

To W.A. Case
From R.J. McLeod
Subject Soluble Arsenic

Date May 11, 1967
Ref. RJM/dp

The soluble arsenic in the mill solutions have been under investigation for a considerable period of time. This problem is being studied by the Extraction Metallurgy Division, Department of Energy, Mines & Resources, by the Department of Health, Engineering Division, Edmonton and by ourselves.

The Extraction & Metallurgy Division have samples of all our products. The arsenic pollution is a problem common to a number of mines in Canada, their Hydrometallurgy Division is endeavouring to develop a process that will reduce this hazard. The department is to keep me posted if any interesting results turn up. To date I have not heard from them.

The Department of Health have taken a number of samples throughout our circuits and have been supplied with tonnages and a flow sheet.

The test work at Giant shows that arsenic in solution can be considerably reduced by treating the solution and pulp in an agitator and thickener. The treatment consists of adding lime to the two wash thickeners, HCD thickener overflow, and calcine residue. The lime precipitates the available iron as a hydroxide which combines with the soluble arsenic to form an insoluble iron arsenate. Calcium arsenate will also be formed which is only slightly soluble.

The problem can be considered in two parts, namely the arsenic already in solution and the As_2O_3 which is latent in the Hot Cottrell dust. The arsenic in solution can be dealt with effectively by the proposed treatment using lime. The latent As_2O_3 in the dust will have to be dealt with differently. We are endeavouring to reduce the solubility by lowering the concentration of the sodium ion in the Carbon process. The use of soda ash has been discontinued and the caustic soda concentration lowered. A separate agitator will be required for treatment of the Hot Cottrell dust residue.

The equipment necessary to treat the mill solutions will be available when the Cyanide Tailing Plant is shut down. With the improvement in the flotation tail, the cyanidation of the tailings is uneconomical. No. 8 agitator and No. 6 thickener will be required. We will also use No. 5 agitator in the calcine section for the Hot Cottrell dust.

In order to justify the shutting down of the cyanide tailing section the category of cyanide tailing plant operator will be discontinued. The mill will operate with a solution operator, flotation operator and a shift helper. The operation of the arsenic treatment agitator and thickener will require little attention, but it is located in the cyanide tailing plant area and will have to be attended to by the solution operator and helper. It will be necessary to watch the timing when No. 8 agitator and No. 6 thickener are used for solution treatment.

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