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DEPARTMENT OF MINES AND TECHNICAL SURVEYS

OTTAWA

MINES BRANCH INVESTIGATION REPORT IR 58-53

CONCENTRATION TESTS ON A SAMPLE OF WAD MANGANESE
BEARING MATERIAL FROM BIRCH ISLAND, B. C., SUBMITTED
BY REXSPAR URANIUM AND METALS MINING CO. LTD.

by

J. D. JOHNSTON

MINERAL DRESSING AND PROCESS METALLURGY DIVISION

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SUMMARY OF RESULTS

Since manganese that is in the samples occurs as wad manganese, a hydrated mineral of low specific gravity, attempts to concentrate it by gravity methods were unsuccessful. The mineral likewise failed to respond to flotation, no collector having yet been found that will float it selectively.

Owing to the soft and crumbly nature of the material it was not possible to prepare polished sections for microscopic study, hence the absence of photomicrographs.

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INTRODUCTION

A shipment of 8 bags of material, weighing 530 lb, was received on October 15, 1957. The shipment was submitted by John W. Scott, Manager, Rexspar Uranium and Metals Mining Co. Ltd., 550 Sherbrooke Street West, Montreal, Quebec.

It was requested that an attempt be made to produce a manganese concentrate that would contain 40 to 45% MnO_2 .

LOCATION OF PROPERTY

The property from which this sample was taken is located on Birch Island in the North Thompson River Valley of British Columbia.

SAMPLING AND ANALYSIS

Manganese	-	2.60 %
Iron	-	4.85 %
Sulphur	-	0.066%
Phosphorus	-	0.069%
Silica	-	65.50 %
Acid Insoluble	-	75.91 %

MINERALOGICAL EXAMINATION *

The material described in this report was picked from a 500 lb sample received from Rexspar in October, 1957.

The manganese ore is extremely heterogeneous in character. Samples representing a range of compositions were selected for closer examination. Polished sections adequate for ore microscopic examination could not be prepared, because of the friable, earthy

* From Mineralogical Laboratory Report No. M-1579-E, March 19, 1958, by E. H. Nickel.

nature of the ore.

The principal types of material present in the sample are as follows:

- a) A loosely-bound conglomeratic rock consisting of rounded pebbles of quartzitic, micaceous, and limonitic rock in a light to dark brown earthy groundmass consisting largely of limonite, with small localized patches of wad;
- b) Black, lustrous material consisting of extremely fine-grained wad, quartz, and mica, in which are suspended some rounded pebbles;
- c) Porous, earthy limonite containing small patches of wad; and
- d) Barren, poorly bedded quartzitic rock.

The presence of limonite and wad in the sample is to be expected in a bog deposit. Neither of these substances is a mineral in the strict mineralogical sense, but is a mixture of amorphous to finely crystalline hydroxides and oxides of iron and manganese, respectively. The substances are soft and earthy and crumble into dust on slight pressure. They can therefore be expected to slime very readily during ore dressing.

DETAILS OF INVESTIGATION

Test No. 1

A 2000 g lot of ore was crushed finer than 20 mesh and fractionated on the following series of screens: 35 mesh, 48 mesh, 65 mesh, and 100 mesh. The sized fractions were treated on a laboratory-size concentrating table, each size yielding two products,

sands and slimes, with not the slightest sign of manganese concentrate in any of them. The sands from all fractions were bulked together for assaying, as were also the slimes. The sand and slime products averaged 2.00% manganese with nothing recovered.

Test No. 2

Flotation

A sample of the ore was ground to 65% finer than 200 mesh and floated as follows:

Charge to Ball Mill -

Ore - 2000 g
Water - 1500 cm³
Sodium silicate - 1.0 lb/ton

Reagents to Cell -

Tall oil-Fuel oil
emulsion - 1.5 lb/ton

Results of Test No. 2

Product	Weight, %	Assay, Mn %	Distribution, Mn %
Flot. conc.	4.38	2.98	6.82
Cleaner tailing	4.82	2.89	7.28
Flot. tailing	90.80	1.81	85.90
Feed (calc.)	100.00	1.91	100.00

The foregoing results and conclusions were further confirmed by other tests of a preliminary nature.

CONCLUSION

Inability to concentrate the material comprising this sample, as well as its low manganese content, indicates that no further work on it is warranted. This conclusion is confirmed by results obtained in previous attempts to concentrate ore of this nature.

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