays from this stringer show high gold values. At a point two hundred sixty-eight (268) feet N.E. from the collar of the shaft an incline has been sunk one hundred seventeen (117) feet; and an upraise from the north drift of seventy (70) feet, from the two hundred (200) foot level to connect with this incline shaft. The outcrop of this VEIN is about three hundred (300) feet from the LA CARRENA VEIN, to the East.

HERMOSILLO VEIN—Lies to the west of the UBARBO VEIN, distant also from the latter about three hundred (300) feet, and has been dilligently worked along its surface for nearly three thousand (3,000) feet. It shows an outcrop of ore three (3) feet in width. An incline eighty (80) feet in depth has been sunk on the vein.

MINA DEL LLANO VEIN—This vein shows three (3) feet of ore on the surface, and has a hundred (100) foot shaft in ore. At the bottom of this shaft a sump has been sunk to retain the water and leave the working shaft free for further sinking.

LA MINIATURA VEIN—The work on the LA MINIATURA VEIN comprises several open cuts, but has not been exploited to any extent.

ESTIMATE OF ORE IN SIGHT.

Estimating the ore in sight on the dumps and blocked in the mines I approximate the total tonnage at six thousand two hundred forty-three (6,243) tons, apportioned as follows:

TARASCA DUMP	500 tons, averaging \$ 30. Sil. and gold per ton	\$ 15,000
UBARBO DUMP	1000 tons, averaging 30. Sil. and gold per ton	30,000
SACKED ORE	50 tons, averaging 100. Sil. and gold per ton	5,000
BLOCKED ORE	4693 tons, averaging 50. Sil. and gold per ton	234,650
TOTAL	6243 tons	\$284,650

In the foregoing estimate no data is included of ores in sight in the HERMOSILLO, MINIATURA, MINA DEL LLANO or other claims in this groupe of mines, any of which has a fair prospect of developing into a producer. The estimate of total values given is most conservative.

SURFACE IMPROVEMENTS.

The property is equipped with

HOISTS (two in number, one large, one small).
 PUMPS (mine and feed).
 CABLE, BOILERS, GALLOWS FRAMES,
 ORE BUCKETS, ORE CARS, TRACKS,
 GALVANIZED IRON WATER TANK (3,000 gallons).
 SHAFT HOUSES, TOOL HOUSE,
 BLACKSMITH OUTFIT COMPLETE,
 ASSAY OFFICE AND OUTFIT,
 ONE-STORY BRICK BOARDING HOUSE,
 COMPANY STORE AND SUPPLIES,
 HORSES, WAGONS, HARNESS, ETC.,
 STABLES AND OUTBUILDINGS.

The MINES are well supplied with mining supplies in the way of
 CORD WOOD, MINING TIMBER,
 STEEL, POWDER, FUSE, CAPS,
 TOOLS, WHEELBARROWS, CANDLES, ETC.

RECOMMENDATIONS.

From my examination at the TARASCA MINES, which covered seven days, I would advise the management to consider the following suggestions relative to the additional blocking out of ore on the UBARBÓ VEIN, viz.:

1.—That the hoist now working at the main shaft on the UBARBO MINE be removed to the incline shaft, and the later be made the principal point of ingress to and egress from that mine.

2.—At the 200-ft. level deep sinking should be prosecuted in both the north and the south drifts, and levels run to block more ore as suggested by accompanying maps.

3.—That the COMPANY have made by contract a few thousand adobe bricks, to be used in the construction of houses for the miners and their families, as this course will aid in securing necessary labor which it seems almost impossible for your superintendent to keep under present conditions.

4.—Work on the crosscut should be maintained for a further distance of thirty (30) or forty (40) feet, the reason for this being that the breast of the crosscut was making water, and the strata was twisted and broken, which condition may denote the casing of an ore body. The stringer of ore mentioned as CROSSCUT PROSPECT shows good gold values and may be a feeder to the TARASCA VEIN. See assays.

CONCLUSION.

As a general resume will say that I found the property in good shape, all the machinery in first-class condition, and the work was prosecuted in a workmanlike manner.

The TARASCA GOLD MINING COMPANY'S PROPERTY promises to become, under extensive development, one of the largest producers of MEXICO. I am convinced that her record of the past will be eclipsed by her showing in the future.

Respectfully,

Geo. A. Bethune

Mining Engineer.

SAN FRANCISCO, CAL., U.S.A., NOVEMBER 17, 1903.

Formerly — Assayer for Charles Butters Co., Ltd., Operating Grand Central and Minas Prietas, Sonora, Mexico — Supt. of Zubiata Mine, Sonora, Mexico — Metallurgist for British Gold Mine, Ltd., at Matepe, Mexico, and State Assayer of Washington, U. S. A.

ASSAYS.

1.—North Drift	74	ozs.	Silver	\$	4.00	Gold
2.—South Drift	172	"	"		6.00	"
3.—South Drift	434	"	"		6.00	"
4.—Crosscut Prospect	46	"	"		13.00	"
5.—Crosscut Prospect	17	"	"		128.00	"
6.—Incline Shaft	35	"	"		4.00	"
7.—Paystreak Incline	140	"	"		4.00	"
8.—Tarasca Dump	46	"	"		8.00	"

— SKETCH MAP —
— SHOWING RELATIVE
— POSITIONS OF —
CAMP, VEINS, & WORKS.
SCALE ABOUT 600 FT = 1 IN.



