Memo to JCD. ID HANSON

Ore Phase Inventory Checks.

Sammary:

The ore phase inventories used in A.F.E. 75-0-01 and those being used for the 1977 Lifetime Plan have been checked to explain a variance of 0.4 % zinc for Phases IX to XIII. It was found that 0.1 % was due to changes in the tonnage and grade model between 1973 and 1975 and that the remaining 0.3 % was attributable to errors in the Laurich-Kennedy phase inventories. Slight changes in the ultimate pit and the "cutting" of erratically high block grades had a negligible effect on the weighted average grades.

Introduction.

Grades for Phases IX to XIII in AFE 75-0-01 came directly from the Laurich Kennedy report. Their projections were based upon the December 1973 tonnage and grade model for all benches down to and including 3510 while the June 1973 model was used for the remaining benches (3470-3390). Volumes were ~~calculate~~ measured within the "1974 Ultimate Pit." No grade adjustments were made.

The 1977 ore phase inventories were derived from the "April 1975 tonnage and grade" model and the "1976 Ultimate pit." Block grades were "cut" to maximums of 7.5% zinc and 6.8% lead to get the "1977 Plan" inventories.

Table I is a comparison of the A.F.E. 75-0-01 phase inventories, the 1977 phase inventories, and the "1977 Plan" inventories. Individual phases cannot be compared due to phase design modifications but a dramatic variance of 0.4% exists in the total weighted average zinc grade. Note that "cutting" the block grades to maximums of 7.5% zinc and 6.8% lead does not change the total grades in the first decimal place.

Laurich-Kennedy Inventory Check.

Laurich Kennedy phase inventories for benches 3550 to 3390 were recalculated using L-K bench plans. The sum of all phases per bench including outside pit material was compared with the bench model total as a check on the accuracy of this

recalculation.

As a further check on the recalculated phase inventories, the totals for Phases IX to XIII were compared with the Zone III totals from the tonnage and grade model with the following corrections:

1) Phase VII and VIII material on 3550 and 3510 benches was added to the inventory.
2) Phase IX material on 3630 and 3590 benches was deleted from the inventory.
3) Material occurring outside the ultimate pit was added to the inventory.

This double check validates the recalculated L-K inventories. (See Table II)

Table III is a comparison of the original L-K inventories and the recalculated inventories. Significant errors in Phases IX and XII ~~caused~~ resulted in a variance of 0.3 % in the total weighted average zinc grade. Some minor drafting errors were observed in the L-K bench plans but they were not significant enough to explain the total variance.

1977 Phase Inventory Check.

As a check on the 1977 phase inventories the total Phase IX to XIII material was compared with the Zone III total from the April 1975 tonnage and grade model. ~~The same add~~ with the following corrections:

1) Phase VIII material on 3550 and 3510 benches was added to the inventory.
2) Phase IX material on 3630 was deleted from the inventory.
3) Material occurring outside the ultimate pit was added to the inventory.
4) Inventory tonnages were converted back to 3.18 SDT/BCY.

This comparison validates the 1977 phase inventories. (See Table IV).

Results:

Table V is a comparison of the recalculated inventories for AFE 75-0-01 ~~and~~ with the 1977 phase inventories. The 0.1 % variance in the total

weighted average zinc grade is due to the model changes between 1973 and 1975. ~~This~~ The effect of these changes is illustrated by the following figures from Tables II and IV:

Model	Tons (000's)	Pb	Zn
1973	17,488	3.0	5.3
1975	19,324	3.1	5.2
Variance	1,836	0.1	(0.1)

DA

Table I.

Phase.	AFE 75001 INVENTORIES.			1977 PHASE. INVENTORIES			1977 PLAN* INVENTORIES.		
	Tons (000's)	Pb	Zn	Tons (000's)	Pb	Zn	Tons (000's)	Pb	Zn
within ultimate pit.									
IX	3503	~~3.4~~ 3.3	~~6.7~~ 6.6	2,875	3.5	6.1	2,875	3.5	5.8
X	2442	~~3.3~~ 3.2	4.9	3,342	3.2	4.7	3,342	3.2	4.7
XI	3579	2.8	5.3	3,116	3.1	5.1	3,116	3.1	5.1
XII	2950	2.8	5.5	3830	2.9	5.0	3830	2.9	5.0
XIII	4642	2.8	5.2	4,486	2.7	4.9	9486	2.7	4.9
adjacent to pit.									
IX	247	2.8	5.3						
XII	546	2.3	4.7						
total	17909	3.0	5.5	17,649	3.0	5.1	17,649	3.0	5.1

* maximum of 7.5% zinc per tonnage block.
maximum of 6.8% lead per tonnage block.

Table II.

Recalculated L-K Phase Inventories.

Phase	Tons (000's)	Pb	Zn	Bench.
IX	3,134	3.2	5.6	
X	2,315	3.2	4.9	
XI	3,103	2.9	5.2	
XII	2,623	2.9	5.0	
XIII	3,975	2.8	5.2	
VII, VIII	632	3.0	5.9	3550 ~~bench~~.
VIII	449	4.3	6.8	3510 ~~bench~~.
IX	-15	1.8	3.6	3630
IX	-309	2.7	5.2	3590
outside pit	1,612	3.2	5.6	
total.	17,519	3.0	5.3	

Zone III Bench Inventories.

Bench	Tons (000's)	Pb	Zn.	Model.
3870	80	3.4	5.1	Dec. 1973
3830	166	3.1	6.1	"
3790	333	2.2	4.6	"
3750	375	2.3	4.5	"
3710	239	2.0	4.9	"
3670	240	1.7	4.8	"
3630	356	2.0	4.9	"
3590	252	2.9	6.1	"
3550	1,941	2.8	5.7	"
3510	2,958	3.0	5.6	"
3470	3,926	3.4	5.3	June 1973
3430	4,217	3.2	5.2	"
3390	2,133	2.9	5.2	"
3350	272	4.1	4.8	"
total.	17,488	3.0	5.3	

variance. 31 — —

Table III.

PHASE	Original L-K PHASE INVENTORIES			RE-CALCULATED L-K PHASE INVENTORIES			VARIANCE.		
	Tons (000's)	Pb	Zn	Tons (000's)	Pb	Zn	Tons (000's)	Pb	Zn
IX	3,097	3.4	6.7	3,134	3.2	5.6	~~(32)~~ 37	(0.2)	(1.1)
X	2,159	3.3	4.9	2,315	3.2	4.9	156	(0.1)	-
XI	3,164	2.8	5.3	3,103	~~3.0~~ 2.9	5.2	(61)	~~0.2~~ 0.1	(0.1)
XII	2,608	2.8	5.5	2,623	2.9	5.0	15	0.1	(0.5)
XIII	4,103	2.8	5.2	3,975	2.8	5.2	(128)	-	-
total	15,131	3.0	5.5	15,150	3.0	5.2	19	-	(0.3)

Table IV.

1977 Phase Inventories.

Phase	Tons (000's)	Pb	Zn	Bench.
IX	2875	3.5	6.1	
X	3342	3.2	4.7	
XI	3116	3.1	5.1	
XII	3830	2.9	5.0	
XIII	4486	2.7	4.9	
VIII	656	3.1	6.0	3550
VIII	457	4.5	7.0	3510
IX	-8	3.8	6.5	3630
outside pit	2321	2.9	5.6	
total (@3.50 SDT/BCY)	21,075	3.1	5.2	
total (@3.18 SDT/BCY)	19,148	3.1	5.2	

Zone III Bench Inventories - April 1975 Model.

~~Zone~~

Bench	Tons (000's)	Pb	Zn
3870	69	3.5	4.6
3830	128	3.0	5.0
3790	256	3.7	6.8
3750	297	3.0	4.9
3710	404	2.4	4.5
3670	218	2.0	4.5
3630	371	2.1	4.3
3590	385	2.9	5.7
3550	1,930	2.9	5.5
3510	3,987	3.2	5.7
3470	3,836	3.4	5.2
3430	4,644	3.2	5.1
3390	2,104	2.9	5.0
3350	695	2.9	4.5
total	19,324	3.1	5.2
Variance	176	—	—

PHASE.	AFETS-0-01 REVISED INVENTORIES			1977 PHASE INVENTORIES			VARIANCE.		
	Tons (000's)	Pb	Zn	Tons (000's)	Pb	Zn	Tons (000's)	Pb	Zn
within ultimate pit									
IX	3503	3.2	5.6	2875	3.5	6.1	(628)	0.3	0.5
X	2442	3.2	4.9	3342	3.2	4.7	900	-	(0.2)
XI	3579	3.0	5.2	3116	3.1	5.1	(463)	0.1	(0.1)
XII	2950	2.9	5.0	3830	2.9	5.0	880	-	-
XIII	4642	2.8	5.2	4486	2.7	4.9	(156)	(0.1)	(0.3)
adjacent to pit									
IX	247	2.8	5.3				(247)	(2.8)	(5.3)
~~IX~~ XII	546	2.3	4.7				(546)	(2.3)	(4.7)
total	17,909	3.0	5.2	17,649	3.0	5.1	(260)	-	(0.1)

Table 1