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CYPRUS ANVIL MINING CORPORATION

MINING RESERVES IN ZONE 3 OF THE FARO OPEN PIT

ANVIL DISTRICT, YUKON

D. W. ASBURY, P.Eng.
April 19, 1982

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ANVIL DISTRICT, YUKON

Introduction -

As part of the study of the mining operations of Cyprus Anvil requested of Mr. Herbert H. Cox, I herein give my opinion of ore reserves in the Faro No. 3 zone. After May, 1982 this orebody must provide all feed to the Faro mill for the next several years, except for about 1.75 million tonnes of stockpiled oxide ore that will also be available.

A manual estimate of total reserves is not easy because assays and specific gravities of drill hole samples are not plotted on plans and sections, but are computer-stored. It was therefore decided to restrict calculations to a manual spot check of reserves that would provide initial millfeed, after first reviewing geological and sampling input, computer procedures and historical production data.

The mine was visited on February 22 to 25, 1982 and investigations were continued in Toronto with data brought back from the property or supplied from the Vancouver office.

Summary and Conclusions -

The Cyprus Anvil Production Forecast to the end of 1986, apart from stockpiled oxide ore and a quarter million tonnes of remnant No. 1 pit material, is based on Model F₃ computer reserves for Zone 3, with lead, zinc and silver grades reduced by 5% as a

'mixing' or dilution allowance. Initial phase NA of the Zone 3 pit is calculated at a 3% combined lead-zinc cut-off while later phases have a 4% cut-off.

1981 production (from Zones 1 and 2) had 95.1% of the combined lead-zinc grade of the computer model and thus tended to confirm that mined grades run about 5% below computer grades. However, my manual estimate of undiluted reserves in three benches of phase NA has only 94.1% of the lead-zinc grade of the computer estimate, suggesting that overall Model F₃ grades and consequently Production Forecast grades may be high, particularly in the early life of the pit.

Table 1, and supporting Tables 2 and 3, show details of the manual estimate while Table 4 compares results of various Company assessments of 1981 millfeed.

The tonnages of various ore types in the three benches were also calculated manually for comparison with Model F₃ figures, but differences, as shown in Table 5, are not considered to be economically significant.

It is concluded that Production Forecast grades may be somewhat high, notably in phase NA, and for this reason a sensitivity run at 95% of forecast grades is recommended. On the other hand, the manual check shows 4.8% more contained lead and zinc and a more favourable stripping ratio which could result in somewhat lower mining costs than predicted, especially in the first year.

Character of the Orebody

The main Faro deposit, of which the No. 3 Orebody is the downfaulted southeast portion, is a gently dipping, tabular, banded, stratiform zinc-lead-silver sulphide zone, occurring within a bed of lower Cambrian graphitic phyllite. Thicknesses

vary up to 200' or more, especially where enhanced by cross folding which is in a predominantly northwest direction. Company geologists are doing an excellent job of defining these folds, which may extend 60 or more feet vertically from crest to trough and consequently cause problems for ore reserve estimation and mining. They are also successfully measuring and sorting the various ore types that have different specific gravities and metallurgical responses.

Method of Ore Reserve Investigation -

Faro do not have a set of plans and sections showing drill hole assays, specific gravities and geology in relation to proposed pit limits, but rely instead on coded versions of this information for their computerized reserve estimates. For this reason, the manual check estimate was limited to benches 3870, 3790 and 3710 of initial phase NA of the pit. These three benches contain about 30% of the ore tonnage and 20% of the total yards of ore and waste of phase NA which will supply the mill-feed, along with stockpiled oxide ore, into the first quarter of 1983.

Drill hole composite bench grades, being the average over the 20' bench height of ore and waste assays, weighted by individual sample lengths and specific gravities and with the percentile clipping of the computer program, were plotted on the appropriate bench plan and geological drill section. Based on the drill grades and the sectional structure, ore limits were then fixed on the sections and then on the plans where calculations of ore and waste for each bench were finally made.

Appended Tables 1, 2 and 3 show results of the calculations.

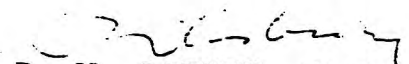
Comparison of Manual Estimate with Model F₃ Estimate and
1981 Operating Statistics -

Table 1 compares the manual and computer estimates. Both are in-place calculations rather than mining reserve estimates in that no reduction in grade for 'mixing' or dilution by waste rock has been made. The manual estimate shows 104.8% of the contained lead plus zinc of the computer results and a more favourable stripping ratio, but only 94.1% of the lead plus zinc grade. Silver in the manual estimate is also lower as to both contained metal (95.2%) and grade (85.6%).

Tonnage and grade of 1981 millfeed from Zones 1 and 2, as calculated by Cyprus Anvil at successive stages, are shown in Table 4. The figures appear to justify the Company practice of reducing computerized Mine Model grades by 5%. The blast holes gave a better indication of millheads (calculated metal balance) but are never available for the calculation of long range reserves.

Ore Type Distribution -

Table 5 shows tonnages of the various ore types that are indicated by computer and manual methods in benches 3870, 3790 and 3710. Despite strong folding, overall agreement is fairly good, with differences insufficient to affect the economics of the deposit.


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ATTACHMENTS

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|---------|--|
| Table 1 | Comparison of Model F ₃ Computer Estimate and Manual Estimate of Ore and Waste in Three Representative Benches of Phase NA of the Faro Pit. |
| Table 2 | Average Grades of Ore Blocks in Three Representative Benches of Phase NA. |
| Table 3 | Manual Estimate of Ore and Waste in Place in Three Representative Benches of Phase NA of The Faro Pit. |
| Table 4 | Tonnage and Grade Comparisons for 1981 Millfeed. |
| Table 5 | Comparison of Computer and Manual Estimates of Ore Types in Three Phase NA Benches. |

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COMPARISON OF MODEL F3 COMPUTER ESTIMATE AND MANUAL ESTIMATE
OF ORE AND WASTE IN THREE REPRESENTATIVE BENCHES OF PHASE NA OF THE FARO PIT
USING A 3.0% COMBINED LEAD-ZINC CUT-OFF

BENCH	ESTIMATE	CUBIC YARDS	ORE				GMS/METRIC TONNE AG	WASTE		RATIO YARDS WASTE TO YARDS ORE
			SHORT DRY TONS	%Pb	%Zn	COMBINED Pb-Zn		CUBIC YARDS	SHORT DRY TONS	
3870	F3	66,667	205,506	3.671	4.969	8.640	51.055	781,766	1,811,817	11.7
	Manual	73,481	237,711	3.582	4.760	8.342	49.270	748,822	1,738,016	10.2
3790	F3	100,000	292,784	3.198	4.694	7.892	48.985	403,375	934,861	4.0
	Manual	108,844	307,867	2.646	4.211	6.857	35.774	380,726	891,660	3.5
3710	F3	55,326	164,625	1.969	3.613	5.582	30.703	163,789	379,598	3.0
	Manual	59,130	192,261	2.099	3.878	5.977	29.871	140,993	329,360	2.4
Combined	F3	221,993	662,915	3.039	4.511	7.550	45.087	1,348,930	3,126,276	6.1
	Manual	241,455	737,839	2.805	4.301	7.106	38.584	1,270,541	2,959,036	5.3

RESULTS FROM THE MANUAL ESTIMATE FOR THE COMBINED BENCHES AS
A PERCENTAGE OF RESULTS FROM THE F3 MODEL

Cubic yards of ore	108.8	Contained lead	102.7
Short tons of Ore	111.3	" zinc	106.1
Lead grade	92.3	" lead & zinc	104.8
Zinc grade	95.3	" silver	95.2
Lead & zinc grade	94.1	Cubic yards of waste	95.8
Silver grade	85.6	Short tons of waste	95.9

Total cubic yards of ore plus waste in the three benches

F3 Model	1,570,923	
Manual	1,511,996	96.2%

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AVERAGE GRADES OF ORE BLOCKS IN THREE REPRESENTATIVE
BENCHES OF PHASE NA, USING A 3% COMBINED LEAD-ZINC
CUT-OFF, WITH CORE SAMPLES MAKING UP THE 20' BENCH
COMPOSITES WEIGHTED FOR LENGTH AND SPECIFIC GRAVITY
AND WITH PERCENTILE CLIPPING, BUT WITHOUT SPECIAL
COMPOSITING PROJECTIONS FROM ADJACENT BENCHES.

BENCH	HOLE	AVERAGE SG	%Pb	%Zn	COMBINED Pb-Zn	GMS/TONNE AG
3870	74-21	3.360	2.346	3.155	5.501	37.312
	81-6	3.889	3.530	5.424	8.954	52.178
	66-E4	3.751	4.796	4.399	9.195	61.034
	74-18	4.358	3.538	5.717	9.255	45.768
		3.839	3.582	4.760	8.342	49.270
3790 North	81-1	2.893	2.660	2.231	4.891	60.064
	74-11	4.756	4.877	8.600	13.477	34.884
	66-E6	3.280	1.014	2.899	3.913	6.427
	81-12	3.247	2.217	2.764	4.981	30.487
	81-8	3.441	3.567	5.793	9.360	48.452
	75-4	3.639	2.939	4.787	7.726	49.282
		3.543	3.029	4.855	7.884	37.910
	South 66-E7	2.873	1.415	2.222	3.637	24.180
	66-E4	2.976	1.720	2.579	4.299	35.190
		2.924	1.570	2.404	3.974	29.782
3710 North	74-20	4.777	3.041	4.875	7.916	18.289
	66-E6	3.070	2.328	4.842	7.170	32.448
	81-20	2.847	1.546	3.944	5.490	26.396
	74-11	2.740	0.952	2.053	3.005	22.713
	75-4	4.261	2.306	2.367	4.673	22.037
		3.283	1.601	2.788	4.389	23.715
		3.710	2.420	4.250	6.670	23.795
South	66-E5	4.036	1.744	3.468	5.212	36,579

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Table

MANUAL ESTIMATE OF ORE AND WASTE IN PLACE IN THREE REPRESENTATIVE BENCHES OF
PHASE NA OF THE FARO PIT, USING A 3.0% COMBINED LEAD-ZINC CUT-OFF

BENCH	ORE*									WASTE**				RATIO	
	AREA SQ.CM	AREA SQ.FT	CUBIC YARDS	TONNAGE FACTOR	SHORT TONS	%Pb	%Zn	GMS/MT AG	AREA SQ.CM	AREA SQ.FT	CUBIC YARDS	TONNAGE FACTOR	SHORT TONS	YARDS	WASTE TO ORE
3870	64.0	99,200	73,481	3.235	237,711	3.582	4.760	49.270	652.2	1,010,910	748,822	2.321	1,738,016		10.2
3790															
North	66.2	102,610	76,007	2.986	226,957	3.029	4.855	37.910							
South	28.6	44,330	32,837	2.464	80,910	1.570	2.404	29.782							
Comb'd	94.8	146,940	108,844	2.829	307,867	2.646	4.211	35.774	331.6	513,980	380,726	2.342	891,660		3.5
3710															
North	28.1	43,555	32,263	3.127	100,886	2.420	4.250	23.795							
South	23.4	36,270	26,867	3.401	91,375	1.744	3.468	36.579							
Comb'd	51.5	79,825	59,130	3.251	192,261	2.099	3.878	29.871	122.8	190,340	140,993	2.336	329,360		2.4

* - Ore and waste areas planimetered from bench plan outlines.

- Tonnage factors and metal grades derived from averaged specific gravities and metal grades of Table 2.

** Waste tonnage factors as for the Model F3 run without special compositing projections.

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CYPRUS ANVIL MINING CORPORATIONTONNAGE AND GRADE COMPARISONS FOR 1981 MILLFEED

	SHORT TONS 000's	%Pb	%Zn	% COMBINED Pb-Zn	GMS/Mt Ag
Mine Model	3,231	3.0	5.1	8.1	35.05
Blast Hole	3,028	3.0	4.8	7.8	40.27
Met. Balance from Daily Production Record	2,980	2.9	4.9	7.8	34.27
Calculated Met. Balance	2,980	2.9	4.8	7.7	37.67
Calculated Met. Balance as % of Mine Model	92.2	96.7	94.1	<u>95.1</u>	107.5

CYPRUS ANVIL MINING CORPORATIONCOMPARISON OF COMPUTER AND MANUAL ESTIMATES OF
ORE TYPES ON THREE PHASE NA BENCHES

ORE TYPE	SHORT TONS MODEL F ₃ COMPUTER ESTIMATE				SHORT TONS MANUAL ESTIMATE			
	3870 BENCH	3790 BENCH	3710 BENCH	COMBINED	3870 BENCH	3790 BENCH	3710 BENCH	COMBINED
7	39,853	119,558	59,779	219,190	24,820	102,874	73,044	200,738
8	70,537	108,519	61,125	240,181	94,623	164,966	57,461	317,050
9	29,444	-	-	29,444	5,502	-	-	5,502
10	40,557	27,038	31,165	98,760	101,036	5,816	29,367	136,219
11	25,113	37,670	12,557	75,340	11,730	34,211	32,389	78,330
	205,504	292,785	164,626	662,915	237,711	307,867	192,261	737,839

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