Review of the FI Model Reserves

During the period October to December 1985 a new mine model was developed for Zone 3 of the Faro deposit. This model was intended as an interim model for use in mine planning until a more elaborate model (the F4) planned for completion by Cyprus Anvil in late 1986 was ready. The model is referred to as the FI model.

The intention was to produce a model that would be as up to date as possible and close to previous models in its methodology so that past experience with model prediction relative to mine production would be relevant. Block size was the same as the T3 model at 50' X 50' X 20' high.

The geological interpretive base was derived from 2 sources (fig. 1). In the southwest part of Zone 3 (Sections 124 to 133) the geological interpretation is the most up to date possible (1983) since that developed for the F4 model was used. In the remainder of Zone 3 (Sections 117 to 124) this new geological interpretation was not yet available thus the interpretation used was that developed for the T3 model in 1981. The interpretations differ in the relative importance of folds and faults which results in significant differences in bench to bench geology but for an overall section thru the deposit the cross section area, hence the volume, is not very different.

The drill hole database used includes all holes in the deposit to the time of model construction. In the northwest half of the deposit the geology has not been adjusted to reflect this information but the assays are used for interpolation.

Like the T3 model the drill hole assays were composited on a 20' bench basis. Composites were selected for interpoltation on the basis of block geology being equivalent to composite geology coding.

Where more than one composite was available they were weighted isotropically by the inverse square of distance to the point being estimated as well as by composite SG and length (8' being the minimum allowed). The search volume, was the same as T3; 225' along strike, 150' along dip and 25' vertically. This volume was enlarged (to as much as 250' X 175' X 105' high) and geology matching restrictions were relaxed through 4 additional passes to interpolate blocks missed by the first pass.

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A major improvement over the T3 model was made in geological coding of the composites. Each composite was checked manually to insure it was coded consistently with the sectional geology rather than machine coded by detailed logged geology. Since large interpreted units often encompass several smaller intervals of different geology, this procedure insurred that the composite would be used to interpolate only relavant units.

Reserves were computed for 6 ore types:
2A, 2BCD, 2CE, 2EF, 2GE, and 2HE within a design pit and phases originally developed by Cyprus Anvil: A to D and JB. The comparative T3 and FI reserves are tabulated on Table I for a 6% Pb + Zn cutoff grade. These reserves are unadjusted and undiluted. To reflect insitu whole rock SG rather than measured pulp SG a downward adjustment of tonnage by 5% is advisable. To quote Mill feed rather than insitu reserves experience of Cyprus Anvil with comparable models suggests a 5% reduction of grade is in order. The historic practice of reducing only the grade by 5% is thus equivalent to a 5% dilution factor.

The reliability of this reserve estimate cannot be very satisfactorily quantified at the present time except by comparing to other calculations. Two such comparisons are presented in Table II. Table II compares three computer calculated valves for phase A all based on the same geology but varying in computational methodology and in the case of FI for the assay database. Also shown is a hand calculated reserve for phase A based on a new geologic interpretation done by the author in September 1985 incorporating all drilling data available and using a fault dominant as opposed to fold dominant interpretation. The FI model tends to report a lower tonnage at a higher grade than previous models. This is likely due to more restrictive application of geology matching during interpolation due to the greater availability of composites for interpolation. The comparison of hand calculated reserves using new geology to FI reserves is the most critical as it deals with estimates derived from very different approaches. The FI model reports 8.5% higher tonnes than the hand model at 5% lower grade.

Much of the grade reduction <u>may</u> be due to the comparison of a nearest neighbor to an inverse squared distance interpolation but at the worst this comparison suggests the reserves compare within 10%.

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Table IIB compares the JB expanded (not the same as the original JB quoted on Table I) as calculated by the FI model with a calculation done by Cyprus Anvil using the same assay data and geologic interpretation. Cyprus Anvil's approach was to compute the actual area of geologic units on the benches and make the most appropriate assay assignment to these areas by manual means. This comparison thus addresses the question of how adequate the block representation of the geology is and how the machine computations compare to manual computations. The comparison is good; the major difference being in tonnage which is probably at least in part due to the inability of 50' X 50' blocks to show every thin geologic unit.

The acid test of a model is to compare to actual production numbers, unfortunately there is little that the FI model can be compared to. Table II shows blasthole results from three benches in the JB zone and the FI predictions. The FI model has overestimated tonnage in this volume by 16% for all three benches; grades from the blasthole data are not available at this time. Considering the great difficulty in modeling this area due to fault problems associated with the Big Indian Fault set, and the small volume of ore concerned this comparison is not bad as it may seem. The FI model was not designed to accurately predict such small domains but was intended to achieve some degree of accuracy when dealing with at best quarterly production.

From the above I conclude that the FI model provides a reasonably accurate prediction of large volumes of ore and its reserves on a global basis can be considered proven reserves. On a global basis the reserves are thought to be reliable within +- 10%; on a bench basis within +- 30% but benches with less than 50,000 tonnes of ore (ie: 8 - 10 FI ore blocks) may be only within 300% but mostly +- 100%.

Respecfully Submitted,

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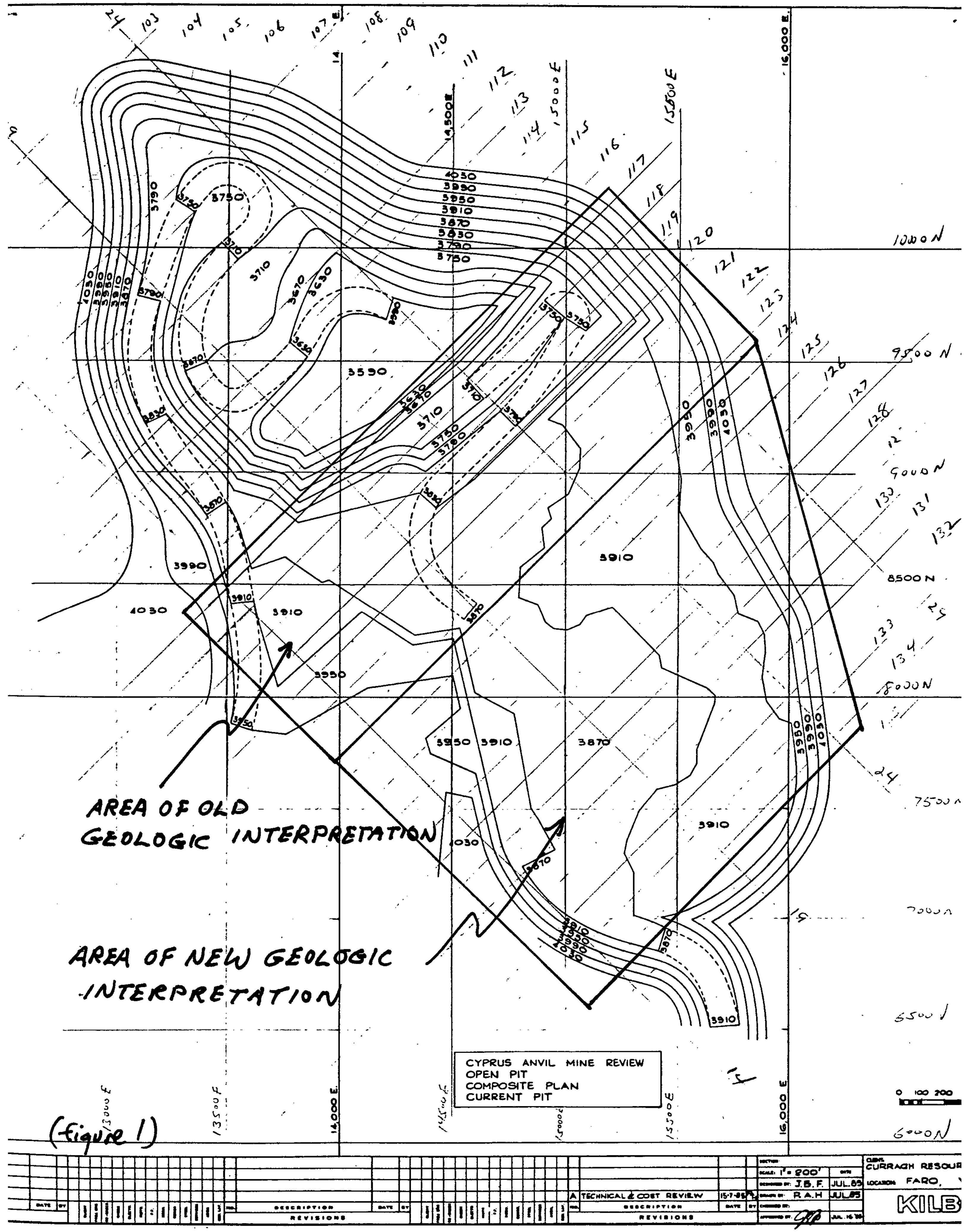

CYPRUS ANVIL MINE REVIEW
OPEN PIT
COMPOSITE PLAN
CURRENT PIT
AREA OF OLD GEOLOGIC INTERPRETATION
AREA OF NEW GEOLOGIC INTERPRETATION
14,000 E.
14,500 E
16,000 E.
13500 E
15000 E
15500 E
10000 N
9500 N
9000 N
8500 N
8000 N
7500 N
6000 N
4030
3990
3950
3910
3870
3830
3790
3750
3710
3670
3630
3590
0 100 200
SCALE: 1" = 200'
DESIGNED BY: J.B.F. JUL.85
DRAWN BY: R.A.H. JUL.85
JUL. 16 '85
A TECHNICAL & COST REVIEW 15-7-85
DESCRIPTION
REVISIONS
DATE
BY
CLIENT: CURRAGH RESOU
LOCATION: FARO,
KILB

(figure 1)

Table I

6% Cutoff

		FI (New)	T3 (Old)	FI- T3 % / T3
JB	MT	169,221	360,935	-53
	Pb	4.04	3.74	+8
	Zn	6.55	5.66	+16
	Ag	52.9	50.6	+5
A	MT	3,595,315	3,668,154	-2
	Pb	3.83	3.63	+6
	Zn	5.62	5.37	+5
	Ag	47.5	41.9	+13
B	MT	4,457,843	5,129,659	-13
	Pb	3.78	3.69	+2
	Zn	5.32	5.12	+4
	Ag	47.9	44.9	+7
C	MT	3,681,852	4,127,797	-11
	Pb	3.60	3.56	+1
	Zn	5.33	4.98	+7
	Ag	47.6	44.0	+8
D	MT	3,736,990	3,393,517	-4
	Pb	3.35	3.18	+5
	Zn	5.53	5.26	+5
	Ag	39.9	35.8	+11
TOTAL				
	MT	15,641,221	17,180,062	-9
	Pb	3.65	3.53	+3
	Zn	5.45	5.18	+5
	Ag	45.9	42.1	+9
		1,423,351	1,496,384	-4.9%

December 5, 1985

Table II A
Phase A

	Tonnes	Pb %	Zn %	AG g/tonne	Pb&Zn %
FI	3,595,315	3.83	5.62	47.5	9.45
T3	4,043,405	3.63	5.37	41.9	9.00
F3	4,254,974	3.6	5.4	43.1	9.00
HAND	3,290,317	3.95	5.98	48.7	9.93
	-8.5%	+3.1%	+6.4%	+2.5	

-3.8% total metal.

Table II B
Phase JBX (not JB as on Table I)

	Tonnes	Pb %	Zn %	AG g/tonne	Pb&Zn %
FI	816,017	3.81	6.19	49.9	10.00
HAND CALC FROM F4 BENCH GEOLOGY	858,887	3.8	6.1	52.4	9.9

Table III

Bench	FI Model Tonnes	Blasthole Tonnes
3890	28,175	29,198
3870	11,801	20,378
3850	54,564	29,549
Total	94,540	79,125