

000872

To

J. C. Devitt

Date

February 17, 1978

From

J. W. Mustard

Subject 3830 ORE

Two areas centered on 10,000 N, 13,600 E (Area A) and 9,900 N, 13,675 E (Area B) are compared using blasthole information and mine model information to give an indication of reliability of Phase V ore. The attached diagram indicates these areas and their proximity to 3830, Phase V ore.

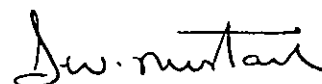
	<u>AREA A</u>		
	<u>Tons Predicted</u>	<u>% Pb</u>	<u>% Zn</u>
Mine Model	583,000	4.6	6.4
Blasthole Data	590,000	5.2	6.3
Variance	+1.2%	+12%	+1.6%

The results of Area A indicate a high degree of reliability when comparing large tonnages.

	<u>Area B</u>		
	<u>Tons Predicted</u>	<u>% Pb</u>	<u>% Zn</u>
Mine Model	52,000	4.1	5.6
Blasthole Data	52,000	6.0	7.4
Variance	-	+39%	+24%

As indicated in these two comparisons, the reliability of the mine model is greater over larger areas. Diamond drill hole spacings of 141 feet severely limit reliability of tonnages less than 100,000 on 40 foot benches.

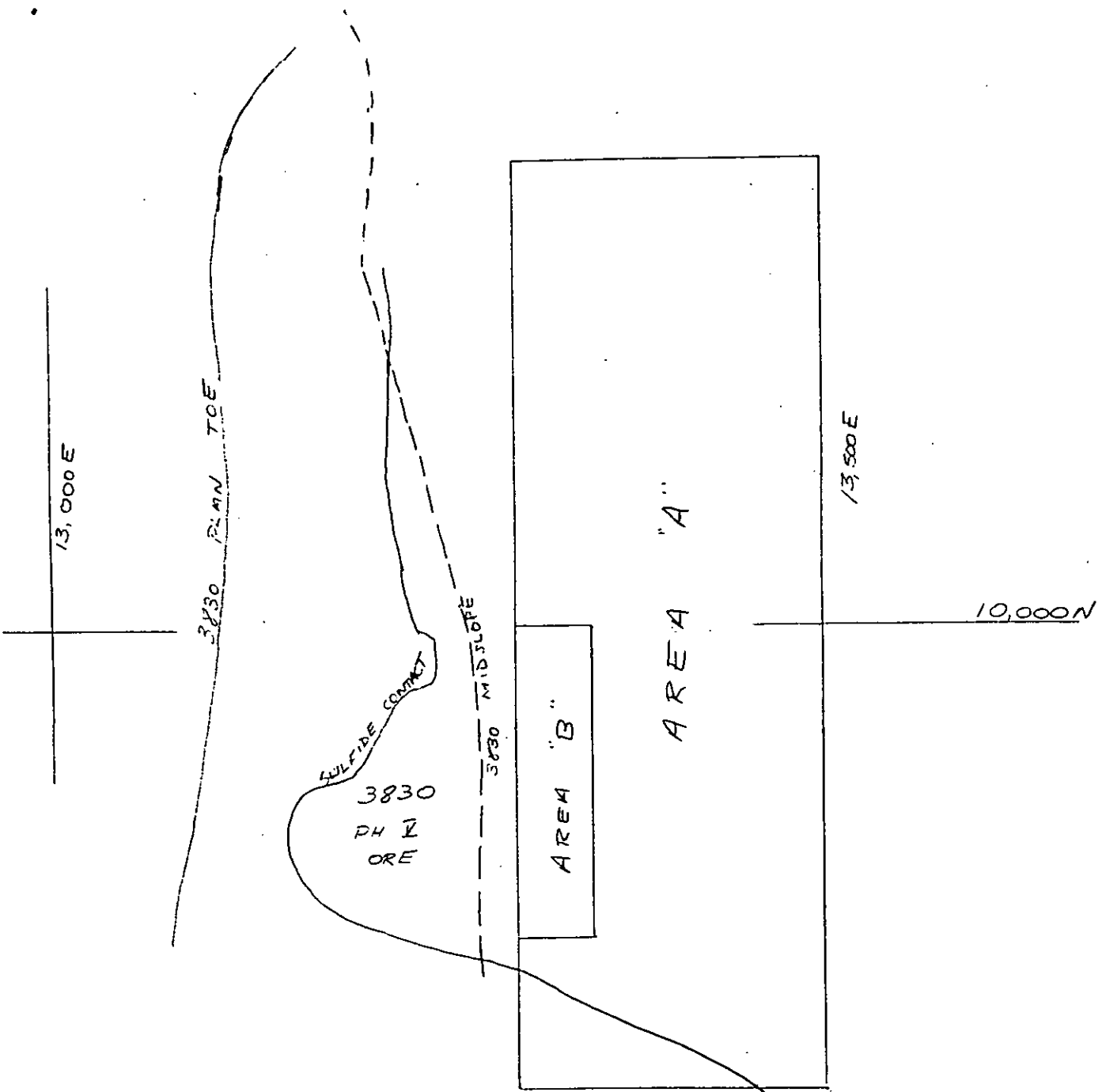
Complexly folded contact areas present unique problems in predicting grades and tonnages. This has been experienced on the upper benches of Phase IV. Until Phase V ore is well established, this area will present similar problems.



J. W. Mustard
Mine Geologist

cc. D. Marr

CYPRUS ANVIL



3830 ORE
1" = 100'

To J. C. Devitt Date January 19, 1978

From J. W. Mustard

Subject 3750 AO ORE

During the period January 13 - January 16, concern over feed grades developed because of a drop in grade and the quality of material being crushed. An analysis of blasthole information using the surveyed face for this period was carried out and results compared with truck counts and mill feeds. The following table summarizes these results:

	<u>Tons</u>	<u>% Pb</u>	<u>% Zn</u>	<u>% Fe</u>	<u>% Py</u>
Surveyed Faces	46,000	2.2	3.0	-	-
Truck Count*	43,000	-	-	-	-
Crusher Feed (Truck Count)	39,000	2.2	3.0	-	-
Mill Reported Feed	41,000	2.3	2.9	22	16

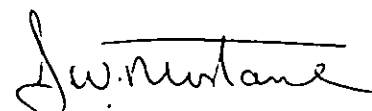
* 3 loads of waste were removed during this period.

Diagram 1 outlines the 3750 AO blast, contact stakes as surveyed, toe and crests for January 13 and January 16. Tonnage and grades were calculated using the midslopes for these two periods. Diagram 2 is a copy of the original blasthole map showing the midslopes for January 13 and 16.

Massive sulfide ore without schist dilution generally averages over 30% Fe and over 26% pyrite. The low iron and pyrite content indicates, for this period, crusher feed was characterized by significant amounts of non-sulfide gangue.

The portion of the 3750 AO ore which was mined during this period contained a larger than usual portion of folded contacts. Drill cuttings of area A (Diagram 2) indicated that much of the upper portion of the bench was waste with ore on the lower portion. Subgrade indications were 80-90% ore, which "salted" the 3750 ore. Blasthole assays for this area show a complex mix of high and low results indicating the type of contacts. Separation of the waste from ore was difficult to achieve with any consistency.

Mixing of waste with ore when blasting to an open face accounted for some dilution in area B (Diagram 2). The feed grades do not appear to be significantly diluted by waste material outside the contact lines. Dilution occurred within the staked area because the nature of the ore-waste contacts precluded effective sorting.



J. W. Mustard
Mine Geologist

Attach.

CYPRUS ANVIL

DIAGRAM 2 3750 AO

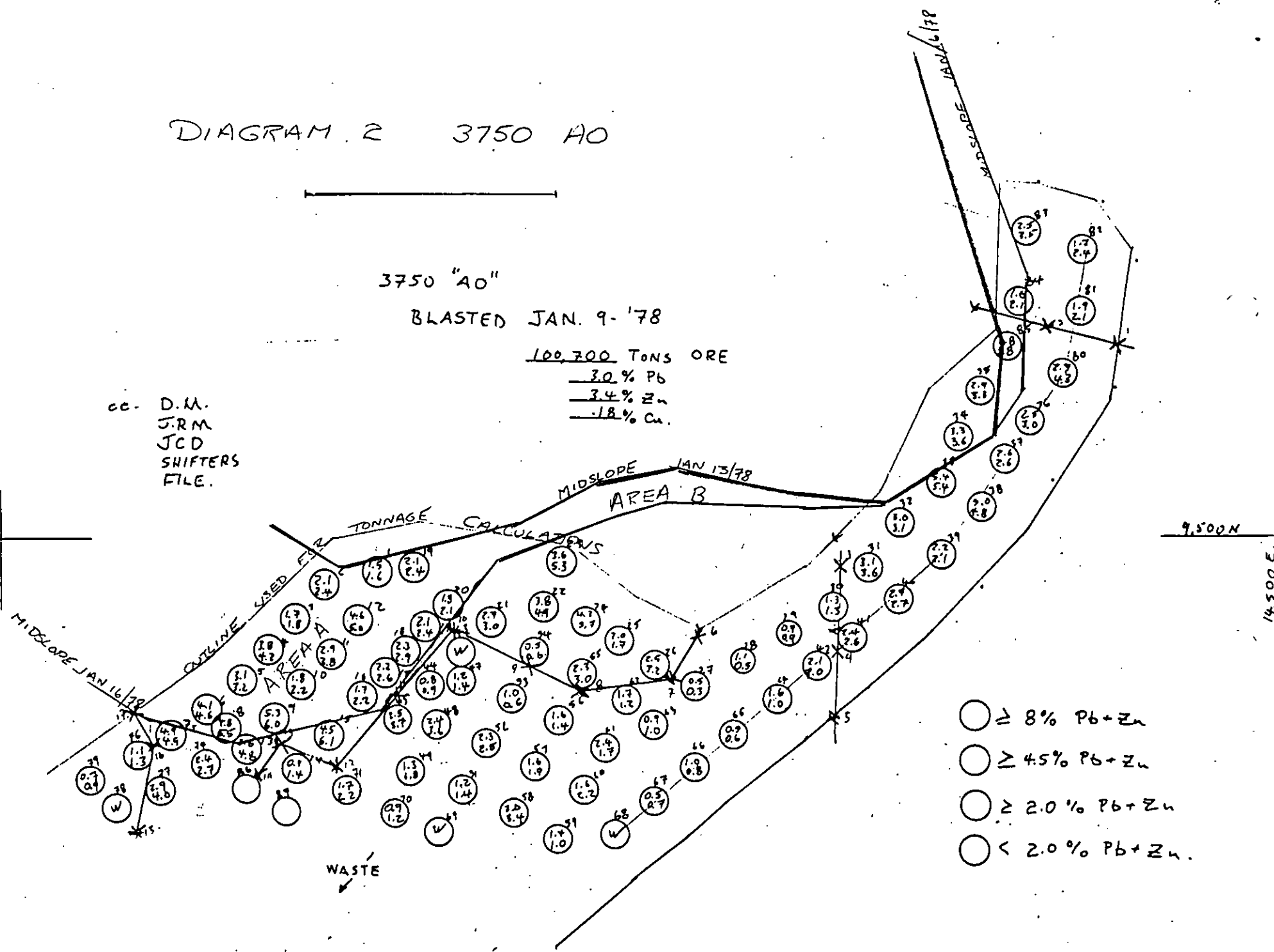


3750 "AO"

BLASTED JAN. 9-'78

100,700 TONS ORE
 — 3.0% Pb
 — 3.4% Zn
 — .18% Cu.

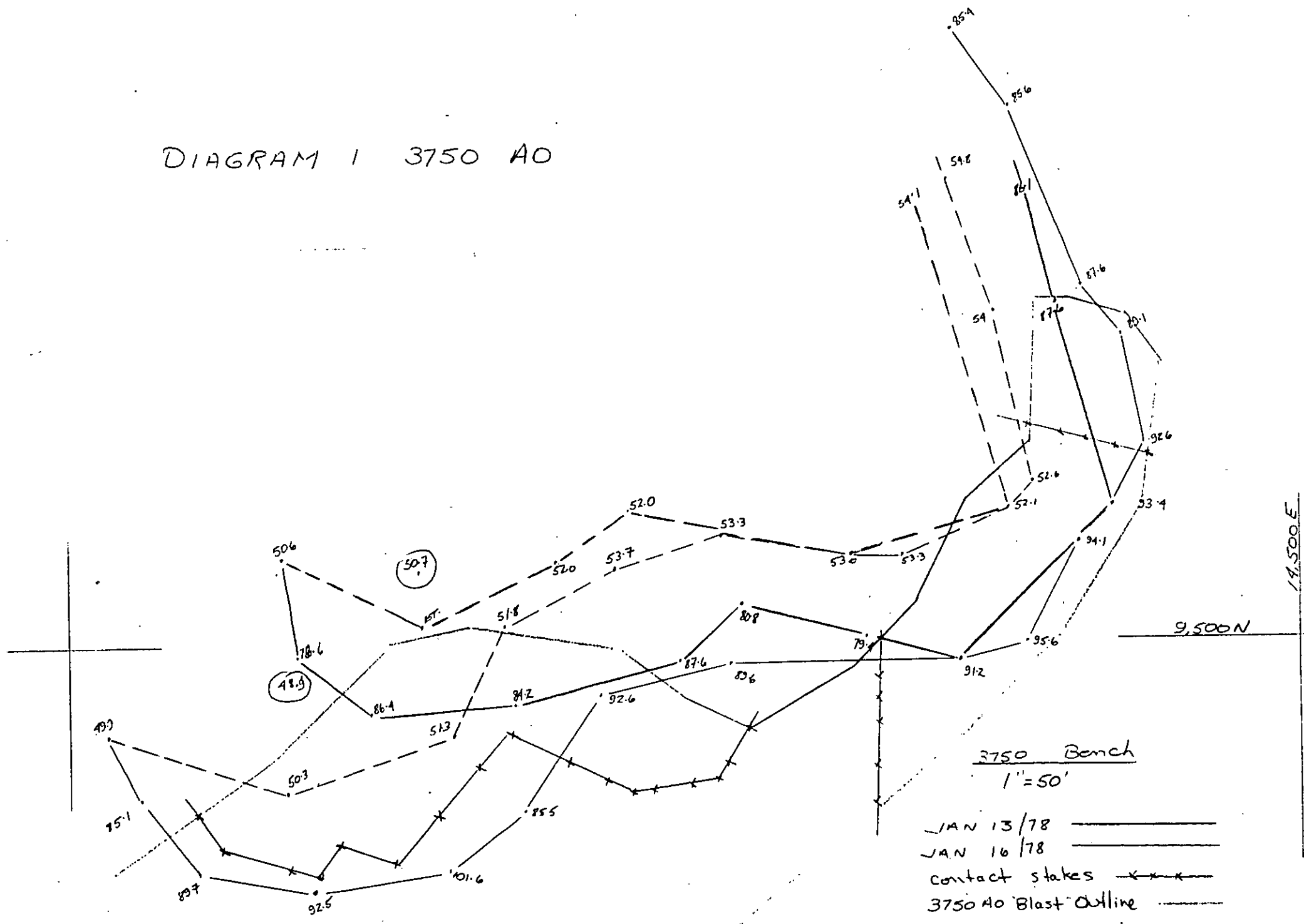
cc- D.M.
 J.R.M.
 J.C.D.
 SHIFTERS
 FILE.



- ≥ 8% Pb+Zn
- ≥ 4.5% Pb+Zn
- ≥ 2.0% Pb+Zn
- < 2.0% Pb+Zn

9,500 N
 14,500 E

DIAGRAM 1 3750 AO



To

J. C. Devitt

Date

January 9, 1978

From

J. W. Mustard

Subject

A shortfall in tonnage predicted by blasthole assays against truck count on 3910 bench is illustrated in the following table:

	<u>Dec. 28 - Dec. 31</u>	<u>Dec. 21 - Jan. 4</u>	<u>Total</u>
Tons Ore Available (Blasthole Assays)	36,000	31,000	67,000
Tons Removed (Truck Count)	26,700	20,000	46,700
Variance	-26%	-35%	-30%

December 28 - December 31:

During this period, there are two factors which are assumed to have contributed to a shortfall in production.

1. The ore available was originally calculated using line "A" as the eastern limit of the blast. (see attached diagram)

It was determined on December 29th. that spillage from the upper benches of Phase V was diluting the feed grades. Consequently, line "B" was surveyed in to separate this waste (area "A") from the ore. This resulted in a downward revision of tonnage by 10,000 tons.

2. It was originally decided that the adit removal should be done during daylight hours to facilitate sorting of foreign material associated with the adit. However, due to mechanical problems with the shovel, this was not done and the adit was removed during the night of December 29th. At that time, the decision was made to remove all material containing the adit as waste, rather than the possibility of plugging the secondary crusher.

The removal of the adit resulted in a significant loss of tonnage, which was included as ore in the original calculation. It is difficult to determine the exact tonnage as the adit was never picked up.

December 31 - January 4:

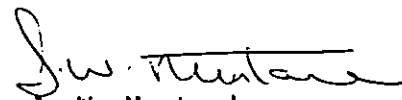
During this period, a shortfall of 12,000 tons is possibly attributed to attempts at sorting of internal waste. External contacts were such that they were too difficult to mine without excess dilution and much of this material may have been taken as waste.

Grades:

The grades from the 3910 bench are difficult to correlate with feed grades in the mill since 37% of the tonnage was blended with lower grade stockpile material. However, it is significant to note that in the centre of the ore blast, assays in excess of 10% combined accounted for 25,000 tons, the majority of this material being mined between December 28 and December 31. Mill feeds for this period do not reflect this higher grade zone. Stockpile additions and the mining of external contacts resulted in diluting this grade.

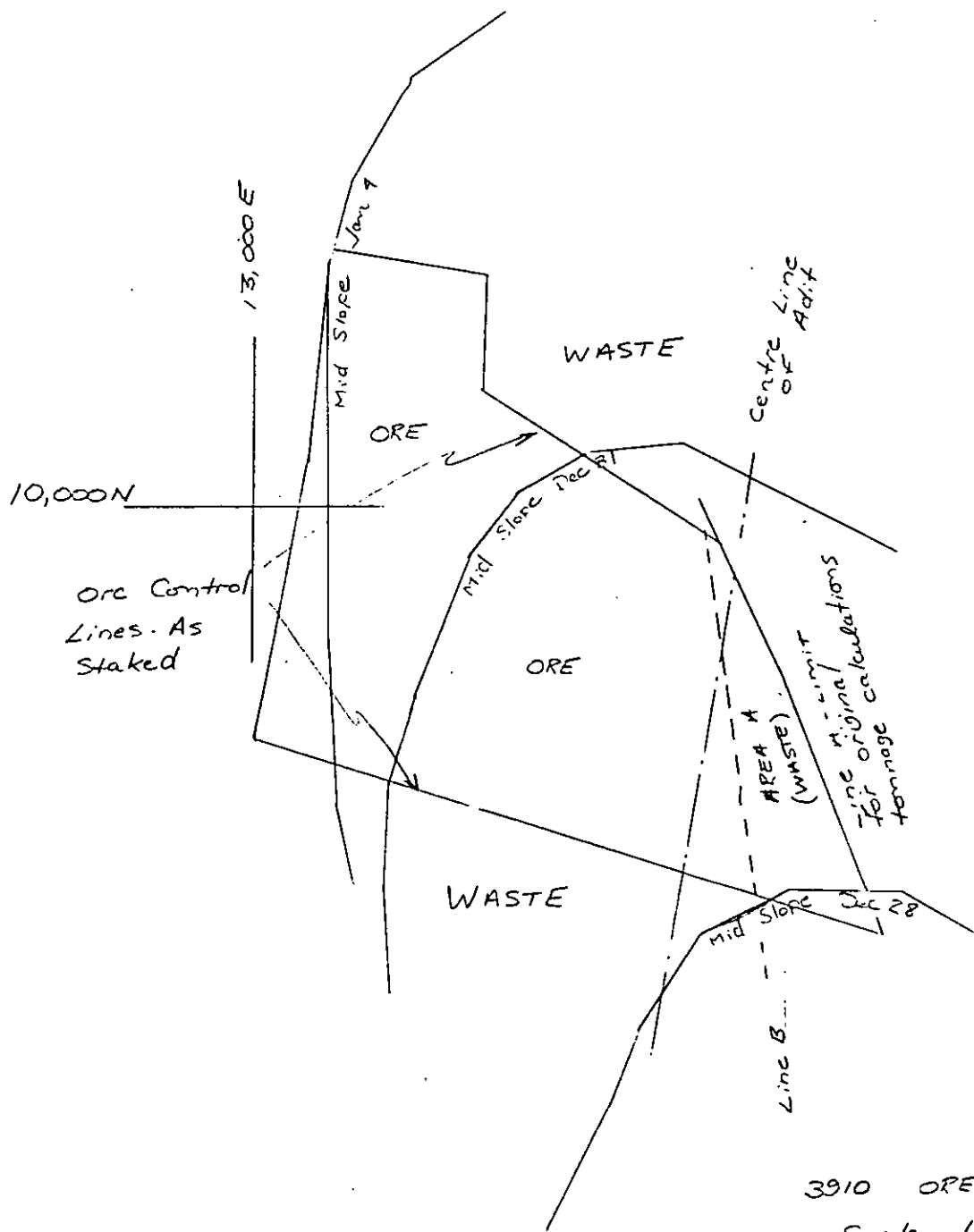
Recommendations:

The policy of digging to the stakes must be maintained to ensure maximum tonnage is obtained from a blast. Deviation from this policy will result in less than desirable output.


J. W. Mustard
Mine Geologist

JWM/mm

Attach.



3910 ORE BENCH
Scale 1" = 50'

To

J. C. Devitt

Date

May 6, 1977

From

J. W. Mustard

Subject

ORE REMOVAL FROM 3870 BENCH

The following table shows a discrepancy in predicted ore and ore removal reported by the mine for the 3870 bench.

<u>Blast</u>	<u>Estimated Available Tonnage</u>	<u>Mine Reported Tonnage</u>	<u>Difference</u>	<u>Variance</u>
3870 AI	132,900	86,080	46,820	0.35
3870 AJ	<u>56,000</u>	<u>22,905</u>	<u>33,095</u>	<u>0.59</u>
	188,900	108,985	79,915	0.42

A more detailed analysis was done on the 3870 AJ blast for the period April 29 to May 2. Attached is a sketch showing the face for April 18, 27 and April 29 on 3870. From visual inspection of the face on May 2, it was determined that no ore remained from this blast.


The following table shows a discrepancy of 20,836 SDT from April 29 to May 2.

<u>Estimated Tonnage April 29</u>	<u>Estimated Tonnage May 2</u>	<u>Mine Reported Tonnage April 29 - May 2</u>	<u>Difference</u>	<u>Variance</u>
31,056	0	10,220	20,836	0.67

These two blasts were well staked and closely monitored to improve grade control, since the average grade was rather low (9.0% combined). As such, internal waste was marked off so that the shovel operator was aware of it. This would cause a certain amount of loss, but in no way accounts for the large discrepancies.

Another possible reason for the loss was the fact that this was white ore, and consequently, was mistaken for waste, especially on the night and graveyard shifts.

The large amount of wastage is not tolerable. In future the mine department will be informed as to the type of ore being mined, especially close to the external contacts.

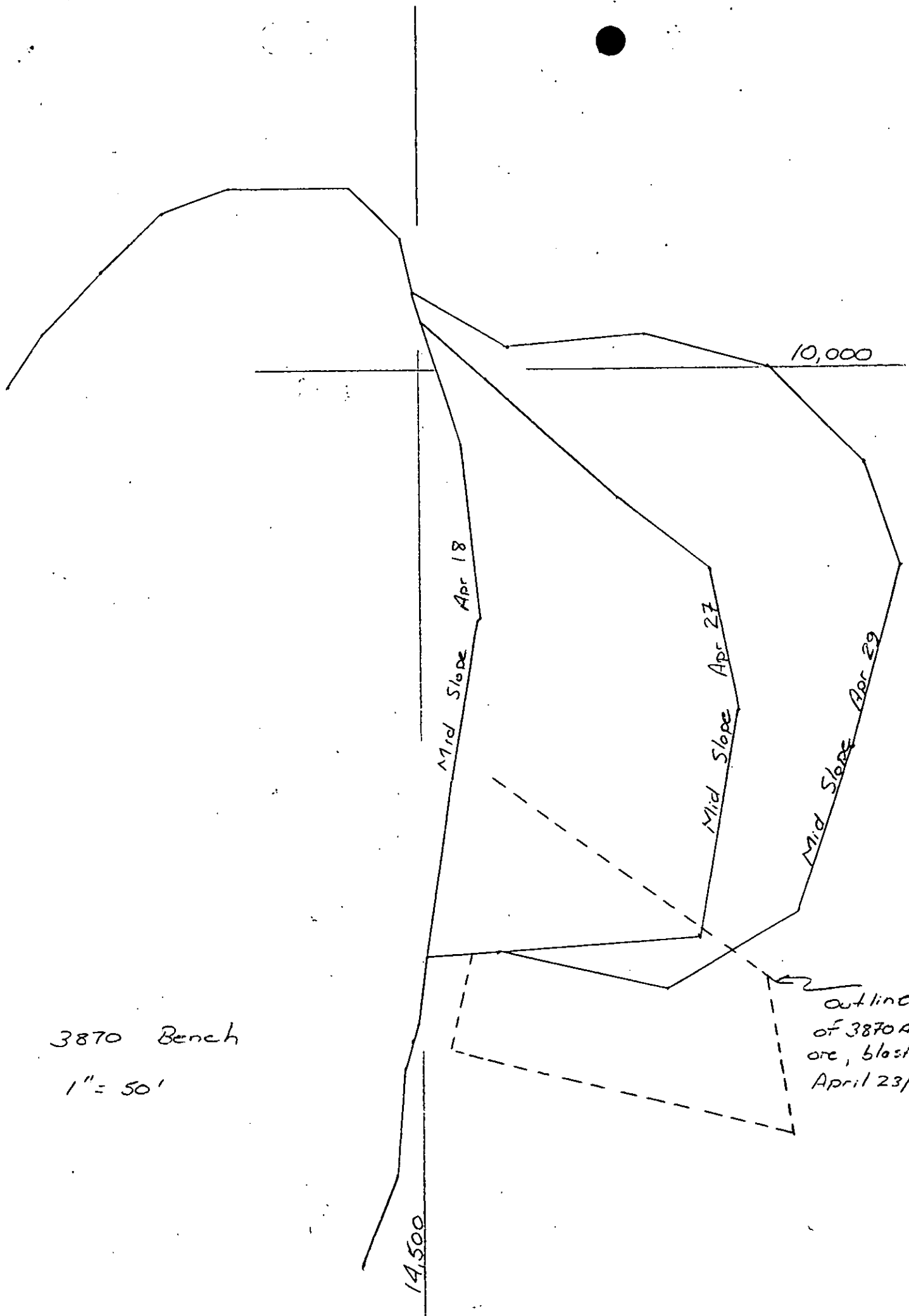


J. W. Mustard
Mine Geologist

JWM/mm

cc. D. Marr
J. Murdoch

Attach.



3870 Bench
1" = 50'

outline
of 3870 A1
ore, blasted
April 23/77