Ottawa, June 14, 1928

REPORT
of the
ORE DRESSING AND METALLURGICAL LABORATORIES

Report No. 302

The Selective Flotation of Aldermac Mine Copper-Zinc-Iron ore

by C.S.Parsons, A.K.Anderson, & J.S.Godard

Shipment: Twenty-three bags of ore, gross weight 2350 pounds, were received at the laboratories March 26th 1928 from Aldermac Mines Ltd. Aldermac, Quebec.

Characteristics and Analysis of the Ore: This material consisted of very heavy iron pyrites associated with small amounts of copper and zinc sulphides. The ore was crushed to pass an 8 mesh screen and a representative head sample cut out. This yielded the following analysis:

Copper	1.78 %
Zinc	1.71 %
Iron	39.88 %
Sulphur	38.85 %
Gold	0.025 oz/ton
Silver	0.80 "

Purpose of Tests: The object of this investigation was to determine the adaptability of the ore to a selective flotation of the copper, zinc, and iron sulphides, producing a copper concentrate, a zinc concentrate, and an iron sulphide concentrate, carrying minimum percentages of the other metals.

Experimental Tests: The minus 8 mesh material was fed to a 12 x 24 inch rod mill in closed circuit with a 12 inch x 6 foot Akins classifier. Flotation was carried out in mechanically agitated flotation machines where copper, zinc, and iron concentrates were produced. The results of the tests follow:

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Head Cu 1.78 % Zn 1.71 % Fe 39.88 % S 38.85 % Au 0.025 oz Ag 0.80 oz

Test No	Product	Weight %	Assays Cu %	Zn %	Fe %	S %	Au oz	Ag oz	% of values Cu	Zn	Fe	Au	Ag
1	Cu conc.	7.41	22.33	1.98			0.10	4.16	92.70	8.77)		44.18	39.74
	Zn "	5.06	0.57	19.48			0.02	0.70	1.68	57.31)	13.24	5.88	5.13
	Fe "	61.89	0.25	0.86	44.94	48.77	0.01	0.47	4.49	29.24	69.73		
	Zn tail		0.11	0.66	39.53		0.01	0.49				52.94	55.13
	Fe	25.64	0.18	0.30	26.47		0.01	0.55	1.13	4.68	17.03		
2	Sample #1												
	Cu conc.	6.17	24.16	1.33			0.08	4.08	84.66	4.68)		28.51	35.71
	Zn conc.	4.71	1.00	13.36			0.02	0.62	2.84	36.84)	12.62	0.71	4.28
	Fe conc.	53.24	0.23	1.28	45.14	49.12	0.01	0.39	7.39	42.69	60.25		
	Zn tails		0.25	1.12	39.11		0.01	0.47				64.28	60.01
	Fe tails	35.88	0.24	0.71	30.16		0.01	0.57	5.11	15.79	27.13		
	Sample #2												
	Cu conc.	4.68	25.79	0.97			0.08	3.48	67.98	2.92		26.67	23.85
	Zn conc.	7.47	3.07	18.05			0.03	0.94	12.92	78.95		13.33	10.29
	Zn tails	87.55	0.30	0.36			0.01	0.51	19.10	18.13		60.00	66.18

Reagents - Test No. 1

Time	Na_2CO_3	NaCN	Cresylic	Pine O	Thio	$CuSO_4$	Xanthate	Pine O	$CuSO_4$	Xanthate	Na_2CO_3	Feed	Class	O'flow
10.25	5.3	0.43	0.28		0.09	1.04	0.05	0.40	0.49	0.59	2.92		1 : 4.8	
11.00	"	"	0.42		"	1.07	"	"	"	"	"	97.5	1 : 4.8	
11.30	"	"	-	0.08	"	"	"	"	"	"	"	Ret	1 : 6.6	
11.40	"	0.52	-	"	"	"	"	"	"	"	"	2700		
12.00	"	"	-	"	"	1.1	"	"	"	"	"		1 : 3.0	
12.30	"	"	-	"	"	1.1	"	"	"	"	"		1 : 3.1	
1.00	"	"	-	"	"	1.1	"	"	"	"	"		1 : 7.3	
1.30	"	1.04	-	"	"	1.1	"	"	"	"	"		1 : 6.1	
2.00	4.2	0.81	-	"	0.07	0.86	"	"	0.38	0.47	2.26	126	1 : 4.2	
2.30	1.7	0.81	-	"	"	"	"	"	"	"	"	Ret	1 : 3.7	
3.00	2.1	1.00	-	"	0.09	1.08	"	"	"	0.59	"	100	1 : 5.6	

Reagents - Test No. 2

Time	Na_2CO_3	NaCN	Pine O	TT	Thio	$ZnSO_4$	$CUSO_4$	Xanthate	Pine O	$CuSO_4$	Xanthate	Na_2CO_3	Feed	Class.	O'flow
9.30	1.87	0.89	0.07		0.076	0.87	0.94	0.05	0.21	0.42	0.50	2.47			
10.00	"	"	"		"	"	"	"	"	"	"	"	115	1 : 8.0	
10.30	"	"	"		"	"	"	"	"	"	"	"	Ret	1 : 5.2	
10.40	2.87	"	"		"	"	"	"	"	"	"	"	2150cc		
11.00	"	"	"		"	"	"	"	"	"	"	"			
			off										115		
2.00	"	0.44		0.11	"	"	"	"	"	"	"	"	Ret		
2.30	"	"		"	"	"	"	"	"	"	"	"	2250cc		
3.00	"	0.22		"	off	"	"	"	"	"	"	"		1 : 7.3	
3.30	"	"		"		"	"	"	"	"	"	"		1 : 3.5	
4.00	"	0.10		off		"	"	"	"	"	"	"		1 : 4.8	
4.30	"			lime		"	"	"	"	"	"	"		1 : 1.6	
4.55	"	off		5.0			"	"	"	"	"	"			

Sample #1 started 3.00 pm
Sample #2 started 4.30 pm

Conclusions: These tests show that satisfactory results can be secured on the copper content of the ore. Due to what is suspected to be oxidation of the heavy sulphides during grinding, results secured on the zinc and iron are not satisfactory.

It will be necessary to do considerably more test work on this ore to determine the correct milling conditions to overcome difficulties encountered.

Report of the Ore Dressing & Metallurgical Laboratories
Report Nº 302

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By C.S. Parsons, J.S. Eckard & A. Anderson

Twenty Three bags of ore, gross weight 2350 lbs were received at the Laboratories on March 26/28. consigned from Anderson, MacKay & Armstrong's property, the Aldermac Mine Que.

This material consisted of very heavy iron pyrites associated with small amounts of copper and zinc sulphides.

The object of this investigation was to determine the adaptability of this ore to a selective flotation of the copper, zinc and iron sulphides, producing a copper conc., a zinc conc. and an iron sulphide conc. carrying a minimum percentages of the other metals.

The ore was crushed to pass an 8 mesh screen and a representative head sample cut out. This yielded the following analysis:

Cu 1.78%, Zn 1.71%, Fe 39.88%, S 38.85%, Au 0.025 oz
Ag 0.80 oz

The -8 mesh material was fed to a 12"x24" rod mill in closed circuit with a 12"x5ft Callow Classifier.

Flotation was carried on in mechanically agitated flotation machines when copper, zinc and iron concentrates were produced.

The results of the tests follow

Test Nº 1 —

Test Nº 2 —

Test Nº 3. —

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