

MEMORANDUM

DATE: (Nov. 17, 1962)

Mr. A. G. Kirkland
 to Mr. H. L. Area from G. W. Neuman

subject Metallurgical laboratory tests on Vangorda ore sample

On instructions from Mr. H. L. Area, an 80 lb sample of diamond drill core from the Vangorda ore deposit was crushed and split into batches for ore testing.

A head sample was cut and assayed with the following results:

Lead	3.75% Pb
Zinc	4.90% Zn
Copper	0.18% Cu
Silver	1.50 tr. oz. Ag/ton
Iron	22.30% Fe
Sulfur	24.04% S.
Insoluble	32.50%

Batch tests were made to determine the grinding time and reagent dosages required. A six-batch locked test was then made using the No. 6 standard bulk flotation procedure. A second six-batch locked test was then made using a modified No. 12 selective flotation procedure, (using cyanide) to produce copper-lead and zinc concentrates. The following tables give results of the locked tests:

Metallurgical Balance - Bulk Flotation Tests P14 - 104/109

	% Weight	Assays				% Distribution			
		% Pb.	% Zn.	% Cu.	Gr. Ag.	Pb.	Zn.	Cu.	Ag.
Heading	100.00	3.65	4.81	0.11	1.45	100.0	100.0	100.0	100.0
Bulk Concentrate	13.09	<u>23.47</u>	<u>34.76</u>	0.55	9.22	<u>84.2</u>	<u>94.5</u>	63.3	83.5
Tailing	86.91	0.65	0.30	0.05	0.27	15.8	5.5	36.7	16.5

58-23

Metallurgical Balance - Selective Flotation, Tests 111 - 114/119.

	% Weight	Assays				% Distribution			
		% Pb.	% Zn.	% Cu.	Os. Ag.	Pb.	Zn.	Cu.	Ag.
Heading	100.00	4.10	5.17	0.30	1.59	100.0	100.0	100.0	100.0
Lead Concentrate	6.47	<u>51.63</u>	8.09	1.03	13.52	<u>89.7</u>	11.1	24.7	82.9
Zinc Concentrate	6.54	1.29	<u>55.35</u>	0.50	0.77	2.3	<u>78.1</u>	12.3	3.5
Tailing	86.99	0.38	0.65	0.22	0.25	8.0	10.8	63.0	13.6

The sulfur dioxide-steam procedure for up-grading bulk concentrate by flotation of pyrite from it, was tried on the concentrate from a preliminary batch test. A pyrite froth was not obtainable, and up-grading results were negative. However, a satisfactory grade of concentrate was obtained with two stages of cleaning, and the up-grading treatment is not required.

Sphalerite minerals appear to be partially activated, and zinc loss in lead concentrate was very high in the preliminary batch tests on selective flotation. Sulfur dioxide, sodium sulfite, and zinc sulfate were tried as depressants with negative results. On the last batch available from the 80 lb. sample for preliminary tests, 0.10 lb/ton of sodium cyanide was tried with positive results. The locked test was then made using 0.20 lb. of NaCN per ton of ore. Results indicate that a slightly higher dosage should give improved results.

Copper recovery was low in the selective flotation test.

Zinc recovery should be improved by using a higher dosage to reduce the 11.1% distribution of Zn in Lead Concentrate.

A 35-minute rod mill grinding time was used on a 2,000 gram batch for bulk flotation with a resulting grind of 73.3% minus 325 mesh, and 71.1% minus 400 mesh.

A 38-minute grind was used for the selective flotation samples with a resulting grind of 81.9% minus 325 mesh, and 78.4% minus 400 mesh.

With the exception of the tendency of zinc to float in the lead concentrate, no difficulty was encountered in the treatment of the Vangorda ore sample.

Insufficient Cu-Pb concentrate was available to try a Copper-lead separation.

Respectfully submitted,

G. W. Beaman

G. W. Beaman,
Mill Superintendent.

cc: Mr. J. R. Schmitt