

MEMORANDUM

TO: W. Krats FROM: J. McLachlan
 SUBJECT: ULTIMATE PIT DESIGN - ZONES 1 and 3 DATE: July 16, 1973
 (REVISION OF APRIL, 1973)

A revised ultimate pit plan to mine virtually all the economic ore in Zones 1 and 3 was completed in April, 1973. Completion of the up-dated model of Zones 1 and 3 orebodies in January, 1973 allowed the new estimates of the ultimate pit to be prepared.

Toe lines were drawn for the study but in line with changing all earthwork measurement to bench midslopes, any future work on the ultimate pit will be with midslopes. Quantities measured were those required to complete the pit to its ultimate designed limits from the pit status of Jan. 1, 1973. Final wall slope has all been designed at 45°. But in some areas of high overburden removal it is entirely possible this may have to be flattened out to a 2:1 slope, dependent largely upon field conditions encountered during the mining of the overburden.

Ore Not Included:

Not all ore as stated in the January, 1973 revision of Zones 1 and 3 is included in the revised ultimate pit design. The ore not included is stated below:

	<u>Tons</u>	<u>Pb</u>	<u>Zn</u>
Zone 1	145,810	4.1	6.7
Zone 3	<u>1,487,060</u>	<u>3.3</u>	<u>5.6</u>
	<u>1,632,870</u>	<u>3.4</u>	<u>5.7</u>

Some ore had to be eliminated and the reasons for these eliminations fell into two broad categories: economics and the requirements of a smoother overall pit configuration.

1. Economics:

- (a) On some benches the ore is discontinuous and so widely separated from the ore on the remainder of the bench that to go after the small, discontinuous portion simply produced too great a quantity of waste for the yield of ore derived.

(b) Sharp isolated irregular projections of ore on the eastern side of the Zone 3 orebody produced an awkward shape required to mine it and an extremely high (and probably costly) stripping ratio. (In one particular case examined in detail, 6,448,400 yards of waste had to be removed to mine 608,400 tons at 2.6, 6.5 on benches 3510-3430. Resulting stripping ratio was 33:1.)

2. Pit Configuration:

Very irregular contacts which have resulted in bumps or depressions in the orebody do not produce smooth configurations of the ultimate pit wall. Sharp points in the walls tend to produce areas of stress concentration and further trouble in later years of pit life. Elimination of any possible sources of problems early in the pit development by trimming irregular corners of ore can only be of help later on.

Conclusion:

The ultimate pit design of April, 1973 represents only one of a number of possible alternate designs based on economics, operating efficiency and safety. It is not intended to be a panacea for all ultimate pits, but rather a starting point from which to alter and modify designs at any time based mainly upon prevailing prices of lead and zinc.

The attached table outlines all relevant data on the April, 1973 ultimate pit revision.

JRM McLachlan
J. R. McLachlan
Planning Engineer

JRM/mm

Attach.

SUMMARY OF ORE OUTSIDE
ULTIMATE PIT DESIGN IN EACH ZONE

AS OF APRIL-73 DESIGN

ZONE 1	145,810	4.1	6.7
ZONE 3	<u>1,487,056</u>	<u>3.3</u>	<u>5.6</u>
	<u>1,632,866</u>	<u>3.4</u>	<u>5.7</u>

MAY 10, 1973 REVISION

ZONE 1	145,810	4.1	6.7
ZONE 3	<u>878,615</u>	<u>3.8</u>	<u>5.5</u>
	<u>1,024,425</u>	<u>3.8</u>	<u>5.7</u>

STRIPPING RATIO TO MINE 608,441 TONS OF ORE IN
ZONE 3 WAS 33/1.

SUMMARY OF ORE OUTSIDE
1973 ULTIMATE PIT DESIGN

ZONE 1

3910	21,671	6.6	9.3	} BEYOND PRESENTLY PLANNED ULTIMATE PIT LIMITS NW CORNER OF PIT.
3870	7,538	2.7	5.4	
3830	—	—	—	
3790	16,960	2.8	6.3	} IRREGULAR CONTACT OF ORE ELIMINATED TO PRODUCE SMOOTHER CONFIGURATION OF ULTIMATE PIT WALL.
3750	27,795	2.6	5.6	
3710	47,818	4.7	6.6	} SHARP POINTS OF ORE PROVEN UNECONOMIC IN INDEPENDENT STUDY
3670	2,356	2.6	4.8	
3630	21,671	3.7	6.4	} SMOOTHING OF FINAL WALLS OF ULTIMATE PIT.
3590	—	—	—	
	<u>145,810</u>	<u>4.1</u>	<u>6.7</u>	

SUMMARY OF ORE OUTSIDE
1973 ULTIMATE PIT DESIGN
ZONE 3

3870	69,016	3.3	4.9	} LONGITUDINAL SHAPE OF ORE IS SUCH THAT COULD ONLY ECONOMICALLY TAKE PORTIONS OF IT.
3830	72,785	2.9	5.2	
3790	—	—	—	
3750	—	—	—	
3710	11,071	1.9	3.4	} SMALL PORTIONS CUT OFF CORNERS OF ORE TO IMPROVE CONFIGURATION OF ULT. PIT WALL.
3670	1,413	1.8	3.2	
3630	34,862	1.8	3.3	} DISCONTINUOUS & WIDELY SEPARATED PARTS OF ORE BENCHES ARE NOT INCLUDED BECAUSE STRIPPING RATIO TO EXPOSE TOO GREAT.
3590	27,089	2.0	5.3	
3550	75,377	2.1	5.1	
3510	301,512	2.6	5.2	} NOT ECONOMIC. ORE PROJECTS LONG WAY INTO EASTERN SIDE OF PIT AND IRREGULAR SHAPE PRODUCED THAT IS REQUIRED TO MINE IT RESULTS IN HIGHLY COSTLY STRIPPING RATIO.
3470	354,747	2.3	5.3	
3430	92,337	4.3	8.1	
3390	175,253	5.9	7.8	
3350	271,594	4.1	4.8	} NOT INCL. ULT. PIT. TOO FAR OFFSET FROM MAIN OREBODY.
	<u>1,487,056</u>	<u>3.3</u>	<u>5.6</u>	