DIVISION OF
ORE DRESSING AND
METALLURGY

DEPARTMENT OF MINES
CANADA

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REPORT

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ORE DRESSING AND METALLURGICAL LABORATORIES

Comparative Cyanide and Settlements Tests on Two Types of Gold Ore from the Sylvanite Gold Mines, Limited, Kirkland Lake, Ontario.

by J.S. Godard.

Ottawa, July 18, 1929.

REPORT OF THE ORE DRESSING AND METALLURGICAL LABORATORIES

Report No...

Comparative Tests on Two Types of Ore from The Sylvanite Gold Mines Ltd. Kirkland Lake, Ont.

J. S. Godard

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Shipment: A shipment consisting of two samples, each weighing 50? pounds was received May 31, 1929 from, The Sylvanite Gold Mines Ltd. Kirkland Lake, Ont.

Characteristics of the Ore: Both samples were those of gold ores. Sample No. 1 was taken from, what is termed, the main south vein. It is more highly schisted and appears to contain a greater percentage of silica than sample No. 2, which represents the regular mill feed and is the typical reddish feldspar porphry of the Kirkland Lake District.

Analysis:

Sample No. 1 gold 0.39 oz/ton.
Sample No. 2 gold 0.47 oz/ton.

Purpose of Experimental Tests: The purpose of the experimental tests was to determine any difference in the extractions, cyanide consumptions and settling properties of the two types of ore.

Experimental Tests:

1. Cyanidation Tests in Winchester Bottles.

Ore at -20 mesh, wet ground to 95% -200 mesh. KCN 0.04%, dilution 1:2.5, time 48 hours.

Results - Sample No. 1

Test 1. Tailings screened on 200 mesh

Mesh	Wt %	Assay Au. oz/ton	Aver. Tailing Au. oz/ton
+ 200	5.0	0.07	0.023
- 200	95.0	0.02	

Test 2.

+ 200	5.2	0.14	0.026
- 200	94.8	0.02	

Sample No. 2

Test 1.

+ 200	5.5	0.13	0.045
- 200	94.5	0.04	

Test 2.

+ 200	4.9	0.07	0.041
- 200	95.1	0.04	

Summary - Samples 1 and 2 - Tests 1 and 2.

Sample No.	Test No	Head	Tail	Extr. %	KCN lb/ton
1	1	0.39	.023	94.1	0.28
1	2	0.39	.026	93.3	0.29
2	1	0.47	.045	90.4	0.12
2	2	0.47	.041	91.3	0.08

II. Cyanidation Tests in Glass Agitators.

Ore at -20 mesh, wet ground 95% -200 mesh, KCN 0.04%, dilution 1:2.5, time 48 Hours.

Results

Sample No. 1, Test No. 3 - Tailing screened on 200 mesh

Mesh	Wt %	Assay Au. oz/ton	Aver. Tailing Au. oz/ton.
+ 200	5.1	0.85	0.062
- 200	94.9	0.02	

Sample No. 2 - Test No. 3

+ 200	5.5	0.05	0.041
- 200	94.5	0.04	

Summary - Samples 1 and 2 - Test 3

Sample No.	Test No	Head Au oz/ton	Tail Au oz/ton	Extr. %	KCN lb/ton
1	3	0.39	.062	84.0	0.28
2	3	0.47	.041	91.3	0.11

III. Cyanidation Tests in 100 lb. Unit.

Ore at -20 mesh. Ground 95% -200 mesh in small rod mill in closed circuit with a classifier. Classifier overflow agitated in pachuca tank, KCN 0.04% for grinding circuit and agitation, dilution 1:2.5 - Time of agitation 34 hours. Tailings filtered in frame press and repulped.

Sample No. 1, Test No. 4 - Tailing screened on 200 mesh

Mesh	Wt %	Assay Au. oz/ton	Aver. Tailing Au. oz/ton
+ 200	4.5		
- 200	95.5	0.03	.016
		0.015	

Sample No. 2 - Test No. 4

+ 200	6.0	0.04	.031
- 200	94.0	0.03	

Duplicate Sample

+ 200	5.7	0.045	0.026
- 200	94.3	0.025	

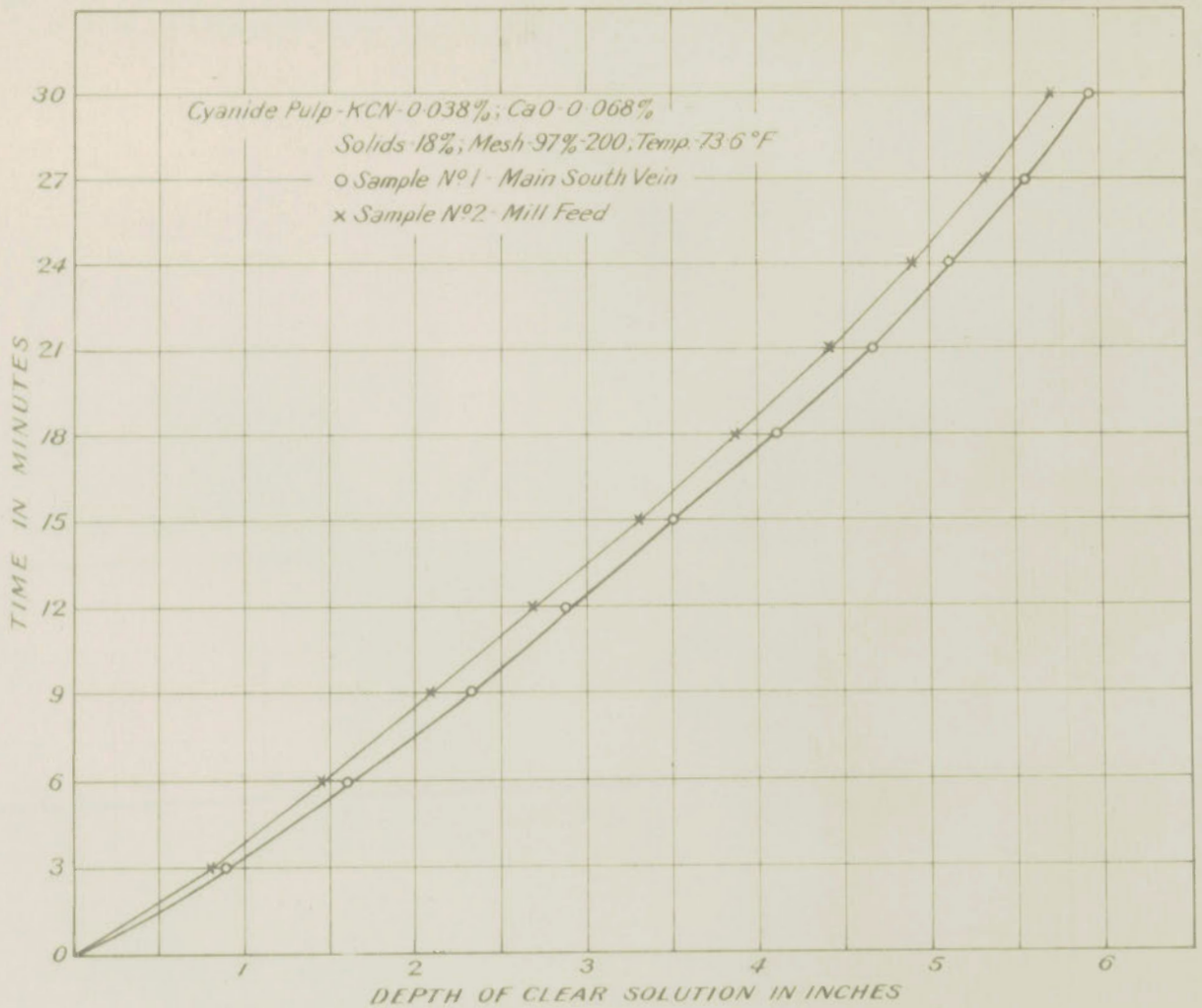
Summary - Samples 1 and 2 - Test 4

Sample No.	Test No.	Head Au oz/ton	Tail Au oz/ton	Extr. %
1	4	0.30	0.016	95.7
2	4	0.47	0.029	93.8

IV. Settlement Tests.

Tests made in 4000 cc. cylinder 4 9/16" diameter. Tailings from sample No. 1 - Test No. 4 and sample No. 2 - Test No. 4 were used. They were screened on 200 mesh and samples were made up containing 3% +200 mesh. Solution from sample No. 2 - Test No. 4 was used. Readings were taken at three minute intervals for a 30 minute period.

For results see accompanying graph.



Graph showing rate of settlement of solids in cyanide pulp, Sylvanite gold ores.

Conclusions:

I Extraction

Sample No. 1 proved to be a less refractory ore than No. 2. A higher extraction and a lower tailing was obtained on sample No. 1 though the head was of lower grade. In sample No. 1 - Test No. 3, the plus 200 mesh tailing was very high. This was due to free gold settling out in the agitator.

II Cyanide consumption

Sample No. 1 consumes more cyanide than No. 2. The cyanide consumptions were in the following proportion:

$$\frac{\text{Sample No. 1}}{\text{Sample No. 2}} = \frac{2\text{S}}{1\text{S}}$$

III Settlement

In the same solution sample No. 1 showed a slightly faster settling rate.