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SUMMARY REPORT

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MAYO CUSTOM LEAD SMELTER

including

FOUR PRODUCING PROPERTIES

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S U M M A R Y      M A Y O   S I L V E R - L E A D   M I N I N G   D I S T R I C T

YUKON TERRITORY, CANADA

This district, 125 miles map distance, east of Dawson, Y.T. Canada, was examined in detail by me in October 1934. As a result, I have conceived a very high opinion of the merits of the camp and its possibilities.

Heretofore, all shipments have gone from the mines to Mayo by motor truck, a distance of some 40 miles on fair roads partly kept up with the assistance of the local Territorial Government, and from there the ore is shipped on "sternwheeler" river steamers going down the Stewart River to the Yukon and up the latter to the end of the railroad at Whitehorse, where it is taken to Skagway, a distance of 110 miles. At Skagway two or three lines of ocean-going vessels take the ore for treatment to custom smelters in British Columbia or the United States.

Under present conditions, lead content of 60% in Mayo ores cannot be shipped with any profit accruing from the lead as total costs from Mayo to smelters come to about \$90. per ton. This includes all costs, mining, freight, deductions, etc.

The camp has produced, with very primitive methods and severe and difficult pioneering conditions, crude ore to the amount of 37,000 tons, containing 300 ozs. silver and 60% lead; also 35,000 tons of concentrate carrying, as per smelter settlements, 600 ozs. silver and 60% lead from the operations of one 100 ton mill. This mill, owned by the Bradley interests of Alaska Juneau fame, made no concentrate from any other than its own mines, a policy to that effect always having been in force.

This total tonnage of some 72,000 tons have come from some ten different mines although there have been some 30 or more individual shippers. The total output as listed in the records of the Government Recorder at Mayo, and which records I examined and tabulated in part, show the amount of \$25,000,000 from the 72,000 tons shipped to date. This, it will be recalled, is the record of smelter returns. Original content would be, of course, higher by the amount of smelter deductions.

As a result of relatively small development, some 10 mines of first magnitude have been opened up and I emphasize the point here that these invariably have the same habit. That is to say, a vein ranging in width from 30 to 50 feet of which some 2 to 10 feet is shipping ore of high grade - that is from 500 to 700 ozs. silver per

## Summary - Cont'd.

ton and with the remaining width carrying from 30 to 80 ozs. I wish also to stress the fact that these particular ten mines are in no sense selected ones by reason of outstanding outcrops or geological peculiarities wherein their possible merits could have been anticipated. On the contrary, the whole area is covered with 8 to 20 feet of wash and, to me at least, it is particularly impressive that so little surface trenching has been done in the light of these very valuable developments. I, therefore, am firmly convinced that numbers of other very large veins and mines will be developed. Also that this district now presents a number of unusual opportunities for lucrative and safe mining investments.

The reason for lack of surface development is seen in the fact that the local prospector, even if he found a high grade vein, was unable to ship any ore unless he was able, preliminarily, to put up, as advance charges for freight, etc., some \$80. per ton. On this account all crude ores produced almost automatically were diverted to the channels of the Treadwell Yukon Co. operations and shipments without exception were routed from Mayo through to Kellogg, Idaho. Furthermore, the invariably accompanying, and still more important large bodies of high grade mill ore were rarely exposed or developed. The local manager for the Treadwell Yukon Co. Ltd., Mr. Wernecke, took advantage of these conditions to the fullest extent, as he made it a point to acquire any new discoveries at the earliest possible moment. This policy was an excellent one and though many initial purchases were made on showings in a ten foot hole and at prices ranging from \$65,000. minimum to \$320,000. maximum, all those acquired were without exception extremely profitable. As an instance of this policy, I quote the purchase of a claim known as the "Lucky Queen", where an open out showed 4 feet of good ore - that is the usual grade of, say, 300 to 400 ozs. silver and 60% lead. The prospector's figure of \$65,000 for this claim was accepted, the usual 10% down payment, in this case \$6000. was made, ten men were put to work in breaking high grade shipping ore and the mine has produced to date \$4,290,000 in net smelter returns and is now only down to a depth of 200 feet. The ore has been developed for 1,300 feet in lateral extent.

In brief, the operations of the Treadwell Yukon Co. have resulted in a net operating profit in this camp of some \$6,000,000. The tabulated returns in the Government Recorder's office at Mayo show a total of net smelter returns from the Treadwell Yukon operations of \$14,000,000. These gross and net returns, it will be recalled, have been made with only one 100 ton mill and about one half was from crude shipping ore running 300 ozs. silver and 60% lead and the other half from concentrate carrying 600 ozs. silver and 60% lead.

Continuity with depth has been established beyond question. First of all, the deposits are all in fault fissures in prevailing schist and quartzite country rocks and the geological horizon is all pre-Cambrian. Gray copper or freibergite, consistently occurs through all the range of some 2,500 feet in vertical depth exposed

in the camp, and these minerals are original minerals. Two or three of the mines have gone to a depth of 600 feet without other than the usual changes in tenor due to thinning out and recurrence of ore lenses.

The plan in mind is to acquire four properties which have been described in detail in accompanying reports and all of which are promising in the extreme. Two of them are already shipping high grade ore.

With these four as additional safeguard for later operations, to erect a 50 ton lead stack and de-silverization plant and to devote 25 tons of this capacity to custom smelting and 25 tons for the output of the four mines taken over.

It is well to state here that operations can be prosecuted the year around without the slightest difficulty. I make this statement unreservedly for the reason that such operations have been so prosecuted for 15 years past. But it will be understood that freight shipments can be only made for six months in the year, during which time the rivers are open for steamers. In the interim, development, mining and milling can go forward as stated without other than the usual troubles due to extremely cold weather for short periods of a week or so, when the thermometer may reach 60 or 70 degrees below zero. Annual precipitation being 12 inches, the snowfall is light and it is almost unprecedented to have any winds causing drifts. Summarized, as far as operating conditions are concerned, they are no different than at any other place in Canada. Good roads are now built to some of the mines and certainly from Mayo to Keno City, the small center at the Mines. The mines can be inspected at any time during the year by taking plane from Whitehorse (the end of the White Pass & Yukon Route Railway) to Mayo. The distance is 2.5 hours flying time and the fare \$100. Time by steamer from Vancouver to Skagway is three days. Railroad is in operation the year around, though only two or three times a week in the winter months.

The basic assumptions on which later calculations are made are :

1. Selling price of silver bullion - 55¢ per oz.
2. The ability of four mines to furnish 6.25 tons daily each or 25 tons for the four.
3. The ability of the district as a whole to furnish 25 tons daily of smelting ore in which the content is enough to give the local shipper a profit under the proposed custom smelting charge of \$40. per ton with no payment for lead.

Under the first assumption, it seems fairly safe to conclude that silver will remain for some years to come at a price of about 55¢

## Summary Continued

But in any event the picture is little changed if silver were to go, for example, to 50¢, except in degree. In other words, the price of silver is not the final determining factor.

I say, with every degree of assurance, that the last two basic requirements can be met with ease. The individual mines themselves are attractive and promising to the highest degree, but in addition, the district as a whole is most promising and finally there are a number of smaller properties which, carrying an average tenor of, say, 150 ozs. per ton or below that figure, can be counted on as a source of custom ore. Certainly they cannot now ship and make a profit but could easily do so with this proposed plant in operation.

The terms upon which the mines are acquirable are very lenient with the first payment deferred for a year as a minimum, except in one instance, which is a producing mine of extraordinary promise wherein \$22,500 must be paid cash and \$11,250. in six months. As this mine will, in my opinion, produce ore by next spring, netting over all expenses some \$80,000. the matter is not of paramount importance.

Covering statistical data regarding this plan follows :-

EST. OPER. PROFITS: (4 MINES) - (25 tons daily from the four)

Content: 300 ozs. silver -- 60% lead.

Extraction: 95% X 300 = 285 ozs. at 55¢ - \$165.00

Costs: (Maximum)

Mining	\$20.00	
Hauling -- Mines to Keno City	5.00	
Treatment	<u>18.15</u>	
Total costs	\$43.15	<u>43.15</u>

Estimated Operating Profit per ton \$121.85

Estimated Operating Profit per day (25) tons - \$3,046.25

Estimated operating profit per annum (300 days) - \$913,875.00

EST. OPER. PROFITS: (SMELTER) - (CUSTOM ORE 25 tons daily)

Income : Treatment charge -- \$40. per ton  
with payment of 95% of silver -  
none for lead - 25 tons per day - \$1,000.00

Costs : 25 tons daily - \$18.15 per ton 453.75

Est. net profit daily \$ 546.25

Estimated net profit annually (300 days) \$163,875.00

ESTIMATED ANNUAL NET OPERATING PROFIT--- \$1,077,750.00

## Summary (Cont'd)

Ford. : Est. Annual Oper. Profits

\$1,077,750.00

POSSIBLE ADDITIONAL PROFITS: (ON PIG LEAD)

It is thought that after some 2000 tons of lead have been accumulated, better freight rates can be obtained. This by shipping by river boats to St. Michaels and thence by ocean-going steamers to Japan or European ports.

Costs on such routing are approximately as shown following :

Truck haul - Keno City to Mayo	\$10.00
River Freight - Mayo - St. Michaels	12.00
Possible refining charges	5.00
Brokerage and incidental	5.00
Ocean freight to Europe or Japan	<u>7.00</u>
Total costs per ton pig lead	\$35.00

With lead selling at 4¢ or \$80 per ton and with costs of \$35. the net is then \$45 per ton.

With 50 tons treated daily at content of lead 40% assumed (the local shipper to custom plant will probably sort to somewhat lesser grade than at present of 60%) and with 95% extraction 19 tons of lead can be produced daily, which at \$45 per ton comes to \$855.00 daily.

300 days per annum at \$855. is therefore an additional annual operating profit possible of

256,500.00

EST. POSSIBLE ANNUAL NET OPERATING PROFIT.....

\$1,334,250.00

The foregoing tabulation is based on a treatment cost of \$18.15 per ton. These details of costs are covered elsewhere in the main report wherein the cost of coke laid down at Keno City is estimated at \$34 per ton. This total estimated cost of \$18.15 is thought to be high if for no other reason that it will be possible to replace about one half the coke with charcoal to be had locally at about \$20. per ton. Coke laid down in bunkers at Skagway will cost about \$7.00 per ton. Balance of the total cost of \$34 at Keno City is due to freight costs, truck haul etc. and is also thought to be amply on the safe side.

A summarized statement of estimated costs of this proposed plan together with profits reasonably to be expected is shown in the following tabulation :

<u>PLAN</u>	<u>CAPITAL INVESTMENT</u>	<u>EST. ANNUAL NET OPERAT. PROFIT</u>
50 ton lead stack and de-silverization plant	\$ 300,000	
25 tons daily of Company mine ore from four mines	265,000	\$ 913,875.
25 tons daily of custom ore	_____	163,875
Total investment	\$ 565,000.	_____
ESTIMATED ANNUAL NET OPERATING PROFIT- - - -		\$1,077,750.
Add possible profits due to 19 tons lead produced daily at no cost		<u>256,500.</u>
ESTIMATED POSSIBLE ANNUAL NET OPERATING PROFIT		\$1,334,250.

I have for the sake of clearness, heretofore omitted the consideration of an obvious step, namely the installation of milling facilities, either as an adjunct of these proposed custom treatment plans or as auxiliary equipment for the four mines under consideration. There is no question that such milling plants will be matters of vital importance within a year at the most, after these operations shall have been started, but I believe that it is not now necessary to confuse the main issue, notwithstanding that two of these mines have on their mill ore dumps at present some 5,000 tons of ore of an average content of about 60 ozs. silver making a total gross content of 300,000 ozs. In passing it may be well to say that extractions and costs on these mill ores have been already well established. Thus, about 150,000 tons have been milled to date and a rough cost thereon, on a basis of 125 tons treated daily, having been \$3.70 per ton. Better than a 95% extraction has been made and the last several months extractions were 98% and 98.5% consistently - by flotation. Costs, therefore, on mill ore will approximate somewhat as follows :-

Hauling - mines to Keno City	\$ 1.30
Milling cost per ton	3.70
Smelting cost (8 : 1 ratio of concent.)	
1/8 X \$18.15	2.27
Milling loss - say 5% on 50 ozs. head	
1.5 ozs. at 55¢	.83
Smelting loss - say 5% " " " "	
2.5 ozs. at 55¢	1.38
General - say	<u>1.52</u>
	\$11.00 per ton

With average grade of mill ore assumed at 50 ozs. with silver value at 55¢ gross value per ton is \$27.50 which makes a possible net of \$16.50 per ton of mill ore. This will give some idea of possibilities along these lines. It is interesting to note

## Summary - Continued

that a very rough ratio of milling to smelter ore heretofore obtained in this camp, based on some 150,000 tons milled is 5 to 1. Consequently an operation turning out 25 tons smelting ore daily, would, in all probability, turn out with very little added cost some such tonnage as 125 tons per day of mill ore.

There are also, and obviously, a number of other most interesting possibilities but the program outlined will illustrate the salient points of what I am firmly convinced is an unusually safe and lucrative enterprise. Details of these matters can be seen in a more comprehensive way in my reports.

I can, with the greatest confidence, recommend the financing of this enterprise, embracing the four mines and the smelting plant, the whole to cost in round figures \$600,000 of which \$100,000 should be immediately available for starting these operations.

The amount of \$1,000,000, as an annual operating profit can, in my opinion, be safely relied upon as a minimum amount; and it is needless to say that ultimate possibilities are very great indeed.

Respectfully,

"Marshall D. Draper"