O T T A W A June 29th, 1940.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 858.

Mill Residue from Peterson Lake,
Cobalt, Ontario.

BUREAU OF MINES
DIVISION OF METALLIC MINERALS
—
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CANADA
DEPARTMENT
OF
MINES AND RESOURCES
MINES AND GEOLOGY BRANCH

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Shipment:

A shipment of mill tailings, gross weight 20 pounds, was received on June 14th, 1940. The material was taken from the tailing deposit at Peterson Lake, near Cobalt, Ontario. The shipment was submitted by E. T. Lansdowne, for the Progress Smelting and Refining Company, 40-42 Mill Street, Toronto, Ontario.

Purpose of the Investigation:

The shipment was submitted for the purpose of investigating the recovery and grade of concentrate obtained by jigging the material.

Sampling and Analysis:

The material was sampled by standard methods and was found to contain:

Gold	-	0.005 oz./ton
Silver	-	8.37 "
Cobalt	-	0.24 per cent
Bismuth	-	Nil.

Investigative Procedure:

The sample of tailing was screened on a 20-mesh screen. The plus 20 mesh material was assayed and the minus 20 mesh tailing was jigged. The concentrate so obtained was re-jigged, producing a concentrate and middling products.

Results of the Investigation:

A final jig concentrate was obtained which assayed as follows: Gold, 0.02 ounce per ton; silver, 166.1 ounces per ton; cobalt, 1.46 per cent; bismuth, nil. Seventy-one per cent of the cobalt reported in the jig tailing.

Details of Test Work:

Test No. 1. - Jig Concentration.

The minus 20 mesh material was passed over a Denver Laboratory Mineral Jig. The first concentrate was repassed, forming a second concentrate and a middling. The second concentrate was repassed, forming a final

concentrate and a second middling. The final products were assayed for gold, silver, and cobalt. The final concentrate was assayed for bismuth.

Results of Jig Concentration:

Product	Weight, per cent	Assays Oz./ton Au	Assays Oz./ton Ag	Assays Per cent Co	Distribution, per cent Au	Distribution, per cent Ag	Distribution, per cent Co	Ratio of concentration
Feed	100.00	0.005	8.38	0.23	100.00	100.00	100.00	
+20 mesh	3.68	0.02	8.08	0.15	3.54	3.55	2.44	77.5:1.
Final conc.	1.29	0.005	166.10	1.46	4.97	25.55	8.34	
Midd. No. 1	32.32	0.005	5.58	0.12	31.11	21.51	17.17	
Midd. No. 2	3.14	0.005	8.04	0.06	3.02	3.01	0.83	
Final tailing	59.57	0.005	6.53	0.27	57.36	46.38	71.22	
Conc. No. 1 (calculated)	36.75	0.0055	11.42	0.16	39.10	50.07	26.34	2.72:1.
Conc. No. 2 (calculated)	4.43	0.01	54.06	0.47	7.99	28.56	9.17	22.6:1.

Summary and Conclusions:

It is apparent that the cobalt minerals are of such a physical character that they are not concentrated by the above procedure. 71.2 per cent of the cobalt passed into the tailing from the first jigging operation. This tailing has a higher cobalt content than the feed. 46.4 per cent of the silver in

the feed also is included in the tailing.

Re-jigging of the concentrate raises the cobalt content from 0.16 per cent to 0.47 per cent. A third jigging raises it to 1.46 per cent, with a total recovery in this third concentrate of 8.34 per cent of the cobalt and 25.5 per cent of the silver.

It is apparent that only the heavier particles of cobalt are recovered in the higher-grade concentrates.

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