The Grum Deposit is a complexly folded set of ore horizons which in cross section have the overall shape of a crumpled N (Fig 1). The folds plunge shallowly toward the northwest in the direction of the Firth showing. The subcrop of the deposit (Fig 2) is largely covered by an extensive blanket of gravel up to about 90 m thick. The Deposit is truncated at its southwest end by the Doal Lake fault which strikes north-south and dips about 35° towards the west. The remaining margins of the deposit have not been completely delineated by drilling. The purpose of this memo is to summarize the remaining areas of the deposit that require further drill definition and to rate the urgency of this drilling first in terms of definition of open pit reserves and second in terms of what enhancement

of overall geological reserves can be expected. No consideration is given to holes needed to define rock characteristics of waste sections peripheral to the deposit but within potential open pits or to holes needed to evaluate potential waste dump areas.

Main Deposit Area

The Deposit has been most extensively drilled between sections 62W and 86W and it is only between these sections where drill defined reserves are available. In this portion of the deposit the only margin of the deposit that is well defined is eastern boundary where the Doal Lake fault truncates the Gunn fold structure. The Northeast and southwest limits of the deposit between 62W and 86W are only partially defined however the available drilling strongly indicates that any additional mineralization would be either too deep or to thin and low grade to be considered economic.

The best potential within this volume is within the deep northeast portion of the deposit where extensions of the upright panel (fig2) have been only partially tested by drilling. This panel of mineralization is usually comprised of good grade massive sulphides but within the only areas requiring further drilling (W to W$\frac{1}{2}$ and N to N) the panel is at great depth ~~[illegible]~~ (m deep) thus cannot be considered open pit material.

Northwest extension

The Gunn deposit is known to extend beyond section 86W to at least section W where it is truncated by another major fault. Drilling in this area has met with mixed success but a large area (fig 2) is interpreted to contain potential for significant additional underground reserves. Based on extension of known mineralization to the northwest this portion of the deposit can reasonably be expected to contain reserves on the order of x10⁶ tonnes with an average grade of about % Pb + Zn g Ag from section 86W to W

Champ Zone

Southeast of G2W extending to S2W is the champ zone. Geologically the champ zone consists of one or more of the stratigraphically highest ore horizons (within Vangorda formation) of the Grum Deposit. All drilling to date has indicated that these horizons are in total thinner and lower grade than other horizons which comprise the bulk of the deposit. The contribution of these upper horizons to the total reserves of the Grum Deposit is small ( )

At the upplunge end of the Grum structure these horizons subcrop beneath gravel from m to m thick. Since this mineralization is relatively shallow and near the edge of planned pits consideration should be given to further definition of this mineralization.

(1976, Mineral Inventory Report)

Kerr Addison estimated that the Champ zone could contain 1.7 $\times 10^6$ tonnes averaging % Pb % Zn gm/tonne Ag (from W to W and S to S) however

This estimate is probably heavily biased by DDH A-63 which cut better mineralization than other holes in the area and may be unrepresentative of the entire zone. The accompanying sections show Kerr Addisons interpretation of the Champ zone updated to reflect 1982 drilling (A218-A226) in the area. The best grade massive sulphide mineralization in this zone is within the relatively shallow (< 120 m) upper limb of the inferred folded structure.

These relationships suggest three possible drill strategies in this area

a) drill nothing on the premise that the mineralization is too low grade to warrant mining

b) drill off the entire area on at least a [illegible] x [illegible] m spacing with 30.5 m spacing as required

c) drill test only the highest grade mineralization in the upper folded limb on a 30.5 x 61 m spacing

Of the latter two possibilities b) would require about 2100 m to 2600 m of drilling in 11 to 15 holes to test

The entire zone and define reserves to a degree comparable to the remainder of the deposit ~~which~~ and might add 2×10^6 tonnes of low grade reserves based on Kerr Addisons estimates (assuming they included no tonnage from 54W)

Possibility C) would require 820 m of drilling in 7 holes and might add 4-500,000 tonnes of reserves at approximately 8-10 % Pb+Zn 50-60 g/t Ag between sections 63 and 55W with a stripping ratio estimated at approximately 10 to 1 on a volume basis. This approach would be a minimum required to define the best grade and shallowest ore however it would result in the highly undesireable situation of stopping holes short of mineralization. A preferred whole minimal program directed at the same target plus deeper mineralization on the lower limb of the fold would total about 1300 m. This program would evaluate all near surface ore within 150 m laterally of the Elk pit and above the Dad Lk fault

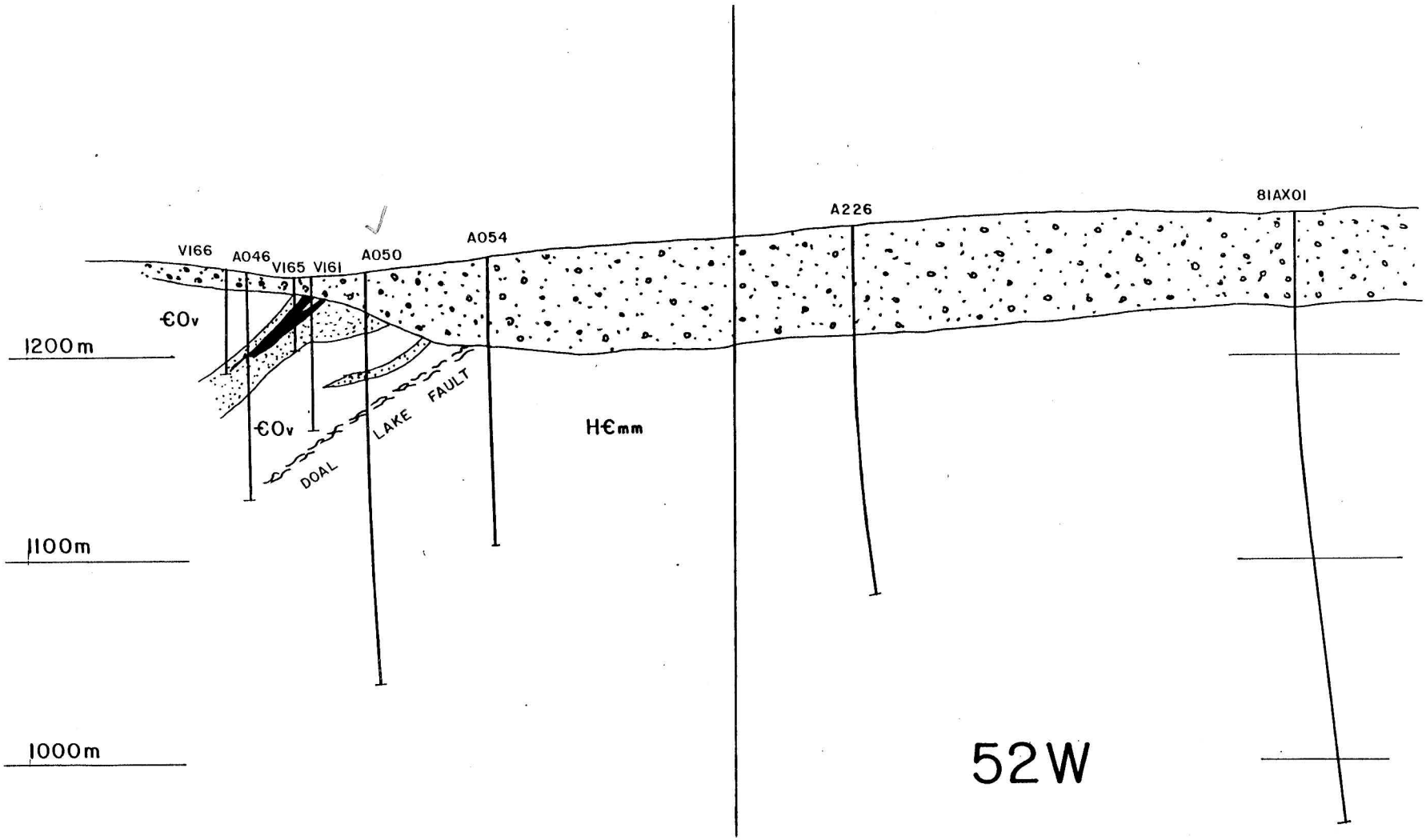
The Grum deposit is a ~~shallowly northwest~~ which plunges shallowly northwest away from complexly folded set of ore layers ~~that~~ their subcrops beneath glacial overburden at the deposits southeast end. The deposit is essentially blind due to ~~either~~ rock or gravel cover ~~of~~ only locally, however most of the ~~remaining~~ remaining marginal definition drilling required involves ~~one~~ too deep to be considered ~~open~~ open pitable.

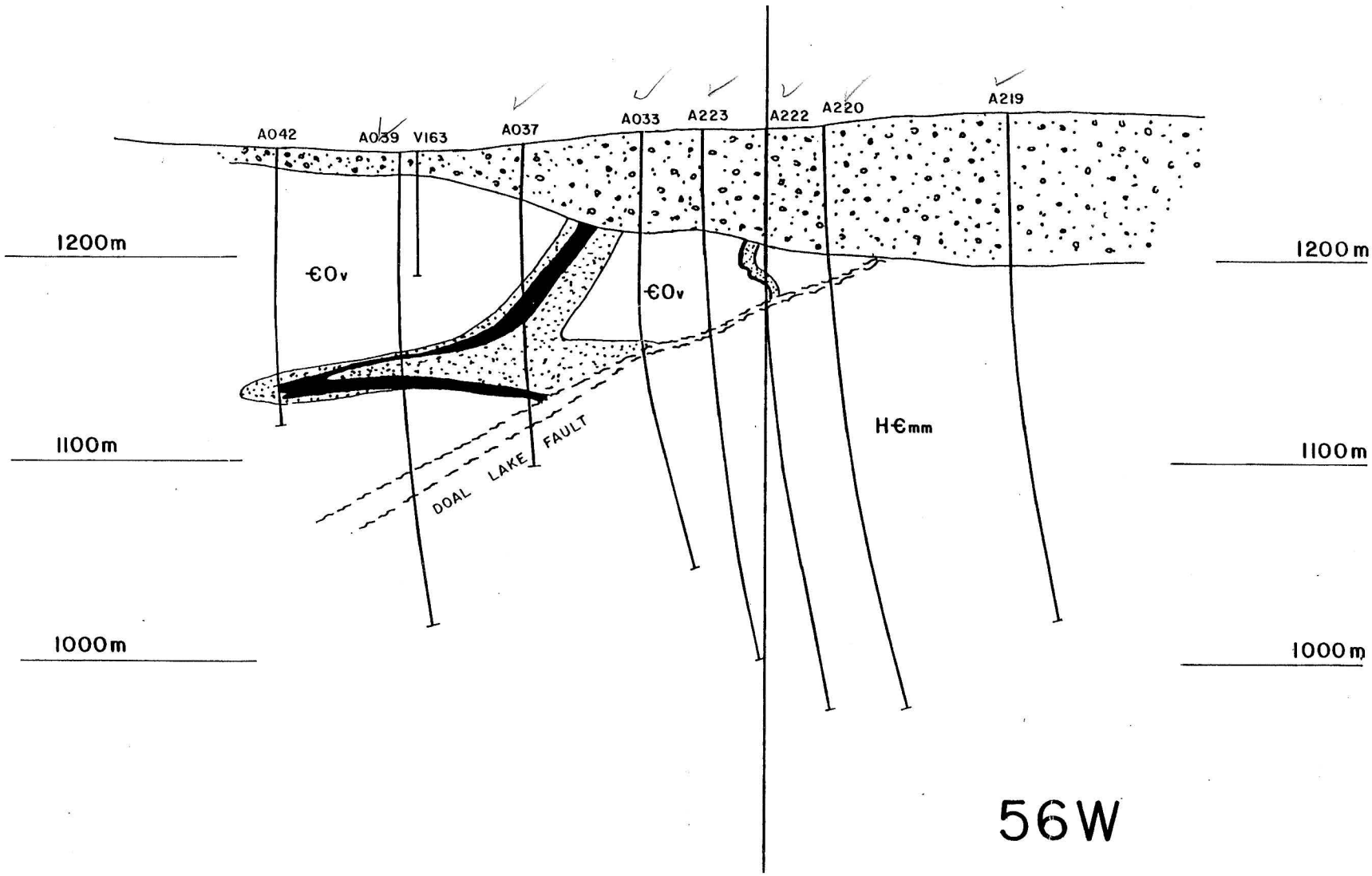
An exception to this generalization is the extreme southend of the deposit where there is subcropping low grade mineralization ~~occurs~~ outside any planned pits. This mineralization is known as the champ zone. Geologically the champ zone is one or ~~several~~ more of the stratigraphically highest of the several ore horizons that comprise the overall Grum Deposit. Drilling down plunge toward the northwest shows that there are two or three

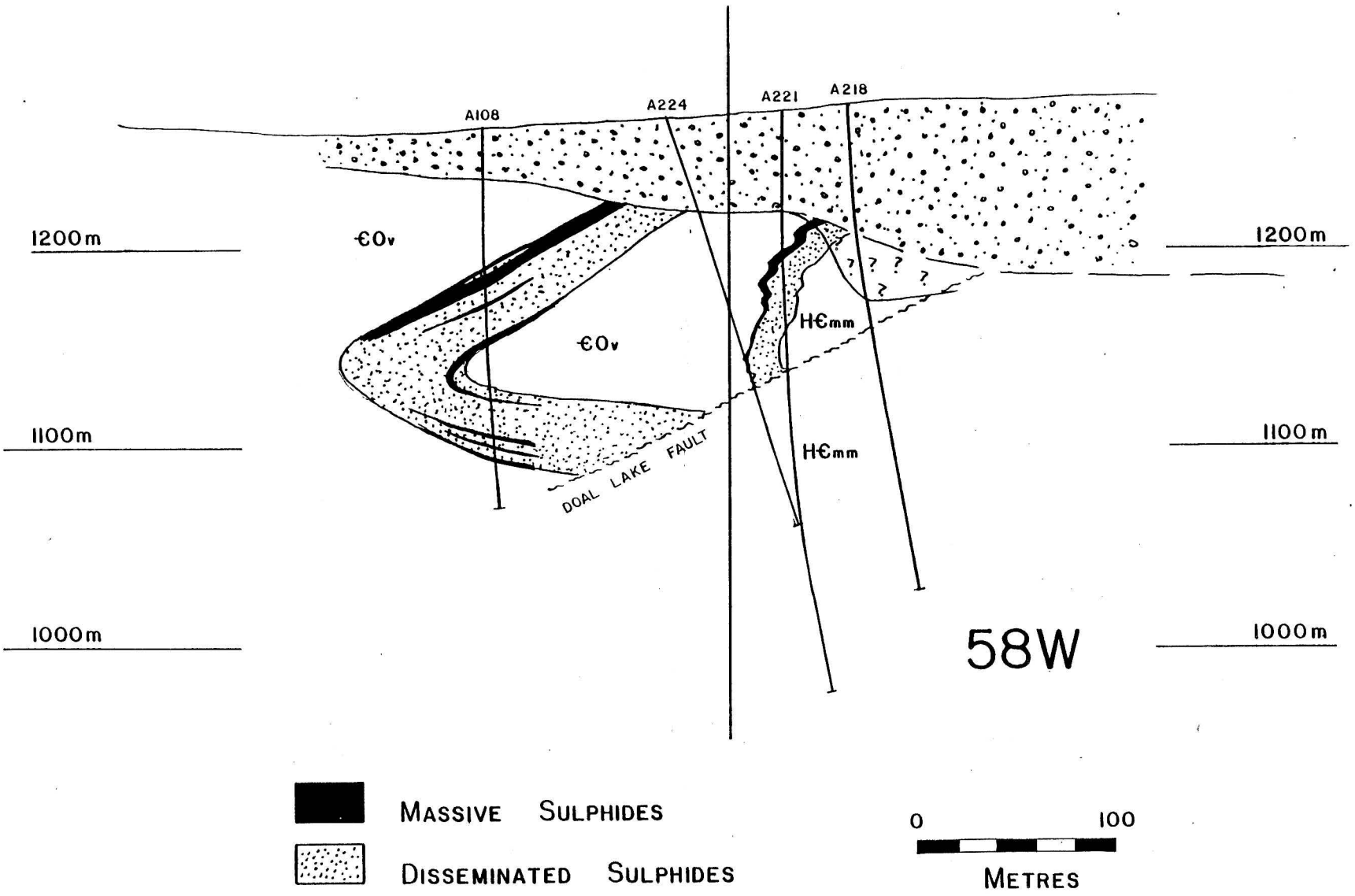
Such horizons and that they tend to be thinner and lower grade than the main horizons which comprise the bulk of ~~Gross~~ Reserves. The upper horizons have thus tended to be only ~~evaluated~~ evaluated on a few sections - These horizons ~~are~~ are close enough to the surface on sections SCW though GOW that they warrant more thorough drill evaluation in the present O/K plan Pit comes within a few hundred feet of this minimization and a deeper pit designed to extract the upright panel one would actually expose some of the champ zone ~~mineralization~~ leaving the remainder with something like a 1:1 incremental stripping ratio.

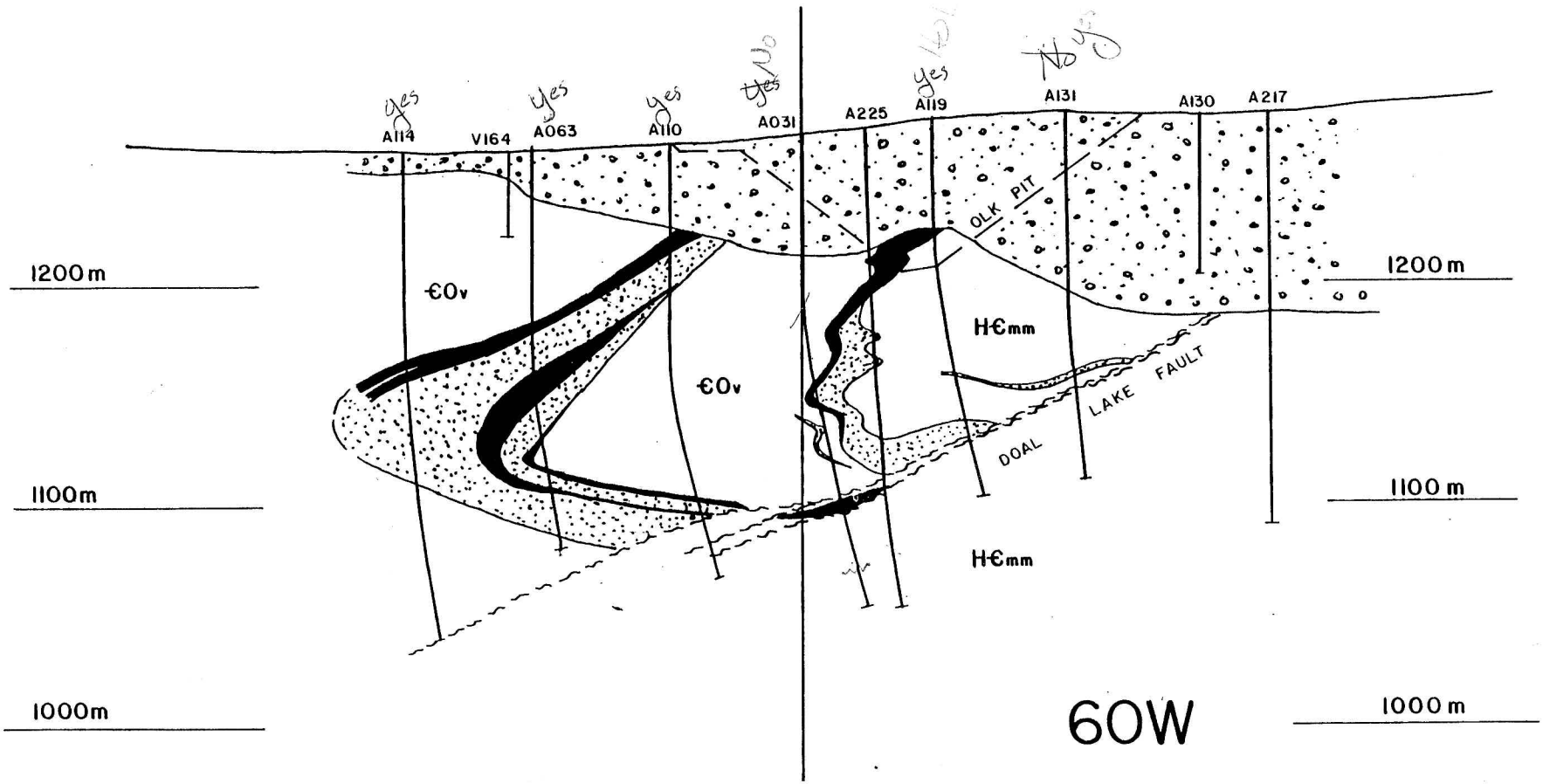
Ken Addison ~~tonnage~~ estimated the champ zone could contain 1.7 mt at 7.8% Pb+Zn this is not included in geological reserves to date

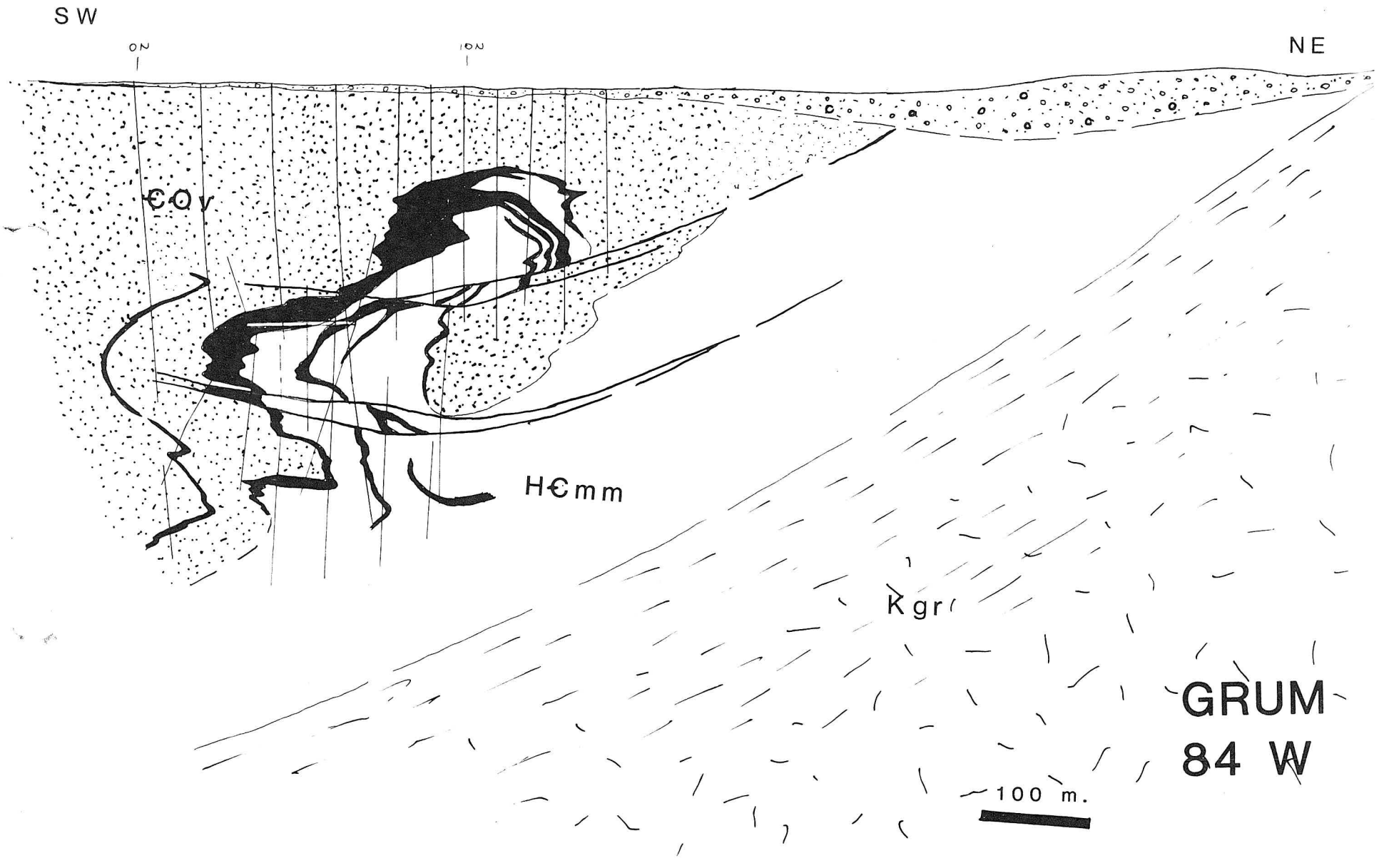
The Grum Deposit is incompletely drilled off in every direction except east where it is truncated by the Doré Lake fault (fig 1). Since the Deposit is a shallowly northwest plunging fold structure (fig 2) the lack of marginal definition drilling is largely of long term or academic importance since the known limits are already too deep to be of relevance to open pit mining in most areas. The major exception to this generalization is in the extreme southend of the deposit (fig 1) known as the Champ Zone. The other major area of interest where significant increases in geologic reserves of the Grum Deposit can be expected to result from additional drilling is known as the Northwest extension (fig 1) where only underground reserves are possible. In the most northerly portion of the deposit, "the Gnomes Cap" (fig 1), additional definition drilling may be required however here one is quite deep and low grade and added information would be mainly needed to evaluate how much marginal ore might be extracted simply in providing room for deeper more southerly portions of a pit.


VI66
A046
VI65
VI61
A050
A054
A226
81AX01
€Ov
€Ov
1200m
1100m
1000m
LAKE FAULT
DOAL
H€mm
52W
MASSIVE SULPHIDES
DISSEMINATED SULPHIDES
0
100
METRES


A042
A039
V163
A037
A033
A223
A222
A220
A219
1200m
1100m
1000m
€Ov
€Ov
H€mm
DOAL LAKE FAULT
56W
MASSIVE SULPHIDES
DISSEMINATED SULPHIDES
0
100
METRES


A108
A224
A221
A218
1200m
1100m
1000m
€Ov
€Ov
H€mm
H€mm
DOAL LAKE FAULT
58W
MASSIVE SULPHIDES
DISSEMINATED SULPHIDES
0
100
METRES


A114
V164
A063
A110
A031
A225
A119
A131
A130
A217
OLK PIT
1200m
1100m
1000m
€Ov
€Ov
H€mm
H€mm
LAKE FAULT
DOAL
60W
MASSIVE SULPHIDES
DISSEMINATED SULPHIDES
0
100
METRES


SW
NE
ON
ION
€Ov
H€mm
Kgr
GRUM
84 W
100 m.

80W	over	P	plat+Pd	Ag	tonnes
16	712	3.08	6.63	44	134,000
17	880	3.11	9.51	57	167,000
18	487	3.33	12.00	69	99,000
20	507	3.90	13.26	96	121,000
21	477	3.41	7.58	54	99,000
22	210	3.46	7.99	63	44,000
23	245	4.47	13.58	112	67,000
24	242	3.94	7.00	46	58,000
26	1102	3.44	10.99	68	231,000
28	175	3.35	15.31	116	36000
34	250	4.19	12.35	82	64,000
35	87	4.36	8.97	60	23,000
36	765	3.83	6.26	46	18,000
37	867	3.98	11.02	73	210000
39	865	3.99	15.57	89	211,000
43	330	3.93	6.44	42	79,000
45	610	4.28	11.46	68	159,000
					1,820,000
(1	1060	3.03	5.89	34	196,000) ?
2	1325	3.39	8.32	52	274,000
3	560	3.03	7.66	49	103,000
4	[illegible]				
5	762	3.03	763	47	141,000
6	310	2.86	622	38	54 000
7	92	2.99	6.39	38	17,000
9	850	2.89	8.95	57	62,000
12	585	3.22	6.96	40	115,000
13	175	2.95	5.21	46	34,000
					993,000
					2813.000

82W

21	237	3	8.41	55	43 000
22	177	3.3	11.31	70	36 000
26	440	3.3	11.95	80	89 000
27	547	3.3	7.76	48	110,000
31	47	3.3	10.67	63	9000
32	1077	4.15	12.83	84	273,000
34	62	4.0	18.83	120	15,000
36	207	3.3	13.92	85	42,000
37	560	3.3	11.17	71	113,000
39	262	3.3	11.70	73	53,000
44	1580	3.98	11.99	77	384,000
45	75	4.0	5.44	54	18,000
48	355	3.8	11.12	72	82,000
50	340	3.3	7.60	58	68,000
58	302	3.3	8.37	53	61,000

5,396,000 @ 11.23 x 70g

metals 156800 tonnes

1	795	3	7.26	42
3	75	4	7.08	29
4	95	4	21.14	134
5	42	3.3	9.20	58
6	160	3.3	6.64	59
8	110	3.3	12.20	62
9	87	3.3	11.81	94
11	142	3.3	4.43	27
12	627	3.3	7.00	45
15	52	3.3	10.37	57
16	327	3.3	6.03	38

84W

10	2550	3.3	7.06	40	513000
14	477	3.3	9.29	62	96000
15	425	3.30	834	53	86000
16	250	3.50	11.97	78	53000
17	342	3.3	8.03	55	69000
18	345	3.3	6.93	41	69000
19	231	3.3	8.07	54	46000
22	135	4.0	11.26	76	34000
23	375	3.3	9.52	62	75000
24	352	3.5	15.21	96	75000
25	72	3.5	21.40	123	15000
26	407	3.3	12.16	80	82000
29	987	4.0	8.77	61	240000
30	60	3.3	9.67	63	12000

1,466,000 @ 8.90

Metal = 130,500 tonnes

2

3

4

5

6

7

86W

12	102	4	25.00	117	25000
13	362	3.5	9.97	78	77000
15	357	3.5	9.67	66	76,000
16	57	3.0	6.15	33	10000
18	857	3.3	11.94	72	173000
20	435	3.0	6.09	38	77,000
27	37	3.3	8.07	40	74000
28	230	3.8	16.11	98	53000
30	447	3.8	9.39	58	104000
32	137	4.0	14.40	94	33000
34	1050	4.0	10.15	66	256,000
24	550	4.0	19.29	102	134000
22	380	3.0	6.12	38	64000

1,161,000 @ 11.40

132,400 tonnes Metal

3
7
8

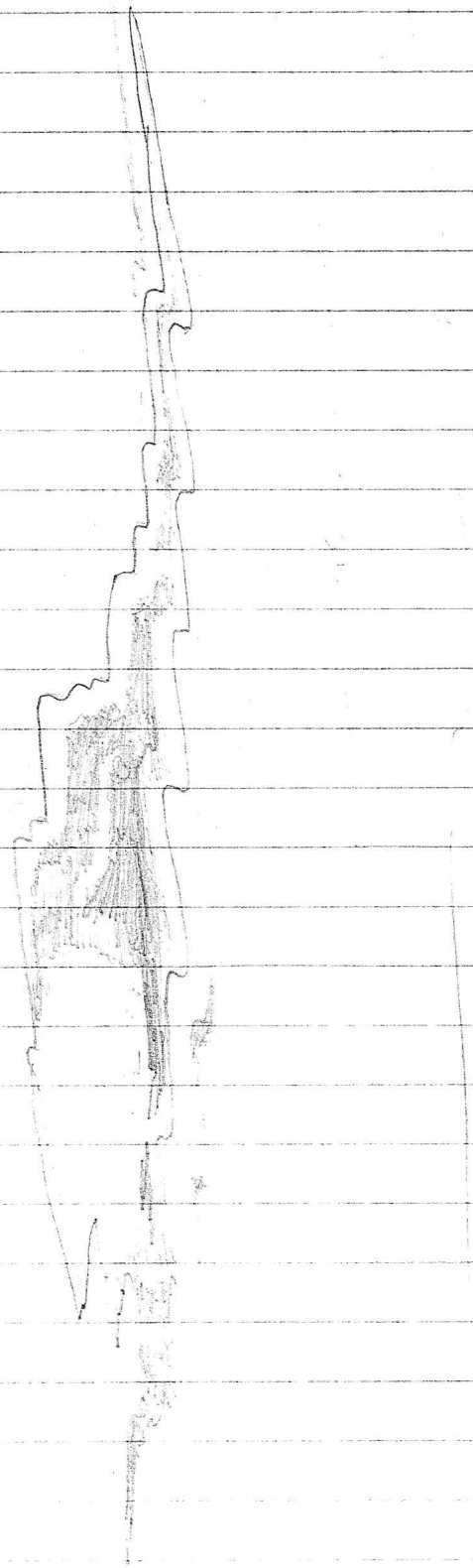


Table I gives the major lithologic subdivisions of the Vaqueros formation, Table II the commonly used modifiers and Table III lists some common lithologic equivalencies with the Mt Mye formation

Table I

Major compositional subdivisions of Unit 5, the Vangorda formation

5B	medium grey phyllite, normally calcareous
5C	metabasite / greenstone
5D	chloritic Phyllite, normally calcareous
5E	limestone / marble
5F	banded chloritic phyllite / bedded metatuff.
5A or G	graphitic phyllite : A used near base of unit G used near top of unit

Note:
in areas of greenschist facies metamorphism unit 3D can be a member of the Vangorda formation, rocks of 3D are calcsilicates derived from higher grade metamorphism of unit 5BD and its ~~[illegible]~~ variants.

Table II

modifiers used to describe compositional or textural variants of subunits listed in table I

0 - "normal"	i.e. has characteristics falling in the normal range defined for unit 5B0 is calcareous as is 5D0, 5C0 is not calcareous
1 - siliceous	often synonym for hard. but should not be used to indicate light colored.
2 - carbonaceous	more carbonaceous (ie dark colored) than is considered normal for subunit, but not enough to be in next darker subunit, 5B0 - 5B20 - 5A0 are a gradational sequence.
3 - calcareous	more calcareous than is considered normal for the subunit or calcite bearing if unit not normally calcareous. 5B3 is highly calcareous 5C3 is simply calcite bearing.
4 - altered	generally indicates light colored relative to normal unit but still having clear textural relationship. Not sufficiently altered to be considered part of the 4L alteration package and not necessarily related to it.

6 - non calcareous	used for a ~~rock~~ that otherwise fits the major compositional definition of a subunit but is not calcareous. SB0 is calcareous but SB6 is not.
8 - chloritic	used to indicate the rock is more chloritic, or greener, than normal. but is otherwise best considered a member of the subunit. SB80 looks like SB0 but is about the same green as SD0
9 - sulphide bearing	contains more than the usual amount of sulphide minerals - especially base metal sulphides

Grim to Vaugonda - what is the significance of the DL Fault - what is its sense of displacement - does it have an apparent lateral throw - what is its effect on detailed conductor traces in the area.

build a cross section from EA 76 X 06 through FAGA 47 - what are the space possibilities for ore in the vicinity -

compile all info on overburden thickness onto a map

What is clear is:

a) we dont know what is going on in that area

b) both footwall and hangingwall lithologies seem to be present

c) there is not much outcrop

d) subsurface data is needed

e) the situation is sufficiently confusing that the claims shouldnt be disputed.

Grum & NW

champ zone drilling

NW extension drilling

Frith potential

SW "down dip" extensions

detailed EIA over grum extension - linecutting-extension and rehab. costs are fileable and could be used for SUN claims problem area.

Where does the Tie fault go toward the IVE??? How does it relate to the DL fault and the make believe fault?

What is going on SW of the Fault zone - what is the exploration potential there - what can be done to address this area?

not certain that conductor trends are offset by SW extension of fault - oil fault may bend, and cross the valley.