

Launceston, 12th September, 1944.

*Duplicate*

N<sup>o</sup> 122

ORE DRESSING INVESTIGATION NO. 347-8/44.

SCANNED

MT. HISCHOFF.

Samples.

Samples of pulp stated to be classifier products from the "40" mill treating "Greisen" ore were submitted for concentration tests and sizing analyses by Mr. L. G. Wilkins H. Q. Metallurgist, Department of Supply & Shipping, Waratah. The samples were labelled as follow:-

A from No. 4 Spigot (Lab. Reg. No. 347)  
M B

B from Classifier Overflow (Lab. Reg. No. 348)  
M B

Sizing Analyses.

British Standard screens were used to 200 mesh size and the minus 200 mesh fractions were sized in a Haultain Infralyzer.

Reg. No. 347. <sup>A</sup>M B No. 4 Spigot)

Sulphur 19.42 percent.

Screen Size.	P e r c e n t			Tin Percent	D i s t r i b u t i o n	
	Weight.	Weight Cum.	Tin		Percent	Cum.
+ 60	0.21	0.21	0.14	0.03	0.03	
+ 85	2.64	2.85	0.27	0.67	0.70	
+ 100	2.11	4.96	0.31	0.62	1.32	
+ 120	4.36	9.32	0.36	1.49	2.81	
+ 150	10.46	19.78	0.49	4.87	7.68	
+ 200	15.85	35.63	0.88	13.24	20.92	
I. S./1	19.59	55.22	2.68	49.83	70.75	
2	12.90	68.12	1.21	14.81	85.56	
3	10.47	78.59	0.80	7.95	93.51	
4	6.24	84.83	0.53	3.14	96.65	
5	3.61	88.44	0.43	1.47	98.12	
6	3.18	91.62	0.28	0.24	98.96	
7	8.38	100.00	0.13	1.04	100.00	
Composite	100.00		1.05	100.00		

Reg. No. 348. (B Classifier Overflow)

Sulphur 3.33 percent.

Screen Size	Percent		Tin	Tin Distribution	
	Weight	Weight Cum.		Percent	Percent Cum.
I. S./2	26.99	26.99	0.60	31.73	31.73
" 3	20.12	47.11	0.76	29.95	61.68
" 4	10.54	57.65	0.76	15.70	77.38
" 5	9.12	66.77	0.56	10.01	87.39
" 6	12.76	79.53	0.28	7.00	94.39
" 7	20.47	100.00	0.14	5.61	100.00
Composite	100.00		0.51	100.00	

The percentage weight of fractions plus 200 mesh and I. S. 1 amounted to 0.1 and were added to I.S. 2.

#### Concentration Tests.

Concentration tests were desired by the following methods.

1. Table concentration to the production of a pyritic concentrate, removal of sulphides by flotation and concentration of the cassiterite in the flotation tailing.
2. Flotation for rejection of sulphides etc., and table concentration of the cassiterite in the flotation tailing.

The concentration tests were required on a composite of the two samples in the proportion of 57: 43 of  $\frac{A}{M B}$  and  $\frac{B}{M B}$  respectively.

Attempts to obtain composites from the two pulps were unsuccessful owing to the fact that the solids in the sample  $\frac{A}{M B}$  could not be kept in suspension for a sufficient period to obtain the proportional weights. Accordingly the concentration tests were performed on each sample separately and the results as reported are calculated composites in the desired proportions.

#### RESULTS.

("P.T." in the tables is an abbreviation for flotation tailing)

Test 1. Table concentration to a pyritic concentrate rougher and cleaner flotation of same to remove sulphides, and table concentration of the flotation tailing to produce a cassiterite concentrate.

#### Flotation Conditions.

Reagents	Pounds per Ton of Ore / Minutes		
	Rougher	1st Cleaner	2nd Cleaner
Copper sulphate	0.1/15		-
Sodium Ethyl Xanthate	0.1/5	0.05/5	-
Cresylic Acid	0.02	0.01	0.01
Flotation	/10	/10	/10

Product.	Percent.		Tin Distribution Percent.
	Weight	Tin	
<u>Table Concentrate</u>			
(Table Concentrate from F.T	0.65	59.46	46.67
(Table Tailing from F T	1.98	1.53	3.66
(Cleaner Flotation Conc.	13.50	1.32	21.51
Table Middling	13.31	0.48	7.72
Table Tailing	70.56	0.24	20.44
Composite	100.00	0.83	100.00
Ratio of Concentration	153.8		
Table Concentrate	16.13	3.69	71.84

Test 2.

Cleaner flotation to remove sulphides etc., and table concentration of flotation tailings to produce a cassiterite Concentrate.

Flotation Conditions.

Reagents	Pounds per Ton of Ore/Minutes.	
	Rougher	Cleaner
Copper Sulphate	0.8/15	-
Sodium Ethyl Xanthate	0.5/10	-
Cresylic Acid	0.13	0.08
Flotation	/10	/10

Product	Percent		Tin Distribution Percent.
	Weight	Tin	
Table Concentrate from F T	0.87	44.33	46.77
Table Middling from F T.	2.56	1.01	3.13
Table Tailing from F.T	38.73	0.38	17.85
Cleaner Flotation Conc.	57.84	0.46	32.25
Composite	100.00	0.82	100.00
Ratio of Concentration	115.0		

Summary.

Recoveries of tin by both methods of treatment amounted to approximately forty six percent. The sizing analysis of the classifier overflow indicates a low recovery of cassiterite from this product by gravity concentration.

Rougher flotation of sulphides etc., results in high loss of cassiterite and cleaner flotation is necessary to reduce this loss to the amounts shown. Previous test work on the "Greisen" ore has shown that this loss is associated with the flotation of talc etc., and that flotation of sulphides following talc flotation results in a concentrate of very low tin content. Evidence that some cassiterite is present as

either composite grains or coated with talc is shown in "Mineragraphic Investigation No. 313, C.S.I.R., by Dr. F. L. Stillwell" on test products from the "Greisen" Ore. The test products examined were concentrates obtained from test flotation concentrates. Flotation conditions as set out in this report result in the flotation of talc and carbonate gangue together with the sulphides. It can be anticipated that any application of sulphide flotation incorporating a depressant for talc would result in a reduction of the loss of cassiterite.

CHIEF CHEMIST AND METALLURGIST