



July 6, 1989

Mr. Marcus Leijon
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Fax: 403-994-2600 Ext. 159

Dear Marcus :

Re: Progress Report, Grum Project

This short note summarizes the work completed to date on Grum composites. It includes:

1. Preparation of composites and head assays.
2. Work Indices
3. Metallurgical testwork on Composite G-2.
 - (a) determination of the optimum primary grind.
 - (b) effect of various NaCN dosages at the lead rougher.
 - (c) effect of replacing the cyanide with reagent PK3-C at the lead rougher.

1. Preparation of Composites and Head Assays

Composite G-2 was prepared as per your instructions and crushed to minus 10 mesh. It is stored frozen to limit its oxidation.

Composite G-1 was prepared as per your instructions; however, samples 16980-88G-01 through 16989-88G-01 were not received in Lakefield, and the Composite G-1 was prepared without these samples. Composite G-3 has been left aside.

The head assays of Composites G-1 and G-2 are shown in the following table.

TABLE NO.1 : Head Assays, Composites G-1 and G-2

	Assays %, g/t								
	Cu	Pb	Zn	Fe	St	PbOx	ZnOx	Au	Ag
Comp. 1	0.056	2.88	5.12	11.3	13.7	0.25	0.23	0.68	47.9
Comp. 2	0.10	3.80	6.52	11.1	12.2	0.17	0.23	0.76	65.4

2. Determination of Bond Work Indices

Bond Work indices of Composites G-1 and G-2 were determined at a grinding size of 150 and 200 mesh. The results are shown in Table No. 2.

TABLE NO. 2 : Bond Work Indices, Composites G-1 and G-2

	Bond Work Index, Wi (kWh/t)	
	150 mesh	200 mesh
Comp. 1	12.1	13.3
Comp. 2	12.8	13.9

3. Metallurgical Testwork

The metallurgical testwork has been centered on Composite G-2. Composite G-1 will be tested later.

a. Determination of the Optimum Primary Grinding Size

The grinding curves of Composite G-2 have been determined using a ball and a rod mill. The results are shown in Figure 1.

The metallurgical results obtained with these various grinding sizes are shown in Figures 2 to 4. If the primary grind size (K_{80}) is below 70 microns, lead recoveries in the rougher are between 90 and 95 %.

b. Effect of Cyanide Level on Lead Rougher

Cyanide additions were varied from 50 to 250 g/t. The results are shown in Figure 5. Best results were obtained with 250 g/t NaCN. A lower dosage will be used however.

c. Effect of Replacing Cyanide with Reagent PK3-C.

A few tests were carried out to determine the possibility of totally replacing cyanide with PK3-C. The results are shown in Figure 6. It appears that PK3-C cannot totally replace cyanide.

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4. Continuing Testwork

Testwork is continuing, in particular to determine the effect of totally replacing cyanide with a thiourea mixture, and testing various collector systems.

The testwork will then be directed towards cleaning tests to optimize the lead circuit. Typical lead and zinc rougher concentrates are sent for a mineralogical analysis to determine the degree of liberation of the various minerals.

Yours sincerely,
LAKEFIELD RESEARCH

Handwritten signature of C.J. Ferron, with initials 'sm' at the end.

C.J. Ferron
Senior Project Engineer

CJF/sem

cc: G. MacDonald
R. Coleman

Figure 1: grindability curves of composite 2.

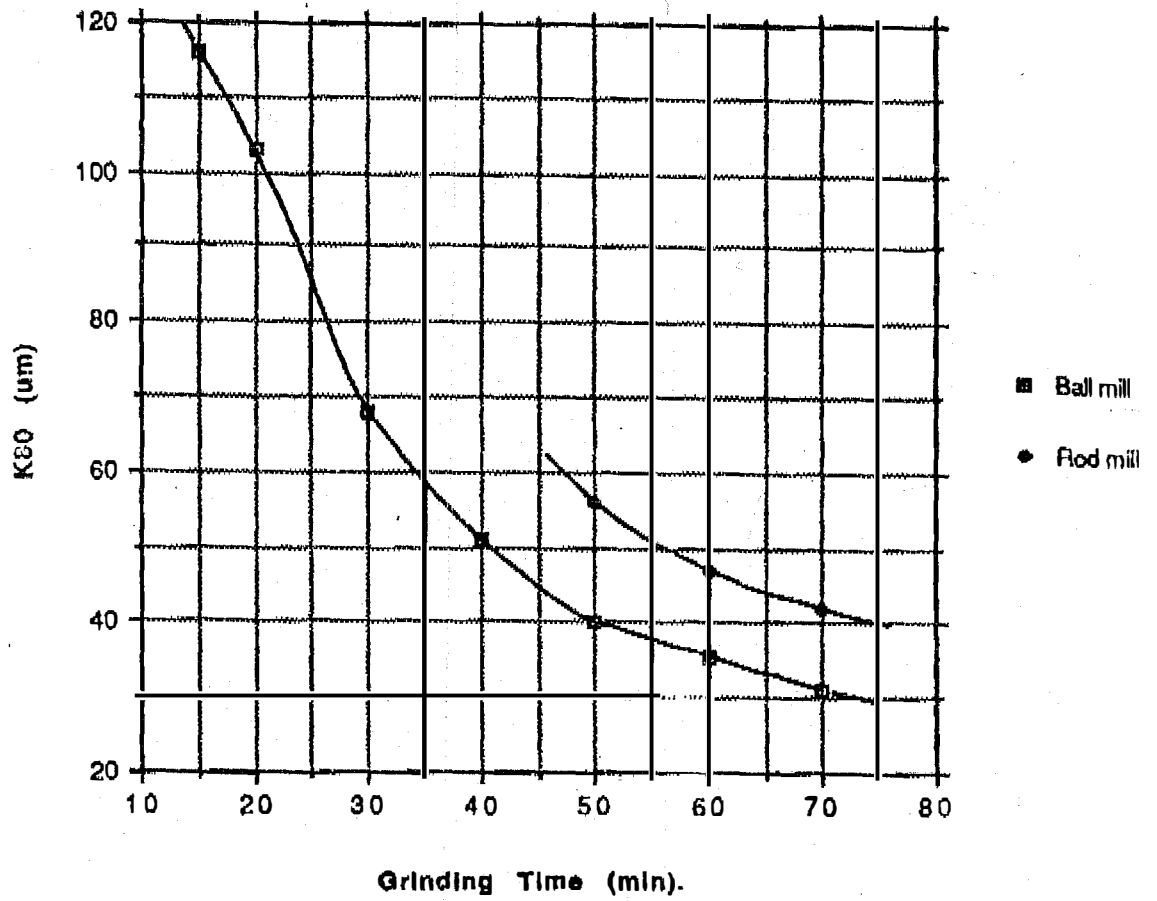


Figure 2: Lead rougher (Effect of grinding time).

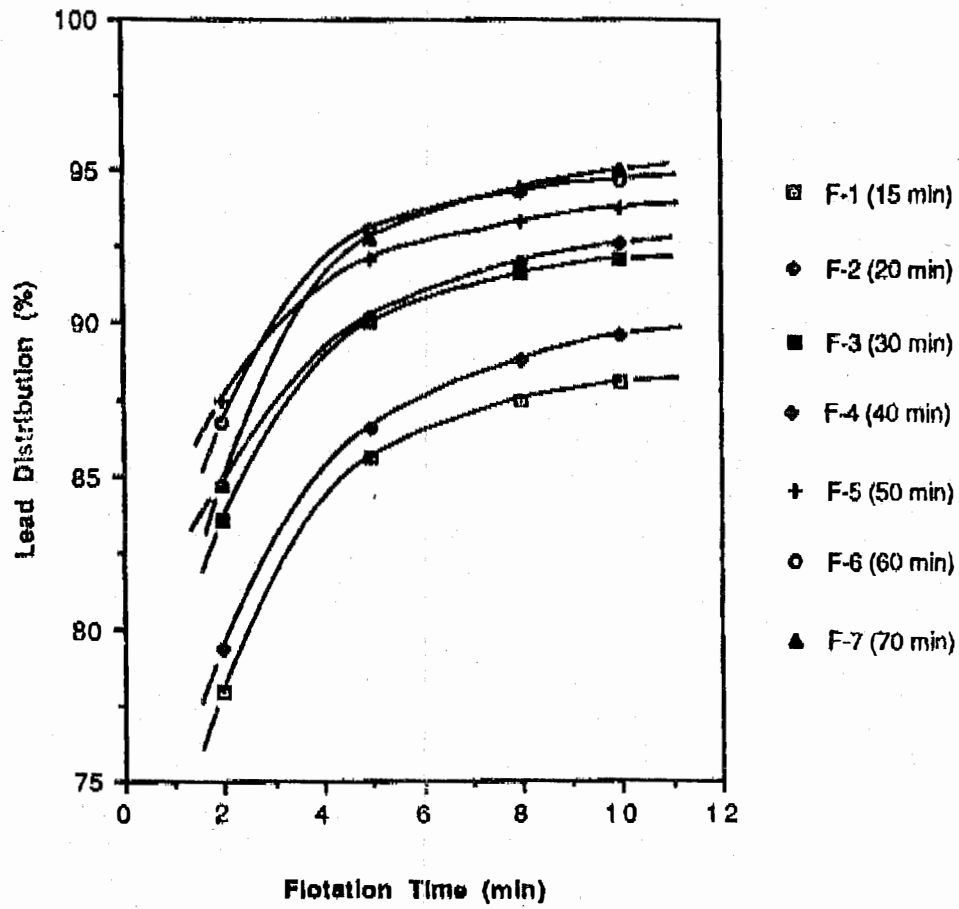


Figure 3: Lead rougher (Effect of grinding time).

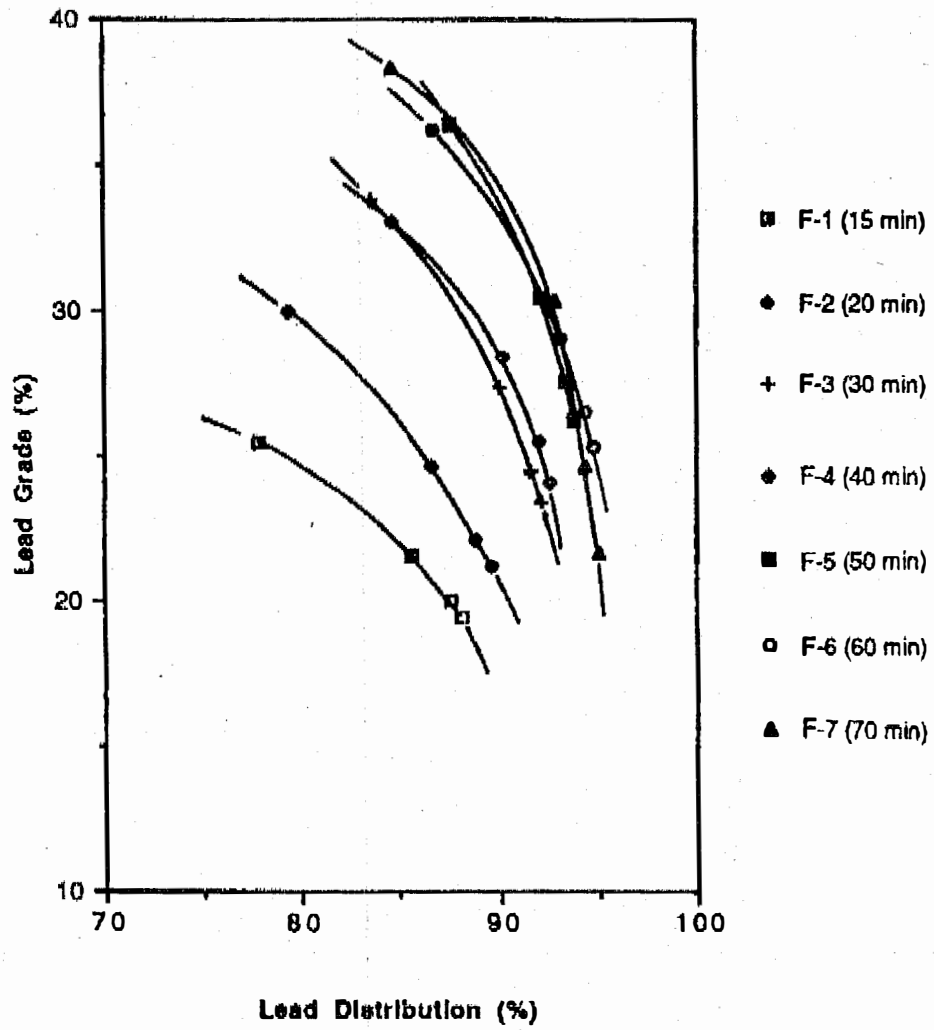


Figure 4: rod versus ball milling; lead rougher.

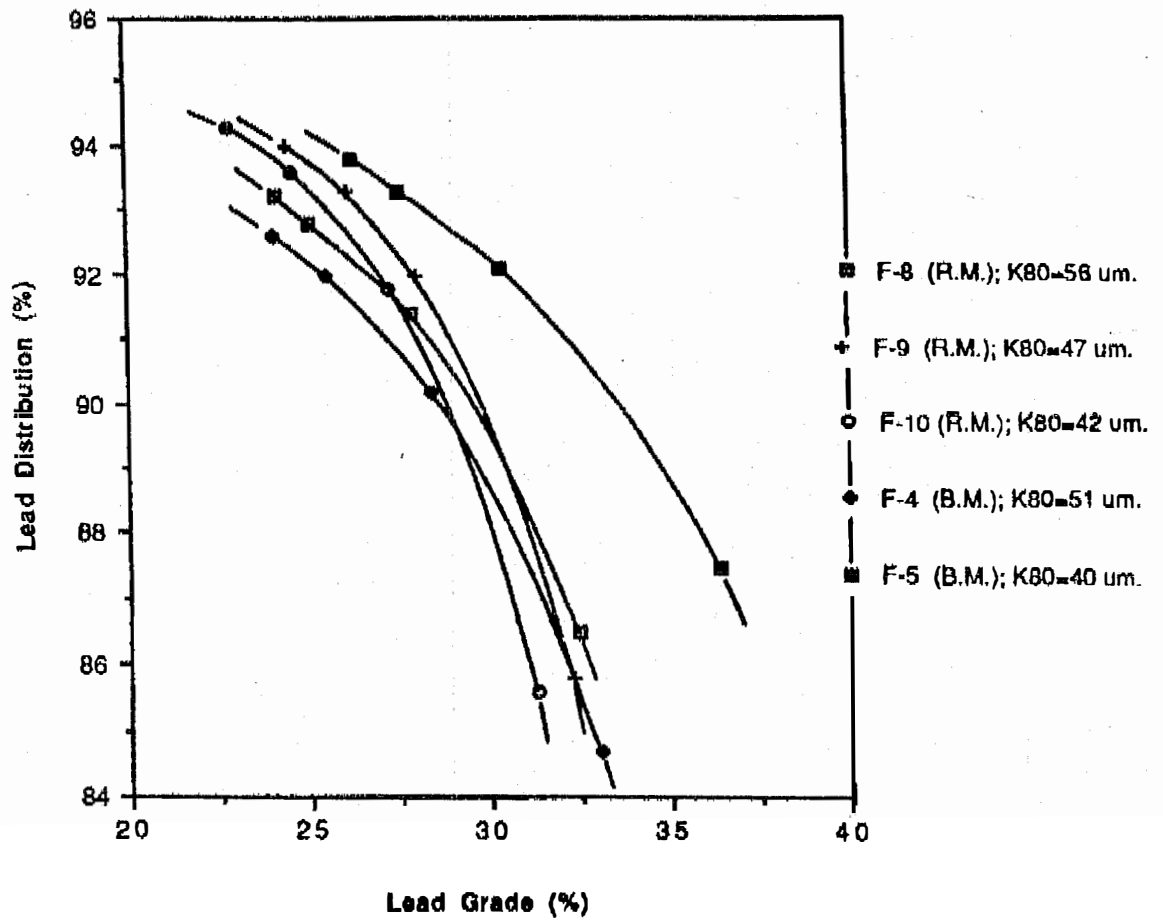


Figure 5: effect of cyanide level on lead rougher. Coarse grind.

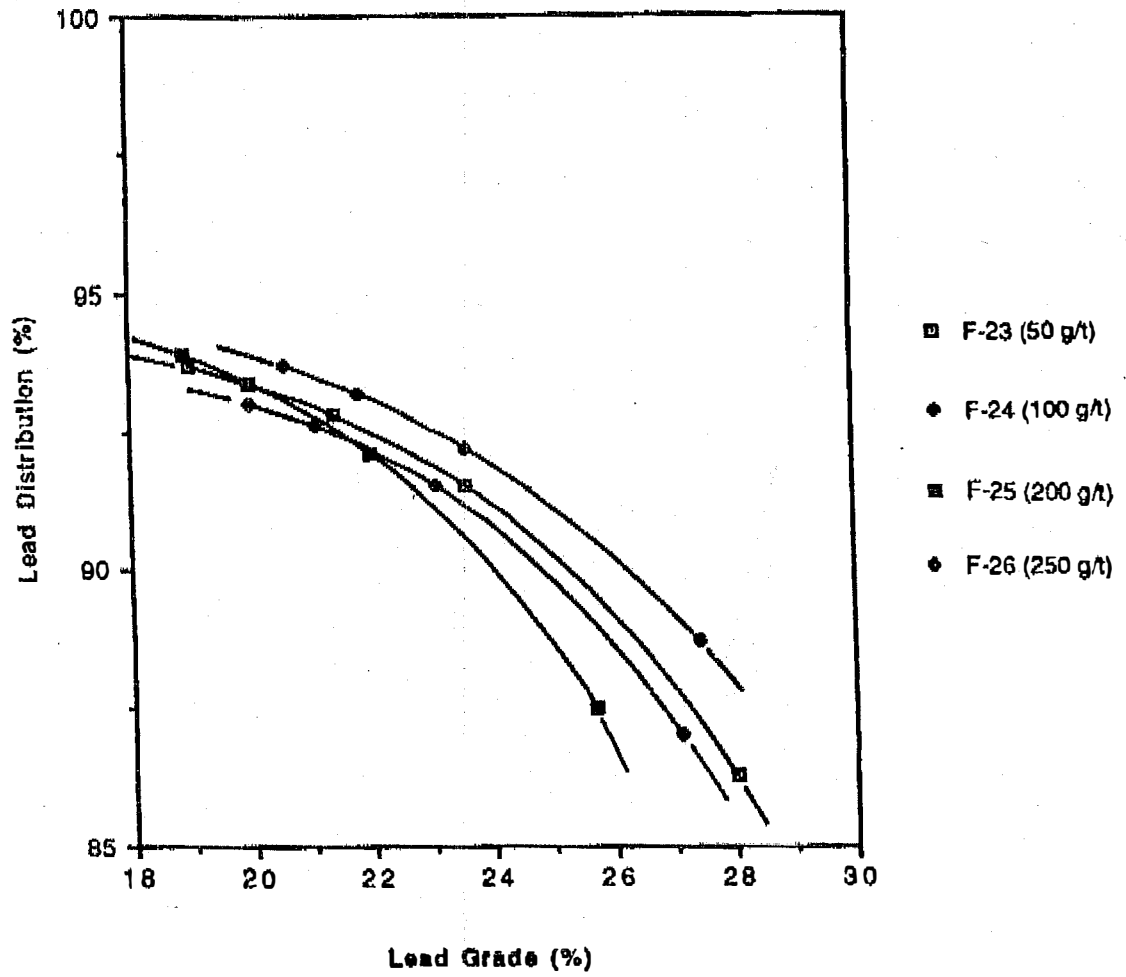


Figure 6: effect of PK3-C additions.

