

REPORT ON THE DAVIS-KEYS PROPERTY

II

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

A major exploration and development program has been carried out over the past four years on the Davis-Keays property. This work included approximately 24,000 feet of underground development in or adjacent to the Eagle vein. In addition, a minor amount of work has been done on other known veins on the property.

Preliminary engineering and economic studies have been made on various proposed operations at 500, 700 and 1000 ton per day mining rates. The studies also explored several optional approaches to extracting and concentrating the reserves.

Pertinent conclusions relating to the viability of a possible mining operation at Davis-Keays are summarized herewith:

1. The Eagle vein is a narrow, near vertical quartz-carbonate vein containing significant but variable amounts of chalcopyrite.
2. The presently outlined reserves mineable by an overhand open stope method after applying factors for dilution and mining extraction are estimated to be:

Semiproven and Probable	1,375,000 tons @ 3.38% Cu
Possible	750,000 tons of undetermined grade

3. It is our opinion that there is a good possibility of finding additional reserves either as extensions to the Eagle vein or by exploring other veins known to exist on the property.

4. The cost of exploring the Eagle vein at depth is, in our opinion, prohibitive unless done in conjunction with mine production development.

5. The results of the preliminary engineering and economic studies indicate that of the alternatives investigated the 700 ton per day onsite mill with mine access via a 4820 level main haulage appears to be the most feasible when considering
 - rate of return vs. magnitude of investment capital

 - the present reserve estimate

 - the physical limitations with respect to high production mining rates

 - the detrimental effects of increased dilution probable at higher rates

 - the exploration potential, the increased safety and the possible water source that a low level access would provide.

6. The studies also indicated that extraction of the reserves via an extension of some 17,000 feet of the main 5200 haulage level from the Magnum deposit currently being mined by Churchill Copper Corporation Ltd. and treated in expanded concentrating facilities at Churchill merits serious consideration. Our economic analysis is based upon assumed operation of the two properties under a single management structure and the results are therefore contingent upon negotiation of satisfactory arrangements between the companies controlling these two deposits.

7. A total of 16 combinations of alternative approaches has been studied as possible methods of extracting and providing facilities to concentrate the Eagle vein reserves. They result in various capital costs, operating costs and annual revenues. A summary of the most attractive alternatives is shown below.

- Case 1 - 1000 tpd onsite mill, 4820 level access
2,232,000 tons reserves including Possible
- Case 2 - 700 tpd onsite mill, 4820 level access
2,125,700 tons reserves including Possible
- Case 4 - 700 tpd onsite mill, 4820 level access.
1,292,300 tons reserves excluding Possible
- Case 12 - Tunnel access to Churchill, mining 700 tpd
2,125,700 tons reserves including Possible

Based on 100% Equity Financing:

	Copper Price	Mine Life (years)	Onward Investment Requirement	Cumulative Net Cash Flow	Rate at which P.V. equals Onward Investment
Case 1	<u>52¢</u>	6.4	\$ 9,735,000	\$15,047,000	<u>9.13%</u>
Case 2B	47¢	8.7	\$ 7,692,000	\$ 7,396,000	-0.59%
2	<u>52¢</u>	8.7	7,692,000	13,176,000	<u>9.73%</u>
2A	57¢	8.7	7,692,000	17,200,000	16.45%
Case 4B	47¢	5.3	\$ 7,692,000	\$ 6,847,000	-2.4%
4	<u>52¢</u>	5.3	7,692,000	10,868,000	<u>8.02%</u>
4A	57¢	5.3	7,692,000	13,879,000	15.07%
Case 12	<u>52¢</u>	8.7	\$ 6,832,000	\$12,333,000	<u>9.51%</u>

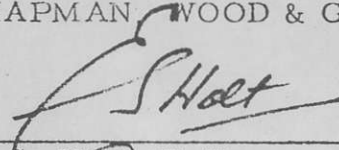
8. The potential profitability of a possible mining operation at Davis-Keays is extremely sensitive to fluctuations in the copper price. Within the 47¢ to 57¢ price range results from the operations

outlined above vary from entirely unfavorable to increasingly profitable in the higher price range.

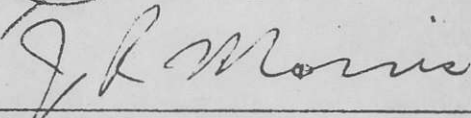
9. The investment of the funds required to bring the Davis-Keays deposit to the point of production involves risks since both discovery of additional reserves and copper prices of 52 cents or more per pound are required to generate profitability. In our opinion both of these requirements are reasonable probabilities but neither is by any means a certainty. In the event that risk capital is available under the conditions described here we recommend that the detailed study outlined in Section XV, RECOMMENDATIONS, be completed prior to any large financial commitment. The estimated cost of the detailed study is \$55,000 and the time required would be approximately three months.

Respectfully submitted,

CHAPMAN WOOD & GRISWOLD LTD.



E. S. Holt, P. Eng.

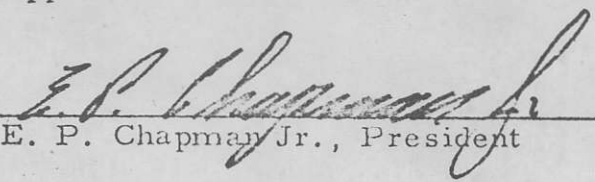


J. R. Morris, P. Eng.



J. L. McCrea

Approved:



E. P. Chapman Jr., President

June 18, 1971

SUMMARY OF ALTERNATIVES

Copper Price	Case	Operating Approach	Mine Production T.P.D.	Initial Mine Access	Estimated Reserves	Onward Capital Requirements	Cumulative Net Cash Flow	Unpaid Loan Balance	Mine Life (years)	Onward Loan Retirement (years)	Total Debt Retirement (years)
At 52¢	1	Onsite plant and facilities	1,000	4820 level	2,232,000*	\$9,735,000	\$1,866,000	-	6.4	6.1	6.4
	2	Onsite plant and facilities	700	4820 level	2,125,700*	7,692,000	2,270,000	-	8.7	7.2	8.7
	3	Onsite plant and facilities	500	4820 level	2,125,700*	6,519,000	-	\$ 254,000	12.1	-	-
	4	Onsite plant and facilities	700	4820 level	1,292,300	7,692,000	966,000	664,000	5.3	5.3	-
	5	Onsite plant and facilities	700	5950 level	1,292,300	7,384,000	-	195,000	5.3	-	-
	6	Onsite plant and facilities	700	5950 level	2,125,700*	7,384,000	1,327,000	-	8.7	7.2	8.7
	7	Onsite plant and facilities	500	5950 level	1,292,300	6,188,000	-	1,650,000	7.4	-	-
	8	Onsite plant and facilities	500	5950 level	2,125,700*	6,188,000	-	2,035,000	12.1	-	-
	9	Trucking ore to Churchill	700	5950 level	1,292,300	7,847,000	-	3,789,000	5.3	-	-
	10	Trucking ore to Churchill	700	4820 level	2,125,700*	5,456,000	-	4,009,000	8.7	-	-
	11	Trucking ore to Churchill	300	5950 level	1,292,300	2,176,000	-	2,520,000	12.3	-	-
	12	Tunnel access to Churchill	700	5200 level	2,125,700*	6,832,000	2,779,000	-	8.7	6.6	8.6
	13	Trucking S.F. conc. to Churchill	700	5950 level	1,292,300	5,541,000	-	3,806,000	5.3	-	-
	14	Trucking S.F. conc. to Churchill	700	4820 level	2,125,700*	5,894,000	-	4,478,000	8.7	-	-
	15	Milling S.F. conc. onsite	700	5950 level	1,292,300	6,482,000	-	3,571,000	5.3	-	-
	16	Milling S.F. conc. onsite	700	4820 level	2,125,700*	6,790,000	-	3,670,000	8.7	-	-
At 57¢	1a	Onsite plant and facilities	1,000	4820 level	2,232,000*	9,735,000	7,351,000	-	6.4	3.1	3.7
	2a	Onsite plant and facilities	700	4820 level	2,125,700*	7,692,000	8,108,000	-	8.7	3.3	4.8
	4a	Onsite plant and facilities	700	4820 level	1,292,300	7,692,000	4,925,000	-	5.3	3.1	4.1
	12a	Tunnel access to Churchill	700	5200 level	2,125,700*	6,832,000	7,562,000	-	8.7	2.4	3.6
At 47¢	1b	Onsite plant and facilities	1,000	4820 level	2,232,000*	9,735,000	424,000	5,913,000	6.4	-	-
	2b	Onsite plant and facilities	700	4820 level	2,125,700*	7,692,000	366,000	6,067,000	8.7	-	-
	4b	Onsite plant and facilities	700	4820 level	1,292,300	7,692,000	492,000	4,936,000	5.3	-	-
	12b	Tunnel access to Churchill	700	5200 level	2,125,700*	6,832,000	386,000	4,284,000	8.7	-	-

* includes possible reserves.

CASES 1, 1a AND 1b

Assumptions:

Production rate	1000 tpd
Mill location	on site
Initial mine access	via 4820 level
Reserve estimate	2,232,000 (includes Possible)
Possible mine life	6.4 years (Semiproven and Probable exhausted in 4.2 years)
Estimated onward capital requirement	\$ 9,735,000 @ 8%
Dowa loan	1,300,000 @ 10.5%
Total debt	\$11,035,000

Estimated Operating Data:

	Mill Feed Grade %	Operating Cost/ton	Net Return from Metal Sales \$ per ton			Operating Profit \$ per ton		
			47¢	52¢	57¢	47¢	52¢	57¢
Year 1	3.85	\$16.19	\$24.29	\$27.80	\$31.30	\$8.10	\$11.61	\$15.11
Year 2	3.27	16.17	20.63	23.61	26.59	4.46	7.44	10.42
Year 3	2.88	15.17	18.17	20.79	23.41	3.00	5.62	8.24
Onward	2.85	14.88	17.98	20.58	23.27	3.10	5.70	8.29

Economic Projections (100% loan financing):

	Years to Onward Capital Repayment	Years to Total Debt Repayment	Cumulative Net Cash Flow
@ 47¢ Cu	-	-	(-) \$5,489,000
@ 52¢ Cu	6.1	6.4	1,866,000
@ 57¢ Cu	3.1	3.7	7,351,000

Discussion:

At 52¢ Cu, 500,000 tons of Possible reserves are required to repay the onward loan. Some difficulty could be encountered in maintaining the mill feed grade and tonnage at this production rate. For this reason the reserves for the 1000 tpd rate include an additional 5% dilution over and above the estimated dilution at 700 tpd.

CASES 2, 2a AND 2b

Assumptions:

Production rate	700 tpd
Mill location	on site
Initial mine access	via 4820 level
Reserve estimate	2,125,700 (includes Possible)
Possible mine life	8.7 years (Semiproven and Probable exhausted in 5.3 years)
Estimated onward capital requirement	\$7,692,000 @ 8%
Dowa loan	<u>1,300,000 @ 10.5%</u>
Total debt	\$8,992,000

Estimated Operating Data:

*173
labour*

	Mill Feed Grade %	Operating Cost/ton	Net Return from Metal Sales \$ per ton			Operating Profit \$ per ton		
			47¢	52¢	57¢	47¢	52¢	57¢
Year 1	4.13	\$ 16.29	\$ 26.06	\$ 29.82	\$ 33.58	\$ 9.77	\$13.53	\$17.29
Year 2	3.90	17.56	24.61	28.16	31.71	7.05	10.60	14.15
Year 3	3.08	17.59	19.43	22.24	25.04	1.84	4.65	7.45
Year 4	3.02	17.40	19.06	21.80	24.55	1.66	4.40	7.15
Onward	3.00	16.35	18.93	21.66	24.39	2.58	5.31	8.04

Economic Projections (100% loan financing):

	Years to Onward Capital Repayment	Years to Total Debt Repayment	Cumulative Net Cash Flow
@ 47¢ Cu	-	-	(-) \$5,701,000
@ 52¢ Cu	7.2	8.7	2,270,000
@ 57¢ Cu	3.3	4.8	8,108,000

Discussion:

At 52¢ Cu, 200,000 tons of Possible reserves are required to repay the onward loan. Based on the economics outlined in this report, the 700 tpd production range appears to offer the most attractive investment opportunities.

CASES 12, 12a AND 12b

Assumptions:

Production rate	700 tpd
Mill location	utilizing an expanded Churchill mill
Initial mine access	extension of Churchill's 5200 level
Reserve estimate	2,125,700 (includes Possible)
Possible mine life	8.7 years (Semiproven and Probable exhausted in 5.3 years)
Estimated onward capital requirement	\$6,832,000
Dowa loan	<u>1,300,000</u>
Total debt	\$8,132,000

Estimated Operating Data:

	Mill Feed Grade %	Operating Cost/ton	Net Return from Metal Sales			Operating Profit		
			\$ per ton			\$ per ton		
			47¢	52¢	57¢	47¢	52¢	57¢
Year 1	4.13	\$17.07	\$ 26.51	\$30.27	\$34.07	\$ 9.44	\$13.20	\$17.00
Year 2	3.90	18.34	25.04	28.59	32.18	6.70	10.25	13.84
Year 3	3.08	18.37	19.77	22.58	25.41	1.40	4.21	7.04
Year 4	3.02	18.18	19.39	22.14	24.92	1.21	3.96	6.74
Onward	3.00	17.13	19.26	21.99	24.75	2.13	4.86	7.62

Economic Projections (100% loan financing):

	Years to Onward Capital Repayment	Years to Total Debt Repayment	Cumulative Net Cash Flow
@ 47¢ Cu	-	-	(-) \$3,898,000
@ 52¢ Cu	6.6	8.6	2,270,000
@ 57¢ Cu	2.4	3.6	7,562,000

Discussion:

This approach is dependent on satisfactory negotiations with Churchill management. It does not require as large a capital investment as the onsite mill and geologically favorable ground would be explored by the long haulage level drive.