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Interoffice Memorandum  
August 4, 1989  
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Case II-B differs from Case II-A in the selling price of copper, now assumed as \$1.00/lb.

### Other Assumptions

As requested by your client, depletion and depreciation expenses are ignored, and the analyses are prepared on a pre-tax basis. The project is assumed to be financed entirely with owners' equity, assumed to be disbursed in the period in which the expenditure occurs. Normal maintenance costs are assumed to be included in the all-in operating costs; however, no provisions for major capital repairs are included. A customary injection of working capital equal to 10% of the total installed cost is assumed to occur in the first year of operations, with subsequent contributions dictated by changes in revenue. Working capital is then recovered at the end of the mine's useful life.

Finally, line items for reclamation costs and royalty payments are included, but assumed as zero.

### Methodology

The best indicator of a project's attractiveness to investors and lenders is the return on project cash flows, represented by the internal rate of return (IRR). Briefly, IRR is that discount rate which equates the present value of the investment in a project with the present value of the cash inflows generated by the copper mine over its economic life. Once the project's IRR is known, the investor/lender compares this return to the best alternative use of funds. In general, if the project's IRR exceeds the return the investor may earn elsewhere, the project should be undertaken. Negative IRRs indicate the project fails to generate sufficient cash flows to pay for itself.

Please note that the IRRs calculated in the attached analyses do not include payment of income taxes at the corporate or personal (investor) level.

**Results and Conclusions**

The results of the analyses are as follows:

- Case I-A                    PreTax IRR = (17.6)%
- Case I-B                    PreTax IRR = 8.8 %
- Case II-A                   PreTax IRR = 15.0 %
- Case II-B                   PreTax IRR = 43.8 %

Case I-A is clearly not attractive as the project does not generate sufficient cash flows (even on a pre-tax basis) to pay for itself over the life of the mine. The negative return is further enhanced by the reality that, in 1991, the owners will face a \$694 thousand deficit which must be funded by further equity injections or a short-term loan.

Although the pre-tax IRR for Case I-B is positive, the owners do not begin to realize returns on investment until 1995, when the mining operation is complete. Under current market conditions, the investor may realize a similar return, at considerably less risk, by investing in Standard & Poor's AAA (highest rating) corporate bonds.

At the 15% pre-tax IRR calculated in Case II-A, the set of possible alternative investments begins to diminish. Such a yield is likely to be found in some of the more volatile common stock issues. Depending upon the investor's level of risk aversion, the project defined by Case II-A may be economically attractive, as the project is paid for after 4.5 years of operation.

Finally, Case II-B's 43.8% pre-tax IRR is probably high enough to attract considerable interest from equity investors and lenders, assuming revenue and operating cost projections are realistic. At this level of profitability, investors may wish to consider funding part of the capital cost through borrowing, thereby leveraging returns on investment.

If I can provide further assistance, please contact me -- extension 4944.

Attachments

*Alucca*

4-89 FRI 12:27

CASE I-A: \$0.80/lb Cu  
INCOME ANALYSIS (\$000)

04-Aug-89  
10:37 AM

	1990	1991	1992	1993	1994	*1995	Total
Revenue	\$0	\$4,818	\$4,818	\$4,818	\$4,818	\$3,854	\$23,126
Operating Costs	0	3,957	3,957	3,957	3,957	3,165	18,993
Reclamation Costs	0	0	0	0	0	0	0
Operating Profit	\$0	\$861	\$861	\$861	\$861	\$689	\$4,134
Gross Margin	NA	18%	18%	18%	18%	18%	
Other Costs:							
Depreciation Expense	0	0	0	0	0	0	0
Depletion Allowance	0	0	0	0	0	0	0
Interest Expense	0	0	0	0	0	0	0
Base Royalty	0	0	0	0	0	0	0
Total Other Costs	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Profit Before Taxes	\$0	\$861	\$861	\$861	\$861	\$689	\$4,134
Income Taxes	0	0	0	0	0	0	0
Net Income	\$0	\$861	\$861	\$861	\$861	\$689	\$4,134
Net Margin	NA	18%	18%	18%	18%	18%	

\* Note: 9.6 month operating period.

CASE I-A: \$0.80/lb Cu  
CASH FLOW ANALYSIS (\$000)

	1990	1991	1992	1993	1994	*1995	Total
Net Income	\$0	\$861	\$861	\$861	\$861	\$689	\$4,134
Depreciation & Depletion	0	0	0	0	0	0	0
Capital Expenditures	(7,025)	(775)	0	0	0	0	(7,800)
Working Capital	0	(780)	0	0	0	780	0
Equity Contribution	7,025	775	0	0	0	0	7,800
Loan Proceeds	0	0	0	0	0	0	0
Principal Repayment	0	0	0	0	0	0	0
Project Cash Flow	(\$7,025)	(\$694)	\$861	\$861	\$861	\$1,469	(\$3,655)
Cumulative Project Cash Flow	(\$7,025)	(\$7,719)	(\$6,858)	(\$5,996)	(\$5,135)	(\$3,666)	

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4-89 FRI

12:28

L3

CASE I-B: \$1.00/lb Cu  
INCOME ANALYSIS (\$000)

04-Aug-89  
10:33 AM

	1990	1991	1992	1993	1994	*1995	Total
Revenue	\$0	\$6,023	\$6,023	\$6,023	\$6,023	\$4,818	\$28,908
Operating Costs	0	3,957	3,957	3,957	3,957	3,165	18,973
Reclamation Costs	0	0	0	0	0	0	0
Operating Profit	\$0	\$2,066	\$2,066	\$2,066	\$2,066	\$1,653	\$9,915
Gross Margin	NA	34%	34%	34%	34%	34%	
Other Costs:							
Depreciation Expense	0	0	0	0	0	0	0
Depletion Allowance	0	0	0	0	0	0	0
Interest Expense	0	0	0	0	0	0	0
Base Royalty	0	0	0	0	0	0	0
Total Other Costs	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Profit Before Taxes	\$0	\$2,066	\$2,066	\$2,066	\$2,066	\$1,653	9,915
Income Taxes	0	0	0	0	0	0	0
Net Income	\$0	\$2,066	\$2,066	\$2,066	\$2,066	\$1,653	\$9,915
Net Margin	NA	34%	34%	34%	34%	34%	

\* Note: 9.6 month operating period.

CASE I-B: \$1.00/lb Cu  
CASH FLOW ANALYSIS (\$000)

	1990	1991	1992	1993	1994	*1995	Total
Net Income	\$0	\$2,066	\$2,066	\$2,066	\$2,066	\$1,653	\$9,915
Depreciation & Depletion	0	0	0	0	0	0	0
Capital Expenditures	(7,025)	(775)	0	0	0	0	(7,800)
Working Capital	0	(780)	0	0	0	780	0
Equity Contribution	7,025	775	0	0	0	0	7,800
Loan Proceeds	0	0	0	0	0	0	0
Principal Repayment	0	0	0	0	0	0	0
Project Cash Flow	(\$7,025)	\$511	\$2,066	\$2,066	\$2,066	\$2,433	\$2,115
Cumulative Project Cash Flow	(\$7,025)	(\$6,514)	(\$4,449)	(\$2,383)	(\$317)	\$2,115	

Project IRR (PreTax)

B.6X

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CASE II-A: \$0.89/lb Cu  
INCOME ANALYSIS (\$000)

	1990	1991	1992	1993	1994	1995	1996	1997	*1998	Total
Revenue	\$0	\$10,623	\$10,623	\$10,623	\$10,623	\$10,623	\$10,623	\$10,623	\$1,593	\$75,954
Operating Costs	0	7,834	7,834	7,834	7,834	7,834	7,834	7,834	1,175	56,016
Reclamation Costs	0	0	0	0	0	0	0	0	0	0
Operating Profit	\$0	\$2,789	\$2,789	\$2,789	\$2,789	\$2,789	\$2,789	\$2,789	\$418	\$19,938
Gross Margin	NA	26%	26%	26%	26%	26%	26%	26%	26%	
Other Costs:										
Depreciation Expense	0	0	0	0	0	0	0	0	0	0
Depletion Allowance	0	0	0	0	0	0	0	0	0	0
Interest Expense	0	0	0	0	0	0	0	0	0	0
Base Royalty	0	0	0	0	0	0	0	0	0	0
Total Other Costs	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Profit Before Taxes	\$0	\$2,789	\$2,789	\$2,789	\$2,789	\$2,789	\$2,789	\$2,789	\$418	\$19,938
Income Taxes	0	0	0	0	0	0	0	0	0	0
Net Income	\$0	\$2,789	\$2,789	\$2,789	\$2,789	\$2,789	\$2,789	\$2,789	\$418	\$19,938
Net Margin	NA	26%	26%	26%	26%	26%	26%	26%	26%	

\* Note: 1.8 month operating period.

CASE II-A: \$0.89/lb Cu  
CASH FLOW ANALYSIS (\$000)

	1990	1991	1992	1993	1994	1995	1996	1997	*1998	Total
Net Income	\$0	\$2,789	\$2,789	\$2,789	\$2,789	\$2,789	\$2,789	\$2,789	\$418	\$19,938
Depreciation & Depletion	0	0	0	0	0	0	0	0	0	0
Capital Expenditures	(10,025)	(775)	0	(775)	0	0	0	0	0	(11,575)
Working Capital	0	(1,080)	0	(78)	0	0	0	0	1,156	0
Equity Contribution	10,025	775	0	775	0	0	0	0	0	11,575
Loan Proceeds	0	0	0	0	0	0	0	0	0	0
Principal Repayment	0	0	0	0	0	0	0	0	0	0
Project Cash Flow	(\$10,025)	\$934	\$2,789	\$1,936	\$2,789	\$2,789	\$2,789	\$2,789	\$1,576	\$8,363
Cumulative Project Cash Flow	(\$10,025)	(\$9,091)	(\$6,303)	(\$4,367)	(\$1,578)	\$1,210	\$3,999	\$6,787	\$8,363	