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August 15th, 1941.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1063.

Sink-and-Float Tests on a Sample
of Low-Grade Copper Ore from the Granby Mine
at Copper Mountain, British Columbia.

BUREAU OF MINES
DIVISION OF METALLIC MINERALS
—
ORE DRESSING AND
METALLURGICAL LABORATORIES


CANADA
DEPARTMENT
OF
MINES AND RESOURCES
MINES AND GEOLOGY BRANCH

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Shipment:

Two sacks of ore, total weight 250 pounds, were received January 2nd, 1941. The samples were submitted by W. R. Lindsay, Assistant General Manager, Granby Consolidated Mining, Smelting and Power Company, Allenby, British Columbia.

Location of Property:

The property from which this ore was taken is located at Copper Mountain, 12 miles west of Princeton, on the Similkameen river, British Columbia.

Character of the Ore:

No microscopic examination of this shipment was made, but a complete description of the ore is to be found in the report of Investigation No. 915, issued in November, 1940.

Sampling and Assaying:

No head sample was cut from the present shipment owing to the nature of the test conducted but a head sample assay calculated from the products of tests showed the feed sample as containing 0.83 per cent copper.

Experimental Tests:

The sample submitted was tested to determine its suitability, or otherwise, for treatment by the Huntington-Heberlein "Sink-and-float" process. Small-scale sink-and-float tests were conducted in which a density separation was effected in a bath of substantially stable galena medium. The medium is a suspension of fine galena and water and its density can be controlled to an accuracy of 0.01 by altering the proportions of two constituents.

For this test the size range of the ore was -5/8" +6 mesh and the separation was made at a density of 2.85, a preliminary test having indicated these to be the most satisfactory conditions.

(Continued on next page)

(Experimental Tests, cont'd) -

The results of the test are tabulated below:

Table I. - Distribution of Products from Crushing.

PRODUCT	Weight, : per : cent :	Assay : Cu, : per cent :	Distribution : of copper, : per cent
S. F. feed	: 78.7	0.78	73.6
Fines -6 mesh	: 21.3	1.03	26.4
Feed sample	: 100.0	0.83	100.0

Table II. - Distribution of Products from S. F. Separation.

S. F. conc.	: 33.3	1.01	43.3
S. F. tailing	: 66.7	0.66	56.7
S. F. feed	: 100.0	0.78	100.0

Table III. - Summary of Products from Pre-Concentration.

S. F. conc.	: 26.2	1.01	31.9
Fines -6 mesh	: 21.3	1.03	26.4
Product to further treatment	: 47.5	1.02	58.3
S. F. tailing	: 52.5	0.66	41.7
Feed sample	: 100.0	0.83	100.0

The results may be summarized as follows:

	Per cent.
Proportion of ore available for S. F. feed	78.7
" " " fed to subsequent processes	47.5
Weight elimination of S. F. feed	66.7
" " " whole ore	52.5

	Copper, per cent
Assay of ore received	0.83
" " S. F. feed	0.78
" " S. F. tailing	0.66
" " S. F. conc.	1.01
" " ore to subsequent processes	1.02
Metal recovery from S. F. feed	43.3 per cent
" " " whole ore	58.3 "

(Experimental Tests, cont'd) -

The result of the operation is therefore an elimination of 52.5 per cent of the weight of ore mined. The grade of the product to be further treated is somewhat lower than that required and at the same time the rejected portion is relatively high grade.

Since two-thirds of the feed to the sink-and-float process has already been eliminated along with 56.7 per cent of the contained copper, separation at a higher density would seem to hold little hope of improving the grade of product to be fed to subsequent processes and at the same time keep recovery up to an economic level.

Conclusions:

The results of the tests conducted on this sample of ore have been unsatisfactory, owing to failure to produce a feed for subsequent treatment assaying 1.20 per cent copper as a minimum. The fact that a high weight elimination accompanied by a comparatively high metal loss has already been effected precludes the possibility of separating at a higher density. Furthermore, the untreatable fines assay only 1.03 per cent copper and would dilute any higher-grade sink product that might be produced by a separation at higher density.

The ore is finely disseminated and, in order to free the minerals from the gangue, should be ground finer than this process is capable of treating successfully.

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