

R E P O R T on
CONDEMEBARO & LA TRINIDAD
MINES.
LAS CRUCES, MICHOACAN, MEXICO.
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REPORT

on

CONDEMBARO LA TRINIDAD MINE.

Las Cruces, Michoacán, Mexico.

May 15, 1945.

CONCLUSION

The strength and very remarkable length of the outcrop of the vein, makes its development to the point of proof or disproof of an important tonnage of sulphide ore, very attractive. Such an ore would have to be concentrated by selective flotation, into a copper concentrate and a lead concentrate. The probable zinc blende would have also to be separated from the other sulphide, but would, not, under normal market conditions be profitably shipped, if all charges of mining and milling were subtracted. It could - however, be stock piled to await favorable zinc prices.

The possibilities for a large tonnage probably amenable to cheap mining and concentration costs, makes the development of the property a very attractive venture. The capital necessary for this initial development company would be about \$ 410,000.00 pesos. (\$ 84,500.00 U. S. Cy.)

If the expenditure of this sum, in the manner recommended - proved at least the expected tonnage and grade, the property would be readily vendable at a large profit.

Another method of procedure would be ^{to}refinance as a mining Company, the original development Company, shareholders receiving a substantial percentage of the mining Company shares.

Such a procedure would yield far larger eventual returns over a long period of operation.

LOCATION.

The mine is in central Michoacán, about eighty kilometers South-East of the town of Apatzingan, and about sixty kilometers North East of the town of Tumbiscatio.

It can be reached best from Mexico City by driving to the town of Uruapan, taking the train from there to Apatzingan and, in the dry season taking a cargo truck over a bad road to Las Cruces. If a truck can be hired in Apatzingan, it can go by fair road from Las Cruces through the village of Cupuan, to the ranch of La Piedra. From there, a mountain trail of three to four kilometers has to be ridden horse-back to the mine. During the rainy season (June to November) cargo trucks go from Apatzingan, to the crossing of the Rio Grande de Tepalcatepec at Rancho Paraiso. There, a boat crossing of the river has to be made to Cofradia, where cargo trucks run to Tumbiscatio, Arteaga and further south to Las Truchas and the sea.

If faster time is desired, The Panini Air-planes run three-times a week to Apatzingan and Arteaga from either of which places, trucks can be ridden to Las Cruces or, if hired, to La Piedra. There are two possible sites for air ports nearer the mine, either of which could be made into ports for small planes. One of these is about a kilometer South of Cupuan, and the second is at the end of the road at Rancho La Piedra. The cost for either port would, not be, over \$ 2,000.00 pesos. When completed, arrangements could be made with the Panini line to make special landings on their regular run from Uruapan Apatzingan-Arteaga-Acapulco. This could cut the time to reach the mine from Mexico City, from 3 days to 6 hours (including the horse back trip from La Piedra to the mine)

To complete the road from La Piedra to the mine, a distance of from three to four kilometers, would cost about \$ 50,000.00 - pesos. However, in order to make this expenditure justified, a bridge would have to be built over the Rio Grande de Tepalcatepec. The cost of bridge and approaches should not exceed \$ 100,000.00 - pesos. Undoubtedly a large part of this expense would be borne by the State of Michoacán, as the bridge would be a great help to the ranchers South of this large stream, during the five months of rain. Even in the dry season, only large cargo trucks can ford the river - This bridge would also make possible trucking from the Railroad into Las Truchas all year round, and would stimulate the improvement of - the present very rough provisional road into a permanent improved - highway.

The mine is in the Sierra Condembaro, South of the prominent double butte known as Cerro Condembaro. The elevation at the mine is about 3000 feet above sea level. The arroyo de la Mina Condembaro crosses the vein and runs as a mountain stream, never completely dry even in the two months of April and May before the start of the rains, as evidenced by the presence in pools of small fish.

The Sierra Condembaro is one of many minor low mountain chains in the hot country, in the valley of the Balsas River and its tributaries. The country is, however, unlike its Eastern extension in the State of Guerrero, almost free from malaria. The only serious health menace is the prevalence of "pinto".

ORE OCCURRENCE

The country rock, through which the vein courses, is a rather

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basic diorite, which varies in phase from a normal quartz-free diorite to a diabase and gabbro. This intrusive rock forms a large batholith cutting highly metamorphosed shales and sandstones of possible jurassic age. Evidenced by boulders in the arroyos, but not actually seen, there are some near-by extrusive rocks of generally andesitic composition.

Mineralization is confined chiefly to one extremely persistent and strong vein, cutting the intrusive rock, striking from N. 28 degrees W. at its North-West end, to S. 45 degrees, E, at its South-eastern end. The dip of vein is vertical. This vein can be followed by strong outcrops a distance of over five kilometers. (3 miles) - In all this distance, it stands out due to the presence of more or less quartz. It is faulted by eastwest faults of minor throw at irregular intervals.

In this vein three strong ore shoots have been partly developed; one at the north west end of about 500 feet in length; one 600 feet to the South East, 50 feet known length with an unknown distance South East of a cross fault, which cuts the ore shoots. The vein has not been picked up to the south East; and a third very strong ore shoot about 3 km. (2 miles) South East, in that part of the vein covered by the La Trinidad mine. This third shoot is over 1000 feet long. In all ore shoots, the primary mineralization consists of chalcopryite-galena - blend -pyrite with quartz. The thickness of the vein where ore shoots occur varies from 10 feet to 40 feet with an average of about 20 feet.

Surface oxidation is probably shallow as some sulphide outcrops even blende. The prevailing outcropping minerals are: -- malachite -cerussite- limonite- quartz-. The maximum depth reached

by any of the tunnels and shallow shafts is 125 feet.

Although possibly coincidental, ore shoots appear to occur where the vein cuts the more acid phases of the intrusive. Where the veins cuts the more basic phases, spar, or quartz with little else occurs.

A second minor type of mineralization occurs sparingly in the more basic parts of the intrusive mass. This consists of extremely small veinlets of chalcopyrite associated with much specularite (crystalline micaceous hematite). Outcrops occur as copper-stained specularite impregnated diabase or gabbro.

ORE TONNAGE AND GRADE

In the two most important ore shoots exposed, that at Condembaro, Northwest of the arroyo, and that at La Trinidad, there is a combined length of ore shoots of 1,500 feet, with an average width of 20 feet. If a depth is assumed of 500 feet (1/3 the length of ore shoots) there are probably $1500 \times 20 \times 500/10$ or 1,500,000 tons of ore.

Until farther works at depth is done, the grade of the unoxidized sulphide ore for both shoots cannot be more than assumed, as an increase in zinc blende is probable, which would entail a decrease in both copper and lead of the surface oxidized ore. It is also probable that the silver values will decrease. From the assays on the five general samples taken at Condembaro and the two at La Trinidad, the average grade is:

Copper 4.66%, Lead 2.16% Zinc 7.47%, Silver 4.40 oz. - If the copper and lead are assumed to decrease 10 % each, the zinc assumed

to increase 20%, and the silver to decrease 20%, the primary sulphide ore would assay as follows:

Copper 4.19% Lead 1.94% zinc 8.97% silver 3.5oz.

Such an ore would have to be concentrated selectively by flotation to yield three products VIZ;- a copper concentrate carrying part of the silver, a lead concentrate carrying most of the silver, and a silver-free zinc concentrate.

The zinc concentrate could not, under normal market conditions be shipped profitably, but it could be stock-piled and shipped when zinc prices are at a premium. However if this zinc concentrate were shipped at normal prices, the milling and mining charges ignored, the profit per ton of ore would be about \$ 2.00 U. S. Cy.

The economic extraction in such an operation, would be about 80% of copper and lead, 90% silver and 60% zinc. The smelter charges for the copper and lead concentrates would be almost \$ 6.00 U. S. Cy. per ton. Such an assumed grade of ore would yield about the following net smelter returns:

COPPER.-	4.19% - 80% - 3.35% - 73.7 lbs. - -	
	90% smelting - 66 lbs. 12 cents.....	\$ 7.92 U.S. Cy.
	Less smelting per ton of concentrates \$ 6.00- 1/8 ratio of concentration.....	\$0.75
	R.R. freight \$ 3.00 per ton --	
	of concentrates 1/8 ratio.....	0.38
	Net smelter copper	<u>6.79 " " "</u>
		-1.13 " " "

Net smelter copper \$ 6.79 U. S. Cy.

LEAD.- 1.04% -80 - 1.55 % -31 lbs. 90%			
smelting 28 lbs. 5 cents.....	\$ 1.40	"	"
Less smelting per ton of conc.			
\$ 6.00 - 1/27 ratio of conc.--	\$ 0.22		
R. R. freight \$ 3.00 per ton of			
concentrate.- ratio of 1/27....	\$ 0.11		
Net smelter value of lead: ...	- 0.33	"	"
	\$ 1.07	"	"
SILVER.-3.5 oz.- 90% 3.15-50 cents.....	\$ 1.57	"	"
Total net smelter value.....	\$ 9.43	"	"
Less 10% tax	- 0.94	"	"
Net smelter value of ore.....	\$ 8.49	"	"

Against this would be:

Mining.....	\$ 1.50	U. S. Cy
Milling.....	1.60	" " "
Truck haul per ton of		
ore \$ 3.00.....		
Ratio of 1/ 12.....	\$ 0.25	" " "
Net per profit per ton of ore....	- 2.75	U. S. Cy
	\$ 5.74	" " "

The yearly net profit would be, on a daily basis of 250 tons ,
\$ 516,600.00 U. S. Cy.

For the total assumed tonnage of 1,500,000 from two known
ore shoots, the profit would be \$ 8,610,000.00 U. S. Cy.

In addition to the ore from the two known ore shoots, --
there will very probably be, many more shoots developed in the --
long vein length of 3 km between them. One ore shoot was encounter-
ed in the tunnel to the south of the arroyo at Condembaro.- This ore
shoot was followed 50 feet where it was cut off by a cross- fault.
The grade of ore in this shoot, represented by sample No. 6 is well
up to average.

It is probable that at least as much ore will be found between Condembaro and La Trinidad, as exists in the two partly developed shoots. Probable greater depth than assumed would also add materially to the life of this property.

RECOMENDATION

I would strongly recommend acquiring the property and expending the following capital to prove or disprove a profitable mine.

- II.- Build an airport at Rancho de la Piedra at a cost of about \$ 2,000.00 pesos.
- III.- Make a topographic survey of a strip 200 meters wide with the vein as center from Condembaro to La Trinidad and beyond. This work should cost about \$ 3,000.00 pesos.
- IV.- Establish a camp at Condembaro for 25 men, with office, small ware-houss etc. for a cost of about, --- \$,25,000.00 pesos.
- V.- Equip with a 3 drill gasoline-run, compresor, tools, drills, (4 sinkers, 4 bars, 2 stopers) drill steel pipes, bits, black smith shop, small lathe, assay office, etc. etc, for a cost of about \$ 100,000.00
- VI.- Sink a shaft at Condembaro 100 meters deep, \$ 485,00 pesos. meter, for a total of \$ 48,500.00 pesos.
- VII.- Drive 300 meters (1000 feet) of cross -cuts drifts and raises, \$ 97.00 pesosm. for a total cost of \$ - \$ 29,100.00 pesos.

VIII.- Duplicate this work at La Trinidad for a cost of about \$ 102,000.00

-If this expenditure, totaling \$ 410,000.00 pesos. (\$ 84,500.00 U. S. Cy) proved up a potentially profitable mine, the ore of which would be amenable to treatment by selective flotation, final capital to bring it to production would involve;

1.- Road improvement from Apatzingan to Las Cruces and bridge across the Rio Grande de Tepalcatepec, which, with probable state aid, would cost about \$ 100,000.00 pesos.

2.- Permanent camp at Condembaro for a cost of \$ 150,000.00 pesos.

3.- Final mine equipment \$ 500,000.00 pesos.

4.- Final mine development of vein between Condembaro and La Trinidad and possibly a long extraction tunnel for a cost of \$ 500,000.00 up to \$ 1,000,000.00 pesos.

5.- 250 tons concentrator \$ 750,000.00

6.- Diessel power plant 750,000.00

7.- Miscelaneous 750,000.00

The total capital would be about \$ 3,250,000.00 pesos - (670,000.00 U. S. Cy.) with the assumed grade given, the final capital on 250 tons a day basis, would be returned in 1-1/2 years after start of production, and assuming 1-1/2 years time to equipping, 3 years. With the probable life of from 15 to 25 years, the profit after repayment of capital would be about \$ 8,000.00 U. S. Cy.

With the very remarkable length of vein outcrop, there will very probably be many more profitable ore shoots, than the two partly proven ones of Condembaro and La Trinidad, which would

add materially to the life of the mine and to the total ultimate profit.

The ore shoots will also very probably extend to a much greater depth than assumed.

I would strongly recommend the expenditure of the preliminary capital to prove or disprove a profitable mine, as an unusually attractive venture, which if successfully consummated, would yield a property which could either be sold at a handsome profit, or could be refinanced at a great ultimate profit over a long life, if that procedure were deemed advisable.

Presented by,

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