

To DRD: JMMortimer, RJMcLeod
From E. O. Foster
Subject Sampling Mill Waste to Bow Lake

Date January 14, 1964
Ref. _____

A sampling program was carried out during the period December 10th to 31st, 1963, on mill waste pulp discharged to Bow Lake. This program was considered as a "dry run" in preparation for the sampling schedule requested by Mr. A. T. Jordan, Chief Mining Inspector, Department of Northern Affairs and Natural Resources, Ottawa, Canada.

The purpose of this sampling program was to ascertain if any problems would be encountered, and to visualize the results that could be expected.

The data requested by Mr. Jordan's department includes:-

- a) The total amount of arsenic in solution which is discharged to waste each day of the month, expressed in pounds of arsenic.
- b) The total volume of wastes discharged for each day of the month.

Details:

The sampling program involved cutting a representative sample of waste pulp, calculations for determining the tonnage of solution and solids, and a chemical determination for the arsenic content in the solution.

Pertinent data recorded during the test period are tabulated as follows:

<u>Date</u>	<u>Volume of Pulp cu. ft/day</u>	<u>Tonnages/Daily</u>			<u>Solution Assay As/p.p.m.</u>	<u>As Content Sol'n. lb/day</u>
		<u>Pulp</u>	<u>Solids</u>	<u>Solution</u>		
11/12/63	315,974	10,355	748	9,607	24.80	476.5 (h)
16/12/63	117,430	4,036	565	3,471	11.17	77.5 (l)
Av. for Period	250,556	8,195	568	7,627	18.69	285.1

(h) record high for period

(l) record low for period

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Conclusions:

As indicated in the tabulated results (see Page 1), it appears wide variations will occur both in tonnage calculations, and in the arsenic content of solutions. It is also evident data recorded on a daily basis will be erratic and misleading. Due to the lack of automatic measuring and sampling equipment, this situation is unavoidable.

Two locations are available for obtaining a sample of the combined pulps from the various mill circuits which make up the flow of waste to Bow Lake.

- 1) A valve on the suction line to the pump discharging the final tailing pulp and sewage to Bow Lake.
- 2) The end of the mill tailing discharge line at Bow Lake.

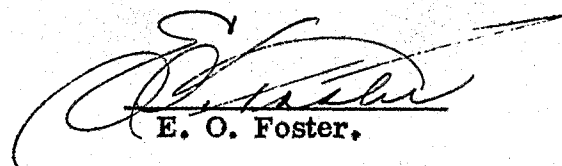
Sampling is limited to hand cut grab samples.

Tonnage calculations are determined from the pulp density (% solids) of the pulp sample collected. The dry tons ore milled each day, minus the tons of sand fill produced, estimated the tons of solids in the pulp discharged each day. The solution tonnage is estimated by the tons of waste pulp minus the tons of solids.

The pulp density of the flow to Bow Lake during the test period averaged 6.93% solids; but varied between 4.3% and 14.0% depending on mill operating conditions at the time the sample was collected. In addition the volume and pulp density of the waste flow can be affected by the sewage flow to the final tails pump box.

Similarly the arsenic content in the sample collected relates only to the brief period the sample is taken, and is not necessarily representative of the day's operation. A more representative estimate would be available from a sample of the solution overflowing the dam at the discharge of Bow Lake. This sample would not be affected by any dilution, except during the brief period of spring run off.

Yellowknife, N.W.T.
January 14, 1964


E. O. Foster.