

October 19, 1972

Memoandum to the File

Meeting J.F. OLK, J. Keily, W. KENTS, R.L. Haffner, N.G. CORNISH.

Subject - Reserves & 5 year mining plans.

Mr OLK had just completed a review of the 5 year MINING plans.

The conclusions of the discussions were:

1. 1973 & 1974 appeared to be reasonable & to be within acceptable tolerances relative to the original 1970 long term plan.

(2.) That 1975-76-77 were very high in all mat'l movement & the grade deviated from the long term plan which called for 9% combined Pb + Zn feed grades. In both these areas, these estimates deviated from the 1970 long term plan.

(3.) It was recommended that since the need for change was not consistent with the long term plan & could not be substantiated without reasonable doubt without significant back up work on the reserves that we would revert to the 1970 long term plan for 1975-76-77 figures, adjusting them to 10,000 Tons/day of mill feed.

(4) The 1974 plan would be slightly modified to reduce all material movement to 7,462,000 Cu Yds & including in it 1,066,000 Cu Yds of Mill feed at 3.75% Pb & 5.86% Zn.

Note for 5 year plan

73,76,77

Mill Feed → 1,147,000 Cu Yds

+ 6,767,000 Waste Cu Yds

Total 7,914,000 Cu Yds. Incl. Mill

N

A A R

✓ ✓

(5.) ① The engineering dept is to continue on to evaluating the ore reserves, applying the most recent D.D. data & a logical geological interpretation to bring the cross sections up to date. A report indicating the parameters used would be made available along with these sections.

② New bench plans would be prepared from these X-sections. The parameters used on these would also be stated as clearly as possible.

(3.) A reserve would be calculated from these bench plans. The parameters would be explained. Perhaps more than one method should be used to verify the reserves.

(4) New plans for 75, 76, 77 would then be developed from this new information

⑥ As per the original 1970 long term plan <sup>of Plant A.F.F.</sup> the following ground rules would apply.

(1.) As of 1-1-75 plant feed would average 10,000 tons per day

(2.) Grade to be achieved if possible to be 9% combined in the mill feed.

(3.) Within reason we would attempt to recover as many metal units as possible & still economically maintain the 9% minimum feed grade.

(4.) The lean or low grade stockpiles would be sampled & evaluated for ability to process thru the plant. The stockpiles should be introduced as mill feed as soon as possible after 1-1-75, & still maintaining grade & product.

(7.) Equipment for the 5 year cost study would be the present fleet.

GENERAL in 5yr

Note J.F.O. comments on the attached sheets.

A dominant factor in the new ore reserve must be general definition of the process, the setting up of it so it can be followed, checked & worked on by many people at erratic times & still maintain the rational continuity of the whole process.

- A recapitulation of the reserves must be such that we can see what was there & what has been removed, leaving what is remaining. It must be made simple to update the reserve picture at least once or twice per year.

# I. Actual and Estimated Stripping Ratios

		<u>Cubic Yards (000's Omitted)</u>	
		<u>Long Term Forecast</u>	<u>Actual or Estimated.</u>
1971	Ore	751	840
	Waste	<u>6,620</u>	<u>6,167</u>
	Total	7,371	7,007
	Ratios	8.8/1	8.25/1
1972	Ore	751	926
	Waste	<u>5,500</u>	<u>4,202</u>
	Total	6,251	5,128
	Ratios	7.3/1	4.55/1
1973	Ore	751	918
	Waste	<u>5,500</u>	<u>4,607</u>
	Total	6,251	5,525
	Ratios	7.3/1	5.0/1
1974	Ore	1,135	1,178
	Waste	<u>6,700</u>	<u>7,036</u>
	Total	7,835	8,214
	Ratios	5.9/1	6.0/1
1975 thru 1977	Ore	1,135	1,205
	Waste	<u>6,700</u>	<u>9,545</u>
	Total	7,835	10,750
	Ratios	5.9/1	7.9/1

## II. Ultimate Pit Stripping Ratio

From late 1970 Long Term Forecast - As at Jan. 1, 1971

$$\frac{114,420,000 \text{ C.Y. Waste}}{19,278,000 \text{ C.Y. Ore}} = 5.9/1$$

(61,304,000 Tons)

## III. Projected Mill Feed Grades - 1975-1977

AFE - Mill Expansion	-	10,000 Tons	=	9.0%
Add - Overtonnage		<u>600</u> "	=	<u>6.0%</u>
Total		10,600 Tons	=	8.6%

	<u>1975</u>	<u>1976</u>	<u>1977</u>
5 Year plan grade	8.95	10.10	9.85
AFE Forecast	<u>8.60</u>	<u>8.60</u>	<u>8.60</u>
Over	0.35	1.50	1.25

## IV. Recommendations.

1. A review of the 5 year plan indicates the following:
  - a. The plans for 1973 and 1974 appear reasonable. I would recommend increasing 1973 stripping to even out both years.
  - b. Years 1975-77 must be reviewed again, due to the large waste yardages shown, which are beyond the capacity of the mine equipment and over the projected grade.
2. In order to properly reassess the 1975-77 plans, the ore block plans and bench ore estimates, which have been receiving revisions from time to time, must be finalized based on latest available drilling information. The bench plans used for 1973-74 appear to be in good shape, but the ones for 1975-77 must be reviewed.
3. Mining plans for 1975-77 should then be redone,

based on the following ground rules:

- a. The grade for these years should conform to the long term forecast
  - b. The stripping ratio's should not exceed the long term forecast.
  - c. Equipment capacities used in this plan should be that of the existing equipment.
  - d. Consideration should be given to the possible utilization of the low-grade ore stockpile as mill feed during these years. Whether or not the degree of oxidation while in stockpile would seriously affect metallurgy at various ratios of feed should be determined.
4. After reassessment of the ore block bench plans, a new ultimate pit plan should be prepared.
5. It is essential that Engineering and Accounting figures on yearly production agree.

## Engineering Department

### ESTIMATES

(I) RESERVE (1) CALCULATE reserve based on latest D.D. information & interpretation

- SECTIONS complete wk of Oct 16<sup>th</sup> /72
- PLANS of INDIVIDUAL benches next.
- Calculate tons & grade after AREAS of influence have been determined
- Catalogue all information in a systematic logical fashion to allow maximum efficiency in future usage.

(2) Design a preliminary ultimate pit which recovers all the mineralized zone.

- Set up guide lines which will determine uneconomic conditions
- Evaluate application of uneconomic conditions
  - manual?
  - computer?
  - timing?
- Adjust ultimate pit as conditions dictate.

(3) Update reserve annually with new data as acquired from future drilling & new geological information.  
\* deplete as mining progress.  
(Set up a master log)

(4) BREAKDOWN INTO increments to exhaustion

- increment to be small enough to define all material flow for equipment & cash flow analysis.

## ESTIMATES CONT'D

### (II) Estimates (Annually)

- (1) July 1 - Estimate July 1 - Dec 31 to determine JAN 1 books
- (2) After (#1) do a one year plan for the complete year Jan 1 - Dec 31, & break down to quarters for budget purposes.
- (3) FIVE YEAR FORECAST
  - 1<sup>st</sup> year is Item 2.
  - 2<sup>nd</sup> year by quarters
  - 3<sup>rd</sup>, 4<sup>th</sup>, & 5<sup>th</sup> years by years

### (III) ESTIMATES (Operating)

- Four 4mos estimates will be done during the year, each overlapping the previous by one month.
  - START dates will be Dec 1
  - Mar 1
  - June 1
  - Sept 1
- These will detail shorter term ore & development requirements.
- Smaller increments than the 4 month overlapping may well be justified for grade control, & these will be produced as required.

## IV

### CHECK ESTIMATES

Volume - Surveys & calculation of volume will be done monthly & accumulated to maintain a running average of the last six months, & also to get any increment we require

Grade - Diamond Drill projections should be compared to blast hole data on some frequency

- Lead/Zinc ratios - D.D.H vs mill feed should be compared.

- Adjustment factors should be developed & applied as justified against future estimates

## V

### WASTE DUMPS

An ultimate waste disposal plan must be evolved.

(1) Step one is to develop the waste disposal plan for the present 5 yr plan. This will give us sufficient data to evaluate our immediate haulage truck requirements.

(2) Waste plans are part of mining plans, particularly during the 5 year plans, so we are able to project haulage requirements.