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To P. Taggart/Rashid Irani
 From D. J. Hanson
 Date January 13, 1981
 Subject VANGORDA GEOLOGICAL RESERVES

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We have now calculated the "geological" (i) ore reserves for the Vangorda Deposit, between sections 2W and 12E, in detail and have produced a new set of figures to up-date those used in the Vangorda Plateau Development A.F.E. The dual intent of this memo is to internally publicize these numbers and to reconcile them against those already published.

VANGORDA GEOLOGICAL RESERVES

(4% Pb + Zn Cut-Off Grade)

	Preliminary Geologic Model (A.F.E.)	Detailed Geologic Model	% Difference
Metric Tonnes (000's)	6,751	5,209	-22.8
% Pb	3.5	3.3	-5.7
% Zn	4.6	4.3	-6.5
Ag (g/tonne)	50.7	47.8	-5.7
Specific Gravity	4.20	3.77	-10.2

RECONCILIATION:

A) Tonnage:

Three major factors led to the discrepancy in tonnage between the two models:

a) Specific Gravity:

The specific gravity of 4.20 used in the preliminary model was based on a geologic estimate of rock type distribution and on past experience. The actual specific gravity of each sample as used in the detailed model was unavailable for use in the preliminary model. This difference is directly attributable to 10.2% of the 22.8% net loss in tonnage.

b) Section Interpretation and Model Construction Technique:

Due to time constraints over the A.F.E., a detailed geologic interpretation of each section was not produced and, therefore, geologic bench plans were not constructed for the preliminary model. It is not possible to directly determine the combined effect of these differences, but a range of + 5-15% would not be unreasonable to assume.

c) Model Block Size:

Since the preliminary model was essentially a vertical section construction, the block length was fixed as the distance between sections (61 meters). Block width was arbitrarily chosen as 19 meters.

In the detailed model, block size was chosen as 12 meters by 12 meters as a compromise between too many blocks for practical purposes and a closer approximation of a complex geometrical situation. It also approximates a "mining unit" in physical terms.

While it is obvious that an array of small blocks can more closely represent an irregular three dimensional object than an array of large blocks can, the magnitude of the difference is impossible to calculate for this particular case. However, a range of + 5-10% would not be unreasonable.

It is interesting to note that GECO's (ii) estimate of the Vangorda "mining" reserve between 2W and 13E was 5,116,500 metric tonnes. While it is not possible to directly compare "mining" and "geological" reserves, it is felt that most of the current geologic reserves will be contained within a re-designed pit.

B) Grade:

The overall decrease in grade of about 6% for each metal is attributable to the method of weighted average calculation used in each model. The detailed model weights by a factor of sample length times specific gravity while the preliminary model weights by sample length only.



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- i) See attached memo for definition of terms.
- ii) "Vangorda Mines Ltd. Preliminary Mining and Cost Study," prepared for Kerr Addison Mines Ltd. by General Engineering Company Ltd., July 2, 1964.