005787

# G R U M  D E P O S I T

## 1975 PROGRAMME FOR CONTINUED EXPLORATION
## AND
## CONFIRMATION OF ORE RESERVE OUTLINES

VANGORDA CREEK AREA

WHITEHORSE MINING DIVISION Y. T.

N.T.S. 105K-6

PREPARED FOR KERR ADDISON MINES LIMITED

BY VANCOUVER OFFICE STAFF

JANUARY 1975

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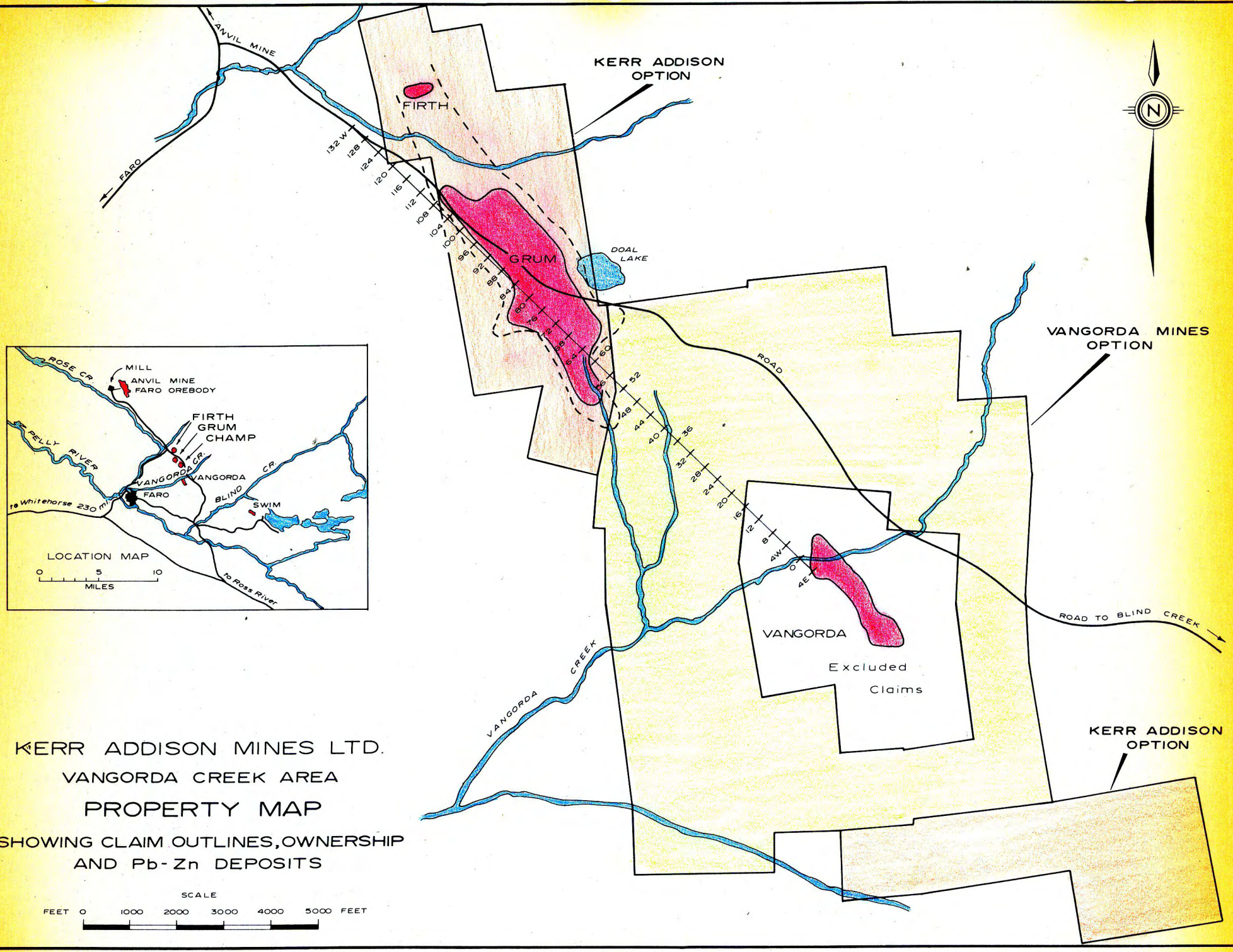



# KERR ADDISON MINES LTD.

## VANGORDA CREEK AREA

## PROPERTY MAP

SHOWING CLAIM OUTLINES, OWNERSHIP AND Pb-Zn DEPOSITS

SCALE

FEET 0 1000 2000 3000 4000 5000 FEET

## SUMMARY

1. The Grum lead-zinc-silver deposit is located on Kerr Addison claims, 8 miles South East of Anvil Mining Co.'s Faro ore body. This location is 30 miles North West of Ross River and 125 miles North East of Whitehorse.

2. The Grum deposit was located by diamond drilling conducted by the AEX Syndicate in 1973, following an option agreement with Kerr Addison Mines. Kerr Addison Mines assumed management of the exploration programme in July 1974.

3. The deposit, as outlined by diamond drilling, has a crudely tabular shape, a known length of approximately 5600' and a width of 1200'. Ultimate dimensions remain to be determined. The long axis trends North Westerly and the deposit dips approximately $25^{o}$ to the South West.

4. The deposit consists of at least four principal sulphide layers in which lead-zinc mineralization varies from a few feet to 130' in thickness. Average thickness is in the order of 35-40'.

5. The total drill-indicated tonnage from 62W to section 88W using a 4% combined lead-zinc cut off is 25,422,167 tons averaging 4.01%Pb, 6.67%Zn, 1.86oz Ag, 0.02oz Au, 0.15%Cu. This estimate is based on 50,000(?) of diamond drilling with holes drilled 200' apart on lines 400' apart. This tonnage does not include 1,500,000 tons of mineralization found in the Champ zone in the extreme South East end of the deposit.

Nor does it include isolated intersections in drill holes between 88W and 108W.

6. The tonnage, for the most part, is too far below surface to be mined by open pit methods. There remains, however, the possibility that some 4,000,000 tons averaging 5.53%Pb, 10.03%Zn and 2.49oz Ag could be mined in this manner. This mineralization sub-outcrops beneath the 100' or more of overburden from section 62W to 70W, near the South East corner of the deposit.

   While the bulk of the mineralization is deeper than other deposits in the Anvil range, the lead-zinc grades together with the silver content are higher in the Grum deposit.

7. An underground test programme is considered necessary because:

   (a) The deposit thickens and thins abruptly in cross section, therefore, continuity and shape remain uncertain from surface diamond drilling.

   (b) The rocks in the hanging walls of the four sulphide layers are incompetent schists or phyllites and ground support problems need to be examined underground.

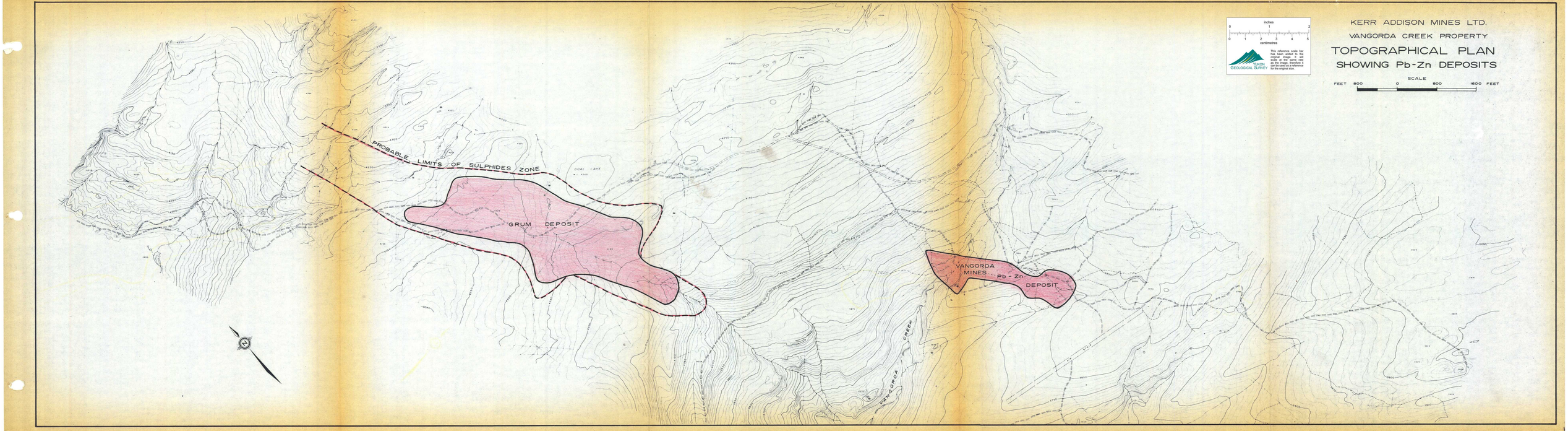
   (c) A metallurgical bulk sample is needed to provide definitive information on recoveries and grades of concentrate.

   (d) Grades compiled from drill hole information need to be correlated with actual mining grades.

8. An underground programme has been designed in concert with Canadian Mines Services of Vancouver, which would test the thickest, shallowest and highest grade portion of the deposit over a length of 2000' to a maximum depth of 600' below surface. This programme calls for some 8603' of underground openings and 25,000 - 30,000' of underground diamond drilling. The underground drilling would increase the depth of explorations to 1100' below surface. When this programme is completed, we anticipate that 8,171,632 tons averaging 5.53%Pb, 9.98%Zn and 2.53oz Ag will have been placed in a positive category above Elev. 3600'. Another 12,969,171 tons averaging 3.26%Pb, 4.95%Zn, 1.51oz Ag, will have been placed in a reasonably assured category.

9. Since the distinct possibility exists that the Grum deposit will extend North Westward to the Firth Zone, the 4000' interval from 88W to 128W requires exploration by drilling. An additional 32 holes, totalling 32,000' have been planned. Another 10 drill holes totalling 10,000' are considered necessary to expand the peripheries of the explored portion between 64W and 80W. This work could begin in mid March 1975.

10. The dimensions and grade of the known portion of the Grum deposit together with the possibility of additional tonnage in the unexplored area to the North West, justify an active surface and underground programme this year.




KERR ADDISON MINES LTD.

VANGORDA CREEK PROPERTY

# TOPOGRAPHICAL PLAN SHOWING Pb-Zn DEPOSITS

SCALE

FEET 800 0 800 1600 FEET

## INTRODUCTION

In 1973, an option agreement was completed between Kerr Addison Mines, Vangorda Mines and AEX Minerals Corporation, whereby AEX Minerals had the right to conduct exploration in the Vangorda creek area on 24 claims held by Kerr Addison, and 37 claims held by Vangorda Mines. These claims are contiguous on the North West to 11 claims owned by Vangorda Mines which contain the Vangorda Mines' lead-zinc deposit, and which were excluded from the option agreement.

During 1973, AEX Minerals conducted a Turam survey and drilled four diamond drill holes. Hole No. 4 on Kerr Addison Grum No. 3 claim encountered a 19.5' intersection averaging 6.7%Pb, 10.8%Zn, 0.3%Cu, and 3.85oz Ag in the interval 656' to 675'.

By July 1974, 16 holes had been drilled by AEX Minerals and arrangements were made whereby the project became a joint venture managed by Kerr Addison Mines.

## LOCATION

The Grum deposit is located at Vangorda Creek, 30 miles North West of Ross River and 125 miles North East of Whitehorse. The town of Faro is five miles South West of the deposit.

## HISTORY

The first discovery in the area was made by Ross River indians and prospector Alan Kulan in the channel of Vangorda Creek in 1953. This property was acquired and explored by Prospectors Airways and title was subsequently transferred to Vangorda Mines of which Kerr Addison now owns 69%.

The Swim deposit, 5 miles South East of Vangorda was discovered by Kerr Addison Mines in 1963 and the Faro deposit was discovered by the Dynasty Syndicate in 1964. The Grum zone was discovered by AEX Minerals in 1973.

## REGIONAL GEOLOGY - ANVIL RANGE

The Vangorda area, which contains four known lead-zinc deposits in a 20 mile belt parallelling the Anvil range, is underlain by regionally metamorphosed Cambrian sediments which were intruded by the Anvil Batholith in Cretaceous time. The Cambrian rocks in which the lead-zinc deposits occur were originally shale, but now exhibit various grades of metamorphism, ranging from quartz-sericite-phyllite to garnet-staurolite schist. "Phyllites" are simply well foliated rocks which have a lustrous sheen on foliation planes, resulting from the parallel orientation of micas.


## LEGEND

| | |
|---|---|
| 11b | CRETACEOUS - INTRUSIVE ANVIL BATHOLITH |
| 3, 3a, 3b | LOWER CAMBRIAN - SERICITE, CHLORITE, GRAPHITE, PHYLLITE. |
| 2, 2b | CAMBRIAN - DIOPSIDE, QUARTZ, SKARN SCHIST AND AMPHIBOLITE |
| 8a, 8b | PENNSYLVANIAN AND PERMIAN BASALT |
| 10 | TRIASSIC CONGLOMERATE |

KERR ADDISON MINES LTD.

VANGORDA CREEK AREA

WHITEHORSE M.D.

# GEOLOGIC PLAN

SCALE: 1" = 2 Miles

NOTE: PRODUCED FROM G.S.C. MAP 1216 A

Structural deformation in the area is dominated by the Tintina trench which is a North Westerly trending transcurrent wrench fault with a right lateral displacement of 250 miles. In the Vangorda area, this fault zone (together with its parallel components) has a width of 8 miles. While we have no proof that any of the mineral deposits are directly related to this fault system, it is reasonable to suspect that this faulting provides a deep seated plumbing system which may well have acted as a conduit for mineralizing solutions in Cambrian time. Certainly, the rocks in the area have been subjected to further deformation as a result of recurrent movement in this very major Tectonic system.

## GEOLOGY AND MINERALIZATION OF THE GRUM DEPOSIT

The metasedimentary rocks which host the Grum deposit are here classified into four units:

Sericite - Phyllite : Graphite - Phyllite : Chlorite - Phyllite : Bleached Phyllite.

Sericite-phyllite is grey to greenish grey, contains 20-50% quartz, 40-60% sericite and 10% carbonate (possibly ankerite).

The graphite-phyllite is greyish black to dense black, contains 20-50% quartz with perhaps 30% of graphite or some other form of carbon. This rock was formed from black shale and has a somewhat erratic distribution in the more dominant sericite-phyllite.

Chlorite-phyllite is a pale green rock similar in composition to the sericite-phyllite, with perhaps 20% chlorite, representing the sericite.

The bleached phyllite is a cream coloured rock, probably caused by hydrothermal(?) alteration of sericite-phyllite and, to some extent, of chlorite phyllite. This unit is found most frequently on the hanging wall of the Grum deposit sulphide layers, but in a gross way, tends to produce a halo around these layers.

All these rocks have been drag folded, crenulated, slip-folded and generally abused in Cambrian-Ordovician time and, to some extent, in Cretaceous time. In consequence, their competence is now questionable and they could not be expected to stand unsupported in the mining process. The Grum mineralized deposit consists of at least four gently dipping layers of pyrite, having a known length of approximately 5600' and a maximum width of 1600'. The pyritic sheets have thicknesses of a few feet to 200' and envelope lead-zinc mineralization of varying thickness from a few feet to 132'. The known width of lead-zinc mineralization is approximately 1200'. The deposit trends North Westerly and dips to the South West at approximately $25^{o}$.

The deposit is remarkably uniform in longitudinal section, but thickens and thins with reckless abandon in cross section. No pattern of metal zoning has emerged thus far, but zinc-lead ratios are generally in the order of 1.7:1. In higher grades the ratio approaches 2:1.

Pyrite is by far the dominant non economic sulphide mineral to the extent that the four mineralized layers in the deposit could be loosely classified as massive pyrite. Their actual pyrite content varies from 10% to 75% but the heavier pyrite sections predominate. Pyrrhotite, marcasite(?), magnetite and barite occur sporadically in no recognized pattern, although barite does tend to occur in discontinuous zones.

Galena and sphalerite are the only known lead-zinc minerals. Silver minerals, as such, have not been identified, although some tetrahedrite is suspected.

Chalcopyrite is the only recognized copper mineral and occurs with lead-zinc minerals and in small late quartz veins which transect the sulphide minerals. All of the mineralized layers are concordant with foliation and, indeed, their present shapes result, in part, from transposition along micaceous or graphitic foliation planes in the folding process.

At the North West end of the area under investigation, the phyllites are terminated abruptly against the granodiorite of the Anvil Batholith. Some shallow drilling was done at this contact by Prospectors Airways in 1954, in the so called Firth Zone. At this time, we do not know whether the Firth Zone represents an uplifting of the downplunge extension of the Grum zone, or whether it is simply a higher level deposit. In any case, this problem will be explored by drilling in due course.


*View Southwest over Grum discovery zone. Target extends from Lake at left to beyond right side. Vangorda deposit lies 1½ miles to left and Anvil Mine 7 miles to right.*

10S

B.L.

10N

20N

DOAL LAKE

800'

4200'

ELEV 700'

600'

4000'

3800'

3600'

3400'

3200'

3000'

A 60

A 19

A 21

A 36

O.B.

843'

856'

1171'

1156'

GRADES

- > 8% COMBINED Pb - Zn
- 6 - 8% COMBINED Pb - Zn
- 4 - 6% COMBINED Pb - Zn
- 2 - 4% COMBINED Pb - Zn
- 1 - 2% COMBINED Pb - Zn

PERCENTAGE OF SULPHIDES

- > 75% SULPHIDES
- 50 - 75% SULPHIDES
- 25 - 50% SULPHIDES
- < 25% SULPHIDES

GEOLOGY

- 1 GREEN - GREY CHLORITE SERICITE PHYLLITE
- 2 GREEN SERICITE QUARTZ PHYLLITE
- 3 BLACK GRAPHITIC PHYLLITE
- 4 WHITE 'BLEACHED' SERICITE PHYLLITE
- 5 BIOTITE PHYLLITE

ORE INTERSECTION Pb, Zn, Ag / Ft

BRECCIA

FAULT

KERR ADDISON MINES LTD.

GRUM DEPOSIT, Y.T.

SECTION 72W.

SCALE

FEET 100 0 100 200 FEET

If significant quantities of lead-zinc mineralization are found adjacent to the granodiorite contact, it is reasonable to expect (based on the experience at Faro) that the grain size of the sulphides will be somewhat coarser than they are elsewhere in the Grum deposit.

## TONNAGE AND GRADE CALCULATIONS - SECTIONS 62W TO 88W

### Qualifying Statement

The erratic nature of the Grum deposit in cross section makes necessary much more detailed drill information than we have at present to permit reliable tonnage estimates. For calculation purposes, we have shown simplistic geometric shapes on most of the cross sections and it is conceivable that in so doing we may be 20% high in our tonnage estimates. Surface drill holes on 200' centres would have provided a much more reliable basis on which calculations could be based.

Preliminary tonnage and grade estimates are based on vertical BQ wireline drill holes 200' apart, drilled on lines 400' apart. This results in a rectangular area of influence 200' x 400' around each drill hole, except in isolated thin horizons where a rectangle 100' x 200' was used. These holes varied from 500' to 1500' in depth with an average length of approximately 1000'. * The total mineral reserve, from 62W to 88W, based on a 4% combined lead-zinc cut off is estimated at 25,422,167 at 4.01%Pb, 6.67%Zn, 1.86oz Ag, 0.02oz Au and 0.15%Cu.

Since the underground work and detailed diamond drilling will be confined to sections 62W to 82W, all of the following tonnage calculations will be based on that interval. For mining purposes grades were placed in six separate categories:

4 - 6% : 6 - 8% : 8 - 10% : 10 - 12% : 12 - 15% : +15%

In addition, at Mr. Rowswell's request, we have calculated tonnages in these various categories for vertical intervals 3000-3200 : 3200-3400 : 3400-3600 : 3600-3800 : and from 3800 to surface (approximately 4200').

Of the total reserve of 25,422,167 tons, 21,140,803 tons or 83.2% of 4.14%Pb, 6.90%Zn, 1.91oz Ag are situated in the interval 62W to 82W above elevation 3000'. When the underground programme is completed, we anticipate that 8,171,632 tons of 5.53%Pb, 9.98%Zn, 2.53oz Ag above the 3600' level would be placed in a proven category. This figure represents 38.85% of the total tonnage in that block. The balance of 12,969,171 tons will have been drilled in detail from 200' centres and would be classed as reasonably assured. The various tabulations of tonnage and grade are shown below.

* This mineral reserve does not include any tonnage for the Champ Zone on the South East end of the Grum deposit, nor does it include ore intersections found as far as 108W, because drilling information is inadequate for calculation purposes beyond 88W.

## SUMMARY OF MINERAL RESERVES

### 62W - 82W

| Category | Tons | % Lead | % Zinc | Oz Silver |
|---|---|---|---|---|
| + 15% | 5,717,119 | 6.25 | 11.78 | 2.94 |
| 12 - 15 | 2,173,600 | 5.65 | 7.79 | 2.48 |
| 10 - 12 | 2,885,375 | 3.78 | 7.10 | 1.68 |
| 8 - 10 | 2,710,851 | 3.50 | 5.15 | 1.55 |
| 6 - 8 | 4,333,375 | 2.70 | 4.15 | 1.26 |
| 4 - 6 | 3,320,483 | 2.22 | 2.72 | 1.07 |
| Total Reserves from 3000' to Surface | 21,140,803 | 4.14 | 6.90 | 1.91 |

## MINERAL RESERVES - GRUM DEPOSIT

From Elevation 3600' to Surface between Sections 62 + 00W and 82 + 00W.

Grade category 10% and greater combined Lead-Zinc.

| Zone | Grade Interval | Tons | Grade | | | Grade x Tons | | | Av. Grade/Zone/Sec | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Pb | Zn | Ag | Pb | Zn | Ag | Pb | Zn | Ag |
| A | + 15 | 3,853,181 | 6.41 | 12.56 | 3.02 | 24,693,522 | 48,384,334 | 11,641,165 | | | |
| B | | 513,800 | 5.55 | 10.16 | 2.49 | 2,851,590 | 5,220,208 | 1,279,362 | | | |
| | | 4,366,981 | | | | 27,545,112 | 53,604,542 | 12,920,527 | 6.31 | 12.28 | 2.96 |
| A | 12-15 | 747,600 | 5.96 | 7.71 | 2.68 | 4,455,696 | 5,763,996 | 2,003,568 | | | |
| B | | 603,100 | 5.01 | 7.86 | 2.28 | 3,021,531 | 4,740,366 | 1,375,068 | | | |
| C | | 240,000 | 7.87 | 6.96 | 2.91 | 1,888,800 | 1,670,400 | 698,400 | | | |
| F | | 20,400 | 7.20 | 6.12 | 2.85 | 146,880 | 124,848 | 58,140 | | | |
| | | 1,611,100 | | | | 9,512,907 | 12,299,610 | 4,135,176 | 5.91 | 7.63 | 2.57 |
| A | 10-12 | 1,403,426 | 3.87 | 7.33 | 1.76 | 5,431,258 | 10,287,112 | 2,470,029 | | | |
| B | | 14,625 | 4.13 | 7.30 | 1.38 | 60,401 | 106,763 | 20,182 | | | |
| E | | 756,500 | 3.32 | 6.77 | 1.46 | 2,511,580 | 5,121,505 | 1,104,490 | | | |
| F | | 19,000 | 6.15 | 5.40 | 2.65 | 116,850 | 102,600 | 50,350 | | | |
| | | 2,193,551 | | | | 8,120,089 | 15,617,980 | 3,645,051 | 3.70 | 7.12 | 1.66 |
| Total Reserves | | 8,171,632 | | | | 45,178,108 | 81,522,132 | 20,700,754 | 5.53 | 9.98 | 2.53 |

## DRILL INDICATED MINERAL RESERVES - ALL GRADES - GRUM DEPOSIT

### Reserves from Elev. 3800' to Surface

| % Combined Pb-Zn | Tons | Pb | Zn | Ag |
|---|---|---|---|---|
| + 15 | 2,154,550 | 6.51 | 12.46 | 3.03 |
| 12 - 15 | 853,000 | 6.66 | 7.20 | 2.76 |
| 10 - 12 | 1,468,275 | 3.72 | 7.18 | 1.66 |
| 8 - 10 | 855,900 | 3.39 | 4.93 | 1.44 |
| 6 - 8 | 1,455,175 | 2.25 | 4.45 | 1.08 |
| 4 - 6 | 92,400 | 3.99 | 1.47 | 1.26 |
| Total | 6,879,300 | 4.61 | 7.90 | 2.07 |

### Reserves from Elev. 3600' to Surface

| | | | | |
|---|---|---|---|---|
| + 15 | 4,366,981 | 6.31 | 12.28 | 2.96 |
| 12 - 15 | 1,611,100 | 5.91 | 7.64 | 2.57 |
| 10 - 12 | 2,193,550 | 3.71 | 7.12 | 1.66 |
| 8 - 10 | 2,318,588 | 3.53 | 5.14 | 1.53 |
| 6 - 8 | 3,477,775 | 2.65 | 4.22 | 1.23 |
| 4 - 6 | 1,551,457 | 2.14 | 2.66 | 1.09 |
| Total | 15,519,451 | 4.25 | 7.17 | 1.95 |

### Reserves from Elev. 3400' to Surface

| | | | | |
|---|---|---|---|---|
| + 15 | 5,357,119 | 6.26 | 11.86 | 2.95 |
| 12 - 15 | 2,043,600 | 5.69 | 7.75 | 2.51 |
| 10 - 12 | 2,460,950 | 3.76 | 7.09 | 1.68 |
| 8 - 10 | 2,623,401 | 3.49 | 5.16 | 1.56 |
| 6 - 8 | 4,245,375 | 2.68 | 4.18 | 1.26 |
| 4 - 6 | 2,785,057 | 2.19 | 2.69 | 1.07 |
| Total | 19,515,502 | 4.15 | 6.94 | 1.92 |

### Reserves from Elev. 3200' to Surface

| | | | | |
|---|---|---|---|---|
| + 15 | 5,357,119 | 6.26 | 11.86 | 2.95 |
| 12 - 15 | 2,173,600 | 5.65 | 7.79 | 2.48 |
| 10 - 12 | 2,703,200 | 3.74 | 7.06 | 1.66 |
| 8 - 10 | 2,648,601 | 3.49 | 5.16 | 1.56 |
| 6 - 8 | 4,333,375 | 2.70 | 4.15 | 1.26 |
| 4 - 6 | 2,976,983 | 2.23 | 2.70 | 1.08 |
| Total | 20,192,878 | 4.14 | 6.91 | 1.91 |

Reserves from Elev. 3000' to Surface

| % Combined Pb-Zn | Tons | Pb | Zn | Ag |
|---|---|---|---|---|
| + 15 | 5,717,119 | 6.25 | 11.78 | 2.94 |
| 12 - 15 | 2,173,600 | 5.65 | 7.79 | 2.48 |
| 10 - 12 | 2,885,375 | 3.78 | 7.10 | 1.68 |
| 8 - 10 | 2,710,851 | 3.50 | 5.15 | 1.55 |
| 6 - 8 | 4,333,375 | 2.70 | 4.15 | 1.26 |
| 4 - 6 | 3,320,483 | 2.22 | 2.72 | 1.07 |
| Total | 21,140,803 | 4.14 | 6.90 | 1.91 |

## DRILL INDICATED MINERAL RESERVES - GRUM DEPOSIT

Tabulated by Section, Grade Interval and Elevation.

### Reserves from Elev. 3800' to Surface

| Section | Grade Interval | Tons | Grade Pb% | Grade Zn% | Grade Ag oz |
|---|---|---|---|---|---|
| 64 + 00 | +15% | 1,048,950 | 6.29 | 12.27 | 3.17 |
| 68 + 00 | | 651,400 | 7.20 | 14.17 | 3.12 |
| 72 + 00 | | 319,200 | 6.10 | 10.75 | 2.59 |
| 76 + 00 | | 135,000 | 5.85 | 9.75 | 2.57 |
| Total | | 2,154,550 | 6.51 | 12.46 | 3.03 |

### Reserves from Elev. 3600' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 68 + 00 | +15% | 572,250 | 7.43 | 15.60 | 3.44 |
| 72 + 00 | | 37,406 | 7.35 | 9.36 | 4.08 |
| | | 513,800 | 5.55 | 10.16 | 2.49 |
| 74 + 00 | | 28,000 | 7.37 | 11.45 | 3.92 |
| 76 + 00 | | 574,125 | 5.52 | 11.89 | 2.77 |
| 78 + 00 | | 269,500 | 5.30 | 10.80 | 2.71 |
| 80 + 00 | | 217,350 | 6.22 | 10.12 | 2.60 |
| Sub Total | | 2,212,431 | 6.12 | 12.09 | 2.89 |
| Plus Reserves above 3800' | | 2,154,550 | 6.51 | 12.46 | 3.03 |
| Total Reserve above 3600' | | 4,366,981 | 6.31 | 12.28 | 2.96 |

### Reserves from Elev. 3400' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 72 + 00 | +15% | 275,300 | 6.44 | 10.83 | 2.97 |
| 74 + 00 | | 12,250 | 7.37 | 11.45 | 3.92 |
| 76 + 00 | | 221,400 | 5.51 | 9.82 | 3.31 |
| | | 346,000 | 5.87 | 10.06 | 2.66 |
| 80 + 00 | | 40,688 | 6.60 | 8.07 | 2.29 |
| | | 94,500 | 6.20 | 8.85 | 2.87 |
| Sub Total | | 990,138 | 6.02 | 10.04 | 2.91 |
| Plus Reserves above 3600' | | 4,366,981 | 6.31 | 12.28 | 2.96 |
| Total Reserve above 3400' | | 5,357,119 | 6.26 | 11.86 | 2.95 |

Reserves from Elev. 3000' to Surface

| Section | Grade Interval | Tons | Grade Pb% | Zn% | Ag oz. |
|---|---|---|---|---|---|
| 80 + 00 | +15% | 360,000 | 6.11 | 10.60 | 2.80 |
| Plus Reserves above 3400' | | 5,357,119 | 6.26 | 11.86 | 2.95 |
| Total Reserve above 3000' | | 5,717,119 | 6.25 | 11.78 | 2.94 |

Reserves from Elev. 3800' to Surface

| Section | Grade Interval | Tons | Grade Pb% | Zn% | Ag oz |
|---|---|---|---|---|---|
| 64 + 00 | 12 - 15% | 98,700 | 5.76 | 9.11 | 2.89 |
| | | 12,400 | 5.92 | 7.11 | 2.37 |
| 68 + 00 | | 168,000 | 5.93 | 7.44 | 2.35 |
| | | 240,000 | 7.87 | 6.96 | 2.91 |
| 72 + 00 | | 333,900 | 6.46 | 6.68 | 2.84 |
| Total | | 853,000 | 6.66 | 7.20 | 2.76 |

Reserves from Elev. 3600' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 64 + 00 | 12 - 15% | 223,850 | 5.93 | 7.11 | 2.37 |
| 72 + 00 | | 147,000 | 5.01 | 9.44 | 2.56 |
| | | 366,850 | 4.42 | 8.35 | 2.23 |
| 80 + 00 | | 20,400 | 7.20 | 6.12 | 2.85 |
| Sub Total | | 758,100 | 5.05 | 8.13 | 2.35 |
| Plus Reserves above 3800' | | 853,000 | 6.66 | 7.20 | 2.76 |
| Total Reserve above 3600' | | 1,611,100 | 5.91 | 7.64 | 2.57 |

Reserves from Elev. 3400' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 72 + 00 | 12 - 15% | 74,000 | 4.35 | 8.94 | 2.16 |
| 76 + 00 | | 229,250 | 4.90 | 7.97 | 2.10 |
| 78 + 00 | | 129,250 | 5.10 | 8.03 | 2.63 |
| Sub Total | | 432,500 | 4.87 | 8.15 | 2.27 |
| Plus Reserves above 3600' | | 1,611,100 | 5.91 | 7.64 | 2.57 |
| Total Reserve above 3400' | | 2,043,600 | 5.69 | 7.75 | 2.51 |

Reserves from Elev. 3200' to Surface

| Section | Grade Interval | Tons | Grade Pb% | Zn% | Ag oz |
|---|---|---|---|---|---|
| 76 + 00 | 12 - 15% | 130,000 | 5.12 | 8.53 | 2.12 |
| Plus Reserves above 3400' | | 2,043,600 | 5.69 | 7.75 | 2.51 |
| Total Reserve above 3200' | | 2,173,600 | 5.65 | 7.79 | 2.48 |

Reserves from Elev. 3800' to Surface

| Section | Grade Interval | Tons | Grade Pb% | Zn% | Ag oz |
|---|---|---|---|---|---|
| 68 + 00 | 10 - 12% | 590,625 | 3.87 | 7.95 | 1.67 |
| 72 + 00 | | 168,000 | 3.47 | 6.47 | 1.33 |
| | | 456,000 | 3.25 | 6.76 | 1.50 |
| 74 + 00 | | 21,150 | 4.80 | 5.47 | 2.16 |
| 76 + 00 | | 152,750 | 4.37 | 6.26 | 2.07 |
| 76 + 00 | | 60,750 | 3.78 | 7.27 | 2.06 |
| 80 + 00 | | 19,000 | 6.15 | 5.40 | 2.65 |
| Total | | 1,468,275 | 3.72 | 7.18 | 1.66 |

Reserves from Elev. 3600' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 72 + 00 | 10 - 12% | 140,438 | 4.24 | 7.25 | 2.07 |
| | | 24,938 | 4.65 | 7.04 | 2.02 |
| | | 14,624 | 4.13 | 7.30 | 1.38 |
| | | 300,500 | 3.52 | 6.79 | 1.41 |
| 74 + 00 | | 3,525 | 4.80 | 5.47 | 2.16 |
| 76 + 00 | | 140,000 | 3.21 | 7.05 | 1.50 |
| | | 101,250 | 3.78 | 7.27 | 2.06 |
| Sub Total | | 725,275 | 3.69 | 7.01 | 1.67 |
| Plus Reserves above 3800' | | 1,468,275 | 3.72 | 7.18 | 1.66 |
| Total Reserve above 3600' | | 2,193,550 | 3.71 | 7.12 | 1.66 |

Reserves from Elev. 3400' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 68 + 00 | 10 - 12% | 105,000 | 3.98 | 6.89 | 2.04 |
| 72 + 00 | | 97,500 | 4.13 | 7.30 | 1.38 |
| 78 + 00 | | 64,900 | 4.50 | 6.27 | 2.24 |
| Sub Total | | 267,400 | 4.16 | 6.89 | 1.85 |
| Plus Reserves above 3600' | | 2,193,550 | 3.71 | 7.12 | 1.66 |
| Total Reserve above 3400' | | 2,460,950 | 3.76 | 7.09 | 1.68 |

Reserves from Elev. 3200' to Surface

| Section | Grade Interval | Tons | Grade Pb% | Zn% | Ag oz |
|---|---|---|---|---|---|
| 76 + 00 | 10 - 12% | 242,250 | 3.62 | 6.67 | 1.48 |
| Plus Reserves above 3400' | | 2,460,950 | 3.76 | 7.09 | 1.68 |
| Total Reserve above 3200' | | 2,703,200 | 3.74 | 7.06 | 1.66 |

Reserves from Elev. 3000' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 76 + 00 | 10 - 12% | 32,175 | 4.73 | 6.72 | 1.79 |
| 80 + 00 | | 150,000 | 4.09 | 7.98 | 1.94 |
| Sub Total | | 182,175 | 4.20 | 7.75 | 1.91 |
| Plus Reserves above 3200' | | 2,703,200 | 3.74 | 7.06 | 1.66 |
| Total Reserve above 3000' | | 2,885,375 | 3.78 | 7.10 | 1.68 |

Reserves from Elev. 3800' to Surface

| Section | Grade Interval | Tons | Grade Pb% | Zn% | Ag oz |
|---|---|---|---|---|---|
| 64 + 00 | 8 - 10% | 182,700 | 3.01 | 5.07 | 1.68 |
| 68 + 00 | | 346,500 | 3.46 | 4.91 | 1.15 |
| 72 + 00 | | 308,700 | 3.55 | 4.78 | 1.62 |
| 76 + 00 | | 18,000 | 3.16 | 6.66 | 1.58 |
| Total | | 855,900 | 3.39 | 4.93 | 1.44 |

Reserves from Elev. 3600' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 64 + 00 | 8 - 10% | 72,600 | 3.52 | 4.59 | 1.26 |
| 68 + 00 | | 294,525 | 3.56 | 4.82 | 1.45 |
| 72 + 00 | | 340,256 | 3.62 | 5.11 | 1.48 |
| 74 + 00 | | 32,025 | 4.55 | 3.87 | 0.87 |
| 76 + 00 | | 229,500 | 3.15 | 6.38 | 1.87 |
| 80 + 00 | | 493,782 | 3.82 | 5.31 | 1.68 |
| Sub Total | | 1,462,688 | 3.62 | 5.27 | 1.58 |
| Plus Reserves above 3800' | | 855,900 | 3.39 | 4.93 | 1.44 |
| Total Reserve above 3600' | | 2,318,588 | 3.53 | 5.14 | 1.53 |

Reserves from Elev. 3400' to Surface

| Section | Grade Interval | Tons | Grade Pb% | Zn% | Ag oz |
|---|---|---|---|---|---|
| 64 + 00 | 8 - 10% | 74,250 | 3.38 | 4.65 | 1.74 |
| 68 + 00 | | 26,250 | 3.57 | 4.76 | 1.46 |
| 76 + 00 | | 34,063 | 2.81 | 5.80 | 2.39 |
| 78 + 00 | | 49,500 | 2.52 | 5.65 | 1.53 |
| 80 + 00 | | 120,750 | 3.19 | 5.54 | 1.83 |
| Sub Total | | 304,813 | 3.12 | 5.30 | 1.79 |
| Plus Reserves above 3600' | | 2,318,588 | 3.53 | 5.14 | 1.53 |
| Total Reserve above 3400' | | 2,623,401 | 3.49 | 5.16 | 1.56 |

Reserves from Elev. 3200' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 80 + 00 | 8 - 10% | 25,200 | 4.19 | 5.34 | 1.75 |
| Plus Reserves above 3400' | | 2,623,401 | 3.49 | 5.16 | 1.56 |
| Total Reserve above 3200' | | 2,648,601 | 3.49 | 5.16 | 1.56 |

Reserves from Elev. 3000' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 76 + 00 | 8 - 10% | 24,750 | 4.23 | 4.42 | 1.33 |
| 80 + 00 | | 37,500 | 3.76 | 4.36 | 1.30 |
| Sub Total | | 62,250 | 3.95 | 4.38 | 1.31 |
| Plus Reserves above 3200' | | 2,648,601 | 3.49 | 5.16 | 1.56 |
| Total Reserve above 3000' | | 2,710,851 | 3.50 | 5.15 | 1.55 |

Reserves from Elev. 3800' to Surface

| Section | Grade Interval | Tons | Grade Pb% | Grade Zn% | Grade Ag oz |
|---|---|---|---|---|---|
| 64 + 00 | 6 - 8% | 192,150 | 2.16 | 4.90 | 1.05 |
| 68 + 00 | | 262,150 | 2.91 | 4.36 | 1.31 |
| 72 + 00 | | 777,000 | 2.06 | 4.24 | 0.85 |
| 76 + 00 | | 223,875 | 2.23 | 4.89 | 1.63 |
| Total | | 1,455,175 | 2.25 | 4.45 | 1.08 |

Reserves from Elev. 3600' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 64 + 00 | | 349,000 | 3.57 | 3.54 | 1.46 |
| 68 + 00 | | 150,400 | 2.95 | 3.78 | 1.23 |
| 72 + 00 | | 446,400 | 2.61 | 4.50 | 1.31 |
| 76 + 00 | | 526,925 | 2.81 | 4.10 | 1.30 |
| 78 + 00 | | 258,500 | 3.42 | 3.57 | 1.34 |
| 80 + 00 | | 291,375 | 2.41 | 4.53 | 1.36 |
| Sub Total | | 2,022,600 | 2.93 | 4.06 | 1.34 |
| Plus Reserves above 3800' | | 1,455,175 | 2.25 | 4.45 | 1.08 |
| Total Reserve above 3600' | | 3,477,775 | 2.65 | 4.22 | 1.23 |

Reserves from Elev. 3400' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 68 + 00 | 6 - 8% | 58,750 | 3.36 | 4.54 | 1.23 |
| 72 + 00 | | 142,800 | 2.84 | 3.83 | 1.57 |
| 74 + 00 | | 197,400 | 2.87 | 4.49 | 1.63 |
| 76 + 00 | | 12,525 | 2.77 | 4.21 | 1.21 |
| 78 + 00 | | 52,250 | 1.94 | 4.57 | 1.07 |
| 80 + 00 | | 283,875 | 3.17 | 3.76 | 1.29 |
| Sub Total | | 767,600 | 2.86 | 3.98 | 1.38 |
| Plus Reserves above3600' | | 3,477,775 | 2.65 | 4.22 | 1.23 |
| Total Reserve above 3400' | | 4,245,375 | 2.68 | 4.18 | 1.26 |

Reserves from Elev. 3200' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 68 + 00 | 6 - 8% | 37,600 | 3.36 | 4.54 | 1.23 |
| 80 + 00 | | 50,400 | 3.58 | 3.29 | 1.26 |
| Sub Total | | 88,000 | 3.49 | 2.69 | 1.25 |
| Plus Reserves above 3400' | | 4,245,375 | 2.68 | 4.18 | 1.26 |
| Total Reserve above 3200' | | 4,333,375 | 2.70 | 4.15 | 1.26 |

Reserves from Elev. 3800' to Surface

| Section | Grade Interval | Tons | Grade Pb% | Grade Zn% | Grade Ag oz |
|---|---|---|---|---|---|
| 72 + 00 | 4 - 6% | 92,400 | 3.99 | 1.47 | 1.26 |

Reserves from Elev. 3600' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 64 + 00 | 4 - 6% | 410,900 | 1.66 | 2.92 | 1.13 |
| 72 + 00 | | 310,406 | 1.65 | 3.14 | 1.06 |
| 76 + 00 | | 296,000 | 1.39 | 2.82 | 0.90 |
| 80 + 00 | | 441,751 | 2.87 | 2.21 | 1.18 |
| Sub Total | | 1,459,057 | 2.03 | 2.73 | 1.08 |
| Plus Reserves above 3800' | | 92,400 | 3.99 | 1.47 | 1.28 |
| Total Reserve above 3600' | | 1,551,457 | 2.14 | 2.66 | 1.09 |

Reserves from 3400' to Surface

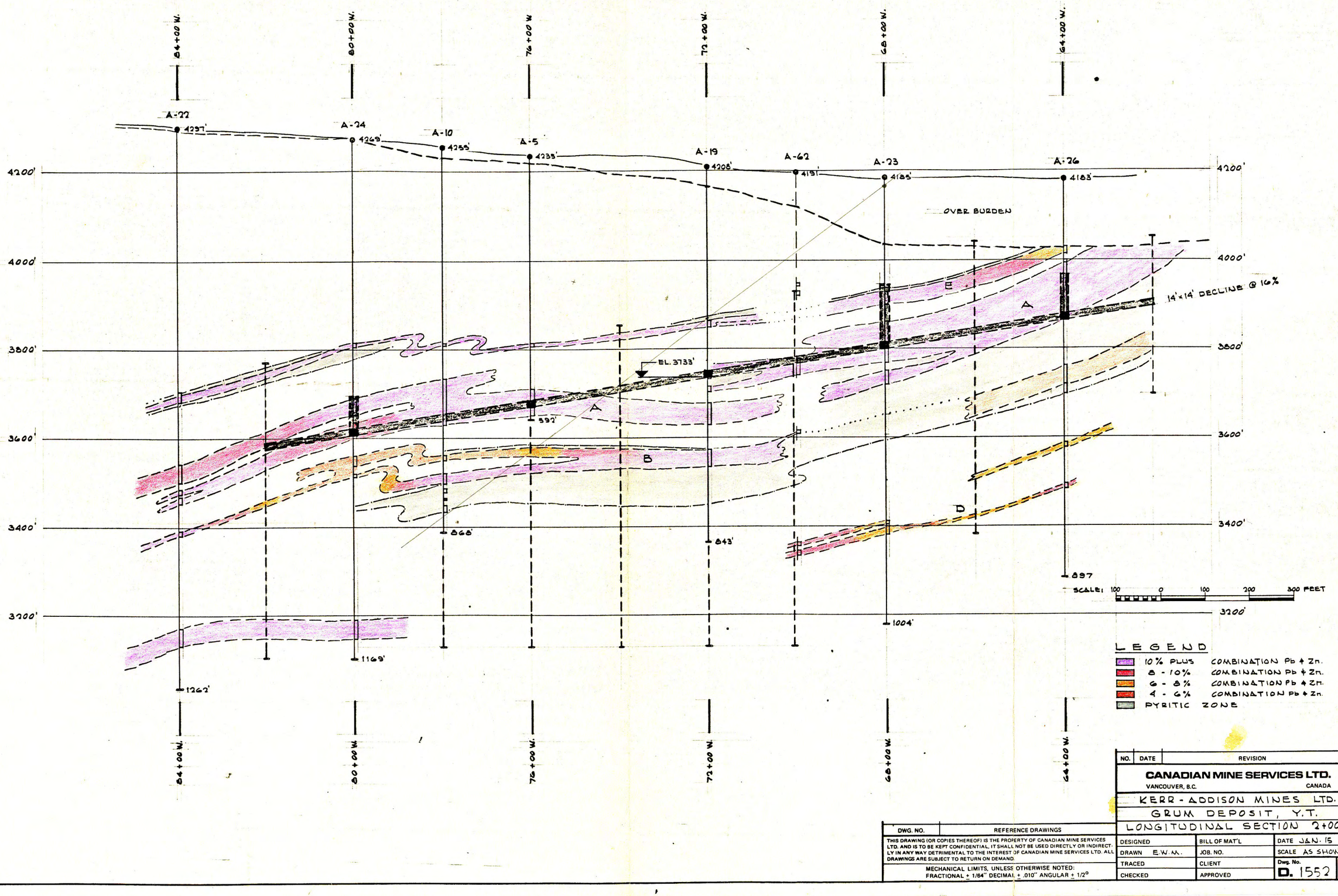
| | | | | | |
|---|---|---|---|---|---|
| 64 + 00 | 4 - 6% | 461,750 | 2.41 | 2.25 | 1.10 |
| 68 + 00 | | 184,300 | 2.26 | 3.50 | 1.13 |
| 76 + 00 | | 162,000 | 2.05 | 2.87 | 0.97 |
| 80 + 00 | | 425,550 | 2.17 | 2.89 | 0.96 |
| Sub Total | | 1,233,600 | 2.26 | 2.74 | 1.04 |
| Plus Reserves above 3600' | | 1,551,457 | 2.14 | 2.66 | 1.09 |
| Total Reserve above 3400' | | 2,785,057 | 2.19 | 2.69 | 1.07 |

Reserves from 3200' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 64 + 00 | 4 - 6% | 5,625 | 2.45 | 2.10 | 1.15 |
| 68 + 00 | | 117,000 | 2.89 | 2.93 | 1.36 |
| 80 + 00 | | 69,301 | 2.53 | 2.57 | 1.00 |
| Sub Total | | 191,926 | 2.75 | 2.78 | 1.22 |
| Plus Reserves above 3400' | | 2,785,057 | 2.19 | 2.69 | 1.07 |
| Total Reserve above 3200' | | 2,976,983 | 2.23 | 2.70 | 1.08 |

Reserves from 3000' to Surface

| | | | | | |
|---|---|---|---|---|---|
| 80 + 00 | 4 - 6% | 343,500 | 2.14 | 3.00 | 1.01 |
| Plus Reserves above 3200' | | 2,976,983 | 2.23 | 2.70 | 1.08 |
| Total Reserve above 3000' | | 3,320,483 | 2.22 | 2.72 | 1.07 |




| NO. | DATE | REVISION | BY |
|---|---|---|---|

**CANADIAN MINE SERVICES LTD.**
VANCOUVER, B.C. CANADA

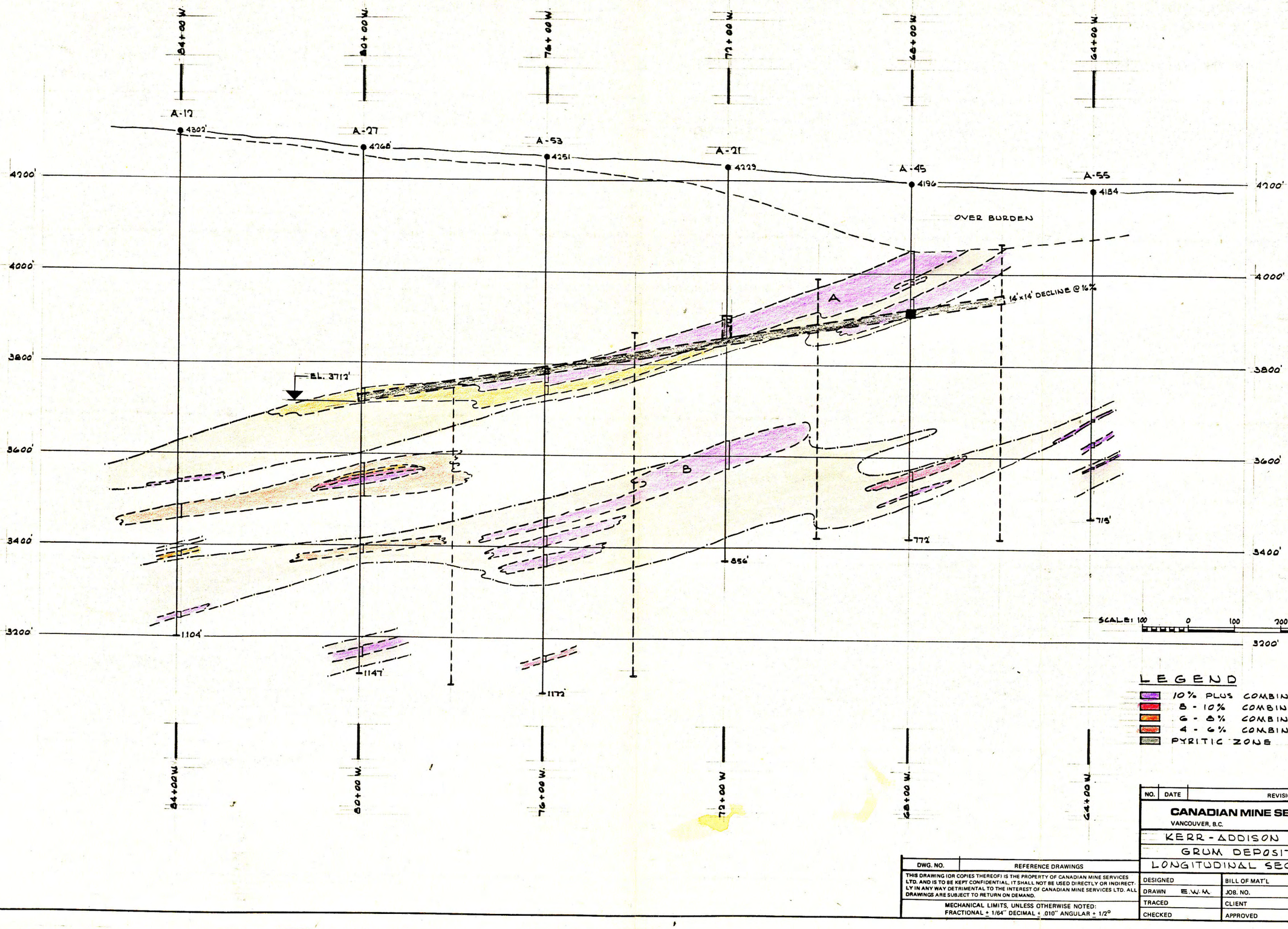
KERR - ADDISON MINES LTD.
GRUM DEPOSIT, Y.T.
LONGITUDINAL SECTION 2+00 N

| DWG. NO. | REFERENCE DRAWINGS |
|---|---|



MECHANICAL LIMITS, UNLESS OTHERWISE NOTED:
FRACTIONAL ± 1/64" DECIMAL ± .010" ANGULAR ± 1/2°

| | | | |
|---|---|---|---|
| DESIGNED | BILL OF MAT'L | DATE | JAN. 15 '75 |
| DRAWN E.W.M. | JOB. NO. | SCALE | AS SHOWN |
| TRACED | CLIENT | Dwg. No. | D. 1552 |
| CHECKED | APPROVED | Rev. | 0 |




## LEGEND

- 10% PLUS COMBINATION Pb + Zn.
- 8 - 10% COMBINATION Pb + Zn.
- 6 - 8% COMBINATION Pb + Zn.
- 4 - 6% COMBINATION Pb + Zn.
- PYRITIC ZONE

| NO. | DATE | REVISION | BY |
|---|---|---|---|

**CANADIAN MINE SERVICES LTD.**
VANCOUVER, B.C. CANADA

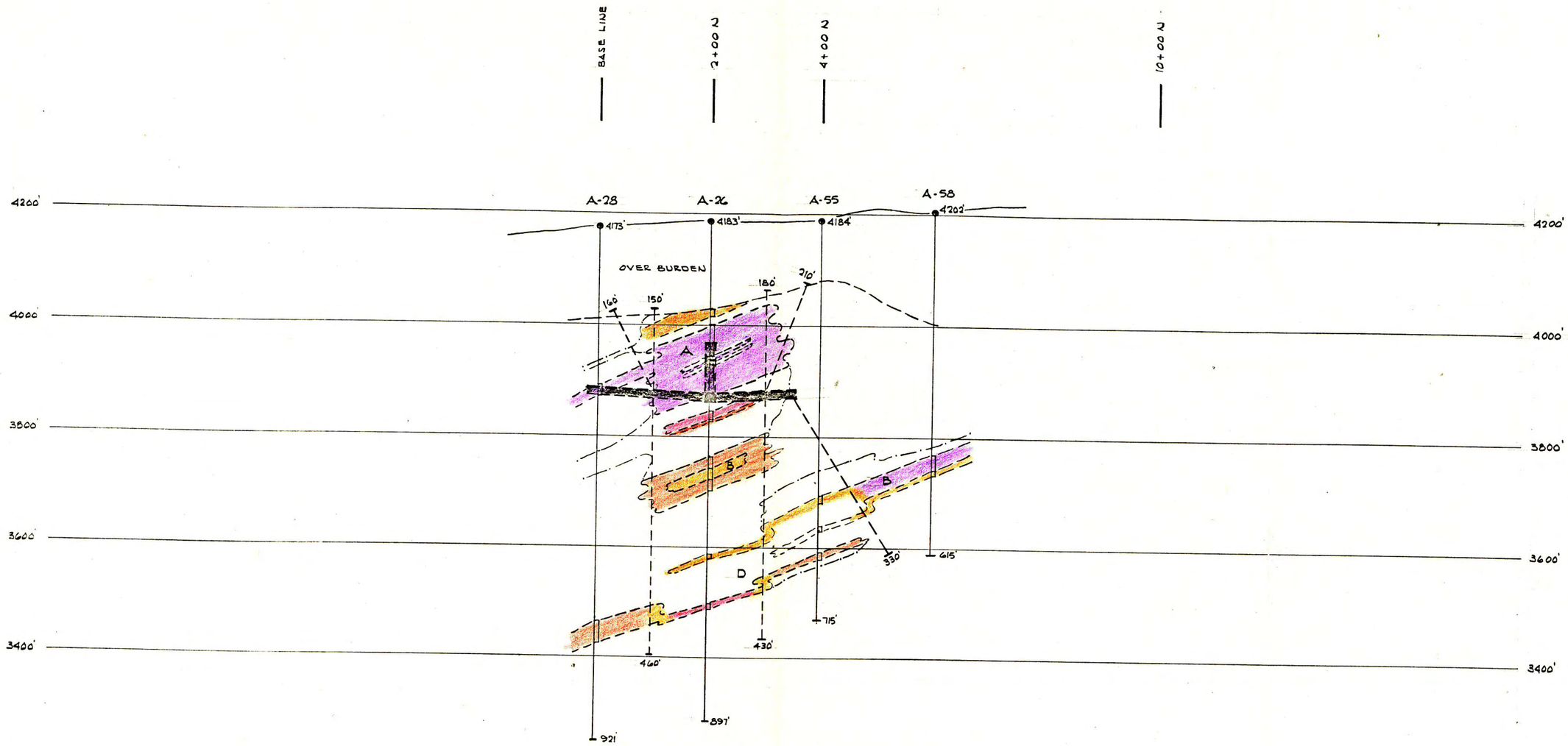
KERR-ADDISON MINES LTD.
GRUM DEPOSIT, Y.T.
LONGITUDINAL SECTION 4+00 N.

| DWG. NO. | REFERENCE DRAWINGS |
|---|---|



MECHANICAL LIMITS, UNLESS OTHERWISE NOTED:
FRACTIONAL ± 1/64" DECIMAL ± .010" ANGULAR ± 1/2°

| | | | |
|---|---|---|---|
| DESIGNED | BILL OF MAT'L | DATE | JAN 15 '75 |
| DRAWN E.W.M. | JOB. NO. | SCALE | AS SHOWN |
| TRACED | CLIENT | Dwg. No. | D. 1553 |
| CHECKED | APPROVED | Rev. | 0 |




SCALE: 100 0 100 200 300 FEET

| NO. | DATE | REVISION | BY |
|---|---|---|---|

**CANADIAN MINE SERVICES LTD.**
VANCOUVER, B.C. CANADA

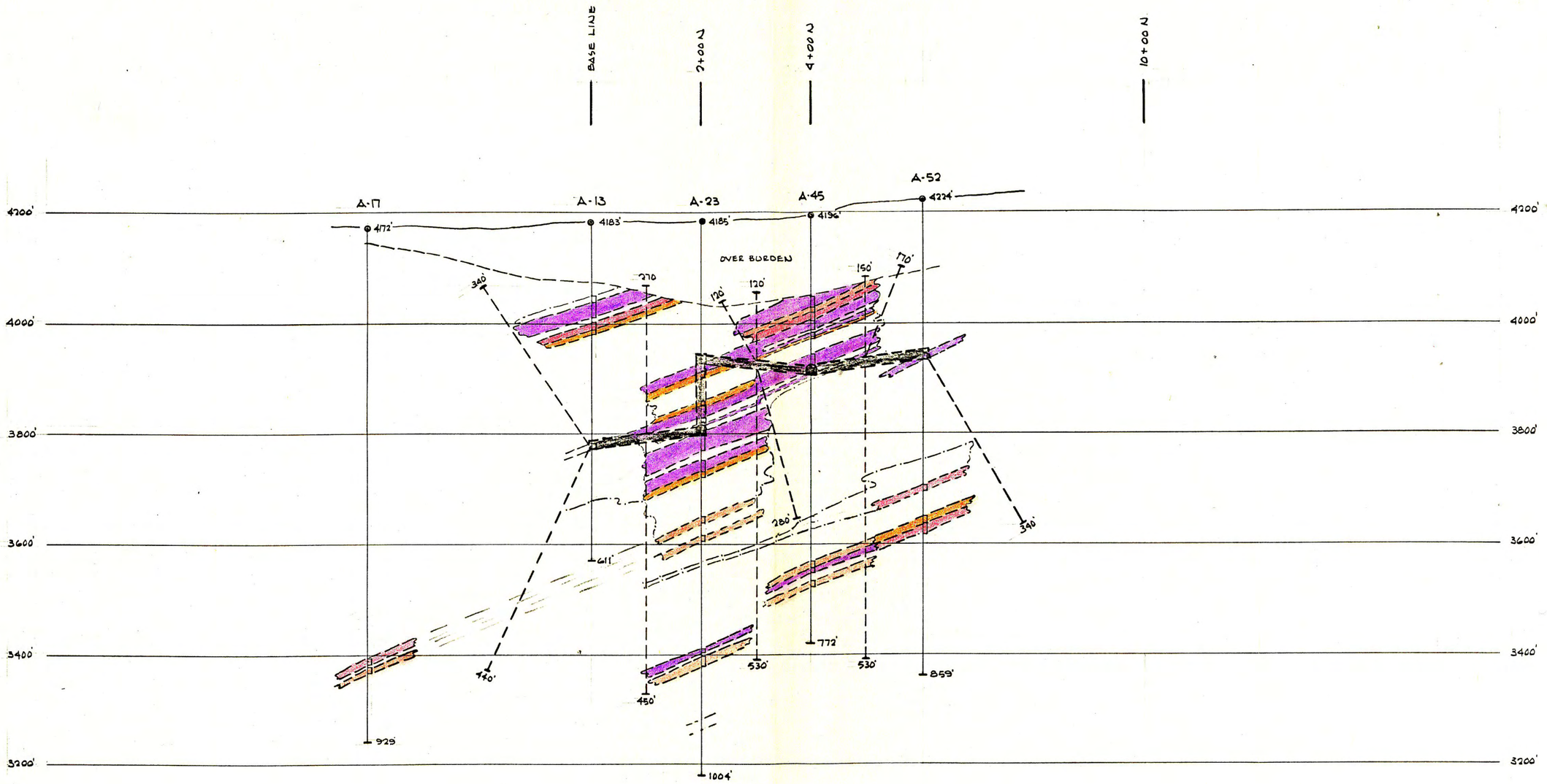
KERR-ADDISON MINES LTD.
GRUM DEPOSIT, Y.T.
SECTION 64+00 W.

| DWG. NO. | REFERENCE DRAWINGS |
|---|---|



MECHANICAL LIMITS, UNLESS OTHERWISE NOTED:
FRACTIONAL ± 1/64" DECIMAL ± .010" ANGULAR ± 1/2°

| | | | |
|---|---|---|---|
| DESIGNED | BILL OF MAT'L | DATE | JAN. 16 '75 |
| DRAWN E.W.M. | JOB. NO. | SCALE | AS SHOWN |
| TRACED | CLIENT | Dwg. No. | D. 1554 |
| CHECKED | APPROVED | Rev. | 0 |




| NO. | DATE | REVISION | BY |
|---|---|---|---|

**CANADIAN MINE SERVICES LTD.**
VANCOUVER, B.C. CANADA

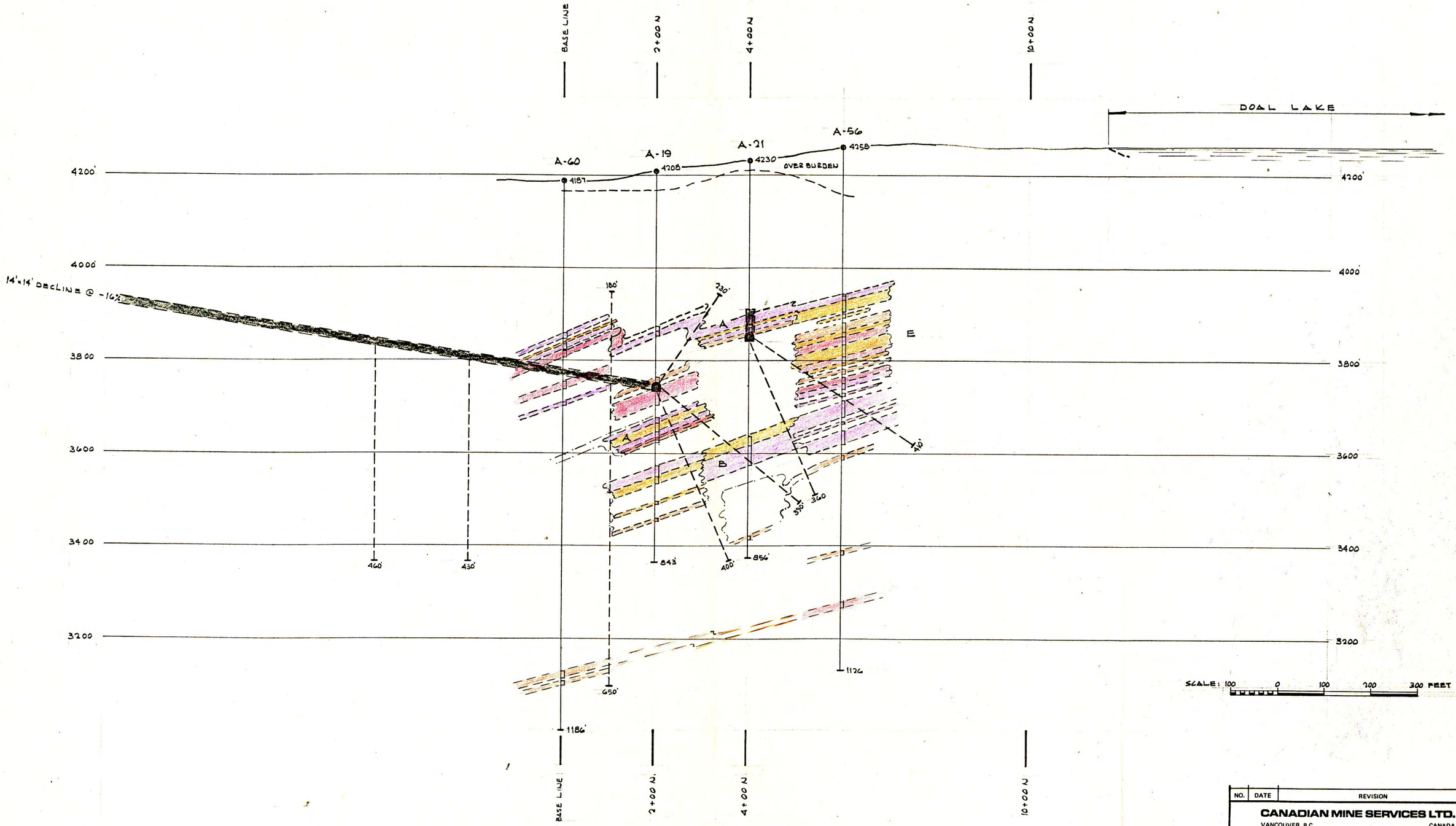
KERR-ADDISON MINES LTD.
GRUM DEPOSIT, Y.T.
SECTION 68+00 W.

| DWG. NO. | REFERENCE DRAWINGS |
|---|---|



MECHANICAL LIMITS, UNLESS OTHERWISE NOTED:
FRACTIONAL ± 1/64" DECIMAL ± .010" ANGULAR ± 1/2°

| | | | |
|---|---|---|---|
| DESIGNED | BILL OF MAT'L | DATE | JAN. 16 '75 |
| DRAWN EWM. | JOB. NO. | SCALE | AS SHOWN |
| TRACED | CLIENT | Dwg. No. | D. 1555 |
| CHECKED | APPROVED | Rev. | 0 |




| NO. | DATE | REVISION | BY |
|---|---|---|---|

**CANADIAN MINE SERVICES LTD.**
VANCOUVER, B.C. CANADA

KERR-ADDISON MINES LTD.

GRUM DEPOSIT, Y.T.

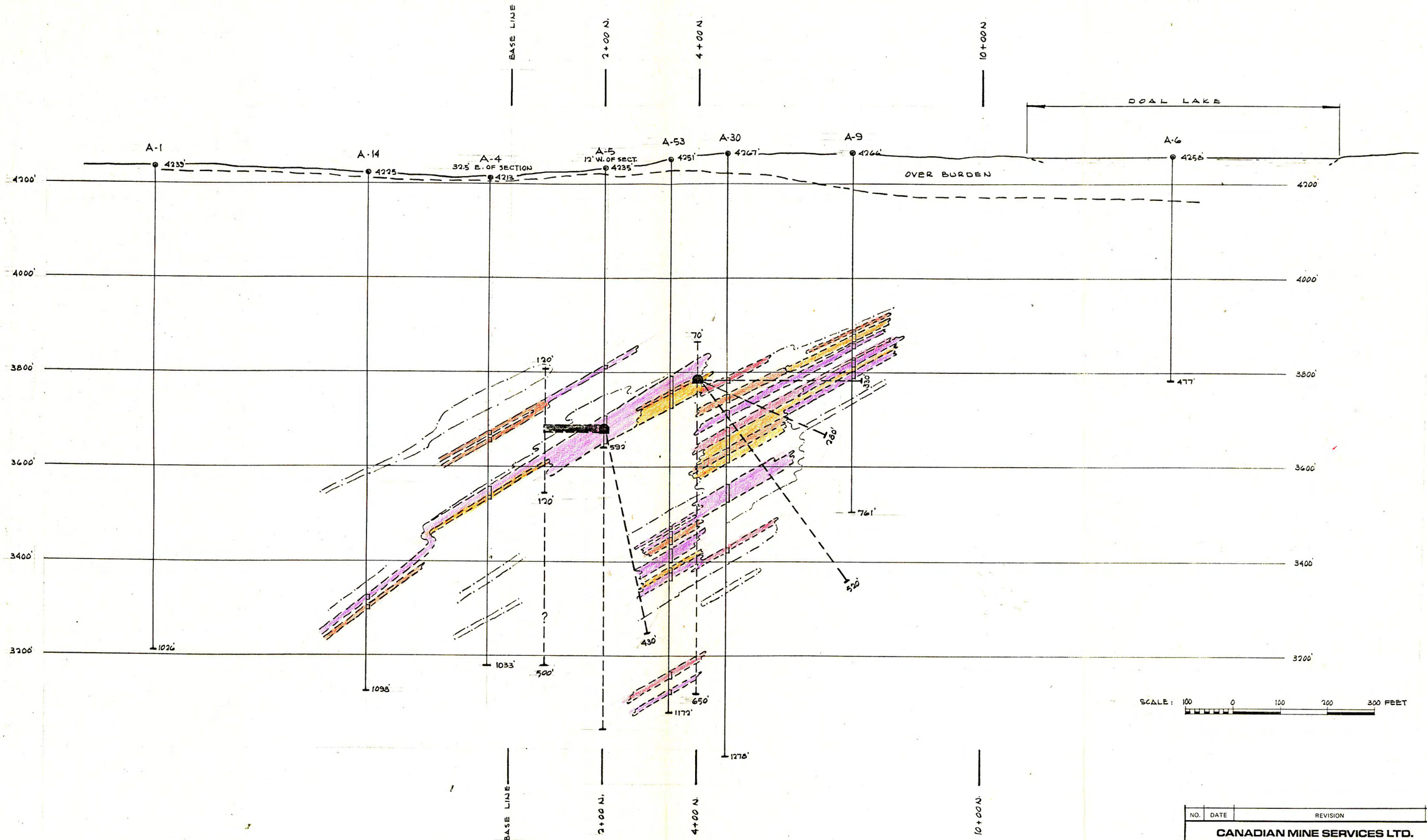
SECTION 72+00 W.

| | | | |
|---|---|---|---|
| DESIGNED | BILL OF MAT'L | DATE | JAN. 16 '75 |
| DRAWN B.W.M. | JOB. NO. | SCALE | AS SHOWN. |
| TRACED | CLIENT | Dwg. No. | Rev. |
| CHECKED | APPROVED | D. 1556 | 0 |

| DWG. NO. | REFERENCE DRAWINGS |
|---|---|



MECHANICAL LIMITS, UNLESS OTHERWISE NOTED:
FRACTIONAL ± 1/64" DECIMAL ± .010" ANGULAR ± 1/2°




| NO. | DATE | REVISION | BY |
|---|---|---|---|

**CANADIAN MINE SERVICES LTD.**
VANCOUVER, B.C. CANADA

KERR-ADDISON MINES LTD.
GRUM DEPOSIT, Y.T.
SECTION 76+00 W.

| DWG. NO. | REFERENCE DRAWINGS |
|---|---|



MECHANICAL LIMITS, UNLESS OTHERWISE NOTED:
FRACTIONAL ± 1/64" DECIMAL ± .010" ANGULAR ± 1/2°

| | | | |
|---|---|---|---|
| DESIGNED | BILL OF MAT'L | DATE | JAN. 16 '75 |
| DRAWN E.W.M. | JOB. NO. | SCALE | AS SHOWN |
| TRACED | CLIENT | Dwg. No. | D. 1557 |
| CHECKED | APPROVED | Rev. | 0 |

## UNDERGROUND PROGRAMME

It was considered necessary to look at the Grum deposit underground for the following reasons:

1. To detmine continuity and shape of lead-zinc mineralization in the interval 62W to 82W, to a depth of approximately 600' below surface (elevation 3600'). This interval was chosen because it contains the shallowest, thickest and highest grade mineralized section.
2. To study rock support problems and determine in a preliminary way a suitable mining system.
3. To provide a metallurgical bulk sample.
4. To correlate underground grade with drill hole grade.

In a preliminary way, we looked at three different concepts for the underground programme. These were:

(a) A ramp driven down plunge at 200N from 64W to 80W with horizontal cross cuts at 400' intervals from which vertical drilling could be carried out.

(b) A diagonal ramp starting at 200N on Section 64W extending down plunge to 4N on section 80W. Again horizontal cross cuts were intended at 400' intervals.

(c) Two inclined down plunge ramps, one at 2N and one at 4N, both extending from 62W to 82W at minus 16% with just enough cross cutting to provide a reasonable drilling base.

This latter concept was selected by M.D. Rowswell as best meeting the requirements of the overall programme.

From these two ramps a fan of drill holes was laid out at 200' cross sections from 62W to 82W to provide a better concept of the shape, tonnage and grade.

In order to correlate drill hole assays with underground assays, four raises were planned on vertical holes previously drilled from surface.

Footages involved in the underground programme are as follows:

Ramps:

| | | | |
|---|---|---|---|
| - | Access decline from Elev.4150 (surface) to 2N on 74W | - | 2639' |
| - | 16% decline in ore at 2N from 62W to 82W | - | 2025' |
| - | 16% decline in ore at 4N from 66W to 80W | - | 1418' |
| - | Access Incline | - | 394' |
| | Total | - | 6476' |

Raises:

| | | | |
|---|---|---|---|
| - | Section 64W on drill hole A-26 | - | 100' |
| - | Section 68W on drill hole A-23 | - | 130' |
| - | Section 72W on drill hole A-21 | - | 60' |
| - | Section 80W on drill hole A-24 | - | 70' |
| - | Ventilation Raise | - | 447' |
| | Total | - | 807' |

Cross Cuts:

| | | | |
|---|---|---|---|
| - | Section 64W from 200N to 350N, Elev. 3860 | - | 150' |
| | 200N to base line, Elev. 3860 | - | 210' |
| - | Section 68W from 200N to base line, Elev. 3800 | - | 200' |
| | 400N to 210N, Elev. 3900 | - | 190' |
| | 400N to 610N, Elev. 3900 | - | 210' |
| - | Section 76W from 200N to 80N, Elev. 3670 | - | 120' |
| - | Section 80W from 200N to 80N, Elev. 3605 | - | 120' |
| | Total | - | 1200' |

Sump at 200N - 50'

Main Remuck Station at 72W at base line - 40'

The total underground workings would be 8573' subject to some variation in the connecting ramp footage.

## UNDERGROUND DIAMOND DRILLING

In as much as the underground programme was considered desirable, we then had to examine the merits of an underground drilling programme as well. While vertical holes were certainly desirable (since the mineralized zones are gently dipping) the cost of providing the necessary cross cuts for vertical drilling was considered prohibitive and a programme of angle drilling was adopted by M.D. Rowswell.

The programme calls for the initial drilling of a ring of holes from the 2N and 4N ramps at 400' intervals. When this work is completed, fill in drilling will be carried out along the same ramps at 200' centres. This programme would provide a very thorough assessment of the shape, tonnage and grade in the interval 62W to 82W and would examine all of the known horizons from surface to slightly below elevation 3100'.

## UNDERGROUND DRILL HOLES

### PHASE I

| Sec. No. & Location | | El. Collar | Incl. | Depth |
|---|---|---|---|---|
| 80W | 1 + 00N | 3616 | Vert.(up) | 170' |
| | | 3606 | Vert.(down) | 500' |
| | 2 + 00N | 3606 | $-56^{0}$ | 220' |

| Sec. No. & Location | | El. Collar | Incl. | Depth |
|---|---|---|---|---|
| | 4 + 00N | 3712 | Hor. | 180' |
| | | 3712 | +60° | 200' |
| | | 3712 | -30° | 220' |
| Total Footage | | | | 1490' |
| 76W | 0 + 75N | 3670 | Vert.(up) | 120' |
| | | | Vert.(down) | 120' |
| | 2 + 00N | 3670 | -78° | 430' |
| | 4 + 00N | 3775 | Vert. | 650' |
| | | 3775 | -24° | 280' |
| | | | -54° | 520' |
| | | | Hor. | 330' |
| | | | Vert.(up) | 70' |
| Total Footage | | | | 2520' |
| 72W | 2 + 00S | 3800 | Vert.(down) | 430' |
| | 1 + 00N | 3768 | Vert.(up) | 180' |
| | | 3750 | Vert.(down) | 650' |
| | 2 + 00N | 3752 | +56° | 230' |
| | | 3742 | -40° | 390' |
| | | 3732 | -67° | 400' |
| | 4 + 00N | 3848 | -34° | 410' |
| | | 3748 | -67° | 360' |
| Total Footage | | | | 3050' |
| 68W | 0 + 00 | 3780 | +56°30 | 340' |
| | | 3772 | -66°30 | 440' |
| | 1 + 00N | 3800 | Vert.(up) | 270' |
| | | 3782 | Vert.(down) | 450' |
| | 3 + 00N | 3932 | Vert.(up) | 120' |
| | | 3932 | +60° | 120' |
| | | 3918 | Vert.(down) | 530' |
| | | 3918 | -76° | 280' |
| | 5 + 00N | 3930 | Vert.(up) | 150' |
| | | 3930 | +69° | 170' |
| | | 3918 | Vert.(down) | 530 |
| | 6 + 00N | 3940 | -60° | 340' |
| Total Footage | | | | 3740' |

| Sec. No. & Location | | El. Collar | Incl. | Depth |
|---|---|---|---|---|
| 64W | 1 + 00N | 3880 | Vert.(up) | 150' |
| | | 3880 | +62° | 160' |
| | | 3868 | Vert.(down) | 460' |
| | 3 + 00N | 3882 | Vert.(up) | 180' |
| | | 3882 | +69° | 210' |
| | | 3870 | Vert.(down) | 430' |
| | 3 + 50N | 3870 | -58°30 | 330' |
| Total Footage | | | | 1920' |
| GRAND TOTAL | | | | 12,720' |

## INTERMEDIATE DRILL HOLES

### PHASE II

Phase II drilling would be conducted on sections 62W, 66W, 70W, 74W, 78W and 82W after the completion of Phase I.

The Phase II hole configuration would be modified as required by Phase I results but for calculation purposes, we can adopt this pattern.

| Section No. | Basis of Calculation | Footage |
|---|---|---|
| 82W | Repeat of Section 80<br>+200 vertical up hole<br>+460 vertical down hole | 1550' |
| 78W | Average of Section 80W and 76W | 2005' |
| 74W | Average of Section 76W and 72W<br>Less 430 drilled from access incline | 2358' |
| 70W | Average of Section 72W and 68W<br>Less 430' | 2935' |
| 66W | Average of Section 64W and 68W | 2830' |
| 62W | Repeat of Section 64 | 1920' |
| Total Footage | | 13,598' |
| TOTAL PHASE I AND PHASE II | | 26,318' |

## BULK SAMPLING

Since two ramps, four raises and portions of the cross cuts were to be driven in ore, involving some 88,000 tons of ore, we had to examine methods of adequately sampling the headings. We did not feel that any form of chip sampling of ore faces was adequate nor were we happy about the customary car sampling process whereby a shovelfull of fine and coarse material is taken from alternate cars.

In as much as Kerr Addison has a sampling plant (exclusive of crushing plant) at Atlin, B.C., we felt that this plant should be utilized on the Grum project.

The procedure would be to put every second round of ore through the jaw crusher and rolls which reduces the ore to ½" size. A Denver Brunton sampler removes * 300 lbs or more of the ½" material which then goes to a gyratory crusher where it is reduced to 10 mesh. A Denver Vezin sampler then removes 5% or 15 lbs of the 10 mesh material for assay. The remainder would go to stock pile for metallurgical purposes.

* Because the main headings are 14 x 14 in cross section, the ultimate sample size could be larger than stipulated.

## PROPOSED 1975 SURFACE DRILLING PROGRAMME

Since it is entirely possible that the Grum Deposit extends North Westward to the Firth Zone, we have a distance of 4000' which has had limited drilling on some sections and none at all on most.

In addition, we plan limited drilling to expand the known deposit North Eastward toward Doal Lake.

Because of the apparent plunge of approximately $10^{o}$ North Westward, many of the drill holes would penetrate 1000' or more of barren rock before reaching ore horizons. For this reason, we felt that a rotary drill could be used for drilling to the ore and a diamond drill would then core through the actual ore horizons. Theoretically a savings of perhaps 40% could be realized by this approach.

We would, however, drill at least one hole to completion by diamond drill on sections 400' apart to provide geological information for that section. The rotary drilling concept would not be adopted unless a firm contract could be obtained at favourable rates.

The contemplated surface drilling programme then, is as follows:

| | | |
|---|---|---|
| Exploratory drilling from Section 88W to 128W (Firth Zone) | | 32 holes |
| | Averaging 1000' | = 32,000' |
| Diamond drilling from Section 64W to 84W | | 10 holes |
| | Averaging 1000' | = 10,000' |
| | Total | = 42,000' |

The actual depth of holes in the exploratory programme may average more than the contemplated 1000' depending upon the amount of upwarp in the ore horizons caused by the intrusion of the Anvil Batholith. If this upwarp is confined to the immediate vicinity of the Firth Zone, then the drill holes may average 1500', thereby increasing the footage of exploratory holes to 48,000'.

## CONCLUDING REMARKS

The Grum deposit, because of its magnitude and grade, might be considered as the key to further mining development in the Anvil Range - Vangorda Creek area of the Yukon Territory.

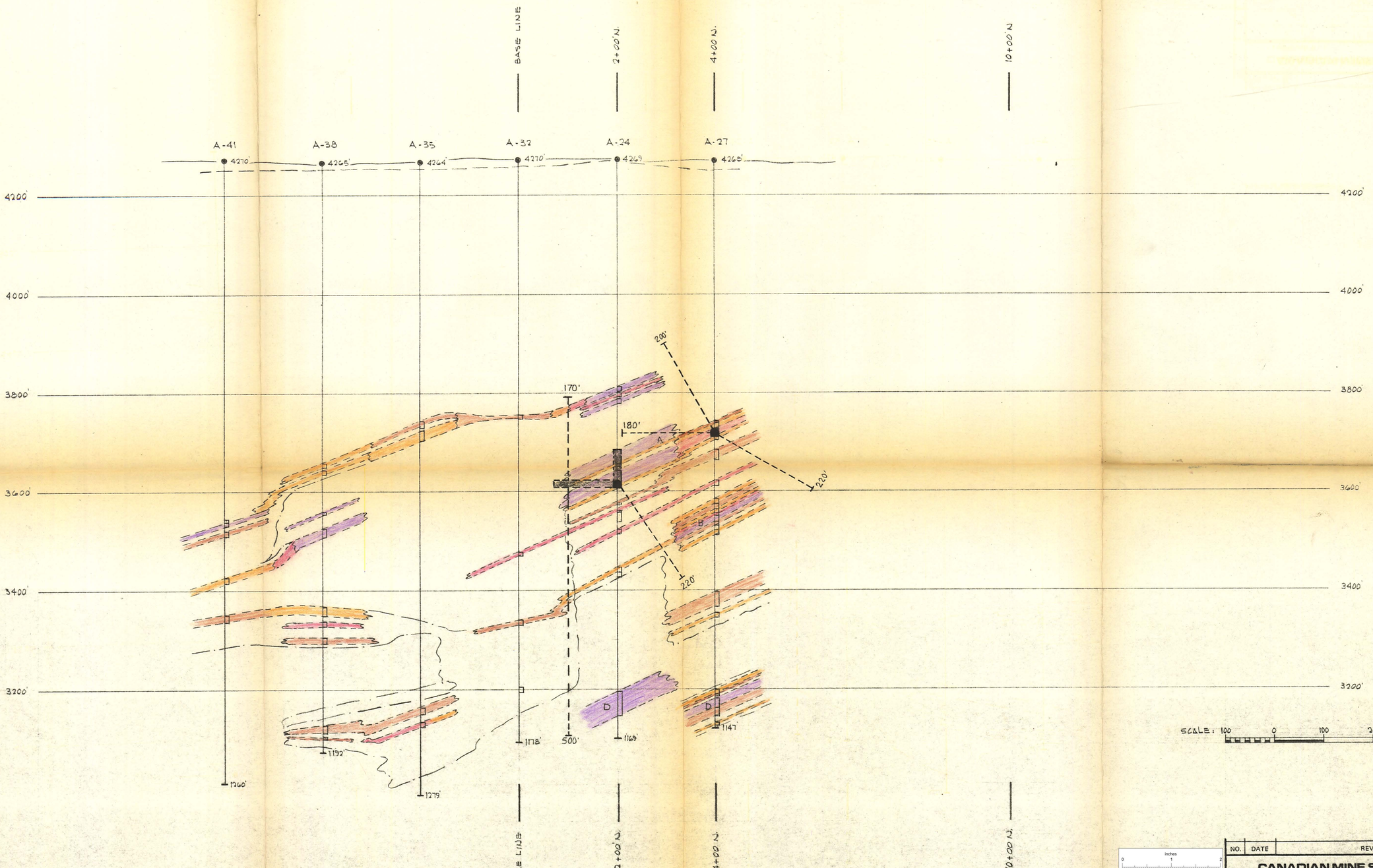
If a successful mining operation can be indicated by the development and drilling programme proposed in this report, such an operation could lead to the development of the adjacent Vangorda Mines property on Vangorda Creek, to the development of Kerr Addison's property at Swim Lakes and, conceivably, to other developments which are currently in the exploration stage.

The proposed development programme on the Grum deposit could be greatly enhanced if most of the development ore could be processed in the Anvil Mining Company's plant. Quite apart from providing an accurate measure of grade, the revenue from this ore would materially offset the cost of the development programme.

Respectfully submitted,

W. M. Sirola, P.Eng.

30th January 1975




inches 0 1 2 / 0 1 2 3 4 5 centimetres

This reference scale bar has been added to the original drawing. It was to scale at the same ratio as the image, therefore it can be used as a reference for the original size.

YUKON GEOLOGICAL SURVEY

| NO. | DATE | REVISION | BY |
|---|---|---|---|

**CANADIAN MINE SERVICES LTD.**
VANCOUVER, B.C. CANADA

KERR - ADDISON MINES LTD
GRUM DEPOSIT, Y.T.
SECTION 80+00 W.

| | | | |
|---|---|---|---|
| DESIGNED | BILL OF MAT'L | DATE | JAN. 16'75 |
| DRAWN W.W.M. | JOB. NO. | SCALE | AS SHOWN |
| TRACED T.S.E. | CLIENT | Dwg. No. | D. 1558 |
| CHECKED | APPROVED | Rev. | 0 |

| DWG. NO. | REFERENCE DRAWINGS |
|---|---|



MECHANICAL LIMITS, UNLESS OTHERWISE NOTED:
FRACTIONAL ± 1/64" DECIMAL ± .010" ANGULAR ± 1/2°

January 24, 1975

MEMO

TO: MR. A.D. McCUTCHEON

FROM: E. W. MARSHALL

cc:

B. SIROLA
F. CHOW
C.D. MACDONALD

# DESIGNED AND ESTIMATED

# UNDERGROUND DIAMOND DRILL FOOTAGE SUMMARY

## KERR - ADDISON MINES LTD.

## GRUM DEPOSIT

The following D.D. footage figures cover footage from drill stations to be established along:

1. The 16 % decline on longitudinal section 2 + 00 N. from section 62 + 00 W. to section 82 + 00 W.

2. The 16 % decline on longitudinal section 4 + 00 N. from section 66 + 00 W. to section 80 + 00 W.

The design footage of 13,750 ft. has been tabulated by scaling the cross - sectional drill footage as layed out every 400 feet in accordance with Bud Rowswell and Bill Sirola of Kerr Addison Mines Ltd.

The estimated footage of 14,825 ft. for the sections between the above 400 ft. sections has been obtained by averaging the two adjacent cross - sections.

The total proposed underground drilling program of 28,575 feet is of course subject to approval by the client.

## I. DESIGNED FOOTAGE

| SECTION | D.D. HOLE NO. | FOOTAGE | TOTAL SECT. FTG. |
|---|---|---|---|
| 64 + 00 W. | 1 | 160 | |
| | 2 | 150 | |
| | 3 | 460 | |
| | 4 | 180 | |
| | 5 | 430 | |
| | 6 | 210 | |
| | 7 | 330 | |
| | | | 1920 |
| 68 + 00 W. | 1 | 340 | |
| | 2 | 440 | |
| | 3 | 270 | |
| | 4 | 450 | |
| | 5 | 120 | |
| | 6 | 530 | |
| | 7 | 120 | |
| | 8 | 280 | |
| | 9 | 150 | |
| | 10 | 530 | |
| | 11 | 170 | |
| | 12 | 530 | |
| | | | 3930 |

DESIGNED FTG. (CONT.)

| SECTION | D.D. HOLE NO. | FTG. | TOTAL SECT. FTG. |
|---|---|---|---|
| 72 + 00 W. | 1 | 460 | |
| | 2 | 430 | |
| | 3 | 180 | |
| | 4 | 650 | |
| | 5 | 230 | |
| | 6 | 400 | |
| | 7 | 390' | |
| | 8 | 360 | |
| | 9 | 410 | |
| | | | 3510 |
| 76 + 00 W. | 1 | 120 | |
| | 2 | 500 | |
| | 3 | 430 | |
| | 4 | 70 | |
| | 5 | 650 | |
| | 6 | 520 | |
| | 7 | 280 | |
| | 8 | 330 | |
| | | | 2900 |
| 80 + 00 W | 1 | 170 | |
| | 2 | 500 | |
| | 3 | 220 | |
| | 4 | 180 | |
| | 5 | 200 | |
| | 6 | 220 | |
| | | | 1490 |

TOTAL DESIGNED FTG. = 13,750'

## II. INTERMEDIATE SECTION ESTIMATES

| SECTION | SECT. FTG. |
|---|---|
| 62 + 00 W.<br>(Repeat of section 64 + 00 W.) | 1920' |
| 66 + 00 W<br>(Avg. of sections 64 + 00 W<br>and 68 + 00 W.) | 2925' |
| 70 + 00 W.<br>(Avg. of sections 68 + 00 W<br>& 72 + 00 W less 890' ft.<br>drilled from access decline) | 3275' |
| 74 + 00 W<br>(Avg. of sections 72 + 00 N<br>& 76 + 00 W. less 890') | 2760' |
| 78 + 00 W.<br>(Avg. of sections 76 + 00 W.<br>& section 80 + 00 W) | 2195' |
| 82 + 00 W<br>(Repeat of FTG. drilled from sect.<br>80 + 00 N on 2 + 00 N decline<br>Plus additional 200' vert. Up hole,<br>460' vert down hole & 200 horiz.hole to the<br>north) | 1750' |

TOTAL INTERMEDIATE SECTION ESTIMATED FTG. = 14,825'

TOTAL FOOTAGE FOR PROPOSED DIAMOND DRILL PROGRAM = 28,575'