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PRELIMINARY REPORT

COLONIAL MINES LTD.

VANCOUVER, B.C.

PROPERTY FILE

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PRELIMINARY REPORT

FOR

COLONIAL MINES

VANCOUVER, B.C.

PROPERTY FILE

PREPARED BY

THE

ENGINEERING GROUP

The Engineering Group,  
VANCOUVER, B.C.

12th September, 1962.

Colonial Mines Ltd.,  
1718 West 5th Avenue,  
VANCOUVER, B.C.

Attention: Mr. R. Campbell

Dear Sir,

We are pleased to submit the enclosed report of work we were requested to do for your Company.

We consider this to complete our preliminary investigation, insofar as information was available, and accordingly enclose our account for professional services.

We would be pleased to discuss our report at any mutually convenient time and also to receive your instructions for further engineering work.

Yours very truly,  
for THE ENGINEERING GROUP

R.J. Hawkesworth

R.E.S. Chambers

Enclosures.

## I N T R O D U C T I O N

This report was commissioned by officials of Colonial Mines Ltd., the main object being to determine the work and equipment necessary to reactivate the Argonaut Mine at Campbell River, B.C., and estimate the capital and operating costs.

As directed, this report omits, except by passing reference, mining, geological and pelletizing studies and does not attempt to arrive at any detailed financial feasibility conclusion.

Operating costs per ton were originally estimated on the basis of one million tons of pellets being shipped over a period of three years. However, due to the fact that the final product was changed in specification, this report is now based on costs for producing one million tons of concentrate. We have assumed 24 hour a day operation for 350 days or 8,400 hours per year.

In costing, we have estimated prices for new equipment, steel, etc., although it is realized that savings may be made by purchasing some used or surplus items. We should point out that the capital cost saved in purchasing used equipment will, in some cases, be partially offset by increased engineering and operating costs: each case should be considered on its merits.

In accordance with reports from geological and mining consultants we have based the size and type of equipment on a maximum ratio of four parts mineral delivered from the mining operation to one part of concentrate produced. We have taken the final concentrate to contain 62% iron content. However, it is possible that some concentrates will be greater.

The crushing and milling operation was estimated on the basis of two parallel crushers and one rod mill in order to obtain the uniformity of product required, i.e. an optimum of 10 - 14 mesh with not more than 30%



passing 100 mesh. Some further study should be made on the possibility of an alternate crushing method and eliminating the rod mill: this may lead to a reduction in both capital and operating costs. There are also other areas where detailed engineering could lead to cost reduction.

Further study is also required on the berthing and loading of ships up to 26,000 gross registered tonnage. Either dredging or additional piling, or a combination, will be required. Piles would require to be 70' (cost \$135.00 each), driven to refusal at 12' to 15'. Dredging would cost 60¢ to 85¢ per cubic yard, depending on the volume.

Overall figures show:-

Based on 62% Fe at \$10.20.

Revenue 1,000,000 tons @ \$10.20	....	\$10,200,000
Expenditure " " @ \$7.80	....	<u>7,800,000</u>
<u>PROFIT</u>	....	<u>\$2,400,000</u>

Capital required will be a maximum of about one million dollars (a cash flow sheet is not in the scope of this report). (Interest has not been included in the above).

Attached is a summary sheet tabulating estimated capital equipment and operating costs. This is followed by brief explanations showing how these figures were determined. A detailed explanation of any area can be provided if required.

# SUMMARY OF ESTIMATED CAPITAL AND OPERATING COSTS

<u>Area</u>	<u>Est. Capital Cost</u>	<u>Est. Operating Cost/Ton</u>
<u>Administrative &amp; Miscellaneous</u>		
01 Management	\$ 2,000	\$ 0.292
02 Interest	-	Not included
03 Royalties	-	0.230 ←
04 Insurance	-	.050
05 Taxes	-	.010

10.20  
+ .03  
-----  
30.60  
30 cents

## Construction

10 Site preparation - minesite	)	Included in equipment costs
11 " " - docksite	)	
14 Foundations - minesite	)	
15 " - docksite	)	
16 Buildings - minesite	)	
17 " - docksite		7,000
18 Sanitary facilities		700
20 Roads & bridges		8,000
		.072

## Services

30 Electricity - minesite	68,000	-
32 " - docksite	12,000	-
34 Compressed Air - minesite	2,200	-
36 " " - docksite		
38 Water - minesite	18,000	.027
40 " - docksite	1,000	.001
44 Piling or Dredging	90,000	-
45 Mooring buoys	32,000	-
46 Supplies	-	.010
48 Vehicles & work boat	12,000	.010

## Process

50 Mining	-	2.950
52 Crushing	76,500	0.630
54 Milling, Separating, Cleaning and Disposal	252,800	1.180
60 Transport	-	1.000
72 Stockpiling	39,000	.090
74 Loading	103,000	.400
	\$724,200	6.952
Contingencies	71,800	
	796,000	
Engineering	48,000	
	\$844,000	
		Amortization .848 approx.
		\$7.80

Mining 1.00/ton ore.  
Loading .40/ton ore



## BASIS OF ESTIMATES

### General

Estimate is based on producing 1,000,000 tons of concentrate over a period of three years = 333,000 tons per year approx.

Electricity cost is based on 8 mils. = \$90.00 per H.P. per year.

Labour costs are averaged at \$5.20 per man hour which figure includes actual wages, compensation, insurance, benefits and overhead.

### Area 01 - Management

Capital cost for office furniture and equipment \$2,000.

Salaries at \$72,000 per year = \$0.22 per ton.

Promotion, advertising, travelling & misc. \$12,000 per year = \$0.036 per ton.

Telephone \$100 per month = \$0.036 per ton.

TOTAL ... \$0.292 per ton.

### Area 02 - Interest

Not included.

### Area 03 - Royalties

Given as \$0.23 per ton.

### Area 04 - Insurance

Plant insurance, public liability, motor vehicle & marine.

Say \$17,000 per year = \$0.05

### Area 05 - Taxes

Income tax = nil.

Local taxes, say \$3,300 per year = \$0.01

Area 10 - Site preparation - minesite

Estimated on

Area 11 - Site preparation - docksite

Estimated on

Area 12 - Foundations - minesite

Estimated on

Included in equipment costs.

Area 14 - Foundations - docksite

Estimated on

Area 16 - Buildings - minesite

Estimated on

Area 17 - Buildings - docksite

Buildings exist in fair order.

Renovations estimated at \$7,000, capital cost.

Area 18 - Sanitary Facilities

Say \$700, capital cost.

Area 20 - Roads and Bridges

Capital cost for initial re-grading of roads and repair of bridges  
estimated at \$8,000.

Operating cost for maintaining and repairing roads and bridges  
estimated at \$2,000 per month = \$0.072 per ton.



Area 30 - Electricity - minesite

Estimated at \$60,000 to bring supply from Strathcona Dam (quoted figure) plus 8,000 for transformer, distribution, boxes and wiring to motor starters. TOTAL ... \$68,000

Motors and starters are included in capital costs of individual equipment. Power consumption is included in operating costs of individual machines.

Area 32 - Electricity - docksite

Power cables already pass this area.

Estimated for transformer, distribution and area lighting installation \$12,000, capital cost.

Maintenance and repairs/ton is negligible.

Area 34 - Compressed Air - minesite

and

Area 36 - Compressed Air - docksite

Estimated at two 65 CFM at 100 PSIG, portable compressors, \$1,100 each.

Total \$2,200, capital cost.

Operating costs, negligible.

Area 38 - Water - minesite

Based on 1,000 G.P.M. at 150' head.

Capital costs: Intake repair \$500, Pump \$2,000, 75 H.P. motor and starter \$2,200, Wiring \$5,000, 2000' of 10" spiralweld pipe \$8,000, Valves \$300.

Total \$18,000, capital cost.

Operating Cost: Power and maintenance \$0.027 / ton.

Further study may show that a diesel driven pump may be preferable.

Area 40 - Water - docksite

It is not known whether main water supply is available.

Requirements are domestic, cleaning and supply to ships.

Even if a small pump and pipe have to be led from a nearby creek

\$1,000 capital cost and \$0.001 per ton should amply cover this item.

Area 44 - Piling or Dredging

Further study is required on the mooring and manoeuvring of ships up to 26,000 tons. A figure of \$90,000 capital cost is included to cover dredging, dolphins and/or dock alterations and repairs.

Area 45 - Mooring Buoys

Four buoys, laid \$32,000, capital cost.

Maintenance over three years negligible.

Area 46 - Supplies

This item is for miscellaneous supplies such as washroom supplies, lubricating and heating oils, first aid, light bulbs, paint, etc. etc.

Allow \$3,330 per year = \$0.01 operating cost.

(Welding rod etc. for maintenance of crushers etc. is included in operating costs of individual machines).

Area 48 - Vehicles and Work Boat

Allow two Jeeps @ \$3,000 and one boat @ \$6,000. Total \$12,000

Operating estimated at \$0.01.

Process

Area 50 - Mining

Contracted at \$2.50 per short ton = \$2.80 per long ton.

It is not known what equipment will be needed to transfer minerals to



Area 50 - Mining (continued ....)

the crushing operation: \$0.15 is therefore added to the above which should be ample to cover additional costs including amortization and operation of equipment. Total \$2.95 operating cost.

Area 52 - Crushing

1 Three compartment hopper	\$ 5,900
2 Symons cone crushers, 4' @ \$31,000	62,000
2 6' x 4' Vibrating screens @ \$4,300	<u>8,600</u>
	\$76,500 capital cost

Operating cost estimated at \$0.63.

Area 54 - Milling, Separating, Cleaning, Classifying and Disposal

Capital:

2 36" dia. x 30" Belt Dry Magnetic Separators @ \$6,750	\$ 13,500
1 Rod Mill	102,000
1 Dorr-Oliver classifier	24,000
2 Triple wet magnetic separators @ \$22,000	44,000
4 Conveyors @ \$4,500	18,000
1 Overhead loader	22,000
Installation and shelter	<u>29,300</u>
	\$252,800 capital cost

Operating:

Dry separation	\$0.17
Milling	0.30
Wet magnetic separation	0.11
Loader operation	0.115

Area 54 - Milling, Separating, Cleaning, Classifying and Disposal (continued...)

Operating: (continued....)

Conveying 0.045

Screening 0.045

Classifying 0.055

Repair, labour and  
material 0.34

\$1.18 operating cost.

Area 60 - Transport

By contract. \$1.00 per ton operating cost.

Area 72 - Stockpiling

Truck dump and feeder conveyor \$10,000 installed

Stacker 29,000 "

TOTAL .. \$39,000

Operating estimated at \$0.09

Area 74 - Loading

Tunnel \$12,000 installed

2 Feeders 10,000 "

1 Feeder Belt 20,000 "

1 Ship loader 59,000 "

1 Weightometer 2,000 "

\$103,000

Operation, including bulldozer operator hired during loading  
periods \$0.40.

Distribution:

6 copies Colonial Mines Ltd.

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