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ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 952.

Recovery of Scheelite from Selected Ore from the Hollinger Consolidated Gold Mines, Limited, Timmins, Ontario.

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

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A shipment of 2,965 pounds of selected scheelite ore was received on November 25th, 1940, from the Hollinger Consolidated Gold Mines, Limited, Timmins, Ontario. This shipment consisted of massive scheelite carried in a gangue of white quartz and diorite. The scheelite aggregates were traversed by fine stringers of gangue. Considerable coarse free gold and pyrite also were present.

The shipment was crushed to pass 8 mesh and sampled. It then was screened on 14 and 30 mesh and the two coarser sizes were concentrated on Butchart and Wilfley tables. The table middlings and tailings were reground, united with original minus 30 mesh portion and concentrated on a Wilfley table. The middling from this operation was re-tabled on a second table. The middlings and tailing from these concentrations were collected, dried, and sampled.

The concentrates, consisting of a mixture of scheelite, pyrite and free gold, were run over an amalgamated plate and the amalgam was recovered and retorted.

The amalgamation plate tailing was then ground in a ball mill and floated in a Denver unit cell. Amyl xanthate, pine oil and sulphuric acid were used as flotation reagents. The flotation concentrate was cleaned twice. The tailing from these cleaning operations contained approximately 65 per cent WO_3 and 3.7 per cent sulphur. The main bulk of the concentrate, after flotation, analysed 0.3 per cent sulphur, while the smaller lot from the re-tabling of the table middling contains 0.69 per cent sulphur.

This lot, together with the high sulphur flotation cleaner-tailing, was roasted to eliminate sulphur, and was then mixed with the main portion and sampled.

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Results:

Product	Weight, pounds	Assays: WO_3, per cent	Assays: Au, oz./ton	WO_3, weight x assay	Gold ounces contained	Distribution, per cent: WO_3	Distribution, per cent: Au
Feed	2,965	33.46	1.98	99,208.90	2.94	100.0	100.0
Scheelite concentrate	1,064	74.82	0.34	79,608.48	0.18	80.2	6.1
Table middling	341	12.90	1.22	4,398.90	0.22	4.4	7.5
Table tailing	1,308	4.42	0.19	5,781.36	0.12	5.9	4.1
Pyrite flotation concentrate	41	20.27	13.40	831.07	0.27	0.8	9.2
Slime loss, spills, etc., (calculated)	211®	-	-	8,589.09	1.04	8.7	35.3
Bullion, fine ounces				-	1.11	-	37.8

® During the emptying of the tank containing the settled table tailing, a spill occurred. This accounts for the main loss in weight. The loss in tungsten occurs chiefly in very fine scheelite escaping in the overflow from the settler.

37.8 per cent of the gold is not accounted for. This is due to hang-up in tables, pipes, pumps and other equipment.

40.1488 grams of gold, assaying 863.5 fine, were recovered. This was returned to the shippers.

The scheelite concentrated was analysed, with the following results:

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Analysis of Concentrated Scheelite.

		Per cent
Tungsten oxide (WO_3)	=	74.82
Silica (SiO_2)	=	0.46
Iron (Fe)	=	0.76
Aluminium oxide (Al_2O_3)	=	0.14
Calcium oxide (CaO)	=	19.11
Magnesium oxide (MgO)	=	0.21
Sulphur (S)	=	0.36
Manganese (Mn)	=	0.01
Copper (Cu)	=	0.01
Phosphorus (P)	=	0.04
Molybdenum (Mo)	=	None detected.
Arsenic (As)	=	" "
Antimony (Sb)	=	" "
Tin (Sn)	=	" "
Lead (Pb)	=	" "
Bismuth (Bi)	=	" "
Gold (Au)	=	0.34 ounce per ton.

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