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MINES BRANCH INVESTIGATION REPORT IR 63-55

**MINERALOGICAL REPORT ON TWO MILL
TAILING SAMPLES, HUDSON BAY MINING
AND SMELTING CO. LTD.,
FLIN FLON, MANITOBA**

by

M. R. HUGHSON & S. KAIMAN

EXTRACTION METALLURGY DIVISION

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M. R. Hughson* and S. Kaiman**

SUMMARY

Pyrite comprises the bulk of the "Cleaner Scavenger Tailing" and the "Cyanide Tailing" samples. The major non-metallic minerals are quartz and dolomite. No gold or silver minerals were observed in either sample; they presumably occur in submicroscopic form.

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INTRODUCTION

In a microscopic investigation of specimen of a zinc-lead ore from the Chisel Lake Mine of Hudson Bay Mining and Smelting Co. Ltd., Flin Flon, Manitoba, the silver-bearing minerals hessite, argentiferous tetrahedrite and pyrargyrite-proustite were identified (see Investigation Report IR 63-31).

In order to further investigate the silver extraction of the Company's cyanidation process, the Mineralogy Section of the Extraction Metallurgy Division undertook to examine samples of mill tailings. Accordingly, two tailing samples, weighing approximately 20 lb each, were submitted by the Company on March 8, 1963 and were assigned our Reference No. 3/63-2. The samples were described as a "Cleaner Scavenger Tailing" and a "Cyanide Tailing" and are, respectively, a flotation tailing and a cyanide leach tailing of the flotation tailing. The purpose of the investigation was to determine the gold- and silver-bearing minerals present in each tailing sample and the nature of their occurrence.

Assays show that the "Cleaner Scavenger Tailing" contains 0.022 oz/ton Au and 0.27 oz/ton Ag and the "Cyanide Tailing" contains 0.01 oz/ton Au and 0.25 oz/ton Ag.

PROCEDURE AND RESULTS

A 200 gram sample was riffled out of each of the submitted tailings. Both samples were washed with ether and alcohol to remove residual flotation reagents. They were wet screened at 325 mesh and the plus 325 mesh material was dry screened at 65, 100, 150, 200, 270, and 325 mesh. Polished sections were prepared of the minus 150 plus 200 mesh and minus 200 plus 270 mesh sizes of each tailing sample. The minus 270 plus 325 mesh size of each tailing sample was treated on the Haultain Superpanner to concentrate the heavy minerals and polished sections were prepared of all the Superpanner fractions. Fifteen polished sections were examined microscopically; each section was traversed at 1/2 mm intervals at 400 magnifications.

The metallic mineral content which comprises the bulk of the "Cleaner Scavenger Tailing" and the "Cyanide Tailing" is similar in both samples. The major metallic mineral is pyrite, there are minor amounts of pyrrhotite, marcasite, ilmenite, magnetite, sphalerite, rutile, and galena. The most abundant non-metallic minerals are quartz and dolomite. There are minor amounts of chlorite, amphibole, biotite, and phlogopite.

No gold- or silver-bearing minerals were observed in any of the polished sections studied.

CONCLUSIONS

Assays show that both the flotation tailing sample and the cyanide tailing sample contain gold and silver, but no gold- or silver-bearing minerals were observed microscopically. It is concluded therefore that the gold and silver must occur in submicroscopic form.