

Whitehorse Copper Mines Ltd.

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MEMORANDUM

Date: December 14, 1977

TO: Vic Jutronich
 FROM: Doug Bent
 RE: Cowley Park

- 1) A recent examination, by the Company geologists, of sections through the Cowley Park ore body, has prompted them to surmise a structure that could increase the present ore reserve. (975,598 tons @ 0.89%, diluted). Conjecture about these structures would, of course, have to be substantiated by further exploration.

The geologists say that structures could be projected to outline an ore body containing 4,000,000 tons, which could be mined by open pit methods with a stripping ratio of $2w/1o$. As a guide to whether the Company should proceed with further exploration expenditures, the following estimates have been compiled. Reserves assumed to be 4,000,000: extraction rate, 850,000 t/yr.

- 2) Estimated Grades: 0.7% Cu.
 0.05% Mo.
 0.01 oz. Au.
 0.15 oz. Ag.

Recoverable in concentrate:

Cu. - 0.7% x .9 = 0.63%
 Mo. - 0.05% x .6 = 0.03%
 Au. - 0.01 = 0.01 oz.
 Ag. - 0.15 = 0.15 oz.

Recoverable at Smelter:

Cu.	-	0.63%	x	.95	=	0.5985%
Mo.	-	0.03%	x	.95	=	0.0285%
Au.	-	0.01 oz	x	.90	=	0.009 oz.
Ag.	-	0.15 oz	x	.95	=	0.1425 oz.

Value per ton at the following metal prices

Cu. @ \$0.60/lb. Mo. @ \$4.00/lb. Au. @ \$160./oz.

Ag. @ \$4.75/oz.

Cu.	-	0.5985%	x	2,000	x	\$0.60	=	\$ 7.18
Mo.	-	0.0285%	x	2,000	x	4.00	=	2.28
Au.	-	0.009 oz	x	160.00			=	1.44
Ag.	-	0.1425 oz	x	4.75			=	0.68
Total								<u>\$ 11.58/t</u>

- 3) The following cost estimates are not substantiated and are only an indicator of what might be expected if an open pit operation were started at Cowley Park.

Capital Expenditures:

Additional Diamond Drilling	\$ 75,000.
Road Construction	75,000.
Power	20,000.
Stripping	50,000.
Mill Alterations	750,000.
Buildings	100,000.
Equipment	200,000.
Total	<u>\$ 1,270,000.</u>

Assuming 40% salvage value and a life of 6 yrs. at 9%, the amortized costs per ton would be:

$$\frac{(1,270,000 - 508,000) (\text{Cap. Rec factor } 9\% \cdot 6) + (508,000 \times .09)}{850,000}$$

$$= \$0.25/t$$

Operating Costs:

Mining (Ore)	\$ 0.75/t of ore
" (Waste)	1.50/t
Transport	1.00/t

Mill	\$ 3.00/t
Plant	0.75/t
Administration	0.50/t
Head office	0.60/t
Smelting & Marketing	4.00/t
Amortization	0.25/t
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	\$12.35/t

Note: Operating costs do not include depreciation, or taxes.

- 4) As mentioned previously, the cost estimates are not substantiated, and are probably low. e.g. In 1970, when most of the mill feed came from the War Eagle pit, a comparable distance with Cowley Park, the costs including depreciation were \$9.79/t. If these costs were escalated 5% per year for 7 years the costs would be \$13.78/t.

Obviously, the metal content of the ore, or metal prices have to change, in order to make an open pit mining operation feasible.

The geologists estimate that another \$25,000.00 would prove or disprove their conjectures about ore structures. It is recommended that this amount be spent.


Doug Bent

DB/lc