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SHOULD BE ADDRESSED TO THE DIRECTOR.

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Report of Ore Dressing & Metallurgical Laboratories

Test No. 85

Graphite Concentrates

A shipment of two bags, 200 pounds of Graphite Concentrates was received on January 25th, 1918 from the "New Quebec Graphite Co., Ltd." Buckingham, Que.

This graphite was their concentrates from some point in their milling operations, and contained as impurities, quartz adhering to the Graphite flake, Mica and a small amount of Iron Sulphides.

The analysis of this shipment showed it to contain:-

Carbon	---	60.10 %
Silica	---	20.10 %
Iron	---	2.20 %

The product desired was a commercial graphite, flake as high in carbon as possible to obtain.

Tests were made on the Huff Electrostatic Separator to remove the mica, without appreciable results. Some of the mica was removed but at the expense of a large loss of the graphite flake.

A test was run on the large Callow Pneumatic Machine,

the

the concentrate being fed in the head of the Rougher Cell with water, a little coal oil and pine oil being added. The analysis of the concentrate made was as follows:-

Carbon	---	72.30 %
Silica	---	11.20 %
Iron	---	2.30 %

On examination of this concentrate it was found that the mica was eliminated but the quartz adhering to the graphite flake remained.

The Iron content was practically the same. It is doubtful whether this came from the graphite concentrates or was picked up in the air lifts of the cells from former tests on Molybdenite ores.

To make a clean concentrate it was necessary to regrind, to free the quartz gangue adhering to the flake. This was done in the Wet Ball Mill using pebbles for grinding. An accurate test could not be made as the amount of concentrate was too small. The mill was charged with 380 pounds of pebbles, 122 pounds of concentrates and 122 pounds of water and allowed to run for 30 minutes.

A screen test was made on the concentrates before grinding and also on the concentrates after grinding and refloating. From the screen test scales submitted in this report it will be found that the grinding produced 10 % more fines than in the original concentrates. This is probably high to what it would be in actual practice as it has been found that with careful operation the regrinding with pebbles does produce but very little more fines than the feed, and frees the flake from the adhering gangue.

The analysis of the final concentrate was as follows:-

Carbon	----	83.45 %
Silica	----	6.50 %
Iron	----	2.00 %

Conclusions:- The above test shows that a considerable improvement has been made on the grade of the concentrate. The concentrates

concentrates were screened on 100, 150 and 200 Tyler Standard Screens with the following results:-

+ 100	---	78.2 % of concentrates
Analysis	---	C - 86.50 %
		SiO <sub>2</sub> - 4.30 %
- 100 + 150	---	13.3 % of concentrates
Analyses	---	C - 82.05 %
		SiO <sub>2</sub> - 11.90 %
- 150 + 200	---	3.8 % of concentrates
Analyses	---	C - 68.45 %
		SiO <sub>2</sub> - 17.00 %
- 200	---	4.7 % of concentrates
Analyses	---	C - 48.32 %
		SiO <sub>2</sub> - 19.40 %

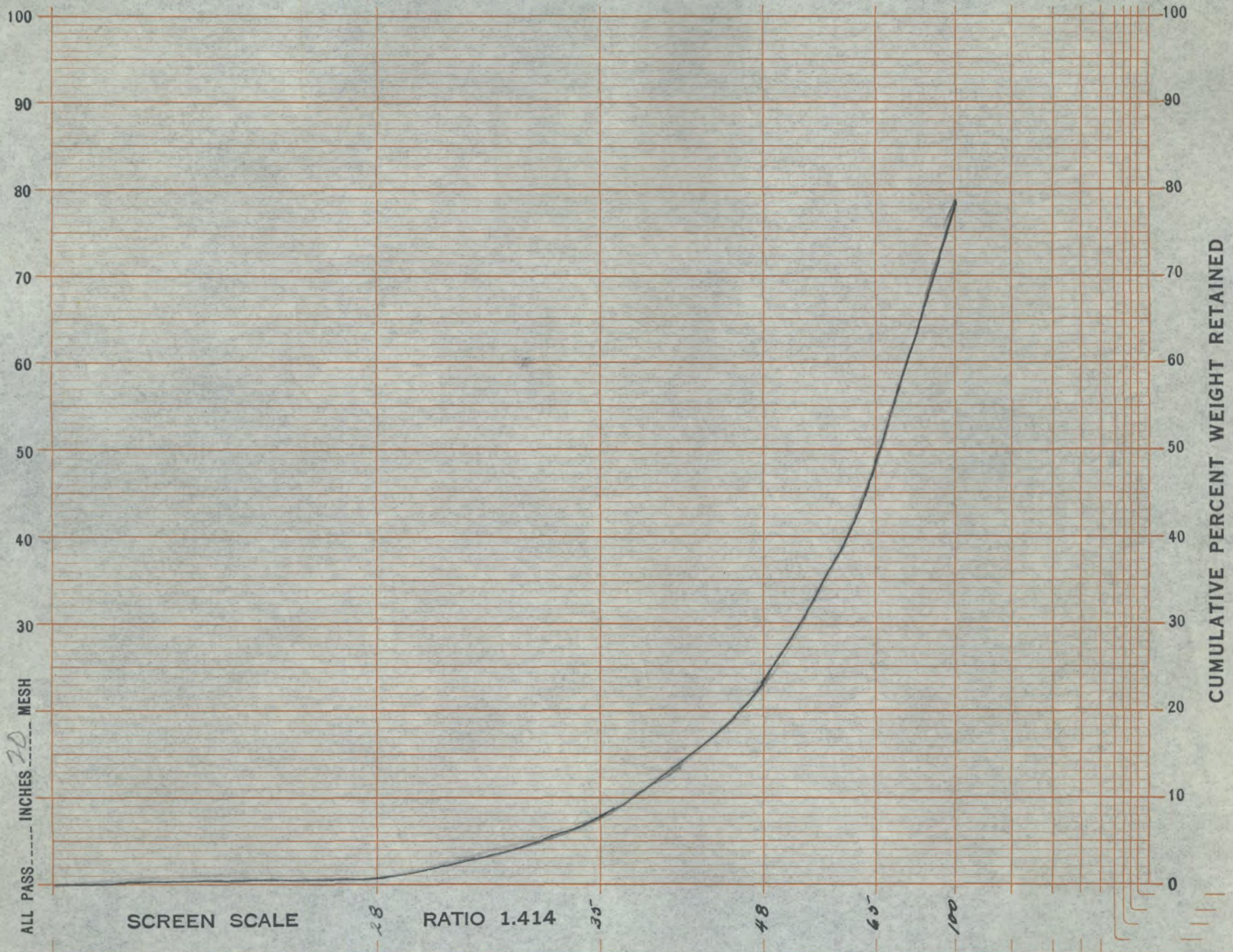
From the + 28 size, the larger pieces of clean flake were picked out and analysed as follows:-

Carbon	---	92.25 %
Iron & Alumina	---	3.60 %
Lime & Magnesia	---	Absent
Insol. Silica	---	3.00 %
Volatile & undetermined	---	1.15 %

This analysis determines the limit of concentration without crushing the flake finer, as the gangue is included in the flake itself.

# The Tyler Standard Screen Scale

Cumulative Direct Diagram of Screen Analysis on Sample of *Graphite Concentrates after crushing in pebble mill for 1/2 hour.*  
 Name \_\_\_\_\_ Date \_\_\_\_\_



Indicate the Screen Crushed through and also First Retaining Screen	SCREEN SCALE RATIO 1.414			Sample Weights	Per Cent	Per Cent Cumulative Weights						
	Inches	Milli-meters	Mesh									
	1.050	26.67		.149								
	.742	18.85		.135								
	.525	13.33		.105								
	.371	9.423		.092								
	.263	6.680	3	.070								
	.185	4.699	4	.065								
	.131	3.327	6	.036								
	.093	2.362	8	.032								
	.065	1.651	10	.035								
	.046	1.168	14	.025								
<i>all pass</i>	.0328	.833	20	.0172								
	.0232	.589	28	.0125	3	0.46	0.46					
	.0164	.417	35	.0122	48	7.4	7.90					
	.0116	.295	48	.0092	99	15.3	23.20					
	.0082	.208	65	.0072	167	25.7	48.9					
	.0058	.147	100	.0042	190	29.3	78.3					
<i>Pass 100</i>	.0041	.104	150	.0026	141	21.8	21.8					
	.0029	.074	200	.0021								
<i>Pass</i>	.0029	.074	200	.0021								
	Totals,				648	99.9						