Report No. 245

Concentration of lead-zinc tailings from the dump at the Notre Dame (Tetreault) mine, Notre Dame des Anges, Quebec

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Shipment: A shipment consisting of a carload of tailings was received at the laboratories February 8th. 1926 from the British Metal Corporation (Canada) Ltd. Montreal, Que. The material was taken from the tailing dump at the Notre Dame (Tetreault) mine at Notre Dame des Anges, Que.

Character of material: The dump consists of table tailings produced during the operation of the mine by Messrs. Tetreault Bros. and when under lease to the Zinc Co. Ltd. The tailings are comparatively coarse and contain very little slime. They have not been affected to any extent by oxidation.

Purpose of tests: The sample of the dump was submitted with a request that flotation tests be made to determine whether the zinc and lead, together with the small amount of silver and gold present could be economically recovered by this method of treatment . A flotation plant treating the run of mine ore is at present in operation at the mine and it is proposed that the old tailings could be treated in the same plant, either mixed with the ore or treated in a separate unit which is already available.

Test No. 1: This is a large scale tonnage test. The tailins were fed to a 4½-ft. Hardinge mill charged with 1800 pounds of steel balls. A selective separation of the lead and zinc was attempted. The pulp from the mill was delivered to an 8-cell Greenawalt mechanical agitation flotation machine. A lead concentrate was taken from one cell and the concentrate from the remaining cells was returned as a

middling to the feed end of the machine. The tailing from the lead cells was pumped to a Callow flat bottom unit consisting of two roughers operated in parallel and two cleaners in series. The tailing from each cleaner was combined and returned to the roughers.

Results:		
	Amount of material run	4,440 lbs.
	Total time of running	4 hours
	Average feed per hour	1,110 lbs.
	Total lead conc. produced	116 lbs.
	Total zinc conc. produced	500 lbs.
	Heads	Lead 0.67% Zinc 9.96%
	Lead conc. (sample whole run)	Lead 15.34% Zinc 11.72 % Copper 3.92% Silver 31.7 oz Gold 0.20 oz/ton
	Zinc conc. (sample whole run)	Zinc 43.16% Lead 0.35%
	" " (sample 1 to 3 pm)	47.13 0.35
	Tailing (sample whole run)	0.35%

Reagents:			
	Soda ash	3.5 lb/ton	Lead flotation
	Acid coal tar creosote	0.35 "	
	Sod. cyanide	0.20 "	
	Cresylic acid	0.15 "	
	Copper sulphate	1.5 "	Zinc flotation
	Xanthate	0.3 "	
	Pine oil	0.15 "	

Test No. 2: The same flow sheet was used as in test no. 1, but particular attention was given to the operation of the lead cells in order to raise the grade of the lead concentrate.

Results:		
	Amount of material run	6,600 lbs.
	Total time of running	5.58 hours
	Average feed per hour	1,182 lbs.
	Total lead conc. produced	149 lbs.
	Total zinc conce produced	1,031 lbs.
	Heads	Lead 0.7% Zinc 10.06%
	Lead conc. (sample 10.50 -11.40am)	Lead 15.34% Zinc 10.20% Copper 3.92%
	Lead conc. (sample 11.40-3.20pm)	Lead 22.81% Zinc 10.41% Copper 4.23%
	Zinc conc. (sample 10.50-11.40am)	Zinc 49.09% Lead 0.14%
	Tailing " " "	0.40% 0.06%
	Zinc conc. (sample 11.40-3.30 pm)	47.38% 0.44%
	Tailing " " "	0.48% 0.10%

Reagents:			
	Soda ash	2.0 lb/ton	Lead flotation
	Acid coal tar creosote	0.35 "	
	Sodium cyanide	0.09 "	
	Caustic soda	0.6 "	
	Cresylic acid	0.6 "	
	Copper sulphate	1.5 "	Zinc flotation
	Xanthate	0.20 "	
	Pine oil	0.15 "	

Test No. 3: In this test the lead was floated in the Callow unit and the zinc in the Greenawalt machine. The object of the change was to try and raise the grade of the lead concentrate by the double cleaning action available in the Callow unit. It was necessary to use the Dorr classifier in closed circuit with the Hardinge mill in order to obtain

in order to obtain an even distribution of the feed to the two Callow cells. In such a short test considerable fine lead is trapped and held in the classifier circuit and there is not sufficient time for the circuit to build up, hence the weight of the lead concentrate will be less than in the preceeding tests.

Results:			
	Amount of material run	6640 lbs.	
	Total time of running	5½ hours	
	Average feed per hour	1,208 lbs.	
	Weight of lead concentrate	137 lbs.	
	Weight of zinc concentrate	744 lbs.	
	Heads assay	Lead 0.77%	Zinc 10.15%
	Lead conc. (sample 11am-2pm)	15.03%	7.67%
	Lead conc. " 2pm-3.30pm	9.76	7.09
	Zinc conc. " 11am-2pm	0.05	49.62
	Tailing " "	0.09	0.88
	Zinc conc. " 2pm-3.30pm	0.15%	46.83%
	Tailing " "	0.05	0.14

Reagents:			
	Soda ash	2.8 lbs/ton	Lead flotation
	Acid coal tar creosote	0.45 "	
	Sodium cyanide	0.10 "	
	Cresylic acid	0.15 "	
	Copper sulphate	1.5 "	Zinc flotation
	Xanthate	0.25 "	
	Pine oil	0.04 "	

Summary & Conclusions: The zinc can readily be recovered from the dump tailings by flotation. There was some difficulty at times in maintaining a froth which could be brought over the sides of the cells, but as a rule this condition could be adjusted by increasing the quantity of pine oil.

It is possible to obtain a lead concentrate containing over 30 ozs. silver and 3 to 4 per cent copper, but low in lead - the best grade made was 22.8% A quantity of gangue floated with the lead and prevented a higher grade concentrate being obtained. It is possible that on a larger tonnage basis the concentrate can be held back in the cleaner cells and a better cleaning action obtained, thereby producing a higher grade concentrate.