

MEMO TO: Mr. W. N. Wallinger cc: Mr. L. P. Taggart
FROM: Mr. P. J. Brown
DATE: March 29, 1982
RE: Site Visit March 23rd - 26th, 1982

The purpose of my visit was to observe the oxide ore treatment scheme and offer suggestions for modifications to the scheme. In addition, I have continued to monitor and advise the metallurgical staff on various aspects of their work.

1. Oxide Ore Treatment Scheme

The present arrangements for the treatment of oxide ore appear to be satisfactory. Considerable improvements in plant performance could be expected, however, if the ore supply to the mill could be improved. Continuous operation of a 10,000 tonne/day plant with near empty ore bins leads to sudden and unpredictable changes in instantaneous mill feed quality. At any time this would be undesirable, but with oxidized ore it causes extreme changes in flotation circuit pH levels and subsequent loss of circuit control.

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Regarding the technical aspects of oxide treatment, the following points represent the consensus of those involved.

- a) The lime mixing and pH control systems must receive maximum priority. The newly installed 2" diameter lime controller and upgraded piping system may be the answer to some of the pH problems but only a well directed program of monitoring and control can provide the required long term system reliability.
- b) Cyanide should be increased gradually in 25 g/tonne increments. I would expect that eventually cyanide consumption will reach 125 - 200 g/tonne assuming a lead circuit pH of 9.2 - 9.8.
- c) As the cyanide is increased the Z-11/CuSO₄ addition can probably be reduced to near normal levels.
- d) Sodium sulphite, which has showed some promise in laboratory studies, should be tested in the plant. I suggest that this test be postponed until all the above stages of development are complete.

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In summary, the predicted metallurgy for oxide ore appears achievable or possibly a little pessimistic. Reagent usage, as expected, has been erratic during start-up, but I have no doubt that eventually the average consumption will be very close to predicted levels.

2. Metallurgical Studies

Laboratory

In the laboratory, the work on sodium sulphite effect is nearing completion. Comparative testing of two types of sulphite (containing different quantities of fuel oil) still remain to be completed. It would be reasonable to expect a final report on the sodium sulphite project by late April.

The first open circuit cleaner tests using oxide ore will be conducted in early April. Initially, these tests cannot be expected to generate too much useful data since the techniques involved will take several weeks of practice to refine. However, I would expect that cleaner test capability will be available to you by mid May.

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I have suggested that initially the work be directed toward the development of the finer points of oxide ore treatment schemes. (eg. pH levels in cleaner stages, additional cleaning stages and reagent balances). In parallel with this work it should be possible to commence development testing to determine methods of treating Type A ore based on preliminary data from Kamloops.

Grinding Circuit

In the plant the on-going work on the grinding circuit optimization suffered due to erratic plant operation in early March. The loss of P.S.M. to mechanical seal failure eliminated on-stream grind control capability for about ten days. Perhaps, the most serious threats to optimization work are the restrictions on water usage and the tonnage imbalance between A & B circuits. It is recommended that a tonnage split of 220/280 to the A & B circuits be strictly observed and that limitations on water usage should not be applied to the grinding circuit, once the current water shortage has ended. The use of 6" apexes in #6 B.M. has resulted in a reduction in the cyclone overflow P_{80} to the target level of 120 μm . Due to water shortages optimization work on #5 B.M. has not progressed and flotation circuit feed P_{80} values remain at 70 μm .

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On the "A" circuit the newly installed 6" apexes have not yet been evaluated due to a lack of reliable survey data. Indications are, that with the larger apexes, circulating loads have increased to about 500 percent. Excessive feed tonnages to the circuit (eg. 300 - 325 t/h) have resulted in flotation P_{80} values of about 100 μ m.

The grinding circuit survey data requires very close attention. No area of plant operation has the capacity to influence plant efficiency to the same extent as the fineness of flotation feed.

Plant Operation

The commissioning of the on-stream analyser has at last been realized and four streams are in operation and approximately calibrated, and two more streams will be operational by month end. To capitalize on the on-line monitoring capacity of the system, the operators will need to be retrained from a very basic level. The problem of who will conduct the training with the attenuated mill staff has to be addressed.

Shift coverage during plant tests by metallurgists is in my opinion essential regardless of overtime costs incurred. I have no doubt that during the next year the overtime costs for metallurgy will be very high.


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General

Following our discussion, I will make arrangements to visit the site at least twice monthly. I have advised those concerned to contact me at Kamloops, on a weekly basis by telephone, and I believe your idea of a weekly scheduled information session with the metallurgical staff is most worthwhile.

Yours truly,



P. J. Brown, P. Eng.
Consulting Metallurgist

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