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MT. BISCHOFF TIN PROSPECT

EXPLORATION LICENCE 13/79

TASMANIA

REPORT ON STAGE 2 A PROGRAMME

VOLUME 1 REPORT NO. 502

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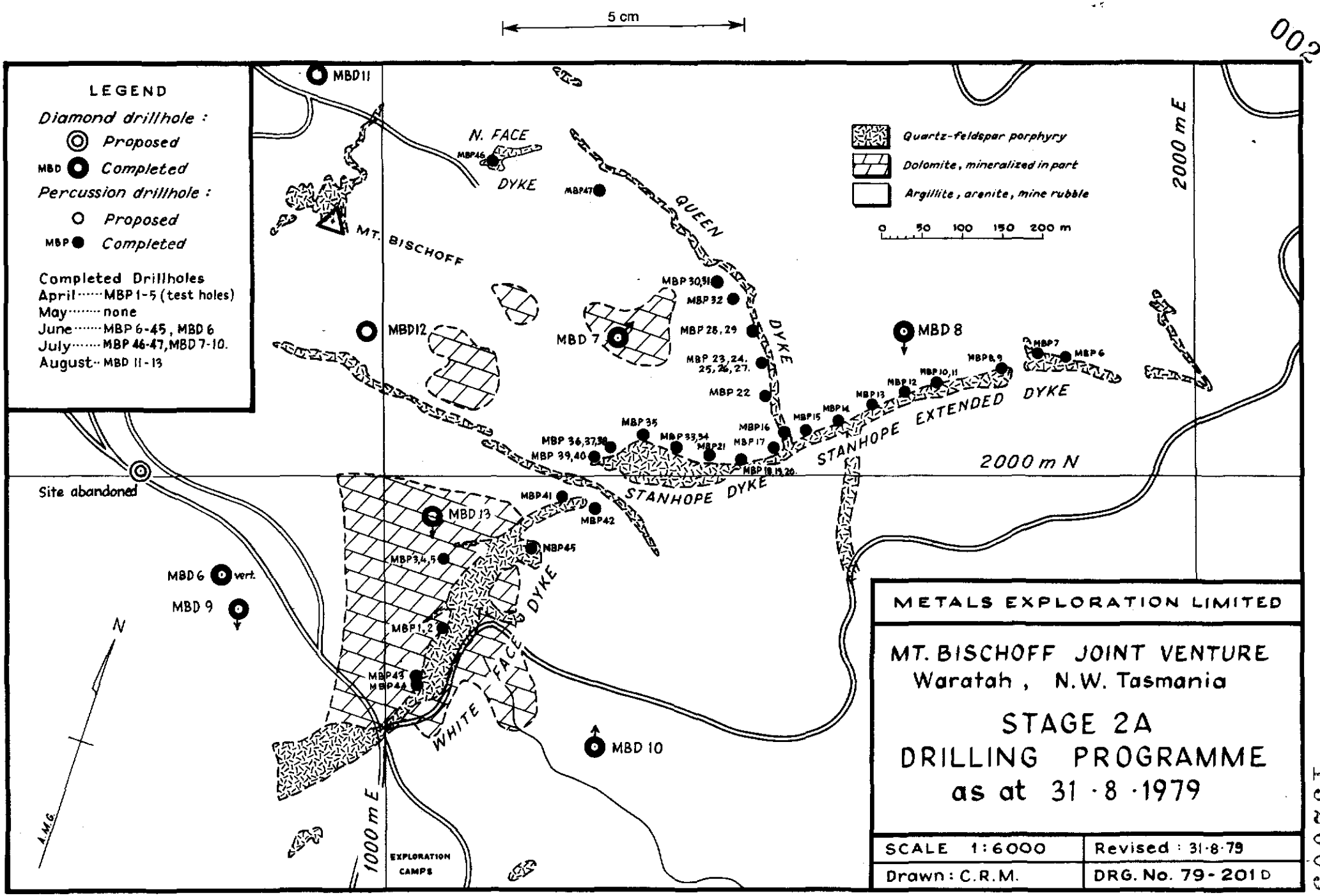
5 cm
002
LEGEND
Diamond drillhole :
Proposed
MBD Completed
Percussion drillhole :
Proposed
MBP Completed
Completed Drillholes
April ····· MBP 1-5 (test holes)
May ····· none
June ····· MBP 6-45, MBD 6
July ····· MBP 46-47, MBD 7-10.
August ·· MBD 11-13
Quartz-feldspar porphyry
Dolomite, mineralized in part
Argillite, arenite, mine rubble
0 50 100 150 200 m
MBD11
N. FACE
MBP46
DYKE
MBP47
QUEEN
MT. BISCHOFF
MBD12
MBP 30,31
MBP 32
MBD 7
MBP 28, 29
DYKE
MBD 8
MBP 23, 24, 25, 26, 27.
MBP 22
MBP7
MBP 6
MBP8,9
MBP10,11
MBP12
MBP13
MBP14
MBP15
MBP16
MBP17
MBP 18,19,20
DYKE
STANHOPE EXTENDED
2000 m E
2000 m N
MBP 35
MBP 33,34
MBP21
MBP 36,37,38
MBP 39,40
Site abandoned
STANHOPE DYKE
MBP41
MBP42
MBD 13
MBP45
MBP 3,4,5
MBD 6 vert.
MBD 9
MBP1,2
WHITE FACE DYKE
MBP43
MBP44
MBD 10
N
A.M.G.
1000 m E
EXPLORATION CAMPS
METALS EXPLORATION LIMITED
MT. BISCHOFF JOINT VENTURE
Waratah, N.W. Tasmania
STAGE 2A
DRILLING PROGRAMME
as at 31·8·1979
SCALE 1:6000
Revised : 31-8-79
Drawn : C.R.M.
DRG. No. 79-201 D
19203

SUMMARY

The Stage 2 A Programme, between February and September, 1979, was designed to extend the limit of known reserves to a potential of 20 million tonnes at about 0.3 % Sn. This objective was not achieved.

The Exploration Area (being part of EL 5/63) was converted to an Exploration Licence No. 13/79 of 20 square kilometers.

The mine grid was extended to cover the Summit area of Mt. Bischoff and a small grid was established over the "northern dolomite" about 1.5 kilometers north east of the Mt. Bischoff trig.

An airborne magnetic survey was flown over the whole exploration area revealing a major anomaly over the Mt. Bischoff mineralisation. Interpretation of the results indicates at least 12 other lesser anomalies most of which are associated with basalt cover. Ground magnetics was run over the two grids mentioned above revealing two separate anomalies in the Summit area - one was broad and low amplitude, the other small and high. A remnant magnetic study was carried out by the C.S.I.R.O. on various rock samples from Mt. Bischoff.

Surface and underground grab and channel samples were taken from various porphyry dykes to give an indication of the extent of tin mineralisation. Joint-plane sampling of porphyry dykes was performed in order to identify preferential tin mineralisation in any one direction.

.../S 2

862.5 metres of percussion drilling in 47 holes on 30 sections was drilled. The programme was only a partial success in that only 8 of the holes succeeded in obtaining a complete penetration of the target porphyry dykes. Strong groundwater flows were the main cause of holes not reaching target depth.

Eight diamond holes were drilled for a total of 1415.9 metres. Holes MBD 6 and 9 were designed to test the south westerly extension of White Face porphyry dyke but obtained only 4 metre intersections of porphyry.

Hole MBD 8 intersected 18 metres of the Stanhope Extended porphyry dyke to the north east. The porphyry averaged 0.15 % Sn including a 10 metre central core of 0.22 % Sn.

Hole MBD 7 was drilled to test the zone of veins around Queen porphyry dyke but no major vein systems were found. Queen dyke itself averaged 193 ppm Sn over 8.1 metres.

Hole MBD 10 was designed to test for possible dolomite sulphide mineralisation to the south east of Pig Flat/Happy Valley but no dolomite was found.

Holes MBD 11 and 12 were sited over the two magnetic anomalies located on the ground in the Summit area. Neither hole found tin mineralisation although sufficient pyrrhotite (in siltstones, shales, quartzites) was found to account for the anomalies.

Hole MBD 13 was drilled to fill in grade and tonnage information within the known mineralisation between Greisen Face and Pig Flat. The following results were obtained :

.../S 3

From(m)	To (m)	Width(m)	% Sn	Rock type
11	18.3	7.3	0.66	Dolomite sulphide lode
40	69.3	29.3	1.48	" " "
69.3	90.9	21.6	0.66	Quartz porphyry
90.9	99.0	8.1	1.68	Dolomite sulphide lode

A broad re-interpretation of the geology of Mt. Bischoff indicates that the central core of Mt. Bischoff, some 900 by 600 metres in area, represents an altered zone where virtually no carbonaceous rocks are present and all sandstones are converted to hard quartzites. This interpretation suggests that the black carbonaceous rocks are not confined to overlying the dolomite horizon as had previously been thought.

A re-assessment of reserves has been calculated for the higher grade mineralisation (0.3 % Sn cut-off) :

Dolomite Sulphide Reserves	924,000	tonnes at	1.07% Sn
Porphyry Reserves	2,642,000	" "	0.56% Sn
Total	3,566,000	" "	0.69% Sn

Metallurgical test work on porphyry rocks comprised gravity and flotation techniques. The most encouraging results using a reverse system of tin flotation prior to gravity treatment indicated a tin concentrate grade of 25% Sn at 85% recovery.

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1. INTRODUCTION

This report covers the exploration activity covered by the budgetted periods Stage 2 A Early Start and Stage 2 A. The field work was carried out between February and early September, 1979, by site personnel comprising one geologist (plus one geologist part time), a technician and a field assistant.

The main objective of the programme was to extend the limit of known reserves such that it might be possible to indicate a potential of 20 million tonnes at a grade of about 0.3% Sn. This objective was not achieved. The targets for extending the reserves were porphyry dykes, a zone veins, possible repetition of dolomite sulphide lodes and magnetic anomalies. One drill hole was also located within the known mineralisation in Greisen Face.

The exploration systems used were chip and channel sampling, airborne and ground magnetics and diamond and percussion drilling. Further metallurgical work was continued.

2. TENEMENTS

The Exploration Area (being part of E.L. 5/63) which is the subject of the Mt. Bischoff Joint Venture was converted into an independent E.L.. Exploration Licence 13/79, in the name of Metals Exploration Ltd., (as manager of the Joint Venture), was granted from 1st July, 1979 and remains in force for 6 months to 31st December, 1979.

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The area covers 20 square kilometers and is bounded by the following metric grid co-ordinates :

5410000 N to 5415000 N

and 375000 E to 379000 E

3. SURVEYING

The previous grid that had been laid in over most of the old workings at Mt. Bischoff was extended to cover the Summit area to the north west. Lines were cut in a grid north-south direction, 40 metres apart, between the following co-ordinates :

2100 N to 2680 N

and 660 E to 1140 E

Grid pegs were put in 20 metres apart (horizontally) along the lines.

A small grid 400 metres long and 200 metres wide was located over the "northern dolomite" about 1.5 kilometers in a north easterly direction from Mt. Bischoff trig. The baseline is in a magnetic east-west direction and north-south lines were laid in 40 metres apart.

A further 52 semi-permanent survey stations were established within the area using a wild T16 Theodolite. The collars of all the diamond drill holes (MBD6 to MBD13) were picked up by Theodolite and the proposed collars of all the percussion drill sites (29 sections) were laid in by Theodolite. Nearly

.../3

all the sections on which percussion and diamond holes were drilled were stadia surveyed.

Downhole surveys were carried out on the diamond drill holes using a Tropari instrument. Readings were taken approximately every 30 metres.

4. GEOPHYSICS

An airborne magnetic survey was flown by helicopter over the whole of the Exploration Area in March, 1979 by Geoex Pty. Ltd.. A Varian 4937A proton precession magnetometer was used with a nominal aircraft survey altitude of 90 metres (i.e. sensor clearance of about 75 metres). A diurnal base station was located at Wynyard aerodrome. Flight lines were in a north-south direction about 100 metres apart. Flight line recovery control in the north-eastern corner of the area flown was poor due to the monotonous tree cover.

The following memorandum by R.J. Smith, chief geophysicist of CRA Exploration Pty. Ltd., outlines the more discrete anomalies :

Mt. Bischoff - Magnetic Anomalies

Anomaly selection has been extremely subjective but does represent an attempt to select discrete anomalies of possible interest.

1. Anomaly 1 occurs on 4 flight lines and coincides with the Mt. Bischoff orebody. Total amplitude is several hundred

gammas (~ 800γ) maximum. There is a much broader, weaker anomaly extending to the west suggesting extensions at depth. This could be mapped in more detail by extending the ground magnetic survey grid. There is no apparent extension to the east, the anomaly appears to terminate between line 250 and line 240.

2,3 Anomalies 2 and 3 appear to coincide with the SW and NE extremities of a mapped zone of basalt. These anomalies are unlikely to represent sulphide mineralisation. Anomaly 3 is noted on line 180 but is not apparent on line 170 although they appear almost coincident at this point. They may have been flown at different altitudes or flight path recovery may be unreliable.

4. Anomaly 4 occurs on only one flight line (line 70), it has an amplitude of approximately 300 gamma and seems to be in an area free of basalt cover. It is therefore a small but possibly significant target.

5. Anomaly 5 occurs close to the basalt contact on four flight lines. It seems likely to be due to locally thicker basalt cover and therefore is unlikely to represent an important target.

6. Anomaly 6 occurs on one (possibly two) flight lines with a maximum amplitude of approximately 100 gamma. It is located on the edge of mapped basalt near a creek which

may have been infilled to produce a local thickening of basalt. It is unlikely to be a significant target.

7, 8 and 9. Anomalies 7, 8 and 9 are primarily negative anomalies (maximum amplitude about 600 gamma in anomaly 8) extending across fourteen flight lines in a roughly linear zone. The zone has been dislocated to produce three apparently separate anomalies but this may be due to faulty path recovery.

This anomaly appears to have a source whithin the basalt (possibly due to an infilled river valley) or beneath the basalt cover. It is the most pronounced anomaly detected by this survey with the exception of the Mt. Bischoff orebody and it may represent sulphide mineralisation beneath the basalt.

10. Anomaly 10 is a low amplitude feature (approximately 50 gamma) on only one flight line (line 200). It is well clear of the mapped basalt and close to an old Comstaff drill hole (B8). It may represent a small occurrence of sulphide mineralisation.

11. Anomaly 11 has an amplitude of approximately 150 gamma, it occurs on only one flight line (line 270), within the Waratah town boundary and apparently within mapped basalt. The source may be cultural or a local thickening of basalt cover. It is unlikely to represent a significant target.

.../6

12. Anomaly 12 occurs on eight flight lines with a maximum amplitude of approximately 200 gamma. It follows a topographic high of mapped Cambrian outcrop close to the Adelaidean contact. This may be simply an altitude effect if the aircraft failed to maintain terrain clearance across the ridge, the analogue charts should be checked for altitude. The location of this feature is possibly significant and if a subsurface source can be confirmed, then it represents a target of possible interest.

13. Anomaly 13 occurs on two or three flight lines with a maximum amplitude of about 200 gamma. It is well within the area of mapped basalt cover and unlikely to represent a significant target.

Conclusions

There are no other anomalies comparable with that over Mt. Bischoff, within the survey area. Anomalies 4 and 10 are low amplitude features without apparent explanation and may represent small targets. Anomalies 7, 8, 9 and 12 are larger features. Anomalies 7, 8 and 9 occur within or beneath basalt cover and may simply represent an old channel infilled by basalt. Anomaly 12 occurs in mapped Cambrian outcrop and may represent mineralisation at the Cambrian - Adelaidean contact.

- - - - -

Ground magnetics were run over the two grids that had been laid in over the Summit area and the northern dolomite.

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Readings were taken every 20 metres on lines spaced 40 metres apart. A Geometrics Model G 816 portable proton magnetometer was used.

Two anomalies were delineated in the Summit area confirming the airborne survey. The "Summit anomaly" had a weak, broad configuration (amplitude approximately 100 gamma) centred near 2500 N on lines 900 E and 940 E. Computer modelling of the readings suggested a weakly magnetic source to lie between 100 and 150 metres below surface. The "Slaughteryard anomaly" occurred some 70 metres grid west of outcropping massive sulphides in Slaughteryard Face. The anomaly had two peaks (amplitude 400 to 500 gammas) and covered an area of about 100 by 40 metres. The source was interpreted to lie 30 to 50 metres below the surface.

Two diamond drill holes were subsequently drilled to test the "Summit" and "Slaughteryard " anomalies, and magnetic susceptibility readings were taken along the length of the core. R.J. Smith's memoranda on the results are included as an appendix to this report.

During March, 1979 the C.S.I.R.O. studied the magnetic properties of various rock samples collected at Mt. Bischoff. The study suggests that remanent magnetisation of pyrrhotite is significant. Their report is included as an appendix to this report.

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5. SURFACE AND UNDERGROUND SAMPLING

Various porphyry dykes were sampled at Mt. Bischoff. Initially lines of chip samples were taken across the Stanhope Extended dyke where there had been little or no previous exploration activity. Some high assay results were obtained, up to 1.03% Sn, and these were thought to be attributable to selective mineralisation on exposed joint faces. The lines were re-sampled by taking 10 to 15 kg of rock grabbed from wider zones. The results of this programme are as follows :

Dyke Name	Section Sampled (normal to dyke)	Approximate Location N	E	% Sn
Stanhope Extended	Total	2015	1485	0.09
" "	Hangingwall	2055	1555	0.06
	Centre	"	"	0.16
	Footwall	"	"	0.07
" "	Hangingwall	2095	1645	0.04
	Centre	"	"	0.11
	Footwall	"	"	0.10
" "	Hangingwall	2120	1740	0.23
	Centre	"	"	0.15
	Footwall	"	"	0.07
" "	Hangingwall	2140	1845	0.03
	Centre	"	"	0.03
	Footwall	"	"	0.03

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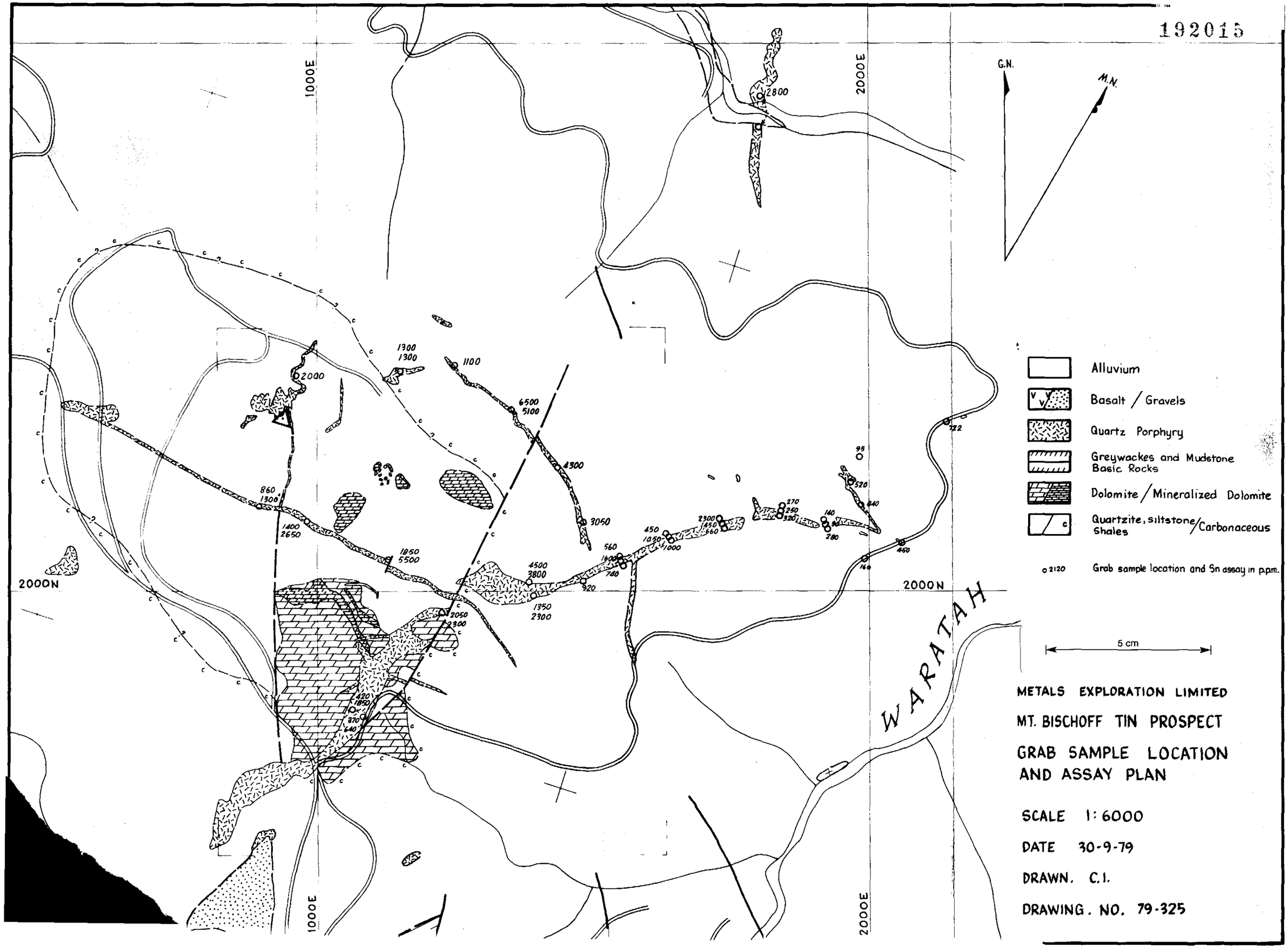

1000E
2000E
2000N
G.N.
M.N.
WARATAH
Alluvium
Basalt / Gravels
Quartz Porphyry
Greywackes and Mudstone Basic Rocks
Dolomite / Mineralized Dolomite
Quartzite, siltstone / Carbonaceous Shales
o 2120 Grab sample location and Sn assay in p.p.m.
5 cm
METALS EXPLORATION LIMITED
MT. BISCHOFF TIN PROSPECT
GRAB SAMPLE LOCATION AND ASSAY PLAN
SCALE 1:6000
DATE 30-9-79
DRAWN. C.I.
DRAWING. NO. 79-325

Dyke Name	Section Sampled (normal to dyke)	Approximate Location N	E	% Sn
Stanhope Extended	Hangingwall	2115	1925	0.01
	Centre	"	"	0.01
	Footwall	"	"	0.03
" "	Total	2195	1960	0.05
" "	"	2235	1990	0.01
" "	"	2290	2145	0.02
" "	"	2315	2210	0.04
Radyo	"	2150	1985	0.08
"	"	2075	2065	0.05
Ringtail	"	2040	2000	0.02
Western	"	2060	1130	0.19
	"	"	"	0.55
"	"	2120	975	0.14
	"	"	"	0.27
"	"	2155	890	0.09
	"	"	"	0.13
White Face	"	1960	1220	0.21
	"	"	"	0.22
" "	Hangingwall	1795	1070	0.19
	"	"	"	0.04
" "	Footwall	1780	1090	0.04
	"	"	"	0.06
Stanhope	Hangingwall	2010	1380	0.45
	"	"	"	0.38
"	Footwall	1990	1390	0.14
	"	"	"	0.23

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Dyke Name	Section Sampled (normal to dyke)	Approximate Location N	E	% Sn
Queen	Total	2120	1480	0.31
"	"	2230	1440	0.43
"	"	2330	1350	0.65
	"	"	"	0.51
"	"	2410	1250	0.11
Summit	"	2390	960	0.20
North Face	"	2400	1150	0.13
	"	"	"	0.13
Northern	"	2850	1800	0.28

Where two samples results are given for the same location, they represent parallel lines of sampling.

In order to ascertain whether there is preferential tin mineralisation along the different joint directions of the porphyry dykes, 18 samples were taken representing the three prominent joint directions :

Dyke Name	Transverse Joint % Sn	Longitudinal Joint % Sn	Flat Joint % Sn
White Face	1.14	0.30	0.28
" "	0.87	0.13	0.25
Average	1.01	0.21	0.26
Western	0.57	0.12	0.17
"	0.52	0.45	0.21
Average	0.55	0.28	0.19

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192018

Porphyry

N.B. All results by XRF BI Method

750 Channel Sample Location and Sn Assays in ppm.

5 cm

MT. BISCHOFF TIN PROSPECT

MT BISCHOFF EXTENDED WORKINGS

PORPHYRY SAMPLING

ON LEVELS 5 & 6

SCALE 1:1200 DRG. NO. 79-151

Dyke Name	Transverse Joint % Sn	Longitudinal Joint % Sn	Flat Joint % Sn
Stanhope	1.16	0.49	0.18
"	0.41	0.76	0.20
Average	0.78	0.63	0.19
Total Average	0.78	0.37	0.21

At the Bischoff Extended mine workings, the porphyry in the adits of the No. 5 and No. 6 levels was channel sampled over 2.5 metre intervals. On the No. 6 level, 77.5 metres of porphyry averaged 563 ppm Sn including 12.5 metres at 0.14% Sn. On the No. 5 level 114.5 metres averaged 394 ppm Sn including 10.0 metres at 0.11% Sn.

6. PERCUSSION DRILLING

A trial percussion drilling programme, using an Atlas Copco Roc 601-03 machine fitted with dust collector and powered by an Atlas Copco PT 900 compressor, was carried out in April, 1979. 120 metres were drilled in 5 holes adjacent to two previously drilled diamond holes. At one site the percussion drilling was succesful insofar that the average tin values of the porphyry intersection compared favourably, albeit individual assays varied :

	B 20	MBP 1	MBP 2
Average % Sn in Porphyry	0.24 %	0.21 %	0.26 %

(over approximately 24 metres)

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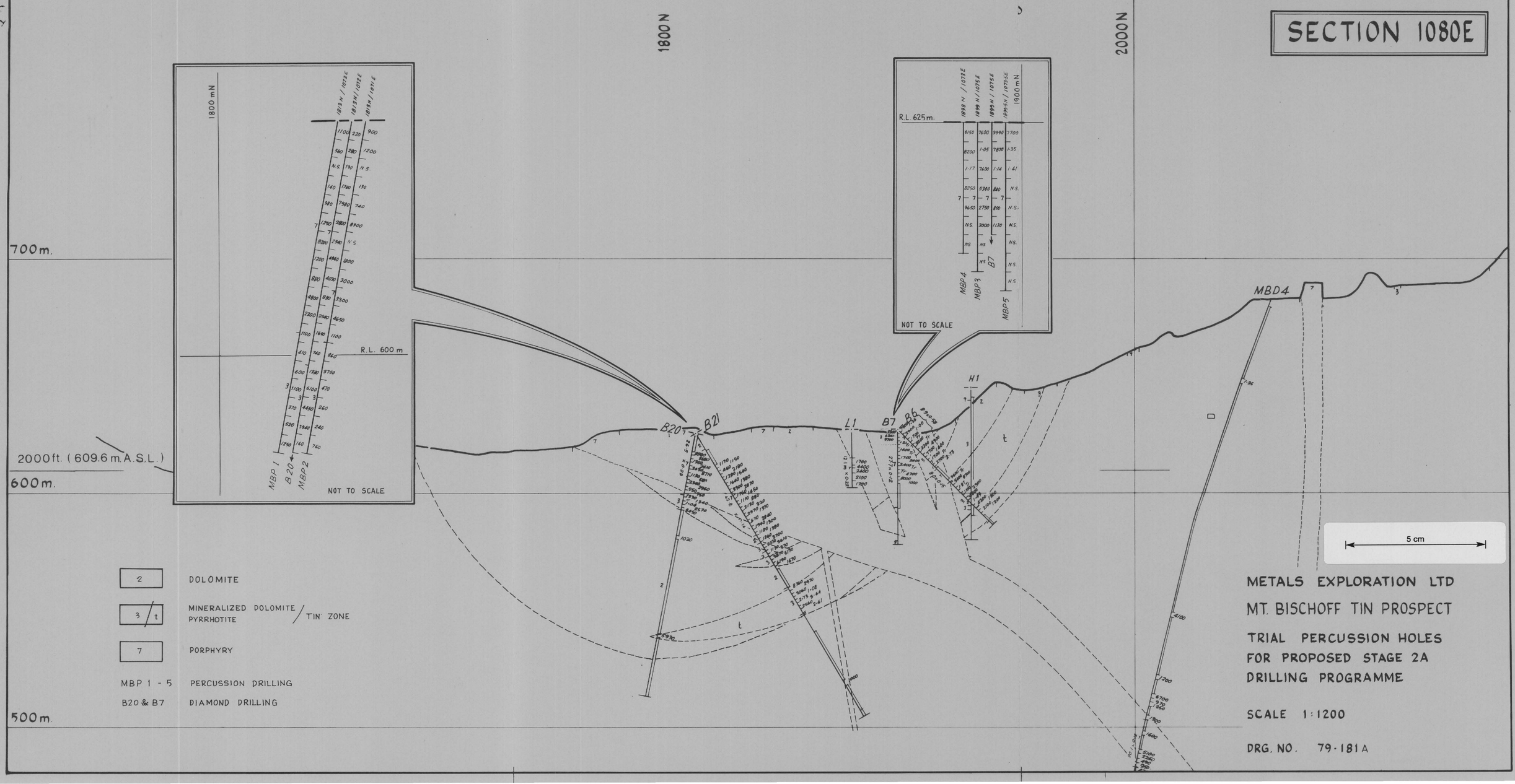
SECTION 1080E



2	DOLOMITE
3 / t	MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE
7	PORPHYRY
MBP 1 - 5	PERCUSSION DRILLING
B20 & B7	DIAMOND DRILLING

METALS EXPLORATION LTD

MT. BISCHOFF TIN PROSPECT

TRIAL PERCUSSION HOLES FOR PROPOSED STAGE 2A DRILLING PROGRAMME

SCALE 1:1200

DRG. NO. 79-181A

At the second site, poor recoveries were achieved due to the porous nature of the sulphide ground (this was also the case for the previously drilled diamond hole B 7).

The main percussion drilling programme, between 4th June, 1979 and 2nd July, 1979, entailed the drilling of 42 holes for 742.5 metres at 29 sites (sections). Each two metre interval was split and sampled, and duplicates were retained at the exploration camp. A total of 355 samples were analysed for tin by AMDEL (XRF B 1 Method). 20 of the duplicate samples were analysed by AMDEL to check both the splitting system and the analysis system. The overall variation between the two sets of results was 4% with the greatest difference being in the higher assays (eg 8350 ppm Sn as against 7200 ppm Sn). A further 10 duplicate samples were analysed by XRF by Australian Laboratory Services Pty. Ltd., and the variation between their results and AMDEL's was 5% overall (greatest difference 3000 ppm Sn as against 3400 ppm Sn).

The percussion drilling was only a partial success. The majority of the holes failed to reach target depths (i.e. a complete penetration of porphyry dyke) due to groundwater problems. In an area where the trial drilling had been carried out 2 months earlier, only 4-6 metres could be drilled before strong flows of water were encountered, whereas the trial drilling reached 36 metres (in 2 holes) and recovery was still good. Elsewhere in dry ground the recovery was consistent and considered good. Only 6 of the 29 sections drilled succeeded in complete penetration of the target porphyry rock.

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Hole No.	Section	Dyke Name	Total Depth	Porphyry Intersection From	To	Width	% Sn	0.1% Sn Cut-Off From	To	Width	% Sn
MBP 6	1840 E	Stanhope Extended	20	8	20	12	0.03	-	-	-	-
MBP 7	1805 E	"	27	0	27	27	0.03	26	27	1	0.19
MBP 8	1760 E	"	16	0	16	16	0.04	-	-	-	-
MBP 9	1760 E	"	18	0	18	18	0.04	-	-	-	-
MBP 10	1680 E	"	12	3.5	12	8.5	0.12	8	12	4	0.21
MBP 11	1680 E	"	29	1	29	28	0.22	6	29	23	0.27
MBP 12	1640 E	"	39	11.5	33	21.5	0.12	24	32	8	0.22
MBP 13	1600 E	"	30	11.5	30	18.5	0.13	18	30	12	0.17
MBP 14	1560 E	"	27	3	23	20	0.21	4	23	19	0.22
MBP 15	1520 E	"	36	7	33.5	26.5	0.09	14	24	10	0.14
MBP 16	2055 N	Queen	13	No Recovery			-	-	-	-	-
MBP 17	1480 E	Stanhope	22	3	22	19	0.21	6	22	16	0.24
MBP 18	1440 E	"	6	3	-	- Not Assayed			-	-	-
MBP 19	1440 E	"	11	3.5	11	7.5	0.19	4	11	7	0.19
MBP 20	1440 E	"	16	1	16	15	0.16	2	16	14	0.17
MBP 21	1400 E	"	26	11	26	25	0.18	11	26	15	0.18
MBP 22	2100 N	Queen	17	16.5	17	0.5	-	-	-	-	-
MBP 23	2140 N	"	18	-	-	-	-	-	-	-	-
MBP 24	2140 N	"	18	-	-	-	-	-	-	-	-
MBP 25	2140 N	"	10	8.75	10	1.25	0.37	8.75	10	1.25	0.37
MBP 26	2140 N	"	4	-	-	-	-	-	-	-	-
MBP 27	2140 N	"	15	3	15	12	0.24	3	15	12	0.24
MBP 28	2180 N	"	18	4.5	18	13.5	0.31	4.5	18	13.5	0.31
MBP 29	2180 N	"	18	6	18	12	0.28	6	18	12	0.28
MBP 30	2240 N	"	12	5.5	12	6.5	0.11	6	12	6	0.12

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Hole No.	Section	Dyke Name	Total Depth	Porphyry Intersection From	To	Width	% Sn	0.1% Sn Cut-Off From	To	Width	% Sn
MBP 31	2237 N	Queen	10	7.5	10	2.5	0.10	7.5	10	2.5	0.10
MBP 32	2220 N	"	20	1	16.5	15.5	0.34	1	16.5	15.5	0.34
MBP 33	1360 E	Stanhope	18	7.5	18	10.5	0.28	8	18	10	0.29
MBP 34	1359 E	"	22	7	22	15	0.36	8	22	14	0.38
MBP 35	1320 E	"	8	0	8	8	0.26	0	8	8	0.26
MBP 36	1280 E	"	4	3	4	1	Not Assayed	-	-	-	
MBP 37	1280 E	"	9	3	9	6	0.12	3	6	3	0.18
MBP 38	1280 E	"	34	2	19.5	17.5	0.11	2	10	8	0.20
MBP 39	1260 E	"	9	2	9	7	0.16	2	9	7	0.16
MBP 40	1255 E	"	36	4	10	6	0.19	4	10	6	0.19
MBP 41	1220 E	White Face	32	13	32	19	0.47	13	32	19	0.47
MBP 42	1260 E	" "	14	-	-	-	-	-	-	-	-
MBP 43	1040 E	" "	4			Not Assayed					
MBP 44	1040 E	" "	4	0	4	4	0.01	-	-	-	-
MBP 45	1184.5 E	" "	4	0	4	4	0.13	0	2	2	0.23
MBP 46	1135 E	North Face	8	0	8	8	0.24	0	8	8	0.24
MBP 47	1265 E	Queen	12	-	-	-	-	-	-	-	-

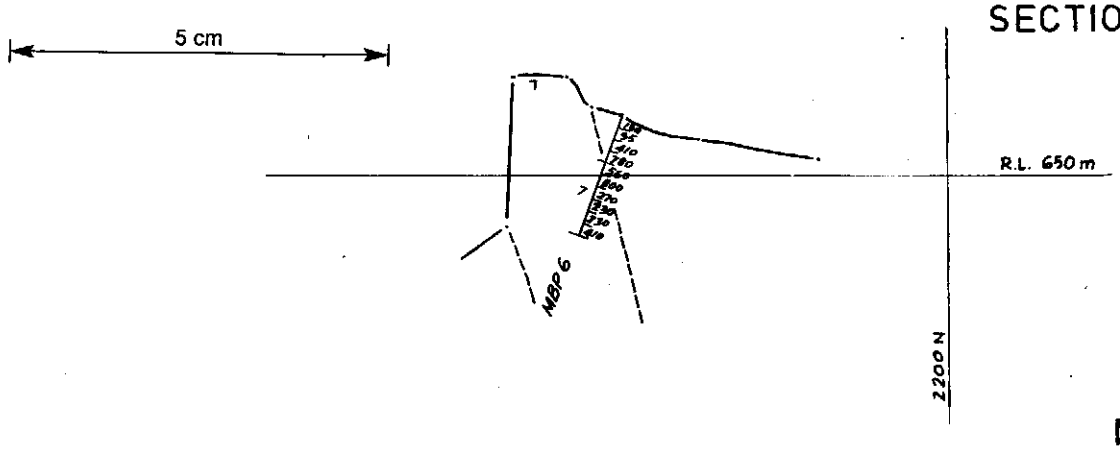
192023

METALS EXPLORATION LIMITED

192024

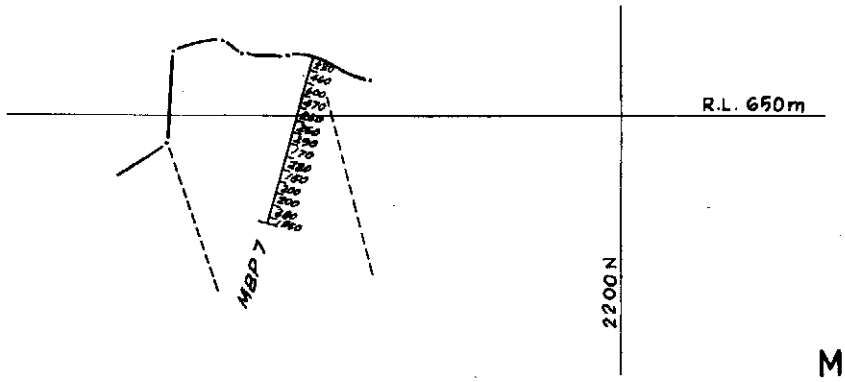
023

SECTION 1840E



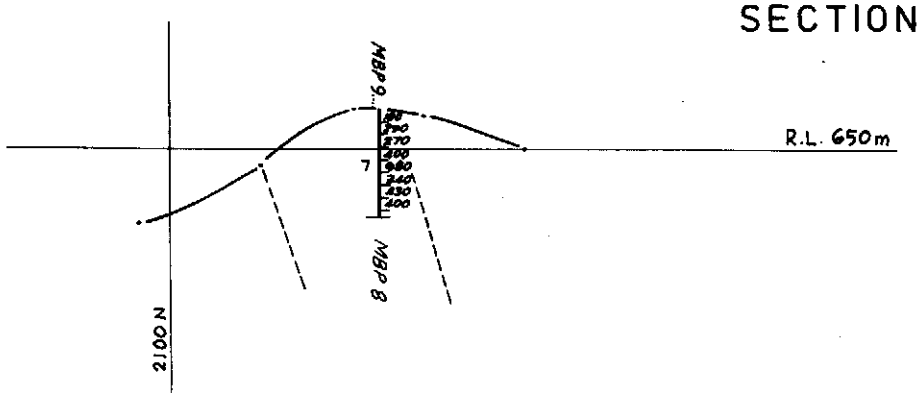
MBP 6

SECTION 1805E



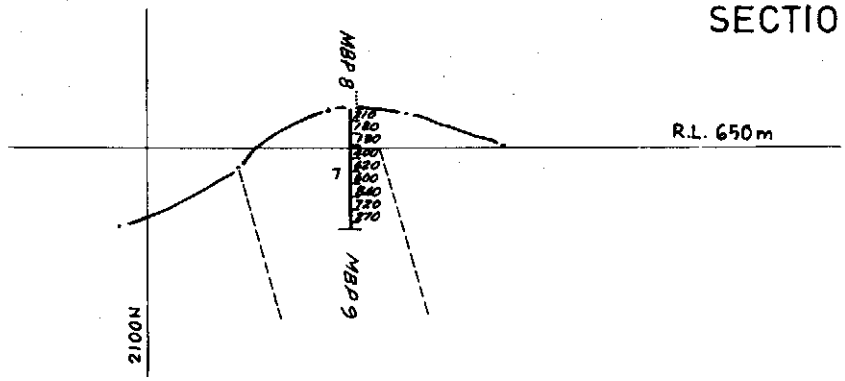
MBP 7

SECTION 1760E



MBP 8

SECTION 1760E



MBP 9

MT. BISCHOFF JOINT VENTURE

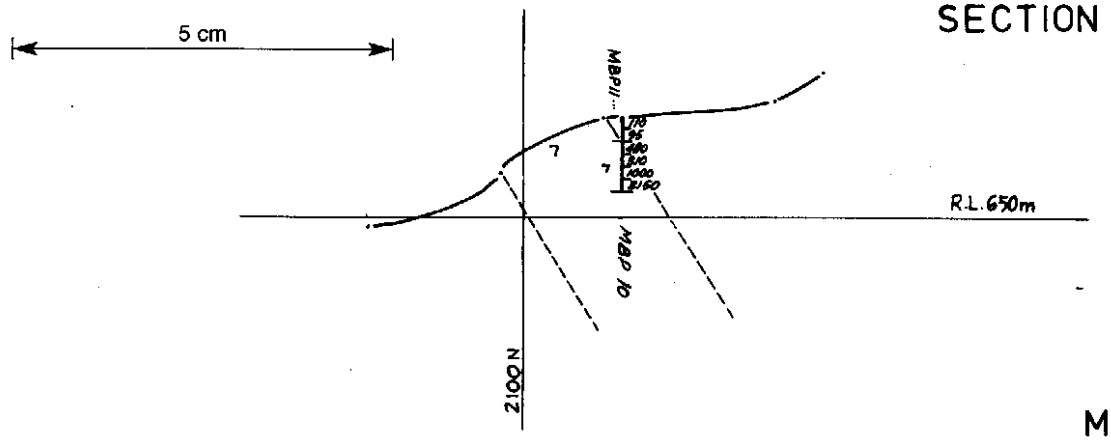
ASSAY SECTIONS MBP 6-9

Prepared :	
Drawn : Date :	
SCALE 1:1200	
Drg. No. 79-240	

M.E.A. A4 75-103 (Melb.)

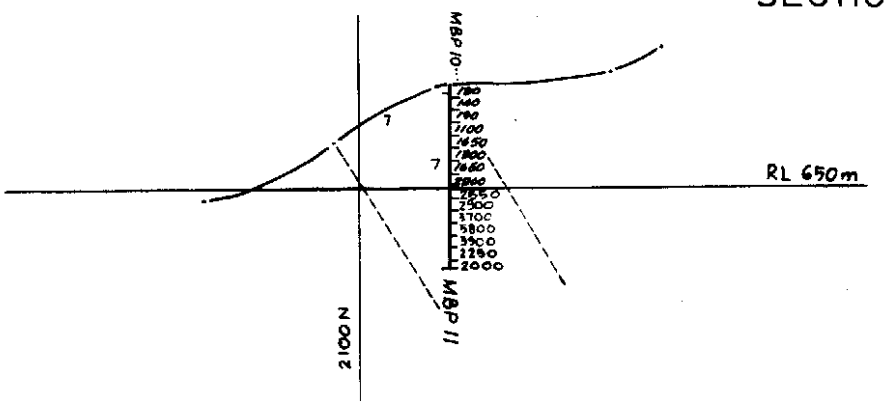
024

SECTION 1680 E



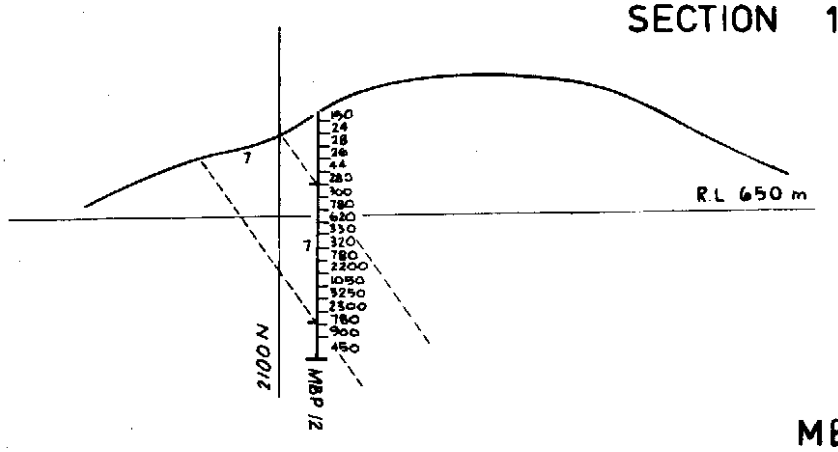
MBP 10

SECTION 1680 E



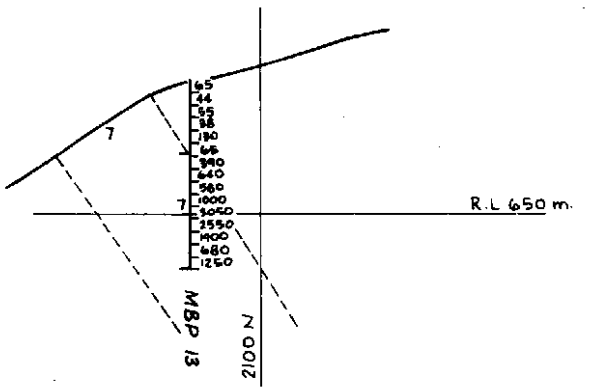
MBP 11

SECTION 1640 E



MBP 12

SECTION 1600 E



MBP 13

MT. BISCHOFF JOINT VENTURE

ASSAY SECTIONS MBP 10-13

Prepared :	
Drawn : Date :	
SCALE 1:1200	
Drg. No. 79-241	

M.E.A. A4 75-103 (Melb.)

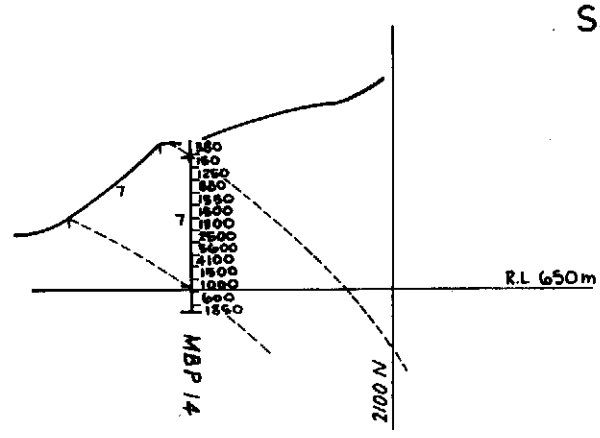
METALS EXPLORATION LIMITED

192026

02

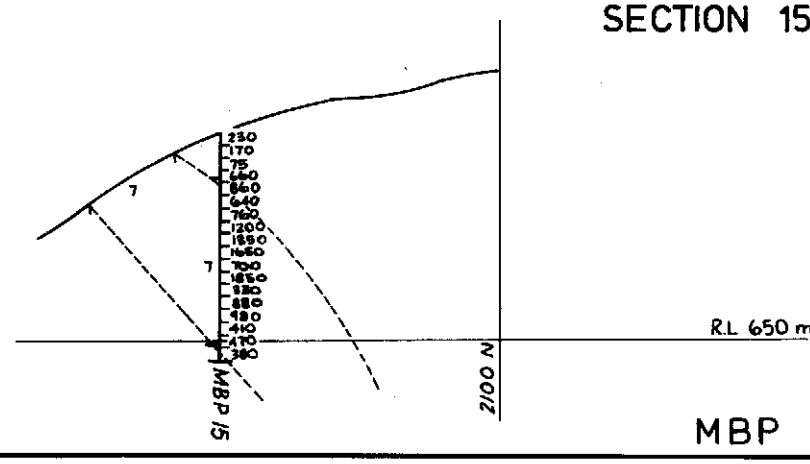
5 cm

SECTION 1560 E



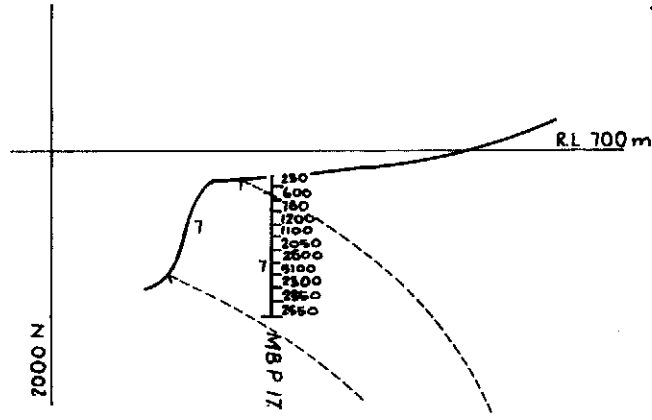
MBP 14

SECTION 1520 E



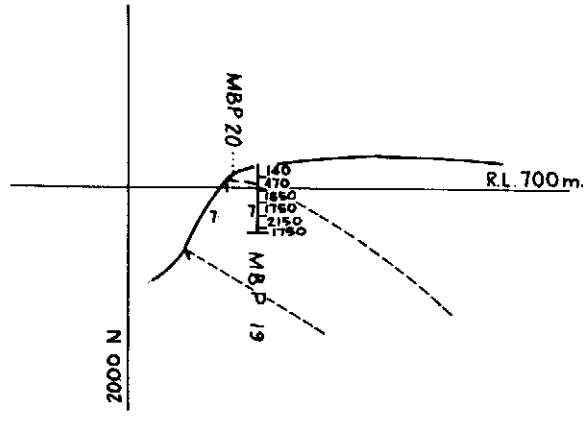
MBP 15

SECTION 1480 E



MBP 17

SECTION 1440 E



MBP 19

MT. BISCHOFF JOINT VENTURE

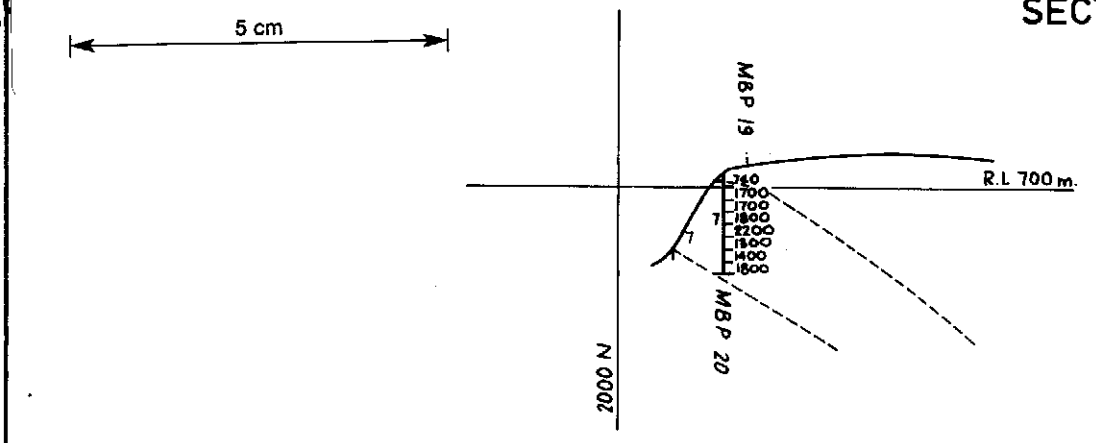
ASSAY SECTIONS MBP 14,15,17,19

Prepared :	
Drawn :	Date :
SCALE 1:1200	
Drg. No. 79-242	

M.E.A. A4 75-103 (Melb.)

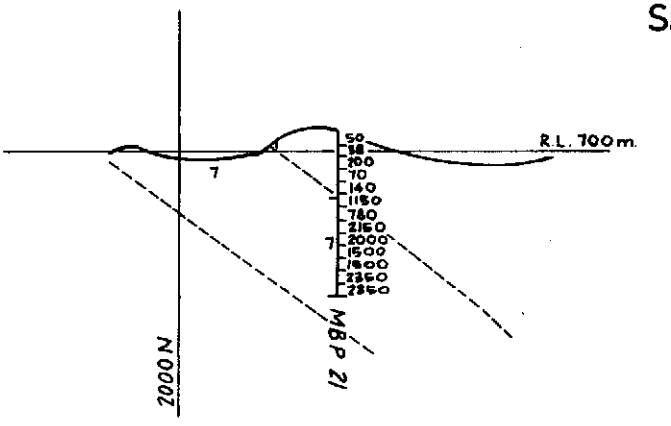
026

SECTION 1440 E



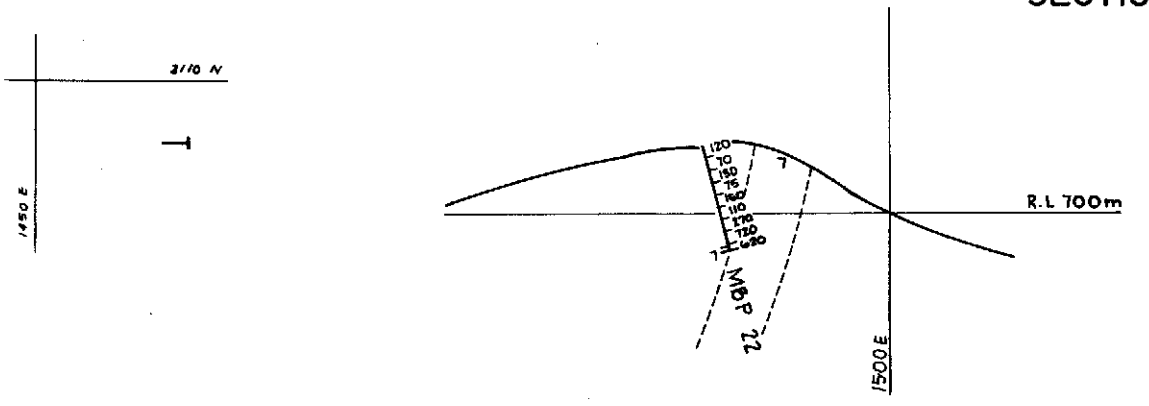
MBP 20

SECTION 1400 E



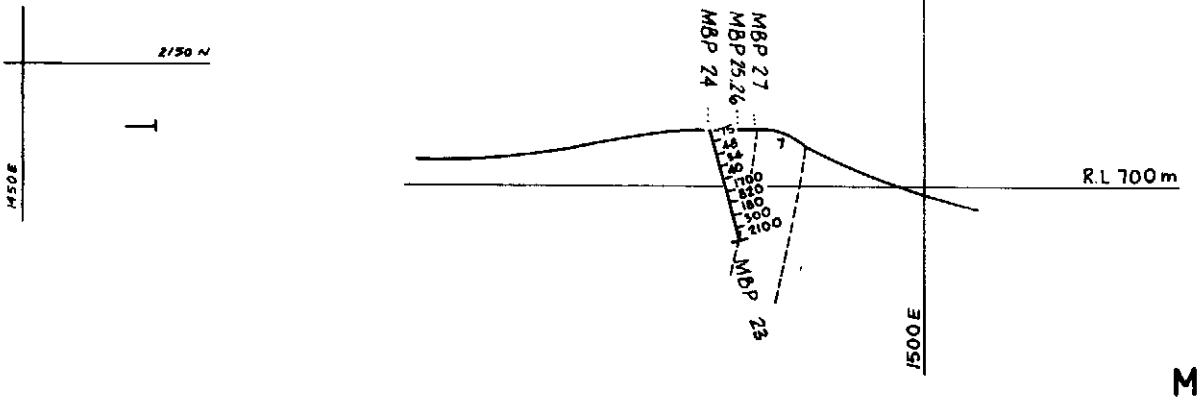
MBP 21

SECTION 2100 N



MBP 22

SECTION 2140 N



MBP 23

MT. BISCHOFF JOINT VENTURE

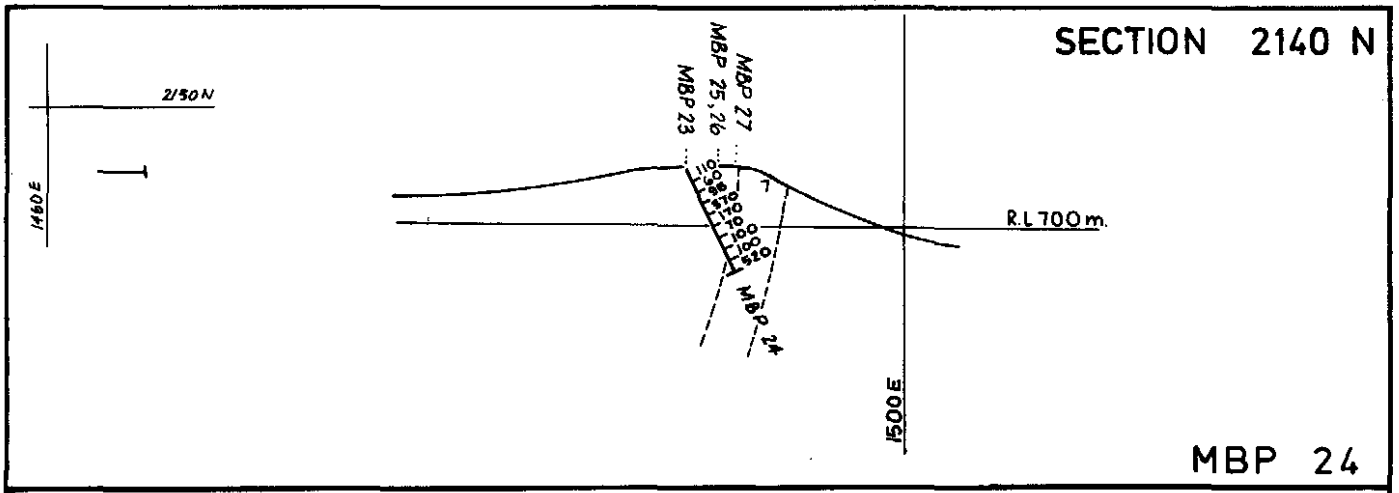
ASSAY SECTIONS MBP 20-23

Prepared :	
Drawn :	Date :
SCALE 1:1200	
Drg. No. 79 - 243	

M.E.A. A4 75-103 (Melb.)

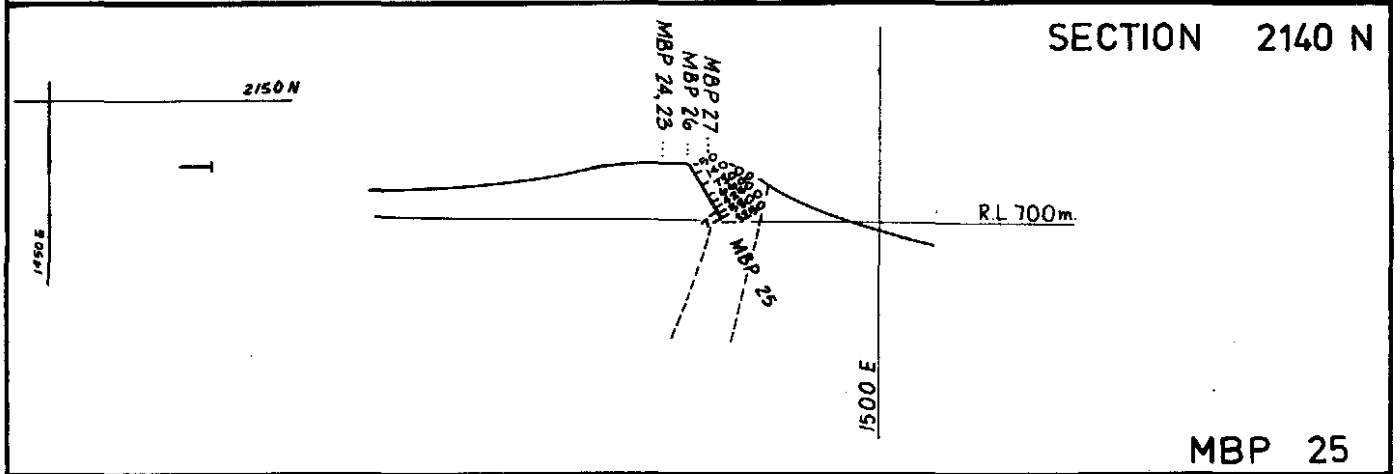
027

SECTION 2140 N



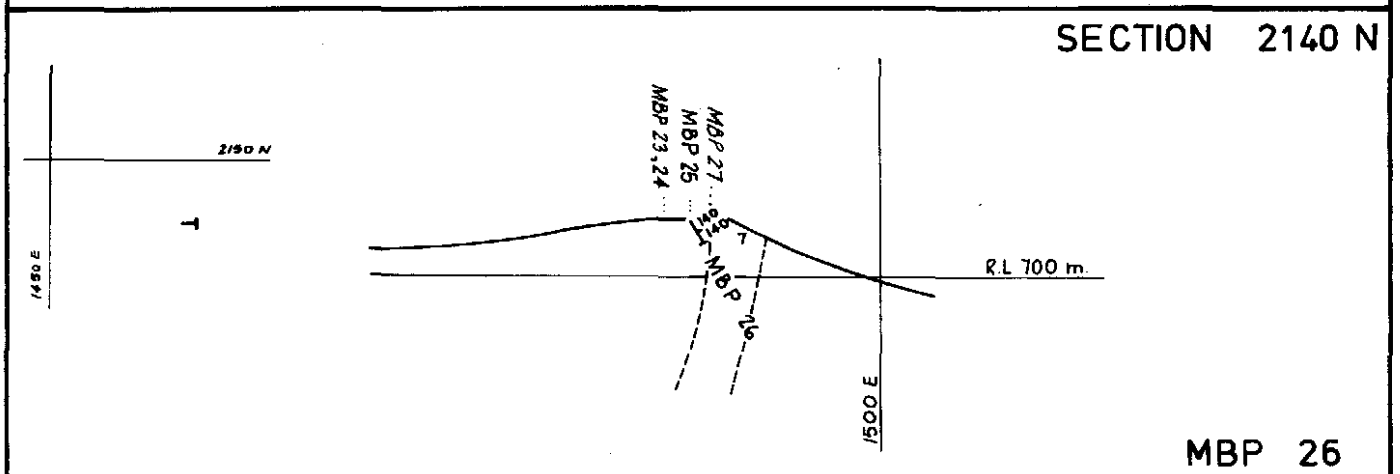
MBP 24

SECTION 2140 N



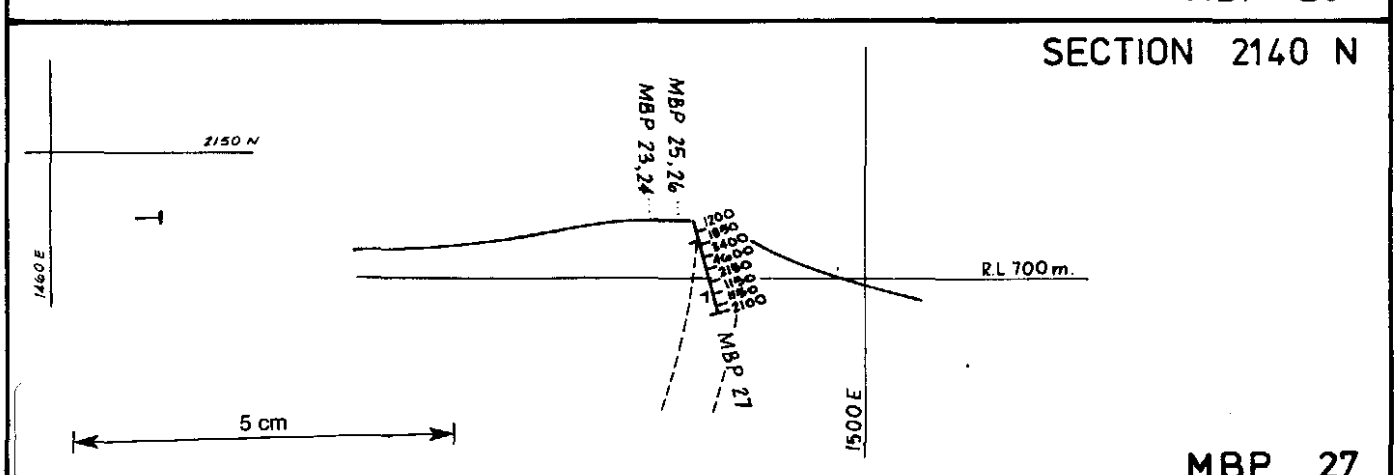
MBP 25

SECTION 2140 N



MBP 26

SECTION 2140 N



MBP 27

MT. BISCHOFF JOINT VENTURE

ASSAY SECTIONS MBP 24-27

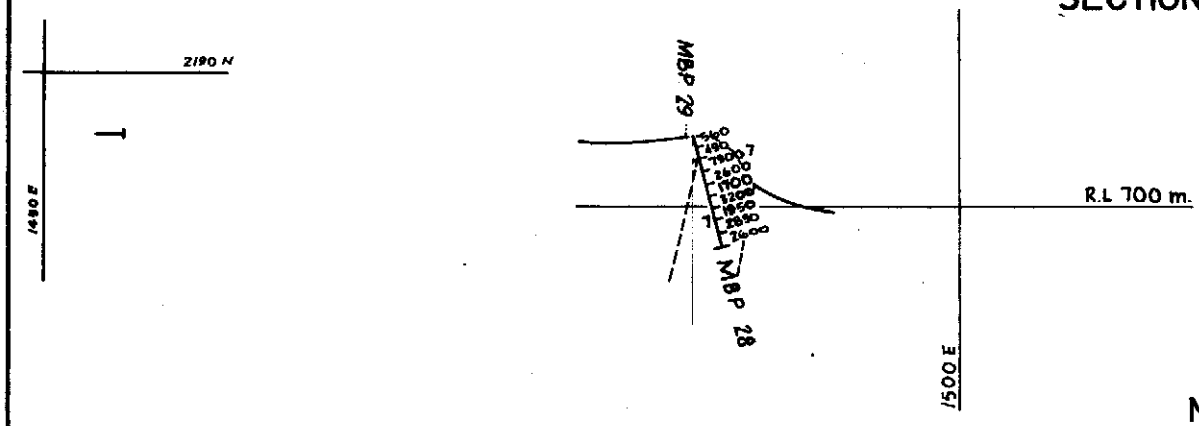
Prepared :	
Drawn : Date :	
SCALE 1:1200	
Drg. No. 79-244	

M.E.A. A4 75-103 (Melb.)

METALS EXPLORATION LIMITED

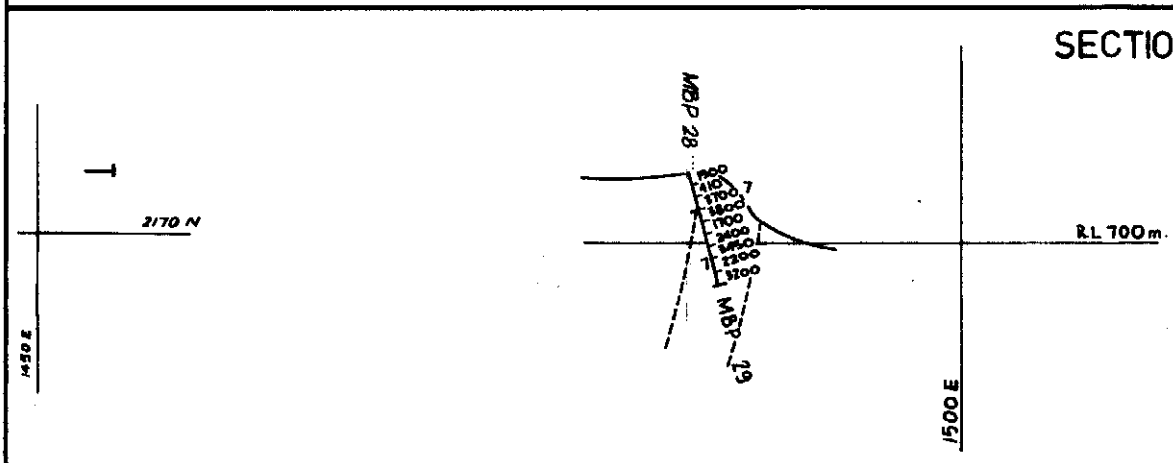
192029

SECTION 2180 N



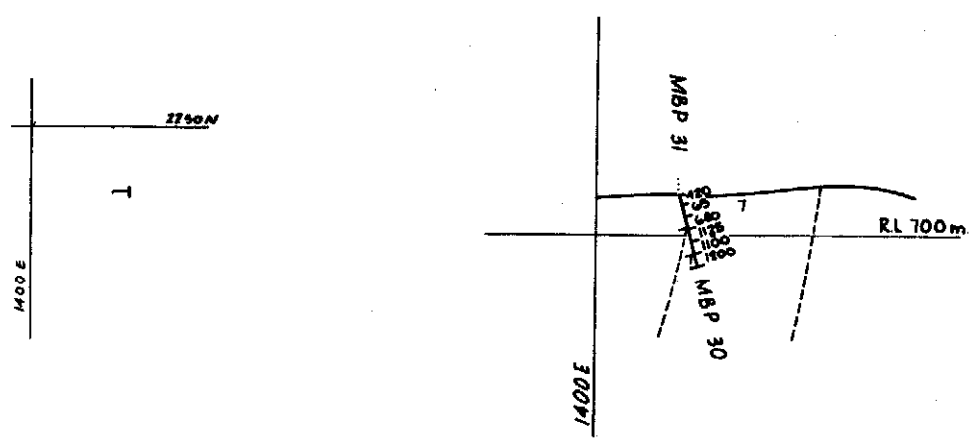
MBP 28

SECTION 2180 N



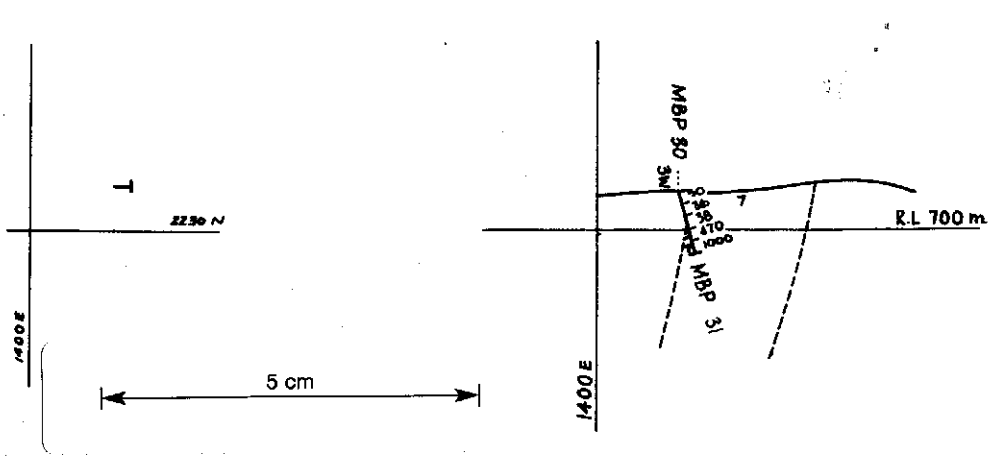
MBP 29

SECTION 2240 N



MBP 30

SECTION 2240 N



MBP 31

MT. BISCHOFF JOINT VENTURE

ASSAY SECTIONS MBP 28-31

Prepared :	
Drawn :	Date :
SCALE 1:1200	
Drg. No. 79-245	

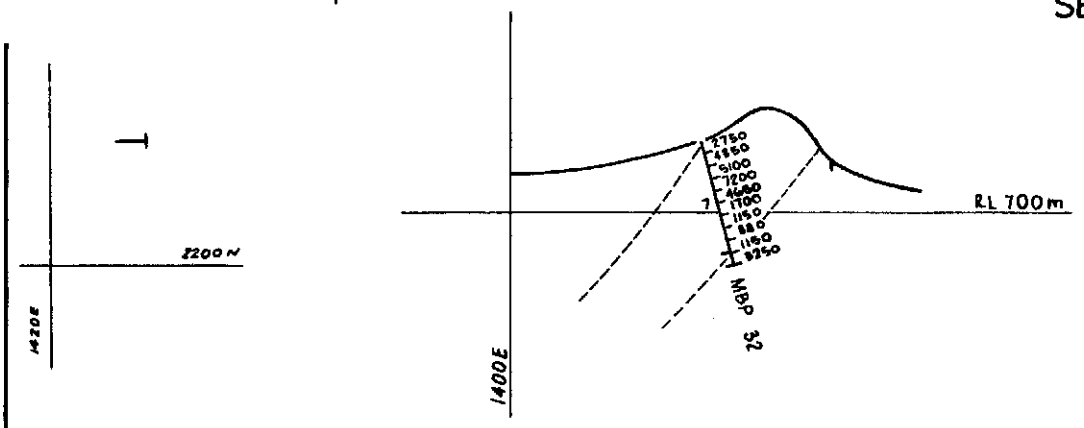
M.E.A. A4 75-103 (Melb.)

METALS EXPLORATION LIMITED

192030

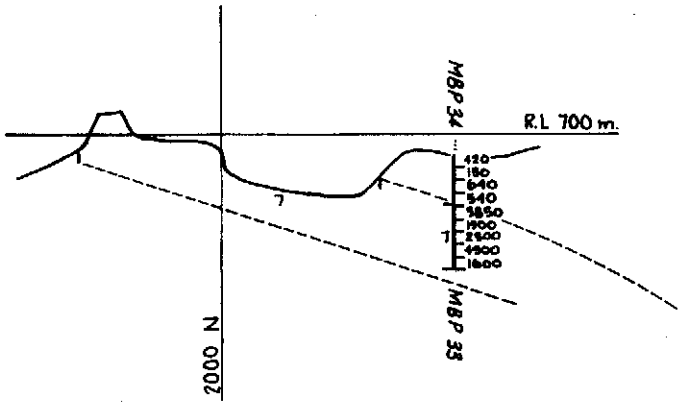
5 cm

SECTION 2220 N



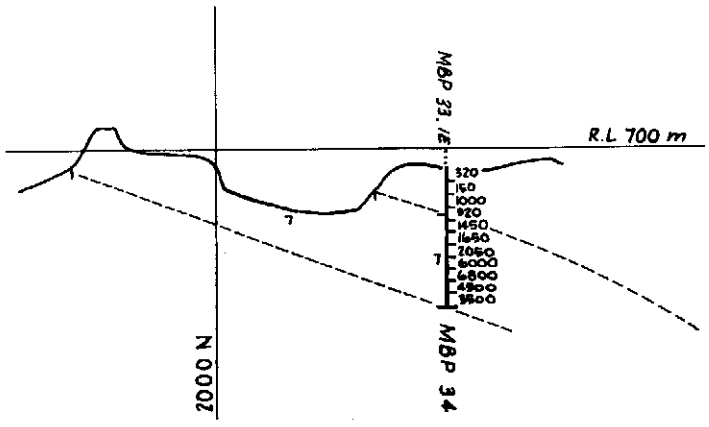
MBP 32

SECTION 1360 E



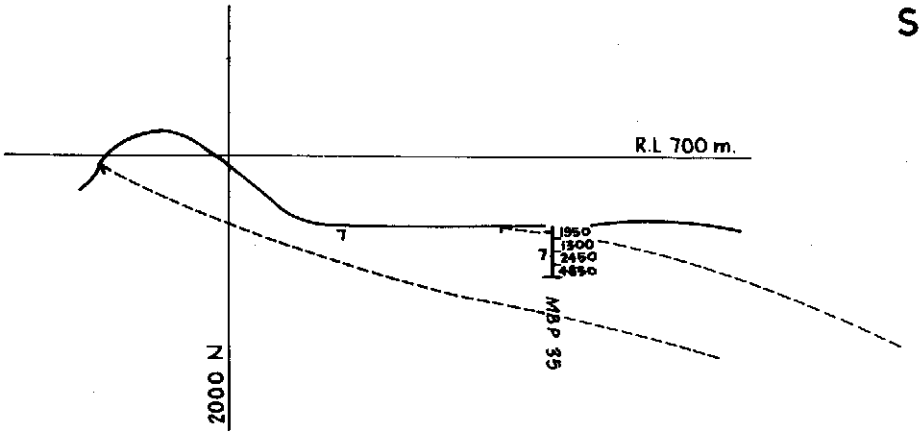
MBP 33

SECTION 1360 E



MBP 34

SECTION 1320 E



MBP 35

MT. BISCHOFF JOINT VENTURE

ASSAY SECTIONS MBP 32-35

Prepared :	
Drawn : Date : - -	
SCALE 1:1200	
Drg. No. 79-246	

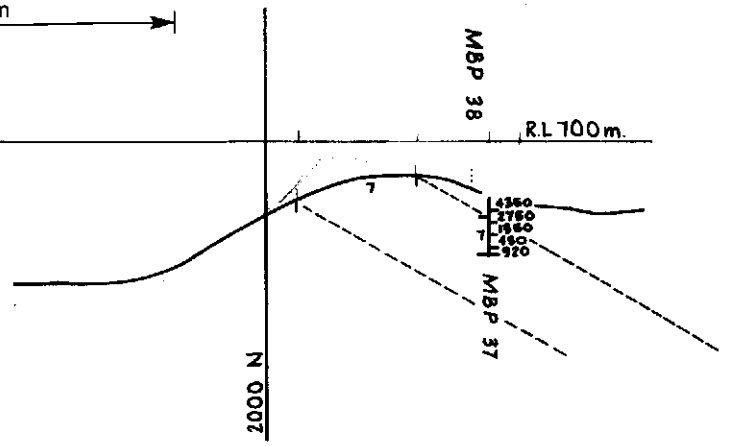
M.E.A. A4 75-103 (Melb.)

METALS EXPLORATION LIMITED

192031

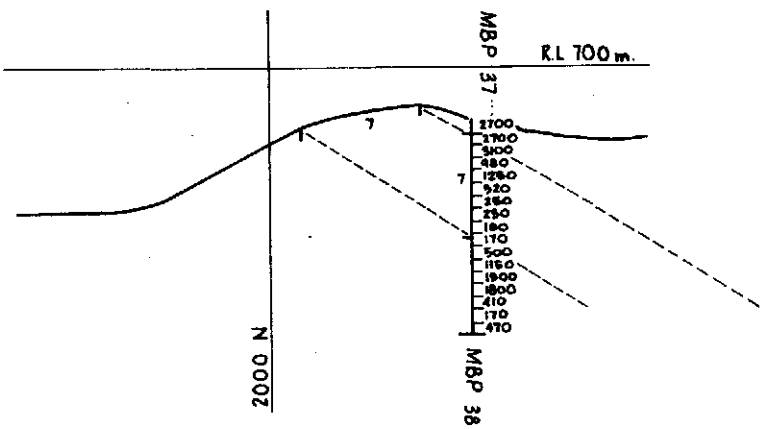
5 cm

SECTION 1280 E



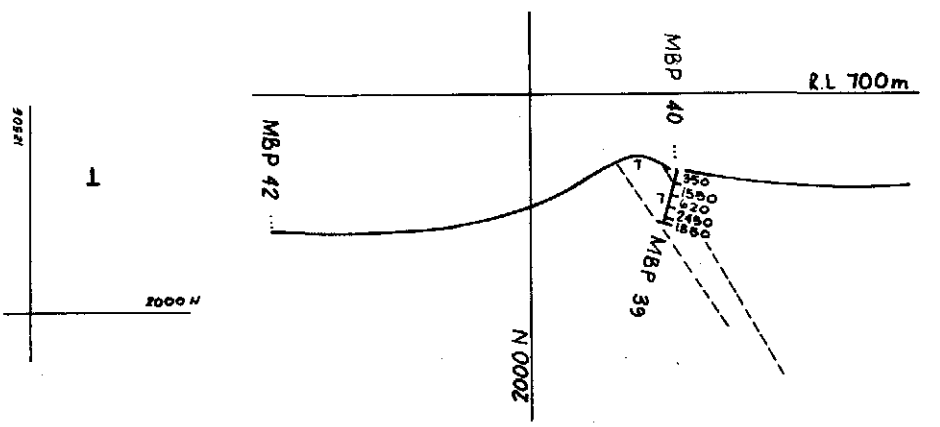
MBP 37

SECTION 1280 E



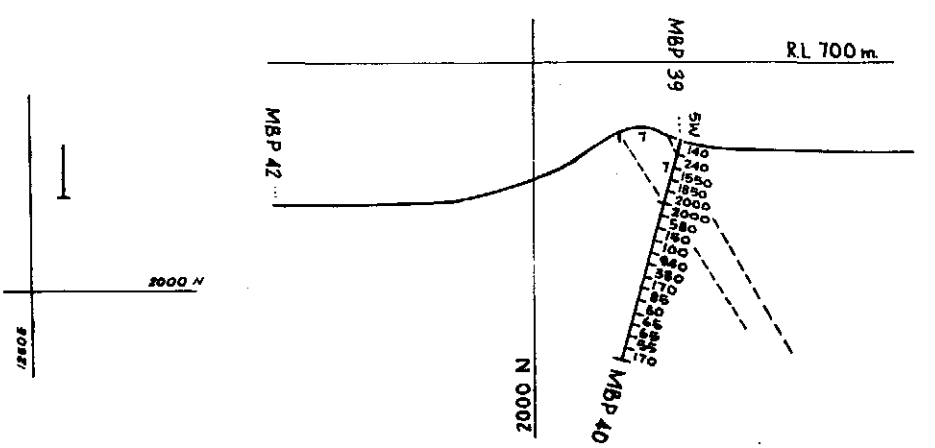
MBP 38

SECTION 1260 E



MBP 39

SECTION 1260 E



MBP 40

MT. BISCHOFF JOINT VENTURE

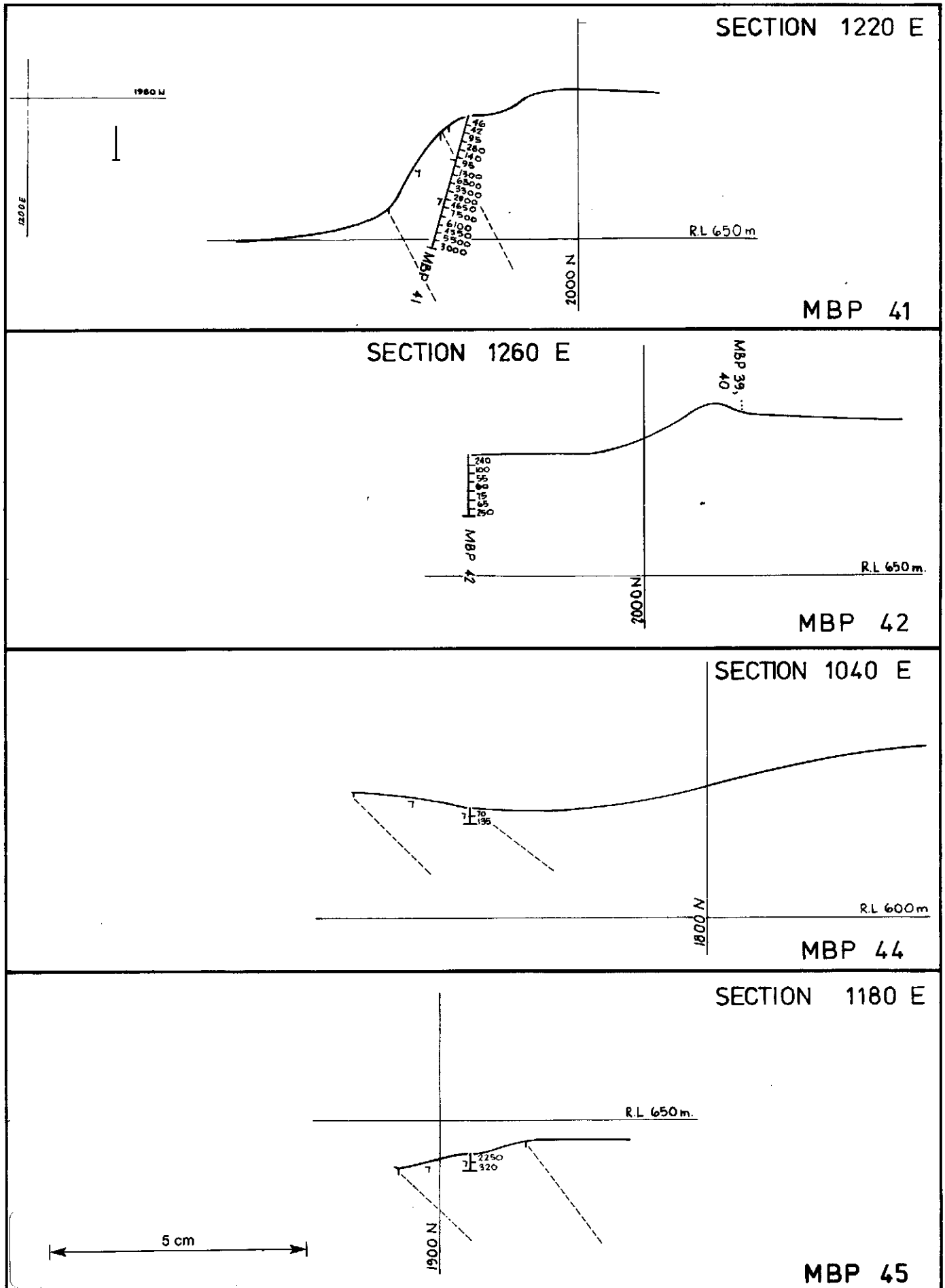
ASSAY SECTIONS MBP 37-40

Prepared :	
Drawn :	Date :
SCALE 1:1200	
Drg. No. 79-247	

M.E.A. A4 75-103 (Melb.)

METALS EXPLORATION LIMITED

192032



MT. BISCHOFF JOINT VENTURE

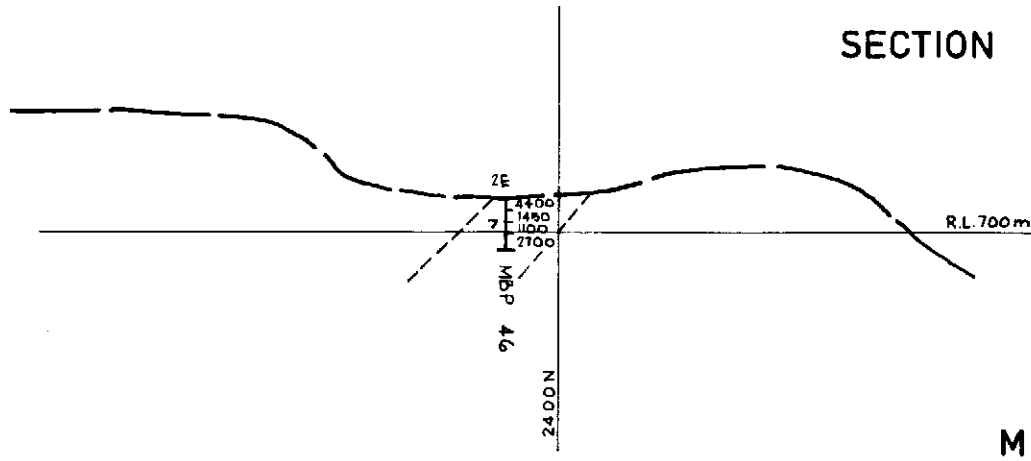
ASSAY SECTIONS MBP 41-42, 44-45

Prepared :	
Drawn :	Date :
SCALE 1:1200	
Drg. No. 79-248	

M.E.A. A4 75-103 (Melb.)

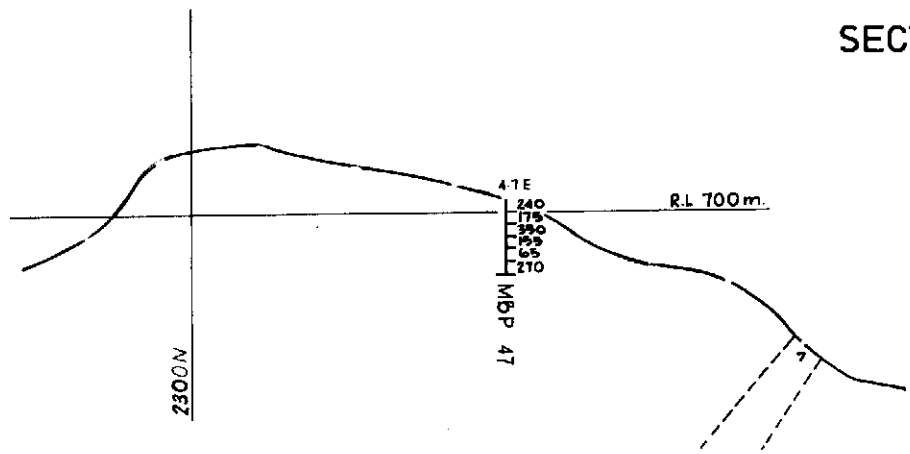
METALS EXPLORATION LIMITED

SECTION 1140 E



MBP 46

SECTION 1260 E



MBP 47

5 cm

MT. BISCHOFF JOINT VENTURE

ASSAY SECTIONS MBP 46-47

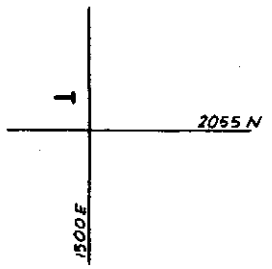
Prepared :	
Drawn :	Date :
SCALE 1:1200	
Drg. No. 79-249	

M.E.A. A4 75-103 (Melb.)

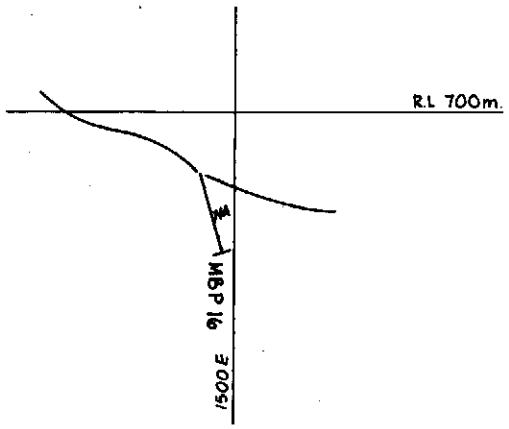
METALS EXPLORATION LIMITED

192034

5 cm

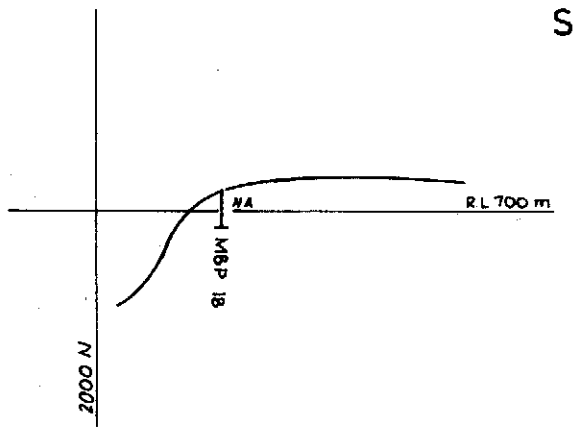


SECTION 2055 N



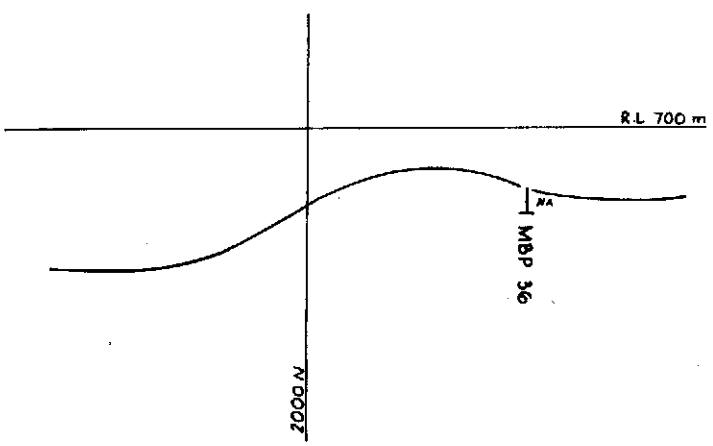
MBP 16

SECTION 1440 E



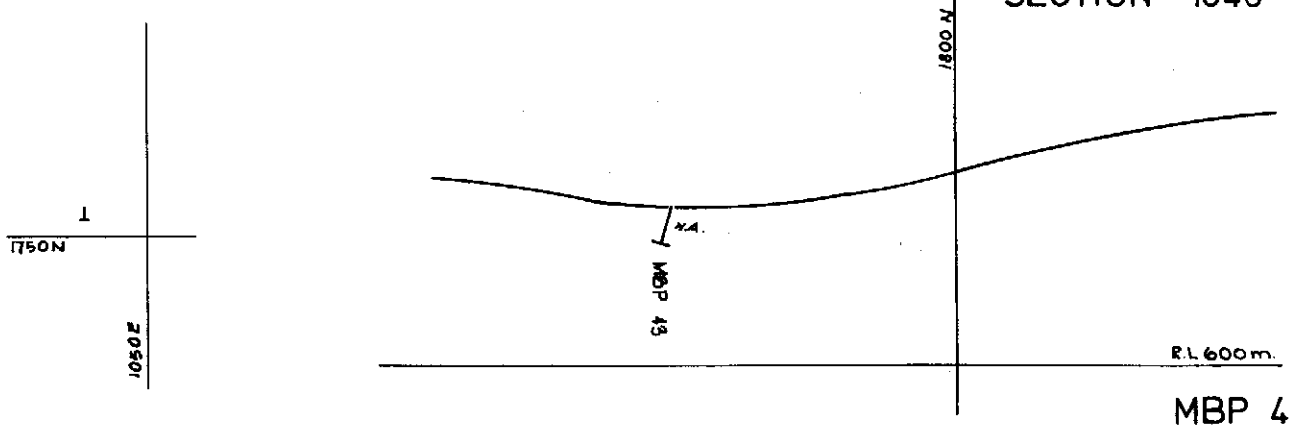
MBP 18

SECTION 1280 E



MBP 36

SECTION 1040 E



MBP 43

MT. BISCHOFF JOINT VENTURE

ASSAY SECTIONS MBP 16, 18, 36, 43

Prepared :	
Drawn :	Date :
SCALE 1:1200	
Drg. No. 79-250	

M.E.A. A4 75-103 (Melb.)

The results of the drilling are recorded in the accompanying drill logs and summarised in the tables (pages 13 & 14). Five porphyry dyke systems were drilled and their average intersected grades are as follows :

Dyke Name	Between Sections	No. of Holes	Meters Intersected	% Sn
Stanhope Extended	1520 E - 1840 E	10	196	0.11
Queen	2100 N - 2240 N	7	63.25	0.27
Stanhope	1260 E - 1480 E	11	136.5	0.20
White Face	1040 E - 1220 E	3	27	0.35
North Face	1135 E	1	8	0.24

All the porphyry intersections averaged greater than 0.1 % Sn except the three most easterly sections along the Stanhope Extended dyke (1760 E - 1840 E) which averaged 0.04 % Sn.

7. DIAMOND DRILLING

A total of 1415.9 metres of diamond drilling in 8 holes was completed in the Stage 2 A Programme, using a Longyear F 38 drill outfit. Five holes were drilled between 21 June, 1979 and 20 July, 1979 (1015.9 metres), and the remaining three holes between 14 August, 1979 and 27 August, 1979 (400 metres). The drill was run on two 10 hour shifts, 7 days per week.

Hole MBD 6 (Section 800 E) was designed to intersect White Face porphyry dyke some 80 metres to the west of the intersection in B 38 which averaged 0.3 % Sn over 32 metres. Only 3.7 metres of porphyry, averaging 0.04 % Sn between 177.8 m and 181.5 metres were struck in MBD 6. The hole was completed

.../16

at 200 metres. Significant assay results were as follows (> 0.1 % Sn) :

From(m)	To (m)	Width(m)	% Sn	% W	Rock type
27.7	27.9	0.2	7.41	0.05	Vein
59.53	60.07	0.54	0.45	0.63	Vein + sediments
74	76	2	0.12		Sediments, narrow veins
125.35	126.47	0.7	0.14		Quartz porphyry
162	164	2	0.11		Sediments, narrow veins
166	168	2	0.15		" " "

Hole MBD 7 (Section BB) was drilled to test a zone of veins around Queen porphyry dyke adjacent to the main tunnel where channel sampling (Comstaff) had revealed about 50 metres of tunnel to average 0.17 % Sn. The hole was collared in dolomite sulphide lode at the east end of Brown Face. 21.1 metres of lode were intersected, but no tin mineralisation was present. Queen dyke was struck between 131.7 and 139.8 metres (8.1 metres) - its average assay was 193 ppm Sn. No major vein systems were found in the hole which reached a depth of 220 metres. The only significant assay result was between 78 and 82 metres (4 metres) which averaged 0.29 % Sn in sediments with thin quartz veins.

As well as the percussion holes that tested the Stanhope Extended porphyry dyke, one diamond hole, MBD 8 (Section 1640 E) was drilled to check the mineralisation at depth. This hole was completed at 151.4 metres and intersected two quartz porphyry dykes. The upper dyke is the Stanhope Extended dyke and was penetrated between 94.6 metres and

.../17

112.5 metres (17.9 metres). It's average assay was 0.15 % Sn with a 10 metre central core of 0.22 % Sn. The lower dyke has not been seen in outcrop and is a much finer grained aplitic looking rock. This dyke was struck between 123.2 metres and 136.65 metres (13.45 metres) and averaged 250 ppm Sn.

Since hole MBD 6 failed to hit a significant quartz porphyry dyke (White Face) intersection, MBD 9 (Section 820 E) was drilled 20 metres closer to hole B 38 which had the 32 metres of 0.3 % Sn in the dyke. In its total length of 200 metres, MBD 9 also failed to find significant porphyry. Two narrow dykes were found :

89.15- 93.35 metres (4.2 metres) at 0.43 % Sn

149.05- 150.25 metres (1.2 metres) at 450 ppm Sn

Intersections greater than 0.1 % Sn were as follows :

From(m)	To (m)	Width(m)	% Sn	Rock type
52	54	2	0.70	Sediments and vein
52.6	52.95	0.35	3.16	Vein within above

Hole MBD 10 (Section 1260 E) was designed to test for possible repetitions and extensions of the dolomite sulphide mineralisation towards the south east of Pig Flat/Happy Valley area. The hole was drilled to 244.5 metres and no dolomite was struck. The only significant results were in a zone of veins between 97.85 metres and 99.45 metres (1.6 metres) which averaged 1.46 % Sn. A slightly wider zone around the veins gave the following results :

96.0-102.0 metres (6 metres) averaging 0.68 % Sn.

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Following the ground magnetic survey in the Summit area of Mt. Bischoff, MBD 11 (Section 920 E) was centred on the "Summit anomaly" and reached a depth of 200 metres. A zone of 45 metres between 147.5 metres and 192.5 metres contained an estimated 5 % pyrrhotite and was interpreted as being the source of the magnetic anomaly (see R.J. Smith's memorandum in appendix). No dolomite rocks were intersected. Four narrow quartz porphyrys (maximum width 6 metres) were intersected. Significant assay results were as follows :

From(m)	To (m)	Width(m)	% Sn	% W	Rock type
14	16	2	0.11		Sediments and vein
26	27	1	0.13		Sediments
27	29.3	2.3	0.10		Quartz porphyry
32	34	2	0.14		Sediments and veins
38	40	2	0.10		" " "
49	49.8	0.8	0.30		Quartz porphyry
66	67.5	1.5	0.21		Sediments and veins
81.9	83.0	1.1	0.30		15mm vein along core
95.7	99.7	4.0	0.16		Sediments and veins
106	106.7	0.7	2.52	0.34	Vein
113	115.3	2.3	0.12		Sediments
122	124	2	0.12		"
127.6	129.7	2.1	0.25		Sediments and veins
138	140	2	0.15		Sediments

Hole MBD 12 (Section 980 E) was sited over the "Slaughteryard" magnetic anomaly some 70 metres grid west of outcropping

.../19

massive sulphides in Slaughteryard Face. A zone of 22 metres between 25.2 metres and 47.2 metres with an estimated pyrrhotite content of 2 % was intersected. This intersection is thought to be part of the source of the magnetic anomaly (see R.J. Smith's memorandum in appendix). No dolomite was found. The following assay results graded higher than 0.1 % Sn :

From(m)	To (m)	Width(m)	% Sn	Rock type
3	4	1	1.95	Sediments and vein
14	16	2	0.23	Sediments and veins
32	34	2	0.21	" " "
52	54	2	0.22	" " "
58.3	58.45	0.15	2.00	Vein

The final depth of the hole was 80 metres.

The last hole of the programme, MBD 13 (Section 1060 E) was drilled within the area of known mineralisation in both dolomite sulphide lode and quartz porphyry. The hole, which was completed at 120 metres, was designed to fill in grade and tonnage information in a spatial gap in the reserve estimates. Tin mineralisation was intersected in both the dolomite sulphide lode zones and the quartz porphyry as follows :

From(m)	To (m)	Width(m)	% Sn	Rock type
8	10	2	0.11	Dolomite and sulphides
11	18.3	7.3	0.66	Dolomite sulphide lode
36	38	2	0.17	" " "
40	69.3	29.3	1.48	" " "

.../20

From(m)	To (m)	Width(m)	% Sn	Rock type
42	69.3	27.3	1.58	Included in above
42	68	26	0.60	" " "
68	69.3	1.3	22.00	" " "
69.3	90.9	21.6	0.66	Quartz porphyry
90.9	99.0	8.1	1.68	Dolomite sulphide lode

The White Face porphyry dyke intersection in hole B 37 in the Don Hill area was split and assayed. 20.7 metres of dyke averaged 60 ppm Sn.

A total of 423 split drill core samples, mostly 2 metres in length, were analysed for tin by XRF (B 1 Method/B 2 Method if over 1 % Sn) by AMDEL.

8. GEOLOGY

Some previous authors of reports on Mt. Bischoff have given stratigraphic columns for the Mt. Bischoff Series in which the dolomite horizon is overlain by carbonaceous shales, and the underlying rocks contain scarse carbonaceous matter. Partly on the basis of the previous thinking, hole MBD 10 was drilled to test the theory that since carbonaceous shales lay under part of the dolomite horizon in the Pig Flat area then that dolomite may lie in a slumped position and the true in situ dolomite horizon lay beneath the carbonaceous shales. MBD 10's core is almost totally carbonaceous.

In holes MBD 6 and 9, which were collared 46 metres apart, the cores reveal very similar rock structures, however, hole

.../21

MBD 9 is almost totally carbonaceous whereas MBD 6 is only partially carbonaceous.

A study of the drill logs of all previous holes and of surface and underground mapping has shown that the central core of Mt. Bischoff, some 900 metres by 600 metres in area, contains virtually no carbonaceous rocks. It is also noticeable that the sandstones are converted into hard quartzites within this area.

It is therefore postulated that a zone of alteration exists in the centre of Mt. Bischoff and that, as a result, the stratigraphic column should be altered such that carbonaceous shales are no longer necessarily overlying the dolomite horizon.

9. RESERVES

A re-assessment of the higher grade reserves has been made incorporating the new data of the Stage 2 A Programme. The basis of the figures and parametres used are given for each set of calculations.

1. Dolomite Sulphide Reserves

Greisen Face - Pig Flat

Parameters: Cut-off grade 0.3 % Sn
Specific gravity 3.2 (Waste 2.89)
Between Sections 930 E - 1130 E

Category: Drill Indicated i.e. within approximately 30 metres of drill hole intersection.

Grade: per drill intersection to half distance to next drill intersection (N.B. recoveries in old drilling were often poor).

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Reserves: 863,000 tonnes at 1.10 % Sn
including 547,000 tonnes in theoretical open pit (slope angle 45°) at 5:1 waste: reserve ratio.

Slaughteryard Face

Parameters: Specific gravity 3.2
Between Sections 1040 E - 1080 E

Category: Possible

Grade: 0.7 % (one grab sample)

Reserves: 61,000 tonnes at 0.70 % Sn
open pit - virtually no waste

Total Dolomite Sulphide Reserves

924,000 tonnes at 1.07 % Sn

2. Porphyry Reserves

White Face Dyke

Parameters: Cut-off grade 0.3 % Sn
Specific gravity 3.05
Between Sections 850 E - 1410 E
Maximum depth RL 450 m (approximately 200 m below surface)

Categories: Drill Indicated i.e. within 50 metres of drill hole on sections and 10 metres between sections.

Drill Inferred i.e. between 50 metres and 100 metres of drill hole on sections and 10 and 30 metres between sections.

Possible i.e. beyond 100 metres of drill hole on sections and 30 metres between sections.

Grade: per drill intersection for indicated, where applicable average of drill holes for inferred and possible.

Reserves:

Drill Indicated	680,000	tonnes at	0.57% Sn
Drill Inferred	1,069,000	" "	0.58% Sn
Possible	523,000	" "	0.54% Sn
Total	2,272,000	" "	0.56% Sn

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Stanhope Dyke

Parametres: As above except:
Between Sections 1290 E - 1410 E
Maximum depth RL 570 m (approximately 125 m below surface)

Reserves:

Drill Indicated	91,000	tonnes at	0.54% Sn
Drill Inferred	220,000	" "	0.53% Sn
Possible	59,000	" "	0.53% Sn
Total	370,000	" "	0.53% Sn

including 297,000 tonnes in theoretical open pit (slope angle 45°) at 6:1 waste:reserve ratio

Other Porphyry

Limited reserves may be available in Queen Dyke with a cut-off grade of 0.3% Sn.

Total Porphyry Reserves

Drill Indicated	771,000	tonnes at	0.56% Sn
Drill Inferred	1,289,000	" "	0.57% Sn
Possible	582,000	" "	0.54% Sn
Total	2,642,000	" "	0.56% Sn

3. Total Reserves

Dolomite Sulphide Reserves	924,000	tonnes at	1.07% Sn
Porphyry Reserves	2,642,000	" "	0.56% Sn
Total	3,566,000	" "	0.69% Sn

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10. METALLURGY

Testwork has been carried out on porphyry rocks by AMDEL between March and August, 1979. The main areas of the work were in gravity and flotation techniques. AMDEL's full report appears as an appendix to this report.

The most encouraging results are that the porphyry rock responded favourably to an unconventional flotation before gravity treatment procedure, the reverse of the usual combined procedure of gravity then flotation. Using flotation first indicates a tin concentrate grade of 25 % Sn at 85 % recovery. The more conventional gravity first system yielded at best 70 % recovery in a similar concentrate grade. The front-end flotation system effectively gave a concentration factor of 8 or 9 with a recovery of over 90 %, (eg a tin rougher concentrate had a grade of 2.78 % Sn from a head grade of 0.35 % Sn with 92.3 % recovery).

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APPENDICES

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22nd August, 1979

Memorandum to: A. JANNINK
T. PORTER

From: R.J. SMITH

Re: MAGNETIC INTERPRETATION - MT. BISCHOFF

Recently (August 1979) the ground magnetic survey grid at Mt. Bischoff was extended to the north and west in an attempt to detect and delineate a possible weak magnetic anomaly suggested by airborne data. This extended grid covered 1140E-660E and 2100N-2680N with measurements at 20 m intervals along north-south lines spaced 40 m apart. A weak anomaly (amplitude approx. 100nT) was confirmed, centred near 2500N on line 900E and line 940E. Some attempt has been made to match the observed magnetic anomaly by computer modelling in order to predict depth, magnetic susceptibility etc. of the source. The results are attached.

Only two lines, 900E and 940E crossed the anomaly near its centre so data on these lines was used in an attempt to simulate the observed response. Although the anomaly appears equidimensional, only two dimensional modelling techniques (assuming infinite strike) were used in this excercise. The anomaly was not pronounced and its shape was no doubt distorted by severe terrain so it was unreasonable to expect a perfect match or to rely too heavily on the results obtained by modelling.

Only the central portion of the anomaly on these two lines was used. Measurements north of 2600N appeared to be excessively distorted by terrain and south of approximately 2400N there was some interference from the Slaughteryard anomaly and steep terrain near the summit of Mt. Bischoff. Models used were flat lying rectangular prisms, simulating flat lying stratiform mineralisation. Any real body of this type might be expected to have tapered edges rather than the

vertical sides used in the model but these would have little influence on the magnetic measurements.

Models of best fit are shown on the attached figures together with a comparison of computed and observed magnetic data. Although the solutions are not unique and the agreement between observed and calculated magnetic data is not perfect some broad conclusions appear reasonable:-

(1) The source extends from approximately 2400N to 2500N.

(2) The source is at a depth of 100 to 150 m below the surface, probably shallower on line 940E.

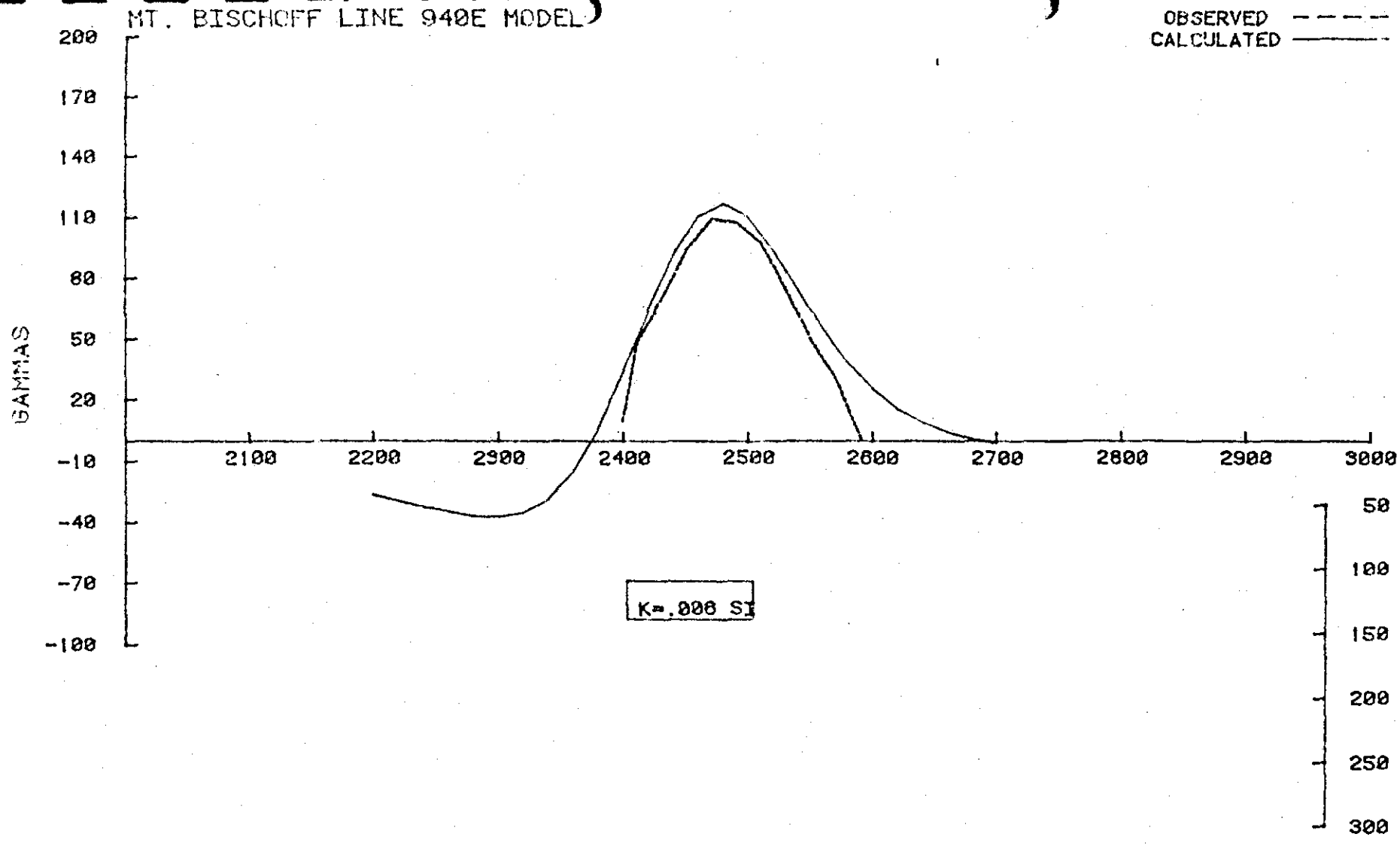
(3) The source is likely to be only weakly magnetic with an effective susceptibility of approximatley 00005 c.g.s. units (0.006 - 0.007 S.I. units). If significant remanent magnetisation is also present, the measured susceptibility may be even less.

(4) A depth extent of 30 m was used for the model but this is not critical. An increase in thickness and decrease in susceptibility would produce much the same response.

A drill hole to test this anomaly is in progress. It is drilling vertically below 2500N/920E. Although this is sited near the interpreted northern edge of the source it should identify the nature of the source material. Since a slight northerly dip is anticipated, the source depth may be slightly deeper than anticipated but this is no doubt complicated by the very steep terrain in this area. Numerous thin veins of weakly magnetic material (approximately 0.0003 - 0.0006 cgs units) have been intersected near 150 m depth in this drill hole and these are porbably sufficient to explain the observed anomaly.

R.J. Smith

R.J. SMITH


MT. BISCHOFF LINE 940E MODEL
OBSERVED
CALCULATED
GAMMAS
200
170
140
110
80
50
20
-10
-40
-70
-100
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
50
100
150
200
250
300
K=.008 SI

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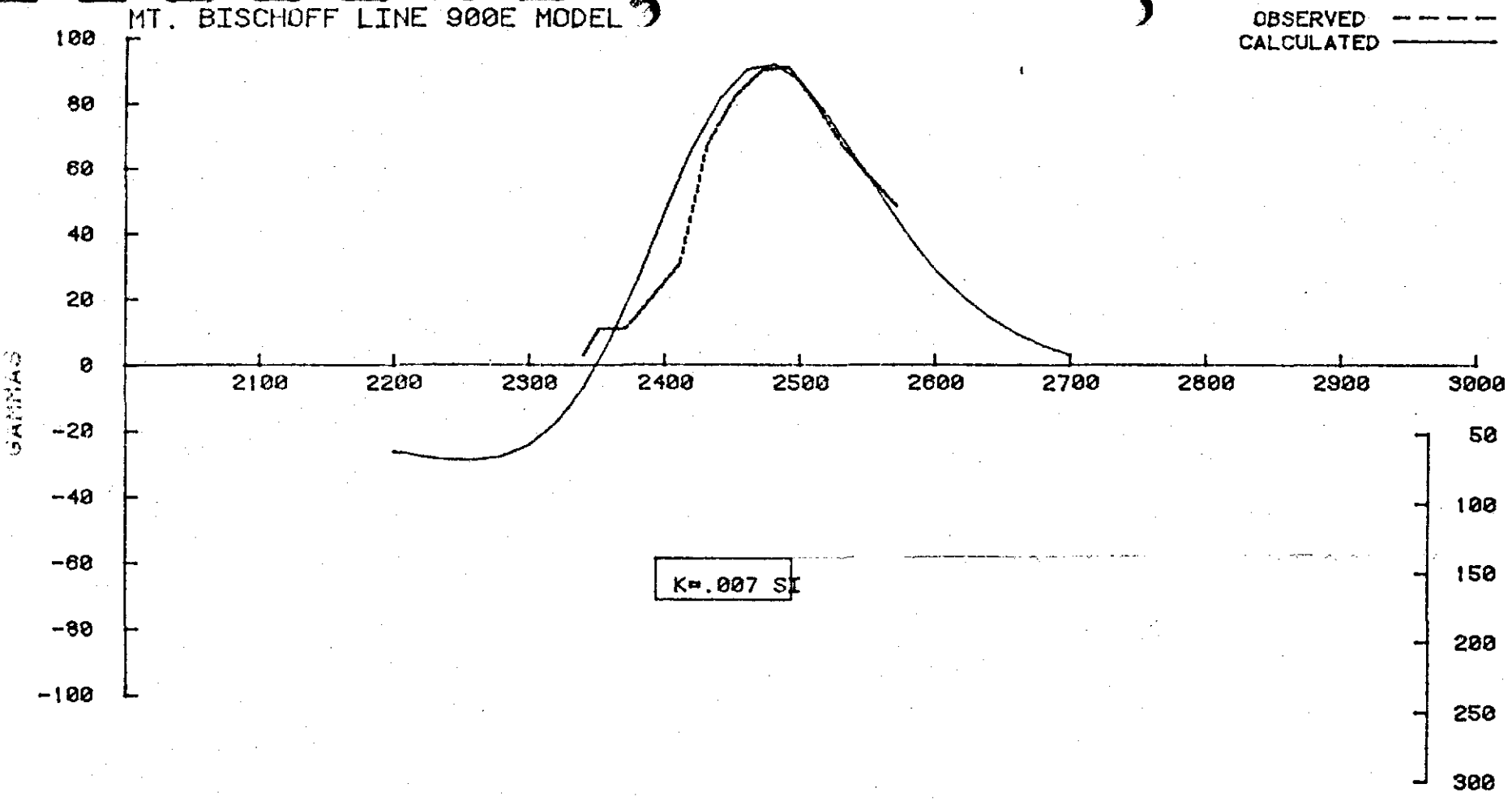
MT. BISCHOFF LINE 900E MODEL
OBSERVED
CALCULATED
100
80
60
40
20
0
-20
-40
-60
-80
-100
2100
2200
2300
2400
2500
2600
2700
2800
2900
3000
50
100
150
200
250
300
K=.007 SI

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September 26, 1979.

Memorandum to: J. LYNCH
A. JANNINK
M. PORTER
J. REBEK

Memorandum from: R.J. SMITH

Re: DRILLHOLE MBD 11, MT. BISCHOFF

Further to my earlier memo of August 22, magnetic susceptibility measurements on core from drill hole MBD 11 are now to hand. The results are summarized in the attached table and histogram (Fig 1).

The model results attached to my earlier memorandum suggest that, beneath lines 900E and 940E, a source with susceptibility of approximately 0.5×10^{-3} c.g.s. would be necessary to explain the observed anomaly, at a depth of approximately 150 metres and with a depth extent of approximately 30 metres. Naturally this is not a unique solution but it suggests an order of magnitude for the source.

Drillhole MBD 11 was located at 2500N/920E and should have tested the source of the observed magnetic anomaly. The results shown in Fig 1 suggest a bulk susceptibility of perhaps 0.2×10^{-3} - 0.25×10^{-3} c.g.s. units over a depth interval of almost 100 metres (from approximately 100 metres to 200 metres). Although the agreement is not precise it is not unreasonable and the weak mineralisation intersected in MBD 11 appears likely to be the source of the observed magnetic anomaly.

I have also enclosed a copy of a brief report from C.S.I.R.O. on a study of the magnetic properties of various rock samples collected at Mt. Bischoff. This study suggests that remanent magnetisation of pyrrhotite at Mt. Bischoff is significant and although it is aligned close to the present earth's field it is likely to increase the effective susceptibility of the mineralisation.

Although some ambiguity is inevitable it seems reasonable to assume that the mineralisation intersected in drillhole MBD 11 is representative of the source of the observed magnetic anomaly at this location.

R.J. SMITH

RJS/lm

encs.

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MBD 11 - MAGNETIC SUSCEPTIBILITY

FROM	TO	RANGE	
0	70 m	0.0 - 0.1	
70	80	0.0 - 0.1	50% @ 0.2
80	89	0.0 - 0.1	
89	89.8	0.3 - 0.5	
89.8	90.0	0.9 - 1.5	Porphyry, upper margin.
90.0	90.8	0.1	Porphyry
90.8	91.7	1.0 - 2.0	"
91.7	91.9	0.1	"
91.9	93.0	0.0 - 0.1	
93.0	94.0	0.1	50% as 10cm long zones 0.3 - 0.4 po splashes in quartzite
94.0	96.0	0.1 - 0.2	
96.0	102.0	0.1 - 0.2	75% 0.3 - 0.6 quartzite with patches and veinlets pyrrhotite (larger patches up to 1cm) A 1cm vein gives 1.2 - 2.5
102.0	104.0	0.1 - 0.2	
104.0	105.0	0.1 - 0.3	with 25% 0.3 - 1.0
105.0	114.0	0.1 - 0.2	
114.0	115.0	0.3 - 0.6	
115.0	119.0	0.1 - 0.2	with 10% patches up to 5cm long of 0.3 - 0.6
119.0	119.3	0.3 - 0.6	
119.3	126.0	0.0 - 0.1	with 10% 0.2 → 0.4
126.0	137.0	0.2 - 0.3	with 20% 0 - 0.1
137.0	141.5	0.0 - 0.1	with 0.2 - 0.4
141.5	147.0	0.0 - 0.2	porphyry
147.0	153.0	0.0 - 0.2	with 20% of 5cm patches 0.2 - 0.6
153.0	154.5	0.3 - 1.0	(laminae and bands up to 5mm thick of pyrrhotite.)
154.5	155.0	0.3 - 0.5	
155.0	159.0	0.0 - 0.2	with 10% 0.3 - 0.6
159.0	161.0	0.0 - 0.2	with 50% 0.3 - 0.4
161.0	164.0	0.3	with 20% 0.1 - 0.2 and 40% 0.4 - 0.5
164.0	165.0	0.4 - 0.7	
165.0	165.8	0.3	
165.8	166.0	0.7 - 1.0	
166.0	171.0	0.2 - 0.3	with 40% 0.4 - 0.5 and 5% 0.6 - 1.0
171.0	172.0	0.1 - 0.3	with 30% 0.4 - 0.6
172.0	173.2	0.4 - 1.1	with 20% 0.3
173.2	181.5	0.2 - 0.3	with 5% 0.0 - 0.1 and 40% 0.4 - 0.5
181.5	184.0	0.2 - 0.3	with 40% 0.4 - 0.7
184.0	192.5	0.1 - 0.2	with 30% 0.3 - 0.5 and 10% 0.5 - 0.8 (peak 1.1)
192.5	194.5	0.0 - 0.1	with 10% 0.2
194.5	200.0	0.0 - 0.1	with 10% 0.2 and 10 cm 0.4

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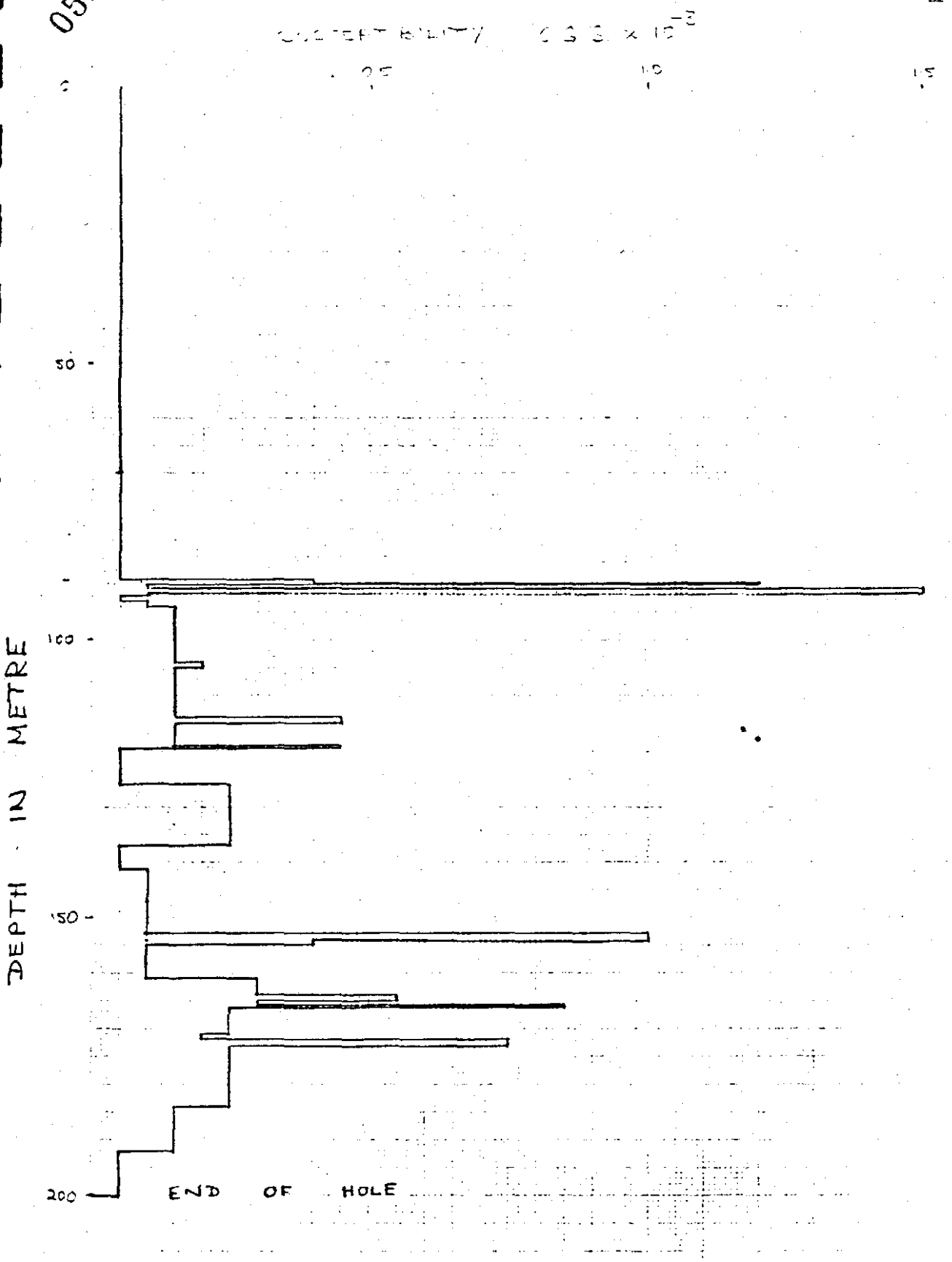

DRILL HOLE MBD 11 – Mt BISCHOFF TAS.

MAGNETIC SUSCEPTIBILITY MEASUREMENTS ON CORE

5 cm

FIG 1

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12th September, 1979

Memorandum to: A. JANNINK
T.M. PORTER

Copy to: R.J. REBEK

Memorandum from: R.J. SMITH

Re: DRILLHOLE MBD 12, MT. BISCHOFF

Drillhole MBD 12 was recently completed at Mt. Bischoff. This hole was drilled vertically below 2180N 980E on the Mt. Bischoff grid to test for possible extensions of the Slaughteryard mineralisation suggested by ground magnetic measurements.

The drillhole did intersect weak pyrrhotite mineralisation and measurements of magnetic susceptibility were made on core samples. The results are attached as Table 1 and illustrated graphically as Figure 1.

A very crude attempt was made to match the observed magnetic anomaly on line 980E with a computed model using thickness and susceptibility as indicated by the drilling results. The results of this curve matching are attached at Figure 2.

It should be noted that, south of 60N, the observed anomaly was obscured by the response over "Slaughteryard" exposed mineralisation, consequently this portion of the "observed" curve has been constructed by visual extrapolation. Although the match between computed and observed magnetic data is imperfect it is not unreasonable. It is apparent that the mineralisation intersected in MBD 12 is sufficient to explain the observed magnetic anomaly and therefore the anomaly has been adequately tested.

R.J. Smith

R.J. SMITH

RJS/pw

TABLE 1

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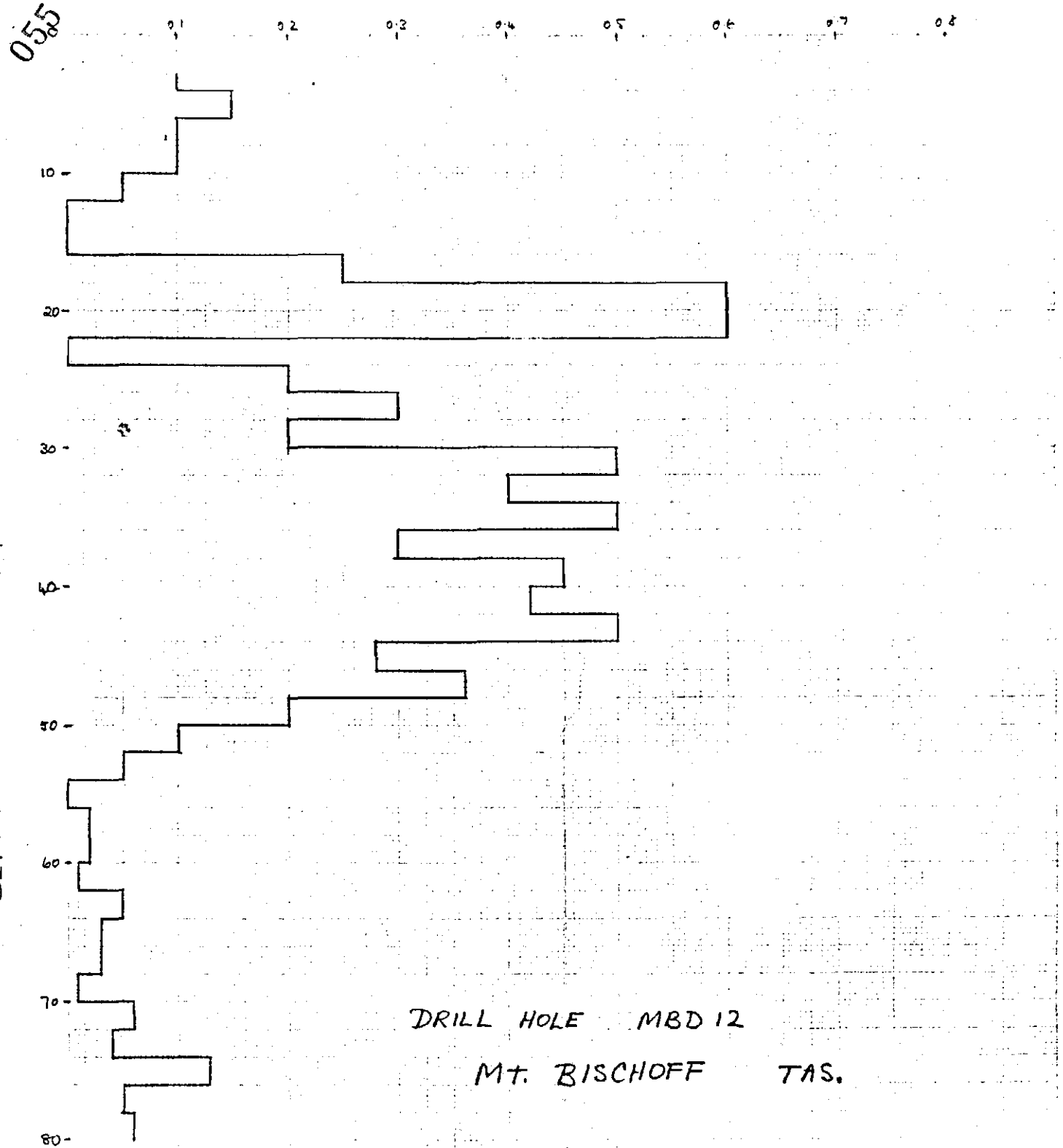
MBD12 MAGNETIC SUSCEPTIBILITY

Depth (m) from	to	Average Susceptibility Reading ($\times 10^{-3}$ c.g.s.)	Variation
3	4	0·1	
4	6	0·15	
6	8	0·10	
8	10	0·10	
10	12	0·05	
12	14	0	
14	16	0	
16	18	0·25	(0·1 - 0·4)
18	20	0·6	(0·3 - 1·2)
20	22	0·6	(0·4 - 1·0)
22	24	0	
24	26	0·2	(0·0 - 1·0)
26	28	0·3	(0·2 - 0·6)
28	30	0·2	(0·1 - 0·6)
30	32	0·5	(0·3 - 0·8)
32	34	0·4	(0·2 - 0·6)
34	36	0·5	(0·2 - 0·9)
36	38	0·3	
38	40	0·45	(0·2 - 0·7)
40	42	0·42	(0·3 - 0·6)
42	44	0·50	(0·3 - 0·7)
44	46	0·28	(0·1 - 0·5)
46	48	0·36	(0·1 - 0·7)
48	50	0·20	(0·0 - 0·6)
50	52	0·10	(0·0 - 0·4)
52	54	0·05	(0·0 - 0·2)
54	56	0	
56	58	0·02	(0·0 - 0·1)
58	60	0·02	(0·0 - 0·1)
60	62	0·01	(0·0 - 0·1)
62	64	0·05	(0·0 - 0·1)
64	66	0·03	(0·0 - 0·1)
66	68	0·03	(0·0 - 0·2)
68	70	0·01	(0·0 - 0·1)
70	72	0·06	(0·0 - 0·1)
72	74	0·04	(0·0 - 0·1)
74	76	0·127	(0·0 - 0·5)
76	78	0·0583333	(0·0 - 0·3)
78	80	0·06	(0·0 - 0·2)

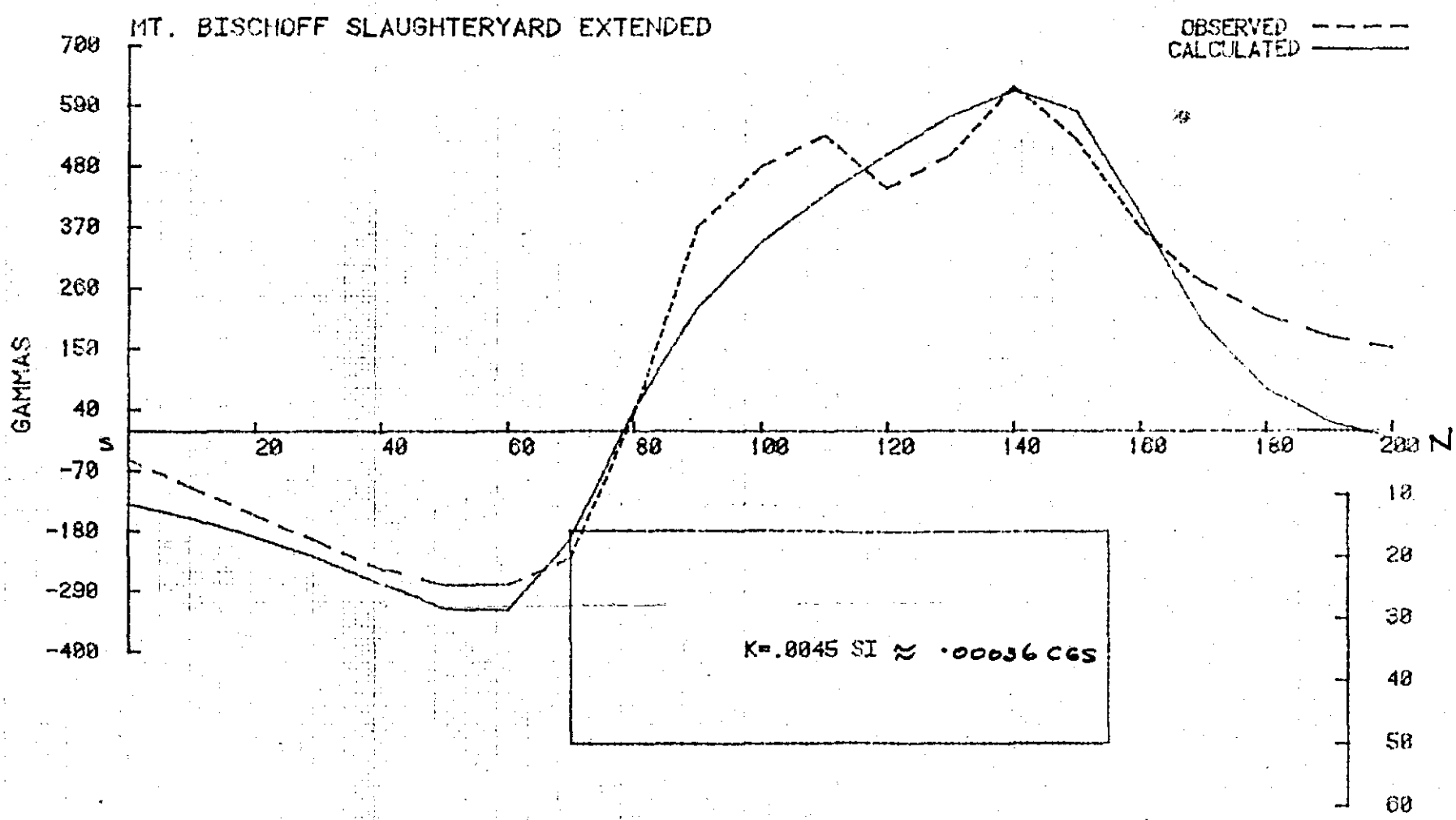


DRILL HOLE MBD 12

MT. BISCHOFF TAS.

5 cm

FIG 1



OBSERVED MAGNETIC DATA 0 — 60N WAS EXTROPOLATED BY VISUAL SMOOTHING.

FIG 2

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C.S.I.R.O.

MAGNETIC PROPERTIES OF VARIOUS ROCK SAMPLES COLLECTED AT MT. BISCHOFF

DISCUSSION OF RESULTS

Samples considered to be representative of the various lithologies exposed at Mt Bischoff were collected by CSIRO at 10 sites in March 1979. In addition 4 crudely oriented block samples of Tertiary basalt from south of Mt Bischoff were sent later by Mike Porter and are designated MB11A-D (site 11).

Remanence and susceptibility anisotropy were measured on a Digico spinner magnetometer system and bulk susceptibility values were determined on a low frequency (211 Hz) transformer bridge.

The site localities are listed in Table I and the magnetic parameters in Table II and III.

It is clear that of the lithologies sampled only the massive sulphides and the Tertiary basalt are strongly magnetic. All other rock types are non-magnetic (quartzite, quartz-feldspar porphyry) or weakly magnetic (pyrrhotite bearing dolomite). Possible sources of magnetic anomalies appear therefore to be restricted to massive pyrrhotite rocks and basalt. Of these the massive pyrrhotites are more intensely magnetised and overall are probably of normal polarity whereas the basalt is reversely magnetised. This gives rise to the expectation that sulphide mineralization at shallow depth should be detectable underneath the basalt flows in the region.

MASSIVE PYRRHOTITE (SITES 1, 3 and 4)

Koenigsberger ratios greater than unity indicate that remanence dominates induction in the massive sulphides and therefore remanence must be taken into account for interpretation.

To gain an understanding of the remanence components present, alternating field (AF) demagnetisation experiments were carried out on all specimens. These tests gave useful information on the stability of remanence and coercivity spectra.

Thermomagnetic analysis determined the major magnetic mineral present as the ferrimagnetic phase Fe_7S_8 with a Curie temperature of approximately 310°C. A small amount of magnetite was also detected, but this may have been produced by oxidation of the pyrrhotite during the heating process.

Site 1 - The dolomite/massive sulphide contact in the Gossan Face was sampled, MB1A-B being dolomite and MB1C-E being massive pyrrhotite. The susceptibility and remanent intensity increase with the pyrrhotite content of the rock, but the remanence directions (whilst fairly scattered) are consistent for all specimens and are directed roughly west horizontally. Only the dolomite samples

could be oriented with a sun-compass. The average local declination found from these two orientations was 30°W, indicating a 40° declination anomaly at this site, and this value was used to correct magnetic compass orientations of the other samples some two or three metres away. The overall consistency of directions obtained implies that the orientations are not greatly in error.

The magnetisation is fairly soft, most being cleaned out by AF demagnetisation in less than 50 Oersteds, but the directions in general are quite stable to AF cleaning up to several hundred Oersteds. The directions are quite different to the present field, and are therefore ancient, but also differ markedly from the directions at the sites away from the margin of the massive mineralization. This indicates different times of acquisition of magnetisation for the margins and the bulk of the massive pyrrhotite. The large scatter of directions precludes definite conclusions being drawn, but the mean direction obtained from site 1 appears to be more consistent with known Cambrian poles than Devonian pole positions, particularly after correction is made for an interpreted bedding tilt of 30°. There is therefore some support in the data for the hypothesis that the pyrrhotite is primary and the mineralization is a stratabound Cambrian chemical deposit, although the evidence is not strong.

The cleaned remanence directions from the other massive pyrrhotite sites are consistent with a Devonian magnetisation, or remagnetisation, associated with intrusion of the porphyry dykes, although there is probably a substantial present field component at site 4.

Site 3 Sun compass orientations improved the reliability of the results as reflected in the well-grouped directions obtained. Site 3 was well within the massive mineralization and the rocks were quite magnetic with remanence dominant ($Q \simeq 3$). The NRMs are somewhat harder than at the other sites with over half the original intensity remaining after AF cleaning to 50 Oersteds, and the directions are fairly stable up to several hundred Oersteds. The magnetisation is ancient but is within 30° of present field which suggests that induction could be assumed as a first approximation in modelling without gross errors.

Site 4 - The rock face at this site was in shadow, precluding sun-compass orientations. This leads to the possibility of a systematic declination error giving erroneous directions. The tight grouping of directions from this site indicates that local declinations are consistent for the different samples.

After AF cleaning, however, the measured directions from site 4 are close to those from site 3, suggesting the magnetic compass orientations are not greatly in error. The problem then arises of the significance of the softer NRM component directed south with shallow negative inclination. This component has an unusual direction which is not consistent with any past dipole field, but is very soft - being mostly demagnetised in less than 10 Oersteds peak alternating field. The low coercive force should be associated with magnetic instability and a tendency both to relax viscously towards the Earth's field direction if undisturbed (acquisition of VRM) and to be readily remagnetised by stray fields of short duration and field strength greater than the coercive force (acquisition of IRM). The divergence of the soft component direction from the present field shows it is not a VRM, and is therefore probably an IRM (isothermal remanent magnetisation). Exposure to laboratory fields of several Oersteds could produce an IRM of coercive force similar to the field strength, but cannot account for the fact that the anomalous component (assumed to be IRM) is not completely cleaned out in 50 Oersted peak AF implying the rocks have been exposed to a field of this order. The most likely cause of the IRM is a nearby lightning strike, although not a direct hit because the relatively low magnetising field and the uniform direction of the IRM component over several metres indicate peripheral influence only. The site is near the top of a small ridge and the rocks are quite conductive, so the lightning strike hypothesis is not unreasonable.

The saturation remanence of a specimen from site 3 is greater than that of a specimen from site 4 indicating a higher pyrrhotite content at site 3. The greater susceptibility at site 4 must then be attributed to larger grain size which is consistent with low coercive force, and would normally be associated with lower Koenigsberger ratio unless the magnetisation was acquired in a higher field at site 4. This evidence supports the IRM interpretation of results from site 4.

The variation of magnetic properties between samples from sites 3 and 4 may be indicative of general heterogeneity of the mineralized zone or may reflect alteration due to the proximity of the porphyry. Further work is needed to establish whether the heterogeneity is compositional or simply due to variation in grain size.

The final cleaned directions from site 4 are close to those from site 3, suggesting the isolated direction may be representative of the remanence of the massive pyrrhotite rocks. Again the cleaned direction from site 4 is close to present field and induction can be assumed in the first instance. The very soft grains are expected to acquire a VRM along the present field direction when undisturbed by surface effects, and should therefore raise the effective susceptibility.

Overall the expected magnetisation vector in the bulk of the rock lies within 20° or 30° of the present field direction and should produce positive anomalies. On the basis of the admittedly limited sampling the average magnetization intensity should be of the order of 30,000 micro-Oersteds (3,000 gammas).

TERTIARY BASALT (SITE 11) - The samples submitted by C.R.A. were somewhat weathered and were thought likely to produce suspect results. However all specimens drilled out from the blocks were found to have downward pointing remanence vectors with declinations determined from the rough orientations supplied mostly being consistent with reversed polarity. Scatter was small within samples despite variation of degree of weathering.

Thus the results indicate reversely polarised NRM with a Koenigsberger ratio of around 11, implying that the basalts should produce negative anomalies.

The high Koenigsberger ratio, which is associated with high stability, is due to the dominance of single domain particles due either to rapid chilling or else weathering of initially larger grains leaving only a small unoxidised core. These single domain grains have very high coercive force and the remanence is extremely stable to AF cleaning, losing only half the NRM intensity in a peak field of 1,000 Oersteds.

Thermal demagnetisation confirms the observation based on AF cleaning that there is only one stable component present up to the maximum blocking temperature of 450°C.

Thermomagnetic analysis indicates the presence of a single magnetic mineral with Curie temperature approximately 570°C corresponding to nearly pure magnetite containing less than 2% ulvospinel in solid solution.

Variations of physical properties from specimen to specimen appear to reflect the degree of weathering, with the freshest specimens being most magnetic. It is believed that the unweathered basalt is fairly homogeneous and bears an average nett magnetisation of around 8,000 micro-Oersteds (800 gammas) with reverse polarity. Because the rocks are relatively young and significant overprinting is unlikely, the expected direction of magnetisation can be derived from the known palaeopole position at the time of formation.

Assuming an age of 20-25 million years B.P., the pole position (75°S, 99°E) gives direction (197°, + 67°) which is within 5° of the present field if reversed.

MAGNETIC FABRIC AND SUSCEPTIBILITY ANISOTROPY - Apart from the massive pyrrhotites, all the other rock types are essentially magnetically isotropic.

When measured on the Digico spinner anisotropy magnetometer the massive pyrrhotite specimens exhibit a distinct foliation with near-equal maximum and intermediate susceptibility axes forming a foliation plane with a significantly smaller minimum susceptibility axis normal to the plane.

The minimum susceptibility axis directions from different specimens within a site are clustered about a mean direction which is taken as the magnetic foliation pole. At site 1 bedding planes could be observed which correspond with the magnetic foliation plane within the estimated error (see Table III).

On this basis the magnetic foliation planes at sites 3 and 4 were interpreted as corresponding to the palaeohorizontal. Overall the massive pyrrhotite formation in this area (near the Slaughteryard Face) appears to be dipping roughly 45° to the south-east. This interpretation assumes the fabric to be primary and not tectonic.

Pyrrhotite exhibits very high magnetocrystalline anisotropy, being easy to magnetise in the basal plane and very difficult to magnetise along the C-axis. This anisotropy swamps grain shape effects and therefore implies that anisotropy in most pyrrhotite bearing rocks is due to alignment of crystal axes rather than preferred orientation of non-equidimensional grains. The marked anisotropy of the Mt Bischoff massive pyrrhotite may however be a textural feature caused by concentration of randomly oriented pyrrhotite crystals into thin bands with consequent lowered apparent susceptibility normal to the banding (foliation planes).

Due to the high operating frequency of the Digico instrument (10 kHz) and the high conductivity of the massive pyrrhotite specimens, the magnitudes of the susceptibility ellipsoid axes were grossly in error. As an illustration, the Digico bulk susceptibility unit gave negative apparent susceptibilities for pyrrhotite specimens. The effect of conductivity on the anisotropy unit is to exaggerate the oblateness of the susceptibility ellipsoid. However the directions of the axes should not be affected if the conductive and magnetic minerals occur in parallel foliation planes (in this case, pyrrhotite is responsible both for the conductivity and susceptibility). This is because the minimum susceptibility axis is normal to the foliation plane, as is the back field set up by induced eddy currents in the foliation plane. The hypothesis was put to the test by measuring the apparent susceptibility anisotropy of a copper disc in the spinner. The result was effectively zero susceptibility in the plane of the disc and a large negative apparent susceptibility normal to

the disc, corresponding to the minimum apparent susceptibility axis.

Confirmation of the susceptibility axis directions obtained from the Digico instrument was obtained by measuring susceptibility of several specimens in different orientations with the accurate, low frequency transformer bridge. From these measurements the anisotropy magnitude could be estimated and was found to be considerably less than the values obtained from the Digico.

The values obtained for susceptibility anisotropy (defined as major axis/ minor axis) ranged from 1.3 to 2.3, whereas the values obtained from the Digico went from 1.4 to 5.9. Anisotropy of 2.0 corresponds to a maximum deflection of induced magnetisation of 19.5^{o}. Given the dominance of remanent magnetisation ($Q \simeq 3$), the effects of anisotropy on modelling should be negligible.

CONCLUSIONS:

(i) The likely sources of magnetic anomalies in the Mt Bischoff area are restricted to two lithologies: massive pyrrhotite with normal magnetisation, and basalt with reversed magnetisation. The intense magnetisation borne by the mineralised rock gives rise to the expectation that a band of moderate thickness could be followed in the aeromagnetics beneath a shallow basalt layer.

(ii) Remanence is clearly dominant in producing anomalies and must be considered in interpretation. Palaeomagnetic cleaning techniques have allowed the isolation of a remanence direction considered to be representative of the magnetisation component carried by the bulk of the massive pyrrhotite.

(iii) Evidence is presented that massive pyrrhotite rocks at Mt Bischoff carry an ancient magnetisation that has been stable over geological time. Thus it is not safe to assume magnetisation by inducation in massive sulphide ore bodies, although in the case of Mt Bischoff the remanence direction is close enough to present field for magnetic interpretation purposes.

(iv) It is highly desirable that drill core samples of massive pyrrhotite and basalt (if available) are submitted to C.S.I.R.O. in order to test the conclusions based on surface sampling regarding magnetic parameters thought to be representative of the rock types. Since it is unlikely there will be any oriented drill core, it is preferable to obtain samples from two or more drill holes of different known attitude with the top of the samples marked.

TABLE I

	Locality	Grid Co-Ordinates	Rock Type
Site 1	Gossan Face	1980 N, 960 E	Dolomite/Massive sulphide contact
Site 2	Track to Slaughter-yard Face	2050 N, 860 E	Quartzite
Site 3	Slaughteryard Face	2110 N, 1040 E	Massive pyrrhotite
Site 4	Slaughteryard Face adjacent to porphyry	2120 N, 1070 E	Massive pyrrhotite partly enclosed by porphyry
Site 5	Western dyke, Slaughter-yard Face	2060 N, 1100 E	Quartz-feldspar porphyry
Site 6	Western dyke, Slaughter-yard Face	2060 N, 1115 E	Quartz-feldspar prophyry
Site 7	Stanhope dyke	2040 N, 1300 E	Quartz-feldspar porphyry
Site 8	Adjacent to Desert Face and Brown Face	2120 N, 1260 E	Quartzite
Site 9	Between Pig Flat and Happy Valley	1840 N, 1160 E	Dolomite
Site 10	Allen's workings	1775 N, 1015 E	Dolomite
Site 11	South of Mt Bischoff	-	Tertiary basalt

TABLE II

Samples	Rock type	No. of specimens	Average susceptibility (emu x 10^{-6})	Susceptibility range (emu x 10^{-6})	Average NRM intensity (Oe x 10^{-6})	NRM intensity range (Oe x 10^{-6})	Average Koenigsberger ratio (H = 0.63 Oe)	Koeni ger r ran
MB1A-B	Mineralized dolomite	3	490	290-890	5,010	390-14,070	10.1	2.1-2
MB1C-D	Massive pyrrhotite	4	5,900	2,990-8,040	5,390	4,420-6,450	1.7	1.2-2
MB2A-B	Quartzite	2	5.5	3-8	2	1-3	0.8	0.2-1
MB3A-D	Massive pyrrhotite	8	8,730	6,640-9,930	17,480	14,140-20,950	3.2	2.9-3
MB4A-D	Massive pyrrhotite	8	23,070	12,950-30,120	41,160	16,670-64,220	2.8	1.9-3
MB5A-B	Quartz-feldspar porphyry	4	2	0-3	2	1-3	-	-
MB6A-B	Quartz-feldspar porphyry	3	0	0	2	2-3	-	-
MB7A-F	Quartz-feldspar porphyry	12	0	0	10	1-32	-	-
MB8A-E	Quartzite	9	2	0-4	1	0-2	-	-
MB9A-B	Dolomite	3	194	193-195	3	2-6	0	0
MB10A-E	Dolomite	6	9	7-11	2	0-6	0.3	0-1.
MB11A-D	Basalt	12	600	380-990	3,740	2,890-7,030	10.9	5.3-1

Notes:

(i) Susceptibility and remanent intensity values have been corrected for demagnetisation assuming emu demagnetising factors $N_x = N_y = N_z = 4\pi/3$ for the pseudo-spherical specimens.

(ii) Koenigsberger ratio = Remanent magnetisation/Induced magnetisation = NRM/(Susceptibility x Earth's field)

TABLE III

Locality	Site 1	Site 3	Site 4
Sun-compass orientation	MB1A-B Yes MB1C-D No	Yes	No
Mean NRM Direction α_{95}	(265°, -12°) 44°	(36°, -41°) 7°	(176°, -23°) 11°
Mean AF Cleaned Direction α_{95}	(249°, -13°) 55°	(31°, -49°) 11°	(18°, -61°) 14°
Bedding Pole	(290°, $+45^o$)	-	-
Magnetic Foliation Pole α_{95}	(301°, $+31^o$) 35°	(339°, $+67^o$) 15°	(285°, $+60^o$) 38°
Mean NRM Direction Corrected to Palaeohorizontal	(265°, $+13^o$)	(19°, $+7^o$)	(207°, -27°)
Mean AF Cleaned Direction corrected to Palaeohorizontal	(250°, $+7^o$)	(10°, $+4^o$)	(318°, -27°)

Notes:

(i) Directions are expressed (declination, inclination) with inclination defined positive downwards.

(ii) α_{95} is the half-angle of the 95% cone of confidence i.e. the true mean direction has 95% probability of lying closer than α_{95} to the sample mean direction.

(iii) The bedding and magnetic foliation poles are defined as the downward directed normals to the bedding and magnetic foliation planes respectively. For the purpose of correcting remanence directions for post-acquisition tilting or folding, the magnetic foliation plane is interpreted as corresponding to the palaeohorizontal.

(iv) Present Earth's field direction is (13°, -72°). Dipole field direction is (0°, -60.4°).

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BENEFICIATION OF MT BISCHOFF TIN ORES

CRA Limited

Part 2

OD 3/1/6/0-3437/79 September 1979

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21 September 1979

OD 3/1/6/0

Mr J.R. Kelly
CRA Limited
95 Collins Street
MELBOURNE Vic 3001

REPORT: OD 3437/79, PART 2

YOUR REFERENCE:	D.P.O. No. 00404
MATERIAL:	Porphyry Tin Ores
LOCALITY:	Mt Bischoff, Tasmania
IDENTIFICATION:	Sample No. 716026, 716027, 716028, 716029
DATE RECEIVED:	28 February 1979
WORK REQUIRED:	Preliminary Beneficiation Study

Investigation and Report by: K.Y. Wong

Manager, Operations Division: Bruce E. Ashton

for Norton Jackson,
Managing Director

rp

Pilot Plant: Osman Place
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Telephone 43 8053
Branch Laboratory: Perth

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1. INTRODUCTION

CRA Exploration Pty Limited is evaluating a low grade tin deposit at Mt Bischoff, Tasmania. AMDEL was requested to conduct a preliminary beneficiation study to obtain the metallurgical data for the evaluation. Report OD 3437/79, Part 1, dated 20 April 1979, covers the capital and operating cost estimates prepared for a conventional tin beneficiation plant as part of the information required for the present feasibility study. This report OD 3437/79, Part 2, gives a full account of the testwork done to date. Throughout the course of the investigation, a close liaison was maintained with the Client representative Mr Bob Kelly and test results were passed on immediately to Mr Kelly for discussion whenever they were available.

2. MATERIAL EXAMINED

Four ore samples were submitted for investigation and the weights received are as follows:

Sample No.	Sample Weight kg
1 (716026)	64.3
2 (716027)	81.4
3 (716028)	87.4
4 (716029)	88.4

3. SAMPLE PREPARATION

The whole of each ore sample as received was stage jaw-crushed to minus ½ inch and approximately 50 kg of each was riffled out for further sample preparation. The rest of each head sample was stored. The 50 kg portion of each sample was then stage cone-crushed to minus 1.70 mm.

4. HEAD ASSAYS

A sub-sample of each of the minus 1.70 mm material was riffled out and prepared for chemical analysis of tin. Results obtained are as follows:

Sample No.	Sn Assay %
1 (716026)	0.35
2 (716027)	0.16
3 (716028)	0.47
4 (716029)	0.25

5. GRINDING AND SCREENING

Each batch of the minus 1.70 mm crushed ore sample as prepared in Section 4 was individually stage wet ground to minus 300 µm (52 mesh BSS). The ground product was then wet screened at 150 and 75 µm (100 and 200 mesh BSS). The weight distribution of the sized fractions obtained for each ground ore sample are as follows:

Sample No.	Total Sample Weight Used, kg	Weight % Sized Fraction		
		-300 +150 µm	-150 +75 µm	-75 µm
1 (716026)	43.6	16.23	28.06	55.71
2 (716027)	43.6	27.01	(Wet screening at 75 µm not completed)	
3 (716028)	48.1	21.92	34.24	43.84
4 (716029)	46.6	33.17	25.86	40.97

Ore Sample Nos 1 and 4 were selected by the Client for further metallurgical testing.

6. METALLURGICAL TESTING ON ORE SAMPLE NO. 4 (716029)

Tabling tests followed by sulphide flotation on table concentrates were conducted on size fractions of ore Sample No. 4 prepared in Section 5.

A Wilfley laboratory concentrating table was used for the testwork. Tabling tests were carried out in stages and test products obtained in each stage were processed and assayed before proceeding with the next stage. This multi-stage stop/start table concentration technique allowed close observation of treatment performance on various particle size/grade materials. Sulphide flotation tests were carried out on the primary and secondary table rougher concentrates using conventional techniques with standard laboratory reagents and equipment including stainless steel rod mill, Agitair LA500 flotation machine and Beckman H5 pH meter. British standard screens were used for sizing analysis. Deionised water was used in all tests.

6.1 Test Procedure

The test procedure used for processing ore Sample No. 4 is described as follows:

(i) Three sized fractions, -300 +150 µm, -150 +75 µm and -75 µm, were tabled individually to obtain the primary (1°) table rougher concentrates, middlings and tailings.

(ii) All rougher tailing products were retabled separately to obtain scavenger concentrates and tailings.

(iii) Each set of combined rougher middling and scavenger concentrate was then tabled individually to obtain the secondary (2°) table rougher concentrates, middlings and tailings.

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(iv) The three primary rougher table concentrates were combined and floated to obtain a primary sulphide and non-sulphide product.

(v) The three secondary rougher table concentrates were also combined and floated to obtain a secondary sulphide and non-sulphide product.

6.2 Flowsheet and Results

The flowsheet and results obtained on each individual test product are as follows:

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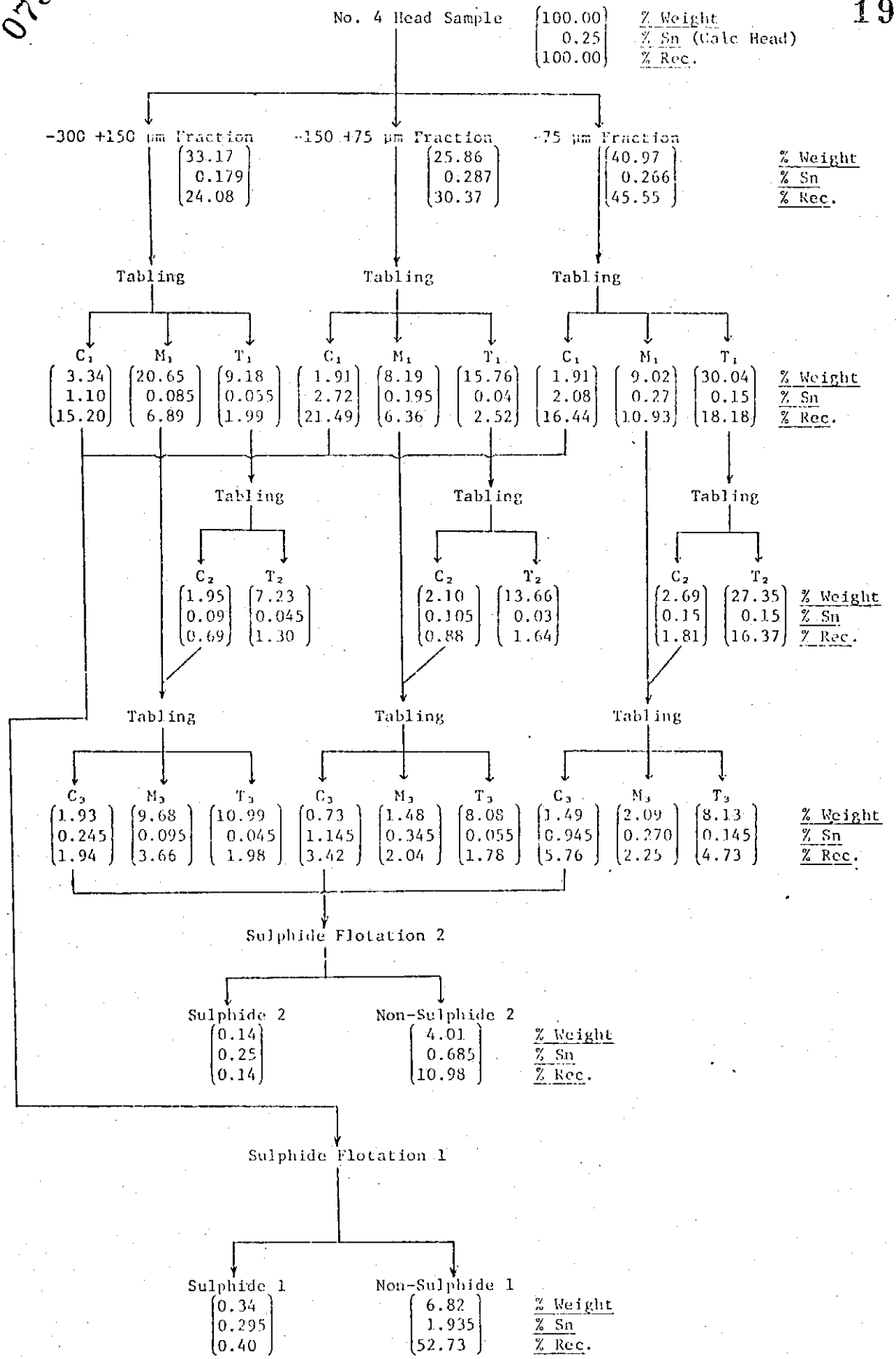


Note: Sulphide Flotation 1: At 30% solids; conditioned 2 min. with 10 g/t PAX, 40 g/t MIBC and floated 11 min.

Sulphide Flotation 2: At 30% solids; conditioned 2 min. with 15 g/t PAX, 45 g/t MIBC and floated 6 min.

PAX = Potassium amyl xanthate

MIBC = Methyl isobutyl carbinol

6.3 Overall Result

Combining all final test products produced by use of this flowsheet gave the following metallurgical balance by calculation:

Test Product	Weight %	Sn Assay %	Sn Distribution %
1° + 2° Non-Sulphide Conc (N-S1 + N-S2)	10.83	1.47	63.71
1° + 2° Sulphide Conc (S1 + S2)	0.48	0.282	0.54
(1° + 2° Table Rougher Conc) ($3 \times C_1 + 3 \times C_3$)	(11.31)	(1.42)	(64.25)
2° Table Middlings ($3 \times M_3$)	13.25	0.15	7.95
2° Table Tails ($3 \times T_3$)	27.20	0.078	8.49
Table Scavenger Tails ($3 \times T_2$)	48.24	0.100	19.31
Calc Head	100.00	0.25	100.00

6.4 Comments

Comments on this test procedure for Sample No. 4 are as follows:

(i) Removal of sulphides by flotation did not upgrade the table rougher concentrates significantly. Although tin losses in sulphide flotation products were small, the flotation up-grading step does not appear to be warranted at this stage of processing.

(ii) It is feasible to obtain good grade concentrates by table cleaning the table rougher concentrates.

(iii) Majority of tin (about 72% relative) distributed in the secondary table middlings was +75 µm material and retreatment by tabling may recover some of the tin distributed in these products.

(iv) More than half the tin (about 56% relative) distributed in the secondary table tails was -75 µm material and further recovery by tabling appears not to be feasible.

(v) Majority of tin (about 85% relative) distribution in the scavenger table tails was also -75 µm material and again it would be difficult to recover any more of this by tabling.

(vi) The overall result indicates that it is possible to recover up to 70% tin by tabling with appropriate disposition of various middling products. The initial table concentrating factor would be between 5 and 6 with a weight rejection of about 85 to 90%. It is estimated that nearly half of the tin distributed in the -75 μm fraction of the original ground feed could not be recovered successfully by tabling and these materials could well be amenable to straight flotation treatment for improving the overall extraction of tin.

7. METALLURGICAL TESTING OF ORE SAMPLE NO. 1 (716026)

Two treatment procedures were used in the beneficiation study of ore Sample No. 1 and these procedures were:

7.1 Conventional tin ore treatment route using gravity techniques followed by flotation recovery of fine tin

7.2 The reverse of this normal route whereby a rougher concentrate is produced first by flotation and gravity techniques are then used to upgrade this concentrate.

Laboratory equipment and techniques used in tabling and flotation testing of ore Sample No. 1 were similar to those used in processing of ore Sample No. 4 as described in Section 6.

7.1.1 Conventional Test Procedure

The conventional test procedure used for processing ore Sample No. 4 is described as follows:

(i) to (v) Same procedures as outlined in procedures (i) to (v) in Section 6.1

(vi) The primary non-sulphide product was cleaned once by tabling to obtain the primary table cleaner concentrate 1, middling 1 and tabling 1.

(vii) Procedure (vi) above was also applied to the secondary non-sulphide product but no middling product was collected.

(viii) The primary table cleaner middling was retabled to obtain the primary table cleaner concentrate 2 and tailing 2.

(ix) Primary table cleaner tailings 1 and 2 were combined and retabled to obtain the primary cleaner concentrate 3 and tailing 3.

(x) Retreatment test procedures (the term 'retreatment' used here is for clarification rather than experimentation) are detailed separately as below:

(a) All secondary table middlings and tailings and scavenger tails of the -300 +150 µm and -150 +75 µm fractions were combined and stage wet ground to -75 µm at 60% solids followed by wet screening at 45 µm. The -45 µm fraction was deslimed at 2 µm by a multiple sedimentation/decantation method. The -75 +45 µm fraction was reprocessed by tabling and super-panning.

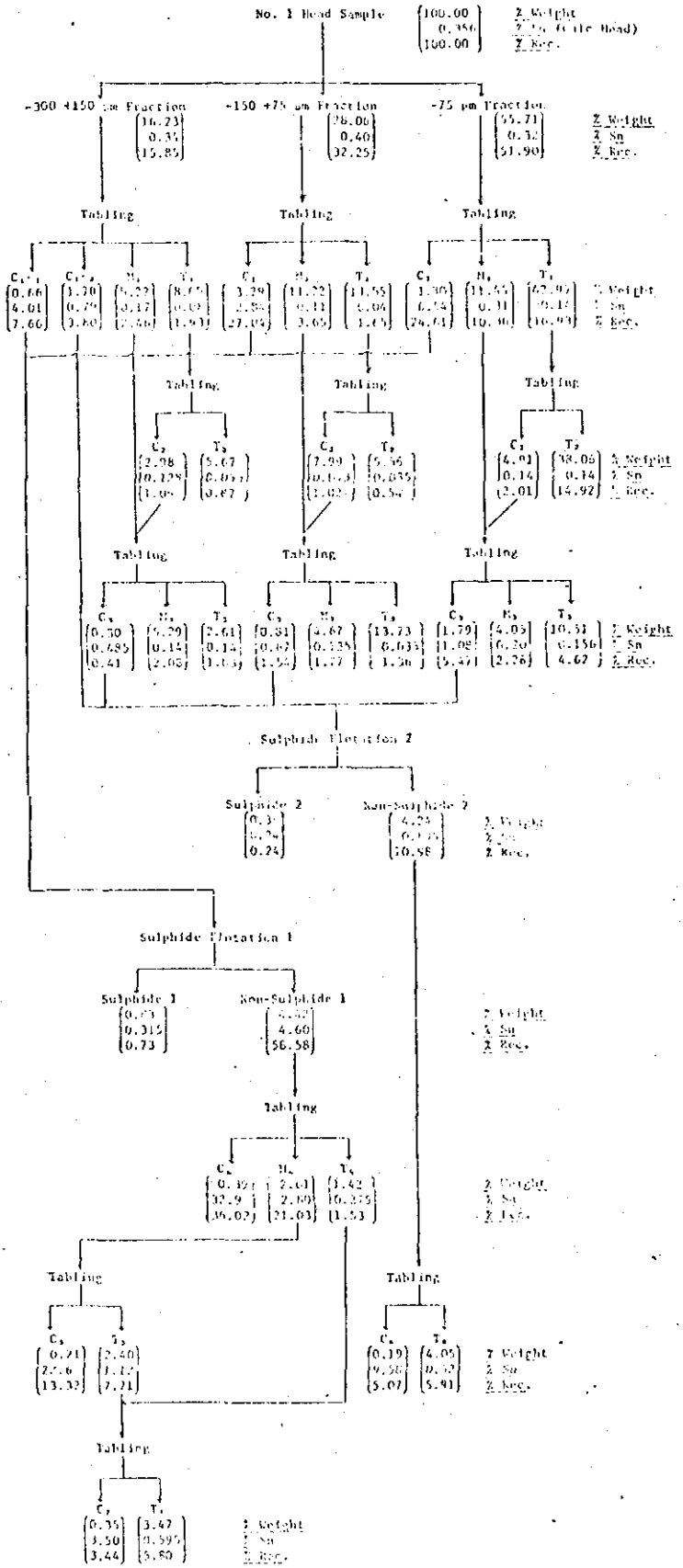
(b) The same procedure as (xa) above was also applied to the similar test products of the -75 µm fraction but no wet grinding was required.

(c) The two -45 +2 µm fractions obtained in (xa) and (xb) above were combined and processed by flotation for recovery of fine tin.

(d) Seven flotation tests were conducted on the -45 +2 µm fractions and the test procedures and conditions are given in Appendix A of this report.

7.1.2 Flowsheet and Results

The flowsheets and results obtained on each individual test product are set out as follows:

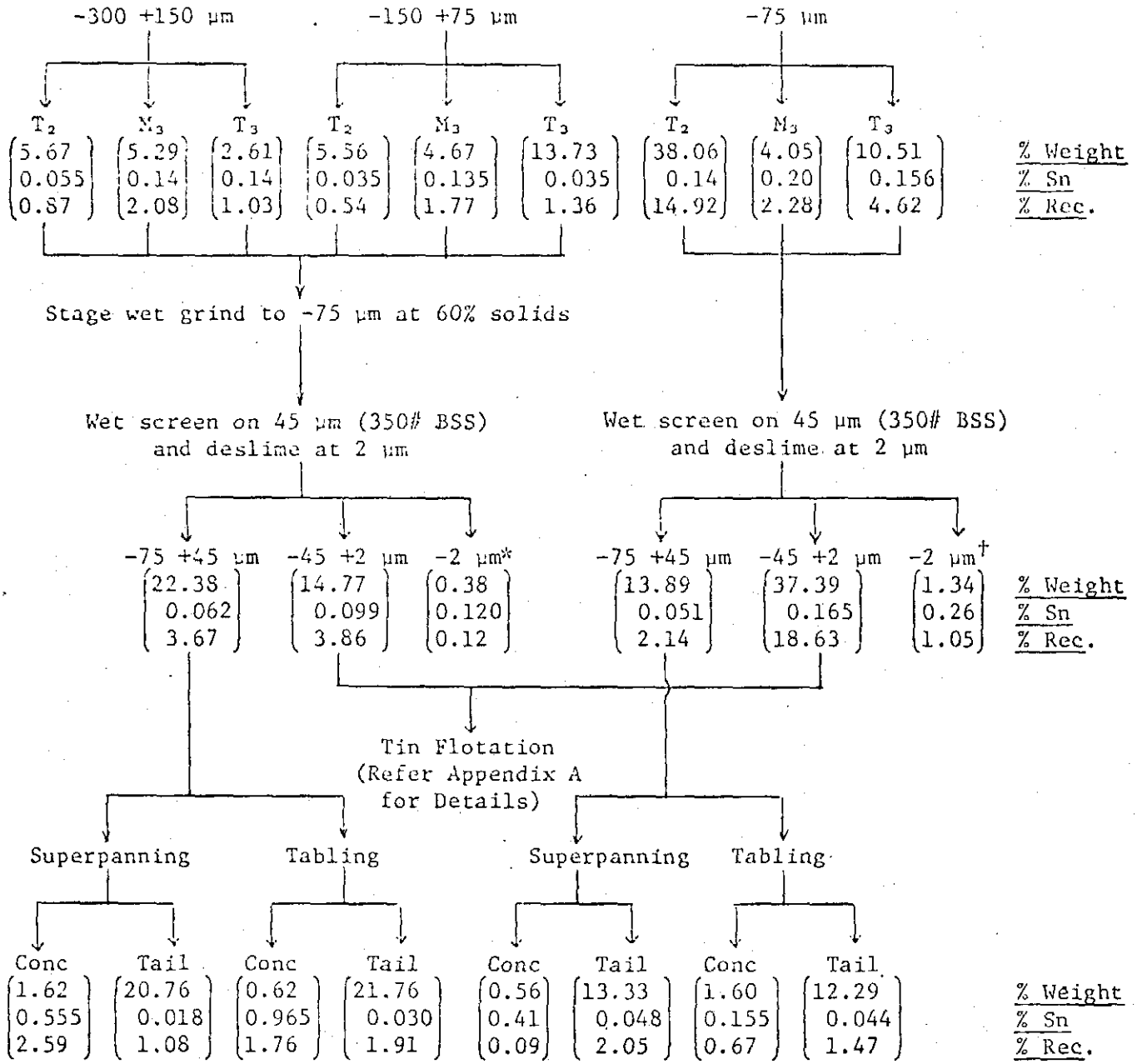


Note: Sulphide Flotation 1: At 30% solids; conditioned 2 min. with 15 g/t PAX, 45 g/t MIBC and floated for 13 min. Test products submitted for mineralogical study (refer to Appendix B of this report)

Sulphide Flotation 2: At 30% solids; conditioned 2 min. with 15 g/t PAX, 45 g/t MIBC and floated for 15 min. Test products also submitted for mineralogical study (refer to Appendix B of this report)

PAX = Potassium amyl xanthate

MIBC = Methyl Isobutyl carbinol



*Fine particle size analysis gave a result of 80% -2 µm of this material.

†Fine particle size analysis gave a result of 72% -2 µm of this material.

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7.1.3 Overall Results

The overall result is calculated on the basis of the main tabling performance only as presented in the first of the two flowsheets of Section 7.1.2. Details of results obtained in table retreatment and flotation recovery of fine tin are referred to the second flowsheet in Section 7.1.2 and Appendix A respectively. The overall result is tablulated as follows:

Test Product	Weight %	Sn Assay %	Sn Distribution %
1° Table Cleaner Conc 1 (C_4)	0.39	32.9	36.02
1° Table Cleaner Conc 2 (C_5)	0.21	22.6	13.32
(1° Table Cleaner Conc 1 + 2)	(0.60)	(29.3)	(49.34)
1° Table Cleaner Conc 3 (C_7)	3.35	3.50	3.44
2° Table Cleaner Conc (C_6)	0.19	9.50	5.07
(1° Table Cleaner Conc 1 + 2 + 2° Table Cleaner Conc)	(0.79)	(24.5)	(54.41)
(1° + 2° Table Cleaner Concs)	(1.14)	(18.1)	(57.85)
1° Table Cleaner Tail 2 (T_7)	3.47	0.595	5.80
1° + 2° Sulphide Conc (S1 + S2)	1.19	0.292	0.97
2° Table Middlings (3 × M_3)	14.01	0.156	6.13
2° Table Tails (3 × T_3)	26.85	0.093	7.01
Table Scavenger Tails (3 × T_2)	44.29	0.118	16.33
Calc Head	100.00	0.356	100.00

7.2 Comments

The following comments are based on the observation and results obtained in tabling, flotation and WHIMS treatment of ore Sample No. 1:

(i) Good grade tin concentrates were extracted by tabling treatment and the result of 24.5% grade at 54.4% recovery is used as a reference for subsequent discussions and evaluation in this report.

(ii) Sulphide removal from tabling products by flotation was effective with very little tin loss in the sulphide concentrates. Cassiterite was the only tin mineral in the non-sulphide products and iron oxides, pyrite and non-opaques (major) were the diluents. Approximately half of this tin mineral was locked with non-opaques.

Stannite, cassiterite and trace franckeite were the tin minerals in the sulphide products. The majority of this loss was cassiterite essentially locked with pyrite and non-opaques. Full details of the mineralogy of these products are given in Appendix B of this report.

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(iii) The tin content in the table middling and tailing products was in the -45 +2 µm fraction and this responded poorly to flotation giving good recoveries in some rougher tests but overall poor upgrading. (Refer Appendix A for details of flotation test results). As discussed in the next section the reverse technique of tabling of flotation concentrates may be a better procedure for this material.

(iv) Overall it is estimated that of the 14% (assaying about 0.6% Sn) of the potentially recoverable tin distributed in middling products about half could be further concentrated to a product grade of about 25% Sn. This estimate is based on subsequent tabling performance on a 0.6% Sn grade material.

(v) Of tin in the tailing products, about 23% (assaying about 0.15% Sn) in the -45 +2 µm fraction would be amenable to recovery by flotation. If 70% recovery indicated in tests is assumed for this material as well as a concentration factor of 10 used, an additional tin recovery of around 8% at 25% concentrate grade is indicated by tabling such a flotation concentrate. The recovery factor of ½ for tabling performance applied in Section 7.1.4 (iv) is also used in deriving this figure.

(vi) Summary for ore Sample No. 1, the overall estimated result possible for the conventional tin treatment procedure is 70% recovery in a 25% tin concentrate.

7.2.1 Unconventional or Reverse Test Procedure

This unconventional or reverse treatment route involves flotation to produce a rougher concentrate with as high a recovery of tin as possible before the use of gravity (tabling) to make final concentrate grade with minimum tin losses. Four tests investigating this procedure were conducted on the minus 1.70 mm (10 mesh BSS) head material of ore Sample No. 1.

Stage grinds at 60% solids to 100% passing 75 µm and 53 µm were used in Tests 1, 2, 4 and Test 3 respectively. PTAA was used as a tin flotation collector throughout this series of tests.

Test 1 was a straight stage roughing test with a sulphide pre-float. Flotation cleaning stages were attempted in Test 2. Two additional processing techniques were applied to Tests 3 and 4 in which the tin rougher concentrates were treated by WHIMS and superpanning. Details of the test procedures and results together with comments on each individual test are presented in Appendix C of this report for further reference.

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12.2 Overall Results and Comments

The overall results and comments are as follows:

(i) Sulphide pre-float gave a sulphide-rich concentrate averaging 3.58% by weight, and assaying 0.44% Sn, for a 4.3% Sn loss.

(ii) The best recovery of tin in a tin rougher concentrate was 92.3% at 2.78% Sn grade in Test 3. If the sulphide concentrate was included then the overall tin recovery was up to 97.1% and 2.23% Sn grade. The head grade of ore Sample No. 1 was 0.35% Sn giving a concentration factor of 8 to 9.

(iii) With over 90% weight rejection this is a very efficient pre-concentration step for processing of these tin ores.

(iv) The tin flotation collector PTAA used in this series of tests was considered to be very selective. Other similar tin collectors should also be tested to assess their performances in this type of circuit.

(v) Tin flotation cleaning stages were difficult to control to maintain good grade and recovery. Further work in this area is required.

(vi) If iron oxide minerals were present in large quantities in the ore, then these minerals would also respond to these flotation treatment conditions but they could be removed by WHIMS. In this series of tests with low iron oxides present the WHIMS step did not appear to be beneficial and justified.

(vii) The superpanning results are very encouraging and give a good indicaiton of the potential of a gravity cleaning step on tin rougher flotation concentrate. Based on the superpanning performance tabling or similar gravity techniques have high potential.

A mineralogical study on mineral make-up, liberation etc. of tin flotaiton rougher concentrates produced will be essential in providing the basic knowledge to design the classification/tabling cleaning circuit.

(viii) An average of 85% (relative) recovery of tin was obtained in the superpanning tests in Tests 3 and 4. If this same treatment route was applied to the tin flotation rougher concentrate by omitting the WHIMS cleaning step, then a superpanner concentrate of about 25% Sn at close to 80% recovery could be expected based on the existing result of Test 4. Moreover, if classified size

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fractions were used in gravity separation then the overall recovery could also be expected to improve accordingly. In view of these considerations, there is every practical possibility of producing a tin concentrate of 25% Sn grade at 85% or better recovery using this unconventional (or reverse) flotation/gravity treatment procedure.

8. CONCLUSION AND RECOMMENDATION

The present beneficiation study of Mt Bischoff low grade porphyry tin ores has revealed that this type of ore has favourably responded to an unconventional flotation/gravity treatment procedure, the reverse of the usual combined procedure of gravity and flotation.

By use of this method a tin concentrate grade of 25% Sn at 85% recovery is indicated.

By comparison use of the conventional route of gravity followed by flotation of fine tin yielded at best 70% recovery in a similar concentrate grade.

Apart from being superior in performance, the unconventional route should show considerable advantages in lower capital investment but further investigations are needed for evaluation of operating costs for the two treatment routes. Extensive metallurgical testing including pilot plant testing of Mt Bischoff tin ores will be required. The immediate requirements to complete the current preliminary study is mineralogical examination of flotation rougher concentrates to provide information on size classification, liberation, mineral make-up and gravity concentration possibilities.

It is recommended this study take place as a pre-requisite to undertaking the next stage of testwork in treatment of Mt Bischoff low grade tin ores.

APPENDIX A

FLOTATION TEST PROCEDURES AND RESULTS ON
-45 +2 μm FRACTION OF ORE SAMPLE NO. 1

FLOTATION TESTS

Seven flotation tests were conducted on the -45 +2 μm fraction of ore Sample No. 1 as indicated in the second flowsheet of Section 7.1.2 of this report. Standard laboratory equipment and procedures as described previously in this report were used. Deionised water was used in all tests. Both 500 g and 1000 g charges were used and the charges were repulped at 30% solids for all roughing tests and at lower densities during the cleaning stages. Reagents used in the test programme consisted of:

PAX = Potassium Amyl Xanthate (Union Carbide)

S3903 = Aerofloat Promoter S3903 (Cyanamid)

PTAA = p-Tolyl Arsonic Acid (I.C.I.)

AF65 = Aerofrother 65 (Cyanamid)

MIBC = Methyl Isobutyl Carbinol (Shell)

H_2SO_4 = Sulphuric Acid (Analab)

Test procedures, conditions and reagents, results and relevant comments are presented individually for each flotation test in this Appendix.

Test 1: Scouting test; sulphide pre-float; S3903 as tin collector in roughing stages.

(a) Conditions and Reagents

Stage	Conditions			Reagent Addition kg/t			
	Time (min.)		pH	PAX	S3903	H_2SO_4	AF65
	Conditioning	Flotation					
Sulphide Rougher Float 1	2	5	6.5	0.005	-	-	0.02
Sulphide Rougher Float 2	2	3	6.5	0.005	-	-	-
Sulphide Rougher Float 3	2	2	6.5	0.005	-	-	-
Sn Rougher Float 1	5	5	5.0	-	0.05	0.20	0.01
Sn Rougher Float 2	5	5	5.0	-	0.05	0.20	0.01

(b) Results

	Weight %	Sn Assay %	Sn Distribution %
Sulphide Ro Conc	13.22	0.185	14.16
Sn Ro Conc 1	5.09	0.465	13.69
Sn Ro Conc 2	4.15	0.760	18.28
(Sn Ro Conc)	(9.23)	(0.355)	(31.97)
Sn Ro Tail	77.54	0.12	53.87
Calc Head	100.00	0.173	100.00

(c) Comments

(i) Tin losses in sulphide floats were high.

(ii) Tin recovery was poor in two stages of rougher flotation using Cyanamid Aerofloat Promoter S3903.

Test 2: Sulphide pre-float; stage rougher floats using S3903 as tin collector.

(a) Conditions and Reagents

Stage	Conditions			Reagent Addition kg/t			
	Time (min.)		pH	PAX	S3903	H_2SO_4	MIBC
	Conditioning	Flotation					
Sulphide Rougher Float 1	3	3	6.3	0.01	-	-	0.01
Sulphide Rougher Float 2	2	3	6.3	0.01	-	-	0.005
Sn Rougher Float 1	5	5	3.0	-	0.025	0.60	0.005
Sn Rougher Float 2	5	5	3.0	-	0.025	0.10	0.005
Sn Rougher Float 3	5	5	3.0	-	0.025	0.10	0.005
Sn Rougher Float 4	5	5	3.0	-	0.025	0.10	0.005

(b) Results

	Weight %	Sn Assay %	Sn Distribution %
Sulphide Ro Conc 1	7.53	0.18	7.70
Sulphide Ro Conc 2	4.39	0.16	3.90
(Sulphide Ro Conc)	(11.92)	(0.173)	(11.69)
Sn Ro Conc 1	7.16	0.31	12.61
Sn Ro Conc 2	4.56	0.53	13.71
Sn Ro Conc 3	3.28	0.835	15.57
Sn Ro Conc 4	3.98	0.925	20.92
(Sn Ro Conc)	(18.98)	(0.583)	(62.81)
Sn Ro Tail	69.10	0.065	25.50
Calc Head	100.00	0.176	100.00

(c) Comments

(i) Improvement in reducing tin losses in sulphide floats.

(ii) Tin recovery was up to 62.8% after four stages of rougher flotation.

Test 3: No sulphide pre-float; longer conditioning time with more S3903 collector in stage tin rougher floats.

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(a) Conditions and Reagents

Stage	Conditions			Reagent Addition kg/t		
	Time (min.)		pH	S3903	H_2SO_4	MIBC
	Conditioning	Flotation				
Sn Rougher Float 1	10	3	3.0	0.05	0.40	0.005
Sn Rougher Float 2	10	5	3.0	0.05	0.10	0.005
Sn Rougher Float 3	5	5	3.0	0.05	0.02	0.005
Sn Rougher Float 4	5	5	3.0	0.05	0.02	0.005

(b) Results

Product	Weight %	Assay % Sn	Distribution % Sn
Sn Ro Conc 1	4.35	0.395	9.36
Sn Ro Conc 2	6.47	0.58	20.42
Sn Ro Conc 3	7.46	0.815	33.13
Sn Ro Conc 4	11.34	0.34	20.99
(Sn Ro Conc)	(29.62)	(0.52)	(83.90)
Sn Ro Tail	70.38	0.042	16.10
Calc Head	100.00	(0.18)	100.00

(c) Comments

Flotation conditions used in this test gave a very high tin recovery of 83.9%. The 3rd rougher stage had the best grade/recovery performance.

Test 4: Similar tin rougher floats as Test 3 with less collector S3903 in the 3rd and 4th stages; three cleaner stage floats to study flotation cleaning performance.

(a) Conditions and Reagents

Stage	Conditions			Reagent Addition kg/t		
	Time (min.)		pH	S3903	H_2SO_4	MIBC
	Conditioning	Floation				
Sn Rougher Float 1	10	3	3.0	0.05	0.40	0.005
Sn Rougher Float 2	10	5	3.0	0.05	0.06	0.005
Sn Rougher Float 3	5	5	3.0	0.02	0.02	0.005
Sn Rougher Float 4	5	5	3.0	0.02	0.02	0.005
Sn Cleaner Float 1-S1	2	3	3.0	0.01	0.10	0.005
Sn Cleaner Float 1-S2	2	5	3.0	0.01	0.02	0.005
Sn Cleaner Float 2-S1	2	3	3.0	0.01	0.10	0.005
Sn Cleaner Float 2-S2	2	5	3.0	0.005	-	0.005
Sn Cleaner Float 3-S1	2	3	3.0	-	0.10	0.005
Sn Cleaner Float 3-S2	2	5	3.0	0.005	-	0.005

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(b) Results

Product	Weight %	Assay % Sn	Distribution % Sn
Sn Cl Conc 3/1	6.15	1.10	37.48
Sn Cl Conc 3/2	5.43	0.58	17.46
(Sn Cl Conc 3)	(11.58)	(0.856)	(54.94)
Sn Cl Tail 3	1.08	0.27	1.62
(Sn Cl Conc 2)	(12.66)	(0.806)	(56.56)
Sn Cl Tail 2	3.21	0.335	5.95
(Sn Cl Conc 1)	(15.87)	(0.711)	(62.51)
Sn Cl Tail 1	10.97	0.23	13.98
(Sn Ro Conc)	(26.84)	(0.514)	(76.49)
Sn Ro Tail	73.16	0.058	23.51
Calc Head	100.00	(0.18)	100.00

(c) Comments

(i) Stage collector additions were important to achieve good recovery of tin in rougher flotation. It was also important to maintain a certain level of collector concentration in each stage.

(ii) Cleaner flotation performance was unsatisfactory with very low concentration and poor recovery.

(iii) Aerofloat Promoter S3903 was shown in these tests as a non-selective collector for flotation of tin. The use of this collector in rougher flotation recovery of tin was satisfactory.

Test 5: Stage rougher floats using PTAA as a tin collector.

(a) Conditions and Reagents

Stage	Conditions			Reagent Addition kg/t		
	Time (min.)		pH	PTAA	H_2SO_4	MIBC
	Conditioning	Flotation				
Sn Rougher Float 1	5	3	5	0.05	0.06	0.02
Sn Rougher Float 2	5	5	5	0.05	0.01	0.01
Sn Rougher Float 3	5	5	5	0.05	0.01	0.01
Sn Rougher Float 4	5	5	5	0.05	0.01	0.01
Sn Rougher Float 5	5	5	5	0.05	0.01	0.01
Sn Rougher Float 6	5	5	5	0.05	0.01	0.01

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(b) Results

	Weight %	Sn Assay %	Sn Distribution %
Sn Ro Conc 1	6.46	0.35	12.64
Sn Ro Conc 2	3.96	0.57	12.61
Sn Ro Conc 3	1.96	0.78	8.56
Sn Ro Conc 4	1.34	1.00	7.50
Sn Ro Conc 5	0.93	1.17	6.09
Sn Ro Conc 6	0.67	1.40	5.27
(Sn Ro Conc)	(15.32)	(0.62)	(52.67)
Sn Ro Tail	84.68	0.10	47.33
Calc Head	100.00	0.18	100.00

(c) Comments

(i) Tin recovery was up to 52.7% after six stages of rougher flotation.

(ii) Tin flotation selectivity improved with time and with staging of PTAA as collector.

Test 6: Same rougher floats as Test 5 plus cleaning stages.

(a) Conditions and Reagents

Stage	Conditions			Reagent Addition kg/t		
	Time (min.)		pH	PTAA	H_2SO_4	MIBC
	Conditioning	Flotation				
(Sn Rougher Float 1 to 6) Same as Test 5						
Sn Cleaner Float 1 S-1	5	3	5.0	0.025	0.01	0.01
Sn Cleaner Float 1 S-2	5	5	5.0	0.025	0.01	0.01
Sn Cleaner Float 1 S-3	5	5	5.0	0.025	0.01	0.01
Sn Cleaner Float 2 S-1	5	3	5.0	0.025	0.01	0.01
Sn Cleaner Float 2 S-2	5	5	5.0	0.025	0.01	0.01
Sn Cleaner Float 3 S-1	5	5	5.0	0.020	0.005	0.01
Sn Cleaner Float 3 S-2	5	5	5.0	0.020	0.005	0.01

(b) Results

Product	Weight %	Sn Assay %	Sn Distribution %
Sn Cl Conc 3	1.57	2.13	18.53
Sn Cl Tail 3	0.43	0.50	1.20
(Sn Cl Conc 2)	(2.00)	(1.78)	(19.73)
Sn Cl Tail 2	1.89	0.56	5.88
(Sn Cl Conc 1)	(3.89)	(1.19)	(25.61)
Sn Cl Tail 1	10.15	0.305	17.18
(Sn Ro Conc)	(14.04)	(0.55)	(42.79)
Sn Ro Tail	85.96	0.12	57.21
Calc Head	100.00	0.18	100.00

(c) Comments

(i) Rougher flotation recovery of tin was about 10% down as compared to Test 5 using the same conditions. It is important to check reproducibility of result when using multiple stages of conditioning and flotation technique.

(ii) Cleaner flotation performance was poor resulting in high losses in recovery with little improvement in concentration.

Test 7: Complex test using both flotation and WHIMS methods according to the following flowsheet:

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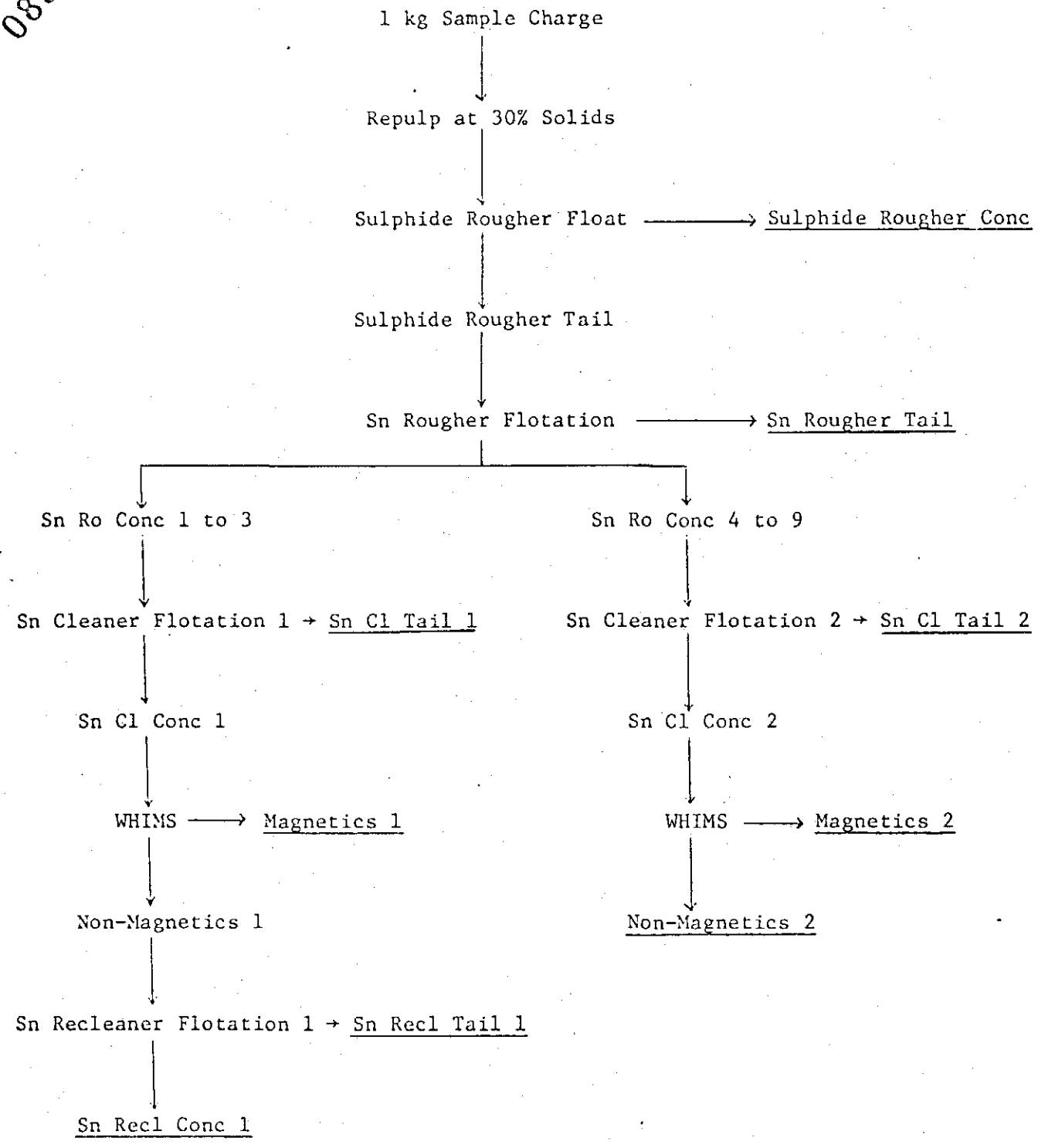

Note: A Jones separator set at an intensity of 16,000 gausses was used to conduct the WHIMS tests. Test samples available for testing were very small and well below the minimum capacity of the separator.

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Conditions and Reagents

Stage	No. of Stages	Conditions Time (min.) Cond.	Flot.	pH	Reagent Addition kg/t SSBX	PTAA	H_2SO_4	MIBC
Sulphide Rougher Float	2	2	5	6.1	0.005	-	-	0.010
Sulphide Cleaner Float	1	1	5	6.1	0.0025	-	-	0.005
Sn Rougher Float	9	5	5	5.0	-	0.05	0.01	0.005
Sn Cleaner Float 1	4	5	5	5.0	-	0.015	0.001	0.005
Sn Cleaner Float 2	4	5	5	5.0	-	0.015	0.001	0.005
Sn Recleaner Float 1	3	5	5	5.0	-	0.2	0.001	0.005

(b) Results

Product	Weight %	Sn Assay %	Sn Distribution %
Non-Magnetics 2	1.20	5.15	34.63
Magnetic 2	0.65	1.49	5.44
(Sn Cl Conc 2)	(1.85)	(3.86)	(40.07)
Sn Cl Tail 2	2.76	0.27	4.17
(Sn Ro Conc 4 to 9)	(4.61)	(1.71)	(44.24)
Sn Recleaner Conc 1	1.59	1.21	10.77
Sn Recleaner Tail 1	0.70	0.355	1.40
(Non-Magnetics 1)	(2.29)	(0.95)	(12.17)
Magnetics 1	0.66	1.25	4.61
(Sn Cl Conc 1)	(2.95)	(1.02)	(16.78)
Sn Cl Tail 1	3.51	0.165	3.25
(Sn Ro Conc 1 to 3)	(6.46)	(0.55)	(20.03)
(Sn Ro Conc 1 to 9)	(11.07)	(1.04)	(64.27)
Sn Ro Tail	84.84	0.068	32.30
(Sulphide Ro Tail)	(95.91)	(0.18)	(96.57)
Sulphide Ro Conc	4.09	0.15	3.43
Calc Head	100.00	0.18	100.00

(c) Comments

(i) Tin collector PTAA used in this test appeared to be reasonably selective and it was shown that selectivity improved with the latter stages of rougher flotation. However, tin recovery was only 64.3% after 9 stages of rougher flotation of a total time 45 minutes.

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(ii) Siderite was thought to be the major contaminant in the tin flotation concentrate. However, removal by WHIMS method did not improve the overall tin concentrate grade significantly. Mineralogical study would be required to identify the other contaminants which were also responded to flotation using PTAA as a collector.

(iii) Multi-stage cleaner flotation technique was necessary to maintain the recovery of tin. However, many cleaning steps would be required to obtain a good grade tin concentrate.

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APPENDIX B

MINERALOGICAL EXAMINATION OF SULPHIDE AND NON-SULPHIDE TEST PRODUCTS OBTAINED FROM TABLE ROUGHING TESTS OF ORE SAMPLE NO. 1

1. INTRODUCTION

Four test products were submitted for mineralogical work to determine tin mineralogy and locking of tin minerals as well as the diluents in the non-sulphide concentrate.

The following samples and assay data were supplied:

	Sn, %
Primary Table Rougher Concentrate, Non-sulphide	4.6
Primary Table Rougher Concentrate, Sulphide	0.315
Secondary Table Rougher Concentrate, Non-sulphide	0.895
Secondary Table Rougher Concentrate, Sulphide	0.24

2. PROCEDURE

The non-sulphide samples were separated in methylene idodide (sp.gr. 3.3) to remove any light diluent minerals. Polished sections (PS27465-70, PS27476) were made of the sulphide samples, the non-sulphide heavy products and the secondary concentrate non-sulphide light products. The polished sections were examined in reflected light and quantitative assessment made of the sulphide samples and non-sulphide heavy products. The stannite-cassiterite ratios and the locking of these minerals in the sulphide samples were determined by gross-counting. The mineralogy of both non-sulphide, heavy products as well as the locking of cassiterite in the primary concentrate heavy products was determined by point-counting. The lower proportion of cassiterite in the secondary concentrate heavy products necessitated gross-counting rather than point-counting to determine its locking characteristics.

The bulk mineralogy of the non-sulphide heavy products was determined by X-ray diffraction.

3. MINERALOGY

The diluents in the non-sulphide heavy products consist mainly of topaz and quartz (some feldspar is also present but is included with quartz since both minerals have a similar density). The heavy liquid separations gave the following weight distribution between the density products:

	% Light Products (Sp.Gr. <3.3)	% Heavy Products (Sp.Gr. >3.3)
Primary Table Rougher Concentrate, Non-sulphide	50.3	49.7
Secondary Table Rougher Concentrate, Non-sulphide	45.8	54.2

The light products consists mainly of quartz and feldspar indicating about half of the diluents are moderately light minerals. The major diluent in the heavy products is topaz (sp.gr. ~3.5) although minor amounts of iron oxides and hematite are also present. The mineralogy of the non-sulphide heavy products is given below:

Sample	Mineralogy (Weight, %)			
	Cassiterite	Iron Oxides	Pyrite	Non-opaques (Topaz)
Primary Table Rougher Concentrate	12	7	1	80
Secondary Table Rougher Concentrate	3	3	2	92

The only tin mineral observed in the non-sulphide heavy products is cassiterite.

The sulphide concentrates consist mainly of pyrite with accessory non-opaques and arsenopyrite. Traces of covellite, chalcocite, chalcopyrite, sphalerite, galena and goethite are also present in the sulphide concentrates.

The major tin minerals in the sulphide concentrates are stannite and cassiterite although a trace of franckeite was observed in the primary concentrate sulphide sample. The relative proportions of cassiterite and stannite and the mineralogical distribution of tin is as follows:

	Mineralogy					
	Volume, %		Weight, %		Sn Distribution, %	
	Cassiterite	Stannite	Cassiterite	Stannite	Cassiterite	Stannite
Primary Table Rougher Concentrate	25	75	35	65	61	39
Secondary Table Rougher Concentrate	22	78	31	69	57	43

4. LIBERATION OF TIN MINERALS

The locking characteristics of cassiterite is given below:

Sample	Product	% Liberated Cassiterite	% Cassiterite Locked with		
			Non-opaques	Iron Oxides	Pyrite
Primary Table Rougher Concentrate	Non-sulphide (sp.gr. >3.3)	15	40	2	-
	Sulphide	14	37	-	49
Secondary Table Rougher Concentrate	Non-sulphide (sp.gr. >3.3)	37	62	1	-
	Sulphide	30	37	-	33

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The locking of stannite in the sulphide concentrate is as follows:

Sample	% Liberated Stannite	% Stannite Locked in Binary Grains with		% Stannite Locked in Ternary (+) Grains
		Non-opaques	Pyrite	
Primary Table Rougher Concentrate	49	42	2	7
Secondary Table Rougher Concentrate	39	59	-	2

5. DISTRIBUTION OF TIN

The tin distribution in each sample calculated from assays and mineralogical examination is summarised in Table B1.

TABLE B1: OVERALL TIN DISTRIBUTION

		Wt Dist.	Sn, %	Sn Dist.	% of Tin in			
					Cassiterite		Stannite	
					Liberated	Locked	Liberated	Locked
Primary Table Rougher Concentrate	Non-sulphide (sp.gr. >3.3)	41.8	8.27	97.3	56.4	40.9	-	-
	Non-sulphide (sp.gr. <3.3)	42.4	0.105	1.3	-	1.3	-	-
	Sulphide	15.8	0.315	1.4	0.1	0.8	0.2	0.3
	Total	100.0	(3.55)	100.0	56.5	43.0	0.2	0.3
Secondary Table Rougher Concentrate	Non-sulphide (sp.gr. >3.3)	53.2	1.62	97.5	36.1	61.4	-	-
	Non-sulphide (sp.gr. <3.3)	44.9	(0.04)*	2.0	-	2.0	-	-
	Sulphide	1.9	0.24	0.5	0.1	0.2	0.1	0.1
	Total	100.0	(0.88)	100.0	36.2	63.6	0.1	0.1

*Assay calculated from assays of heavy products and total non-sulphide concentrate (0.895% Sn).

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APPENDIX C

FLOTATION TEST PROCEDURES AND RESULTS ON HEAD ORE SAMPLE NO. 1

FLOTATION TESTS

Test 1: Stage grind to 100% -75 μm (200# BSS) at 60% solids (time 7½ mins); sulphide pre-float; stage tin rougher floats with PTAA as collector.

(a) Flotation Conditions and Reagents

Stage	Conditions			Reagent Addition kg/t			
	Time (min.)		pH	PAX	PTAA	H_2SO_4	MIBC
	Conditioning	Flotation					
Sulphide Float 1	2	3	6.3	0.01	-	-	0.04
Sulphide Float 2	2	5	6.3	0.01	-	-	0.02
Tin Rougher Float 1	5	3	5.0	-	0.07	0.06	0.01
Tin Rougher Float 2	5	5	5.0	-	0.07	0.03	0.01
Tin Rougher Float 3	5	5	5.0	-	0.10	0.03	0.01
Tin Rougher Float 4	5	5	5.0	-	0.10	0.03	0.01
Tin Rougher Float 5	5	5	5.0	-	0.10	0.03	0.01
Tin Rougher Float 6	5	5	5.0	-	0.20	0.06	0.01
Tin Rougher Float 7	5	5	5.0	-	0.20	0.06	0.01

Note: PAX = Potassium Amyl Xanthate (Union Carbide)
PTAA = p-Tolyl Arsonic Acid (I.C.I.)
MIBC = Methyl Isobutyl Carbinol (Shell)
H_2SO_4 = Sulphuric Acid (Analab)

(b) Results

Product	Weight %	Sn Assay %	Sn Distribution %
Sulphide Ro Conc	3.94	0.43	4.63
Sn Ro Conc 1	1.20	1.58	5.18
Sn Ro Conc 2	1.68	1.86	8.54
Sn Ro Conc 3	1.69	2.29	10.54
Sn Ro Conc 4	1.28	5.10	17.84
Sn Ro Conc 5	1.10	2.44	7.30
Sn Ro Conc 6	1.98	5.65	30.61
Sn Ro Conc 7	1.53	0.32	1.34
(Sn Ro Conc 1 to 7)	(10.46)	(2.85)	(81.35)
Sn Ro Tail	85.60	0.06	14.02
Calc Head	100.00	0.366	100.00

097

192098

(c) Comments

(i) Tin losses in sulphide float were small and acceptable.

(ii) Tin recovery was 81.4% after 7 stages of rougher flotation using PTAA as a tin collector.

(iii) Rougher flotation Stages 4 and 6 were most selective and also gave the highest individual tin recoveries.

Test 2: Stage grind to 100% -75 µm (200# BSS) at 60% solids (7½ mins); sulphide pre-float; stage tin rougher floats with higher dosages of PTAA but less stages; stage tin cleaner floats.

(a) Flotation Conditions and Reagents

Stage	Conditions			Reagent Addition kg/t			
	Time (min.)		pH	PAX	PTAA	H_2SO_4	MIBC
	Conditioning	Flotation					
Sulphide Float 1	2	3	6.5	0.01	-	-	0.04
Sulphide Float 2	2	5	6.5	0.01	-	-	0.02
Tin Rougher Float 1	5	5	5.0	-	0.20	0.08	0.02
Tin Rougher Float 2	5	5	5.0	-	0.20	0.04	0.01
Tin Rougher Float 3	5	5	5.0	-	0.20	0.04	0.01
Tin Rougher Float 4	5	5	5.0	-	0.20	0.04	0.01
Tin Rougher Float 5	5	5	5.0	-	0.20	0.04	0.01
Tin Cleaner Float 1/1	5	3	5.0	-	0.10	0.02	0.02
Tin Cleaner Float 1/2	5	5	5.0	-	0.10	0.01	0.01
Tin Cleaner Float 1/3	5	5	5.0	-	0.10	0.01	0.01
Tin Cleaner Float 2/1	5	5	5.0	-	0.06	0.01	0.02
Tin Cleaner Float 2/2	5	5	5.0	-	0.06	0.01	0.01

(b) Results

Product	Weight %	Sn Assay %	Sn Distribution %
Sulphide Ro Conc	3.62	0.435	4.29
Sn Cleaner Conc 2	1.69	6.0	27.66
Sn Cleaner Tail 2	1.27	2.72	9.38
(Sn Cleaner Conc 1)	(2.96)	(4.59)	(37.04)
Sn Cleaner Tail 1	3.53	3.30	31.72
(Sn Ro Conc)	(6.49)	(3.89)	(68.76)
Sn Ro Tail	89.89	0.11	26.95
Calc Head	100.00	0.367	100.00

098

192099

(c) Comments

(i) Tin recovery in rougher flotation was related to the number of stages (i.e. flotation time) rather than overall collector dosage. This was shown between Tests 1 and 2 in the present series of flotation tests.

(ii) Flotation cleaning efficiency was low with very high losses in recoveries. A tin concentrate of 6.0% Sn was obtained after two cleanings with multiple stages in each.

Test 3: Stage grind to 100% -53 μm (300# BSS) at 60% solids (9½ mins); sulphide pre-float; stage tin rougher floats with PTAA as collector and extended staging; WHIMS on tin rougher concentrate; stage cleaner float on non-magnetics followed by superpanning of tin flotation cleaner concentrate.

(a) Flotation Conditions and Reagents

Stage	Conditions			Reagent Addition kg/t			
	Time (min.)		pH	PAX	PTAA	H_2SO_4	MIBC
	Conditioning	Flotation					
Sulphide Float 1	2	5	6.2	0.01	-	-	0.04
Sulphide Float 2	2	5	6.2	0.01	-	-	0.01
Sn Rougher Float 1	5	3	5.0	-	0.10	0.06	0.01
Sn Rougher Float 2	5	5	5.0	-	0.10	0.02	0.01
Sn Rougher Float 3	5	5	5.0	-	0.10	0.02	0.01
Sn Rougher Float 4	5	5	5.0	-	0.10	0.02	0.01
Sn Rougher Float 5	5	5	5.0	-	0.10	0.02	0.01
Sn Rougher Float 6	5	5	5.0	-	0.20	0.02	0.01
Sn Rougher Float 7	5	5	5.0	-	0.20	0.02	0.01
Sn Rougher Float 8	5	5	5.0	-	0.30	0.02	0.01
Sn Rougher Float 9	5	5	5.0	-	0.30	0.02	0.01
Sn Cleaner Float 1/1	5	3	5.0	-	0.05	0.04	0.04
Sn Cleaner Float 1/2	5	5	5.0	-	0.03	0.01	0.01
Sn Cleaner Float 1/3	5	5	5.0	-	0.03	-	0.01
Sn Cleaner Float 1/4	5	5	5.0	-	0.03	-	0.01

099

(b) Flowsheet and Results

500 g -1.70 mm (10# BSS) Composite 1

↓

Stage Grind at 60% Solids to 100% -53 µm (300# BSS)

↓

Sulphide Flotation ⟶ Sulphide Ro Conc

↓

Sulphide Ro Tail

↓

Sn Rougher Flotation ⟶ Sn Ro Tail

↓

Sn Rougher Conc

↓

WHIMS (Jones at 16,000 Gauss) ⟶ Magnetics

↓

Non-Magnetics

↓

Sn Cleaner Flotation ⟶ Sn Cleaner Tail

↓

Sn Cleaner Conc

↓

Superpanning ⟶ Superpan Tail

↓

Superpan Conc

192101

100

Product	Weight %	Sn Assay %	Sn Distribution %
Superpan Conc	0.81	18.9	40.67
Superpan Tail	3.71	0.75	7.44
(Sn Flotation Cleaner Conc)	(4.53)	(3.98)	(48.11)
Sn Flotation Cleaner Tail	5.99	1.59	25.43
(Non-Magnetics)	(10.52)	(2.62)	(73.54)
Magnetics	1.95	3.62	18.80
(Sn Flotation Rougher Conc)	(12.47)	(2.78)	(92.34)
Sn Flotation Rougher Tail	83.62	0.013	2.90
(Sulphide Flotation Rougher Tail)	(96.09)	(0.371)	(95.24)
Sulphide Flotation Rougher Conc	3.91	0.455	4.76
Calc Head	100.00	0.375	100.00

(c) Comments

(i) Tin recovery was 92.3% after 9 stages of rougher flotation. It appeared that both longer flotation time and finer grind (100% -53 µm in Test 3 as compared to 100% -75 µm in Tests 1 and 2) were beneficial to improvement of overall tin extraction by flotation.

(ii) The use of WHIMS did not result in any upgrading of the tin flotation rougher concentrate. In fact the magnetics gave a higher tin assay than the non-magnetics in this particular test. The effect of iron oxides as concentrate diluents would require further evaluation in the beneficiation study.

(iii) Based on the superpanning result, the tin rougher flotation concentrate would be suitable for upgrading by tabling in actual ore-dressing practice.

Test 4: Stage grind to 100% -75 µm (200# BSS) at 60% solids (7½ mins); sulphide pre-float; stage tin rougher floats with PTAA as collector as in Test 1 conditions plus 2 more stagings; WHIMS on tin rougher concentrate followed by superpanning of non-magnetics.

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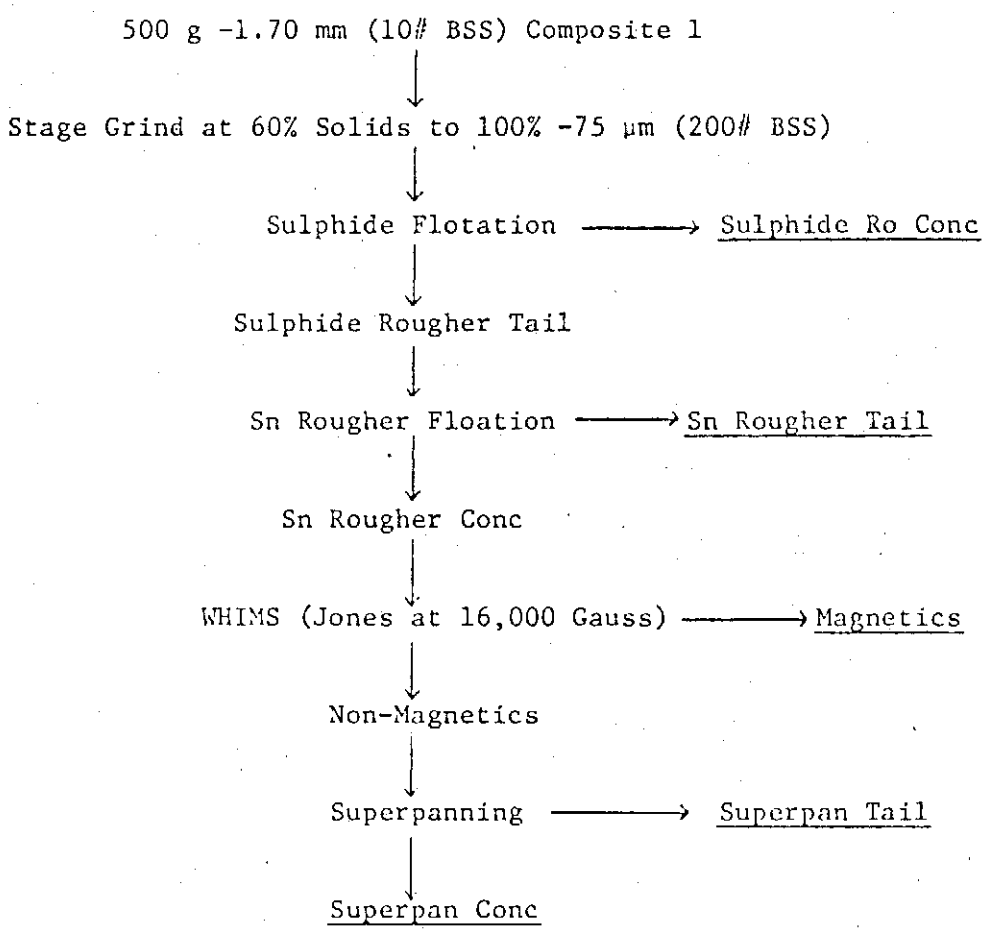
(a) Flotation Conditions and Reagents

Stage	Conditions		pH	Reagent Addition kg/t			
	Time (min.)			PAX	PTAA	H_2SO_4	MIBC
	Conditioning	Flotation					
Sulphide Float 1	2	5	6.5	0.01	-	-	0.04
Sulphide Float 2	2	5	6.5	0.01	-	-	0.01
Sn Rougher Float 1	5	5	5.0	-	0.07	0.06	0.01
Sn Rougher Float 2	5	5	5.0	-	0.07	0.02	0.01
Sn Rougher Float 3	5	5	5.0	-	0.10	0.02	0.01
Sn Rougher Float 4	5	5	5.0	-	0.10	0.02	0.01
Sn Rougher Float 5	5	5	5.0	-	0.10	0.02	0.01
Sn Rougher Float 6	5	5	5.0	-	0.20	0.02	0.01
Sn Rougher Float 7	5	5	5.0	-	0.20	0.02	0.01
Sn Rougher Float 8	5	5	5.0	-	0.20	0.02	0.01
Sn Rougher Float 9	5	5	5.0	-	0.20	0.02	0.01

(b) Flowsheet and Results



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Product	Weight %	Sn Assay %	Sn Distribution %
Superpan Conc	0.92	24.5	63.22
Superpan Tail	6.12	0.685	11.71
(Non-Magnetics)	(7.04)	(2.81)	(74.93)
Magnetics	1.29	4.24	15.31
(Sn Flotation Rougher Conc)	(8.33)	(3.88)	(90.24)
Sn Flotation Rougher Tail	88.83	0.025	6.20
(Sulphide Rougher Tail)	(97.16)	(0.355)	(96.44)
Sulphide Rougher Conc	2.84	0.45	3.56
Calc Head	100.00	0.358	100.00

(c) Comments

Similar test results were obtained in this test as compared to Test 3 and the superpanning performance was better in this test.

DETAILED LIST OF ACCOMPANYING PLANS

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CONTENTS: VOLUME 2

Percussion Drill Logs	MBP 1 - 47
Diamond Drill Logs	MBD 6 - 13

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CONTENTS: VOLUME 3

Pocket Number	Title		Drawing Number
1	1:1200	Surface Geological Plan	79-091A
2	1:1200	Surface Geological Interpretation Plan	79-296
3	1:1200	Stanhope Dyke Extended Area Geology and Sampling	79-147A
4	1:1200	Summit Area Sheet Geology	79-268
5	1:6000	Aeromagnetic Intensity Contours and Geology	79-203
6	1:1200	Summit Area Total Magnetic Intensity Readings and Contours	79-266 A
7	1:1200	Northern Dolomite Area Ground Magnetic Survey and Fact Geology	79-293

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CONTENTS: VOLUME 4 - Part 1.

Pocket Number	Title		Drawing Number
1	1:1200 Interpreted Geological Section	800E	79-252
2	ditto	820E	79-003
3	ditto	840E	79-004
4	ditto showing reserves	860E	79-297
5	ditto " "	880E	79-298
6	ditto " "	900E	79-299
7	ditto " "	920E	79-300
8	ditto " "	940E	79-301
9	ditto " "	960E	79-302
10	ditto " "	980E	79-303
11	ditto " "	1000E	79-304
12	ditto " "	1020E	79-305
13	ditto " "	1040E	79-306
14	ditto " "	1060E	79-307
15	ditto " "	1080E	79-308
16	ditto " "	1100E	79-309
17	ditto " "	1120E	79-310
18	ditto " "	1140E	79-311
19	ditto " "	1160E	79-312
20	ditto " "	1180E	79-313
21	ditto " "	1200E	79-314
22	ditto " "	1220E	79-315

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CONTENTS: VOLUME 4 - Part 2

Pocket Number	Title			Drawing Number
1	1:1200 Interpreted Geological Section showing reserves		1240E	79-316
2	ditto	"	" 1260E	79-317
3	ditto	"	" 1280E	79-318
4	ditto	"	" 1300E	79-319
5	ditto	"	" 1320E	79-320
6	ditto	"	" 1340E	79-321
7	ditto	"	" 1360E	79-322
8	ditto	"	" 1380E	79-323
9	ditto	"	" 1400E	79-324
10	ditto		1420E	79-033
11	ditto		1440E	79-034
12	ditto		1460E	79-035
13	ditto		1480E	79-036
14	ditto		1500E	79-037
15	ditto		1520E	79-038
16	ditto		1560E	79-040
17	ditto		1600E	79-042
18	ditto		1640E	79-253
19	ditto		1680E	79-254
20	ditto		1760E	79-256
21	ditto		1800E	79-257
22	ditto		1840E	79-258
23	ditto		BB	79-152A

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CONTENTS: VOLUME 2

Percussion Drill Logs	MBP 1 - 47
Diamond Drill Logs	MBD 6 - 13

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 1

PROJECT MT BISCHOFF JOINT VENTORE DATE 11 April 1979

LOCATION OF COLLAR 1813 N 1072 E 626 Elev.

STRIKE 180° Grid DIP 80° FINAL DEPTH 36m

COMMENCED 11.4.79 COMPLETED 11.4.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No. of ~~Kms~~ splits	Observations	Sample No.	Assay ppm Sn
0	2	4	Dark grey surface rubble, sulphides, porphyry, clay. Damp. trace Sn	33809	1100
2	4	3	Dark grey puggy clay + sulphides. Damp	33810	560
4	6		1m Dark grey puggy clay. 1m white porphyry. Damp. Poor recovery contaminated with clay	No Sample	
6	8	3	White porphyry. Dry. Some dark grey clay balls contaminating	33812	140
8	10	3	Grey/white porphyry. Dry. 3% sulphides. Trace Sn Occasional dark grey clay balls contaminating	33813	980
10	12	3	Grey/white porphyry. Dry. 1-2% Sulphides. Trace Sn	33814	1250
12	14	3	" " " " 5% " 0.5% "	33815	8200
14	16	3	" " " " " " <0.5% "	33816	1200
16	18	3	" " " " " " " "	33817	880
18	20	3	" " " " " " 0.5% "	33818	4800
20	22	3	" " " " 3-5% " <0.5% "	33819	2300
22	24	3	Grey/white porphyry 1m. Cream Dolomite 1m Dry. 1% sulphide. Trace Sn	33820	1100
24	26	3	Light grey/cream dolomite. Dry. 1% Sulphides Weak Tr Sn	33821	410
26	28	3	" " " " " <1% " " " "	33822	600
28	30	3	" " " " " " " Trace "	33823	1100
30	32	3	" " " " " 1% " Weak Tr "	33824	370
32	34	3	Light grey dolomite. Dry. 1% Sulphide Trace Sn	33825	520
34	36	3	" " " " Trace " " "	33826	1250
			Hole completed at 36m		

192112

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 2

PROJECT MT BISCHOFF JOINT VENTURE DATE 11-12 APRIL 1979

LOCATION OF COLLAR 1813 N 1071 E 626 Elev.

STRIKE 180° Grid DIP 80° FINAL DEPTH 36m

COMMENCED 11.4.79 COMPLETED 12.4.79 GEOLOGIST A.J

Metres From	Metres To	No of ~~Key~~ Splits	Observations	Sample No.	Assay ppm Sn
0	2	3	Grey/brown clay, dolomite, porphyry nibble. Damp	33827	900
2	4	3	Grey clay, porphyry, sulphide minor galena. Damp	33828	1200
4	6		Grey clay, porphyry, sulphide. Solid porphyry at 5.5m. Minor sphalerite, galena. Wet + contamin.	No Sample	
6	8	3	Cream porphyry. Damp. Trace sphalerite, galena	33830	130
8	10	3	Grey/white porphyry. Dry. 3-5% sulphides. Weak Tr Sn	33831	740
10	12	3	" " " " 5% " 0.5% "	33832	8900
Overnight at 12m			" " " Wet " " <0.5% "		
12	14		Water in hole overnight. Cleaned out hole	No Sample	
14	16	3	Grey/white porphyry. Dry. 5% Sulphide <0.5% Sn	33834	1800
16	18	3	" " " " " " 0.5% "	33835	3000
18	20	3	" " " " " " <0.5% "	33836	3300
20	22	3	" " " " " " 0.5% "	33837	4650
22	24	3	1m grey/white porphyry, 1m hard cream dolomite. 3% sulphides. Trace Sn Dry	33838	1100
24	26	3	Light grey/cream dolomite. Dry. 1% sulphide. Weak Tr Sn	33839	800
26	28	3	" " " " " <1% " <0.5% "	33840	3750
28	30	3	Light grey dolomite. Dry. 1% " Weak Tr "	33841	470
30	32	3	" " " " <1% " " " "	33842	260
32	34	3	" " " " Trace " " " "	33843	240
34	36	3	" " " " <1% " Trace "	33844	760
			Hole completed at 36m		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP3

PROJECT MT BISCHOFF JOINT VENTURE DATE 12 April 1979

LOCATION OF COLLAR 1899 N 1075 E 628 Elev.

STRIKE DIP Vertical FINAL DEPTH 16m

COMMENCED 12.4.79 COMPLETED 12.4.79 GEOLOGIST A.J

Metres ~~Footage~~ From	To	No of ~~Key~~ Splits	Observations	Sample No.	Assay ppm Sn
0	2	3	Grey/green pyrite, porphyry. 50% sulphide. <0.5%Sn	33845	7600
2	4	3	" " " " 80% " " "	33846	1.05%
4	6	1	" " " " " " 0.5%Sn Poor Recovery	33847	7600
6	8	2	Grey/white porphyry. 20% sulphide <0.5%Sn	33848	5300
8	10	1	Green/light brown porphyry. 5% sulphide. c.5%Sn Poor Recovery	33849	2750
10	12	1	" " " " " " " " "	33850	3000
12	14		No Recovery	No Sample	
14	16		" "	No Sample	
			Hole abandonned due to loss of air return hence no sample recovery		

192114

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CLIENT METALL EXPLORATION LTD HOLE No. MBP 4

PROJECT MT BISCHOFF JOINT VENTURE DATE 17. APRIL 1979

LOCATION OF COLLAR 1898 N 1073 E 628 Elev.

STRIKE – DIP Vertical FINAL DEPTH 14m

COMMENCED 17.4.79 COMPLETED 17.4.79 GEOLOGIST A.J

~~Metres~~ Footage From	To	No. of ~~Kelly~~ Splits	Observations	Sample No.	Assay ppm Sn
0	2	3	Grey/brown/green porphyry, clay, 10% Sulphides, 0.5% Sn	33852	6150
2	4	3	Grey/green porphyry. 50% sulphides, 1% Sn	33853	8200
4	6	3	" " " 50-75% " 0.5-1.0% "	33854	1.17%
6	8	3	Grey porphyry. 10-25% " 1% "	33855	8250
8	10	3	Grey/green porphyry. 75% " 0.5% "	33856	9650
10	12			No Sample	
12	14			No Sample	
			Hole abandoned due to loss of sample recovery		

192115

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 5

PROJECT MT BISCHOFF JOINT VENTURE DATE 17 APRIL 1979

LOCATION OF COLLAR 1899.5 N 1073.5 E 628 Elev.

STRIKE - DIP Vertical FINAL DEPTH 18m

COMMENCED 17.4.79 COMPLETED 17.4.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No of ~~Key~~ Splits	Observations	Sample No.	Assay ppm Sn
0	2	3	Grey/green/brown porphyry, minor clay. 5-10% sulphides, 0.5% Sn	33857	7700
2	4	3	Grey/green porphyry, 50% sulphides, 1.0% Sn	33858	1.35%
4	6	3	" " " 75% " 1.0% "	33859	1.41%
6	8			No Sample	
8	10			" "	
10	12			" "	
12	14			" "	
14	16			" "	
16	18			" "	
			Hole abandoned due to loss of sample recovery		

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192116

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CLIENT METALS EXPLORATION LTD — HOLE No. MBP 6

PROJECT MT BISCHOFF JOINT VENTURE — DATE 4 June 1979

LOCATION OF COLLAR 2148 N 1840 E 658.9 Elev.

STRIKE 180° Grid — DIP 70° — FINAL DEPTH 20m

COMMENCED 4.6.79 — COMPLETED 4.6.79 — GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No of ~~Key~~ Splits	Observations	Sample No.	Assay ppm Sn
0	2	3	Pale grey shale	33861	130
2	4	3	" " "	33862	95
4	6	3	Pale grey shale, trace light brown porphyry. Water at 6m - cased off. Trace sulphide, w. trace Sn	33863	410
6	8	3	Pale grey shale minor grey/white porphyry. weak trace sulphides, weak trace Sn	33864	780
8	10	3	White, minor orange/brown porphyry. Trace sulphides, weak trace Sn	33865	560
10	12	3	" " " " " 1% " weak trace "	33866	380
12	14	3	" " " " " Trace " weak trace "	33867	270
14	16	3	White and orange/brown porphyry Weak trace sulphides	33868	230
16	18	3	" " " " " Weak Trace " trace Sn	33869	230
18	20	2	" " " " " Poor recovery 1% " trace "	33870	410
			Hole abandoned due to loss of sample recovery in damp ground		

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R. HARE & ASSOCIATES — DRILL LOG

Form 4516

CLIENT METALS EXPLORATION LTD HOLE No. MBP7

PROJECT MT BISCHOFF JOINT VENTURE DATE 5 June 1979

LOCATION OF COLLAR 2151 N 1805 E 658.9 Elev.

STRIKE 180° Grid DIP 75° FINAL DEPTH 27m

COMMENCED 5.6.79 COMPLETED 5.6.79 GEOLOGIST A. J.

~~Metres~~ Footage From	To	No of ~~Key~~ splits	Observations	Sample No.	Assay ppm Sn
0	2	3	White and light brown porphyry, minor shale Trace sulphides, weak trace Sn	33871	230
2	4	3	" " " " " " " Trace " trace "	33872	460
4	6	3	" " " " " " " Weak trace " trace "	33873	600
6	8	3	" " " " " " " Weak trace " trace "	33874	470
8	10	3	White and light brown porphyry, weak trace Sn	33875	250
10	12	3	White and light brown porphyry Weak trace sulphides, weak trace Sn	33876	260
12	14	3	" " " " " Trace " v. w. trace "	33877	290
14	16	3	Light brown, minor white porphyry Weak trace sulphides, weak trace Sn	33878	170
16	18	3	" " " " " Trace " weak trace "	33879	230
18	20	3	" " " " " Weak trace " trace "	33880	150
20	22	4	" " " " " (Slight contamination) 1% " trace "	33881	200
22	24	3	Light brown and white porphyry Trace sulphides, weak trace Sn	33882	200
24	26	2	" " " " " (Poor recovery) Trace " weak trace "	33883	380
26	27	1	" " " " " (") Trace " weak trace "	33884	1850
			Hole abandoned due to loss of sample recovery in wet ground		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP8

PROJECT MT BISCHOFF JOINT VENTURE DATE 6 June 1979

LOCATION OF COLLAR 2133 N 1760 E 656.3 Elev.

STRIKE - DIP Vertical FINAL DEPTH 17m

COMMENCED 6.6.79 COMPLETED 6.6.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No of ~~Key~~ splits	Observations	Sample No.	Assay ppm Sn
0	2	3	Pale grey/white porphyry, 2% sulphides, weak trace Sn	33885	180
2	4	3	" " " " 3-5% " weak trace "	33886	290
4	6	3	" " " " 2-3% " weak trace "	33887	270
6	8	3	Dark grey shale, minor pale grey/white porphyry 2-3% sulphides <0.5% Sn	33888	400
8	10	3	White and Light brown porphyry Trace sulphides <0.5% Sn	33889	980
10	12	3	White, pale green/yellow, Light brown porphyry Weak trace sulphides, trace Sn	33890	340
12	14	3	White and light brown porphyry weak trace Sn	33891	430
14	16	3	White, minor light brown porphyry weak trace sulphides, trace Sn	33892	400
16	17	*		No Sample	
			Hole reamed and cased to 12m.		
			Hole abandoned due to loss of sample recovery in wet ground		

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192119

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 9

PROJECT MT BISCHOFF JOINT VENTURE DATE 7 June 1979

LOCATION OF COLLAR 2132 N 1760 E 656.3 Elev.

STRIKE - DIP Vertical FINAL DEPTH 19m

COMMENCED 7.6.79 COMPLETED 7.6.79 GEOLOGIST A.J.

~~Metres~~ ~~Footage~~ From	To	No of ~~Key~~ splits	Observations	Sample No.	Assay ppm Sn
0	2	4	Pale grey/white and light brown porphyry 2% sulphides, weak trace Sn	33893	210
2	4	4	Pale grey/white minor light brown porphyry 3-5% sulphides, trace Sn	33894	130
4	6	4	Pale grey/white porphyry and dark grey shale 5% sulphides trace Sn	33895	130
6	8	4	Dark grey shale, minor white and light brown porphyry 1% sulphides trace Sn	33896	400
8	10	3	White and light brown porphyry minor dark grey shale Trace sulphides <0.5% Sn	33897	620
10	12	4	white and light brown porphyry Trace sulphides trace Sn	33898	600
12	14	3	" " " " " Weak trace " weak trace "	33899	840
14	16	4	" " " " " Weak trace " <0.5% "	33900	720
16	18	2	White minor light brown porphyry (Damp) Weak trace sulphides, weak trace Sn	34322	270
18	19			No Sample	

Large diameter hole to 16m and cased to 16m

Hole abandonned due to loss of sample recovery in wet ground

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192120

R. HARE & ASSOCIATES — DRILL LOG

Form 4516

CLIENT METALS EXPLORATION LTD HOLE No. MBP 10

PROJECT MT BISCHOFF JOINT VENTURE DATE 7 June 1979

LOCATION OF COLLAR 2116 N 1680 E 666.1 Elev.

STRIKE - DIP Vertical FINAL DEPTH 12m

COMMENCED 7.6.79 COMPLETED 7.6.79 GEOLOGIST A.J.

~~Metres~~ ~~Footage~~ From	To	No of ~~Key~~ Splits	Observations	Sample No.	Assay ppm Sn
0	2	3	Medium grey, minor light brown shale, minor quartzite.	34323	110
2	4	3	Medium grey, minor light brown quartzite minor shale and ⅓ pale yellow/white porphyry	34324	95
4	6	3	Pale green/white minor light brown porphyry weak trace sulphides, weak trace Sn	34325	480
6	8	3	" " " " " " " weak trace "	34326	310
8	10	4	Pale green/white porphyry Trace sulphide trace ~~sand~~ Sn	34327	1000
10	12	2	Pale green/white porphyry, minor medium grey shale weak trace sulphides, <0.5% Sn	34328	3150
			Hole abandoned due to rods jamming in a cavity at 12m.		

192121

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 11

PROJECT MT BISCHOFF JOINT VENTURE DATE 8 June 1979

LOCATION OF COLLAR 2114.5 N 1680 E 666.1 Elev.

STRIKE - DIP Vertical FINAL DEPTH 29m

COMMENCED 8.6.79 COMPLETED 8.6.79 GEOLOGIST A.J.

~~Metres~~ ~~Footage~~ From	To	No of ~~Key~~ Splits	Observations	Sample No.	Assay ppm Sn
0	2	3	1m medium grey shale, 1m white and light brown porphyry	34329	130
2	4	3	Pale green/white minor light brown porphyry	34330	140
4	6	3	" " " " " " " Weak trace sulphides, weak trace Sn	34331	190
6	8	3	" " " " " " " Weak trace " trace "	34332	1100
8	10	3	" " " " " " " Trace " trace "	34333	1650
10	12	3	" " " " " " " Weak trace " weak trace "	34334	1300
12	14	4	" " " " " " " Weak trace " <0.5% "	34335	1650
14	16	3	" " " " " " " Weak trace " 0.5% "	34336	2800
16	18	2	White, minor light brown porphyry Weak trace sulphides, 0.5% "	34337	2550
18	20	2	White, trace light brown porphyry weak trace sulphides 0.5-1.0% Sn	34338	2900
20	22	3	White porphyry Weak trace sulphides <0.5% Sn	34339	3700
22	24	2	White, trace light brown porphyry Weak trace sulphides <0.5% Sn	34340	5800
24	26	2	White, minor light brown porphyry Weak trace sulphides trace Sn	34341	3900
26	28	3	White and light brown porphyry Weak trace sulphides trace Sn	34342	2250
28	29	1	" " " " " Weak trace " weak trace "	34343	2000
			Hole abandoned due to rods jamming in hole.		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 12

PROJECT MT BISCHOFF JOINT VENTURE DATE 12 June 1979

LOCATION OF COLLAR 2106 N 1640 E 667.5 Elev.

STRIKE - DIP Vertical FINAL DEPTH 39m

COMMENCED 12.6.79 COMPLETED 12.6.79 GEOLOGIST A.J

Metres Footage From	To	No of Key Splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	Medium and dark grey shale minor quartzite	34344	150
2	4	3	" " " " " " "	34345	24
4	6	3	Medium and dark grey shale	34346	28
6	8	3	" " " " "	34347	26
8	10	3	" " " " "	34348	44
10	12	3	1.5m medium and dark grey shale, 0.5m pale green/white porphyry. Weak trace sulphides	34349	280
12	14	3	Pale green/white porphyry Weak trace sulphides	34350	300
14	16	3	" " " " Weak trace " Weak trace Sn	34351	780
16	18	3	" " " " Trace " Weak trace "	34352	620
18	20	3	" " " " Trace " weak trace "	34353	330
20	22	3	" " " " Weak trace " weak trace "	34354	320
22	24	3	" " " " Weak trace " weak trace "	34355	780
24	26	3	" " " " Weak trace " trace "	34356	2200
26	28	3	Pale green/white minor Light brown porphyry Trace sulphides weak trace Sn	34357	1050
28	30	3	" " " " " " " Weak trace " <0.5% "	34358	3250
30	32	3	" " " " " " " Weak trace " <0.5% "	34359	2300
32	34	3	1.0m pale green/white porphyry, 1.0m pale and dark grey quartzite and shale. Weak trace sulphide, trace Sn	34360	780
34	36	3	Pale and dark grey quartzite and shale Weak trace sulphide, weak trace Sn	34361	900
36	39	3	" " " " " " " Weak trace " weak trace "	34362	450
			Hole completed at 39m		

192123

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CLIENT METALS EXPLORATION LTD. HOLE No. MBP 13

PROJECT MT BISCHOFF JOINT VENTURE. DATE 13 June 1979

LOCATION OF COLLAR 2089 N 1600 E 669.5 Elev.

STRIKE - DIP Vertical FINAL DEPTH 30m

COMMENCED 13 6 79 COMPLETED 13 6 79 GEOLOGIST A. J.

Metres. Footage From	To	No of ~~Keys~~ Splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	Dark and medium grey minor light brown shale and quartzite	34363	65
2	4	3	Medium and dark grey quartzite and shale	34364	44
4	6	3	" " " " " " "	34365	55
6	8	3	Medium, minor dark grey minor light brown quartzite and shale	34366	38
8	10	3	" " " " " " "	34367	130
10	12	3	1.5m medium, minor dark grey quartzite and shale, 0.5m white porphyry	34368	65
12	14	3	Grey/white minor pale green and light brown porphyry Weak trace sulphides	34369	340
14	16	3	Grey/white minor light brown porphyry Weak trace sulphides, weak trace Sn	34370	640
16	18	3	" " " " " " Weak trace " weak trace "	34371	580
18	20	3	" " " " " " Weak trace " trace "	34372	1000
20	22	3	" " " " " " Trace " <0.5% "	34373	3050
22	24	3	" " " " " " 1% " <0.5% "	34374	2550
24	26	3	Grey/white trace Light brown porphyry 1% sulphides trace Sn	34375	1900
26	28	3	" " " " " " 1-2% " trace "	34376	680
28	30	3	" " " " " " 1% " <0.5% "	34377	1250
			Hole abandonned due to loss of sample recovery in wet ground		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 14

PROJECT MT. BISCHOFF JOINT VENTURE DATE 13 June 1979

LOCATION OF COLLAR 2068 N 1560 E 672.5 Elev.

STRIKE - DIP Vertical FINAL DEPTH 27 m.

COMMENCED 13/6/79 COMPLETED 13/6/79 GEOLOGIST A.J

Metres ~~Footage~~ From	To	No of ~~Key~~ Splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	Pale grey, minor light brown shale, minor clay; quartz	34378	380
2	4	4	0.25m pale grey shale, 1.75m pale yellow/white Porphyry	34379	150
4	6	4	Pale green/white minor Light brown porphyry Trace Sulphides Trace Sn	34380	1250
6	8	3	" " " " " " " Trace " Weak Trace "	34381	880
8	10	3	" " " " " " " Trace " Weak Trace "	34382	1550
10	12	3	" " " " " " " 1% " Trace "	34383	1500
12	14	3	" " " " " " " 1% " Trace "	34384	1300
14	16	3	" " " " " " " 1% " Trace "	34385	2500
16	18	3	Pale green/white porphyry Trace sulphides <0.5% Sn	34386	5600
18	20	3	Pale green/white minor Light brown porphyry trace mica Weak Trace Sulphides <0.5% Sn	34387	4150
20	22	3	Pale green/white porphyry Trace sulphides Trace Sn	34388	1500
22	24	3	1.0m pale yellow/white porphyry, 1.0m dark and medium grey shale, Weak Trace sulphide, Weak Trace Sn	34389	1000
24	26	3	Dark and medium grey, minor light brown shale	34390	600
26	27	2	" " " " " " " " " Weak Trace Sulphide, Weak Trace Sn	34391	1850
			Hole completed at 27m		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 15

PROJECT MT. BISCHOFF JOINT VENTURE DATE 14 June 1979

LOCATION OF COLLAR 2056 N 1520 E 682.9 Elev.

STRIKE — DIP Vertical FINAL DEPTH 36m

COMMENCED 14.6.79 COMPLETED 14.6.79 GEOLOGIST A.J.

Metres Footage From	To	No. of Key Spuds	Observations	Sample No.	Assay ppm Sn.
0	2	2	Pale grey shale	34392	230
2	4	5	Pale and dark grey minor light brown shale	34393	170
4	6	4	Dark grey shale. Weak Trace sulphide	34394	75
6	8	4	1.0m dark grey shale, 1.0m pale green/white porphyry Trace sulphides	34395	660
8	10	4	Pale grey/white minor light brown porphyry Trace sulphides	34396	860
10	12	4	Pale green/white and light brown porphyry Trace sulphides, Weak Trace Sn	34397	640
12	14	3	" " " " " " Weak Trace " Weak Trace "	34398	760
14	16	3	Pale green/white minor light brown porphyry Trace sulphides. Weak Trace Sn	34399	1200
16	18	3	" " " " " " 1% " Weak Trace "	34400	1350
18	20	3	Pale green/white ~~minor~~ and Light brown porphyry Trace sulphides Trace Sn	96500	1650
20	22	3	Pale green/white minor light brown porphyry Trace sulphides Trace Sn	96501	700
22	24	3	" " " " " " " Weak Trace " Trace "	96502	1850
24	26	3	Pale green/white porphyry Weak Trace sulphides, Weak Trace Sn	96503	330
26	28	3	Pale green/white minor light brown porphyry Trace sulphides Weak Trace Sn	96504	880
28	30	3	Pale green/white and light brown porphyry Weak Trace sulphides, Weak Trace Sn	96505	980
30	32	3	Pale green/white minor light brown porphyry Weak Trace sulphides, Weak Trace Sn	96506	410
32	34	3	1.5m pale green/white porphyry, 0.5m medium grey shale Trace sulphides Weak Trace Sn	96507	470
34	36	3	Medium grey minor light brown shale Trace sulphides	96508	380
			Hole completed at 36m		
			Large diameter hole 2-9m		
			Casing 0-9m		

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Form 4516

CLIENT METALS EXPLORATION LTD HOLE No. MBP 16

PROJECT MT BISCHOFF JOINT VENTURE DATE 14 June 1979

LOCATION OF COLLAR 2055 N 1494.5 E 690.8 Elev.

STRIKE 90° GRID DIP 75° FINAL DEPTH 13m

COMMENCED 14.6.79 COMPLETED 14.6.79 GEOLOGIST A.J

Metres Footage From	To	No of Key splits	Observations	Sample No.	Assay ppm Sn.
0	2			No Recovery	
2	4			"	
4	6			"	
6	8		0.5 Pale grey and light brown shale At 6.5 old workings	"	
8	10			"	
10	12			"	
12	13			"	
			Hole abandoned in old workings		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 17

PROJECT MT BISCHOFF JOINT VENTURE DATE 14 June 1979

LOCATION OF COLLAR 2035 N 1480 E 695.4 Elev.

STRIKE — DIP Vertical FINAL DEPTH 22m.

COMMENCED 14.6.79 COMPLETED 14.6.79 GEOLOGIST A.J

Metres Footage From	To	No. of Key Spads	Observations	Sample No.	Assay ppm Sn
0	2	4	Pale grey minor light brown shale minor quartzite	96509	230
2	4	4	1.cm pale grey and light brown shale, 1.cm white porphyry	96510	600
4	6	4	Grey/white minor light brown porphyry	96511	780
6	8	3	" " " " " " Weak Trace Sulphides, Weak Trace Sn	96512	1200
8	10	3	" " " " " " Weak Trace " Weak Trace "	96513	1100
10	12	3	Grey/white some light brown porphyry Weak Trace Sulphides, <0.5% Sn	96514	2050
12	14	3	Grey/white and light brown porphyry Weak Trace sulphides Trace Sn	96515	2500
14	16	3	Light brown minor grey/white porphyry Weak Trace sulphides <0.5% Sn	96516	5100
16	18	3	Grey/white minor light brown porphyry 2% sulphides <0.5% Sn	96517	2300
18	20	3	" " " " " " 2% " <0.5% "	96518	2350
20	22	3	Grey/white and light brown porphyry 1% sulphides Trace Sn	96519	2550
			Large diameter hole to 6m		
			Hole cased to 6m		
			Hole abandoned due to loss of sample recovery in wet ground		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 18

PROJECT MT. BISCHOFF JOINT VENTURE DATE 15 June 1979

LOCATION OF COLLAR 2020 N 1440 E 723 Elev.

STRIKE DIP Vertical FINAL DEPTH 6m

COMMENCED 15.6.79 COMPLETED 15.6.79 GEOLOGIST A.J.

Metres Footage From	To	No of Key splits	Observations	Sample No.	Assay
0	2	3	Pale grey and light brown shale Weak Trace sulphide Weak Trace Sn	96520	Not
2	4	3	1.0m pale grey and light brown shale, 1.0m grey/white and light brown porphyry. Trace sulphide Weak Trace Sn	96521	dispatched
4	6	—	No recovery		
			Compressor failure. Hole filled with water and abandonned. MBP 19 drilled within 50 cm.		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 19

PROJECT MT BISCHOFF JOINT VENTURE DATE 19 June 1979

LOCATION OF COLLAR 2020 N 1440 E 703.3 Elev.

STRIKE DIP Vertical FINAL DEPTH 13.5m

COMMENCED 19.6.79 COMPLETED 19.6.79 GEOLOGIST A.J.

Metres Footage From	To	No of Key splits	Observations	Sample No.	Assay ppm Sn
0	2	4	Pale grey and light brown shale and quartzite	96522	140
2	4	4	1.5m pale grey and light brown shale and quartzite 0.5m white and light brown porphyry	96523	470
4	6	3	White minor light brown porphyry Weak Trace Sulphides Weak Trace Sn	96524	1850
6	8	3	White and light brown porphyry Weak Trace sulphides Weak Trace Sn	96525	1750
8	10	3	" " " " " Weak Trace " Weak Trace "	96526	2150
10	11	2	Light brown minor white porphyry Weak Trace sulphides Weak Trace Sn	96527	1750
11	13.5	–	Old workings or cavity	No Recovery	
			Large diameter hole to 6m		
			Hole cased to 6m		
			Hole abandonned in old workings or cavity		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 20

PROJECT MT. BISCHOFF JOINT VENTURE DATE 19 June 1979

LOCATION OF COLLAR 2017.5 N 1440 E 703.2 Elev.

STRIKE — DIP Vertical FINAL DEPTH 16m

COMMENCED 19.6.79 COMPLETED 19.6.79 GEOLOGIST A.J

Metres Footage From	To	No. of Key Splits	Observations	Sample No.	Assay ppm Sn.
0	2	4	1.0m medium grey and light brown shale 1.0m white and light brown porphyry	96528	740
2	4	5	Light brown and white porphyry Weak Trace sulphides Weak Trace Sn	96529	1700
4	6	4	" " " " " Trace " Weak Trace "	96530	1700
6	8	3	Light brown, white minor grey porphyry Weak Trace sulphides Weak Trace Sn	96531	1800
8	10	3	Light brown and white porphyry Trace sulphides Trace Sn	96532	2200
10	12	3	Light brown, white minor grey porphyry Trace ~~Fe~~ sulphides Trace Sn	96533	1300
12	14	3	" " " " " " 1% " Trace "	96534	1400
14	16	3	" " " " " " 1% " Trace "	96535	1800
			Old workings or cavity		
			Large diameter hole to 6m		
			Hole cased to 6m		
			Hole abandonned in old workings		
			or cavity		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 21

PROJECT MT. BISCHOFF JOINT VENTURE DATE 19 June 1979

LOCATION OF COLLAR 2025 N 1400 E 702.9 ~~702.89~~ Elev.

STRIKE — DIP Vertical FINAL DEPTH 26m.

COMMENCED 19.6.79 COMPLETED 19.6.79 GEOLOGIST A.J.

Metres Footage From	To	No. of Key splits	Observations	Sample No.	Assay ppm.
0	2	3	Pale and medium grey shale	96536	50
2	4	3	" " " " "	96537	38
4	6	3	Pale and medium grey shale minor quartzite	96538	200
6	8	3	" " " " " " "	96539	70
8	10	3	Pale and medium grey minor light brown shale minor quartzite	96540	140
10	12	3	1.0m medium grey shale and quartzite, 1.0m white and light brown porphyry Weak Trace Sn	96541	1150
12	14	3	White porphyry	96542	780
14	16	3	" " <0.5% Sn	96543	2150
16	18	3	" " Trace "	96544	2000
18	20	3	White minor light brown porphyry, minor medium grey shale (? contamination) Weak Trace Sn	96545	1500
20	22	3	Light brown minor grey/white porphyry 1% sulphides <0.5% Sn	96546	1500
22	24	3	Grey/white minor light brown porphyry 2% sulphides <0.5% Sn	95647	2350
24	26	3	" " " " " " 2-5% " <0.5% "	95648	2350
			Hole abandoned due to loss of sample recovery in wet ground		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 22

PROJECT MT BISCHOFF JOINT VENTURE DATE 20 June 1979

LOCATION OF COLLAR 2100 N 1470 E 710.6 Elev.

STRIKE 90° DIP 75° FINAL DEPTH 18m

COMMENCED 20.6.79 COMPLETED 20.6.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No. of ~~Key~~ Splits	Observations	Sample No.	Assay ppm Sn
0	2	4	Pale grey quartzite and shale	96549	120
2	4	3	Pale minor medium grey shale minor quartzite	96550	70
4	6	3	Pale and medium grey minor light brown shale and quartzite	96551	130
6	8	3	" " " " " " " " "	96552	75
8	10	3	Pale, medium and dark grey shale Weak Trace sulphides Weak Trace Sn	96553	150
10	12	3	Medium and dark grey minor light brown shale Weak Trace sulphides Weak Trace Sn	96554	110
12	14	3	" " " " " " " " " Weak Trace " Weak Trace "	96555	270
14	16	3	" " " " " " " " "	96556	720
16	17	2	Pale and medium grey and light brown shale trace grey/white porphyry. Weak Trace sulphides Weak Trace Sn	96557	620
17	18	—	Old workings	No Recovery	
			Large diameter hole to 6m		
			Hole cased to 6m		
			Hole abandonned in old workings due to rods jammed in hole.		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 23

PROJECT MT BISCHOFF JOINT VENTURE DATE 20 June 1979

LOCATION OF COLLAR 2140 N 1466 E 709.0 Elev.

STRIKE 90° DIP 75° FINAL DEPTH 18m

COMMENCED 20.6.79 COMPLETED 20.6.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No of ~~Key~~ splits	Observations	Sample No.	Assay ppm Sn
0	2	3	Medium and pale grey minor light brown shale and quartzite	96558	75
2	4	3	" " " " " " " " minor quartzite	96559	48
4	6	3	Pale, medium and dark grey minor light brown shale and quartzite. Trace quartz	96560	34
6	8	3	" " " " " " " " " " "	96561	40
8	10	3	Pale and medium grey some light brown shale Trace Sn	96562	1700
10	12	3	Pale and medium grey and light brown shale	96563	820
12	14	3	Pale and medium grey some light brown shale trace quartz	96564	180
14	16	3	Pale grey and light brown quartzite minor shale	96565	300
16	18	3	" " " " " " " " Trace Sn	96566	2100
			Hole abandoned due to loss of sample recovery in wet ground.		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 24

PROJECT MT. BISCHOFF JOINT VENTURE DATE 20 June 1979

LOCATION OF COLLAR 2140 N 1468 E 709.0 Elev.

STRIKE 90° DIP 65° FINAL DEPTH 18m

COMMENCED 20.6.79 COMPLETED 20.6.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No. of ~~Key~~ splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	Medium and pale grey minor light brown shale and quartzite	96567	110
2	4	3	" " " " " " " " "	96568	60
4	6	3	Medium and pale minor dark grey minor light brown shale and quartzite	96569	95
6	8	3	Medium and pale grey and light brown quartzite and shale. Trace quartz	96570	310
8	10	3	" " " " " " " " "	96571	170
10	12	3	Pale and medium grey minor light brown shale	96572	70
12	14	3	" " " " " " " " minor quartzite	96573	100
14	16	3	Pale grey minor light brown shale and quartzite	96574	100
16	18	3	Pale grey and light brown shale and quartzite	96575	520
			Hole abandoned due to loss of sample recovery in wet ground		

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Form 4516

CLIENT METALS EXPLORATION LTD HOLE No. MBP 25

PROJECT MT. BISCHOFF JOINT VENTURE DATE 21 June 1979

LOCATION OF COLLAR 2140 N 1470 E 709.0 Elev.

STRIKE 90° DIP 60° FINAL DEPTH 10m

COMMENCED 21.6.79 COMPLETED 21.6.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No of ~~Key~~ Splits	Observations	Sample No.	Assay ppm Sn
0	2	3	Medium grey minor light brown quartzite and shale	96576	50
2	4	3	Light brown minor medium grey quartzite and shale	96577	140
4	6	3	Medium to pale grey minor light brown quartzite minor shale. Trace quartz <0.5% Sn	96578	7300
6	7	2	" " " " " " " " <0.5% "	96579	6600
7	8	2	" " " " " " " " <0.5% "	96580	4250
8	9	2	0.75m quartzite minor shale as above, 0.25m white and light brown porphyry <0.5% Sn	96581	5300
9	10	2	Orange/white/light brown porphyry. Minor pale grey quartzite <0.5% Sn	96582	3250
			Hole abandoned due to loss of sample recovery in wet ground		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 26

PROJECT MT BISCHOFF JOINT VENTURE DATE 21 June 1979

LOCATION OF COLLAR 2140.2 N 1470 E 709.0 Elev.

STRIKE 90° DIP 60° FINAL DEPTH 4m

COMMENCED 21.6.79 COMPLETED 21.6.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No of Key Splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	Medium/pale grey minor light brown quartzite minor shale	96583	140
2	4	4	Light brown and medium/pale grey quartzite minor shale	96584	140
			Hole terminated at 4m in order to shift to MBP 27.		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 27

PROJECT MT. BISCHOFF JOINT VENTURE DATE 21 June 1979

LOCATION OF COLLAR 2140 N 1473 E 709.1 Elev.

STRIKE 90° DIP 75° FINAL DEPTH 15m

COMMENCED 21.6.79 COMPLETED 21.6.79 GEOLOGIST A.J

Metres Footage From	To	No of Key Splits	Observations	Sample No.	Assay ppm Sn
0	2	3	Surface rubble - medium grey quartzite and shale and white/orange/brown porphyry. Trace sulphide W.T. Sn	96585	1200
2	4	3	1.0m medium grey quartzite, 1.0m white and minor light brown porphyry Weak Trace Sn	96586	1850
4	6	3	White and Light brown porphyry Trace Sn	96587	3400
6	8	3	Light brown minor white porphyry <0.5% Sn	96588	4600
8	10	3	Pale green/white and Light brown porphyry <0.5% Sn	96589	2150
10	12	3	" " " " " " " Weak Trace Sn	96590	1150
12	14	3	Orange / Light brown porphyry Trace Sn	96591	1150
14	15	1	" " " " Trace "	96592	2100
			Old workings at 15m		
			Hole abandonned in old workings		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 28

PROJECT MT BISCHOFF JOINT VENTURE DATE 21 June 1979

LOCATION OF COLLAR 2180 N 1458 E 711.1 Elev.

STRIKE 90° DIP 75° FINAL DEPTH 18m.

COMMENCED 21.6.79 COMPLETED 21.6.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No. of Key Splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	Medium/pale grey minor light brown quartzite minor shale	96593	560
2	4	3	" " " " " " " " "	96594	490
4	6	3	0.5m medium grey quartzite, 1.5m white, minor light brown porphyry <0.5% Sn	96595	7900
6	8	3	Grey/white and light brown porphyry Trace sulphide Weak Trace Sn	96596	2600
8	10	3	White and light brown porphyry Weak Trace sulphide Trace Sn	96597	1700
10	12	3	" " " " " <0.5% "	96598	3200
12	14	3	Light brown/white porphyry <0.5% Sn	96599	1950
14	16	3	" " " " <0.5% "	96600	2850
16	18	1	Orange/brown porphyry <0.5% Sn	96601	2600
			Hole abandoned due to loss of sample recovery and loss of air pressure return.		

192139

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 29

PROJECT MT BISCHOFF JOINT VENTURE DATE 22 June 1979

LOCATION OF COLLAR 2180 N 1457 E 711.0 Elev.

STRIKE 90° DIP 75° FINAL DEPTH 18m

COMMENCED 22.6.79 COMPLETED 22.6.79 GEOLOGIST A.J

Metres Footage From	To	No. of Key Splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	Medium and pale grey minor light brown quartzite minor shale Trace Sn	96602	1500
2	4	3	" " " " " " " " " "	96603	410
4	6	3	" " " " " " " " " " Trace light brown porphyry <0.5% Sn	96604	3700
6	8	3	Trace pale grey quartzite. Light brown some white porphyry <0.5% Sn	96605	3800
8	10	3	Light brown and white porphyry Trace Sn	96606	1700
10	12	3	White minor light brown porphyry <0.5% Sn	96607	2400
12	14	3	" " " " " <0.5% "	96608	3450
14	16	3	White and Light brown porphyry Trace Sn	96609	2200
16	18	3	Light brown minor white porphyry <0.5% Sn	96610	3200
			Hole abandoned due to loss of sample recovery in wet ground		

192140

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 30

PROJECT MT BISCHOFF JOINT VENTURE DATE 22 June 1979

LOCATION OF COLLAR 2240 N 1413 E 706.4 Elev.

STRIKE 90° DIP 75° FINAL DEPTH 12m

COMMENCED 22.6.79 COMPLETED 22.6.79 GEOLOGIST A.J

Metres ~~Footage~~ From	To	No of ~~Key~~ Spurs	Observations	Sample No.	Assay ppm Sn.
0	2	3	Pale grey minor light brown shale minor quartzite	96611	420
2	4	3	Medium and pale grey minor light brown shale minor quartzite	96612	65
4	6	3	1.5m medium and pale grey shale. 0.5m white porphyry Weak Trace Sn	96613	680
6	8	3	White porphyry Trace Sn	96614	1250
8	10	2	Pale green/white porphyry Trace Sn	96615	1100
10	12	3	" " " " . Minor pale grey shale (? contamination) Weak Trace sulphides Trace Sn	96616	1200
			Hole abandonned due to loss of sample recovery in probable old workings		

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CLIENT METALS EXPLORATION LTD. HOLE No. MBP 31

PROJECT MT. BISCHOFF JOINT VENTURE DATE 22 June 1979

LOCATION OF COLLAR 2237 N 1413 E 706.4 Elev.

STRIKE 90° DIP 75° FINAL DEPTH 10m

COMMENCED 22.6.79 COMPLETED 22.6.79 GEOLOGIST A.J.

Metres Footage From	To	No. of Key Splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	Medium/pale grey minor light brown shale	96617	50
2	4	3	" " " " " " " minor quartzite	96618	36
4	6	3	Medium minor pale grey minor light brown shale minor quartzite	96619	38
6	8	3	1.5m medium grey shale minor quartzite, 0.5m white porphyry	96620	470
8	10	1	White porphyry, minor medium grey shale (? contamination) Weak Trace Sn	96621	1000
			Hole abandoned due to loss of sample recovery in probable old workings		

192142

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 32

PROJECT MT. BISCHOFF JOINT VENTURE DATE 22 June 1979

LOCATION OF COLLAR 2220 N 1430 E 711.0 Elev.

STRIKE 90° DIP 75° FINAL DEPTH 20m

COMMENCED 22.6.79 COMPLETED 22.6.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No of Key splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	1.0m pale grey shale, 1.0m white porphyry <0.5% Sn	96622	2750
2	4	3	White and light brown porphyry <0.5% Sn	96623	4350
4	6	3	" " " " " Trace "	96624	5100
6	8	3	" " " " " <0.5% "	96625	7200
8	10	3	White minor light brown porphyry <0.5% Sn	96626	4650
10	12	3	Pale green/white minor light brown porphyry Trace sulphides Weak Trace Sn	96627	1700
12	14	3	" " " " " " " Trace " Weak Trace "	96628	1150
14	16	3	" " " " " " " Weak Trace " Weak Trace "	96629	880
16	18	3	0.5m pale green/white porphyry, 1.5m medium grey shale Weak Trace Sn	96630	1150
18	20	1	Contaminated samples: medium grey shale and light brown and white porphyry Trace Sn	96631	3250

Hole abandoned due to loss of sample recovery in wet ground

192143

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 33

PROJECT MT BISCHOFF JOINT VENTURE DATE 25.6.79

LOCATION OF COLLAR 2036 N 1360 E 695.4 Elev.

STRIKE — DIP Vertical FINAL DEPTH 18m

COMMENCED 25.6.79 COMPLETED 25.6.79 GEOLOGIST A.J

Metres ~~Footage~~ From	To	No of Key Spurts	Observations	Sample No.	Assay ppm Sn
0	2	3	Medium and pale grey shale and quartzite weak Trace Sn	96632	420
2	4	3	" " " " " " "	96633	130
4	6	3	Dark, medium and pale grey minor Light brown shale minor quartzite	96634	640
6	8	3	1.5m medium grey minor Light brown shale, 0.5m white porphyry weak Trace sulphide weak Trace Sn	96635	540
8	10	3	Light brown and white porphyry weak Trace sulphides Trace Sn	96636	3950
10	12	3	White minor Light brown porphyry weak Trace Sn	96637	1900
12	14	3	" " " " " <0.5% "	96638	2300
14	16	3	" " " " " 0.5% "	96639	4900
16	18	2	Grey/white minor Light brown porphyry weak Trace Sulphide Trace Sn	96640	1600
			Hole abandoned due to loss of sample recovery in wet ground		

192144

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CLIENT METALS EXPLORATION LTD HOLE No. MBD 34

PROJECT MT. BISCHOFF JOINT VENTURE DATE 25.6.79

LOCATION OF COLLAR 2036 N 1359 E 695.4 Elev.

STRIKE — DIP Vertical FINAL DEPTH 22m

COMMENCED 25.6.79 COMPLETED 25.6.79 GEOLOGIST A.J.

Metres Footage From	To	No of Key splits	Observations	Sample No.	Assay ppm Sn
0	2	3	Medium and pale grey shale and quartzite	96641	320
2	4	3	" " " " " " "	96642	150
4	6	3	Dark minor medium and pale grey shale minor quartzite Trace sulphides	96643	1000
6	8	3	1.0m dark and medium grey shale, 1.0m white minor light brown porphyry	96644	420
8	10	3	White minor Light brown porphyry Trace Sn	96645	1450
10	12	3	White porphyry Trace Sn	96646	1650
12	14	3	Grey/white minor Light brown porphyry Weak Trace sulphides Trace Sn	96647	2050
14	16	3	" " " " " " 1% " <0.5% "	96648	6000
16	18	3	Grey/white and Light brown porphyry 1% sulphides <0.5% Sn	96649	6800
18	20	3	Light brown and grey/white porphyry 1% sulphides 0.5% Sn	96650	4900
20	22	2	Grey porphyry, trace dark grey shale (? contamination) 2% sulphides <0.5% Sn	96651	3500
			Hole abandoned due to loss of sample recovery in wet ground		

192145

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 35

PROJECT MT. BISCHOFF JOINT VENTURE DATE 25.6.79

LOCATION OF COLLAR 2050 N 1320 E 688.8 Elev.

STRIKE — DIP Vertical FINAL DEPTH 8m

COMMENCED 25.6.79 COMPLETED 25.6.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No. of ~~Key~~ splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	Trace medium grey shale, white and light brown porphyry Trace sulphide Trace Sn	96652	1950
2	4	3	White minor light brown porphyry, trace medium grey shale (? contamination) <0.5% Sn	96653	1300
4	6	3	Grey/white and light brown porphyry 1% sulphide Trace Sn	96654	2450
6	8	3	" " " " " " 1% " <0.5% "	96655	4850
			Hole abandonned due to loss of sample recovery in wet ground		

192146

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 36

PROJECT MT. BISCHOFF JOINT VENTURE DATE 25.6.79

LOCATION OF COLLAR 2035 N 1280 E 690.2 Elev.

STRIKE - DIP Vertical FINAL DEPTH 4m.

COMMENCED 25.6.79 COMPLETED 25.6.79 GEOLOGIST A.J.

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Metres ~~Footage~~ From	To	No of Key splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	Pale grey/brown shale Trace sulphide <0.5% Sn	96656	Not
2	4	3	1 cm pale grey shale, 1 cm pale grey porphyry 1% sulphide Trace Sn	96657	despatched
			Hole filled with water whilst bit was sharpened. MBP 37 was drilled within 50 cm.		

192147

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 37

PROJECT MT. BISCHOFF JOINT VENTURE DATE 26.6.79

LOCATION OF COLLAR 2035 N 1280 E 690.2 Elev.

STRIKE – DIP Vertical FINAL DEPTH 9m.

COMMENCED 26.6.79 COMPLETED 26.6.79 GEOLOGIST A.J.

Metres Footage From	To	No. of Key Splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	Pale grey/brown shale. Weak Trace sulphides Trace Sn	96658	4350
2	4	3	1.0m pale grey shale, 1.0m grey/white porphyry Trace sulphides Weak Trace Sn	96659	2750
4	6	3	Pale green/grey porphyry 1% sulphides	96660	1350
6	8	3	" " " " Trace "	96661	430
8	9	2	" " " " 1% " Weak Trace Sn	96662	920
			Hole abandonned due to loss of sample recovery in wet ground		

192148

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CLIENT METALS EXPLORATION LTD. HOLE No. MBP 38

PROJECT MT BISCHOFF JOINT VENTURE DATE 26.6.79

LOCATION OF COLLAR 2032.4 N 1280 E 690.3 Elev.

STRIKE — DIP Vertical FINAL DEPTH 34m.

COMMENCED 26.6.79 COMPLETED 26.6.79 GEOLOGIST A.J.

Metres Footage From	To	No of Key Splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	Pale grey/brown shale trace quartz. Weak Trace sulphides Weak Trace Sn	96663	2700
2	4	3	Pale grey/white minor Light brown porphyry 1% sulphides Weak Trace Sn	96664	2700
4	6	3	Pale grey/white porphyry 2% sulphides Trace Sn	96665	3100
6	8	3	" " " " 2-5% " Weak Trace "	96666	980
8	10	3	" " " " 2-5% " Weak Trace "	96667	1250
10	12	3	Pale green/grey porphyry Trace sulphide Weak Trace Sn	96668	520
12	14	3	" " " " Trace "	96669	250
14	16	3	" " " " Weak Trace "	96670	230
16	18	3	" " " " Weak Trace " Weak Trace Sn	96671	190
18	20	3	0.5m pale green/grey porphyry, 1.5m medium grey shale Trace sulphide	96672	170
20	22	3	Medium dark grey shale 1% sulphides	96673	500
22	24	3	" " " " Trace "	96674	1150
24	26	3	" " " " Trace "	96675	1900
26	28	3	" " " " Trace "	96676	1800
28	30	3	Medium grey shale Trace sulphides	96677	410
30	32	3	" " " " Trace "	96678	170
32	34	3	" " " " Trace "	96679	470
			Hole completed at 34m (Wet ground at 34m)		

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 39

PROJECT MT. BISCHOFF JOINT VENTURE DATE 27.6.79

LOCATION OF COLLAR 2023 N 1260 E 6876 Elev.

STRIKE 180° DIP 75° FINAL DEPTH 12m

COMMENCED 27.6.79 COMPLETED 27.6.79 GEOLOGIST A.J.

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Metres Footage From	To	No of ~~Key~~ Splits	Observations	Sample No.	Assay ppm Sn
0	2	3	Pale and medium grey, minor Light brown shale	96680	350
2	4	3	Trace pale grey shale. Grey/white porphyry 2% sulphides	96681	1550
4	6	3	Grey/white porphyry 2-5% sulphides	96682	620
6	8	3	0.5m grey/white porphyry, 1.5m medium to dark grey shale 2-5% sulphides Weak Trace Sn	96683	2450
8	9	2	Medium to dark grey shale. Trace grey/white porphyry (?contamination) 5% sulphide Weak Tr Sn	96684	1850
9	12	—	Old workings	No Recovery	
			Hole abandonned in old workings		

192150

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 40

PROJECT MT. BISCHOFF JOINT VENTURE DATE 27.6.79

LOCATION OF COLLAR 2023 N 1295 E 687.5 Elev.

STRIKE 180° DIP 75° FINAL DEPTH 36m

COMMENCED 27.6.79 COMPLETED 27.6.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No of Key Spots	Observations	Sample No.	Assay ppm Sn.
0	2	3	Medium to pale grey minor brown shale Trace sulphide	96685	140
2	4	3	Medium and dark grey shale Trace Sulphide	96686	240
4	6	3	~~from~~ Trace dark grey shale. Grey/white minor light brown porphyry. Trace sulphide weak Trace Sn	96687	1850
6	8	3	Pale grey porphyry 2-5% sulphides Weak Trace Sn	96688	1850
8	10	3	Grey/white porphyry 2-5% sulphides weak Trace Sn	96689	2000
10	12	3	Trace grey/white porphyry. Medium and dark grey shale 2% sulphides weak Trace Sn	96690	2000
12	14	3	Medium and dark grey shale 1-2% sulphides	96691	580
14	16	3	" " " " " 1% "	96692	150
16	18	3	Medium and pale grey minor Light brown shale Trace sulphides	96693	100
18	20	3	Medium and pale grey and Light brown shale	96694	940
20	22	3	Medium and pale grey minor Light brown shale Trace sulphides Weak Trace Sn	96695	330
22	24	3	Medium grey shale Trace sulphides	96696	170
24	26	3	Medium minor dark grey shale Trace sulphides	96697	85
26	28	3	" " " " " Weak Trace "	96698	80
28	30	3	" " " " " Weak Trace "	96699	65
30	32	3	" " " " " Trace "	96700	65
32	34	3	" " " " " Trace "	96701	55
34	36	2	" " " " " Trace " Weak Trace Sn	96702	170
			Hole completed at 36m		

192151

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 41

PROJECT MT BISCHOFF JOINT VENTURE DATE 27 June 1979

LOCATION OF COLLAR 1974 N 1220 E 677.8 Elev.

STRIKE 180° DIP 75° FINAL DEPTH 33m.

COMMENCED 27.6.79 COMPLETED 27.6.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No. of Key Splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	Pale grey minor light brown shale	96703	46
2	4	3	Pale grey shale	96704	42
4	6	3	" " "	96705	95
6	8	3	" " "	96706	280
8	10	3	" " "	96707	140
10	12	3	" " "	96708	95
12	14	3	1.0m pale grey shale, 1.0m orange/brown and white porphyry Trace Sn	96709	1300
14	16	3	White and orange/brown porphyry 1% sulphides <0.5% Sn	96710	6300
16	18	3	Grey/white minor light brown porphyry 1% sulphides Trace Sn	96711	3300
18	20	3	Orange/brown minor grey/white porphyry Trace sulphides Trace Sn	96712	2900
20	22	3	" " " " " " 1% " Trace "	96713	4650
22	24	3	" " " " " " 1% " <0.5% "	96714	7500
24	26	3	" " " " " " 1% <0.5% "	96715	6100
26	28	3	" " " " " " Trace <0.5% "	96716	4350
28	30	3	" " " " " " Trace 0.5% "	96717	5500
30	32	3	" " " " " " Trace 0.5% "	961718	3000
32	33	—	Contaminated Sample Trace " <0.5% "	96719	Not despatched

Hole abandoned due to loss of sample recovery in wet ground.

192152

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 42

PROJECT MT BISCHOFF JOINT VENTURE DATE 28.6.79

LOCATION OF COLLAR 1959 N 1260 E 677.7 Elev.

STRIKE — DIP Vertical FINAL DEPTH 14m

COMMENCED 28.6.79. COMPLETED 28.6.79 GEOLOGIST A.J.

Metres Footage From	To	No. of Key splits	Observations	Sample No.	Assay ppm Sn.
0	2	3	Pale grey minor Light brown shale	96720	240
2	4	3	" " " " " "	96721	100
4	6	3	" " " " " "	96722	55
6	8	3	" " " " " "	96723	60
8	10	3	" " " " " "	96724	75
10	12	3	" " " " " "	96725	65
12	14	3	Pale minor medium grey minor Light brown shale	96726	250
			Hole abandoned due to loss of sample recovery in wet ground		
			Hole MBP 42a drilled at same site to 9m but not sampled		

192153

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 43

PROJECT MT. BISCHOFF JOINT VENTURE DATE 28.6.79

LOCATION OF COLLAR 1755 N 1040 E 624.3 Elev.

STRIKE 180° DIP 75° FINAL DEPTH Com.

COMMENCED 28.6.79 COMPLETED 28.6.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No of Key Splits	Observations	Sample No.	Assay ppm Sn.
0	2	1	Roadfill: Pale grey and light brown shale, minor Light brown and white porphyry	96727	Not
2	4	1	" " " " " " " " " " " " " " " " " "	96728	despatched
4	6	–		No Recovery	
			Hole abandonned due to loss of sample recovery in wet ground		

192154

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 44

PROJECT MT. BISCHOFF JOINT VENTURE DATE 28 June 1979

LOCATION OF COLLAR 1745 N 1040 E 624.3 Elev.

STRIKE — DIP Vertical FINAL DEPTH 4m

COMMENCED 28.6.79 COMPLETED 28.6.79 GEOLOGIST A.J.

Metres ~~Footage~~ From	To	No of Key Spots	Observations	Sample No.	Assay ppm Sn.
0	2	3	Pale grey porphyry Weak Trace Sn	96729	70
2	4	3	" " " Weak Trace Sulphides	96730	135
			Hole abandonned due to loss of sample recovery in wet ground		

192155

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R. HARE & ASSOCIATES — DRILL LOG Form 4516

CLIENT METALS EXPLORATION LTD HOLE No. MBP 45

PROJECT MT. BISCHOFF JOINT VENTURE DATE 29 June 1979

LOCATION OF COLLAR 1907.5 N 1184.5 E 642.2 Elev.

STRIKE — DIP Vertical FINAL DEPTH 4m.

COMMENCED 29.6.79 COMPLETED 29.6.79 GEOLOGIST A.J.

Metres Footage From	To	No of Key Splits	Observations	Sample No.	Assay ppm Sn
0	2	3	Grey/white porphyry 2-5% sulphides Weak Trace Sn	96731	2250
2	4	3	" " " 2-5% " Weak Trace "	96732	320
			Hole abandonned due to loss of sample recovery in wet ground		

192156

R. HARE & ASSOCIATES — DRILL LOG Form 4516

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CLIENT METALS EXPLORATION LTD HOLE No. MBP 46

PROJECT MT. BISCHOFF JOINT VENTURE DATE 2 July 1979

LOCATION OF COLLAR 2391.76 N 1135.49 E 707.4 Elev.

STRIKE — DIP Vertical FINAL DEPTH 9m

COMMENCED 2.7.79 COMPLETED 2.7.79 GEOLOGIST A. J.

Metres Footage From	To	No. of Key Splits	Observations	Sample No.	Assay ppm Sn
0	2	3	Light brown and white porphyry 1% sulphides Trace Sn	96733	4440
2	4	3	Grey/brown and white porphyry 1% sulphides Trace Sn	96734	1450
4	6	3	Grey/brown minor white porphyry 1% sulphides Trace Sn	96735	1100
6	8	3	" " " " " 1% " <0.5% "	96736	2700
8	9	-		No Recovery	
			Hole abandonned due to loss of sample recovery in wet ground		

192157

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R. HARE & ASSOCIATES — DRILL LOG Form 4516

CLIENT METALS EXPLORATION LTD. HOLE No. MBP 47

PROJECT MT. BISCHOFF JOINT VENTURE DATE 2.7.79

LOCATION OF COLLAR 2354.3 N 1266 E 689.9 Elev.

STRIKE – DIP Vertical FINAL DEPTH 14m.

COMMENCED 2.7.79 COMPLETED 2.7.79 GEOLOGIST A. J

~~Footage~~ Metres From	To	No of ~~Key~~ Spads	Observations	Sample No.	Assay ppm Sn.
0	2	3	Pale grey some Light brown shale weak Toxic sulphides	96737	240
2	4	3	" " " " " "	96738	175
4	6	3	" " " " " "	96739	350
6	8	3	Pale grey minor Light brown shale	96740	155
8	10	3	" " " " " "	96741	65
10	12	3	" " " " " "	96742	270
12	14	–		No Recovery	
			Hole abandoned due to loss of sample recovery in wet ground		
			Hole ~~#2a~~ MBP 47a drilled at same site to 9m but not sampled		

% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description over interval marked	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	-: OBSERVATIONS :- Commence with length from collar, either point (relates to marker) or 'from-to' (relates to brackets) ATTITUDE OF BEDDING OR FOLIATION; ATTITUDE & SPACING OF JOINTS; ATTITUDE, WIDTH & DESCRIPTION OF SHEARED ZONES [Attitude = angle of structure to long core axis] MINERALIZATION; ETC.	% MINERALIZATION (VISUAL ESTIMATE)

157

192158

SUMMARY DRILL LOG MBD 6

			Veins etc all veins over 50mm	Mineralization excluding veins over 50mm	
Tricone Drilled - No core	0 - 13.5 (13.5)				
SHALE minor SILTSTONE Grey, minor black carbonaceous, brecciated, folded, disrupted	13.5 - 38.0 (24.5)	20	27.7-27.9, 115mm, 50° fluorite-qtz-py-sp-cassiterite-? stibnite	py in stringers, rare disseminated	1-2%
				py >> po in stringers, veins minor disseminated	2%
SHALE and SILTSTONE Greenish grey, moderately bedded, usually disrupted and folded	38.0 - 57.5 (19.5)	40	← Bedding 90°	py and po in stringers, dissem.	2-5%
			← Bedding 45°	py and po in stringers, minor disseminated	1-2%
SILTSTONE minor SILTY SHALE and QUARTZITE, greenish grey, disrupted	57.5 - 74.6 (17.1)	60	← 59.53-60.07, 270mm, 50° qtz-carbonate-py-cassiterite-sphalerite-wolfram	py and po in stringers, rare disseminated	<1%
QUARTZITE impure, pale grey, hard	74.6 - 83.3	80	← 76.25, ngg. 100mm, 50° qtz-carb-py-stibnite, cassiterite	py >> po in stringers, veinlets	1-2%
SILTY SHALE minor QUARTZITE pale greenish grey, folded, disrupted, minor brecciation	83.3 - 125.35 (42.05)	100	← Bedding 65°	py >> po in stringers, veins, rare disseminated in quartzite up to 5%	1%
QUARTZ PORPHYRY green grey	125.35 - 126.45	120	117.4, 80mm qtz breccia ← Bedding 25° contact ~ 60° contact 35°	po in stringers, veinlets, along bedding po disseminated trace Sn	1% 5-10%
QUARTZITE minor SILTY SHALE	126.45 - 129.5			py and po in stringers, veinlets	2-3%
SILTY SHALE pale green/grey with minor interbeds of black carbonaceous SHALE. well bedded, folded.	129.5 - 177.8 (48.3)	140 160	← Bedding 50° ← Bedding 60° contact ~ 80°	py and po in stringers, veins, rare blebs and disseminated	2%
QUARTZ PORPHYRY white	177.8 - 181.5	180		py/mercasite + po disseminated	15-20%
SILTY SHALE and SILTSTONE minor interbeds of carbonaceous SHALE	181.5 - 200 (18.5)		contact 75° ← bedding 90°	po > py in veins, stringers along bedding	3-5%
END OF HOLE 200m		200			

REPORT No. 192159 PAGE 158

METALS EXPLORATION LTD.
& SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG

Prospect, area, project or mine. MT BISCHOFF

HOLE No. MBD6

COLLAR LOCATION

Grid name | Rectangular space co-ordinates: PLANAR CO-ORDINATES | ELEVATION

(1) M.E.L.	1878·35 N	801·10 E	603·28
(2)	N	E	
(3) Aust. Map Grid (PRECISE / APPROX.)	mE	mN	m A.H.D.

1:250 000 Sheet No. BURNIE SK 55-3 | 1:100 000 Sheet No. HELLYER 8015 | State TASMANIA

Mineral Tenement E.L. 13/79 | Holder M.E.L.

Cadastral location and details (CROWN LAND / PRIVATE)

W.C. Bearing from collar
_____ magnetic
_____ grid (1)
_____ grid (2)
_____ grid (3)
_____ true

Inclination at collar VERTICAL

Total length 200m.

Commenced: 21/6/79
Completed: 25/6/79

Drilling contractor: Longyear Aust P/L

Rig type: LONGYEAR F 38

Core size and non-coring (NC)

TRICONE	0	TO	13.5
NQ	13.5	TO	60.1
BQ	60.1	TO	200
		TO	
		TO	
		TO	

Details of down hole location-survey methods.
TROPARI

Purpose of drilling and anticipated lengths to targets.
To intersect white Face porphyry dyke to the west of B38 intersection

Results of down hole location-survey.

LENGTH FROM COLLAR	W.C. BEARING type.....	DIP
30	193	88
60	287	86
90	312	88
120·5	309	84
150·5	319	82
180	311	79
199·5	321	77

Comments on drilling. 14.5 HQ rod left in hole

Legend for graphic log column (see drill log for Hole No. _____)
'DERWENT' PENCIL NO. | FIELD ROCK NAME, ETC.

Symbols and abbreviations for drilling notes column.

LOGGED BY A. JANNINK | FROM 0 TO 200 | DATE June 1979
LOGGED BY _____ | FROM _____ TO _____ | DATE _____
LOGGED BY _____ | FROM _____ TO _____ | DATE _____

Company managing exploration programme.
METALS EXPLORATION LIMITED

HOLE No. MBD6
Log sheet 1 of 11

REPORT No. 192160 PAGE 159 2

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m. cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Altitude of bedding or foliation; Altitude & spacing of joints, Altitude, width & discription of sheared zones, [Altitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	0.00 m									Veins etc (over 5mm only) Includes veins under 5mm	
TRICONED NO CORE											
NQ core	3.2	3.0	100		SHALE minor SILTSTONE Shale is medium grey minor black carbonaceous, Siltstone only medium grey. Often brecciated, folded and disrupted, otherwise well bedded 13.5-22.3 Brecciated	13.5-38.0 (24.5)			18.2 Bedding 40° ←	pyrite in thin irregular stringers especially in shale, rarely disseminated in siltstone, some smears along bedding	1-2%
	3.1	2.7									

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 6
LOG SHEET 2 of 11

Preliminary Design for Form Oct 78

REPORT No. 192161 100 PAGE 3

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS ⌐	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.1	3.2			See page 2						
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100		Gradual change to SHALE and SILTSTONE see page 4	38.0-57.5 (19.5)			← 38.2 Bedding 55°	pyrite and pyrrhotite mainly in thin stringers minor disseminated and in blebs. Some thin carbonate stringers	2-5%

20 22 24 26 28 30 32 34 36 38 40

See page 2

23.1 Bedding 55°
23.35: 5mm vein, 25°, carbonate trace Py

27.7: 45mm vein, 50°, flourite minor qtz trace py, sp
27.85: 70mm vein, 50°, qtz, flourite, cassiterite, ?stibnite trace py, sp
28.9: 6mm vein, 40°, py, qtz, carbonate trace cp

31.5: 8mm vein, 20°, py, qtz, carbonate trace cp, po
31.8 Bedding 70°

pyrite, minor pyrrhotite (increasing with depth) in thin stringers, minor disseminations and blebs in siltstone, minor veins, minor smears along bedding — 2%

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 6
LOG SHEET 3 of 11

Preliminary Design for Form Oct 78

REPORT No. 192162 161 PAGE 4

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (#)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	3.0	100		Medium grey, slightly greenish. No black carbonaceous shale. Interbedded and moderately bedded. Usually disrupted and folded. Some brecciation					See page 3	
	2.5	2.4									
	0.5	0.60	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100		Gradual change to SILTSTONE minor SILTY SHALE and QUARTZITE See page 5	57.5-74.6 (17.1)			42.3 Bedding 90° 44.63: 5 to 2 mm vein, 60° qtz, carbonate minor cassiterite 50.7: 12 mm vein, 15°, carbonate minor qtz 51.95: 10 mm vein, 75° 53.05: 30 mm vein, 55°, vuggy py, minor qtz, carbonate, trace sp, cassiterite 55.5 Bedding 45° 58.1: 150 x 20 mm irregular patch of carbonate, py, trace po 58.7: 8 mm irregular vein, 60°, qtz, py 59.53-60.07 Thompson's Lode, 50°, 50% brecciated quartzite, rest is qtz, carbonate, py trace sp, cassiterite, wolfram	pyrite and pyrrhotite mainly in thin stringers, minor disseminated and in blebs. Some thin carbonate stringers pyrite and pyrrhotite in thin stringers, rare blebs and disseminated	1-2% <1%

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 6
LOG SHEET 4 of 11

Preliminary Design for Form Oct 78

REPORT No. 192163 162 PAGE 5

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)

000m	BQ core	2.0	1.9	95	Medium grey, slightly greenish. Quartzite is hard, paler grey and impure. Poorly bedded. Disrupted and folded with some brecciation. Siltstone is partly silicified.						
		3.0	2.9	97							
		3.0	3.0	100							
		3.0	3.0	100							
		3.0	3.0	100							
		3.0	3.0	100							
		3.0	2.9	97							
					QUARTZITE minor SILTY SHALE Pale grey, hard, impure. No bedding Slightly brecciated. Silty shale is medium grey, disrupted	74.6-83.3 (8.7)				pyrite >> pyrrhotite decreasing with depth. in thin stringers, veinlets minor blebs		1-2%

60
62
64
66
68
70
72
74
76
78
80

See page 4

←61.3: 7mm vein, 40°, qtz, py
←63.6: 6mm vein, 45°, qtz carbonate
←72.5 Bedding 50°
←72.9: 11mm vein, 35°, flowrite qtz, carbonate minor py
←74.15: 12mm vein, 40°, qtz minor py, marcasite trace sp
←74.3: 40mm vein, 30°, carbonate qtz, minor py, sp, ? stibnite
←74.45: 25mm vein, 55°, vuggy, broken, carbonate, qtz minor py, sp, ? stibnite
←74.55: 45mm vein, 30°, carbonate qtz, minor sp, py, ? stibnite
75.35: Irregular 5 to 20mm vein, 30°, qtz minor py, po
76.15-76.35: Zone of veins and 50% quartzite, 50°, qtz, carbonate trace ? stibnite, Py, cassiterite
←78.55: 10mm vein, 45°, qtz, py ~~trace ? cassiterite~~ carbonate trace cp
←79.3: 33mm vein, 45°, qtz py trace ? cassiterite

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 6
LOG SHEET 5 of 11

REPORT No. 192164 163 PAGE 6

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	2.9	97		See page 5					See page 5	
	3.0	3.1			SILTY SHALE minor QUARTZITE Interbedded. Shale is pale greenish grey, quartzite is pale grey	83.3-125.35 (42.05)			84.1 Bedding 45°	pyrite >> pyrrhotite in stringers, thin veins, rare blebs. Rarely disseminated in quartzite up to 5%	1%
	3.0	3.0	100		Poorly bedded at start Disrupted, folded, minor brecciation				86.7: 150x10mm patch of qtz, trace py 87.1: 80x30mm patch of qtz minor py 87.6: 60x13mm patch of qtz trace py, po 88.4: 12mm in 2 veins, qtz minor py		
	3.0	2.9							89.7 Bedding 45°		
	3.0	3.0	100						95.5: 8mm vein, 10°, qtz py, flourite		
	2.6	2.6	100						97.78: 11mm vein, 45°, qtz, carbonate, py 97.85: 20mm vein, 50°, qtz carbonate, py trace wolfmm		
	3.1	3.1	100						99.0 Bedding 65°		

5 cm

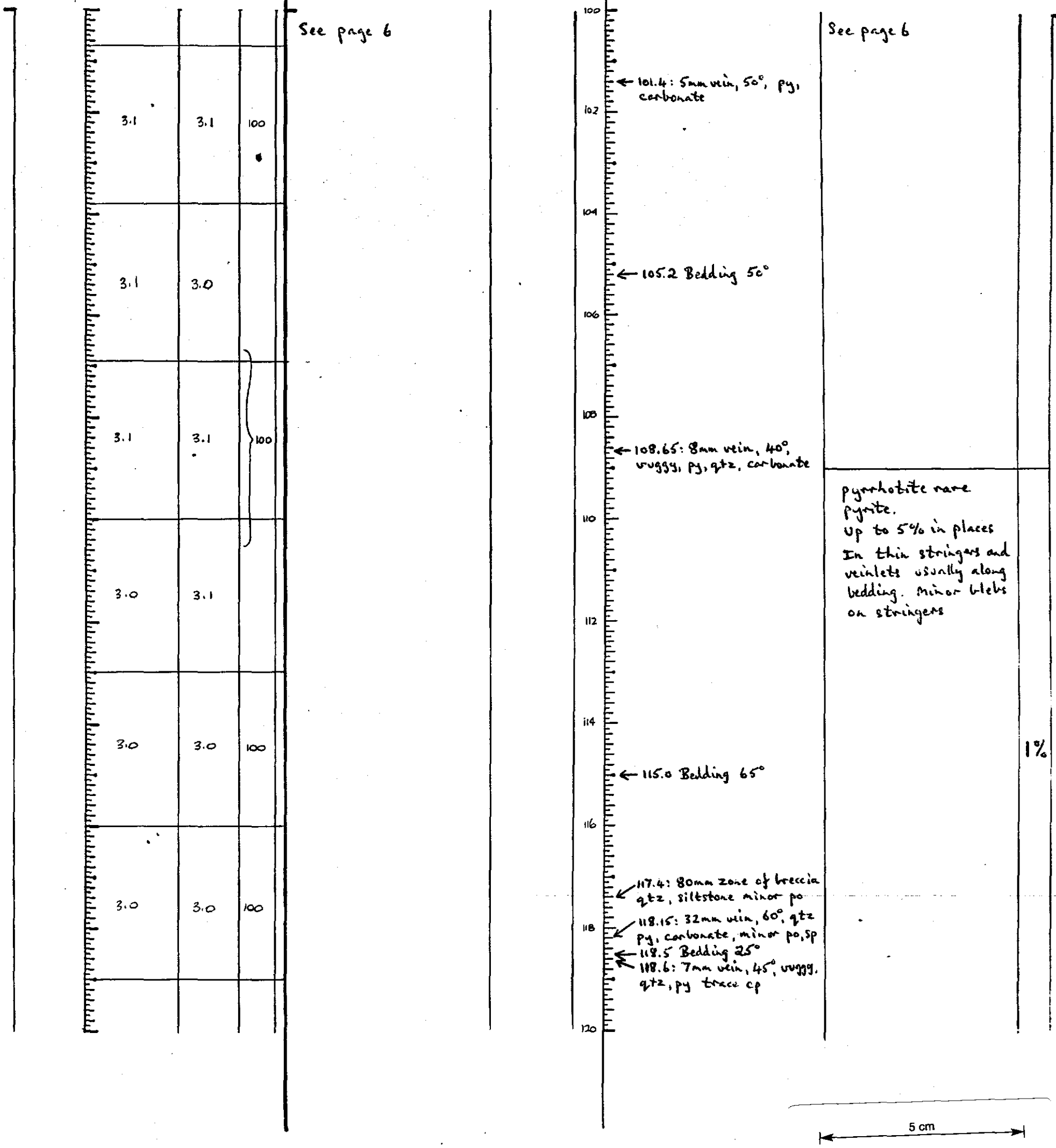
METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 6
LOG SHEET 6 of 11

REPORT No. 192165 164 PAGE 7

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)



METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 6
LOG SHEET 7 of 11

REPORT No. 192166 165 PAGE 8

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	3.0	100		See page 7						
	3.0	3.0	100								
	2.5	2.6			QUARTZ PORPHYRY Pale green/grey matrix, <2% phenocrysts of quartz rare feldspar up to 2mm diameter	125.35-126.45 (1.1)			125.35 Contact indistinct approx 60° 126.45 Contact 35°	pyrrhotite disseminated. 1% pyrite in later veinlets Trace fluorite, cassiterite	5-10%
	3.2	3.1	100		QUARTZITE minor SILTY SHALE Pale grey, hard, impure. Shale is greenish grey. No bedding, slightly brecciated	126.45-129.5 (3.05)				pyrite and pyrrhotite in stringers, veinlets, rare blebs. pyrrhotite sometimes disseminated	2-3%
	3.1	3.1	100		SILTY SHALE with minor SHALE Pale green grey and light grey. Shale is black carbonaceous as thin (<2mm) interbeds making up 5% of the rock to 149.3m, thereafter rare. Well bedded and folded (variable core angles) Occasionally disrupted and brecciated especially after 143.5m More silty after 149.3m	129.5-177.8 (48.3)			129.9: 7mm vein, 20°, qtz, py trace cp 130.1: 9mm vein, 30°, py, qtz 130.6: 40x10mm patch of qtz 131.5: 5mm vein, 5°, py, qtz minor carbonate trace cp, ? cassiterite 133.1 Fold axis 133.9 Fold axis 136.0: Bedding 65°	pyrrhotite >> pyrite mainly in thin stringers and veins, sometimes along bedding. pyrrhotite rarely disseminated	3%
	3.1	3.1	100							pyrite > pyrrhotite in thin stringers and veins	1%
	3.1	3.1	100								

See page 7

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 6
LOG SHEET 8 of 11

REPORT No. 192167 166 PAGE 9

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS [ ]	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)

00m

3.0	3.0	100		
3.0	3.0	100		
3.0	3.0	100		
3.0	3.0	100		
3.0	3.0	100		
3.0	3.0	100		

See page 8

140
142 ← 142.c Bedding 50°
144 ← 143.95: app 100mm vein, irregular qtz, minor py trace cp
← 144.9: 15mm vein, 40°, qtz py trace cp
146
← 147.5 Bedding 65°
148
150
152
154 ← 153.7 Bedding 75°
156 ← 156.4: 10mm vein, 65°, qtz, py
158 ← 158.1: 5mm vein, qtz, carb, py, minor arsenopyrite
160

See page 8

pyrrhotite >> pyrite in veinlets, stringers & blebs rare disseminatia

1-2%

pyrrhotite > pyrite in veinlets, stringers, blebs, occasionally disseminated.

up to 5%

2-3%

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 6
LOG SHEET 9 of 11

REPORT No. 192168 167 PAGE 10

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) BRACKETS ⊢	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	160.00m				See page 8						
	3.0	2.9	97								
	3.0	2.9	97								
	3.0	3.0	100								
	1.6	1.7	100								
	1.4	1.3			172.2-172.75 Massive pale grey Quartzite						
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
					QUARTZ PORPHYRY White matrix with quartz phenocrysts up to 3mm diameter and more feldspar phenocrysts	177.8-181.5 (3.7)				pyrite/marcasite and pyrrhotite disseminated Trace chalcopyrite, fluorite, weak trace cassiterite	15-20%
									160.1: 5mm vein, 55°, qtz, py trace cp, cassiterite		
									161.5; 5mm vein, 20°, qtz carbonate, py trace fluorite		
									161.9: 17mm vein, 15°, qtz, carbonate, py minor po trace fluorite, cp, cassiterite		
									163.6: 8mm vein, 10°, py, carbonate minor qtz, sp trace cp, cassiterite		
									165.6 Bedding 60°	pyrite and pyrrhotite pyrite is in stringers and veins, pyrrhotite is also occasionally in blebs and disseminated	1%
									167.8: 17mm vein, 30°, py, qtz, carbonate, arsenopyrite minor cassiterite		
									172.2: 7mm vein, 65°, qtz minor py		
									172.3: 5mm vein, 20°, py minor qtz, carbonate trace cp, fluorite		
									174.0 Bedding 80°		
									175.7: 5mm vein, 20°, py, qtz, carbonate trace ?cassiterite		

REPORT No. 192169 168 PAGE 11

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	3.0	100		See page 10				See page 10		
	3.0	3.0	100		SILTY SHALE and SILTSTONE rare SHALE Pale green/grey and light grey. Shale is black, carbonaceous as thin interbeds Poorly bedded, mostly disrupted, slumped and folded with variable core angles. Minor brecciation.	181.5-200 (18.5)			pyrrhotite > pyrite Pyrite is in veins and stringers, pyrrhotite is also along bedding, minor disseminated and blebs up to 8mm diameter Occasionally up to 10% especially 191.0-193.0, 196.0-200.0		
	3.0	3.0	100						←184.5 Bedding 40°		
	3.0	3.0	100								3-5%
	3.0	3.0	100						←193.2: 5mm vein, 25°, py carbonate minor qtz, sp		
	3.0	2.9	100						←195.0 Bedding 90°		
	3.0	3.1							←199.5 Bedding 75°		
					END OF HOLE 200m						

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 6
LOG SHEET 11 of 11

% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description over interval marked	ADOPTED INTERVAL (m. cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	RESULTS MARKER (▼)	OBSERVATIONS — Commence with length from collar, either point (relates to marker) or 'from-to' (relates to brackets) ATTITUDE OF BEDDING OR FOLIATION, ATTITUDE & SPACING OF JOINTS, ATTITUDE, WIDTH & DESCRIPTION OF SHEARED ZONES [attitude = angle of structure to long core axis] MINERALIZATION; ETC.	% MINERALIZATION (VISUAL ESTIMATE)
						Veins etc all veins over 5mm	Mineralization excluding veins over 50mm
		LIMONITIC CLAY orange-brown	0 - 1.0				
		DOLOMITE SULPHIDE LODE Pyrrhotite, pyrite, talc, serpentinite minor dolomite	1.0 - 21.2 (20.2)	20		Contact ~75°	po >> py and marcasite usually banded — 5-60%
		SILTSTONE pale grey, hard, poorly bedded, broken	21.2 - 41.5 (20.3)	40		Bedding 65° Bedding 35°	py >> po and marcasite in stringers, veins, dendritic — <1%
		QUARTZITE minor SILTY SHALE	41.5 - 47.4				py in stringers, blebs — 1%
		SILTY SHALE broken	47.4 - 51.6				py in thin veins — <1%
		QUARTZITE minor SILTY SHALE pale grey, fairly massive, hard	51.6 - 81.5 (29.9)	60 80		Bedding 60°	py disseminated, minor veins and stringers — 1-2%
		SILTSTONE and SILTY SHALE interbedded, pale-medium grey, disrupted, brecciated, broken	81.5 - 101.9 (20.4)	100		85.8-86.1 Fault Zone 93.55, 20cm quartz breccia zone	py in stringers, veinlets minor disseminated — 1-2%
		QUARTZITE, SILTSTONE minor SILTY SHALE, pale-medium grey poorly bedded, silicified.	101.9 - 124.0 (22.1)	120		Bedding 70°	py rare po, in veins, stringers minor disseminated — 2-3%
		SILTSTONE and SILTY SHALE	124.0 - 131.7			126.4, 70mm, 70° py-marcasite-calcite	po > py in stringers, veinlets — 5-10%
		QUARTZ PORPHYRY pale yellow/cream	131.7 - 139.8	140		Contact 60°	py and po disseminated — 10-15%
		SILTY SHALE and SILTSTONE minor QUARTZITE at start. Greenish medium-pale grey, folded and disrupted	139.8 - 185.7 (45.9)	160 180		Contact 40° Bedding 80° Bedding 60° Bedding 75° Bedding 70°	py, weak trace po, in stringers, rare veins, blebs — 2% py in stringers, disseminated — 1%
		SILTSTONE, SILTY SHALE and QUARTZITE/FINE GRAINED SANDSTONE interbedded. Medium-pale grey. Disrupted	185.7 - 206.4 (20.7)	200		Bedding 80° Bedding 40°	py disseminated, in blebs — 3-5% py disseminated — 2% py disseminated — <1%
		QUARTZITE/FINE GRAINED SANDSTONE	206.4 - 212.8			212.8 Fault Zone	py breccia, disseminated — 3%
		SILTY SHALE, SILTSTONE, QUARTZITE	212.8 - 220	220			py in blebs, disseminated — <1%
		END OF HOLE 220m					

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192170

SUMMARY DRILL LOG MBD7

REPORT No. 192171 PAGE 170

METALS EXPLORATION LTD.
& SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG

Prospect, area, project or mine. MT BISCHOFF

HOLE No. MBD7

COLLAR LOCATION

Grid name | Rectangular space co-ordinates: PLANAR CO-ORDINATES | ELEVATION

(1) MBJV	2169.79 N	1289.79 E	677.34	
(2)	N	E		
(3) Aust. Map Grid (PRECISE / APPROX.)	mE	mN	mA.H.D.	

W.C. Bearing from collar

15°	magnetic
45°	grid (1)
	grid (2)
	grid (3)
	true

1:250 000 Sheet No. BURNIE SK 55-3 | 1:100 000 Sheet No. HELLYER 8015 | State TASMANIA

Mineral Tenement EL 13/79 Holder M.E.L.

Cadastral location and details (CROWN LAND / PRIVATE)

Inclination at collar -80°

Total length 220m.

Commenced: 26/6/79

Completed: 3/7/79

Drilling contractor: LONGYEAR AUST P/L

Rig type: LONGYEAR F 38

Details of down hole location-survey methods.
TROPARI

Purpose of drilling and anticipated lengths to targets.
To test dolomite sulphide lode in Brown Face (East) and a zone of veins around Queen porphyry dyke

Core size and non-coring (NC)

HQ	0	TO	39
NQ	39	TO	93
BQ	93	TO	220
		TO	
		TO	
		TO	

Results of down hole location-survey.

LENGTH FROM COLLAR	W.C. BEARING type.....	DIP
32	173 (casing)	82
62	13	81
92	9	81
123	227 (pyr)	83
153	74	84
179	-	90
220	243	89

Comments on drilling. Passed through old workings ("Flat Make") between 29.0-30.1 and cased with HQ. No rods left in hole

Legend for graphic log column (see drill log for Hole No. ____)

'DERWENT' PENCIL NO. | FIELD ROCK NAME, ETC.

Symbols and abbreviations for drilling notes column.

LOGGED BY A. JANNINK FROM 0 TO 220 DATE July 1979

LOGGED BY ____ FROM ____ TO ____ DATE ____

LOGGED BY ____ FROM ____ TO ____ DATE ____

Company managing exploration programme.
METALS EXPLORATION LIMITED.

HOLE No. MBD7
Log sheet 1 of 12

REPORT No. 192172 171 PAGE 2

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
100m HQ core					LIMONITIC CLAY Orange/brown	0 – 1.0 (1.0)	0		Veins etc (over 5mm only) Very broken	Includes veins under 5mm	
	1.6	0.7	44		DOLOMITE SULPHIDE LODE 1.0–3.0 Black friable decomposed sulphide with distorted bands of greenish white talc	1.0–21.2 (20.2)	2		1.0–3.0 Very broken	Marcasite minor pyrrhotite and pyrite	60%
	1.4	1.0	71								
	1.5	1.5	100		3.0–11.3: 60% metallic brown pyrrhotite and 40% green talc with darker green to black serpentinite. Oxidized in places otherwise massive Generally banded and in swirls		4			Pyrrhotite minor pyrite	
	1.0	0.9	90				6		3.0–11.3 Broken in places		60%
	1.8	1.7	113								
	1.5	1.4	100				8				
	1.5	1.6					10				
	1.5	1.4	93		11.3–13.2 Dolomite, cream coloured. No bedding. Criss-crossed with thin stringers and veins partially replaced talc/serpentinite. Slightly spotty appearance.		12			pyrrhotite trace pyrite in stringers, minor blebs and disseminated 11.9–12.1 30% pyrrhotite	3%
	1.5	1.5	100							pyrrhotite in concretionary blebs up to 20mm diameter	5%
	1.5	1.5	100		13.2–14.5 Serpentinite slightly talcy. Apple green to dark green. Brecciated and swirly in texture		14			pyrrhotite	50%
	1.5	1.5	100		14.5–21.2 Metallic brown pyrrhotite and light creamy brown and green talc in varying proportions, with minor dark green to black serpentinite Banded, brecciated and swirly. Slightly oxidized in places		16			pyrrhotite > pyrite	25%
	1.5	1.4	93				18			pyrrhotite	50%
	1.5	1.5	100							pyrite, marcasite minor pyrrhotite	30%
							20			see page 3	

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 7
LOG SHEET 2 of 12

Preliminary Design for Form Oct 78

REPORT No. 192173 172 PAGE 3

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & distription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	1.5	1.3	87		See page 2		20			Pyrrhotite	30%
	1.5	1.6	107		SILTSTONE Pale grey, hard, poorly bedded. Occasional dendritic appearance, (sulphides) Occasional fine black specs of ? tourmaline.	21.2-41.5 (20.3)	22		← 21.2 contact indistinct approx 75° 21.2-36.0 core very broken	Pyrite minor pyrrhotite trace cp	20%
	1.5	1.5	100				24		← 23.6: 18mm vein, 55°, vuggy, qtz, minor arseno pyrite	Pyrite >> pyrrhotite some marcasite in thin stringers, veins and dendritic. Rarely up to 2%	
	1.5	1.5	100						← 24.9 Bedding 65°		
	1.5	1.6	107				26		← 26.7: approx 12 mm vein, qtz, trace py, cassiterite, cp ← 26.8: approx 5mm vein, qtz trace arsenopyrite, py, ? cassiterite		
	1.5	1.5	100				28		← 28.9: aggregate 10mm of veins, carbonate minor py		
	1.1	OLD Workings			29.0 } old workings "Flat Make Lode" 30.1 }		30		← 30.6: 8mm vein, qtz		<1%
	0.4	0.2	50						← 31.6: 15mm vein, 60°, qtz minor py trace ? cassiterite ← 31.9: 10mm vein, irregular, qtz minor py		
	1.5	1.5	100				32				
	1.5	1.5	100						← 33.7: 18mm vein, 55°, vuggy, qtz, trace marcasite ← 33.75: 10mm vein, 65°, qtz trace marcasite ← 33.8: 25mm vein, 50°, qtz trace marcasite, sp, ? cassiterite ← 34.4: 8mm vein, 75°, qtz trace marcasite		
	1.5	1.6	107				34				
	1.5	1.5	100								
	1.5	1.6	107				36		← 37.3 Bedding 35°		
	1.0	0.9	90								
NQ core	2.0	1.9	95				38		37.8-38.8 Quartzite breccia zone with 3-5% py, marcasite		
									← 39.8: 7mm vein, 65°, qtz minor py trace gl		
							40				

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 7
LOG SHEET 3 of 12

Preliminary Design for Form Oct 78

REPORT No. 192174 173 PAGE 4

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)

00 m

				See page 3		40		See page 3
3.0	3.0	100		QUARTZITE minor SILTY SHALE Pale grey, hard, mostly massive. Rarely bedded. Some brecciation in places	41.5-47.4 (5.9)	42	42.95: 5mm vein, 80°, py marcasite 43.0: 5mm vein, 55°, py marcasite 43.3: 5mm vein, 40°, py marcasite	pyrite in stringers and blebs on stringers Patchy: sometimes barren sometimes up to 5%
2.3	2.3	100				44	← 44.4 Bedding 55°	1%
2.3	2.1	91				46		
1.7	1.7	100		SILTY SHALE Pale grey, moderate to poorly bedded, folded, partly brecciated	47.4 - 51.6 (4.2)	48	← Bedding 60° Core very broken 47.4-51.6	pyrite in rare thin veins
1.7	1.7	100				50		<1%
0.8	0.7	88		QUARTZITE minor SILTY SHALE Pale grey with occasional light brown tinge in upper part Shale is medium grey Fairly massive, slightly brecciated, rare bedding except in shales. Some fine pitting of core	51.6-81.5 (29.9)	52	← 52.1: aggregate 45mm veins, qtz, py	pyrite mostly disseminated, minor veins and stringers Patchy: sometimes barren sometimes up to 5%
1.5	1.3	87				54		
1.4	1.3	93				56	← 56.0 Bedding 60°	1-2%
1.3	1.1	85				58	← 57.7: 5mm vein, 40°, qtz minor wolfram	
2.0	2.0	100				60		
				59.0-76.0 No shale present				

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

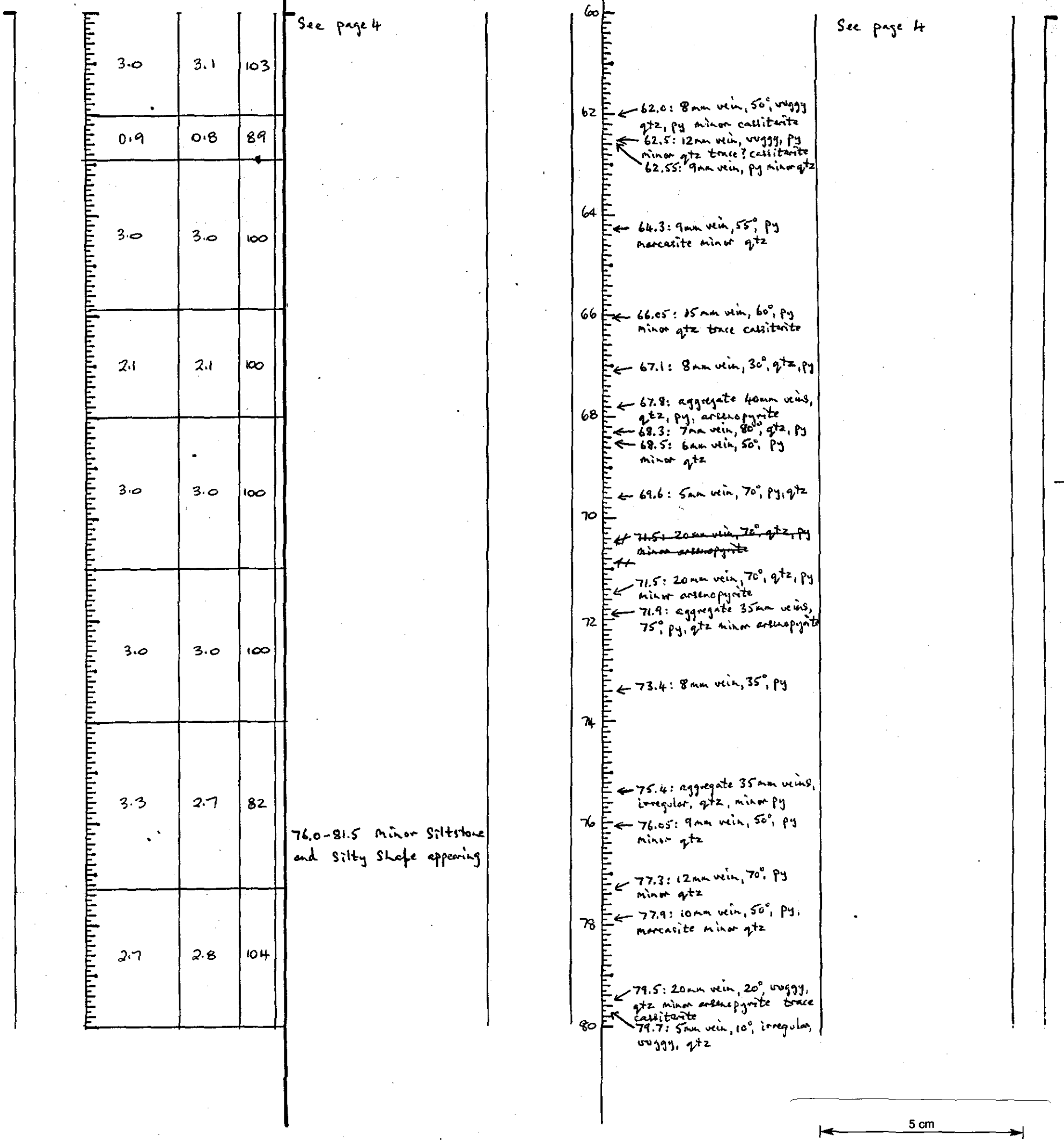
MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 7
LOG SHEET 4 of 12

Preliminary Design for Form Oct 78

REPORT No. 192175 174 PAGE 5

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Altitude of bedding or foliation; Altitude & spacing of joints, Altitude, width & discription of sheared zones, [Altitude = angle of structure to long core axes]	MINERALIZATION	% MINERALIZATION (visual estimate)



METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 7
LOG SHEET 5 of 12

Preliminary Design for Form Oct 78

REPORT No. 192176 175 PAGE 6

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	2.0	2.0	100		See pages 4 and 5 Gradual change to		80		80.4: aggregate 25mm veins, irregular, qtz, py 80.8: 9mm vein, 30°, qtz 80.9: 7mm vein, 30°, vuggy, qtz, py 81.0: 5mm vein, 55°, vuggy, qtz, py 81.15: 12mm vein, 60°, py, qtz minor carbonate	See page 4	
	1.0	0.5	50		SILTSTONE and SILTY SHALE Siltstone is pale grey, Silty Shale is pale to medium grey. Interbedded, variable core angles Generally poorly bedded, folded and brecciated Minor pale grey QUARTZITE increasing with depth	81.5-101.9 (20.4)	82		81.2: 18mm vein, 30°, py, qtz, carbonate 81.4: 7mm vein, qtz minor cassiterite 82.7: 5mm vein, 20°, qtz, py	pyrite mainly in stringers and veinlets minor blebs and disseminated	
	1.2	0.6	50				84		83.5: 10mm vein, 20°, vuggy, qtz minor py 81.5-87.5 Very broken core		
	1.8	1.2	67				86		85.8-86.1 Poggy clay fault zone 87.0: 7mm vein, 60°, vuggy, qtz minor py 87.2: 5mm vein, qtz minor py 87.5 Bedding 55°		
	3.0	3.0	100				88				
	3.0	3.0	100				90				1-2%
	1.0	0.7	70				92				
BQ core	2.0	2.2	110				94				
	1.6	1.6	100				96		96.5-101.0 Very broken core		
	0.7	0.7	100								
	1.3	0.6	46				98		98.45-98.65 Breccia zone, qtz, py (50% core loss) 99.3: 8mm vein, vuggy, qtz, py 99.6: 6mm vein, 15°, marcasite py		
	0.8	0.4	50								
	0.8	0.8	100				100				

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 7
LOG SHEET 6 of 12

Preliminary Design for Form Oct 78

REPORT No. 192177 176 PAGE 7

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3:1	3.0	97		See page 6					See page 6	
	0.7	0.7	100		Gradual change to QUARTZITE and SILTSTONE Gradual change from above due to increase in Quartzite content. minor SILTY SHALE	101.9-124.0 (22.1)			101.85: 7mm vein, 35°, marcasite Py, qtz trace sp, cp	pyrite very rare pyrrhotite in thin veins, stringers, occasionally disseminated	2-3%
	0.9	0.9	100								
	3.1	3.1	100		Quartzite is pale grey, hard, fairly massive Siltstone is medium to pale grey, hard, silicified. Silty Shale is medium grey				104.9: 6mm vein, qtz, py 105.2: 8mm vein, 70°, marcasite, Py, minor qtz		
	2.0	2.0	100		Poorly bedded, minor disruption and brecciation Frequent very thin (<1mm) veining of pyrite Occasional black specs of ? tourmaline				107.4: 6mm vein, 50°, Py, marcasite trace qtz 108.15: 8mm vein, 80°, marcasite minor qtz, carbonate ?cassiterite 108.2: 6mm vein, 90°, qtz minor marcasite 108.6: 8mm vein, 60°, marcasite minor py, qtz, carbonate 108.9: 5mm vein, 75°, qtz, marcasite 108.95: 12mm vein, irregular, marcasite, py, minor carbonate trace sp 109.15: 23mm vein, 75°, marcasite py trace ? cassiterite 110.8: 18mm vein, 65°, marcasite py, minor carbonate 111.5: 40×25mm patch of qtz minor py		
	3.0	3.0	100								
	3.0	3.0	100						113.7 Bedding 70° 114.25: 11mm vein, 15°, irregular, vuggy, marcasite, Py minor qtz		
	3.0	3.0	100		119.5-124.0 Massive Quartzite						

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 7
LOG SHEET 7 of 12

Preliminary Design for Form Oct 78

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	MARKERS (▼) BRACKETS [ ]	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	00 m				See page 7						
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100		SILTSTONE and SILTY SHALE Medium to pale grey. Poorly bedded, much disruption and folding. Pyrrhotitic	124.0-131.7 (7.7)			125.6: 35mm vein, irregular, ~85°, vuggy, py, marcasite, qtz 126.4: 70mm vein, 70°, qtz, py, marcasite trace cassiterite 126.9: 10mm vein, irregular, vuggy, py, marcasite minor qtz 127.3: 35mm vein, 50°, py, marcasite, qtz, carbonate, sp	pyrrhotite in irregular stringers and veinlets, minor blebs on stringers	5-10%
	3.0	3.0	100								
	3.0	3.0	100						131.0 Bedding 55°	pyrite and pyrrhotite in stringers, veinlets, often along bedding	5-10%
	3.0	3.0	100		QUARTZ PORPHYRY Pale yellow/cream matrix. 20% phenocrysts of quartz (up to 2mm diameter) and feldspar (up to 1mm diameter) 132.0-132.3 Half siltstone half porphyry with irregular contact	131.7-139.8 (8.1)			131.7 Contact 60°	pyrite and pyrrhotite disseminated, occasionally in thin stringers. Up to 20% Trace fluorite and ? tourmaline Very weak trace cassiterite	10-15%
	3.0	3.0	100								
	3.0	3.0	100						139.8 Contact 40°		
					See page 9					See page 9	

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 7
LOG SHEET 8 of 12

Preliminary Design for Form Oct 78

REPORT No. 192179 178 PAGE 9

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)

m	DRILL ADVANCE	LENGTH OF CORE RECOVERED	% RECOVERY	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	OBSERVATIONS: Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
00	3.0	3.0	100	SILTY SHALE and SILTSTONE minor QUARTZITE at start Silty Shale is greenish grey Siltstone is medium to pale grey Quartzite is pale grey Moderate bedding, mostly disrupted and folded with variable core angles. Rare brecciation. Some thin irregular carbonate stringers	139.8-185.7 (45.9)	140		pyrite, weak trace pyrrhotite in thin stringers, rare veins and blebs	2%
	3.0	3.0	100			142			
						144			
	3.0	2.96	99			146	← 146.0 Bedding 80°		
						148			
	3.0	3.0	100			150			
						152	← 151.4: 40mm vein, irregular, qtz, py minor fluorite ← 152.05: 20mm vein, irregular, qtz minor py ← 152.6: 9mm vein, 70°, vuggy, py, minor qtz, trace fluorite ← 152.9: 10mm vein, 65°, py minor qtz ← 153.55: 5mm vein, irregular, py minor qtz, fluorite		
	3.0	3.08	103			154			
						156	← 157.0 Bedding 60°		
	3.0	3.03	101			158			
	3.0	3.01	100			160			

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 7
LOG SHEET 9 of 12

Preliminary Design for Form Oct 78

REPORT No. 192180 179 PAGE 10

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS & BRACKETS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Altitude of bedding or foliation; Altitude & spacing of joints, Altitude, width & discription of sheared zones, [Altitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.10	2.96	99								
	3.0	2.96	99								
	3.10	3.03	101								
	3.10	3.11	104		170.0 – 178.0 Increase in Quartzite content to 50%						
	3.10	3.0	100								
	3.10	2.88	96								

See page 9

See page 9

161.4: 5mm vein, 45°, qtz, Py, marcasite, carbonate

165.5: 35mm vein, 65°, qtz, carbonate, arsenopyrite minor py, marcasite trace sp

167.2 Bedding 75°

167.5: 22 mm vein, 35°, vuggy. Py, marcasite, minor qtz, carbonate trace po

172.9: 8 mm vein, 40°, marcasite, py, carbonate

173.45: 5mm vein, 35°, Py

175.5 Bedding 60°

176.9: 6mm vein, irregular, 35°, qtz minor marcasite

pyrite in thin stringers and disseminated in quartzite. Often barren

1%

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 7
LOG SHEET 10 of 12

Preliminary Design for Form Oct 78

REPORT No. 192181 180 PAGE 11

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones. [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	180.00				See page 9					See page 10	
	3.0	3.05	102								
	3.0	3.04	101								
	3.0	2.93	98		SILTSTONE, SILTY SHALE and QUARTZITE/ FINE GRAINED SANDSTONE interbedded Siltstone is medium to pale grey, Shale is medium grey Quartzite / Fine Grained Sandstone is pale grey Shale and Siltstone is moderately bedded, usually disrupted, folded and brecciated. Quartzite tends to fine grained Sandstone and is occasionally bedded	185.7-206.4 (20.7)				pyrite disseminated and in blebs in quartzite	3-5%
	2.7	2.8	104							pyrite disseminated in quartzite only	2%
	3.2	2.98	93								
	3.1	2.9	94							pyrite disseminated in quartzite only Mostly barren.	<1%
	3.0	3.0	100								

180
182 ← 182.5: 5mm vein, 40°, py, marcasite
184 ← 184.0 Bedding 90°
186
188 ← 187.8: 5mm vein, vuggy, qtz, py
← 188.3: 8mm vein, py, arsenopyrite qtz
← 189.0 Bedding 80°
190 ← 190.25: 10mm vein, 35°, py arsenopyrite, qtz
← 190.5: 22mm vein, 55°, vuggy, py minor qtz
192
194
196
198 ← 199.2: 15mm vein, 35°, py, marcasite minor qtz
200

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 7
LOG SHEET 11 of 12

Preliminary Design for Form Oct 78

REPORT No. 192182 131 PAGE 12

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	2.7	90		See page 11					See page 11	
	3.0	2.7	90						← 201.7 Bedding 40°		
									← 204.9: 10mm discontinuous vein, 50°, qtz, py		
	3.0	2.8	93		QUARTZITE / FINE GRAINED SANDSTONE Pale grey to fawnish colour, Very minor medium grey Silty Shale. Hard and fractured No bedding Possibly tuffaceous Some brecciation often filled with pyrite	206.4-212.8 (6.4)			206.4-212.8 Broken core	Pyrite mainly in breccia zones, some disseminated, in stringers and veins	3-5%
	1.4	1.1	79						← 209.0: 10mm vein, 30°, py, qtz ← 209.2: 7mm vein, 65°, qtz, py	pyrite disseminated, in stringers and veins	
	1.1	0.7	64								1%
	1.4	1.4	100								
	3.1	2.9	94		SILTY SHALE, SILTSTONE and QUARTZITE / FINE GRAINED SANDSTONE Silty Shale is medium grey Siltstone is medium / pale grey. Quartzite / Fine Grained Sandstone is pale (sometimes fawnish) grey (? tuffaceous) Poorly bedded, disrupted, folded, brecciated.	212.8-220.0 (7.2)				Pyrite only in Quartzite / Fine grained Sandstone disseminated and in blebs	
	1.6	1.1	69								<1%
	2.4	2.5	104						← 217.6: 11 mm vein, qtz, py trace cassiterite		
					END OF HOLE 220m						

5 cm

METALS EXPLORATION LTD.
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MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 7
LOG SHEET 12 of 12

Preliminary Design for Form Oct 78

132

192183

SUMMARY DRILL LOG MBD 8

% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description over interval marked	ADOPTED INTERVAL (m.cm) & ADOPT LENGTH FROM COLLAR m.cm	GRAPHIC LOG	OBSERVATIONS — commence with length from collar, either point (relates to marker) or 'from-to' (relates to brackets) ATTITUDE OF BEDDING OR FOLIATION, ATTITUDE & SPACING OF JOINTS, ATTITUDE, WIDTH & DESCRIPTION OF SHEARED ZONES [attitude = angle of structure to long core axis] MINERALIZATION; ETC.	Veins etc all veins over 50mm	Mineralization excluding veins over 50mm	% MINERALIZATION (VISUAL ESTIMATE)
		Tricone Drilled - No Core	0 - 3.0					
		SILTY SHALE and QUARTZITE Medium and pale grey, often brecciated Minor limonitic staining. Very broken	3.0 - 26.0 (23.0)	20	← Bedding 40°		No sulphides	0
		SHALE and SILTSTONE Medium/pale grey, minor carbonaceous shale	26.0 - 39.0 (13.0)		← Bedding 35°		py in veinlets	<1%
		QUARTZITE brecciated	39.0 - 44.8	40			py in veinlets	<1%
		SILTY SHALE and SILTSTONE Medium and pale grey. Shale slightly carbonaceous below 60m. Very broken, sometimes brecciated Minor pale grey QUARTZITE	44.8 - 94.6 (49.8)	60 80	← Bedding 35° ← Bedding 65° ← Bedding 60° ← Bedding 30°		py in veinlets, blebs. Occasionally up to 2%	<1%
		QUARTZ PORPHYRY Pale green/cream/white/grey. Pitted. 50% quartz and feldspar phenocrysts	94.6 - 112.5 (17.9)	100	← contact indistinct in broken core ← contact 45°		py disseminated, minor Sn	1%
							py, marcasite disseminated Trace Sn	3-5%
		SILTSTONE, SILTY SHALE minor QUARTZITE. Fractured, disrupted	112.5 - 123.2 (10.7)	120	← Fault zones 117.5, 118.8, 119.4 - 119.7		py in veins and disseminated in quartzite	1-2%
		QUARTZ PORPHYRY Cream white, fine grained, <5% phenocrysts	123.2 - 136.65 (13.45)		← Contact irregular ~65° ← Contact irregular ~55°		py/marcasite disseminated crystals up to 8mm	5%
		SILTY SHALE and SILTSTONE Medium grey, well bedded. Very broken	136.65 - 151.4 (14.75)	140	← Bedding 40°		py in stringers and blebs on stringers. Up to 5%	1-2%
		END OF HOLE 151.4m						

REPORT No. 192184 PAGE

METALS EXPLORATION LTD.
& SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG

Prospect, area, project or mine. MT BISCHOFF.

HOLE No. MBD8

COLLAR LOCATION

Grid name | Rectangular space co-ordinates: PLANAR CO-ORDINATES | ELEVATION

(1) MBJV. — 2176.58 N — 1639.82 E — 657.39

(2) _____ — _____ N — _____ E — _____

(3) Aust. Map Grid (PRECISE / APPROX.) — _____ mE — _____ mN — _____ m A.H.D.

1:250 000 Sheet No. BURNIE SK-55-3 | 1:100 000 Sheet No. HELLYER 8015 | State TASMANIA

Mineral Tenement E.L. 13/79 — Holder M.E.L.

Cadastral location and details (CROWN LAND/ PRIVATE) _____

W.C. Bearing from collar
150° magnetic
180° grid (1)
_____ grid (2)
_____ grid (3)
_____ true

Inclination at collar -70°

Total length 151.4m

Commenced: 4/7/79
Completed: 8/7/79

Drilling contractor: Longyear Aust P/L

Rig type: LONGYEAR F38

Core size and non-coring (NC)

TRICONE	0	TO	3
NQ	3	TO	93
BQ	93	TO	151.4
		TO	
		TO	
		TO	

Details of down hole location-survey methods.
TROPARI every 30m.

Purpose of drilling and anticipated lengths to targets.
To test tin mineralization in Stanhope Extended porphyry dyke

Results of down hole location-survey.

LENGTH FROM COLLAR	W.C. BEARING type.....	DIP
30m	154	68
52.3m	148	71
87 m	150	71
123.5m	154	72
150 m.	150	73

Comments on drilling. _____

Legend for graphic log column (see drill log for Hole No. _____)
'DERWENT' PENCIL No. | FIELD ROCK NAME, ETC.

Symbols and abbreviations for drilling notes column.

LOGGED BY A. JANNINK — FROM 0 TO 151.4 — DATE July 1979
LOGGED BY _____ — FROM _____ TO _____ — DATE _____
LOGGED BY _____ — FROM _____ TO _____ — DATE _____

Company managing exploration programme.
METALS EXPLORATION LIMITED.

HOLE No. MBD8
Log sheet 1 of 9

REPORT No. 192185 184 PAGE 2

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
TRICONED NO CORE	0.00 m										
NQ core	2.10	0.5	25		SILTY SHALE and QUARTZITE Shale is medium grey Quartzite is pale grey Minor brown Limonitic staining. Frequently breccinated Poorly bedded	3.0-26.0 (23.0)			3.0-26.0 Very broken core	No sulphides	0
	1.6	0.6	38								
	0.9	0.5	56								
	1.4	0.6	43								
	0.9	0.9	100								
	1.2	1.0	83								
	1.1	1.1	100								
	1.9	1.9	100						←12.4: 20mm vein, 45°, Limonite stained qtz		
	0.2	0.1	50								
	0.8	0.6	75								
	2.0	1.8	90								
	3.0	1.6	53								

Veins etc (over 5mm only)

Includes veins under 5mm

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 8
LOG SHEET 2 of 9

Preliminary Design for Form Oct 78

REPORT No. 192186 185 PAGE 3

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	1.6	0.8	50		See page 2						
	1.4	0.4	29								
	0.3	0.05	17								
	0.5	0.1	20								
	0.6	0.2	33								
	0.6	0.4	66								
	1.0	0.3	30								
	1.1	0.5	45		SHALE and SILTSTONE interbedded Medium grey Shale Pale grey Siltstone Minor thin interbeds of dark slightly carbonaceous Shale Moderately bedded Minor brecciation Minor brown limonitic staining	26.0-39.0			26.0-39.0 Core very broken	pyrite in veinlets	<1%
	1.9	0.8	42								
	0.9	0.9	100								
	0.9	0.8	89								
	1.2	1.0	83								
	1.3	0.9	69								
	0.6	0.7	117								
	0.8	0.6	75								
	0.6	0.6	100								
	1.3	1.3	100								
	0.9	0.9	100								
	1.3	1.3	100								
	2.2	2.1	95		See page 4					See page 4	

00 m

20
← 20.5 Bedding 40°
22
24
26
28
30
32
← 33.5 Bedding 35°
34
36
38
40

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 8
LOG SHEET 3 of 9

Preliminary Design for Form Oct 78

REPORT No. 192187 186 PAGE 4

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	1.3	1.0	77		QUARTZITE Pale grey, hard No bedding Brecciated 42.0-42.8 5% vuggy gossanous patches	39.0-44.8 (5.8)			39.0-44.8 Broken core 42.2: 25mm vein, 20°, Limonite gossan 42.8: 8mm vein, 40°, vuggy qtz	pyrite in veinlets	<1%
	0.3	0.15	50								
	1.4	1.3	93								
	1.5	1.3	87								
	1.3	1.0	77		SILTY SHALE and SILTSTONE Medium and pale grey. Much brecciated (especially 44.8-49.8) Moderately bedded where not brecciated. Sometimes disrupted	44.8-94.6 (49.8)			44.8-94.6 Very broken core 49.4 Bedding 35°	pyrite in veinlets, blebs, occasionally up to 2%	<1%
	1.2	1.2	100								
	0.5	0.3	60								
	1.5	1.1	73								
	0.2	0.1	50								
	1.2	1.0	83								
	0.5	0.5	100								
	0.9	0.9	100								
	0.6	0.3	60								
	0.8	0.8	100								
	0.3	0.3	100		54.2-55.3 Pale grey Quartzite						
	0.1	0.1	100								
	0.14	0.2	50								
	0.3	0.1	33								
	0.8	0.3	63								
	0.5	0.5	100								
	0.2	0.1	50								
	0.1	0.05	50								
	0.7	0.7	100								
	3.1	2.9	94								

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 8
LOG SHEET 4 of 9

Preliminary Design for Form Oct 78

REPORT No. 192188 187 PAGE 5

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)

2.0	1.7	85		See page 4 Shale is less silty below 60.0 and becomes darker with occasional thin carbonaceous interbeds
2.4	2.0	83		
1.5	1.4	93		
3.2	3.1	97		68.5-70.0 Pale grey Quartzite
1.3	1.1	85		
1.4	0.8	57		
1.6	0.6	38		
0.7	0.5	71		
0.7	0.3	43		
1.1	0.7	64		
0.5	0.1	20		
0.2	0.2	100		
1.0	0.7	70		
0.4	0.2	50		
0.2	0.1	50		
1.1	0.8	73		

60 62 64 ← 64.0 Bedding 65° 66 68 70 72 ← 73.0 Bedding 60° 74 76 78 80

See page 4

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 8
LOG SHEET 5 of 9

Preliminary Design for Form Oct 78

REPORT No. 19218.9 138 PAGE 6

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	100m										
	1.1	0.9	82		See pages 4 and 5						
	1.8	1.7	94								
	0.8	0.5	63								
	1.0	1.0	100								
	2.4	2.4	100								
	2.3	1.9									
	2.7	2.6	96								
	1.0	0.7	70								
BQ core	0.3	0.3	100								
	0.6	0.3	50								
	0.5	0.4	80								
	0.3	0.2	66								
	2.7	2.65	100		QUARTZ PORPHYRY 94.6-104.4 Pale green/cream/white with Light brown staining Trace triangular tourmaline 94.6-96.6 Pyrite replaces some feldspar phenocrysts up to 50% phenocrysts of quartz and feldspar with maximum diameter of 5mm	94.6-112.5 (17.9)			94.6 Contact indistinct in broken core 97.9: 10mm vein, 50°, Limonitic ? qtz-carbonate 99.9: 20mm vein, 30°, Limonitic ? carbonate	Pyrite disseminated Some sulphides have been oxidized Trace cassiterite	1%
	1.6	1.6	100								
	2.0	2.0	100								
									See page 4		

80 82 84 86 88 90 92 94 96 98 100

85.2: 5mm vein, 50°, red/brown ? carbonate
85.6: 12mm vein, 30°, red/brown ? carbonate
89.5 Bedding 30°

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 8
LOG SHEET 6 of 9

Preliminary Design for Form Oct 78

REPORT No. 192190 189 PAGE 7

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axes]	MINERALIZATION	% MINERALIZATION (visual estimate)
					See page 6					See page 6	
	3.0	3.0	100		104.4-112.5 Pale green-grey matrix Up to 50% phenocrysts of quartz and feldspar with maximum diameter of 5mm Pitted and partly broken					pyrite and marcasite disseminated Trace cassiterite	
	3.0	1.5	50								3-5%
	2.4	2.4	100		Trace triangular tourmaline 110.5-112.5						
	3.1	3.2	100		SILTSTONE and SILTY SHALE minor QUARTZITE Pale to medium grey Poorly bedded Fractured Disrupted Slightly porous	112.5-123.2 (10.7)				pyrite in veins and disseminated in quartzite	
	1.8	1.7									1-2%
	1.7	1.6	94								
	0.9	1.0									

00 m

100
102
104
106 ← 105.6: 8mm vein, 30°, Limonitic ? carbonate
108
110
112 ← 112.5 Contact 45°
114
116 ← 115.6: 30mm vein, 40°, gossanous ? qtz-carbonate
117.4-119.7 Shattered core
← 117.5: puggy clay fault zone
118
← 118.8: puggy clay fault zone
] 119.4-119.7: puggy clay fault zone
120

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 8
LOG SHEET 7 of 9

Preliminary Design for Form Oct 78

REPORT No. 192191 190 PAGE 8

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS & BRACKETS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	2.4	2.38	99		QUARTZ PORPHYRY Creamy/white fine grained slightly aplitic appearance <5% phenocrysts of quartz and feldspar up to 2mm diameter	123.2-136.65 (13.45)			123.2 Contact irregular ~65° 125.4: 5mm vein, 40°, py, qtz minor? stibnite 131.7: 7mm vein, 60°, py qtz minor arsenopyrite 134.9: 50x20mm patch of py 136.65 Contact ~55° in broken core	pyrite / marcasite disseminated Crystals up to 8mm diameter	5%
	3.1	3.13	101								
	2.7	2.63	97								
	2.0	1.90	95								
	1.8	1.85	103								
	1.5	1.32	88								
	1.9	1.8	95								
	1.2	1.25	104		SILTY SHALE and SILTSTONE Medium grey Fairly well bedded Folded partly disrupted and brecciated	136.65-151.4 (14.75)			136.65-151.4 Broken core	pyrite in stringers and blebs on stringers Occasionally up to 5% especially in disrupted parts	1-2%
	1.0	0.67	67								
	0.1	0.07	70								

See page 7

See page 7

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 8
LOG SHEET 8 of 9

Preliminary Design for Form Oct 78

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DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	100 m.	1.0	1.0	100	See page 8						
		0.5	0.4	80							
		0.6	0.5	83							
		0.8	0.7	88							
		0.5	0.4	80							
		0.9	0.8	89							
		0.7	0.6	86							
		0.9	0.9	100							
		0.6	0.5	80							
		2.1	1.2	57							
		1.6	1.5	94							
		1.5	1.0	66							
					END OF HOLE 151.4m						
	140				See page 8						
	142										
	144				← 145.0 Bedding 35°						
	146				← 146.5 Bedding 45°						
	148										
	150										
	152										

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 8
LOG SHEET 9 of 9

Preliminary Design for Form Oct 78

% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description over interval marked	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▲)	OBSERVATIONS :- Commence with length from collar, either point (relates to marker) or 'from - to' (relates to brackets) ATTITUDE OF BEDDING OR FOLIATION; ATTITUDE & SPACING OF JOINTS; ATTITUDE, WIDTH & DESCRIPTION OF SHEARED ZONES [Attitude = angle of structure to long core axis] MINERALIZATION; ETC.	% MINERALIZATION (VISUAL ESTIMATE)
						Veins etc all veins over 5cm	Mineralization excluding veins over 50cm
		Tricone Drilled - no core	0 - 6.0				
		SHALE Black and dark grey, carbonaceous Poorly bedded, disrupted, folded. Becomes silty with depth	6.0 - 74.4 (68.4)	20 40 60		← 2 pyritic tuff bands 25mm and 40mm ← Bedding 55° ← 180mm vein, 30°, qtz, fluorite, carbonate, py minor py, sp, gt, calcite ← Bedding 40°	py disseminated, patches, occ. veins + stringers. 2% - 10% py in stringers, rare disseminated patches up to 10%
		SILTY SHALE and SILTSTONE Gradual change from above	74.4 - 85.8	80			py in stringers, blebs on stringers minor disseminated
		~~QUARTZITE minor SILTY SHALE~~	~~85.8 - 89.15~~			← Bedding 40°	py disseminated veins
		QUARTZ PORPHYRY white	89.15 - 93.35			← Contact irregular ~45° ← Contact irregular ~40°	py disseminated minor 5a
		SILTY SHALE, SILTSTONE and FINE GRAINED SANDSTONE (/QUARTZITE) rare carbonaceous shale. Medium greenish grey + light grey. Disrupted	93.35 - 119.05 (25.7)	100 120		← Bedding 60° ← Bedding 30°	py in stringers, blebs on stringers, disseminated
		SHALE minor SILTSTONE interbedded, gradual change from above. Dark grey and black carbonaceous shale. Mod disrupted	119.05 - 149.05 (30.0)	140		← Contact 65° ← Bedding 0° ← Bedding 10° ← Bedding 65° ← Bedding 55° ← Contact 85°	py disseminated (esp in siltstone), in stringers (py) disseminated
		QUARTZ PORPHYRY cream coloured	149.05 - 150.25	160		← Contact 75° ← Bedding 65°	py in veinlets, along bedding Some disseminated and stringers
		SHALE minor SILTSTONE interbedded, stripey. Dark - medium grey, black carbonaceous shale. Well bedded, some disruption		180		← Bedding 45° ← Bedding 70°	
		END OF HOLE 200m		200		← Fault zone	

192

192193

SUMMARY DRILL LOG MBD9

REPORT No. 192194 PAGE 193

METALS EXPLORATION LTD.
& SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG

Prospect, area, project or mine. MT BISCHOFF

HOLE No. MBD 9

COLLAR LOCATION

Grid name — Rectangular space co-ordinates — PLANAR CO-ORDINATES — ELEVATION

(1) MBJV	1836.48 N	819.95 E	610.04	
(2)	N	E		
(3) Aust. Map Grid PRECISE / APPROX.	mE	mN	m A.H.D.	

W.C. Bearing from collar

150	magnetic
180	grid (1)
	grid (2)
	grid (3)
	true

1:250 000 Sheet No. BURNIE SK 55-3 | 1:100 000 Sheet No. HELLYER 8015 | State TASMANIA.

Mineral Tenement E.L. 13/79. Holder M.E.L.

Cadastral location and details
CROWN LAND / PRIVATE

Inclination at collar −70°

Total length 200 m.

Commenced: 9/7/79
Completed: 13/7/79

Drilling contractor LONGYEAR AUST P/L

Rig type LONGYEAR F 38

Core size and non-coring (NC)

TRICONE	0	TO	6
NQ	6	TO	54
BQ	54	TO	200
		TO	
		TO	
		TO	

Details of down hole location-survey methods.

TROPARI every 30m.

Purpose of drilling and anticipated lengths to targets.

To intersect White Face porphyry dyke to the west of B 38 intersection

Comments on drilling.

Results of down hole location-survey.

LENGTH FROM COLLAR	W.C. BEARING type.....	DIP
30.5	152	71
54	151° 30'	70
90.5	151° 30'	72
122.5	149	74
150.5	157	77
180	143° 30'	84
200	147° 30'	81

Legend for graphic log column (see drill log for Hole No. ____)

'DERWENT' PENCIL No. — FIELD ROCK NAME, ETC.

Symbols and abbreviations for drilling notes column.

LOGGED BY A. JANNINK FROM 0 TO 200 DATE July 1979

LOGGED BY ____ FROM ____ TO ____ DATE ____

LOGGED BY ____ FROM ____ TO ____ DATE ____

Company managing exploration programme.
METALS EXPLORATION LIMITED

HOLE No. MBD9.
Log sheet 1 of 11

REPORT No. 192195

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
0.00m TRICONED NO CORE									Veins etc (over 5mm only)	Includes veins under 5mm	
NQ Core	2.0	1.5	75		SHALE Black and dark grey carbonaceous. Usually poorly bedded. Disrupted, folded, minor brecciation. Pyritic at start. Becomes slightly silty with depth	6.0-74.4 (68.4)				pyrite disseminated, in patches, occasional veins and stringers varying from 2% to 10%	5%
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.1	103								
	3.0	3.0	100								

See page 3

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 9
LOG SHEET 2 of 11

REPORT No. 192196

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (#)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & disruption of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	0.00m				See page 2						
	3.0	3.0	100		At 22.0: 25mm pale grey pyritic tuff band At 22.2: 40mm pale grey pyritic tuff band Grading indicates possibly base upwards ie. overturned					pyrite mainly in stringers, rarely disseminated Patches up to 10%	
	3.0	2.4	80								
	2.60	2.4	92								
	3.1	2.9	94								1%
	3.1	3.1	100								
	3.1	3.05	98								
	3.1	3.05	98								
						20					
						22					
						24			← 24.2: aggregate 5mm veins, irregular, 40°, carbonate minor py trace po		
						26					
						28					
						30					
						32					
						34			← 34.6: 7mm vein, spidery, 25°, carbonate, minor qtz, py.		
						36					
						38					
						40					

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 9
LOG SHEET 3 of 11

REPORT No. 192197 196

PAGE 4

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	BRACKETS (▼) MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
BQ core	3.0	3.05	102								
	3.0	2.6	87								
	3.0	2.1	70								
	1.0	0.7	70								
	1.1	0.7	64								
	0.3	0.3	100								
	1.6	1.7	106								
	2.0	1.8	90								
	3.0	2.9	97								

See page 2

See page 3

42 ← 42.5: 8mm vein, 40°, carbonate, py minor qtz

44 ← 43.6: 23 mm vein, 45°, carbonate, sp, minor qtz, py

46

48 ← 48.4: 34mm vein, 35°, vuggy py, marcasite

50 ← 52.2: 25mm vein, 30°, qtz, carbonate, py, arsenopyrite trace sp

52.6-52.95: 180mm vein, 30°, qtz, flourite, carbonate, py, arsenopyrite, sp, minor gl trace cassiterite, ? wolfram

52 ← 53.4: 5mm vein, 40°, carbonate, qtz, py, flourite

← 53.5: 6mm vein, 50°, qtz carbonate, py, minor sp, trace ? wolfram, ? cassiterite

← 53.6: 30mm vein, 40°, qtz, py, arsenopyrite, carbonate, sp, trace ? cassiterite ? wolfram

54 ← 54.7: 17mm vein, 40°, carbonate, trace py, po

56

58 ← 57.3: 5mm vein, 40°, carbonate

60

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 9
LOG SHEET 4 of 11

REPORT No. 192198 PAGE 5

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axes]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	3.0	100		See page 2						
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	2.9									
	2.0	2.1	100								
	1.4	1.3	93		Gradual change to						
	2.6	2.6	100		SILTY SHALE and SILTSTONE Medium and pale grey, slightly greenish at base. Rare carbonaceous shale. Much disrupted and brecciated Poorly bedded Minor carbonate stringers	74.4-85.8 (11.4)				pyrite in stringers, blebs on stringers, minor disseminated. often barren, sometimes locally up to 5%	<1%
	3.0	3.0	100								

See page 3

68.5: 12mm vein, 40°, py carbonate minor qtz
69.7 Bedding 40°
69.6: 6mm vein, irregular, 25°, carbonate minor qtz, py
71.3: 14mm vein, 45°, qtz, carbonate, py, trace po
72.0: aggregate 7mm veins, spidery, 20°, carbonate, qtz, py, marcasite
72.4: 5mm vein, 20°, py, marcasite, qtz

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 9
LOG SHEET 5 of 11

Preliminary Design for Form Oct 78

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	3.0	100		See page 5						
	3.0	3.0	100								
	2.6	2.4	92		QUARTZITE minor SILTY SHALE Pale grey, hard, impure Minor carbonate stringers	85.8-89.15 (3.35)				pyrite disseminated, in veins and stringers	1%
	0.4	0.5	125								
	1.2	1.25	} 100		QUARTZ PORPHYRY White matrix 25% phenocrysts of quartz and (lesser) feldspar up to 5mm diameter Trace tourmaline at start	89.15-93.35 (4.2)				pyrite disseminated trace cassiterite throughout trace flourite	15%
	1.8	1.75									
	3.0	3.0	100		SILTY SHALE, SILTSTONE and QUARTZITE (/FINE GRAINED SANDSTONE) Interbedded Medium greenish grey Shale, Lighter grey Siltstone and Quartzite Rare dark carbonaceous Shale. Moderately bedded. Much disrupted. Minor brecciation. Much folded, variable core angles. Occasional thin carbonate stringers	93.35-119.05 (25.7)				pyrite disseminated in quartzites and in stringers and blebs on stringers in shale/siltstone	1%
	3.0	3.0	100								
	3.0	3.0	100								

00 m

80

82

← 83.0: aggregate 20mm veins, irregular, ~15°, carbonate with breccia pieces of qtz and siltstone

See page 5

84

86

88

← 87.7 Bedding 40°

← 89.15 Contact irregular ~45°

90

92

← 93.35 Contact irregular ~90°

94

← 95.3: 5mm vein, 30°, carbonate

96

← 97.5: 6mm vein, 45°, qtz minor py

← 97.9: 8mm vein, 20°, pale green ? opaline qtz, minor py, trace sp, ? cassiterite

98

100

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 9
LOG SHEET 6 of 11

Preliminary Design for Form Oct 78

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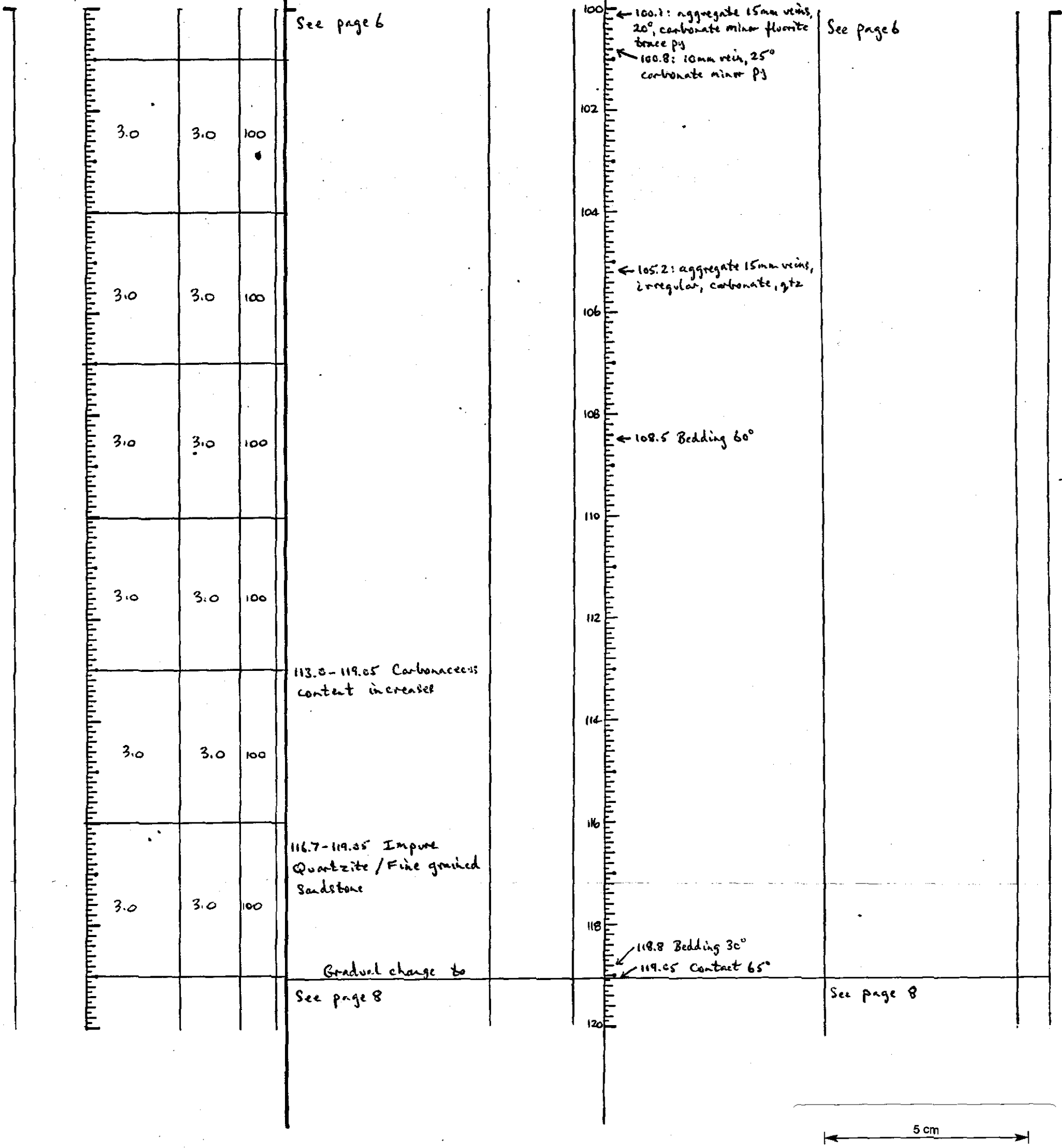
DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)



METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 9
LOG SHEET 7 of 11

Preliminary Design for Form Oct 78

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	0.00m										
	3.0	3.0	100		SHALE minor SILTSTONE Interbedded Shale is dark grey and black carbonaceous Siltstone is pale grey moderately bedded, much disrupted, folded with variable core angles. Some brecciation often stripey in appearance Some thin carbonate stringers	119.05-149.05 (30.0)				pyrite mostly disseminated in siltstone, also in stringers. In siltstone breccia pieces pyrite replaces up to 30% of the rock	2-3% 1%
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								

120
122 ← 122.3 Bedding 0°
124 ← 124.3: 8mm irregular vein, 15°, qtz, Py
126
← 127.2 Bedding 10°
← 127.5: 9mm vein, 5° along core, qtz, Py
128
← 129.0: 9mm irregular vein, 25°, qtz, carbonate, arsenopyrite minor ? cassiterite
130
132 ← 132.0 Bedding 65°
134
136
← 137.7 Bedding 55°
138
140

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 9
LOG SHEET 8 of 11

REPORT No. 192202 201

PAGE 9

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	3.0	100		See page 8 140.1 – 149.05 Some interbedded pale grey Fine Grained Sandstone				140.3: 11mm vein, 10°, carbonate, fluorite minor qtz	See page 8	
	3.0	3.0	100						142.7: aggregate 18mm veins, 20°, carbonate minor qtz, fluorite trace sp		
	3.0	3.0	100						144.7: 5mm vein, 20°, carbonate trace qtz 145.4: 9mm vein, 25°, qtz carbonate, py 145.9: 11mm vein, 20°, carbonate minor sp, qtz		
	3.0	3.0	100						147.4: 15mm irregular vein, carbonate minor fluorite		
	3.0	3.0	100		QUARTZ PORPHYRY Cream coloured, fine grained. 5% phenocrysts of quartz and feldspar up to 2mm diameter	149.05-150.25 (1.2)			149.05 Contact 85° 150.25 Contact 75°	pyrite disseminated Minor flourite	<1%
	3.0	3.0	100		SHALE minor SILTSTONE Shale is dark grey, medium grey and black carbonaceous Siltstone is palar grey Interbedded and well bedded with stripey appearance Some folding Some disruption after 168m	150.25-200.0 (49.75)			152.0 Bedding 55°	pyrite in veinlets, along bedding, some disseminated and in stringers Occasionally up to 5%	2-3%
	2.7	2.7	100								
	3.0	3.0	100								
	2.9	2.9	100								

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 9
LOG SHEET 9 of 11

REPORT No. 192203 202 PAGE 10

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS ⌐	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)

See page 9

3.1	3.1	100	
3.1	3.2		
3.2	3.1	100	
3.0	3.0	100	
3.0	3.0	100	
3.0	3.0	100	

174.7 - 200.0 Occasional small patches of Fine Grained Sandstone

See page 9

161.7: 9mm vein, 50°, carbonate

162.0 ← Bedding 65°

163.1: 13 mm vein, qtz, carbonate

163.7: 15mm vein, 25°, carbonate

163.9 - 165.2: 8mm vein along core, qtz, Py, carbonate

173.4 ← 5mm irregular vein, 20°, carbonate

175.5 ← Bedding 45°

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 9
LOG SHEET 10 of 11

REPORT No. 192204 PAGE 11

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)

0.00 m

DRILL ADVANCE (m.mm)	LENGTH OF CORE RECOVERED m.mm	% RECOVERY
3.10	3.0	100
3.10	3.0	100
3.0	3.0	100
3.0	3.0	100
0.14	0.12	50
3.0	3.1	100
2.9	3.0	
2.7	2.7	100

See pages 9 and 10

193.6 - 198.1 : Some carbonate in stringers, brecciation and in veins

END OF HOLE 200m

See page 9

180
182
184 ← 183.4: 14mm vein, 35° carbonate trace py
186 ← 185.8 Bedding 70°
188 ← 187.3: 10mm irregular vein, ~35°, carbonate
190
192 ← 192.7: 13mm vein, 30°, carbonate minor sp
194 ← 193.6: 30mm vein, 20°, qtz, sp, py
← 193.8: +30mm vein, carbonate, qtz, py trace sp
196
198 ← 198.1: Puggy clay fault zone
← 199.5: Bedding 70°
200 ← 199.9: 7mm vein, 20°, carbonate qtz, py, sp and pale green mineral

5 cm

METALS EXPLORATION LTD.
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MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 9
LOG SHEET 11 of 11

% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description over interval marked	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	-: OBSERVATIONS :- Commence with length from collar, either point (relates to marker) or 'from-to' (relates to brackets) ATTITUDE OF BEDDING OR FOLIATION; ATTITUDE & SPACING OF JOINTS; ATTITUDE, WIDTH & DESCRIPTION OF SHEARED ZONES [Attitude = angle of structure to long core axis] MINERALIZATION; ETC.	% MINERALIZATION (VISUAL ESTIMATE)

204

192205

SUMMARY DRILL LOG MBD 10

			Veins etc all veins over 50mm	Mineralization excluding veins over 50mm	
Tricone Drilled - no core	0 - 3.0				
SHALE and SILTSTONE interbedded. Dark to medium grey, some carbonaceous shale. Poorly to moderately bedded. Frequent disruption. Very broken 3.0-64.0 Minor interbedded QUARTZITE 31.6-40.2 Numerous thin carbonate stringers below 65m	3.0-136.1 (133.1)	20	Bedding 45°; 19.7-20.3 vein in broken core, py, shale, arsenopyrite, sp	py disseminated, rare blebs, veins	<1%
		40	Bedding 65°	py disseminated in quartzite	1-2%
		60	Bedding 60°	py in veins, stringers, rare disseminated, blebs	<1%
		80	79.95-80.2 Tuff band, 30°; Bedding 75°; 93.6, 90mm vein, ?30°, qtz, carbonate, py arsenopyrite, cassiterite	py in stringers, rare blebs disseminated, veins	1-2%
				py weak trace po, in stringers, veins, bedding	2-3%
		100	97.3-99.6 agg 940mm veins (4), qtz, carbonate fluorite, sp, cassiterite, py, cp, wolfram?	py in stringers, veins, blebs	3-5%
				py in stringers, veins	<1%
		120	Bedding 30°	py>po in stringers, veins disseminated, bedding	3-5%
				py>>po in stringers, veins	1-2%
FINE GRAINED SANDSTONE	136.1-144.0	140	Bedding 35°	py>po in veinlets, disseminated	<1%
FINE GRAINED SANDSTONE and SHALE	144.0-148.9		Bedding 45°	py>>po stringers, veins	3%
SHALE and SILTSTONE interbedded minor FINE GRAINED SANDSTONE Medium grey, minor black carbonaceous	148.9-175.2 (26.3)	160	Bedding 70°; Bedding 70°	po, py, bedding, stringers	5%
				py>po stringers, veinlets	1%
				py stringers, veins	10-15%
FINE GRAINED SANDSTONE, SHALE and SILTSTONE interbedded gradual change from above by increase in sandstone content Mostly disrupted, some brecciation, folded	175.2-214.6 (39.4)	180	Bedding 80°	py stringers, disseminated	2%
				po>>py disseminated	2%
				py rare po stringers, veins	2-3%
		200		py>po stringers, blebs, disseminated	1%
QUARTZITE	214.6-216.6			py rare po, blebs, stringers	1-2%
SHALE, SILTSTONE interbedded minor QUARTZITE/FINE GRAINED SST	216.6-231.6 (15.0)	220		py in blebs, stringers, veins	<1%
QUARTZITE, F.G. SANDSTONE minor SHALE	231.6-237.9		Bedding 50°	No Sulphides	0
SHALE and SILTSTONE interbedded	237.9-244.5	240	Bedding 90°	py>>po stringers, veins	1%

END OF HOLE 244.5m

REPORT No. 192206 205 PAGE 1

METALS EXPLORATION LTD.
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MINERAL EXPLORATION
DIAMOND DRILL LOG

Prospect, area, project or mine. MT BISCHOFF

HOLE No. MBD 10

COLLAR LOCATION

Grid name	Rectangular space co-ordinates PLANAR CO-ORDINATES		ELEVATION
(1) MBJV	1667·39 N	1259·94 E	574·14
(2)	N	E	
(3) Aust. Map Grid PRECISE / APPROX.	mE	mN	mA.H.D.

1:250 000 Sheet No. BURNIE SK55-3 | 1:100 000 Sheet No. HELLYER 8015 | State TASMANIA.

Mineral Tenement E.L. 13/79. Holder M.E.L.

Cadastral location and details
CROWN LAND / PRIVATE

W.C. Bearing from collar
330° magnetic
360° grid (1)
grid (2)
grid (3)
true

Inclination at collar -65°

Total length 244·5 m.

Commenced: 10/7/79
Completed: 20/7/79

Drilling contractor LONGYEAR AUST P/L

Rig type LONGYEAR F 38

Core size and non-coring (NC)

TRICONE	0	TO	3
NQ	3	TO	69
BQ	69	TO	244.5
		TO	
		TO	
		TO	

Details of down hole location-survey methods.
Tropari every 30m.

Purpose of drilling and anticipated lengths to targets.
To test for possible extension and repetition of dolomite sulphide mineralization to the south east of Pig Flat / Happy Valley

Results of down hole location-survey.

LENGTH FROM COLLAR	W.C. BEARING type.....	DIP
45	(casing)	66
88	330	64
120	333	66
146·4	343	68
182	268	69
244	9	70

Comments on drilling.

Legend for graphic log column (see drill log for Hole No. ____)
'DERWENT' PENCIL No. | FIELD ROCK NAME, ETC.

Symbols and abbreviations for drilling notes column.

LOGGED BY A. JANNINK FROM 0 TO 244.5 DATE August 1979

LOGGED BY ____ FROM ____ TO ____ DATE ____

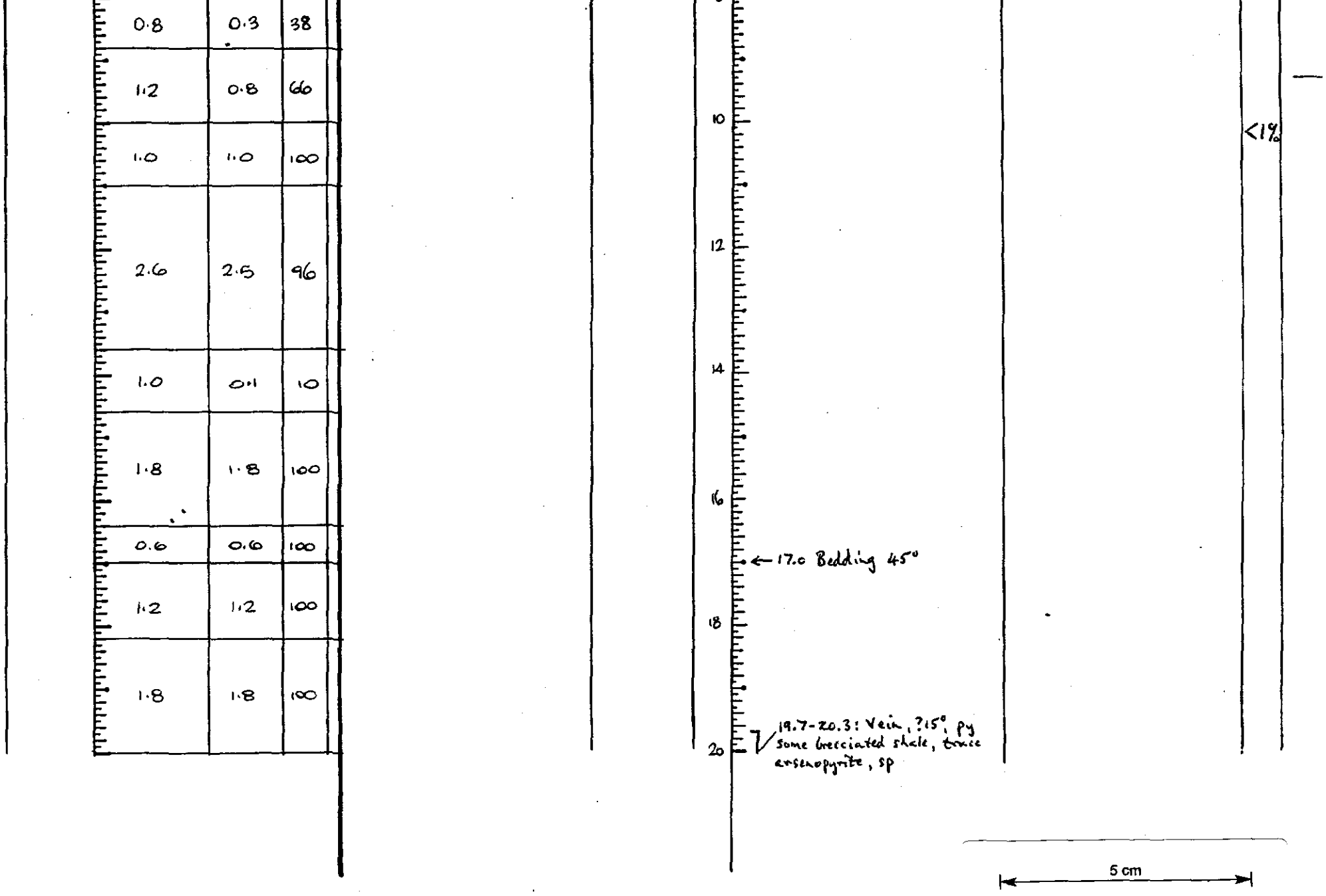
LOGGED BY ____ FROM ____ TO ____ DATE ____

Company managing exploration programme.
METALS EXPLORATION LIMITED.

HOLE No. MBD 10
Log sheet 1 of 14

REPORT No. 192207 PAGE 2 206

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
TRICONED No CORE	0.00 m										
NQ core	1.8	0.8	44		SHALE and SILTSTONE Interbedded Dark to medium grey partly carbonaceous. Poor to moderate bedding Frequent disruption					pyrite disseminated in siltstone, rare blebs, occasional veins	<1%
	0.5	0.4	80								
	2.7	2.3	85								
	0.8	0.3	38								
	1.2	0.8	66								
	1.0	1.0	100								
	2.6	2.5	96								
	1.0	0.1	10								
	1.8	1.8	100								
	0.6	0.6	100								
	1.2	1.2	100								
	1.8	1.8	100								



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MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 10
LOG SHEET 2 of 14

Form Oct 78

REPORT No. 192208

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)

00 m

0.5	0.4	80	See page 2
2.5	2.3	92	
2.1	2.1	100	
0.9	0.9	100	
2.9	2.9	100	
0.8	0.8	100	
2.3	2.2	96	
1.3	1.3	100	31.6–40.2 Minor interbedded pale grey quartzite
0.4	0.2	50	
1.1	1.1	100	
2.1	1.5	71	
1.1	1.0	91	
1.3	0.8	62	
0.8	0.95	119	

20 See page 2

22

←25.0: 10 mm vein, qtz minor py

26

28

30

←30.5 Bedding 45°

32

←31.8: 5mm vein, 30°, vuggy qtz, Py

←32.4: ~20mm irregular vein, qtz minor Py

34

36

38

38.7 Bedding 65°

←38.9: ~10mm vein; Py

40

See page 2

pyrite especially disseminated in quartzites
Some veins and stringers

1-2%

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 10
LOG SHEET 3 of 14

Preliminary Design for Form Oct 78

REPORT No. 192209

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS [ ]	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	00m				See pages 2 and 3					See page 3	
	1.3	1.25	96							pyrite in veins, stringers, rare disseminated and blebs	
	1.2	0.8	67								
	1.8	1.8	100								
	1.1	0.8	79								
	1.8	1.6	89								
	1.8	1.1	61								
	1.0	0.7	70								<1%
	1.3	1.2	92								
	2.9	2.4	83								
	2.0	1.5	75								
	2.4	2.3	96								
	2.4	2.4	100								

40 42 44 46 48 50 52 54 56 58 60

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 10
LOG SHEET 4 of 14

REPORT No. 192210 PAGE 4-5

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)

60.0 m

BQ Core	1.10	0.8	80
	2.9	2.9	100
	3.1	2.9	94
	1.0	0.95	95
	2.0	2.0	100
	3.0	3.0	100
	3.0	3.0	100
	3.0	3.0	100

See page 2

65.0 - 70.4 Numerous very thin carbonate stringers

79.95 - 80.2 Greenish grey tuffaceous band, 30° to core

60
62
64
66
68
70
72
74
76
78
80

← 63.1 Bedding 60°

← 66.1: 40x10 mm bleb of py

← 70.5: 35 mm vein, 60°, vuggy; py

← 71.5 Bedding 50°

← 73.8 - 73.93: 130x30 mm patch of py, concretionary appearance

← 78.0: 9 mm vein, 55°, qtz, py, marcasite
← 78.7: 7 mm irregular vein, 55°, qtz, minor py, carbonate
← 78.8: 5 mm vein, 60°, qtz minor py; carbonate
← 79.0: 9 mm vein, 35°, carbonate minor qtz, py

See page 4

pyrite mainly in thin stringers, occasional blebs, rarely disseminated and in veins

1-2%

5 cm

METALS EXPLORATION LTD.
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MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 10
LOG SHEET 5 of 14

REPORT No. 192211 PAGE 210

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)

	3.0	3.0	100		See pages 2 and 5					See page 5	
	3.0	2.95								pyrite, weak trace pyrrhotite mainly in stringers and veins, occasional blebs, disseminations and along bedding	2-3%
	3.0	3.05	100							pyrite mainly in stringers, veins and blebs, some disseminated	3-5%
	3.0	2.9	97								
	2.0	2.05	103								
	3.1	3.0	97								
	0.6	0.6	100								
	3.1	3.1	100								

.00 m

80
82
84 ← 85.0 Bedding 75°
86
88
90 ← 90.7: 8mm vein, 10°, py minor qtz
92 ← 93.1: 18mm vein, 35°, brecciated, qtz minor py
← 93.6: 90 mm vein, ?30°, qtz, carbonate, Py, minor arsenopyrite trace cassiterite
94 ← 94.3: 6mm vein, 25°, py trace cp
← 94.4: aggregate 25mm veins, irregular, qtz, siderite minor py
← 94.7: 9mm vein, 20°, py minor qtz
96 ← 98.0: 70mm vein, irregular, qtz carbonate py, fluorite minor cassiterite
← 97.3-97.5 irregular vein, qtz carbonate, fluorite, py, trace sp, cp, cassiterite
98 ← 97.9: 5mm vein, 45°, qtz, minor py, marcasite, fluorite
← 98.6: 13mm irregular vein, qtz, py, carbonate, fluorite minor cassiterite
← 98.8-99.4, vein, 35°, qtz, carbonate, fluorite, py, minor shale breccia, trace wolfram, cassiterite
100 ← 99.6: 70mm vein, 60°, arsenopyrite fluorite, carbonate, qtz

5 cm

METALS EXPLORATION LTD.
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MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 10
LOG SHEET 6 of 14

REPORT No. 192212 PAGE 211 7

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS & BRACKETS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Altitude of bedding or foliation; Altitude & spacing of joints, Altitude, width & discription of sheared zones, [Altitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.10	3.10	100		See page 2						
	3.2	3.2	100		104.1 - 108.7: Pale to medium grey Siltstone						
	3.0	3.0	100								
	3.10	3.0	100								
	3.10	3.0	100								
	3.0	3.0	100								
									←103.7: 8mm vein, 20°, py, qtz, carbonate ←104.3: 8mm vein, 40°, qtz, py	pyrite in stringers and veins	<1%
									←111.3: 7mm vein, 60°, qtz, py ←112.5: 5mm vein, 55°, py minor arsenopyrite ←113.0 Bedding 65° ←113.3: 8mm brecciated vein, qtz minor py		
										See page 8	

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 10
LOG SHEET 7 of 14

REPORT No. 192213 PAGE 212 8

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS & BRACKETS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Altitude of bedding or foliation; Altitude & spacing of joints, Altitude, width & discription of sheared zones, [Altitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	2.95	98		See page 2						
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	2.9	97								
	3.0	3.04	101		134.9-136.1 Increase in Fine Grained Sandstone content						
	3.0	2.92	97		FINE GRAINED SANDSTONE tending towards QUARTZITE Medium pale grey Trace Shale Minor brecciation Poorly bedded	136.1-144.0 (7.9)					

120
122
124
126
128
130
132
134
136
138
140

← 120.4: 9mm vein, 70°, Py

pyrite > pyrrhotite
Pyrite in stringers and veinlets, pyrrhotite disseminated and along bedding

3-5%

← 132.0 Bedding 30°

pyrite >> pyrrhotite
in stringers and veinlets

1-2%

← 137.5 Bedding 35°

pyrite > pyrrhotite
in veinlets and disseminated.
Mostly barren, 143-144 contains most sulphide

<1%

5 cm

METALS EXPLORATION LTD.
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MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 10
LOG SHEET 8 of 14

Form Oct 78

REPORT No. 192214 PAGE 9 213

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS ⌐	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & disruption of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.10	3.01	100		See page 8						
	2.2	2.18	99		FINE GRAINED SANDSTONE and SHALE Interbedded Sandstone is pale grey Shale is medium grey, trace black carbonaceous Poorly bedded Some disruption in shales	144.0-148.9 (4.9)			← 144.9 Bedding 45°	pyrite >> pyrrhotite mainly in shale as fine stringers and veins, minor dissemination in sandstone	3%
	2.2	2.23	101								
	0.8	0.74	93								
	3.0	3.11	104		SHALE and SILTSTONE minor FINE GRAINED SANDSTONE Interbedded Shale is medium grey with occasional thin black carbonaceous layers Siltstone and Fine Grained Sandstone is pale grey Moderately to well bedded, sometimes stripey in appearance Some disruption and brecciation	148.9-175.2 (26.3)			← 155.5 Bedding 70° ← 159.5: 35 mm vein, 50°, vuggy, py minor qtz	pyrrhotite and pyrite pyrrhotite is usually along bedding and disseminated, sometimes in stringers pyrite is usually in stringers and veinlets	5%
	3.2	3.08	96								
	3.1	3.13	101								
	3.1	3.07	99								
									See page 10		

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 10
LOG SHEET 9 of 14

REPORT No. 192215

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) BRACKETS &	OBSERVATIONS Commence with length from collar either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	00 m				See page 9						
	3.60	3.41	103								
	3.2	3.07	96							pyrite > pyrrhotite in stringers, veinlets minor disseminated	1%
	3.1	3.15	102								
	3.0	2.93	98.							pyrite in stringers, veins, disseminated especially along bedding	10-15%
	3.1	3.02	97		Increase in Sandstone content giving gradual change to						
	3.0	2.90	97		FINE GRAINED SANDSTONE, SHALE and SILTSTONE Fine grained Sandstone and Siltstone are pale grey Shale is dark to medium grey with minor black carbonaceous. Moderately bedded, mostly disrupted, some brecciation	175.2-201.3 (26.1)				pyrite in stringers, disseminated (especially in sandstone) and blebs	2%

160 162 164 166 168 170 172 174 176 178 180

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 10
LOG SHEET 10 of 14

REPORT No. 192216

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	2.95	98		See page 10						
	1.7	1.7	100								
	1.8	1.7	94								
	2.5	2.45	98								
	1.1	1.03	94								
	0.1	0.25	250								
	1.8	1.78	99								
	3.0	2.93	98								
	3.0	2.96	99								
	3.0	3.0	100								
									←184.7 Bedding 80°	pyrrhotite > pyrite disseminated (often along bedding), in blebs and stringers	2%
									←189.1: aggregate 10mm veins, py trace sp ←190.3: 30mm vein, 50°, qtz, py, arsenopyrite minor carbonate	pyrite rare pyrrhotite in stringers, minor veins and disseminated	2-3%
										pyrite and pyrrhotite pyrite in stringers, pyrrhotite in blebs and disseminated along bedding	1%

See page 10

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 10
LOG SHEET 11 of 14

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Altitude of bedding or foliation; Altitude & spacing of joints, Altitude, width & discription of sheared zones, [Altitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	3.0	100		See page 10 Gradual decrease in Sandstone content to					See page 11	
	2.8	2.83	101		SHALE and SILTSTONE Interbedded Shale is medium and dark grey some carbonaceous Siltstone is medium to pale grey Moderately to well bedded sometimes stripey appearance Much folded to give variable core angles (0°-90°) Some disruption and brecciation	201.3-212.05 (10.75)				Pyrite rare pyrrhotite pyrite in stringers, occasionally disseminated along bedding, rare veins. pyrrhotite in rounded blebs	1%
	3.02	3.22	101								
	3.0	3.0	100								
	3.0	3.0	100		FINE GRAINED SANDSTONE medium grey, poorly bedded, minor brecciation	212.05-213.2 (1.15)				Pyrite > pyrrhotite disseminated and in stringer	1%
					SHALE Medium and dark grey, minor carbonaceous. Poorly bedded, disrupted	213.2-214.6 (1.4)				Pyrite in stringers, minor disseminated	<1%
	1.4	1.4	100		QUARTZITE Pale grey, impure, brecciated	214.6-216.6 (2.0)				Pyrite rare pyrrhotite in blebs, stringers and disseminated	1-2%
	1.6	1.54	96		SHALE and SILTSTONE minor QUARTZITE/FINE GRAINED SANDSTONE Interbedded Shale is medium to dark grey minor carbonaceous Others are medium to pale grey. See page 13	216.6-231.6 (15.0)				Pyrite in blebs, stringers and veins	<1%
	1.0	1.02	102								

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 10
LOG SHEET 12 of 14

REPORT No. 192218

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.1	3.2	103		See page 12 Poorly bedded, much disrupted and brecciated				See page 12		
	1.9	1.76	93								
	1.2	1.25	104								
	0.3	0.35	117								
	1.5	1.55	103								
	3.0	2.98	99								
	3.0	2.97	99								
	3.0	2.92	99								
	3.0	3.0	100								
					QUARTZITE, FINE GRAINED SANDSTONE minor SHALE Quartzite is pale grey Sandstone is medium grey Shale is dark grey Poorly bedded Partly brecciated	231.6-237.9 (6.3)			←231.6 Contact 15° ←237.6 Bedding 50°	No sulphides	0
					SHALE and SILTSTONE interbedded Shale is medium to dark grey minor black carbonaceous Siltstone is pale grey See page 14	237.9-244.5 (6.6)			←239.6 Bedding 90°	pyrite >> pyrrhotite in stringers and veins	1%

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 10
LOG SHEET 13 of 14

REPORT No. 192219 218

PAGE 14

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	3.06	102		See page 13 Moderately to poorly bedded Much folded and disrupted						
	2.4	2.4	100								
	0.1	0.02	20		END OF HOLE 244.5m						

0.00m

240

241.2: 14mm vein, 45°, qtz minor carbonate trace cassiterite

241.75: 24mm vein, 50°, qtz, minor py trace ? cassiterite

242

241.8 – 241.9: 48mm quartz breccia zone, 35°, qtz, shale, carbonate minor py, po

244

246

See page 13

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 10
LOG SHEET 14 of 14

219

19220

SUMMARY DRILL LOG MBD 11

% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
						Veins etc all veins over 50 mm	Mineralization excluding veins over 50mm	
		Tricone Drilled - no core	0-3.0					
		SILTSTONE, QUARTZITE minor SILTY SHALE. Interbedded	3.0-16.9 (13.9)			50mm vein, 40°, qtz, limonite, cassiterite	py disseminated, in veins	<1%
		SILTSTONE and SILTY SHALE	16.9-27.0	20		← Bedding 80° ← contact ~90°	No sulphides	0
		~~QUARTZ PORPHYRY~~	~~27.0-29.3~~				~~No sulphides~~	~~0~~
		QUARTZITE / SILICIFIED SILTSTONE	29.3-39.1			↖ contact 90°	py in veinlets, minor disseminated	<1%
		SILTY SHALE and SILTSTONE	39.1-49.0	40		← Bedding 85° ↙ contact 45°	py in stringers, minor veins	3-5%
		~~QUARTZ PORPHYRY~~	~~49.0-49.8~~				py, marcasite, minor arsenopyrite	2%
		SILTSTONE, SILTY SHALE minor QUARTZITE	49.8-65.0	60		↖ contact 60° ← Bedding 55°	py in stringers, dendritic, veins	20% <1%
		~~QUARTZITE~~	~~65.0-67.7~~				py disseminated, cassiterite veins	2%
		SILTSTONE and SILTY SHALE Interbedded, pale grey	67.7-89.6 (21.9)	80		← Bedding 60°	py >> po, py in stringers, veins po disseminated	1%
		~~QUARTZ PORPHYRY~~	~~89.6-92.0~~			↙ contact 25° ↙ contact 20°	po >> py in stringers, disseminated py, py disseminated	1% 15%
		SILTSTONE and SILTY SHALE minor QUARTZITE	92.0-112.3 (20.3)	100		← 60mm vein, along core, py, arsenopyrite, qtz breccia cp ← 60 mm vein, 35°, qtz, fluorite, Py, Po, cassiterite, cp, sp, carbonate	po > py stringers, disseminated minor veins	1-2%
		QUARTZITE minor SILTSTONE and SILTY SHALE	112.3-125.7 (13.4)	120		← Bedding 70°	po > py disseminated, stringers veins	1-2%
		SILTSTONE and SILTY SHALE	125.7-136.2			← Bedding 70°	po > py disseminated, stringers veins	2%
		QUARTZITE	136.2-141.7	140		← Contact 60°	py, po veinlets, stringers	1%
		QUARTZ PORPHYRY	141.7-147.55				py disseminated	20%
		SILTY SHALE and SILTSTONE Interbedded, pale to medium grey, some disruption	147.55-200.0 (52.45)	160		↖ Contact ~80° ← Bedding 80°	po >> py po in stringers, along bedding, minor blebs, veins py in veins and stringers	5%
		163.9-165.0 } slightly carbonaceous shale beds 185.4-185.5 } 187.0-187.4 }		180		← Bedding 10°	Locally up to 10%	
						← Bedding 80°	py > po disseminated, veins	1%
		END OF HOLE 200m		200				

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METALS EXPLORATION LTD.
& SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG

Prospect, area, project or mine. MT BISCHOFF

HOLE No. MBD 11

COLLAR LOCATION

Grid name	Rectangular space co-ordinates PLANAR CO-ORDINATES		ELEVATION
(1) MBJV	2496·91 N	919·69 E	720·02
(2)	N	E	
(3) Aust. Map Grid PRECISE / APPROX.	mE	mN	m A.H.D.

1:250 000 Sheet No. BURNIE SK 55-3 | 1:100 000 Sheet No. HELLYER 8015 | State TASMANIA

Mineral Tenement E.L. 13/79. Holder M.E.L.

Cadastral location and details
CROWN LAND/ PRIVATE

W.C. Bearing from collar
— magnetic
— grid (1)
grid (2)
grid (3)
true

Inclination at collar VERT

Total length 200m.

Commenced: 14/8/79
Completed: 21/8/79

Drilling contractor LONGYEAR AUST P/L.

Rig type LONGYEAR F 38

Core size and non-coring (NC)

TRICONE	0	TO	3
NQ	3	TO	81
BQ	81	TO	200
		TO	
		TO	
		TO	

Details of down hole location-survey methods.
TROPARI every 30 m.

Purpose of drilling and anticipated lengths to targets.
To test the "Summit" magnetic anomaly

Results of down hole location-survey.

LENGTH FROM COLLAR	W.C. BEARING type.....	DIP
29	119	88
61	213	87
90	152	87
120	184	86
199	199° 30'	80

Comments on drilling. 3.0 metres of HQ rod left in hole
Electrode placed at 152 metres (Hole had caved in at this depth)

Legend for graphic log column (see drill log for Hole No. ____)

'DERWENT' PENCIL No.		FIELD ROCK NAME, ETC.
—	☐	
—	☐	
—	☐	
—	☐	
—	☐	
—	☐	
—	☐	
—	☐	
—	☐	
—	☐	
—	☐	
—	☐	

Symbols and abbreviations for drilling notes column.

LOGGED BY A. JANNINK	LOGGED BY	LOGGED BY
FROM 0 TO 200	FROM TO	FROM TO
DATE August 1979	DATE	DATE

Company managing exploration programme.
METALS EXPLORATION LIMITED.

HOLE No. MBD 11
Log sheet 1 of 11

REPORT No. 192222 PAGE 2 221

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
TRICONED NO CORE									Veins etc (over 5mm only)	Including veins under 5mm	
NQ CORE	1.0	1.0	100		SILTSTONE, QUARTZITE minor SILTY SHALE Interbedded Pale to medium grey, Quartzite occasionally has a brownish tinge Moderately bedded, rare brecciation and folding. Hard and silicified. Frequent brown iron oxide staining Occasional thin quartz veins	3.0-16.9 (13.9)			3.0 Bedding 90°	pyrite disseminated and in veins	<1%
	3.0	2.8	93						5.3: 40mm brecciated qtz		
	2.0	1.2	60						6.5: 20x50mm patch of qtz		
									7.1: 100x20mm patch of qtz, trace py, ? cassiterite		
	2.0	1.7	85						8.8: 5mm vein, 35°, qtz minor py		
	1.8	1.8	100						11.0: 4mm vein, 75°, qtz trace cassiterite 11.05: 5mm vein, 75°, qtz trace cassiterite 11.15: 40mm aggregate veins, qtz trace soft black sulphide 11.25: 8mm irregular vein, vuggy, qtz 11.4: 18mm vein, 70°, vuggy, qtz minor cassiterite		
	1.2	1.2	100								
	1.2	1.3									
	2.0	2.0	100		Gradual change from above due to absence of Quartzite				15.0: 50mm vein, 40°, qtz, boggy limonitic clay, cassiterite 15.8 Bedding 60°		
	1.4	1.4			SILTSTONE and SILTY SHALE Pale, some medium, grey. Moderately well bedded, sometimes stripey appearance Minor disruption See page 3	16.9-27.0 (10.1)			17.1: 1mm vein, 40°, calcite, qtz 16.9-27.0 Broken core 17.6: 1mm vein, 20°, qtz, cassiterite	No sulphides	0
	1.7	1.8							19.3: 1mm vein along core, qtz, limonite, minor cassiterite		

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 11
LOG SHEET 2 of 11

REPORT No. 192223 222

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	1.4	1.2			See page 2 Minor iron oxide staining Siltstone slightly micaceous in parts				See page 2		
	3.0	3.0	100								
	0.8	0.8	100								
	0.8	0.8	100								
	1.2	1.2	100								
	1.5	1.4	93		QUARTZ PORPHYRY White matrix. Pitted 25% quartz phenocrysts up to 5mm diameter, more feldspar phenocrysts 27.3-27.5 Pale grey sandstone 27.8-27.9 Pale grey sandstone	27.0-29.3 (2.3)			No sulphides Trace cassiterite Weak trace sphalerite		0
	1.0	1.0	100		QUARTZITE / SILICIFIED SILTSTONE Pale grey with slight brown tinge. Hard Finely pitted Poorly bedded Some irregular thin quartz veining Minor iron oxide staining Dendritic appearance towards base	29.3-39.1 (9.8)			29.3-39.1 Broken core pyrite in veinlets, minor disseminated		<1%
	1.5	1.5	100								
	0.9	0.9	100								
	2.5	2.5	100								
	0.7	0.7	100								
	0.3	0.3	100								
	0.5 0.1	0.5 0.1	100 100								
	1.2	1.4	100								
	3.1	2.9									
					See page 4				See page 4		

20 m

20
22
24
26
28
30
32
34
36
38
40

← 23.0 Bedding 80°
← 24.1 : 7mm vein, 55°, qtz
← 26.8 Bedding 85°
← 27.0 Contact indistinct ~80°
← 29.3 Contact 90°
29.3-39.1 Broken core
← 30.0 Bedding 85°
← 31.9 : 5mm vein, 5° along core, irregular, qtz, ? cassiterite
← 32.1 : 8mm vein, qtz
← 33.0 : 8mm vein, along core, qtz, trace cassiterite
36-38 : 36.8-37.0 : vuggy qtz breccia
← 39.0 : 2mm vein, 20°, vuggy, qtz, cassiterite
← 39.5 Bedding 85°

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 11
LOG SHEET 3 of 11

REPORT No. 192224 223

PAGE 4

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	MARKERS (▼) BRACKETS ⌐ ⌐	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	00 m				SILTY SHALE and SILTSTONE Pale to medium grey, Moderately bedded Slightly disrupted Minor brecciation. Sometimes dendritic appearance					pyrite in stringers, dendritic, minor veins and disseminated	3-5%
	1.4	1.5									
	1.9	1.9									
	1.5	1.5	100								
	2.7	2.5									
	1.1	1.2									
					QUARTZ PORPHYAY Cream white matrix, 15% qtz minor feldspar phenocrysts to 3mm	49.0-49.8 (0.8)			49.0 Contact 45° 49.8 Contact 60°	pyrite/marcasite minor arsenopyrite disseminated weak trace cassiterite	20%
	2.8	2.8	100		SILTSTONE, SILTY SHALE minor QUARTZITE Pale grey to medium grey, Silty Shale sometimes has a greenish tinge Moderately bedded Slightly disrupted Minor dendritic appearance Hard, especially Quartzite and Siltstone (which is partly silicified) 49.8 - 50.5 brownish colour	49.8-65.0 (15.2)			50.4: 22 mm vein, 20°, Py, qtz soft black mineral? graphite trace arsenopyrite 51.5 Bedding 60° 52.2: 2mm vein, 10°, vuggy cassiterite, qtz 55.4: 1 mm vein, 20°, vuggy, qtz, cassiterite 56.2 - 64.4 Broken core 59.1: 7mm vein, qtz, Py 59.5 Bedding 55°	pyrite in stringers minor dendritic, in veins, disseminated in Quartzite.	<1%
	1.4	1.3	92.8								
	2.4	2.4	100								
	1.1	1.1	100								
	1.2	1.0	83								
	0.7	0.6	85.7								
	2.0	1.8	90.0								

40 42 44 46 48 50 52 54 56 58 60

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 11
LOG SHEET 4 of 11

REPORT No. 192225 PAGE 5

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	1.0	0.6	60		See page 4						
	1.1	0.65	59.1								
	0.4	0.3	75								
	0.6	0.6	100								
	2.1	2.1	100		QUARTZITE Pale grey-brown, Hard Slightly dendritic appearance No bedding Minor brecciation	65.0-67.7 (2.7)			65.4: 5mm vein, 30°, py minor qtz trace ? cassiterite 65.9: 12mm vein, 20°, qtz, soft black mineral ? graphite 66.0: 7mm vein, qtz minor py 66.7: 1mm vein, 20° qtz, cassiterite 66.8: 1mm vein, 25° qtz, cassiterite 66.9: 1mm vein, 25° qtz, cassiterite 67.4: 1mm vein, 20°, qtz, cassiterite	pyrite disseminated, dendritic, and in stringers	2%
	1.3	1.3	100								
	2.7	2.7	100		SILTSTONE and SILTY SHALE Pale grey minor medium grey. Occasional greenish tinge, rare purple/brown tinge. moderately bedded some deformation	67.7-89.6 (21.9)			69.1: 12mm vein, 20°, py, arsenopyrite, marcasite minor qtz, carbonate 71.2 Bedding 70° 72.8: 8mm vein, 15° py, carbonate, minor qtz 73.8: 5mm vein, 10°, py, carbonate, qtz, minor arsenopyrite 74.3: 9mm vein, 75°, qtz minor py 76.4: 8mm vein, 15°, carbonate qtz, minor sp, py 78.5: 5mm vein, 15°, carbonate py, qtz, minor arsenopyrite trace sp	pyrite >> pyrrhotite pyrite in stringers and veins, pyrrhotite mostly disseminated	1%
	2.6	2.6	100								
	1.4	1.3	92.9								
	2.9	2.9	100								

5 cm

METALS EXPLORATION LTD.
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MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 11
LOG SHEET 5 of 11

REPORT No. 192226 PAGE 6 225

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description of over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	0.00 m BQ core										
	1.0	0.9	90.0		See page 5						
	2.0	1.8	90.0								
	0.6	0.6	100								
	1.5	1.4	93.3								
	3.1	3.1	100								
	2.0	2.0	100								
	1.8	1.8	100		QUARTZ PORPHYRY White matrix. 15% phenocrysts of quartz minor feldspar up to 4mm diameter	89.6-92.0 (2.4)			89.6 Contact 25°	pyrrhotite and pyrite minor arsenopyrite disseminated. Minor fluorite Trace chalcopyrite, Sphalerite	15%
	3.0	3.0	100		SILTSTONE and SILTY SHALE minor QUARTZITE Interbedded Pale to medium grey, occasional green and brown tinge Moderately to poorly bedded Moderate def disruption Some brecciation (especially 103.3-106.0)	92.0-112.3 (20.3)			92.0 Contact 20°,	pyrrhotite >> pyrite in stringers, disseminated, occasional veins	
	2.1	2.1	100						94.0 Bedding 65°		1-2%
	3.1	3.1	100								

80 — See page 5

82 — 81.9-82.9: 15mm vein along core, py minor arsenopyrite, qtz, trace cp, ? cassiterite

84

86

88 — 88.7: 9mm vein, 25°, vuggy: qtz minor py, arsenopyrite

90

92

94

96 — 95.8-96.6: 60mm vein along core, py, arsenopyrite, qtz trace cp

98 — 97.8: 8mm vein, ~15°, py, qtz, trace sp; 98.5: 13mm vein, 15°, py, qtz, arsenopyrite trace cp

100 — 100.0: 30x30mm patch of po

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 11
LOG SHEET 6 of 11

Form Oct 78

REPORT No. 192227

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) BRACKETS [ ]	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axes]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.00	3.0	100		See page 6						
	1.1	1.1	100								
	2.7	2.8	100								
	0.6	0.6	100								
	2.4	2.4	100								
	3.0	3.0	100								
	1.3	1.3	100								
	1.7	1.7	100								
	3.0	3.0	100		QUARTZITE minor SILTSTONE and SILTY SHALE Quartzite is pale grey/brown. Siltstone and Shale is pale and medium grey. Very hard Quartzite is partly brecciated - no bedding Siltstone/Shale is moderately bedded with some disruption	112.3-125.7 (13.4)				pyrrhotite > pyrite disseminated, in stringers and veins	1-2%

100

102.0 Fold axis
102.3: 7mm vein, 10°, py, qtz minor po, carbonate
102.4: 17mm vein, 30°, qtz, po, py, trace cp, sp
103.0 Bedding 75°
103.3-103.7: qtz-siltstone breccia zone, minor py, po, trace cp, sp

104

104.7: 7mm vein, 20°, qtz, po, py minor carbonate, trace sp, ? cassiterite

106

106.0-106.7: Vein, 35°, qtz, fluorite, py, arsenopyrite, carbonate, trace cp, minor po, cassiterite, sp, wolfram
107.0: 10mm vein, 55°, py, qtz, carbonate

108

110

111.0: 5mm vein, 20°, qtz, carbonate, py, fluorite
111.6 Fold axis

112

114

114.2: 9mm vein, 35°, qtz minor py trace sp

116

116.4: 5mm vein, 25°, py, minor arsenopyrite, qtz, carbonate, trace sp.
117.0 Bedding 70°

118

117.9: 5mm vein, 20°, py, qtz, carbonate, arsenopyrite trace sp

120

See page 6

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 11
LOG SHEET 7 of 11

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	0.00 m										
	3.0	3.0	100		See page 7		120		See page 7		
	1.2	1.2	100				122				
	1.8	1.8	100				124		124.4: 6mm vein, 10°, py, qtz carbonate ~~arsenopyrite~~ minor cp, ? cassiterite 124.8 Bedding 60°		
	3.0	3.0	100		SILTSTONE and SILTY SHALE Pale to medium grey, some green and brown tinge Moderately well bedded Some disruption Minor folding	125.7-136.2 (10.5)	126		126.3: 6mm vein, 15°, qtz, carbonate, py, minor arsenopyrite trace cp 127.7: 6mm vein, 25°, qtz, py, carbonate, trace sp, ? cassiterite	pyrrhotite > pyrite pyrrhotite is disseminated and in stringers, pyrite is in veins and stringers	
	3.0	3.0	100				128		128.0: 5mm vein, 10°, py, arsenopyrite, minor qtz, trace cp, cassiterite 128.5: 6mm vein, irregular, 10° py, qtz, minor carbonate trace cp 128.9: 6mm vein, 5°, qtz, carbonate, py, marcasite, trace fluorite 129.0-129.7: 8mm vein along core qtz, carbonate, py, marcasite, fluorite 130.0 Bedding 70°		2%
	3.0	3.0	100				130				
	3.0	3.0	100				132		131.8: 5mm vein, 10°, qtz, py, marcasite, carbonate trace cp, sp		
	1.0	1.0	100				134				
	3.0	3.0	100				136				
	2.8	2.7	97		QUARTZITE minor SILTSTONE and SILTY SHALE Pale to medium grey No bedding in quartzite. Siltstone/Shale is poorly bedded with some disruption Some brecciation	136.2-141.7 (5.5)	138		138.5 Bedding 65°	pyrite and pyrrhotite in veinlets, stringers. pyrrhotite is also disseminated	1%
							140				

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 11
LOG SHEET 8 of 11

REPORT No. 192229 PAGE 9

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	100 m				See page 8		140			See page 8	
	1.9	1.8	94.7		QUARTZ PORPHYRY White matrix 10-15% phenocrysts of quartz and minor feldspar up to 5mm diameter 146.9 - 147.3 Siltstone 147.4 - 147.48 Siltstone	141.7-147.55 (5.85)	142		↖ 141.7 Contact 60°	pyrite minor marcasite, arsenopyrite, trace pyrrhotite disseminated Trace fluorite	20%
	2.6	2.3	95				144				
	3.2	3.0	93.8				146		↙ 147.55 Contact irregular ~80°		
	1.7	1.75			SILTY SHALE and SILTSTONE Interbedded Pale to medium grey, slight greenish tinge Moderate to well bedded Some folding and disruption. Some narrow (<5mm) pyrrhotite along bedding	147.55-200.0 (52.45)	148		← 147.8 Fold axis ← 148.4 Fold axis	pyrrhotite >> pyrite pyrrhotite in stringers, along bedding, minor blebs and veins pyrite in veinlets and stringers. Locally up to 10%	
	3.1	3.1	100				150		← 150.0 Bedding 90°		5%
	1.9	1.93					152				
	0.5	0.54					154				
	2.5	2.45					156		← 156.0: 5mm vein, 30°, qtz minor py, po ← 156.2: 6mm vein, 25°, qtz, carbonate, py, marcasite minor arsenopyrite, sp		
	3.0	2.86					158				
							160		← 160.0 Bedding 80°		

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 11
LOG SHEET 9 of 11

REPORT No. 192230 PAGE 229 10

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axes]	MINERALIZATION	% MINERALIZATION (visual estimate)

100

See page 9

3.0	3.10			
3.0	3.05			
3.0	3.0	100		
3.0	3.0	100		
2.8	2.8	100		
3.1	3.1	100		

163.8-165.0 Some slightly carbonaceous shale bands

160

See page 9

162 ← 162.2: 8mm vein, 15°, qtz, py, carbonate minor po, arsenopyrite, sp

← 163.4: 11mm vein, 15°, qtz, py, carbonate, minor arsenopyrite po, cp

164

166 ← 166.1: 7mm vein, 5°, qtz, po, py, arsenopyrite, trace cp, fluorite

← 166.7: 5mm vein, 15°, qtz, carbonate, py, arsenopyrite minor fluorite

168

170 ← 170.0 Bedding 35°

172

← 172.9: 45mm vein, 45°, py, qtz, arsenopyrite, carbonate, fluorite, trace cp, sp

174

← 175.0 Bedding 10°

176

178 ← 178.3: 5mm vein, 25°, py, po, qtz, arsenopyrite, minor cp

← 178.6: 5mm vein, 15°, qtz, carbonate, fluorite, po minor py

180 ← 180.0 Bedding 40°

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 11
LOG SHEET 10 of 11

REPORT No. 192231 PAGE 11

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	0.00 m										
	3.1	3.1	100		See page 9						
	2.0	2.0	100								
	3.0	3.1			185.4-185.5 Some slightly carbonaceous shale bands						
	3.0	3.1			187.0-187.4 Some slightly carbonaceous shale bands						
	3.2	3.1	100								
	3.1	3.1									
	2.1	.2									
	1.6	1.5									
					END OF HOLE 200m						

180
182 ← 182.1: 10mm vein, 20°, qtz, carbonate, py, minor arseno-pyrite, sp
184 ← 184.9: 7mm vein, 15°; py, qtz, carbonate, fluorite
← 185.0 Bedding 75°
186
188 ← 188.4: 5mm vein, 20°, arseno-pyrite, py, qtz
190 ← 190.0 Bedding 80°
192
← 193.2: 5mm vein, 20°, qtz, carbonate, py, minor cp, fluorite
194
← 195.0 Bedding 80°
196 ← 196.0: 5mm vein, 15°; py, qtz, carbonate
198
← 198.8: 10mm irregular vein, 15°, py, marcasite, qtz, carbonate, minor fluorite trace cp
200

See page 9

pyrite > pyrrhotite disseminated, in veins and stringers

1%

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 11
LOG SHEET 1. of 11

231

192232

SUMMARY DRILL LOG MBD 12

% RECOVERY	CORE ZONE	FIELD ROCK NAME and general description over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS: Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis] — Veins etc all veins over 50mm	MINERALIZATION — Mineralization excluding veins over 50mm	% MINERALIZATION (visual estimate)
		Tricone drilled – no core	0 – 3.0					
		SILTSTONE pale grey	3.0 – 13.8			← 50mm vein, gossan, qtz, ? cassiterite	py, po, veins, disseminated	<1%
		QUARTZITE minor SILTSTONE	13.8 – 25.2	20		← 50mm vein, 40°, gossan, qtz, py, ? cassiterite	po >> py stringers, disseminated, veins	1-2%
		SILTSTONE and SILTY SHALE minor F.G. SANDSTONE/ QUARTZITE	25.2 – 47.2 (22.0)	40		← Bedding 20° ← Bedding 65°	po >> py stringers, disseminated blebs, veins	2%
		QUARTZITE / F.G. SANDSTONE	47.2 – 53.2			← Bedding 40°	po > py disseminated, stringers	1-2%
		SILTSTONE and SILTY SHALE Pale to medium grey, minor folding, moderately disrupted	53.2 – 80.0 (26.8)	60		← 150mm vein, 45°, carbonate, fluorite, siderite, gl, cassiterite, ? wolfram ← Bedding 70°	py disseminated, blebs, stringers, veins varying from 0 – 2%	1%
		END OF HOLE 80m		80				

REPORT No. 192233 232 PAGE 1

METALS EXPLORATION LTD.
& SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG

Prospect, area, project or mine. MT BISCHOFF

HOLE No. MBD 12

COLLAR LOCATION

Grid name — Rectangular space co-ordinates

	PLANAR CO-ORDINATES		ELEVATION
(1) MBJV	2179.91 N	979.79 E	739.5
(2)	N	E	
(3) Aust. Map Grid (PRECISE / APPROX.)	mE	mN	m A.H.D.

1:250 000 Sheet No. BURNIE SK 55-3 | 1:100 000 Sheet No. HELLYER 8015 | State TASMANIA.

Mineral Tenement EL 13/79 Holder M.E.L.

Cadastral location and details
CROWN LAND/ PRIVATE

W.C. Bearing from collar
— magnetic
— grid (1)
— grid (2)
— grid (3)
— true

Inclination at collar VERT.

Total length 80m.

Commenced: 23/8/79
Completed: 24/8/79

Drilling contractor Longyear Aust P/L.

Rig type LONGYEAR F 38

Core size and non-coring (NC)

TRICONE	0 TO	3
NQ	3 TO	80
	TO	
	TO	
	TO	
	TO	

Details of down hole location-survey methods.

Tropari every 10m.

Purpose of drilling and anticipated lengths to targets.

To test the "Slaughteryard" magnetic anomaly

Results of down hole location-survey.

LENGTH FROM COLLAR	W.C. BEARING type.....	DIP
41	270° 30'	88°
80	305° 30'	88°

Comments on drilling. 3.0 metres of HQ rod left in hole
Electrode placed at 80 metres

Legend for graphic log column (see drill log for Hole No. ____)

'DERWENT' PENCIL No. | FIELD ROCK NAME, ETC.

Symbols and abbreviations for drilling notes column.

LOGGED BY A. JANNINK FROM 0 TO 80 DATE August 1979

LOGGED BY ____ FROM ____ TO ____ DATE ____

LOGGED BY ____ FROM ____ TO ____ DATE ____

Company managing exploration programme.
METALS EXPLORATION LTD.

HOLE No. MBD12
Log sheet 1 of 5

REPORT No. 192234 233 PAGE 2

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
									Veins etc. (over 5mm only)	Includes veins under 5mm	
TRICONED NO CORE											
NQ CORE	1.3	1.2			SILTSTONE Pale grey Brown iron oxide staining to 7.3m with occasional bands thereafter Minor Silty Shale Poorly bedded, disrupted, minor brecciation Some thin (<5mm) vuggy veins	3.0-13.8 (10.8)			←3.7: ~50mm vein, 20°, gossan minor qtz, cassiterite	pyrite and pyrrhotite pyrite in thin veins, pyrrhotite disseminated and in stringers	Trace
	3.1	3.15							←11.1: 10mm vein, 20°, vuggy, qtz, py		
	2.8	2.6	98.3								
	3.1	3.1									
	3.1	3.17			QUARTZITE minor SILTSTONE Pale grey Quartzite tends towards Fine Grained Sandstone Poorly bedded, disrupted, folded, minor brecciation	13.8-25.2 (11.4)			←14.2: 5mm vein, vuggy, 10°, gossan, qtz, py ←15.1: 50mm vein, 40°, gossan, qtz, py, cassiterite ←15.6: 5mm vein, 35°, gossan, qtz	pyrite and pyrrhotite pyrite in veins pyrrhotite disseminated	Trace
	3.0	3.05	101.6						←17.0 Bedding 55° 18.5-19.4: 11mm vein along core, qtz, carbonate, py, minor po, sp, fluorite trace cassiterite	pyrrhotite >> pyrite pyrrhotite in stringers some disseminated and in veins. Rare pyrite, in veins	3%
	0.6	0.58	96.7								

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 12
LOG SHEET 2 of 5

Prelim. page Design for Form Oct 78

REPORT No. 192235 PAGE 3

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	3.10	100		See page 2 20.15-20.35: Tuffaceous band with 5-10% pyrrhotite Upper contact 60° Lower contact 40°				See page 2		
	3.0	3.10	100							pyrrhotite >> pyrite pyrrhotite in stringers, disseminated and in veins pyrite in veins	<1%
	3.0	3.0	100		SILTSTONE and SILTY SHALE minor FINE GRAINED SANDSTONE/ QUARTZITE Pale to medium grey Moderately bedded. Disrupted and folded Some thin (<5mm) veins often running at <10° to core	25.2-47.2 (22.0)			← 27.5 Bedding 20° ← 29.4: 10mm vein, 40°, qtz, carbonate	pyrrhotite > pyrite pyrrhotite in stringers and disseminated, pyrite in veins	1%
	3.0	2.9	100						← 30.3 Bedding 50°	pyrrhotite >> pyrite pyrrhotite in stringers, disseminated, occasional blebs and veins, pyrite in veins	2-3%
	3.0	3.1							← 32.3: 6mm vein, 5°, qtz, py, fluorite, carbonate trace po ← 33.3: 8mm vein, 5°, qtz, carbonate, py, trace fluorite, sp, cassiterite ← 34.6: aggregate 7mm irregular vein, 10°, py minor qtz, carbonate fluorite		
	3.0	2.9	96.7						← 36.0 Bedding 65° ← 37.0: 8mm vein, brecciated, qtz minor py	pyrrhotite >> pyrite in stringers, blebs and disseminated pyrite in veins	1%
	3.0	3.0	100							See page 4	

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 12
LOG SHEET 3 of 5

Prelim. Design for Form Oct 78

REPORT No. 192236 235 PAGE 4

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	30.00 m				See page 3		40				
	30	2.9					42		← 42.5 Bedding 40°	pyrrhotite >> pyrite pyrrhotite in stringers often along bedding, in blebs, disseminated, minor in veins. Pyrite in veins, minor stringers	2-3%
	3.0	3.1					44				
							46		← 46.3: 7mm vein, 10°, carbonate, fluorite, qtz, py, minor arsenopyrite, po		
	3.0	3.0	100		QUARTZITE / FINE GRAINED SANDSTONE minor SILTY SHALE Pale grey Moderate to poorly bedded Minor disruption	47.2-53.2 (6.0)	48			pyrrhotite >> pyrite disseminated, in stringers and blebs	2%
	3.0	3.0	100				50		← 50.0 Bedding 40°	pyrite and pyrrhotite in stringers and veinlets	<1%
							52		← 52.0: 9mm vein, 5°, qtz, carbonate, cassiterite ← 53.0: 8mm vein, 20°, py, carbonate minor qtz, sp		
	3.0	3.0	100		SILTSTONE and SILTY SHALE minor FINE GRAINED SANDSTONE / QUARTZITE Pale to medium grey, occasional purple/brown tinge. Moderately bedded Moderately disrupted Minor folding	53.2-80.0 (26.8)	54		← 54.8 Bedding 65°	pyrite disseminated, blebs, in stringers and veins Ranging from 0 to 2%	1%
	2.8	2.8	100				56				
							58		57.9 Fold axis 58.2 Fold axis 58.3-58.45: brecciated vein, 45°, carbonate, fluorite, qtz, cassiterite, wolfram 58.6: 10 mm brecciated vein, 50°, carbonate, fluorite, qtz, ? cassiterite		
							60				

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 12
LOG SHEET 4 of 5

Preliminary Design for Form Oct 78

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)

0.00 m

3.1	3.1	100	
3.1	3.1	100	
3.0	3.1		
3.0	2.8	98.3	
3.0	2.8		
3.0	3.1	100	
3.0	3.1		

See page 4

60

← 61.5 Bedding 75°

62

64

66

68

← 69.4 Bedding 70°

70

72

72.7-73.0: 40 mm vein, 15°, carbonate, qtz, py, fluorite, arsenopyrite trace sp, cassiterite

74

76

78

78.1-78.6: 9 mm vein alongcore qtz, py, arsenopyrite, sp, fluorite

80

END OF HOLE 80 m

See page 4

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 12
LOG SHEET 5 of 5

Drill Design for Form Oct 78

% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m. cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	MARKERS (▼) BRACKETS &	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation, Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)

237

192238

SUMMARY DRILL LOG MBD 13

			Veins etc all veins over 50 mm	Mineralization excluding veins over 50 mm	
Tricone drilled - no core	0 - 3.0				
DOLOMITE minor SULPHIDE LODE	3.0 - 11.0			Po >> Py in lodes. Trace cassiterite	3-5%
DOLOMITE SULPHIDE LODE 11.0-18.3 Serpentinite, Po, talc 18.3-26.6 Pyrrhotite, talc 26.6-33.1 Talcy serpentinite, pyrrhotite minor dolomite 33.1-44.7 Talcy serpentinite, pyrrhotite, dolomite, qtz/calcite 44.7-69.3 Po, talc, qtz/calcite	11.0 - 69.3 (58.3)	20 40 60	← Contact ~30° ← 26.0-26.2 Shear zone	Po disseminated, blebs. Tr cassit. Po ~ massive Po banded, disseminated Po>Py banded, disseminated weak trace cassiterite Po ~ massive 65.0-65.5 5% cassiterite 67.4-68.9 3-5% cassiterite 68.9-69.3 30-50% cassiterite	20% 70% 20-30% 20% 70%
QUARTZ PORPHYRY white, pale grey, cream 25% quartz, feldspar phenocrysts	69.3 - 90.9 (21.6)	80		Py > Po disseminated 0.5% cassiterite	10-20%
DOLOMITE SULPHIDE LODE Pyrrhotite, talc, quartz/calcite	90.9 - 106.4 (15.5)	100	← 95-95.75 Quartz Porphyry	Po ~ massive Trace cassiterite Po disseminated	70% 40%
SILTSTONE minor SILTY SHALE	106.4 - 120.0 (13.6)	120	← Bedding 30°	Po >> Py stringers, blebs, disseminated, bedding	1%
END OF HOLE 120 m					

238

REPORT No. 192239 PAGE 1

METALS EXPLORATION LTD.
& SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG

Prospect, area, project or mine. MT BISCHOFF.

HOLE No. MBD13

COLLAR LOCATION

Grid name	Rectangular space co-ordinates PLANAR CO-ORDINATES		ELEVATION
(1) MBJV	1950.01 N	1059.9 E	642.05
(2)	N	E	
(3) Aust. Map Grid PRECISE / APPROX.	mE	mN	m A.H.D.

1:250 000 Sheet No. BURNIE SK55-3

1:100 000 Sheet No. HELLYER 8015

State TASMANIA

Mineral Tenement EL 13/79

Holder M.E.L.

Cadastral location and details
CROWN LAND/ PRIVATE

W.C. Bearing from collar

150° magnetic

180° grid (1)

grid (2)

grid (3)

true

Inclination at collar −70

Total length 120m.

Commenced: 25/8/79

Completed: 27/8/79

Drilling contractor Longyear Aust P/L.

Rig type LONGYEAR F 38

Core size and non-coring (NC)

TRICONE	0 TO	3
NQ	3 TO	120
	TO	
	TO	
	TO	
	TO	

Details of down hole location-survey methods.

Tropari every 30m

Purpose of drilling and anticipated lengths to targets.

To test both dolomite sulphide lode and white Face porphyry dyke between Greisen Face and Pig Flat

Results of down hole location-survey.

LENGTH FROM COLLAR	W.C. BEARING type.....	DIP
65	155°30'	70
119	152°	71

Comments on drilling. 3.0 metres of HQ rod left in hole
Electrode placed at 100 metres

Legend for graphic log column (see drill log for Hole No. ____)

'DERWENT' PENCIL No. | FIELD ROCK NAME, ETC.

Symbols and abbreviations for drilling notes column.

LOGGED BY A. JANNINK FROM 0 TO 120 DATE September 1979

LOGGED BY ____ FROM ____ TO ____ DATE ____

LOGGED BY ____ FROM ____ TO ____ DATE ____

Company managing exploration programme.
METALS EXPLORATION LIMITED.

HOLE No. MBD13
Log sheet 1 of 7

REPORT No. 192240 239

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS ⌐ ¬	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	0.00m								Veins etc (over 5mm only)	Including veins under 5mm	
	TRICONED NO CORE										
NQ CORE	2.0	1.9	95		DOLOMITE Grey/white with patches of quartz, calcite minor ? fluorite No bedding	3.0 - 11.0 (8.0)				20% pyrrhotite, 10% pyrite blebs, disseminated, Minor fluorite	30%
										pyrrhotite blebs and disseminated 3-3% sphalerite	15-20%
	3.0	3.0	100		3.0-3.5 Pale and dark green Serpentinite, bronze pyrrhotite and white calcite 4.2-4.6 white calcite, pale to dark green serpentinite, bronze pyrrhotite, cream/white talc 4.9-4.95 Dolomite Sulphide Lode 5.6-5.67 " " " 7.03-7.1 Quartz, calcite minor talcy serpentinite				1% pyrrhotite >> pyrite	pyrrhotite >> pyrite	5%
										pyrrhotite >> pyrite	10%
	3.0	3.0	100		7.2-7.5 Quartz, calcite, pyrrhotite minor talcy serpentinite 7.9-8.1 Quartz, calcite, talcy serpentinite 8.25-8.5 Pyrrhotite, calcite, quartz 8.65-9.0 Quartz, calcite, talcy serpentinite 10.7-10.9 Patchy quartz, calcite					pyrrhotite trace cassiterite	60%
										pyrrhotite trace cassiterite	7-10%
										pyrrhotite	10-15%
	3.0	3.0	100		DOLOMITE SULPHIDE LODE 11.0-18.3 Apple green Serpentinite with bronze pyrrhotite. Much foliation, minor banding Some cream/white carbonate and pale green talc	11.0 - 69.3 (58.3)			← 11.0 Contact irregular ~30°	pyrrhotite disseminated and in blebs sometimes banded Minor arsenopyrite, cassiterite, sphalerite trace chalcopyrite	
	3.0	3.0	100								20%
	3.0	2.9	97		18.3 - 26.6 Bronze pyrrhotite and pale green talc, trace calcite and quartz Virtually massive pyrrhotite No bedding				← 16.8: 8 cm vein, 10° carbonate, qtz, ? tourmaline, trace sp, po	pyrrhotite, massive. trace pyrite, chalcopyrite	70%

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 13
LOG SHEET 2 of 7

REPORT No. 192241 240

PAGE 2

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)

1.4	1.3	93		
1.6	1.6	100		
3.0	3.1	} 100		
3.0	2.9		26.6-33.1 Apple green to dark green talcy serpentinite with bronze pyrrhotite and 5% unaltered dolomite Minor white quartz/calcite Mottled appearance with very slight banding	
3.0	3.0	100		
3.0	3.0	100	33.1-44.7 Pale grey/green and apple green mixture of talcy serpentinite, bronze pyrrhotite, minor grey dolomite some st calcite/ quartz Mottled appearance, partly brecciated, some foliation and banding Dolomite content decreases with depth	
3.0	3.0	100		
3.0	3.0	100		

See page 2

See page 2

pyrrhotite
weak trace pyrite, chalcopyrite

20-30%

pyrrhotite > pyrite
weak trace cassiterite, chalcopyrite

20%

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 13
LOG SHEET 3 of 7

Preliminary Design for Form Oct 78

REPORT No. 192242

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m .cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	3.0			See page 3						
	3.0	2.95	100								
	3.0	3.05			44.7-69.3 Bronze pyrrhotite, lesser pale grey/green tale and calcite/quartz Less taley with depth Virtually massive pyrrhotite No bedding					Pyrrhotite, massive. Trace chalcopyrite, arsenopyrite, pyrite, sphalerite. Minor ? fluorite	70%
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.07	100							57.0-67.4 Fine black cassiterite	
	3.0	2.95			See page 3						

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 13
LOG SHEET 4 of 7

Preliminary Design for Form Oct 78

REPORT No. 192243 PAGE 5

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	BRACKETS & MARKERS (▼)	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.0	3.0	100		See page 4					See page 4	
	3.0	3.0	100								
	1.3	1.3	100								
	3.0	2.9	100		QUARTZ PORPHYRY White, pale grey, cream matrix 25% phenocrysts of quartz and feldspar up to 5mm diameter	69.3-90.9 (21.6)			↖69.3 Contact irregular ~65° ←69.9: 23 mm vein, 60°, qtz, fluorite, marcasite, py, minor cassiterite on edges	pyrite > pyrrhotite disseminated minor marcasite, arsenopyrite trace fluorite 70.5-71.5 Trace cassiterite 71.5-72.5 Minor cassiterite 72.5-83.0 0.5%+ cassiterite 83.0-90.9 Minor to trace cassiterite cassiterite is disseminated and generally free from sulphides	10-20%
	1.7	1.8									
	3.0	3.0	100								
	0.5	0.4	80								
	2.5	2.5	100								

00m

60 62 64 66 68 70 72 74 76 80

64.75 3x5mm cassiterite
65.0-65.5 5-7% cassiterite with patches up to 40x15mm
65.9 2x3mm cassiterite
67.4-69.3 Strong cassiterite including:
67.4-68.9: 3-5% cassiterite
68.9-69.3: 50% cassiterite

←76.3: 9mm vein, 40°, marcasite, py, minor fluorite, qtz, trace cassiterite
←76.9: 25mm vein, 50°, fluorite qtz, py, marcasite
←78.4: 12 mm vein, 55°, qtz, py, marcasite, trace cassiterite

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 13
LOG SHEET 5 of 7

REPORT No. 192244 243
PAGE 6

DRILLING NOTES	DRILL ADVANCE (m.mm) & LENGTH FROM COLLAR m.mm	LENGTH OF CORE RECOVERED m.mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general description of over interval marked.	ADOPTED INTERVAL (m.cm) & ADOPT. LENGTH FROM COLLAR m.cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & description of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	80.0m				See page 5				80.5: 10mm vein, 45°, py/ marcasite, trace qtz, cassiterite 80.6: 20mm vein, 45°, py/ marcasite, qtz, minor arsenopyrite fluorite, cassiterite	See page 5	
	3.0	3.0	100								
	3.0	3.0	100						←84.7: 12mm vein, 30°, py minor po, cassiterite, qtz, fluorite		
	3.0	3.0	100								
	3.0	3.0	100						90.9 Contact 70°		
	3.0	3.0	100		DOLOMITE SULPHIDE LODE 90.9-96.7 Bronze pyrrhotite with lesser grey/green to black talc. Minor quartz/calcite decreasing with depth Pyrrhotite decreases with depth and lode becomes more talcy. Partly brecciated Minor banding	90.9-106.4				pyrrhotite, massive, minor pyrite, chalcopyrite arsenopyrite, trace fluorite 91.5 Cassiterite 93.9 cassiterite	70%
	3.0	3.0	100						95.5-95.75 Dark grey Quartz Porphyry contacts 45°		
	3.0	3.0	100		96.7-106.4 Grey green to black talc with lesser pyrrhotite Minor carbonate stringers at base					pyrrhotite weak trace sphalerite	40%
	3.0	3.0	100								

5 cm

METALS EXPLORATION LTD.
and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 13
LOG SHEET 6 of 7

Preliminary Design for Form Oct 78

REPORT No. 192245 PAGE 7

DRILLING NOTES	DRILL ADVANCE (m. mm) & LENGTH FROM COLLAR m. mm	LENGTH OF CORE RECOVERED m. mm	% RECOVERY	LOST CORE ZONE	FIELD ROCK NAME and general discription over interval marked.	ADOPTED INTERVAL (m. cm) & ADOPT. LENGTH FROM COLLAR m. cm	GRAPHIC LOG	MARKERS (▼) & BRACKETS	OBSERVATIONS Commence with length from collar, either point (relates to marker) or 'from' to (relates to brackets). Attitude of bedding or foliation; Attitude & spacing of joints, Attitude, width & discription of sheared zones, [Attitude = angle of structure to long core axis]	MINERALIZATION	% MINERALIZATION (visual estimate)
	3.10	3.10	100		See page 6						
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	3.0	3.0	100								
	1.0	1.0	100		SILTSTONE minor SILTY SHALE Pale to medium grey, occasional brown and green tinge Moderately well bedded Some disruption Minor brecciation Some thin carbonate stringers	106.4-120.0 (13.6)			106.4 Contact 40° 106.6: 10 mm vein, 35°, po, minor carbonate, talc, trace py 108.6: 30x30mm patch of po 110.7: 6mm vein, 45°, qtz, carbonate, minor py 112.5 Bedding 30° 112.5: 5mm vein, 25°, sp, fluorite, minor carbonate, py trace cp 113.0: 10 mm vein, 35°, qtz, carbonate trace fluorite 119.5 Bedding 35°	pyrrhotite >> pyrite in stringers, blebs, disseminated along bedding	1%
					END OF HOLE 120m						

See page 6

5 cm

METALS EXPLORATION LTD. and SUBSIDIARY COMPANIES

MINERAL EXPLORATION
DIAMOND DRILL LOG
Scale 1:80

HOLE No. MBD 13
LOG SHEET 7 of 7

Preliminary Design for Form Oct 78

245

192246

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MT. BISCHOFF TIN PROSPECT

EXPLORATION LICENCE 13/79

TASMANIA

REPORT ON STAGE 2 A PROGRAMME

VOLUME 3 REPORT NO. 502

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192247

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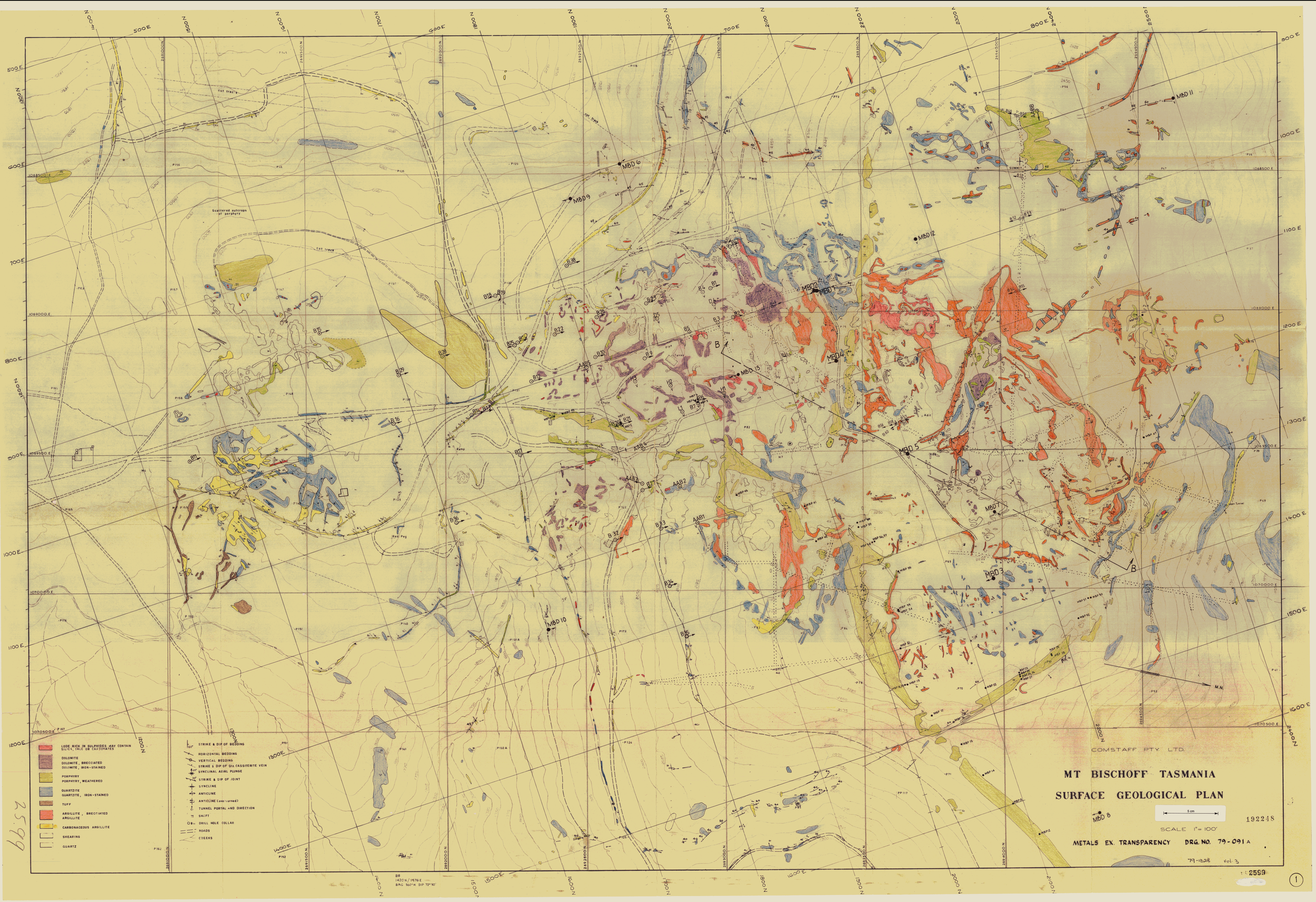
Pocket Number	Title		Drawing Number
1	1:1200	Surface Geological Plan	79-091A
2	1:1200	Surface Geological Interpretation Plan	79-296
3	1:1200	Stanhope Dyke Extended Area Geology and Sampling	79-147A
4	1:1200	Summit Area Sheet Geology	79-268
5	1:6000	Aeromagnetic Intensity Contours and Geology	79-203
6	1:1200	Summit Area Total Magnetic Intensity Readings and Contours	79-266
7	1:1200	Northern Dolomite Area Ground Magnetic Survey and Fact Geology	79-293


COMSTAFF PTY. LTD.
MT BISCHOFF TASMANIA
SURFACE GEOLOGICAL PLAN
SCALE 1" = 100'
METALS EX. TRANSPARENCY
DRG. NO. 79-091 A
192248
79-1328 Vol. 3
2599
LODE RICH IN SULPHIDES MAY CONTAIN SILICA, TALC OR CARBONATES
DOLOMITE
DOLOMITE, BRECCIATED
DOLOMITE, IRON-STAINED
PORPHYRY
PORPHYRY, WEATHERED
QUARTZITE
QUARTZITE, IRON-STAINED
TUFF
ARGILLITE, BRECCIATED
ARGILLITE
CARBONACEOUS ARGILLITE
SHEARING
QUARTZ
STRIKE & DIP OF BEDDING
HORIZONTAL BEDDING
VERTICAL BEDDING
STRIKE & DIP OF Qtz. CASSITERITE VEIN
SYNCLINAL AXIAL PLUNGE
STRIKE & DIP OF JOINT
SYNCLINE
ANTICLINE
ANTICLINE (overturned)
TUNNEL PORTAL AND DIRECTION
SHAFT
DRILL HOLE COLLAR
ROADS
CREEKS
MBD 6
MBD 9
MBD 11
MBD 12
MBD 13
MBD 4
MBD 5
MBD 7
MBD 3
MBD 10
MBD 8
Scattered outcrops of porphyry
cut track
Red Peg
Ramp
Conveyor
Main Tunnel
M.N.
1420 N / 1976 E
BRG 360° M DIP 72° 30'

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA

SURFACE GEOLOGICAL
INTERPRETATION PLAN

5 cm

192249

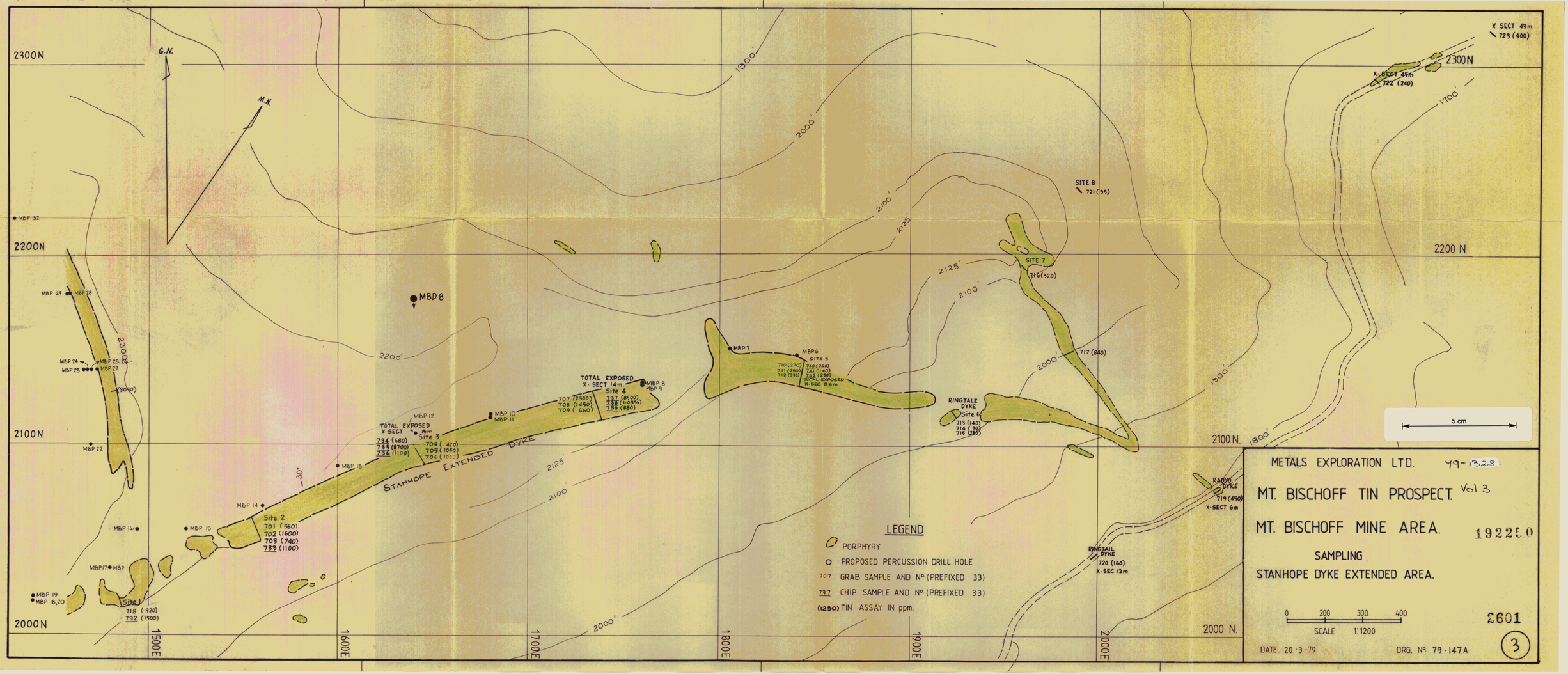
SCALE 1:1200 DATE: SEPT 79

REVISIONS: DRG. NO. 79-296

79-1328 Vol 3

(2)

2600


2300N
2200N
2100N
2000N
1500E
1600E
1700E
1800E
1900E
2000E
G.N.
M.N.
MBP 32
MBP 29
MBP 28
MBP 24
MBP 25
MBP 26
MBP 27
(3050)
MBP 22
MBP 16
MBP 17
MBP
MBP 19
MBP 18,20
Site 1
718 (920)
732 (1500)
MBD 8
MBP 14
MBP 15
MBP 12
MBP 10
MBP 11
MBP 8
MBP 9
TOTAL EXPOSED X-SECT 14m.
Site 4
737 (8500)
738 (10500)
735 (880)
707 (2300)
708 (1450)
709 (660)
TOTAL EXPOSED X-SECT 15m
Site 3
734 (480)
735 (8700)
736 (1100)
704 (420)
705 (1050)
706 (1000)
Site 2
701 (560)
702 (1600)
703 (740)
733 (1100)
STANHOPE EXTENDED DYKE
30'
MBP 7
MBP 6
SITE 5
710 (270)
711 (250)
712 (330)
740 (240)
741 (140)
742 (280)
TOTAL EXPOSED X-SEC. 8m
RINGTALE DYKE
Site 6
713 (140)
714 (190)
715 (280)
SITE 7
716 (920)
717 (840)
SITE 8
721 (95)
X SECT 43m
723 (400)
X-SECT 45m
722 (240)
RADIO DYKE
719 (450)
X-SECT 6m
RINGTAIL DYKE
720 (160)
X-SEC 12m
2200 N
2100 N.
2000 N.
1700'
1800'
1900'
2000'
2100'
2125'
2300'
5 cm
LEGEND
PORPHYRY
PROPOSED PERCUSSION DRILL HOLE
707 GRAB SAMPLE AND Nº (PREFIXED 33)
737 CHIP SAMPLE AND Nº (PREFIXED 33)
(1250) TIN ASSAY IN ppm.
METALS EXPLORATION LTD.
49-1328
MT. BISCHOFF TIN PROSPECT.
Vol 3
MT. BISCHOFF MINE AREA.
192250
SAMPLING
STANHOPE DYKE EXTENDED AREA.
0 200 300 400
SCALE 1:1200
2601
DATE. 20·3·79
DRG. Nº 79-147A
3

LODE RICH IN SULPHIDES MAY CONTAIN SILICA, TALC OR CARBONATES

DOLOMITE
DOLOMITE, BRECCIATED
DOLOMITE, IRON-STAINED

PORPHYRY
PORPHYRY, WEATHERED

QUARTZITE
QUARTZITE, IRON-STAINED

TUFF

ARGILLITE, BRECCIATED
ARGILLITE

CARBONACEOUS ARGILLITE

SHEARING

QUARTZ

TUNNEL PORTAL AND DIRECTION

M.E.L. DRILL HOLE

Full line grid – 200m intervals of the Metals Exploration Mine Area Grid.

Grid crosses – 200m intervals of the Australian Map Grid Zone 55 (based on Mt. Bischoff trig stn.)

N

SHEET LAYOUT

WEST FLANK

SUMMIT AREA

MINE AREA

EAST FLANK

METRES
0 50 100
0 100 200 400
FEET

SCALE 1:1200

METALS EXPLORATION LIMITED

MT. BISCHOFF TIN PROSPECT

79-1328 Vol. 3

SUMMIT AREA SHEET

5 cm

192251

DRAWN BY H.W. DATE 24-9-79

LAST REVISION BY DATE

DRAWING No. 79-268

2602

4

5410000 mN
5411000 mN
5412000 mN
5413000 mN
5414000 mN
5415000 mN

375000 mE
376000 mE
377000 mE
378000 mE
379000 mE

2000 N
3000 N
4000 W
3000 E
4000 E

WARATAH RIVER

NO RECOVERY CONTROL IN THIS AREA

1 2 3 4 5 6 7 8 9 10 11 12

REFERENCE

RECENT		Alluvium
TERTIARY	V V V	Basalt / Gravels
DEVONIAN		Quartz porphyry
CAMBRIAN		Greywackes and mudstone Basic rocks
PROTEROZOIC		Dolomite / Mineralized Dolomite
	c	Quartzite, siltstone and shales / Carbonaceous

SURVEY BOUNDARY

MAGNETIC LOW

MAGNETIC HIGH

CONTOUR VALUE IN GAMMAS

CONTOUR INTERVAL – 10 GAMMAS

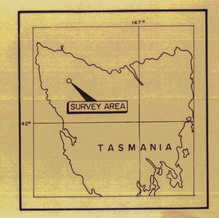
THE DATA HAS BEEN ADJUSTED FOR DIURNAL VARIATION WITH AN ADOPTED VALUE OF 62255 GAMMAS AT THE DIURNAL BASE STATION AT WYNYARD AERODROME 40°59'51" SOUTH & 145°43'34" EAST. THE SENSOR HEIGHT WAS 2 METRES.
THE DATUM FOR THE TOTAL MAGNETIC INTENSITY CONTOURS IS THE INTERNATIONAL GRID REFERENCE FIELD 1979.25.

SURVEY SPECIFICATIONS

AIRCRAFT	BELL 206 B
MAGNETOMETER	VARIAN 4937 A PROTON PRECESSION USING TOWED BIRD CONFIGURATION WITH 37m CABLE
DIURNAL RECORDER	GEOMETRICS G826 PROTON PRECESSION MAGNETOMETER WITH RUSTRAK RECORDER & CRYSTAL CLOCK
ALTIMETER	BONZER TRN-70
ANCILLIARY EQUIPMENT	GEOEX INTERVALOMETER, GEOEX DIGITAL AQUISITION SYSTEM
	CENTURY 444 6 CHANNEL ANALOGUE LIGHT BEAM RECORDER
	VINTEN 16 mm GROUND TRACKING CAMERA
READING INTERVAL	1·0 SECOND
NOMINAL AIRCRAFT SPEED	60 KNOTS
NOMINAL AIRCRAFT SURVEY ALTITUDE	90 METRES
SENSOR CLEARANCE	75 METRES

100 50 0 100 200 300 400 500 metres
SCALE IN METRES

LOCATION



192252

5 cm

GEOEX PTY. LTD. 79-1228 Vol 3

METALS EXPLORATION N.L.

MT. BISCHOFF AREA – TAS.

AEROMAGNETIC TOTAL INTENSITY CONTOURS AND GEOLOGY

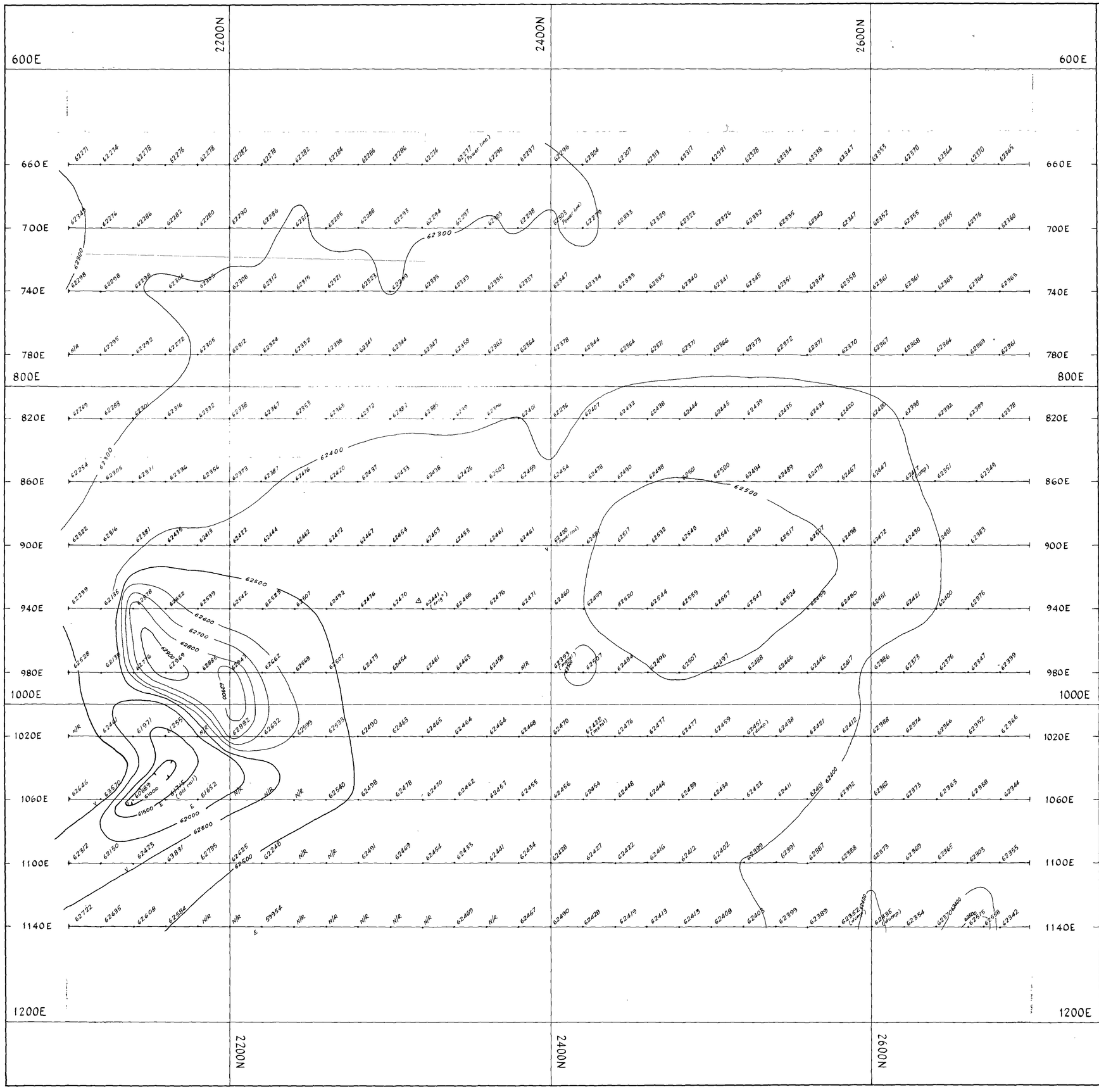
SCALE 1:6000

SURVEYED MARCH '79			APPROVED J.E.HAIGH
DRAWN R.G.Z.		PROJECT № 79187	SHEET № 1

M.E.L. DRG. NO 79-203

2603

5



M.E.L. GRID NORTH — G.N.

MAGNETIC NORTH — M.N.

Contour Interval: 100γ (with 500γ index)
Survey by D Barrell using G-816 Magnetometer
Readings every 20m on 40m spaced lines

V — VARIABLE
NOT REPEATABLE WITHIN 20-30γ 50 READING AVERAGED.

E — ERRATIC
NOT REPEATABLE WITHIN 100's γ 50 READING AVERAGED.

N/R — NO READING
DANGEROUS GROUND, OR STEEP SLOPES, OR NEAR SCRAP IRON.

METRES
0 50 100
0 100 200 400
FEET
SCALE 1:1200

METALS EXPLORATION LIMITED

MT. BISCHOFF TIN PROSPECT

THE SUMMIT AREA
GROUND MAGNETIC SURVEY
TOTAL MAGNETIC INTENSITY READINGS

5 cm

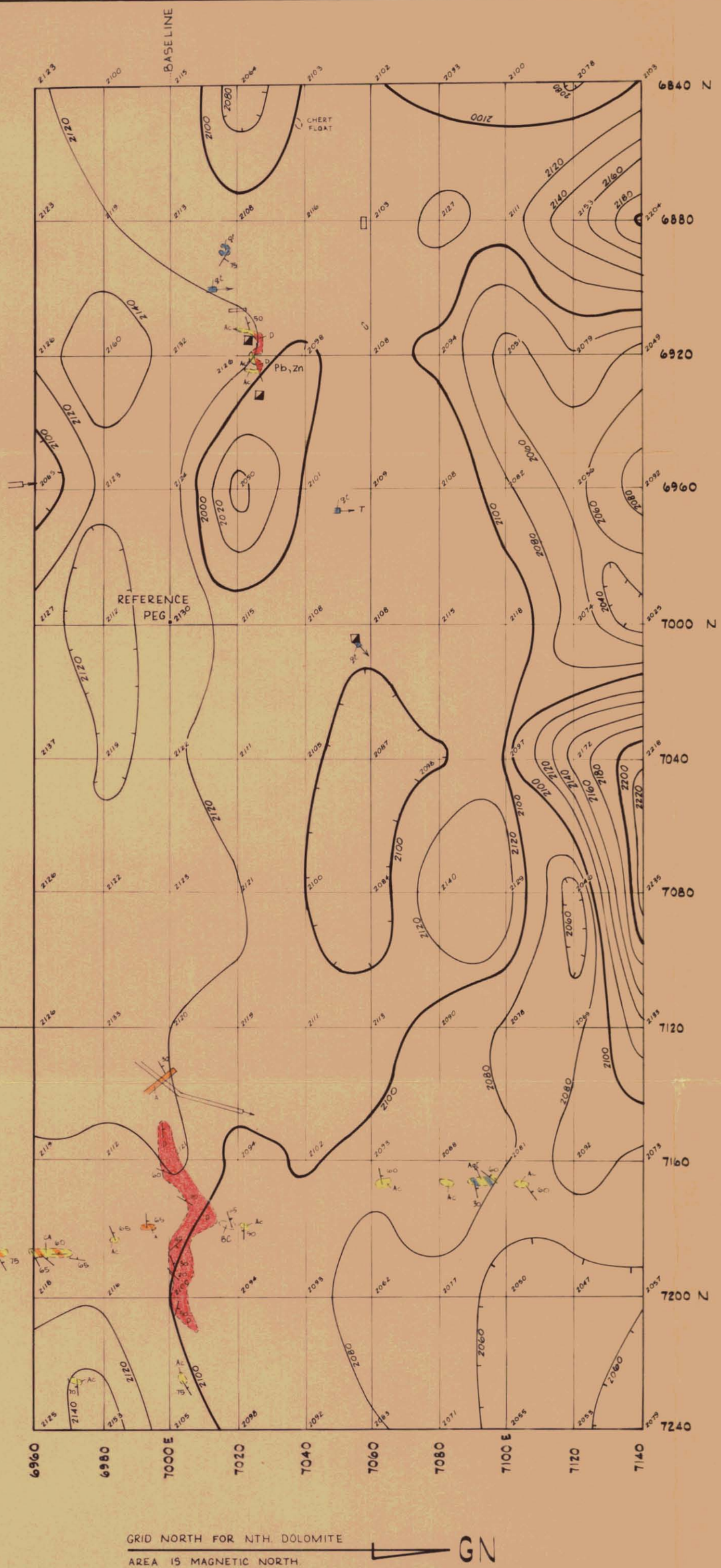
192250

DRAWN BY: C. IRWIN DATE: 9-8-79

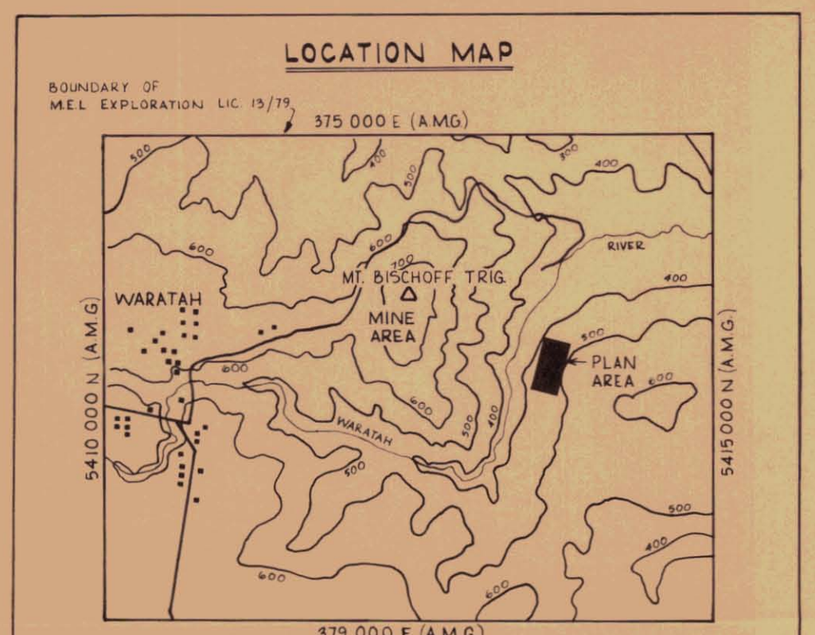
DRG. NO. 79-266 A (6)

79-1328 Vol 3

2004



LOCATION MAP



CONTOURS OF TOTAL MAGNETIC INTENSITY .

2180
2200
2220

CONTOUR INTERVAL 20 GAMMAS . ADD 60,000 GAMMAS TO ALL READINGS TO OBTAIN MEASURED VALUE OF TOTAL MAGNETIC INTENSITY.

5 cm

D — DOLOMITE

qt — QUARTZITE

A — ARGILLITE

Ac — CARBONACEOUS ARGILLITE

CA — ARGILLITE AND CARBONACEOUS ARGILLITE

A qt — ARGILLITE AND QUARTZITE

BC — BLUE AND BLACK CHERT

60 — STRIKE AND DIP OF BEDDING

TUNNEL PORTAL AND DIRECTION

SHAFT

GEOLOGICAL BOUNDARY

THE LOCATION OF REFERENCE PEG IS FROM COMSTAFF PLAN SHEET 7, DRG No TAS-2-67, IT HAS APPROX. A.M.G. CO-ORDINATES OF 5413 726 m N AND 376 945 m E.

NORTHERN DOLOMITE AREA GRID IS DIFFERENT FROM M.E.L GRID (MINE AREA)

METALS EXPLORATION LIMITED

79-1328

MT. BISCHOFF TIN PROSPECT

Vol. 3

192254

"NORTHERN DOLOMITE" AREA

GROUND MAGNETIC SURVEY AND FACT GEOLOGY

(7)

MAGNETIC SURVEY BY D BARREL USING GEOMETRICS G-816, PROTON MAGNETOMETER, LATE AUGUST 1979.

GEOLOGY FROM COMSTAFF PLAN , SHEET 7 AND 10.

DATE : 21·9·79 SCALE 1:1200 DRG. No. 79-293

DRAWN - H.W

2605

192255

217

D of M | A.O. | CG | CC&M | D.S.M.E. | Registrar | E&IL
RECEIVED 29 OCT 1979
ANSWERED
DEPT OF MINES

MT. BISCHOFF TIN PROSPECT

EXPLORATION LICENCE 13/79

TASMANIA

REPORT ON STAGE 2 A PROGRAMME

VOLUME 4 Part 1 REPORT NO. 502

DISTRIBUTION:	Copy No.		
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243

192256

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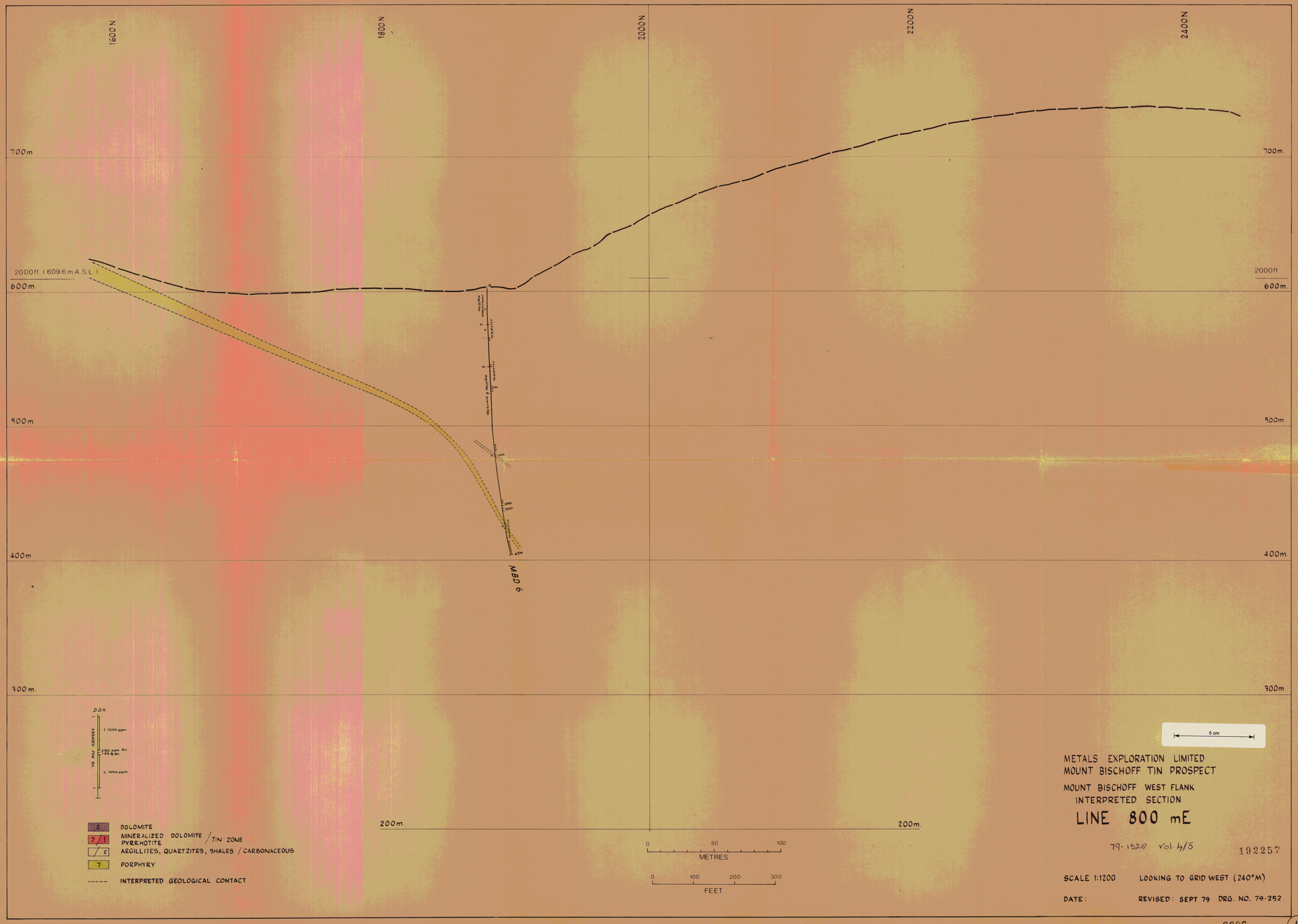
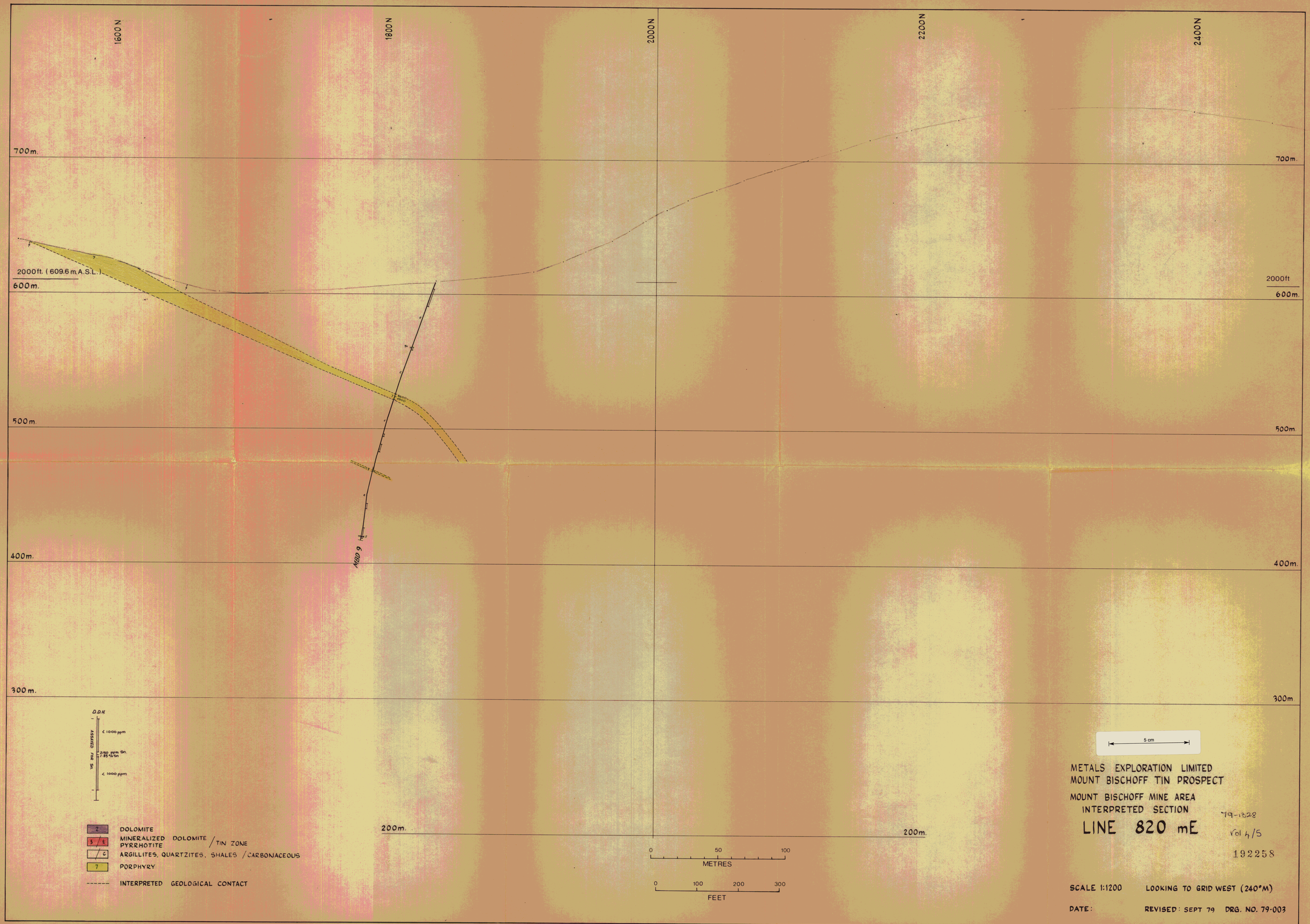
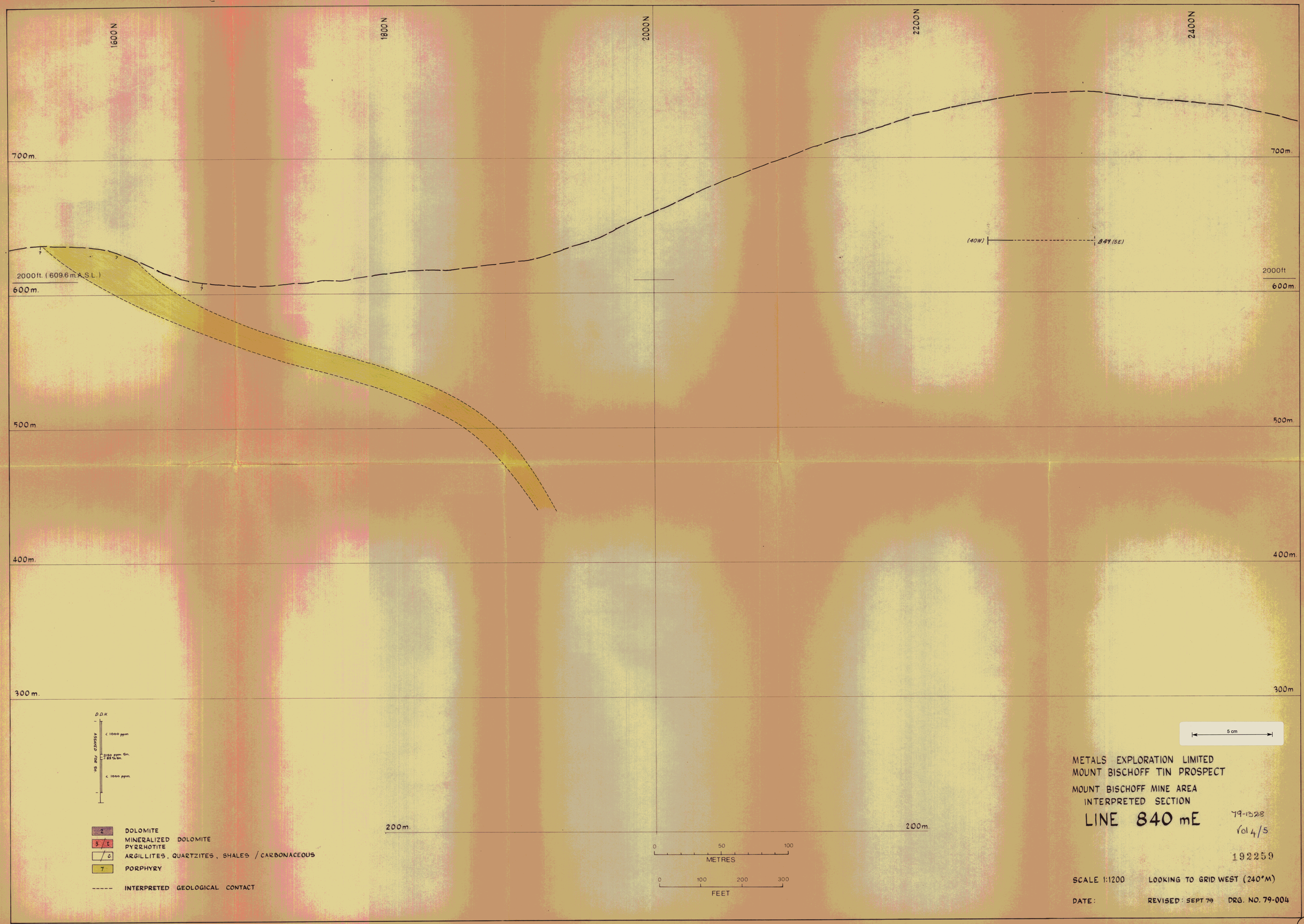
Pocket Number	Title			Drawing Number
1	1:1200 Interpreted Geological Section		800E	79-252
2	ditto		820E	79-003
3	ditto		840E	79-004
4	ditto	showing reserves	860E	79-297
5	ditto	" "	880E	79-298
6	ditto	" "	900E	79-299
7	ditto	" "	920E	79-300
8	ditto	" "	940E	79-301
9	ditto	" "	960E	79-302
10	ditto	" "	980E	79-303
11	ditto	" "	1000E	79-304
12	ditto	" "	1020E	79-305
13	ditto	" "	1040E	79-306
14	ditto	" "	1060E	79-307
15	ditto	" "	1080E	79-308
16	ditto	" "	1100E	79-309
17	ditto	" "	1120E	79-310
18	ditto	" "	1140E	79-311
19	ditto	" "	1160E	79-312
20	ditto	" "	1180E	79-313
21	ditto	" "	1200E	79-314
22	ditto	" "	1220E	79-315


1600 N
1800 N
2000 N
2200 N
2400 N
700m
2000ft (609.6 m A.S.L.)
600m
500m
400m
300m
200m
MBD 6
D.D.H.
< 1000 ppm
2160 ppm Sn
1.88 % Sn
< 1000 ppm
ASSAYED FOR Sn
2 DOLOMITE
3/1 MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE
/ C ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
----- INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF WEST FLANK
INTERPRETED SECTION
LINE 800 mE
79-1328 Vol. 4/5
192257
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE:
REVISED: SEPT 79 DRG. NO. 79-252
MASTER SECTION DRG. NO. 79-215
2603
1.


1600 N
1800 N
2000 N
2200 N
2400 N
700m.
600m.
500m.
400m.
300m.
200m.
2000ft. (609.6 m A.S.L.)
2000ft
MBD 9
D.D.H.
ASSAYED FOR Sn.
< 1000 ppm
2150 ppm Sn.
1.85 % Sn
< 1000 ppm
2 DOLOMITE
3 / t MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE
/ c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
------ INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
LINE 820 mE
79-1328
Vol 4/5
192258
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE:
REVISED: SEPT 79
DRG. NO. 79-003

2607 (2)


1600 N
1800 N
2000 N
2200 N
2400 N
700m.
600m.
500m.
400m.
300m.
200m.
2000ft. (609.6 m A.S.L.)
(40W)
B49 (5E)
D.D.H.
ASSAYED FOR Sn.
< 1000 ppm
2150 ppm Sn.
1.83 % Sn.
< 1000 ppm.
2 DOLOMITE
3/t MINERALIZED DOLOMITE
PYRRHOTITE
/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
----- INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
LINE 840 mE
79-1328
Vol 4/5
192259
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE:
REVISED: SEPT 79
DRG. NO. 79-004

2608

3

1600N 1800N 2000N 2200N 2400N

700m. 700m

2000ft. (609.6m A.S.L.)

600m. 2000ft 600m

500m. 500m

400m. 400m

300m. 300m

200m 200m

D.D.H.

ASSAYED FOR Sn

< 1000 ppm

≥ 1000 ppm Sn. ≤ 88% Sn.

< 1000 ppm

RESERVE BOUNDARIES 0·3% Sn CUTOFF

DRILL INDICATED

DRILL INFERRED

POSSIBLE

2 DOLOMITE

3/t MINERALIZED DOLOMITE PYRRHOTITE / TIN ZONE

/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS

7 PORPHYRY

INTERPRETED GEOLOGICAL CONTACT

0 50 100 METRES

0 100 200 300 FEET

5 cm

METALS EXPLORATION LIMITED

MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF MINE AREA

INTERPRETED SECTION

LINE 860 mE

SHOWING RESERVES

79-1328

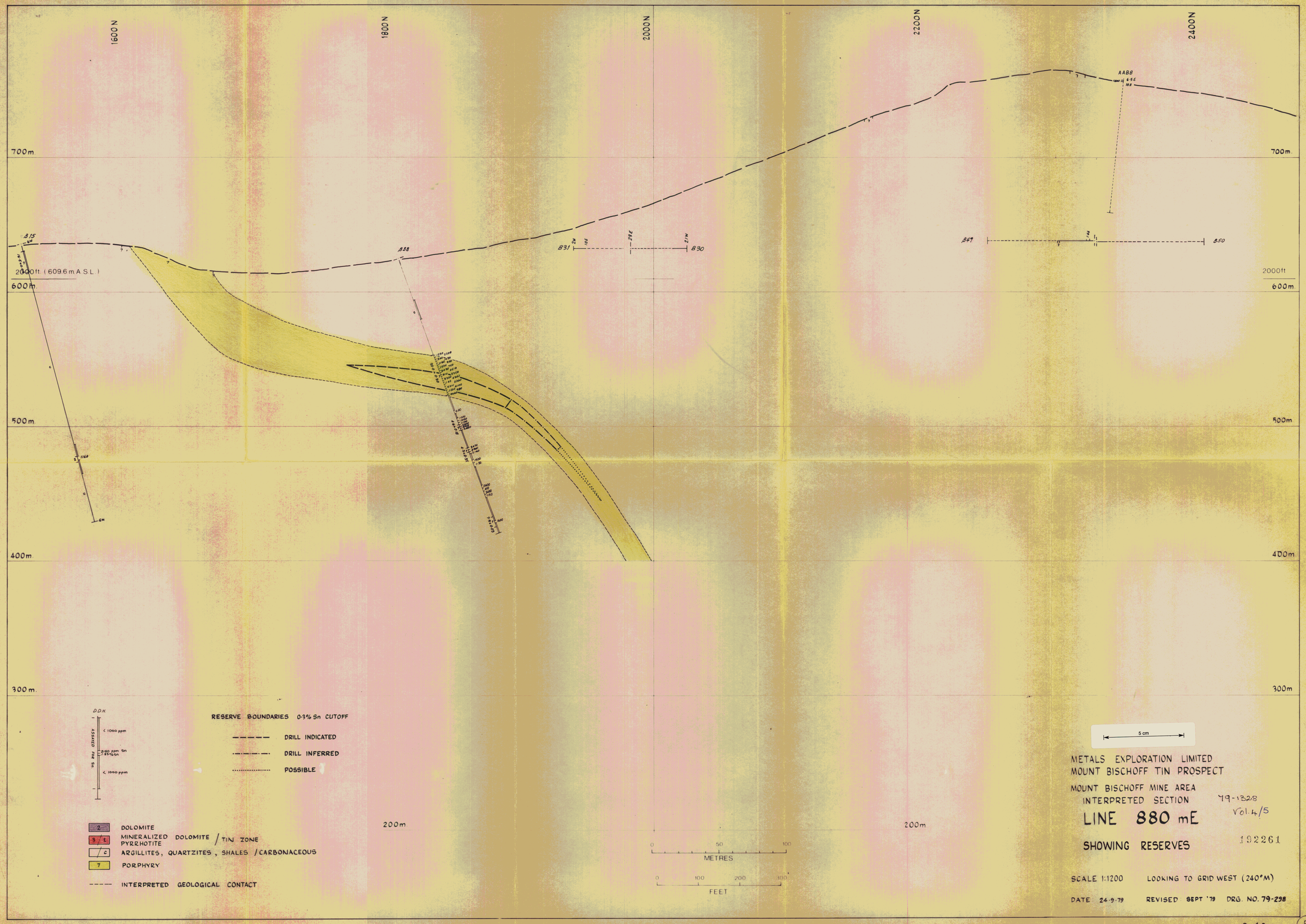
Vol 4/5

192260

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

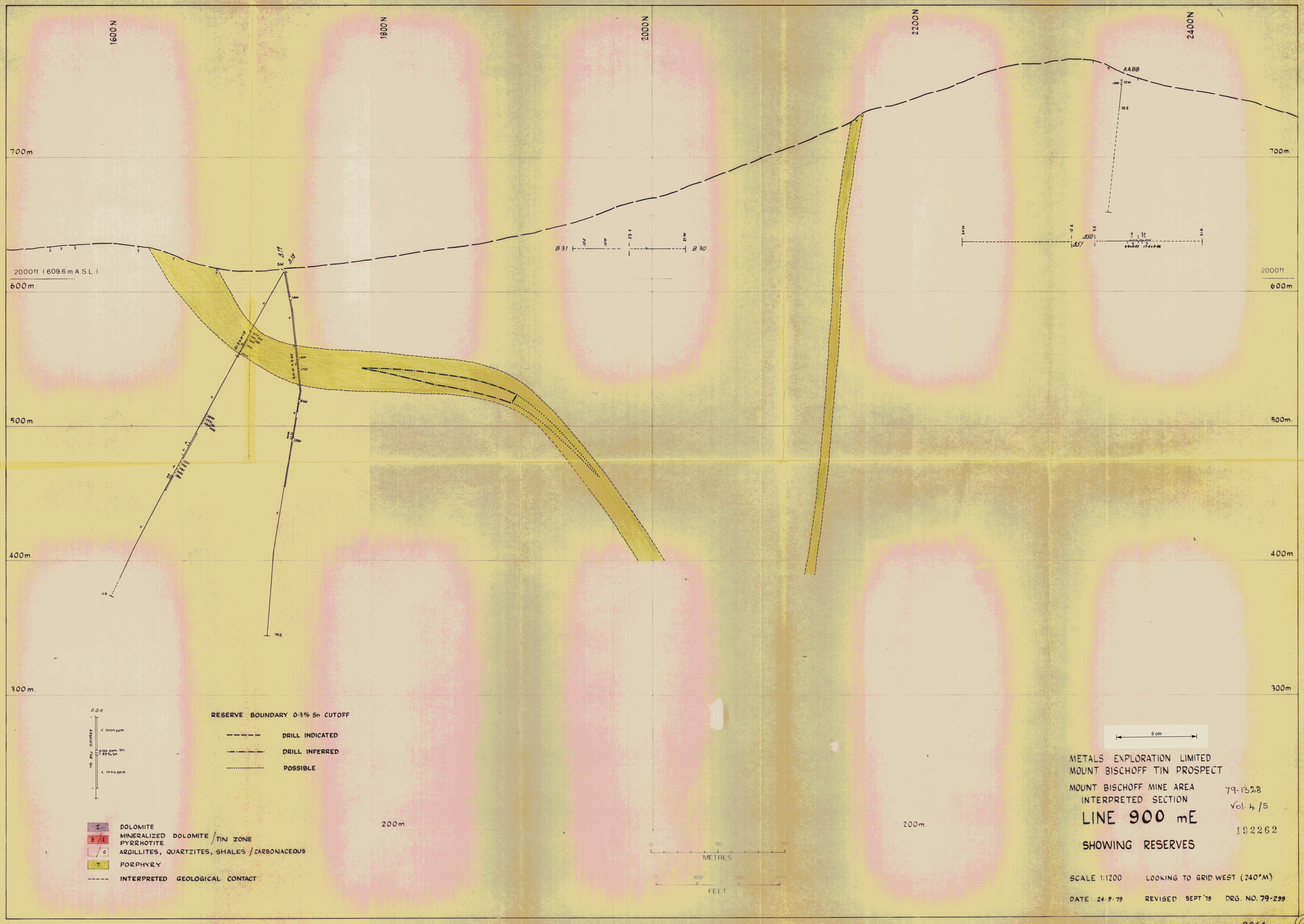
DATE: 24·9·79 REVISED: SEPT '79 DRG. NO. 79-297

2609 (4)


1600 N
1800 N
2000 N
2200 N
2400 N
700m
600m
500m
400m
300m
200m
2000ft (609.6 m A.S.L.)
2000ft
B15
B38
B31
B30
B49
B50
AABB
D.D.H.
ASSAYED FOR Sn.
< 1000 ppm
2150 ppm Sn
1.85% Sn
< 1000 ppm
RESERVE BOUNDARIES 0·3% Sn CUTOFF
DRILL INDICATED
DRILL INFERRED
POSSIBLE
2 DOLOMITE
3/t MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE
/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
LINE 880 mE
SHOWING RESERVES
79-1328
Vol. 4/5
192261
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE 24·9·79
REVISED SEPT '79
DRG. NO. 79-298

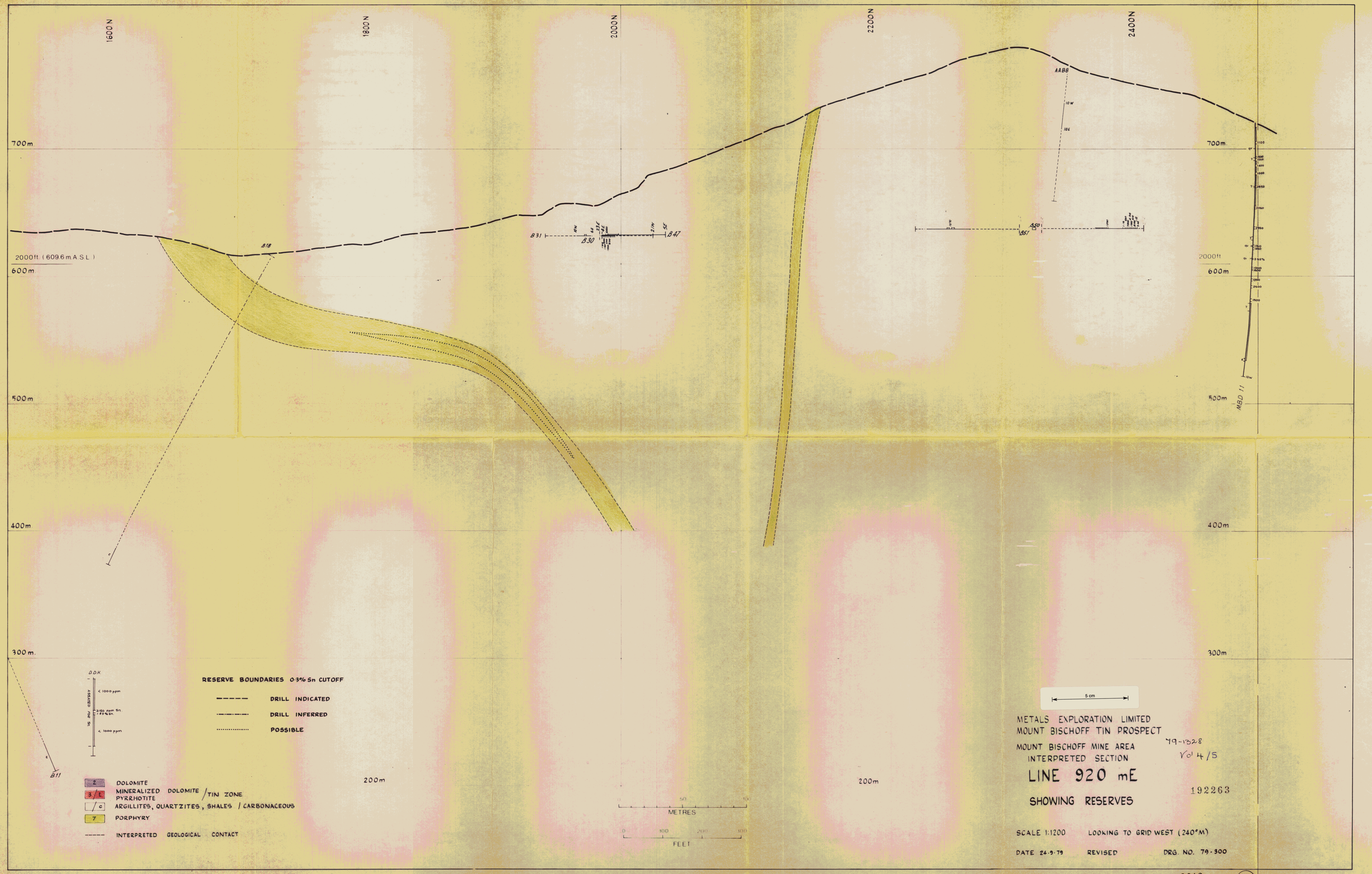
2710

5


1600N
1800N
2000N
2200N
2400N
700m
600m
500m
400m
300m
200m
2000ft (609.6m A.S.L.)
2000ft
AABB
B31
B30
B19
B18
B50
B51
D.D.H.
< 1000 ppm
2150 ppm Sn
1.83% Sn
< 1000 ppm
RESERVE BOUNDARY 0·3% Sn CUTOFF
DRILL INDICATED
DRILL INFERRED
POSSIBLE
2 DOLOMITE
3/t MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE
/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
INTERPRETED GEOLOGICAL CONTACT
METRES
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
LINE 900 mE
SHOWING RESERVES
79-1328
Vol. 4/5
192262
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE 24·9·79
REVISED SEPT '79
DRG. NO. 79-299

2611

6


1600 N
1800 N
2000 N
2200 N
2400 N
700m
600m
500m
400m
300m
200m
2000ft (609.6 m A.S.L.)
B18
B31
B30
B47
B50
B51
AABB
MBD 11
B11
D.D.H.
ASSAYED FOR Sn
< 1000 ppm
2160 ppm Sn
1.83% Sn
< 1000 ppm
RESERVE BOUNDARIES 0.3% Sn CUTOFF
DRILL INDICATED
DRILL INFERRED
POSSIBLE
2 DOLOMITE
3/t MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE
/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
INTERPRETED GEOLOGICAL CONTACT
METRES
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
LINE 920 mE
SHOWING RESERVES
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE 24.9.79
REVISED
DRG. NO. 79-300
79-1328
Vol 4/5
192263
MASTER SECTION DRG. NO. 79-054A

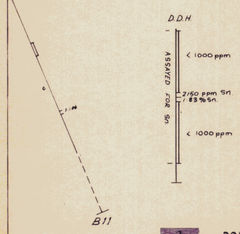
2612

7

1600 N
1800 N
2000 N
2200 N
2400 N

700m
2000ft. (609.6m A.S.L.)
600m.
500m
400m
300m
200m

829
828
AABB
10W
10E
34W
12E
9E
51E
D850
1257



RESERVE BOUNDARIES 0·3% Sn CUTOFF

DRILL INDICATED

DRILL INFERRED

POSSIBLE

2 DOLOMITE

3/t MINERALIZED DOLOMITE / TIN ZONE PYRRHOTITE

/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS

7 PORPHYRY

INTERPRETED GEOLOGICAL CONTACT

0 50 100
METRES

0 100 200 300
FEET

5 cm

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION

79-1328
Vol 2/5

LINE 940 mE

192264

SHOWING RESERVES

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: 24·9·79 REVISED SEPT '79 DRG. NO. 79-301

2613

8

1600 N

1800 N

2000 N

2200 N

2400 N

700m

2000ft (609.6 m A.S.L)

600m

500m

400m

300m

200m

B11

B5 (30m W)

B25 (1W)

B24 (3W)

B22 (5W)

B26 (8W)

B23 (6W)

B4

B1

B3

AABB

10W

10E

(54W)

B51 (8W)

2000ft

600m

500m

400m

300m

200m

RESERVE BOUNDARIES 0·3% Sn CUTOFF

DRILL INDICATED

DRILL INFERRED

POSSIBLE

< 1000 ppm

1000 ppm Sn - 85% Sn

< 1000 ppm

2 DOLOMITE

3 / L MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE

/ C ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS

7 PORPHYRY

INTERPRETED GEOLOGICAL CONTACT

0 50 100

METRES

0 100 200 300

FEET

5 cm

METALS EXPLORATION LIMITED

MOUNT BISCHOFF TIN PROSPECT 79-1328

MOUNT BISCHOFF MINE AREA

INTERPRETED SECTION Vol 4/5

LINE 960 mE 192265

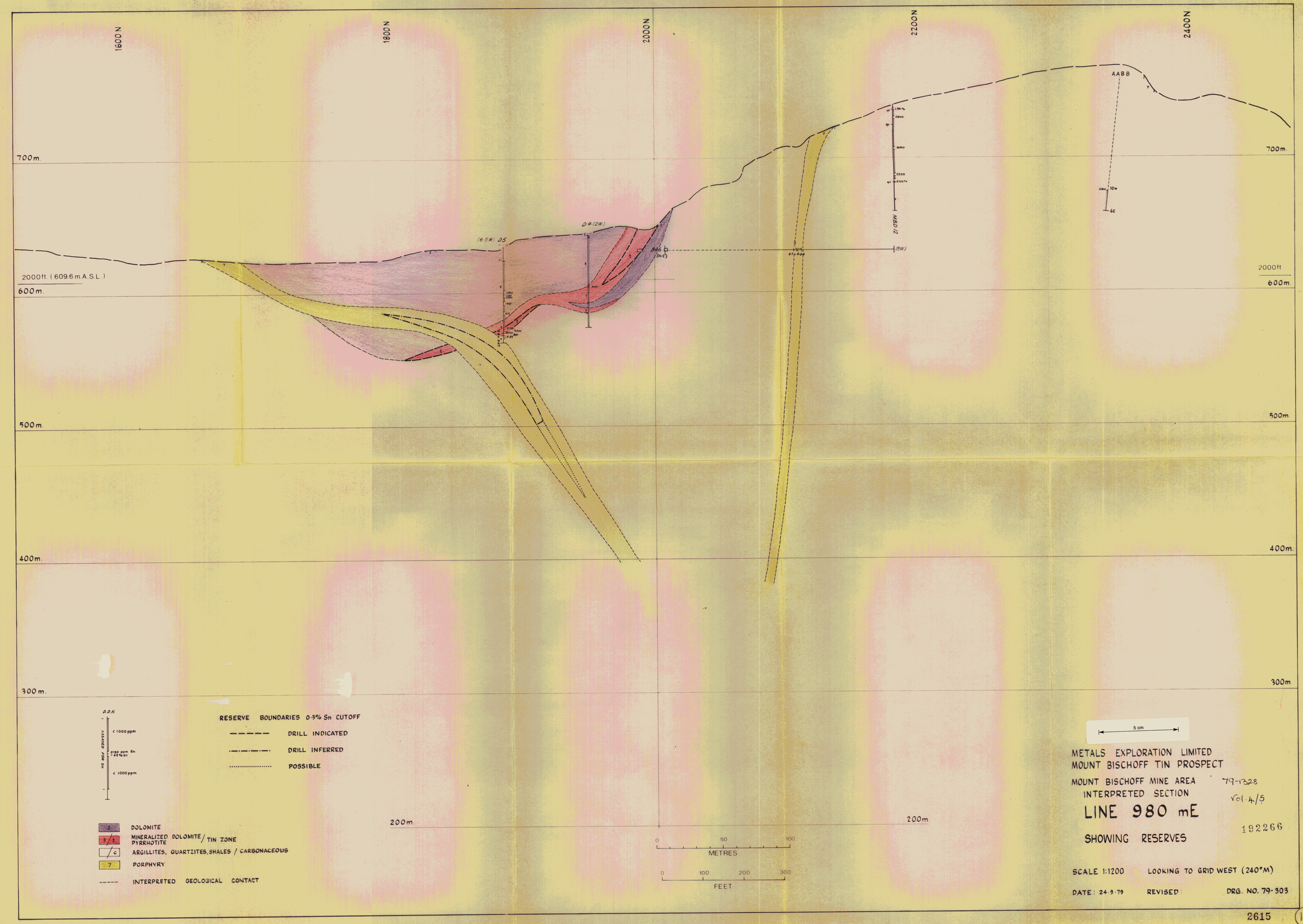
SHOWING RESERVES

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE 24-9-79 REVISED SEPT '79 DRG. NO. 79-302

2014

9


1600 N
1800 N
2000 N
2200 N
2400 N
700m.
600m.
500m.
400m.
300m.
200m.
2000ft. (609.6 m A.S.L.)
2000ft
AAB8
MBD12
D4 (2W)
(6·5W) D5
(5W)
D.D.H.
ASSAYED FOR Sn
< 1000 ppm
2150 ppm Sn.
1·65% Sn
< 1000 ppm
RESERVE BOUNDARIES 0·3% Sn CUTOFF
DRILL INDICATED
DRILL INFERRED
POSSIBLE
2 DOLOMITE
3/t MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE
/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
LINE 980 mE
SHOWING RESERVES
79-1328
Vol. 4/5
192266
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE: 24·9·79
REVISED:
DRG. NO. 79-303

2615 (10)

1600 N

1800 N

2000 N

2200 N

2400 N

700m.

600m.

500m.

400m.

300m.

200m

2000ft. (609.6 m A.S.L.)

B16 (7W)

B12 (4W)

AAB5

B10 (7W)

B5 (1W)

B3

B2

MBD2

MBD1

B52

B46

B53

2000ft

D.D.H.

ASSAYED FOR Sn

< 1000 ppm

1160 ppm Sn. 85 %Sn

< 1000 ppm

RESERVE BOUNDARIES 0·3% Sn CUTOFF

DRILL INDICATED

DRILL INFERRED

POSSIBLE

2 DOLOMITE

3 / t MINERALIZED DOLOMITE / TIN ZONE PYRRHOTITE

/ C ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS

7 PORPHYRY

INTERPRETED GEOLOGICAL CONTACT

0 50 100 METRES

0 100 200 300 FEET

5 cm

METALS EXPLORATION LIMITED

MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF MINE AREA

INTERPRETED SECTION

LINE 1000 mE

SHOWING RESERVES

79-132-8

Vol 4/5

192267

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: 24.9.79 REVISED: SEPT '79 DRG. NO. 79-304

2616

11

1600N 1800N 2000N 2200N 2400N

700m. 700m.

2000ft. (609.6m A.S.L.) 2000ft

600m. 600m.

500m. 500m

400m. 400m.

300m. 300m

200m 200m

B14 (9.5m W) B13 (9.5m W) B9 (9.5m W)

(3.0m W) (6.0m W)

D.D.H. ASSAYED FOR Sn

< 1000 ppm

2/50 ppm Sn. / 0.1% Sn

< 1000 ppm

RESERVE BOUNDARIES 0.3% Sn CUTOFF

DRILL INDICATED

DRILL INFERRED

POSSIBLE

2 DOLOMITE

3/t MINERALIZED DOLOMITE / TIN ZONE PYRRHOTITE

/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS

7 PORPHYRY

INTERPRETED GEOLOGICAL CONTACT

0 50 100 METRES

0 100 200 300 FEET

to Section

5 cm

METALS EXPLORATION LIMITED

MOUNT BISCHOFF TIN PROSPECT 79-1328

MOUNT BISCHOFF MINE AREA V614/5

INTERPRETED SECTION

LINE 1020 mE 192268

SHOWING RESERVES

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: 24.9.79 REVISED: SEPT '79 DRG. NO. 79-305

2617 (12)

1600 N
1800 N
2000 N
2200 N
2400 N

700m.
2000ft. (609.6 m.A.S.L.)
600m.
500m.
400m.
300m.
200m.

2000ft.
600m.
500m.
400m.
300m.
200m.

H3
H2
Pr=RW
SG=RW
no recovery

D.D.H
ASSAYED FOR Sn
< 1000 ppm
3/50 ppm Sn. / 65% Sn
< 1000 ppm

RESERVE BOUNDARIES 0·3% Sn CUTOFF

DRILL INDICATED
DRILL INFERRED
POSSIBLE

2 DOLOMITE
3/t MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE
/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY

INTERPRETED GEOLOGICAL CONTACT

0 50 100
METRES

0 100 200 300
FEET

5 cm

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT 79-1328
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION Vol 4 /5

LINE 1040 mE

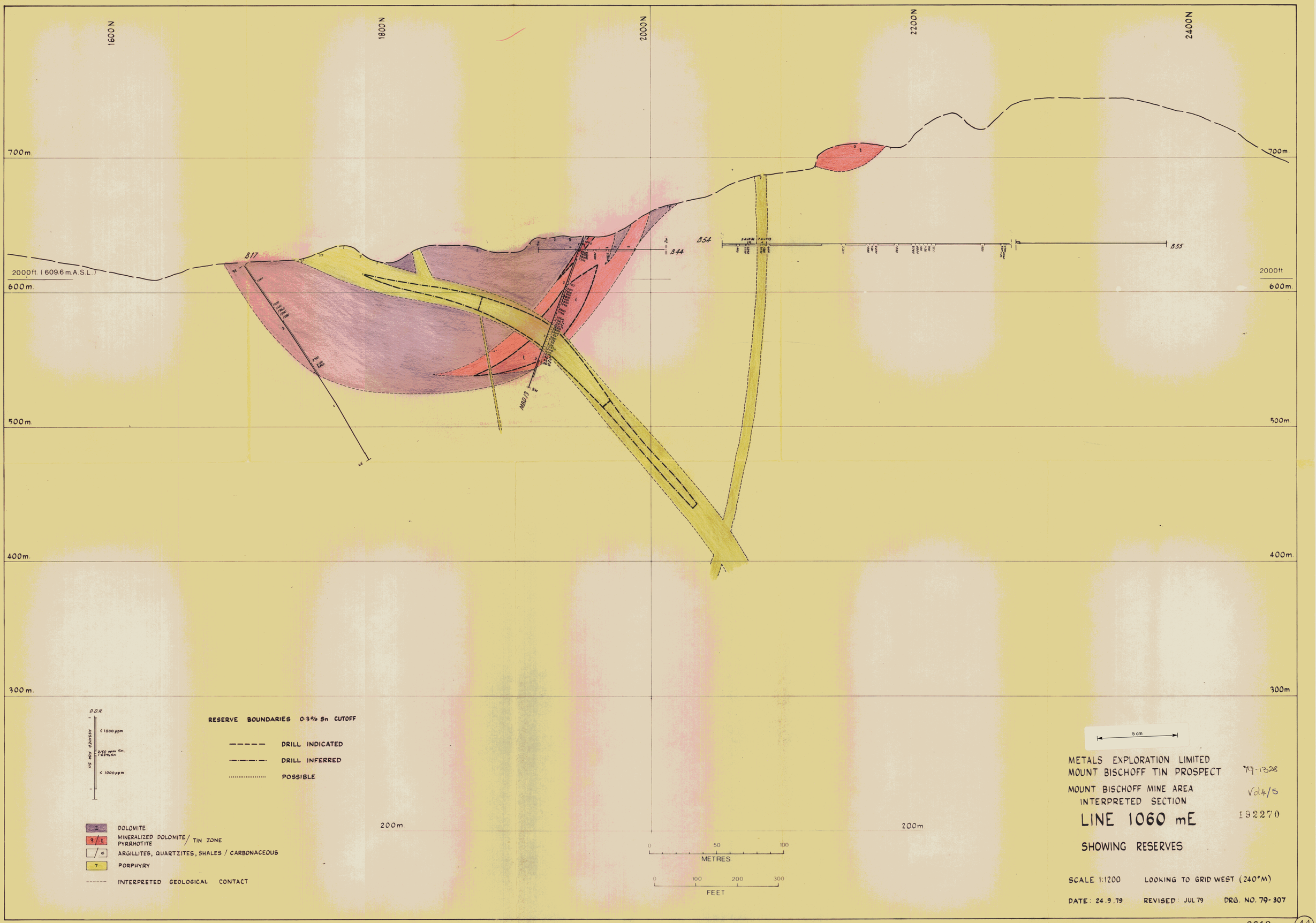
132269

SHOWING RESERVES

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: 24.9.79 REVISED: SEPT '79 DRG. NO. 79-306

2618 (13)


1600 N
1800 N
2000 N
2200 N
2400 N
700m.
600m.
500m.
400m.
300m.
200m.
2000ft. (609.6 m A.S.L.)
2000ft
B17
B44
B54
B55
MBD13
D.D.H.
ASSAYED FOR Sn
< 1000 ppm
2150 ppm Sn.
1·63% Sn
< 1000 ppm
RESERVE BOUNDARIES 0·3% Sn CUTOFF
DRILL INDICATED
DRILL INFERRED
POSSIBLE
2 DOLOMITE
3/t MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE
/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
79-1328
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
Vol4/5
LINE 1060 mE
192270
SHOWING RESERVES
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE: 24.9.79
REVISED: JUL 79
DRG. NO. 79-307

2619 (14)

1600 N
1800 N
2000 N
2200 N
2400 N

700m.
2000ft. (609.6m A.S.L.)
600m.
500m.
400m.
300m.
200m.

700m.
2000ft
600m.
500m.
400m.
300m.
200m.

MBD4
H1
L1
B20
B21
B5
B6
D
D

D.D.H.
ASSAYED FOR Sn
< 1000 ppm
≥ 1000 ppm Sn. / 0.1%Sn
< 1000 ppm

RESERVE BOUNDARIES 0·3% Sn CUTOFF

DRILL INDICATED
DRILL INFERRED
POSSIBLE

2 DOLOMITE
3/t MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE
c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY

INTERPRETED GEOLOGICAL CONTACT

0 50 100
METRES
0 100 200 300
FEET

5 cm

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
LINE 1080 mE
SHOWING RESERVES

79-1328
Vol 4/5
192271

SCALE 1:1200 LOOKING TO GRID WEST (240°M)
DATE: 24.9.79 REVISED: SEPT '79 DRG. NO. 79-308

2620
15

1600 N
1800 N
2000 N
2200 N
2400 N

700m.
2000ft. (609.6m.A.S.L.)
600m.
500m.
400m.
300m.
200m.

AAB4

D
D

t
t

2000ft
600m.
500m.
400m.
300m.
200m.

D.D.H.
ASSAYED FOR Sn.
< 1000 ppm
2150 ppm Sn. = 0.1% Sn
< 1000 ppm

RESERVE BOUNDARIES 0·3% Sn CUTOFF

----- DRILL INDICATED
-·-·-·- DRILL INFERRED
..... POSSIBLE

2 DOLOMITE
3 / t MINERALIZED DOLOMITE / TIN ZONE PYRRHOTITE
/ c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
----- INTERPRETED GEOLOGICAL CONTACT

0 50 100
METRES
0 100 200 300
FEET

5 cm

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION

LINE 1100 mE

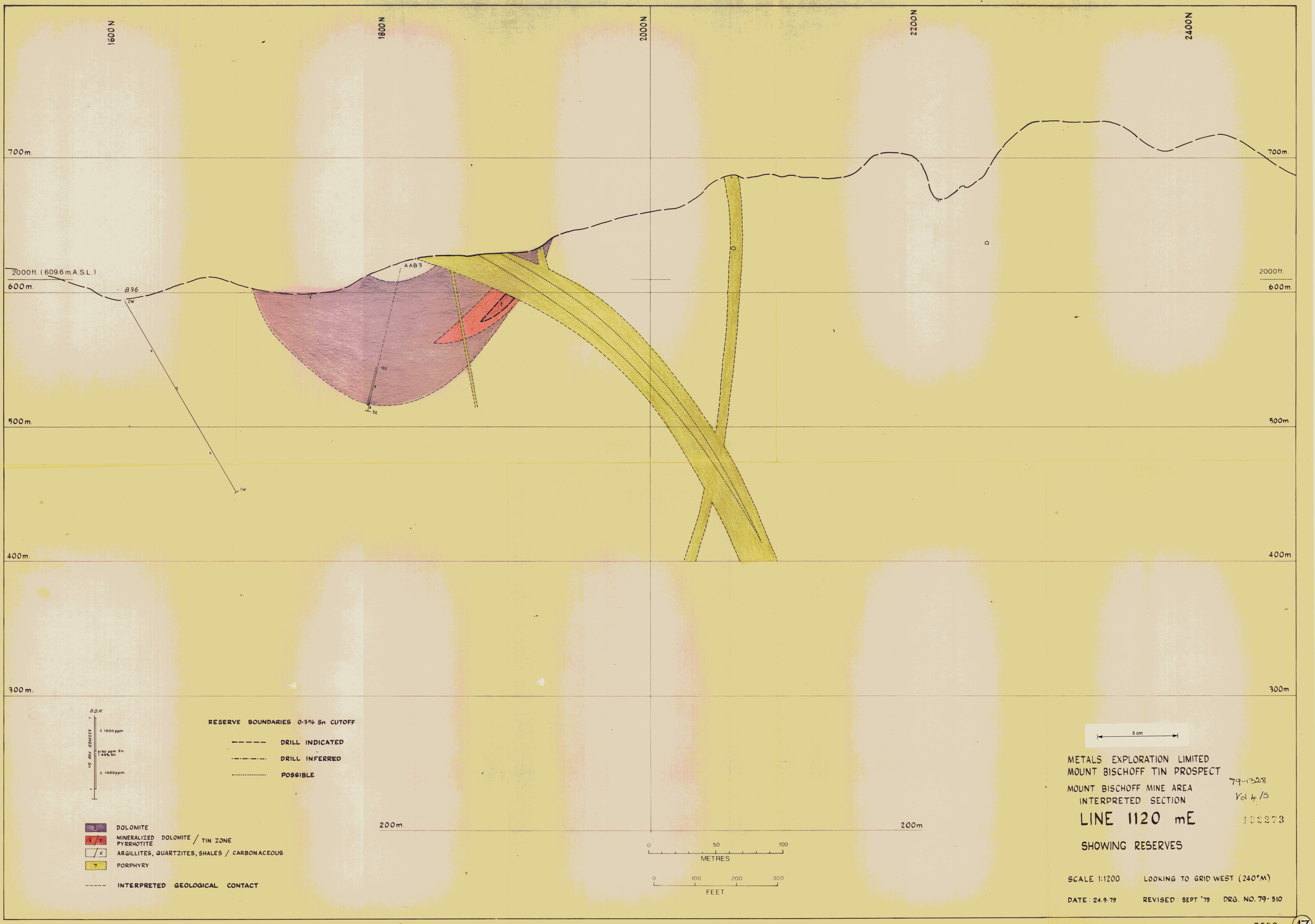
SHOWING RESERVES

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

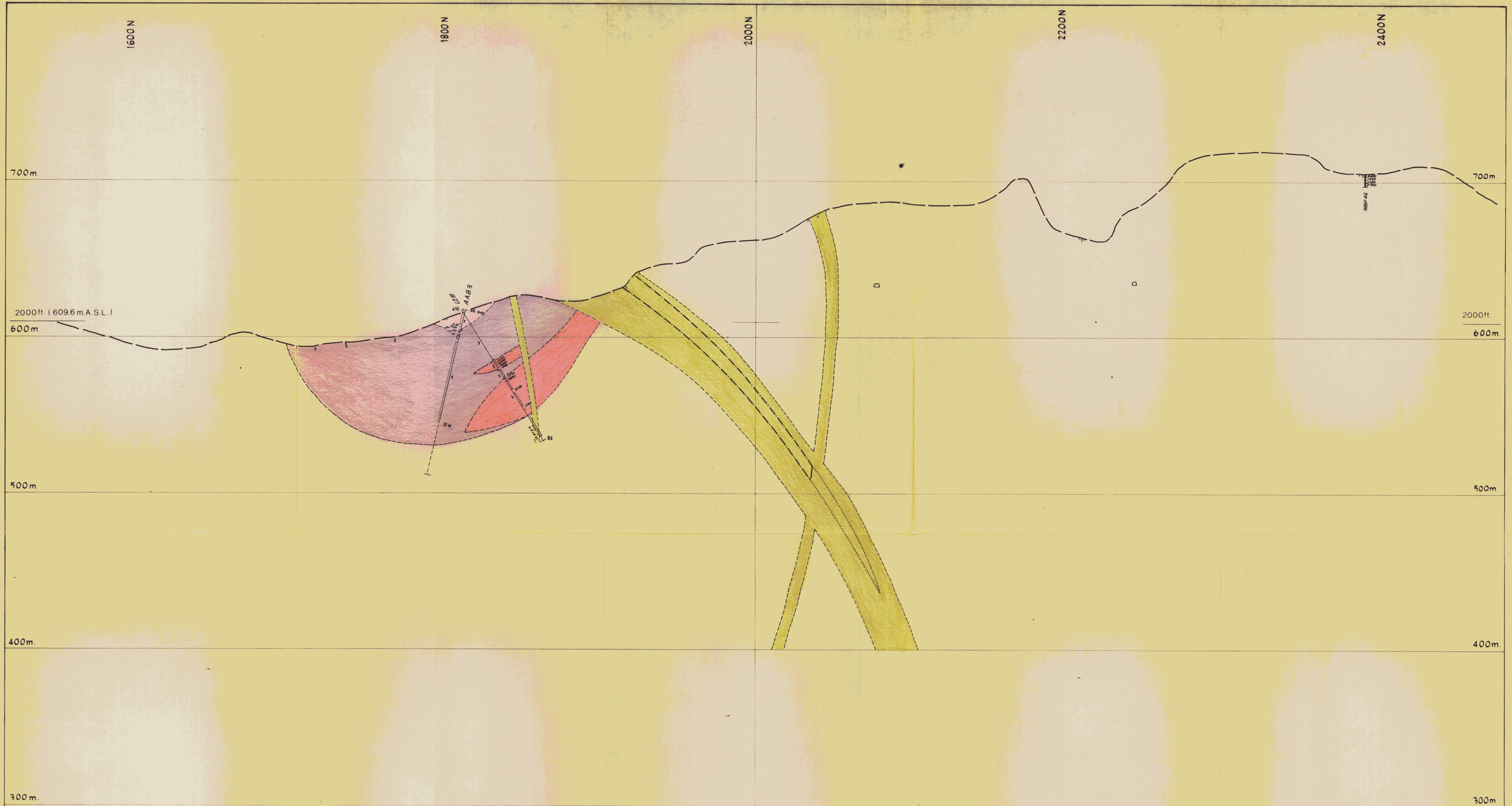
DATE: 24·9·79 REVISED: SEPT '79 DRG. NO. 79-309

79-1328
Vol 4/5
192272

2621
16


1600 N
1800 N
2000 N
2200 N
2400 N
700m.
2000ft. (609.6 m A.S.L.)
600m.
500m.
400m.
300m.
200m.
B36
AAB3
D
D.D.H.
ASSAYED FOR Sn
< 1000 ppm
2150 ppm Sn
1.45% Sn
< 1000ppm
RESERVE BOUNDARIES 0·3% Sn CUTOFF
DRILL INDICATED
DRILL INFERRED
POSSIBLE
DOLOMITE
MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE
ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
PORPHYRY
INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
LINE 1120 mE
SHOWING RESERVES
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE: 24.9.79
REVISED: SEPT '79
DRG. NO. 79-310
79-1328
Vol 4/5
132273

2622 (17)



D.D.H.

ASSAYED FOR Sn

< 1000 ppm

2150 ppm Sn
1.63% Sn

< 1000 ppm

RESERVE BOUNDARIES 0·3% Sn CUTOFF

– – – – –	DRILL INDICATED
·–·–·–·–·	DRILL INFERRED
··············	POSSIBLE

2	DOLOMITE
3 / t	MINERALIZED DOLOMITE / TIN ZONE PYRRHOTITE
/ c	ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7	PORPHYRY
-----	INTERPRETED GEOLOGICAL CONTACT

200m. 200m

0 50 100
METRES

0 100 200 300
FEET

5 cm

METALS EXPLORATION. LIMITED
MOUNT BISCHOFF TIN PROSPECT

79-1328
Vol. 4/5

MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION

192274

LINE 1140 mE

SHOWING RESERVES

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: 24.9.79 REVISED: SEPT '79 DRG. NO. 79-311

2623

18

1600 N

1800 N

2000 N

2200 N

2400 N

700m.

2000ft. (609.6 m A.S.L.)

600m.

500m

400m.

300 m.

200m.

AAB 2

B56

B60

B57

B58

B59

2000ft.

600m.

500m

400m.

300m

200m

D.D.H.

ASSAYED FOR Sn

< 1000 ppm

≥ 1000 ppm Sn. i.e. 0.1% Sn

< 1000 ppm

RESERVE BOUNDARIES 0·3% Sn CUTOFF

DRILL INDICATED

DRILL INFERRED

POSSIBLE

2 DOLOMITE

3/t MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE

/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS

7 PORPHYRY

INTERPRETED GEOLOGICAL CONTACT

0 50 100 METRES

0 100 200 300 FEET

5 cm

79-1328

Vol. A/5

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION

192275

LINE 1160 mE

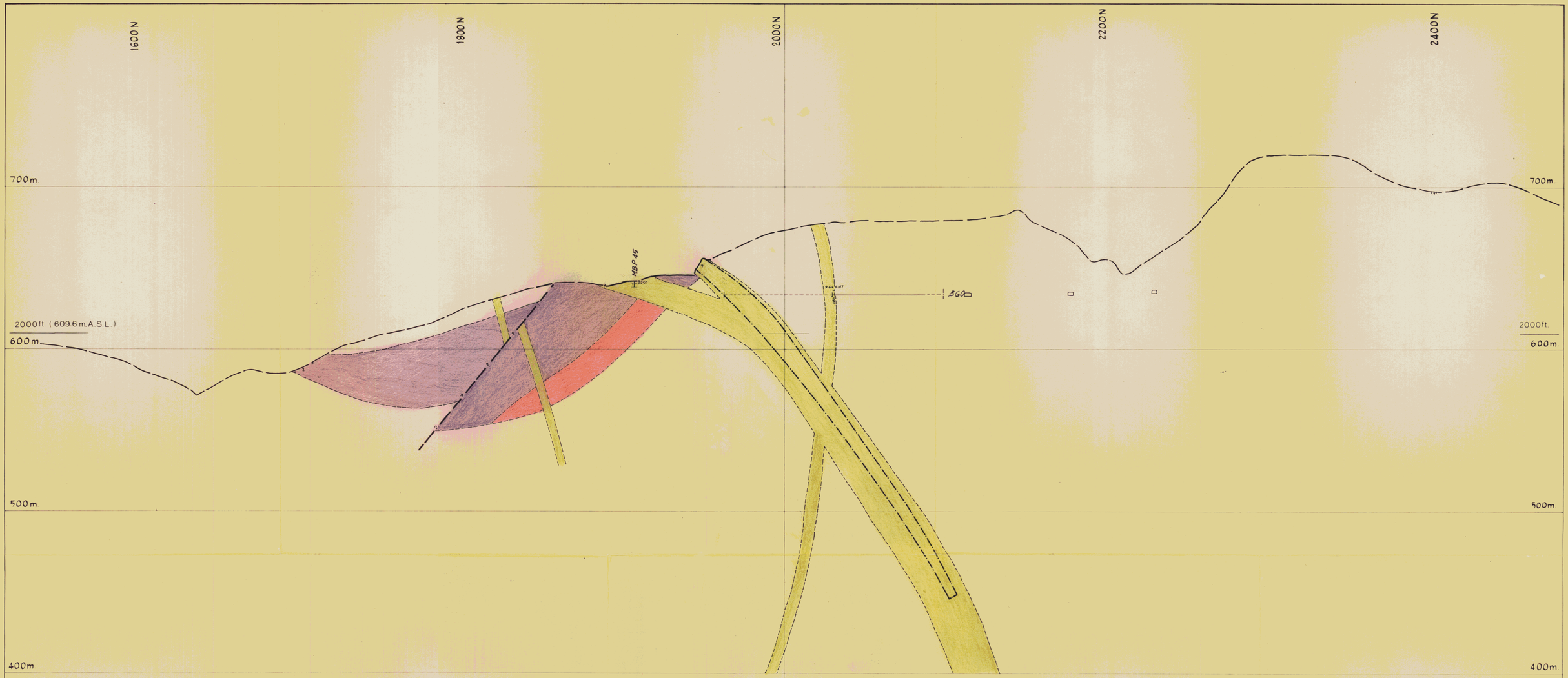
SHOWING RESERVES

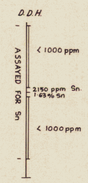
SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: 24·9·79 REVISED: SEPT '79 DRG. NO. 79-312

2624

19





RESERVE BOUNDARIES 0·3% Sn CUTOFF

DRILL INDICATED

DRILL INFERRED

POSSIBLE

2 DOLOMITE

3/4 MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE

/c ARGILLITES, QUARTZITIES, SHALES / CARBONACEOUS

7 PORPHYRY

INTERPRETED GEOLOGICAL CONTACT

200m.

0 50 100 METRES

0 100 200 300 FEET

5 cm

79-13208

METALS EXPLORATION LIMITED Vol. 4/5

MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF MINE AREA

INTERPRETED SECTION 192276

LINE 1180 mE

SHOWING RESERVES

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE : 24·9·79 REVISED : SEPT '79 DRG. NO. 79-313

2625 (20)

1600 N

1800 N

2000 N

2200 N

2400 N

700m

2000ft (609.6m A.S.L.)

600m

500m

400m

300m

200m

AAB1

B33

B32

MBD5

B60

700m

2000ft

600m

500m

400m

300m

200m

D.D.H.

ASSAYED FOR Sn

< 1000 ppm

2150 ppm Sn. / 0.3% Sn

< 1000 ppm

RESERVE BOUNDARIES 0·3% Sn CUTOFF

DRILL INDICATED

DRILL INFERRED

POSSIBLE

2 DOLOMITE

3/t MINERALIZED DOLOMITE / TIN ZONE PYRRHOTITE

/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS

7 PORPHYRY

INTERPRETED GEOLOGICAL CONTACT

0 50 100 METRES

0 100 200 300 FEET

See Dwg. No. 79-122 (1:2000)

5 cm

METALS EXPLORATION LIMITED

MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF MINE AREA

INTERPRETED SECTION

LINE 1200 mE

SHOWING RESERVES

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: 24.9.79 REVISED SEPT '79 DRG. NO. 79-314

79-1328

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192277

2626

(21)

1600 N
1800 N
2000 N
2200 N
2400 N

700m
600m
500m
400m
300m
200m

2000ft (609.6m A.S.L.)
2000ft

NBP-41
NBD5
360
348

D.D.H.
< 1000 ppm
≥150 ppm Sn
≥ 0.8% Sn
< 1000 ppm

RESERVE BOUNDARIES 0.3% Sn CUTOFF

------ DRILL INDICATED
-·-·-·- DRILL INFERRED
..... POSSIBLE

2 DOLOMITE
3/4 MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE
/c ARGILLITES, QUARTZITES, SHALES, / CARBONACEOUS
7 PORPHYRY

----- INTERPRETED GEOLOGICAL CONTACT

0 50 100
METRES
0 100 200 300
FEET

5 cm

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION

LINE 1220 mE

SHOWING RESERVES

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: 24.9.79 REVISED SEPT '79 DRG. NO. 79-315

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192278

192279

MT. BISCHOFF TIN PROSPECT

EXPLORATION LICENCE 13/79

TASMANIA

REPORT ON STAGE 2 A PROGRAMME

VOLUME 4 Part 2 REPORT NO. 502

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192280

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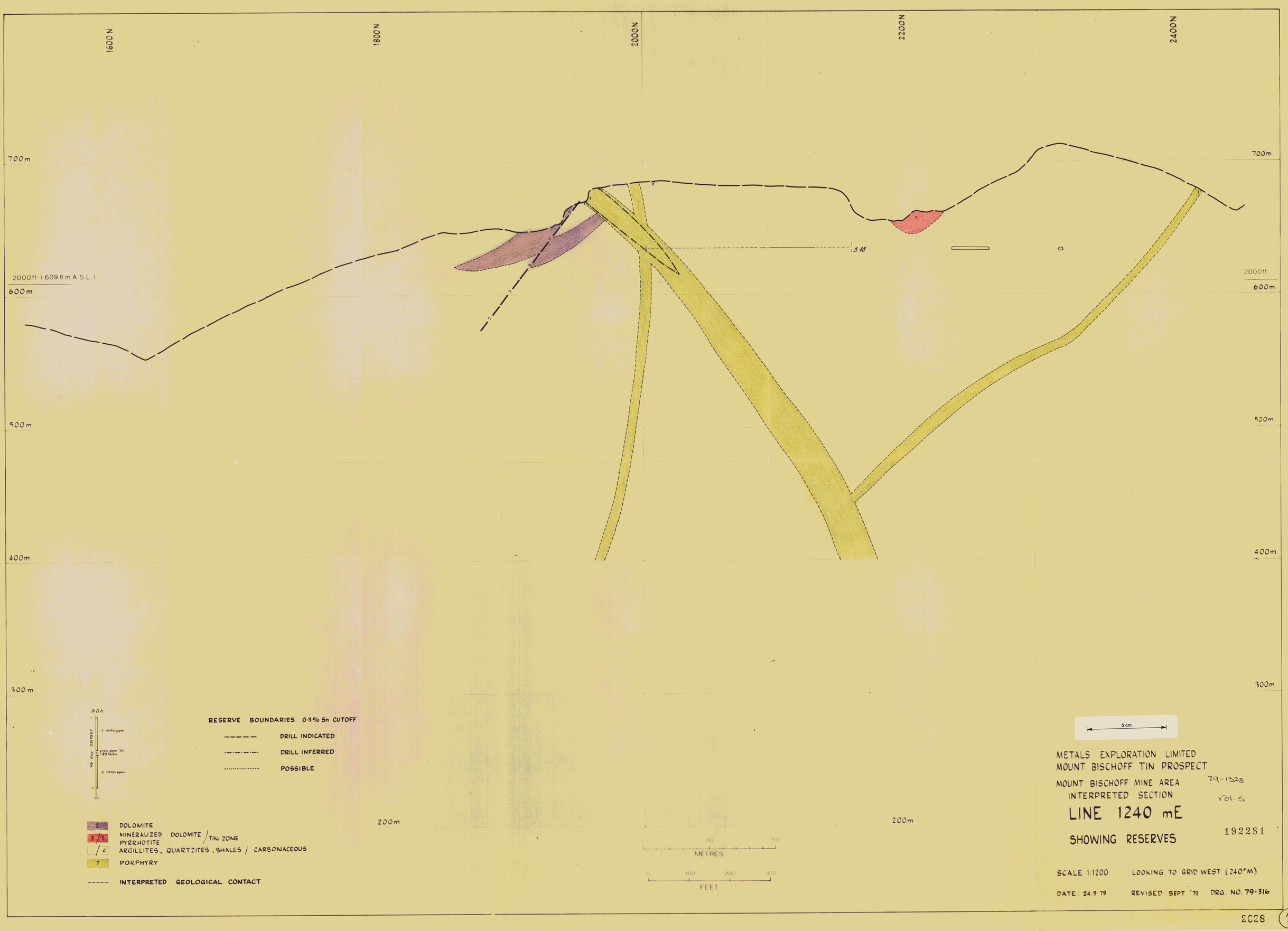
3	ditto " " 1280E	79-318
4	ditto " " 1300E	79-319
5	ditto " " 1320E	79-320
6	ditto " " 1340E	79-321
7	ditto " " 1360E	79-322
8	ditto " " 1380E	79-323
9	ditto " " 1400E	79-324
10	ditto 1420E	79-033
11	ditto 1440E	79-034
12	ditto 1460E	79-035
13	ditto 1480E	79-036
14	ditto 1500E	79-037
15	ditto 1520E	79-038
16	ditto 1560E	79-040
17	ditto 1600E	79-042
18	ditto 1640E	79-253
19	ditto 1680E	79-254
20	ditto 1760E	79-256
21	ditto 1800E	79-257
22	ditto 1840E	79-258
23	ditto BB	~~79-152A~~ 79-197A



METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION

79-1328
Vol. 5

LINE 1240 mE

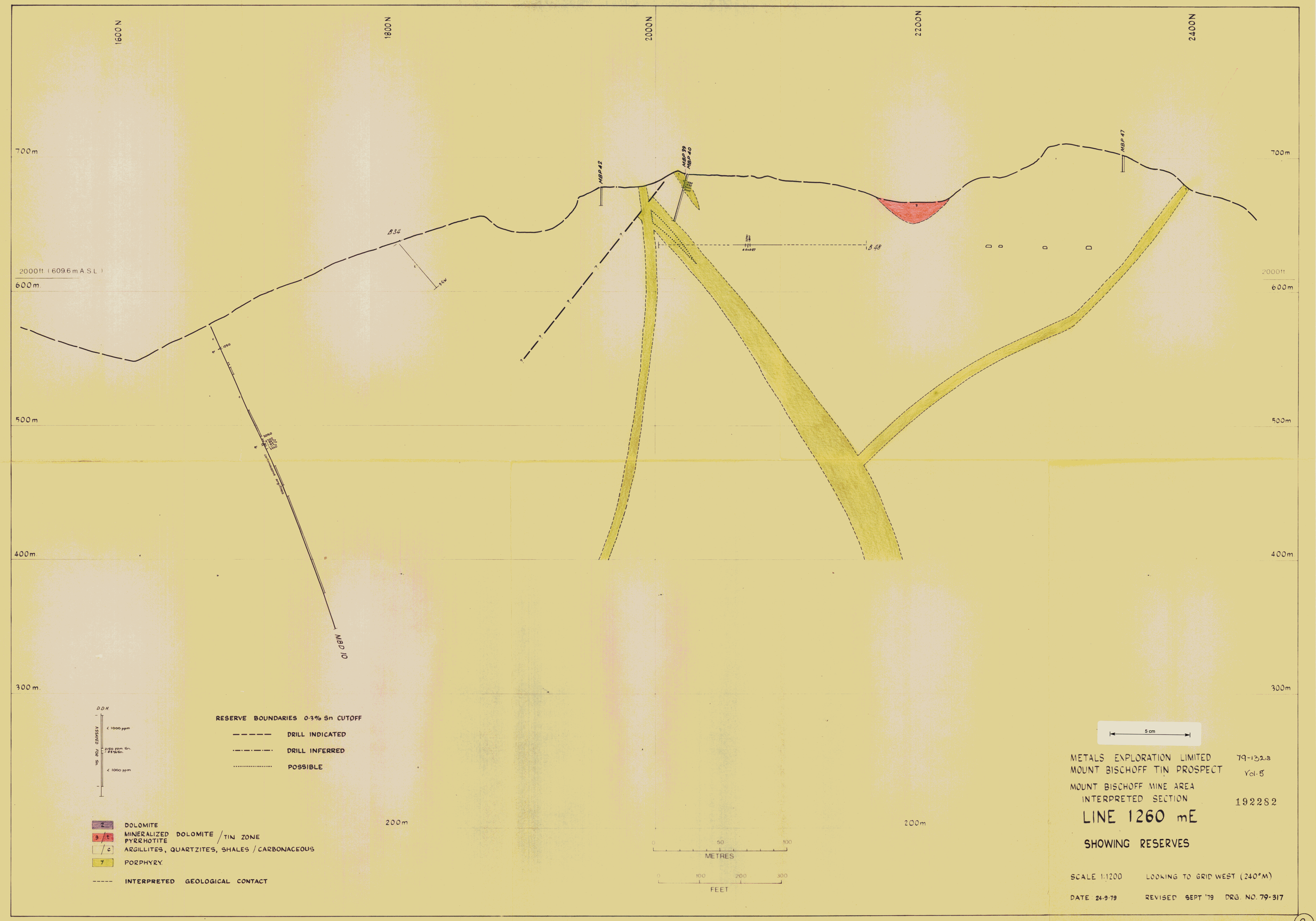
SHOWING RESERVES

192281

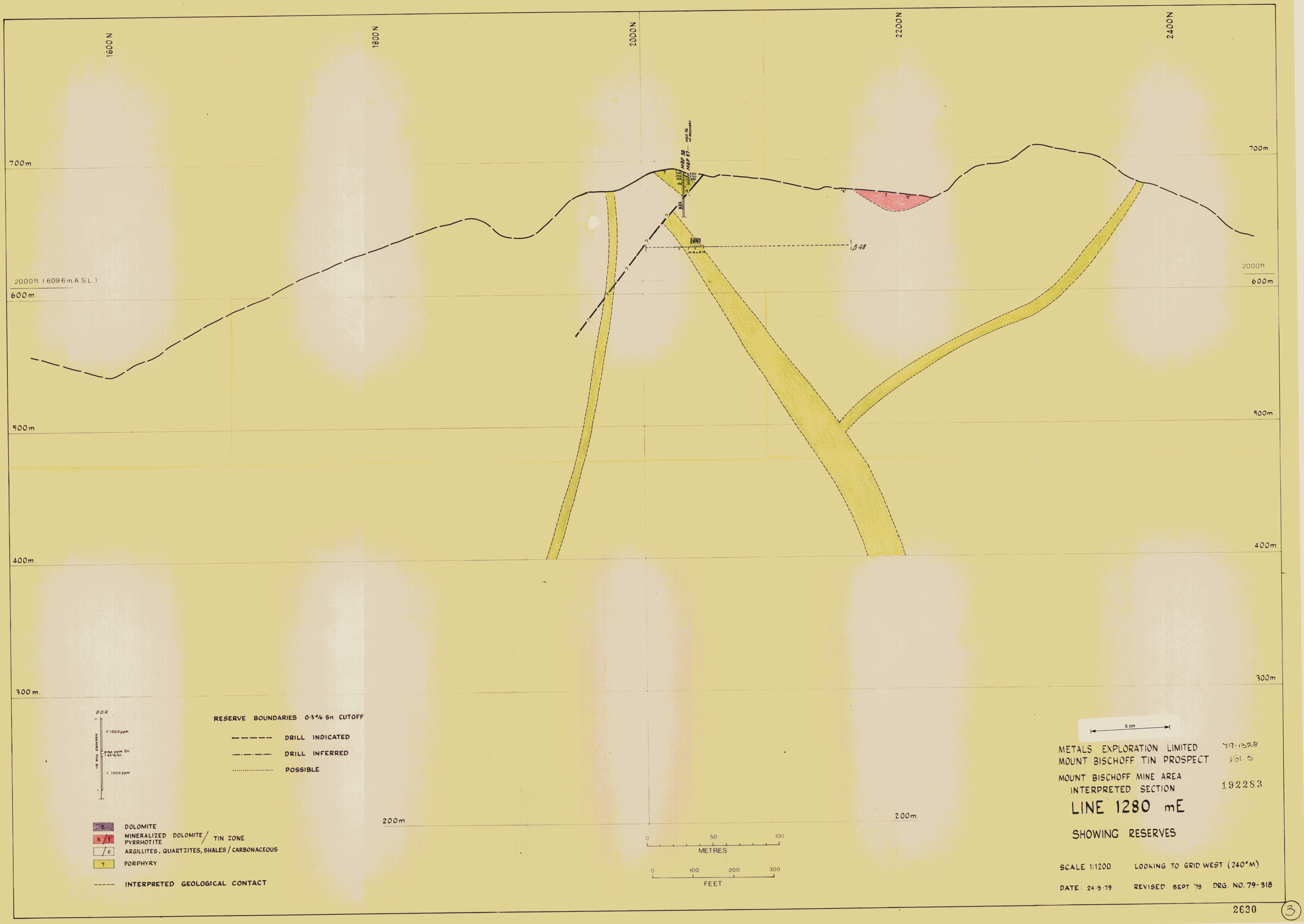
SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: 24.9.79 REVISED SEPT '79 DRG. NO. 79-316

2028 (1)

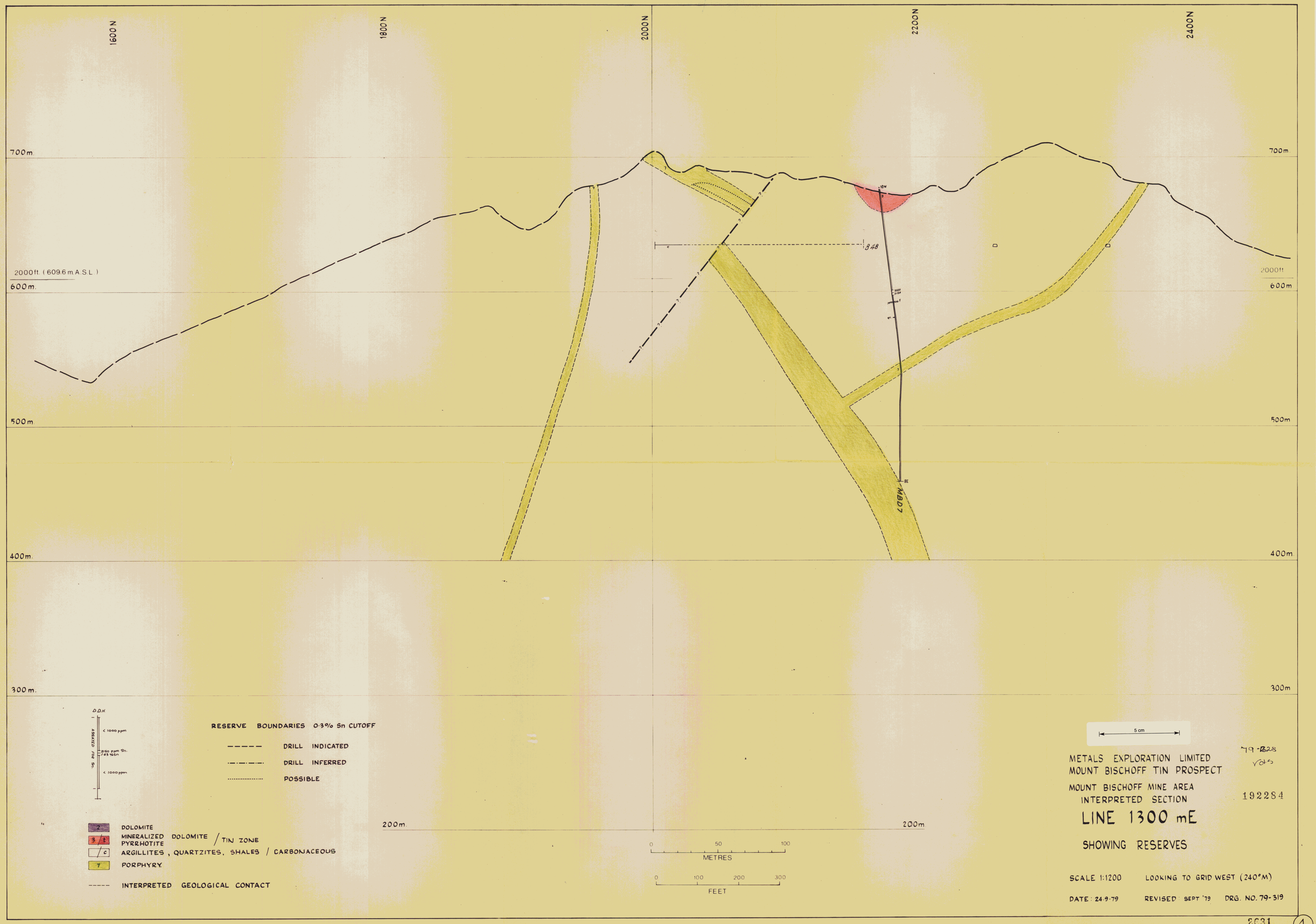

1600 N
1800 N
2000 N
2200 N
2400 N
700m
600m
500m
400m
300m
200m
2000ft (609.6 m A.S.L.)
MBP 42
MBP 39
MBP 40
MBP 47
MBP 10
B34
B48
D.D.H.
ASSAYED FOR Sn.
< 1000 ppm
2150 ppm Sn.
< 1000 ppm
RESERVE BOUNDARIES 0·3% Sn CUTOFF
DRILL INDICATED
DRILL INFERRED
POSSIBLE
2 DOLOMITE
3 / t MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE
/ c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
79-1328
Vol. 5
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
192282
LINE 1260 mE
SHOWING RESERVES
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE 24·9·79
REVISED SEPT '79
DRG. NO. 79-317

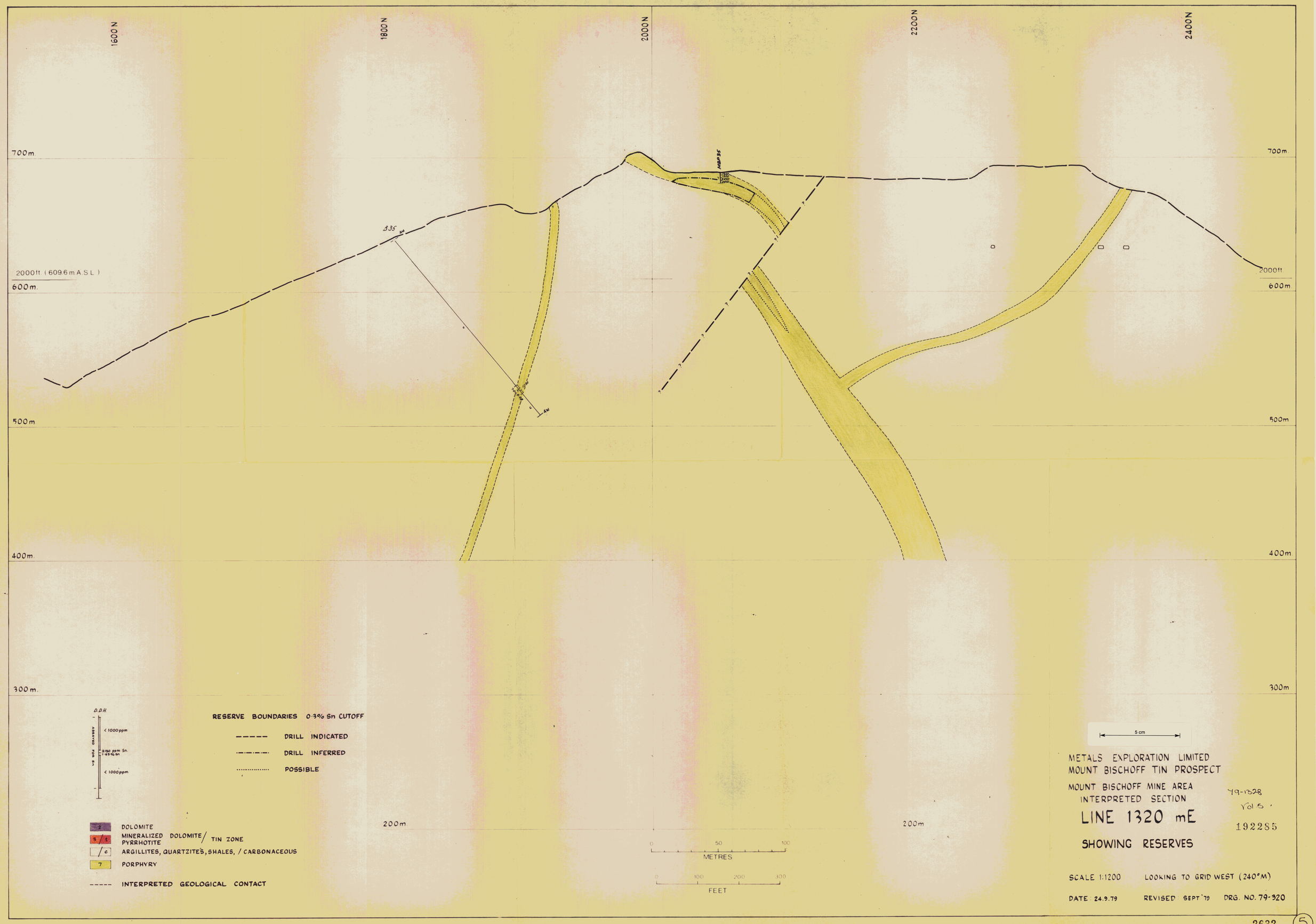
2629 (2)


1600 N
1800 N
2000 N
2200 N
2400 N
700m
600m
500m
400m
300m
200m
2000ft (609.6 m A.S.L.)
2000ft
MBP 38
MBP 37
MBD 36
NO RECOVERY
B48
D.D.H.
< 1000 ppm
ASSAYED FOR Sn
2150 ppm Sn
1.63 % Sn
< 1000 ppm
RESERVE BOUNDARIES 0.3% Sn CUTOFF
DRILL INDICATED
DRILL INFERRED
POSSIBLE
2 DOLOMITE
3 / t MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE
/ c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
79-1328
Vol. 5
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
192283
LINE 1280 mE
SHOWING RESERVES
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE: 24.9.79
REVISED SEPT '79
DRG. NO. 79-318

2630

3


1600 N
1800 N
2000 N
2200 N
2400 N
700m
600m
500m
400m
300m
200m
2000ft. (609.6 m A.S.L.)
848
MBD7
D.D.H.
< 1000 ppm
2160 ppm Sn.
1.83 % Sn
< 1000 ppm
RESERVE BOUNDARIES 0.3% Sn CUTOFF
DRILL INDICATED
DRILL INFERRED
POSSIBLE
2 DOLOMITE
3 / t MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE
/ c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
LINE 1300 mE
SHOWING RESERVES
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE: 24.9.79
REVISED: SEPT '79
DRG. NO. 79-319
79-B28
192284
2031
4


1600 N
1800 N
2000 N
2200 N
2400 N
700m
600m
500m
400m
300m
200m
2000ft (609.6 m A.S.L.)
B35
MBP35
D.D.H.
ASSAYED FOR Sn
< 1000 ppm
2150 ppm Sn.
1·69 % Sn
< 1000 ppm
RESERVE BOUNDARIES 0·3% Sn CUTOFF
DRILL INDICATED
DRILL INFERRED
POSSIBLE
DOLOMITE
MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE
ARGILLITES, QUARTZITES, SHALES, / CARBONACEOUS
PORPHYRY
INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
LINE 1320 mE
SHOWING RESERVES
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE 24.9.79
REVISED SEPT '79
DRG. NO. 79-320
79-1328
Vol 5
192285

2632 (5)

1600 N
1800 N
2000 N
2200 N
2400 N
700m
600m
500m
400m
300m
200m
2000ft. (609.6 m A.S.L.)
D
D.D.H.
ASSAYED FOR Sn
< 1000 ppm
2150 ppm Sn.
1.83 % Sn.
< 1000 ppm
RESERVE BOUNDARIES 0·3% Sn CUTOFF
DRILL INDICATED
DRILL INFERRED
POSSIBLE
2 DOLOMITE
3/t MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE
/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
LINE 1340 mE
SHOWING RESERVES
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE: 24·9·79
REVISED: SEPT '79
DRG. NO. 79-321
79-1328
Vol. 5
192286

2633 (6)

1600 N

1800 N

2000 N

2200 N

2400 N

700m

2000ft. (609.6 m A.S.L.)

600m.

500m

400m

300 m.

200m

MBD 3

MBP 53
MBP 54

D.D.H.

< 1000 ppm

2150 ppm Sn.
1.64 % Sn

< 1000 ppm

RESERVE BOUNDARIES 0·3% Sn CUTOFF

DRILL INDICATED

DRILL INFERRED

POSSIBLE

2 DOLOMITE

3/t MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE

/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS

7 PORPHYRY

INTERPRETED GEOLOGICAL CONTACT

0 50 100
METRES

0 100 200 300
FEET

5 cm

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION

LINE 1360 mE

SHOWING RESERVES

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: 24·9·79 REVISED SEPT '79 DRG. NO. 79·322

79-1328
Vol. 5.
192287

1600 N

1800 N

2000 N

2200 N

2400 N

700m.

2000ft. (609.6m A.S.L.)

600m.

500m.

400m.

300m.

200m

D.D.H.

ASSAYED FOR Sn

< 1000 ppm

2400 ppm Sn. / 0.3% Sn.

< 1000 ppm.

RESERVE BOUNDARIES 0.3% Sn CUTOFF

DRILL INDICATED

DRILL INFERRED

POSSIBLE

2 DOLOMITE

3/t MINERALIZED DOLOMITE PYRRHOTITE / TIN ZONE

/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS

7 PORPHYRY

INTERPRETED GEOLOGICAL CONTACT

0 50 100
METRES

0 100 200 300
FEET

5 cm

METALS EXPLORATION LIMITED

MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF MINE AREA

INTERPRETED SECTION

LINE 1380 mE

SHOWING RESERVES

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: 24-9-79 REVISED SEPT '79 DRG. NO. 79-323

79-1528
Vol 5
192288

1600 N | 1800 N | 2000 N | 2200 N | 2400 N

700m. | 700m.

MBP 21

2000ft. (609.6 m.A.S.L.) | 2000ft.

600m. | 600m.

D

500m. | 500m

400m. | 400m.

300 m. | 300m

200m. | 200m.

D.D.H.

ASSAYED FOR Sn

< 1000 ppm

≥150 ppm Sn ≥0.5% Sn

< 1000 ppm

RESERVE BOUNDARIES 0·3% Sn CUTOFF

DRILL INDICATED

DRILL INFERRED

POSSIBLE

2 DOLOMITE

3 4 MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE

C ARGILLITE, QUARTZITE, SHALES / CARBONACEOUS

7 PORPHYRY

INTERPRETED GEOLOGICAL CONTACT

0 50 100 METRES

0 100 200 300 FEET

5 cm

79-1328

METALS EXPLORATION LIMITED

MOUNT BISCHOFF TIN PROSPECT

Vol. 5.

MOUNT BISCHOFF MINE AREA

INTERPRETED SECTION

192289

LINE 1400 mE

SHOWING RESERVES

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: 24-9-79 REVISED: SEPT '79 DRG. NO. 79-324

2636

9

1600 N | 1800 N | 2000 N | 2200 N | 2400 N

700m. | 700m.

2000ft. (609.6 m.A.S.L.) | 2000ft

600m. | 600m.

500m. | 500m.

400m. | 400m.

300m. | 300m

200m. | 200m.

D.D.H.

ASSAYED FOR Sn

< 1000 ppm

2140 ppm Sn - 1.65% Sn

< 1000 ppm

2 DOLOMITE

3/t MINERALIZED DOLOMITE / TIN ZONE PYRRHOTITE

/c ARGILLITES, QUARTZITE, SHALES / CARBONACEOUS

7 PORPHYRY

------ INTERPRETED GEOLOGICAL CONTACT

0 50 100 METRES

0 100 200 300 FEET

5 cm

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
LINE 1420mE

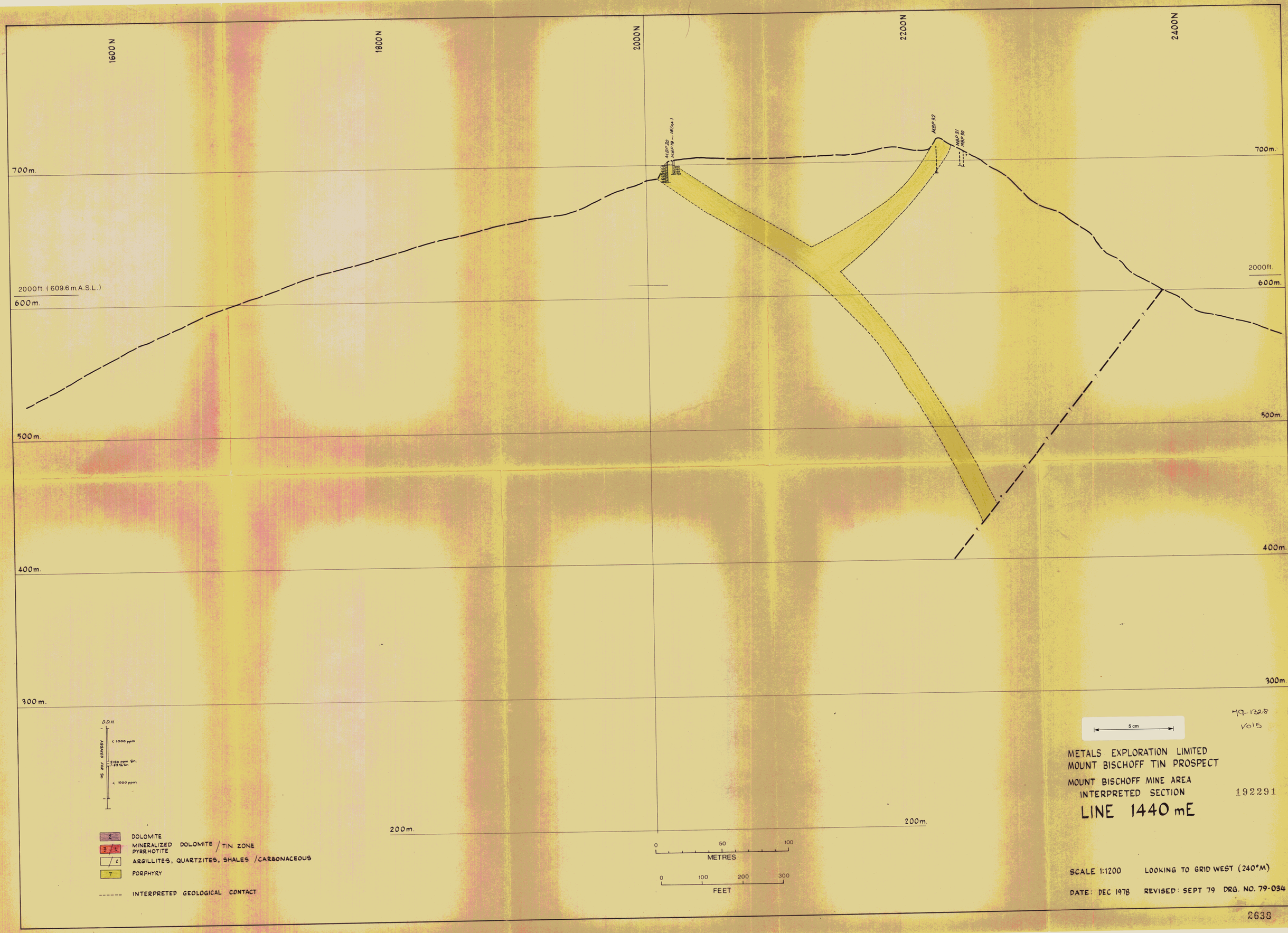
79-1328
Vol.5
192290

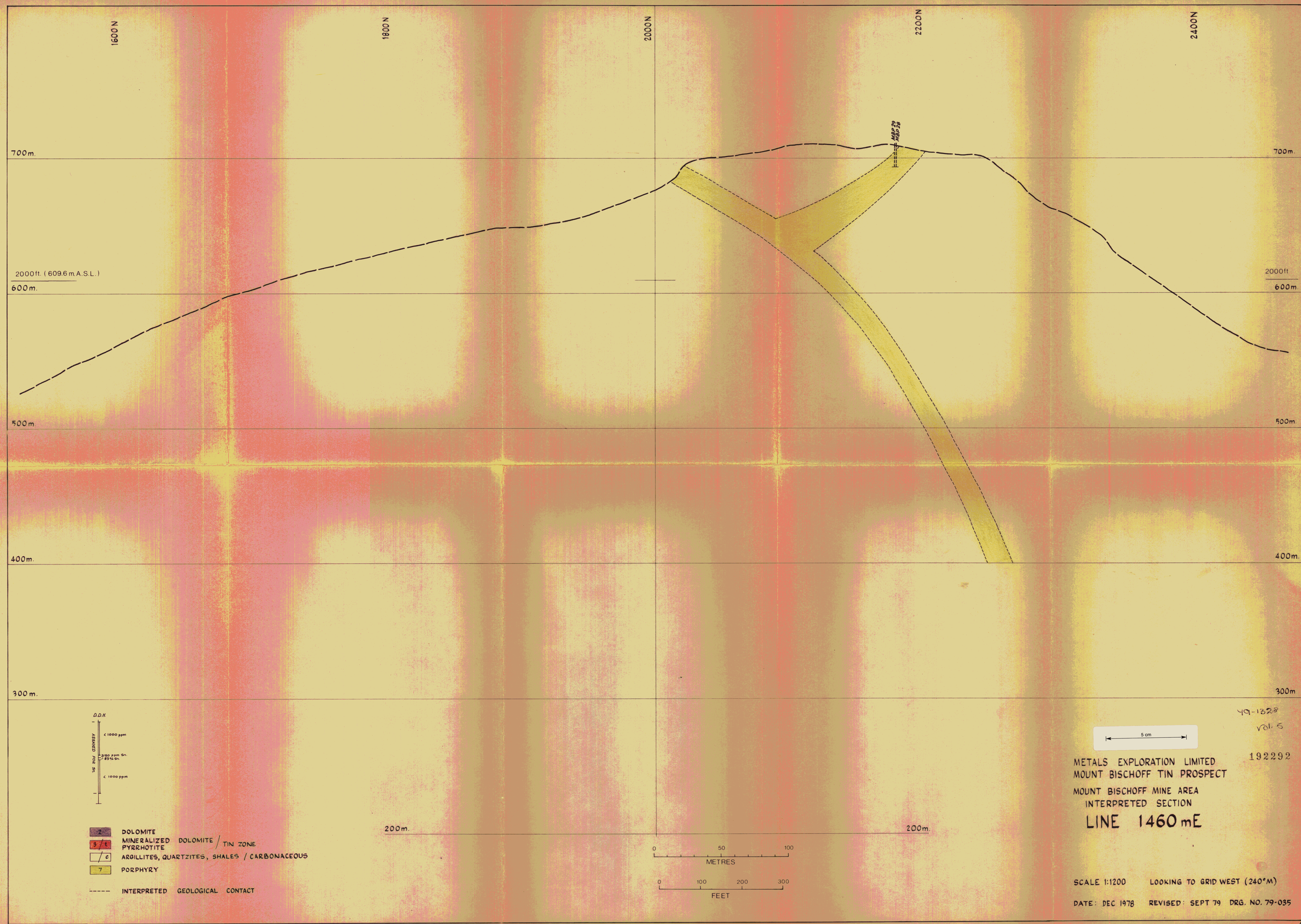
SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: REVISED: SEPT 79 DRG. NO. 79-033

2637

10


1600 N
1800 N
2000 N
2200 N
2400 N
700m.
600m.
500m.
400m.
300m.
200m.
2000ft. (609.6 m A.S.L.)
MBP 20
MBP 19
MBP 32
MBP 31
MBP 30
D.D.H.
ASSAYED FOR Sn.
< 1000 ppm
2150 ppm Sn.
1.83% Sn
< 1000 ppm
2 DOLOMITE
3/t MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE
/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
79-1328
V015
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
192291
LINE 1440 mE
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE: DEC 1978
REVISED: SEPT 79
DRG. NO. 79-034
2638
11



49-1328
vol. 5

192292

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT

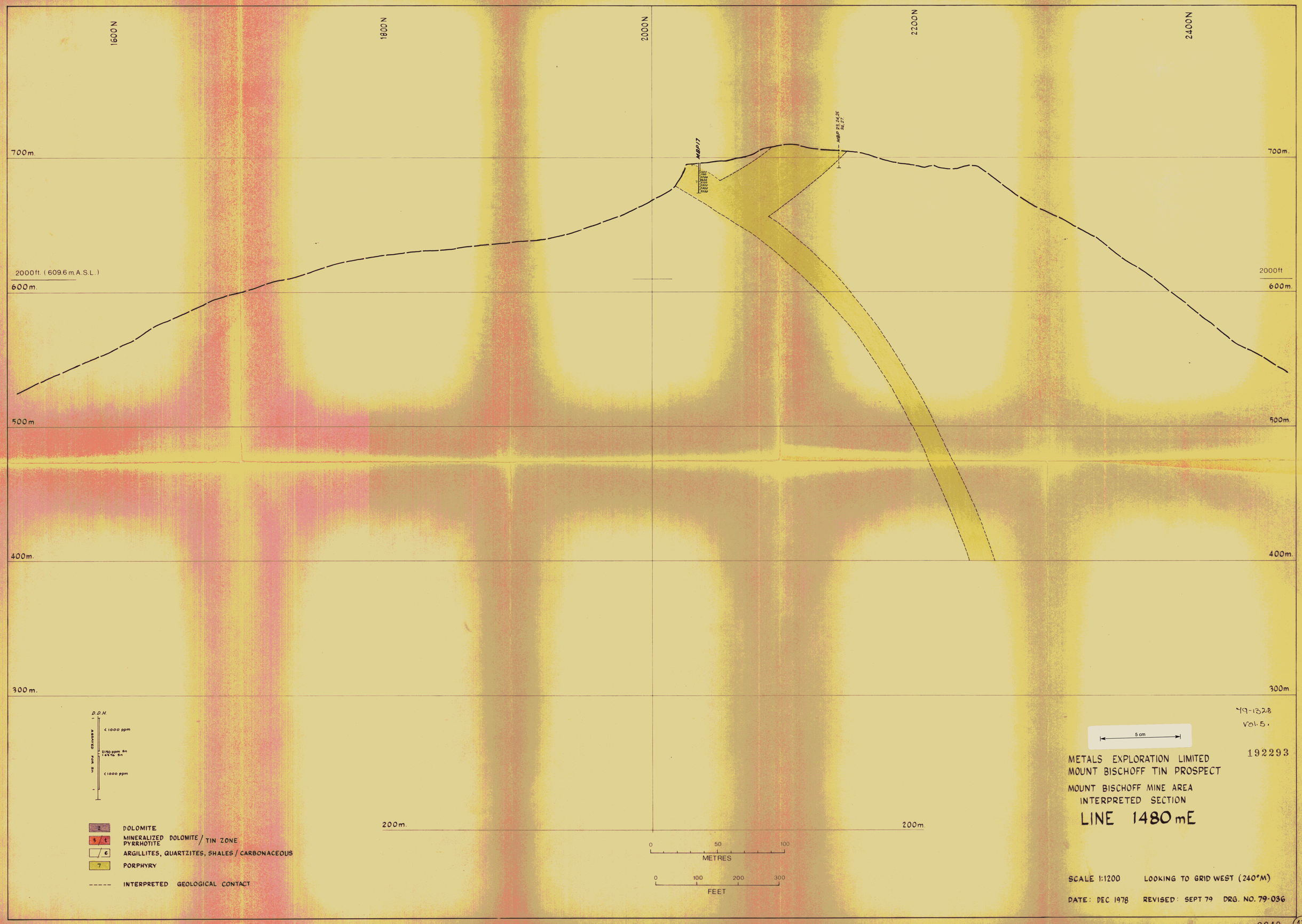
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION

LINE 1460 mE

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: DEC 1978 REVISED: SEPT 79 DRG. NO. 79-035

2639 (12)


1600 N
1800 N
2000 N
2200 N
2400 N
700m.
2000ft. (609.6 m.A.S.L.)
600m.
500m.
400m.
300m.
200m.
MBP 17
MBP 23, 24, 25, 26, 27
D.D.H.
ASSAYED FOR Sn
< 1000 ppm
2150 ppm Sn
1.63% Sn
< 1000 ppm
2 DOLOMITE
3 / t MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE
/ c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
----- INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
79-1328
Vol. 5.
192293
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
LINE 1480 mE
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE: DEC 1978
REVISED: SEPT 79
DRG. NO. 79-036
2640
13

1600 N

1800 N

2000 N

2200 N

2400 N

700m.

700m.

MBP16

2000ft. (609.6m A.S.L.)

2000ft

600m.

600m.

500m.

500m.

400m.

400m.

300m.

300m.

D.D.H.

ASSAYED FOR Sn

< 1000 ppm

2150 ppm 1.65%

< 1000 ppm

200m.

200m.

2 DOLOMITE

3 / t MINERALIZED DOLOMITE PYRRHOTITE / TIN ZONE

/ c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS

7 PORPHYRY

------ INTERPRETED GEOLOGICAL CONTACT

0 50 100
METRES

0 100 200 300
FEET

5 cm

79-1328
Vol. 5.

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION

192294

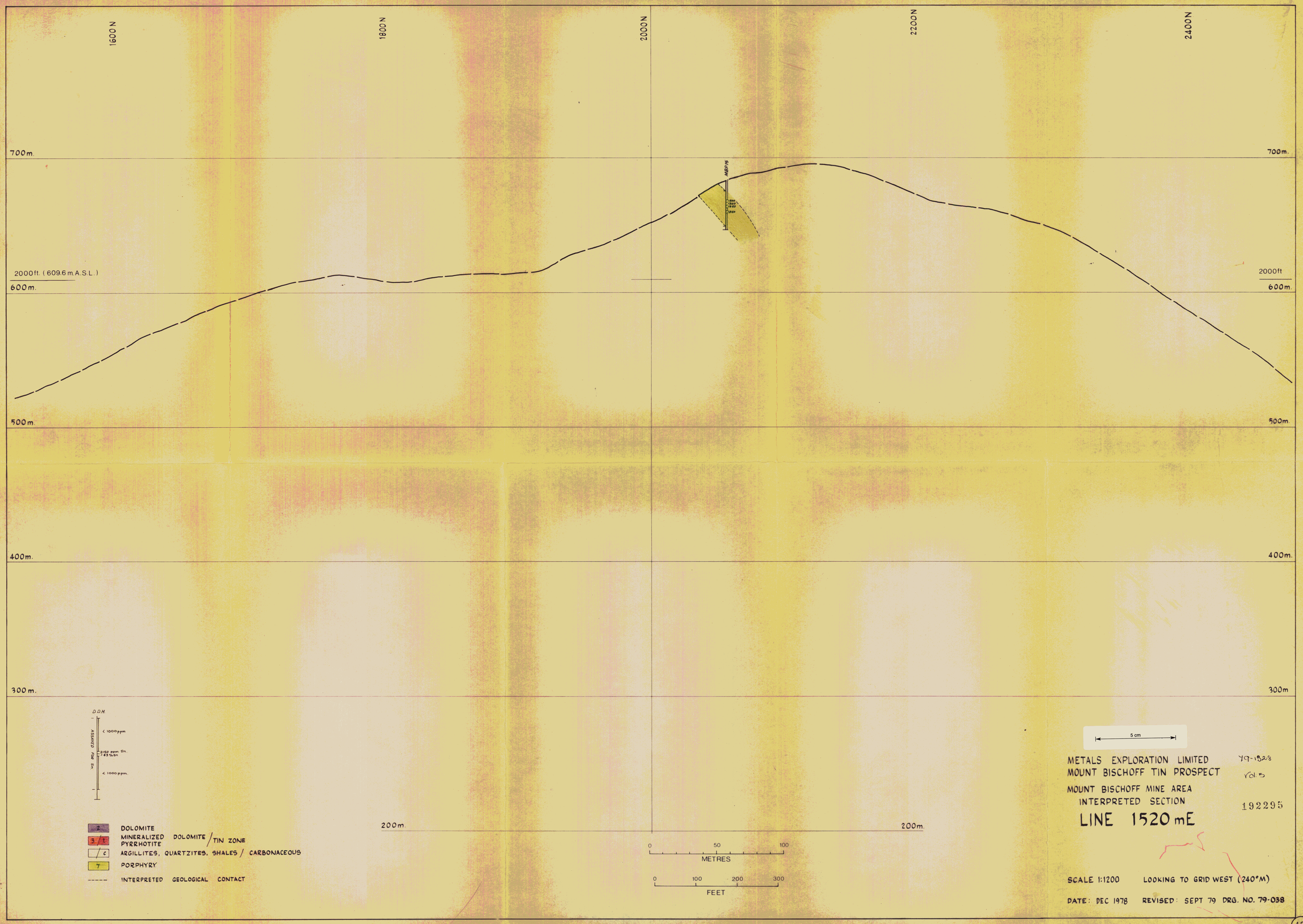
LINE 1500 mE

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: DEC 1978 REVISED: SEPT 79 DRG. NO. 79-037

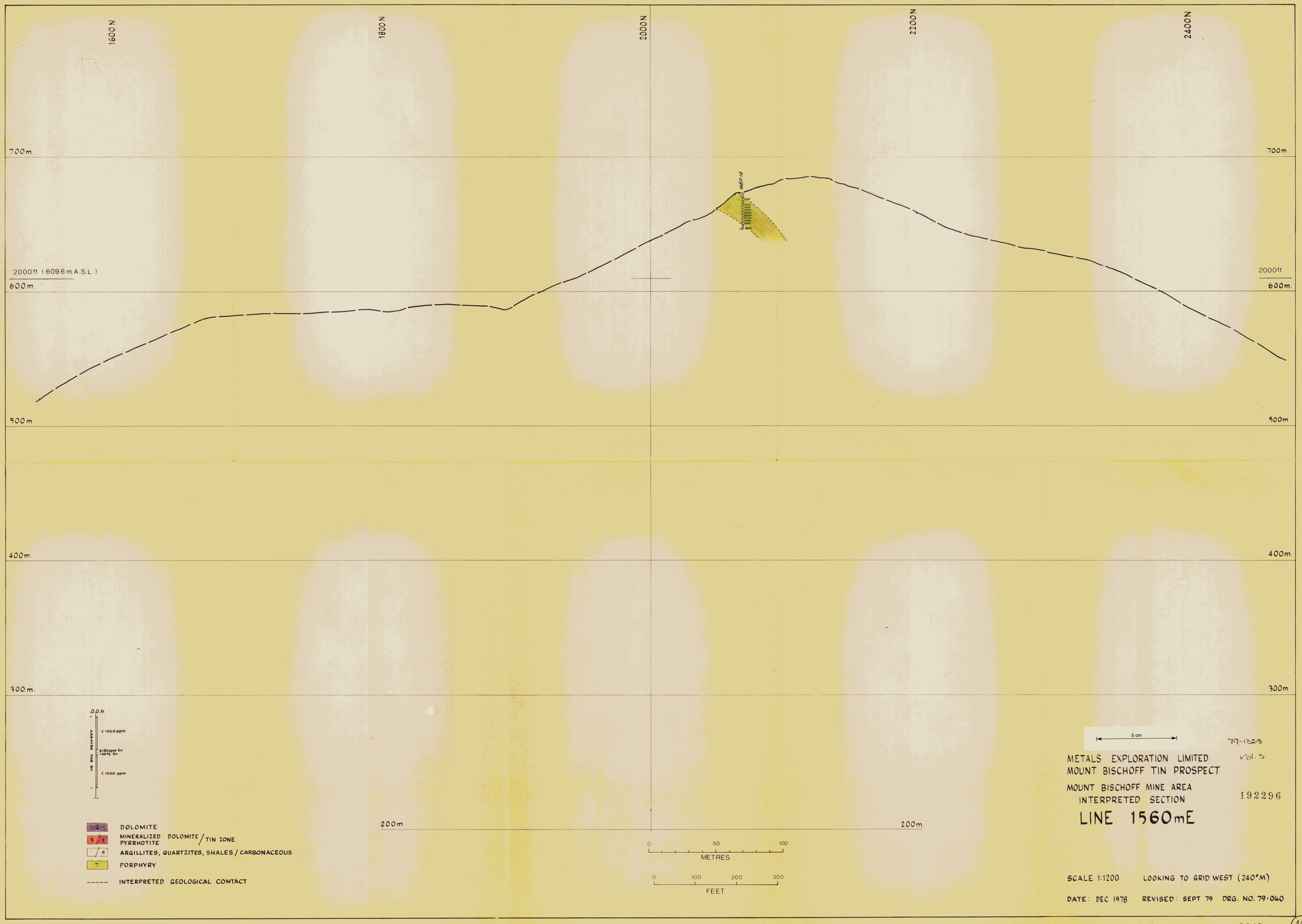
2641

14


1600 N
1800 N
2000 N
2200 N
2400 N
700m.
2000ft. (609.6 m A.S.L.)
600m.
500m.
400m.
300m.
200m.
2000ft
D.D.H.
ASSAYED FOR Sn.
< 1000 ppm
2150 ppm Sn.
1.83 % Sn
< 1000 ppm.
2 DOLOMITE
3/t MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE
/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS
7 PORPHYRY
----- INTERPRETED GEOLOGICAL CONTACT
0 50 100
METRES
0 100 200 300
FEET
5 cm
METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT
MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION
LINE 1520 mE
79-1328
Vol. 5
192295
SCALE 1:1200
LOOKING TO GRID WEST (240°M)
DATE: DEC 1978
REVISED: SEPT 79 DRG. NO. 79-038

2642

15



79-1328
Vol. 5

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION

192296

LINE 1560mE

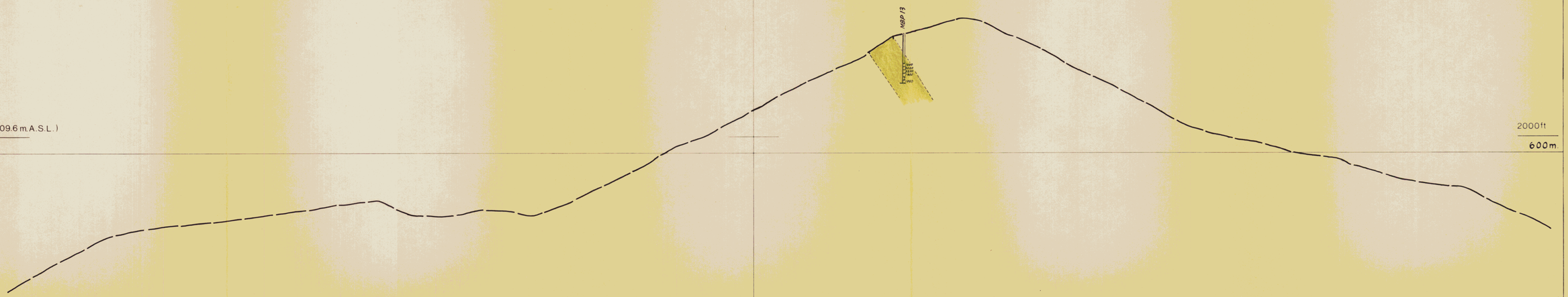
SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: DEC 1978 REVISED: SEPT 79 DRG. NO. 79-040

2643 (16)

1600 N | 1800 N | 2000 N | 2200 N | 2400 N

700m. | 700m.



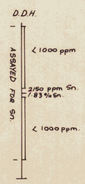
2000ft. (609.6 m.A.S.L.)

600m. | 2000ft | 600m.

500m. | 500m.

400m. | 400m.

300m. | 300m.



2 DOLOMITE

3/t MINERALIZED DOLOMITE PYRRHOTITE / TIN ZONE

/c ARGILLITES , QUARTZITES , SHALES / CARBONACEOUS

7 PORPHYRY

----- INTERPRETED GEOLOGICAL CONTACT

200m. | 200m.

0 50 100
METRES

0 100 200 300
FEET

5 cm

79-1328
Vol 5

192297

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION

LINE 1600 mE

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: DEC 1978 REVISED: SEPT 79 DRG. NO. 79-042

2644

17

1600 N | 1800 N | 2000 N | 2200 N | 2400 N

700m.

2000ft. (609.6 m.A.S.L.)

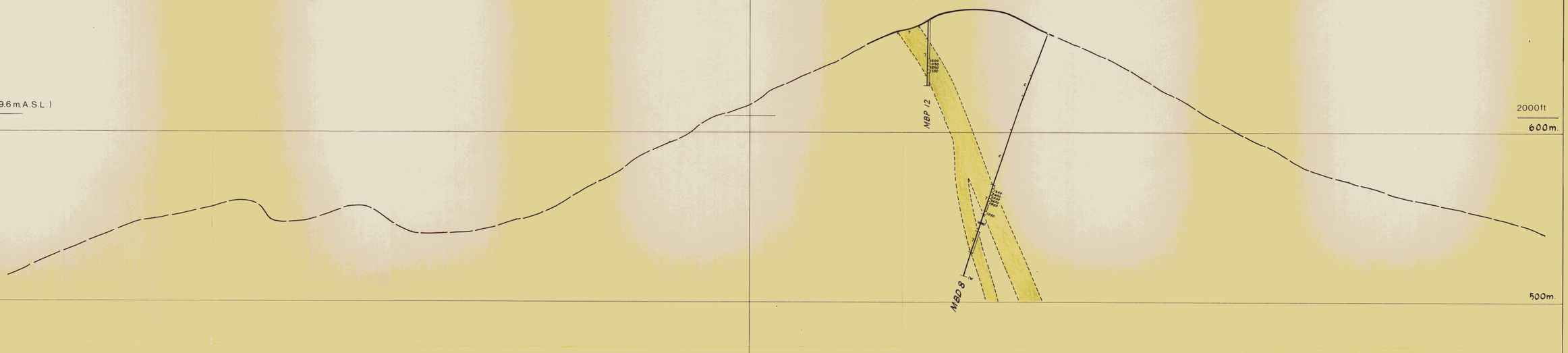
600m.

500m.

400m.

300m.

200m.



D.D.H.

ASSAYED FOR Sn

< 1000 ppm

≥ 150 ppm Sn
≤ 1.65% Sn

< 1000 ppm

2 DOLOMITE

3/t MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE

/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS

7 PORPHYRY

------ INTERPRETED GEOLOGICAL CONTACT

0 50 100
METRES

0 100 200 300
FEET

5 cm

79-1328
Vol 5

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF EAST FLANK
INTERPRETED SECTION

192298

LINE 1640 mE

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: REVISED: SEPT 79 DRG. NO. 79-253

SECTION BASE 79-217

2645

18

1600 N | 1800 N | 2000 N | 2200 N | 2400 N

700m.

2000ft. (609.6 m.A.S.L.)

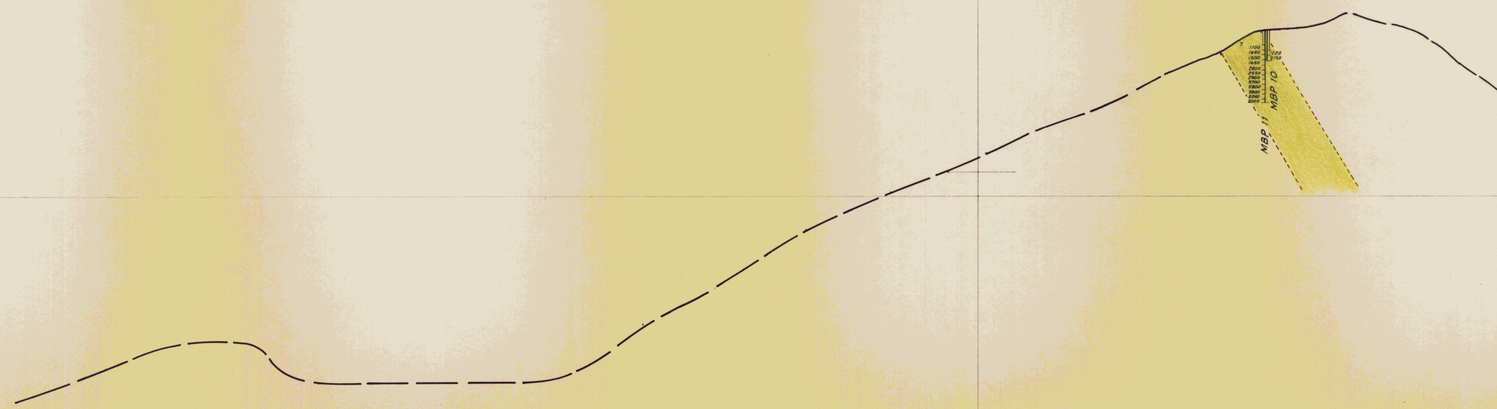
600m.

500m

400m.

300 m.

200m.



D.D.H.

ASSAYED FOR Sn

< 1000 ppm

2150 ppm Sn
1.65% Sn

< 1000 ppm

2 DOLOMITE

3/4 MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE

/c ARGILLITES, QUARTZITES, SHALE / CARBONACEOUS

7 PORPHYRY

----- INTERPRETED GEOLOGICAL CONTACT

0 50 100
METRES

0 100 200 300
FEET

5 cm

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF EAST FLANK
INTERPRETED SECTION

LINE 1680 mE

79-1328
Vol. 5
192299

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: REVISED: SEPT 79 DRG. NO. 79-254

SECTION BASE 79-217

2646 (19)

1600 N | 1800 N | 2000 N | 2200 N | 2400 N

700m. | 700m.

2000ft. (609.6 m.A.S.L.) | 2000ft.

600m. | 600m.

500m. | 500m.

400m. | 400m.

300m. | 300m.

200m. | 200m.

MAP 9
MAP 8

D.D.H.

ASSAYED FOR Sn

< 1000 ppm

2150 ppm Sn
1.43% Sn

< 1000 ppm

2 DOLOMITE

3/t MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE

/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS

7 PORPHYRY

------ INTERPRETED GEOLOGICAL CONTACT

0 50 100
METRES

0 100 200 300
FEET

5 cm

79-1328
Vol 5
192300

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF EAST FLANK
INTERPRETED SECTION

LINE 1760 mE

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: REVISED: JUL 79 DRG. NO. 79-256

SECTION BASE 79-217

2647

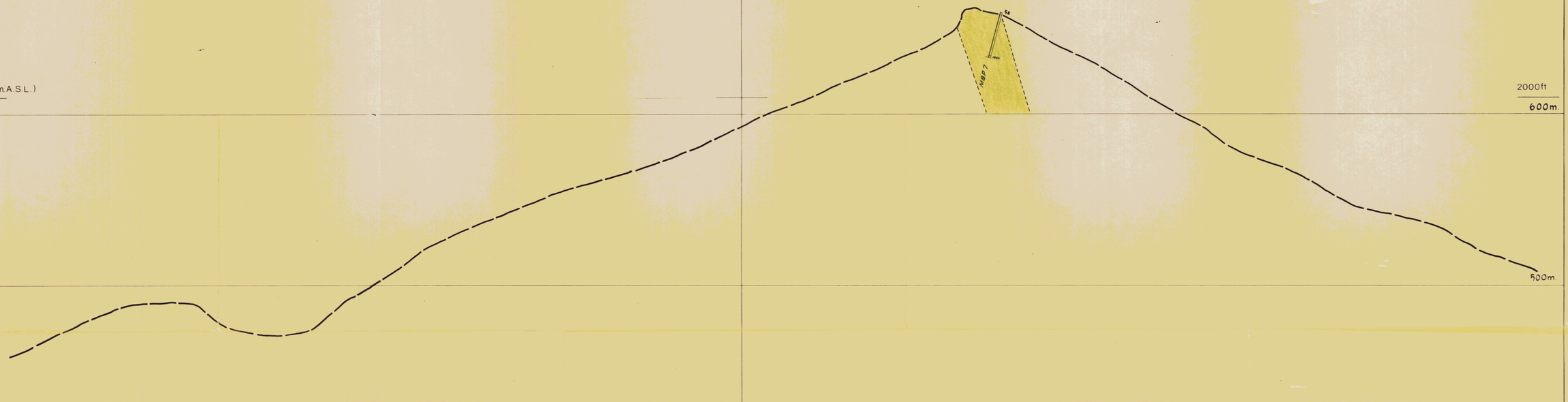
1600N 1800N 2000N 2200N 2400N

700m. 700m.

2000ft. (609.6m A.S.L.) 2000ft

600m. 600m.

500m. 500m



400m. 400m.

300m. 300m

D.D.H.

ASSAYED FOR Sn

<1000 ppm

2150ppm 1.69%

<1000 ppm

2 DOLOMITE

3/t MINERALIZED DOLOMITE / PYRRHOTITE / TIN ZONE

/c ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS

7 PORPHYRY

----- INTERPRETED GEOLOGICAL CONTACT

200m. 200m.

0 50 100
METRES

0 100 200 300
FEET

5 cm

79-1328

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT

Vol 5

MOUNT BISCHOFF EAST FLANK
INTERPRETED SECTION

192301

LINE 1800 mE

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: REVISED: SEPT 79 DRG. NO. 79-257

SECTION BASE 79-217

2018 (21)

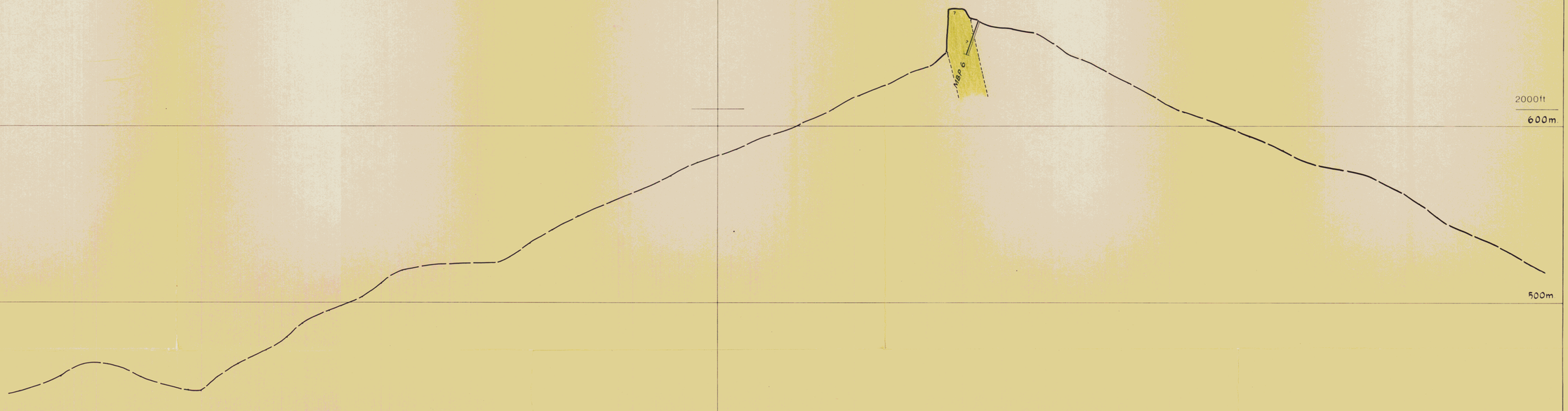
1600 N | 1800 N | 2000 N | 2200 N | 2400 N

700m. 700m.

2000ft. (609.6 m.A.S.L.) 2000ft

600m. 600m.

500m. 500m.



400m. 400m.

300m. 300m.

200m. 200m.

0 50 100
METRES

0 100 200 300
FEET

5 cm

DOLOMITE

MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE

ARGILLITES, QUARTZITES, SHALES / CARBONACEOUS

PORPHYRY

INTERPRETED GEOLOGICAL CONTACT

79-1328

Vol 5

192302

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT

MOUNT BISCHOFF EAST FLANK
INTERPRETED SECTION

LINE 1840 mE

SCALE 1:1200 LOOKING TO GRID WEST (240°M)

DATE: REVISED: SEPT 79 DRG. NO. 79-258

SECTION BASE 79-217

2049 (22)

1200 E

1300E

1400E

700m.

MBD5
13m NW

FLAT MAKE

631·0m Main Tunnel Level

2000ft. (609.6 m A.S.L.)

CROSS LODE

QUEEN LODE

2000ft

600m.

Fault Zone

594·5m Stanhope Tunnel Level

QUEEN PORPHYRY DYKE

500m.

WHITE FACE

MBD7 PORPHYRY DYKE

400m.

300m.

200m.

2 DOLOMITE

3/1 MINERALIZED DOLOMITE / TIN ZONE
PYRRHOTITE

ARGILLITES, QUARTZITES AND SHALES

7 PORPHYRY

0 50 100
METRES

0 100 200 300
FEET

5 cm

79-1328

METALS EXPLORATION LIMITED
MOUNT BISCHOFF TIN PROSPECT

Vol. 5

MOUNT BISCHOFF MINE AREA
INTERPRETED SECTION

192303

LINE 'BB'

(THROUGH 2170 N, 1290 E)

SCALE 1:1200 LOOKING TO 315° GRID

DATE: MAY 1979 REVISED: 30-5-79 DRG. NO. 79-197A

2050

23