Grum Orebody

006338

- Manual Estimate - Geological Reserve (Sec. 62 to Sec 86, 25 to 2N.)

c/o	Pb	Zn	Ag (Gms/T)	Tonnes
+1%	4.1	6.4	62	26.1 MM
+6%	4.6	7.3	69	20.7 MM
+10%	5.5	9.0	83	13.1 MM.

No assay for Au. - (± ½ Oz/T. conc)

- Computer Mineral Inventory (MIF)

c/o	Pb	Zn	Ag (Gms/T)	Tonnes
+1%	3.1	4.9	48	27.8 MM
+6%	3.7	5.9	57	18.5 MM.
+10%	5.0	8.3	77	6.1 MM

- Computer blocks - 15M x 15M x 9M. - Manual - Min. Depth - 3M.
- AVB (Actual Value Blocks) - with DH assays.
- Rock coded on 5M x 5 blocks. Comb. Ore/w blocks on 5M x 5M. interpretation. Grade from total 15M x 15M block. Tons from 5 x 5 blocks.
- Mineralized zones in "5" fold - 3M to 10-20M wide (Few up to 30M)

- Mineable Reserve - Computer Inventory. - Pit 2.1

c/o	Pb	Zn	Ag	Tonnes
+4%	3.3	5.5	51	12.8 MM.
+8%	4.4	7.3	67	6.3 MM
+12%	5.6	9.7	86	2.2 MM
0%	3.0	4.8	46	15.0 MM

- Costs -

Mining	0.70 / MT	Design c/o 1%.
Mill	8.00 "	
G+A	3.25 "	

- Recly's + Prices

	Con Prod. Recly	Price	NSR (FOB Minesite)
Pb	80%	30¢	32.2 $/Kg. (11¢)
Zn	83%	35¢	28.4 $/Kg (15¢)
Ag	72%	5.00	14.5 $/Gr.

- Conversion costs - 10% on Zinc

- Computer Pit Design
  - Each block assigned NSR value - Waste at $0.
  - Slopes: - 45° on one side - 38° on other O/B - 32°
  - 3D Lerch Grossman Search Routine.
  - Ultimate pit - Breakeven point.

"Smoothed" Pits -

- GPS Pit - Case I - Expanded size (Used for econ. study).

C/O	Pb	Zn	Ag	T
+4%	3.3	5.4	51	14.1 MM
+8%	4.4	7.2	67	6.7 "
+12%	5.6	9.7	86	2.3 "
0%	2.0	4.7	45	16.8 "

- GPS Pit - Case II - Reduced size.

C/O	Pb	Zn	Ag	T
+4%	3.2	5.2	50	13.0 MM
+8%	4.3	7.1	66	5.9 "
+12%	5.7	9.6	87	1.9 "
0%	2.9	4.6	44	15.4 "

- Stripping - GPS Pit Case I

- O/B - 15.7 MM Tons
  W/R - 74.8 " "
  Ore 16.8 " "
  111.1 " Tons - Total Material.

- Pit Scheduling - Based on 5,000 Tonnes/Day ore
  - Preprod. - 20 MM T.

- Mining Phases

	w/o Ratio *	000's Ore Tonnes	All < 4% Tonnes	Pb	Zn	Comb
Step 1	10.24	1,653	16,917	3.79	6.77	10.56
Step 2	13.05 6.2	1,946	25,396	3.74	5.53	9.27
" 3	11.55	2,500	28,873	3.78	5.65	9.43
" 4	3.86 8.4	4,093	15,780	3.00	5.20	8.20
" 5	3.68 6.6	3,318	12,055	3.00	4.80	7.80
Rem.	9.15	235	2,152	3.64	5.90	9.50

* Includes 20 MM Tons Preproduction

- Yearly Sched. - 1st Try

	Ore Milled		Ore Mined		Waste	
Year	Tons	Grade	Tons	Grade	Mined	
1	1,750	10.00	1,750	10.00	13,542	
2	1,750	8.97	1,750	8.87	18,250	
3	1,750	8.56	1,750	8.56	18,250	
4	1,750	8.4	1,750	8.4	9,730	
5	1,750	7.6	1,750	7.6	4,869	
6	1,750	8.2	1,750	8.2	10,330	
7	1,750	7.2	1,750	7.2	3,167	
8	1,750	7.9	1,750	8.1	884	
	13,510	8.41			79,021	5.85

- P.P. Stripping - 20,000,000
- Above through Step 5.

- Further trials on Schedule
  - Rerun steps on mining phases.
  - Then rerun sched. for smoothing out S/R.
  - Feed access into computer.

- BOR's - 1977 $
  - 30/35/4.50 - 8.1%
  - 40/50/6.00 - 21.0%
  - 35½/43/5.50 - 15.0%
  - capital exc. @ 8%

8.00 Milling
3.80 Mining (/ton milled
2.70 G+A.
14.50 Total

Revised cost - 5.90 Mine (60¢/ton)
5.00 Mill
0.25 G+A
16.65 Total

For these RORs, manual reserves: 3.8/6.1/1.9 (Dilution 10%) (588)
1.6 Pb/2.4 Zn/Ag.

- To complete study
  - Schedules finalized - 8 weeks.
  - Drawings - 2-4 wks.
  - Two months to complete.
  - R. Gray + Gord. Watts. - Ex Noranda (Watts recommended)
  - Dan Nissi - Noranda. - Most suitable.

- Availability of info
  - Bench plans + sections in Vancouver

- Mining Costs - Per J.M. Gibbs - Dec. 19, 1977

Drilling -	0.047	1 - 40R shifts/day - 1700 ft/day.
Blasting -	0.120	
Loading -	0.080	- 2-7 cu. Yd shovels/shift.
Hauling -	0.244	- 8-100 T Trucks/shift.
Roads	0.045	
General	0.035	
Power	0.055	
Cost/Ton	0.626 (SWT)	

- Equip Costs

Drills	- $30/hr	2 - 40R
Shovels	45 "	- 7 cu. Yd. - 6500 Tons/shift.
Trucks	40 "	- 100 ton trucks - 10 Total
Tractors	25 "	
Graders	15 "	
Sand/Water Tr	10 "	
Loader	20 "	
Serv. Vehs	- 10,000/Mo.	

- Mine Prod - 45,000 tons/day
- Conversion

Waste/OB - 2.28 T/Yd Massive Ore 3.37 ST/Yd.
Sulphide Ore - 2.5 "

Ramp e 8%

- Total Capital - $11.8 MM

- Total Manpower - 346 (Mine - 92)

Vangorda Deposit

- 9.0 MM tons - 8% - Drilled in 1954-56
- Drill spacing 30 M in central part, 60 M on periphery
- Core Recly poor - Sampling + assay errors suspected (metal ratios not consistent with Crum + Ewim)
- Central zone - ± 4.0 MM tons - But potential for e/p.
- Recommended drilling - 5175 ft 1st priority, 1500 Ft 2nd priority,

U/G - JC Est - 1,000 - 1500 TPD present ramp

- $20-25/ton

Grade - between MLT + Manvel (⅔ Man - ⅓ MIF)

- Cut + Fill.