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THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED

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E.L. 10/69

DORA-HUXLEY

MICROFILMED

ANNUAL REPORT

1977-78

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Drafting: R. G. Wilson

August, 1978

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Tas. Mines Department
Getty Oil Development Co. Ltd.

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AMG REFERENCE POINTS ADDED

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1. INTRODUCTION

Exploration during 1977-78 was confined to the Lake Beatrice Grid situated between Mt. Sedgwick and the Comstock Valley.

The western ends of grid lines 14N, 16N, 18N, and 20N were extended to cover the volcanic rocks up to the unconformable contact with the Tyndall Group rocks. Soil sampling was carried out over most of the western half of the grid.

Exploration proposed for 1978-79 includes completion of the soil sampling programme in the western half of the Beatrice Grid, soil sampling covering anomalous I.P. zones in the eastern half of the grid and two diamond drill holes to test coincident I.P. and geochemical anomalies associated with shales and tuffs in the western part of the grid.

Exploration costs during 1977-78 were \$21 383 bringing the total expenditure on E.L.10/69 since 1969 to \$178 868.

The proposed 1978-79 programme will cost approximately \$105 860.

2. WORK COMPLETED 1977-78

2.1 Beatrice Grid

2.1.1 Access

Grid lines 14N, 16N, 18N and 20N were extended to 2410W, 2250W, 2070W and 2220W respectively, thereby completing the cover over pre-Tyndall Group volcanic rocks. The total extensions of 4090 metres were cut at a cost of \$250/km and were pegged on a 30m interval.

2.1.2 Geochemistry

Work commenced on the soil sampling programme covering the western half of the grid. The sampling interval was 30m with intermediate 15m sampling over zones of anomalous I.P. response. At some localities more than one soil horizon was sampled to get an idea of the base metal distributions within the soil profile.

The samples were sieved to -80# and -10# +80# fractions and assayed by AAS for Cu, Pb, Zn, Ag and Mn. results show no significant differences between the two fractions and for this reason it is recommended that only the -80# fraction be assayed in future.

Threshold values for Cu, Pb and Zn have been estimated at 100ppm, 300ppm and 100ppm respectively (see Figures 4 to 7, Appendix I). Samples with greater than threshold values have been plotted on Figure 3.

A major geochemical anomaly was detected between lines 16N and 08N (open to the north) corresponding with a SW-trending black shale unit and altered tuffs to the east of the shales. Values within this zone range up to 510 ppm Cu, 11,000ppm Pb, 1900ppm Zn and 6ppm Ag (-80# fraction). The width of the zone and the magnitude of the assay results both tend to increase to the north and high values are expected for lines 18N and 20N. Throughout the zone Mn values are very high with peaks of 15.5% Mn at line 12N/645W and 11% Mn at line 16N/885W.

A minor geochemical zone corresponds with an I.P. anomaly and black shales between line 08N/1530W and line 04N/1620. Not all soil assays are anomalous in this zone but the bunching of high assays indicates that there is a controlling factor on the soil geochemistry which could be mineralization associated with the shales.

At places where more than one soil horizon was sampled results show that, in general, values are higher in the A horizon for Cu and Pb but higher in the C horizon for Zn.

Thirteen rock chip samples were assayed for Cu, Pb, Zn, Ag and Mn, and results are given in Appendix II. The most significant results came from a black shale sample (22904) from line 14N/910W (outcrop in creek) which assayed 132ppm Cu, 2300ppm Pb, 3000ppm Zn, 9ppm Ag and 790ppm Mn. Sphalerite was recorded from this locality during the 1976-77 mapping programme.

2.1.3 Geology

Geological mapping during 1977-78 was confined to checking the Geology Map in the 1976-77 Annual Report during the soil sampling programme.

On line 06N a foliated black shale unit was found in outcrop at 665W. A piece of black shale float at 675W contains a small veinlet of GALENA with minor PYRITE. Also found at 675W were outcrops of well-layered fine-grained felsic lava which, at 670W, contained angular to sub-rounded clasts of black shale. This could indicate a westward-facing sequence.

On line 16N, in a southwest-flowing creek, at 925W, the black shale unit is strongly sheared with a fair proportion of vein quartz. PYRITE layers are common and the pyrite has been remobilised along shear planes.

Preliminary petrographic investigation of the quartz-feldspar porphyry body to the west of the shale unit suggests that it may be a series of ash flows ("ignimbrites"). The reason for the strong I.P. anomalies over this body has not been determined at this stage.

2.1.4 Conclusions

As with several other areas along the West Coast geochemical and I.P. anomalies have been found to coincide with units of black shales and adjacent tuffs. Two such zones have been delineated to date.

1. A zone corresponding with a SW-trending unit of black shale from line 16N/900W to line 04N/645W. GALENA, SPHALERITE and PYRITE have been found in minor proportions within the shales which occur along the eastern edge of a large I.P. anomaly. The geochemical anomalies overlap onto the tuffs to the east of the shales (see Fig. 3).
2. A small zone with black shales between line 04N/1590W and line 06N/1500W which corresponds with I.P. anomalies. Geochemical anomalies again extend beyond the I.P. zone. Black shales were found in outcrop on a track at 500N/1590W.

Both zones warrant detailed follow-up work, and diamond drilling is recommended for the major anomalous zone.

2.2 EXPLORATION EXPENDITURE 1977-78

* Salaries and Wages	\$ 6 543
* Burden charges	2 386
* Materials	5 267
Access	1 023
Geophysics	2 119
* Geochemistry, Petrology	755
General costs	1 028
* Equipment and Facilities	1 211
Indirect charges, 6% of *	1 051
Total	<u>\$21 383</u>

Total expenditure since 1969 is \$178 868.

3. PROPOSED EXPLORATION PROGRAMME 1978-79

3.1 Beatrice Grid

3.1.1 Introduction

Exploration priorities during 1978-79 will centre on the zone covering the prominent SW-trending black shale between line 20N/1050W and line 06N/665W which will be tested with one or two diamond drill holes, depending upon access.

The soil sampling programme over the western half of the grid, started in 1977-78, will be completed during Periods 1, 2 and 3 of 1978-79. The eastern half will be sampled later in the year.

The line extensions in the north western corner of the grid will be surveyed with gradient array E.I.P. and total field magnetics to complete the geophysical coverage over the entire grid.

Unit costs are given in Table 1.

3.1.2 Access

To date vehicular access is restricted to the south-western corner of the grid, the road ending at line 02N/1230W. Swampy ground and steep terrain has prevented the construction of roads to other parts of the grid.

Attempts will be made to find suitable routes for roads to provide access to anomalous zones in both the western and eastern parts of the grid. If such routes can be found road construction could be of the order of \$6 000 for the western part and \$8 000 for the eastern part.

With a helicopter on the West Coast for the Jules Darwin and possibly Henty River programmes, it may be used to provide access to more remote parts of the grid if roads do not eventuate.

3.1.3 Geochemistry

The soil sampling programme over the western half of the grid should be completed during Period 3. Some follow-up sampling may be required to fill-in anomalous zones.

The eastern half of the grid will be sampled during the summer field season if personnel and funds are available. If necessary a helicopter may be used to pick up samples left in cleared areas.

To reduce costs only the -80# fraction will be assayed for samples from the eastern section.

The estimated costs for the soil sampling programmes are:

Western section - 450 samples at \$4.50 per sample = \$2 025
 Eastern section - 360 samples at \$2.25 per sample = \$ 810

Two hundred drill core samples are planned for the two proposed diamond drill holes. At a unit cost of \$5.80 per sample the total cost will be \$1160.

3.1.4 Geophysics

About 4km of gradient array E.I.P. and total field magnetics surveys will be required to complete the geophysical coverage over the line extensions in the north-west of the grid. About 200 crew-days will be required for this operation for a total of \$3200.

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Geophysical logging of the two proposed drill holes will cost \$300/hole, a total of \$600.

3.1.5 Diamond Drilling

Two 300m diamond drill holes are proposed to test coincident geochemical and I.P. anomalies in the western part of the grid. Two zones have already been delineated - the SW-trending unit of black shales between line 16N/900W and line 06N/665W, and a small shale unit between line 06N/1500W and line 04N/1590W.

The determining factor as to the position and orientation of the holes will be the availability of access. If suitable drill sites cannot be reached by a road then a helicopter-based programme may be utilised (see E.L.21/76 Annual Report, 1977-78, Appendix III).

The cost of the drilling programme will depend on whether a Mount Lyell crew or a contract crew are used. A rough estimate of the costs involved is:

Drilling - 2 x 300m (contract crew)	\$39 000
2 x 300m (Mt. Lyell crew)	27 000
Site preparation - 20 hrs. bulldozer hire/site	1 200
Helicopter hire - 20 hours	6 800

3.2 Exploration Budget 1978-79

The proposed 1978-79 budget given in Table 2 has been broken into the various sections of the programme to assist in planning overall expenditure covering all four licence areas. Depending upon availability of funds parts of this programme may be postponed until a later date.

Where alternative costs are available both the maximum and minimum alternatives are given in Table 1.

Table 3 shows the maximum expenditure required to complete the entire proposed programme. For this purpose it is assumed that both western and eastern access roads will be constructed and an outside contractor used for the drilling programme. Manpower proposals are one geologist and one field assistant for the full year.

TABLE 1

UNIT COSTS USED IN 1978-79 EXPLORATION BUDGET

EXPLORATION METHOD	UNIT COST	PRODUCTIVITY
1. <u>TRACK CUTTING</u>	Max. \$350/km Min. \$250/km	} 500 m/crew/day
2. <u>GEOCHEMICAL ASSAYS</u>		
(i) soils	1 fraction - \$2.25	} Cu, Pb, Zn, Ag, Mn less \$2.00 if sample preparation by field assistants
(ii) rock chips	2 fractions - \$4.50 Cu, Pb, Zn, Ag, Mn - \$4.25	
(iii) drill core	Cu, Pb, Zn, Ag, S - \$5.80	
3. <u>GEOPHYSICS</u>		
(i) gradient array I.P.	\$400/km	} 1 km/crew/day 1 hole/day 3 km/operator/day
(ii) D.D.H. E.I.P. logging	Max. \$300/hole (Scintrex) Min. \$100/hole (Mt. Lyell)	
(iii) ground magnetics	\$130/km	
4. <u>DIAMOND DRILLING</u> (all inclusive)	Outside contractor \$65/m Mt. Lyell crew \$45/m	} 10 m/shift
5. <u>EARTHMOVING</u>		
(i) drill site preparation	D7 - \$30/hour	20 hours/drill site 20 dozer days/km 7 dozer days/km
(ii) road construction	\$6,000/km - steep terrain \$2,100/km - flat terrain	
6. <u>HELICOPTER</u>	\$340/hour Bell Jetranger 206B	1977-78 average usage 4 hours/day

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TABLE 2ITEMISED 1978-79 EXPLORATION BUDGET

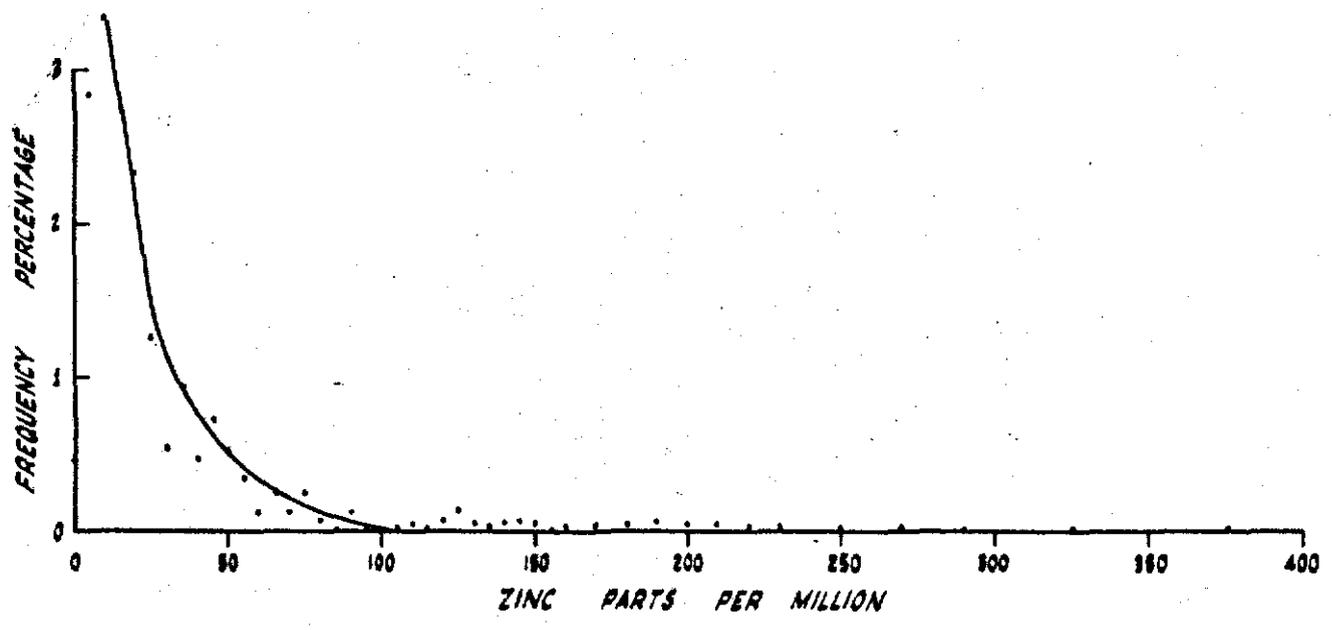
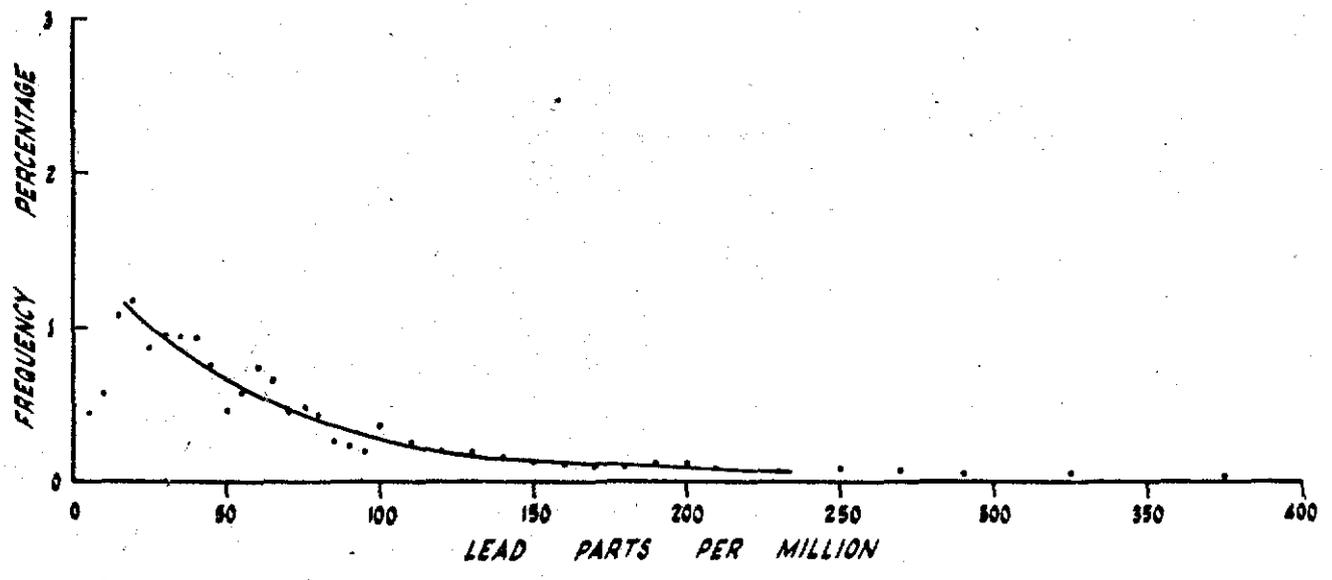
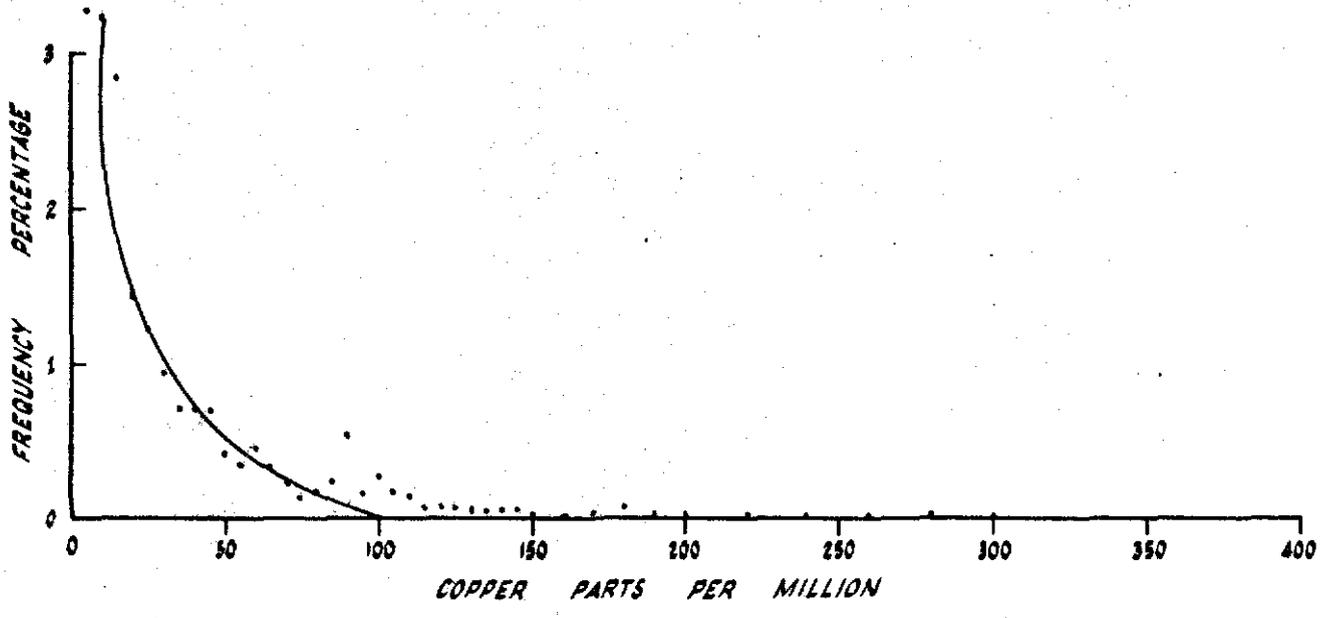
1. Access		
(i) Road construction - western section		\$ 6 000
- eastern section		8 000
(ii) Helicopter hire - 10 hours		3 400
2. Soil Sampling - western section		2 025
- eastern section		810
3. Geophysics - E.I.P. gradient array and magnetics, 8 days		3 200
4. Diamond Drilling		
Drilling, 2 x 300m holes - Outside contractor		39 000
- Mt. Lyell crew		27 000
Site Preparation - 20 hours bulldozer hire/site		1 200
Helicopter hire - 20 hours (if not accessible by road)		6 800
E.I.P. Logging - Outside contractor (Scintrex)		600
Mt. Lyell		200
Drill core assays - 200 samples		1 160

TABLE 3EXPLORATION BUDGET 1978-79

* Salaries, Wages, Burdens	\$ 30 000
* Materials	6 000
Access	14 000
Geophysics	3 800
* Geochemistry, Petrology	4 000
General costs	2 060
* Equipment and Facilities	3 000
Diamond Drilling	40 200
Indirect charges, $6\frac{1}{2}\%$ of *	2 800
	<u>\$105 860</u>

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APPENDIX I



BEATRICE GRID - 80 #
SOIL ASSAY DISTRIBUTION

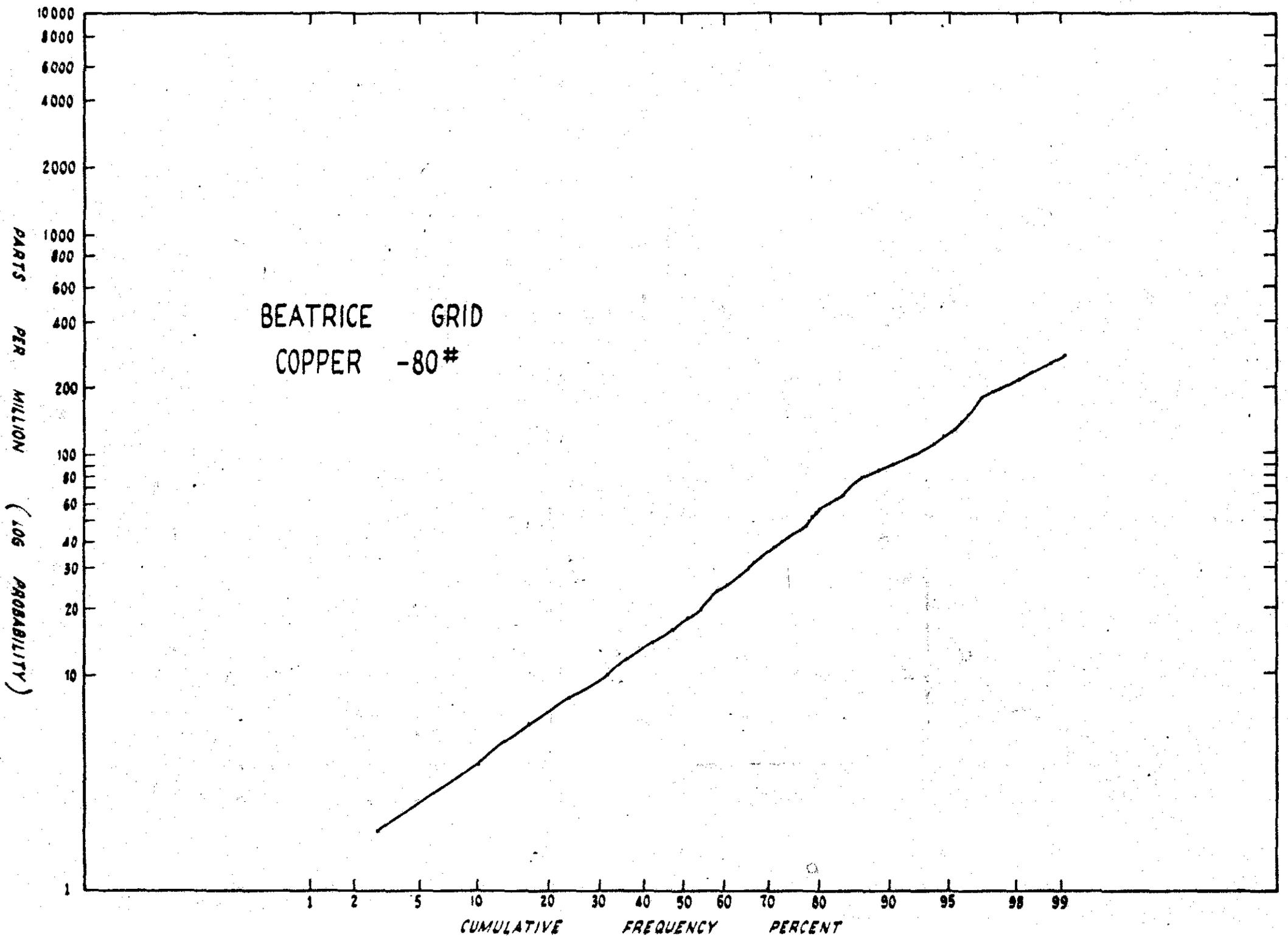


FIG. 5

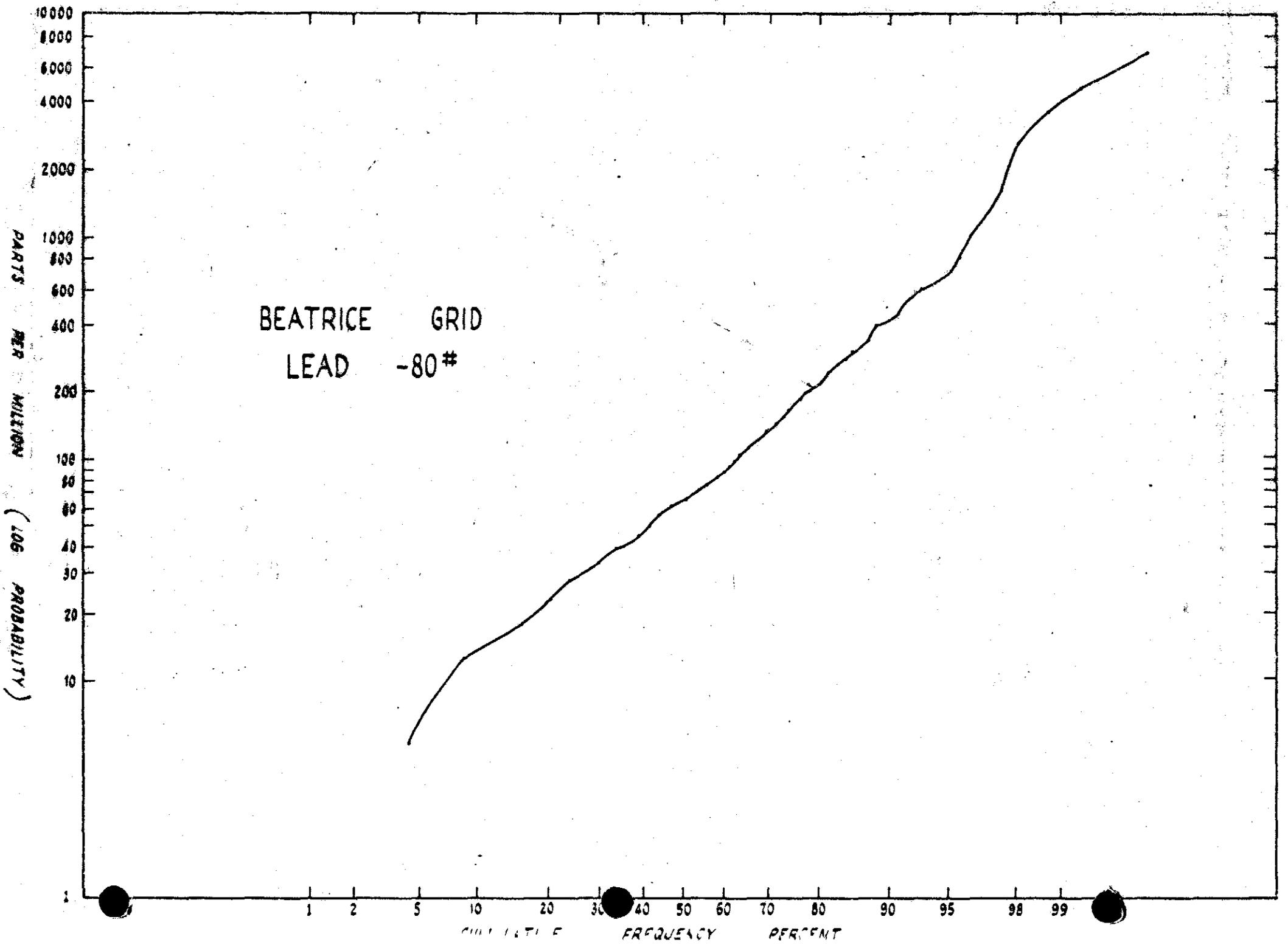


FIG. 6

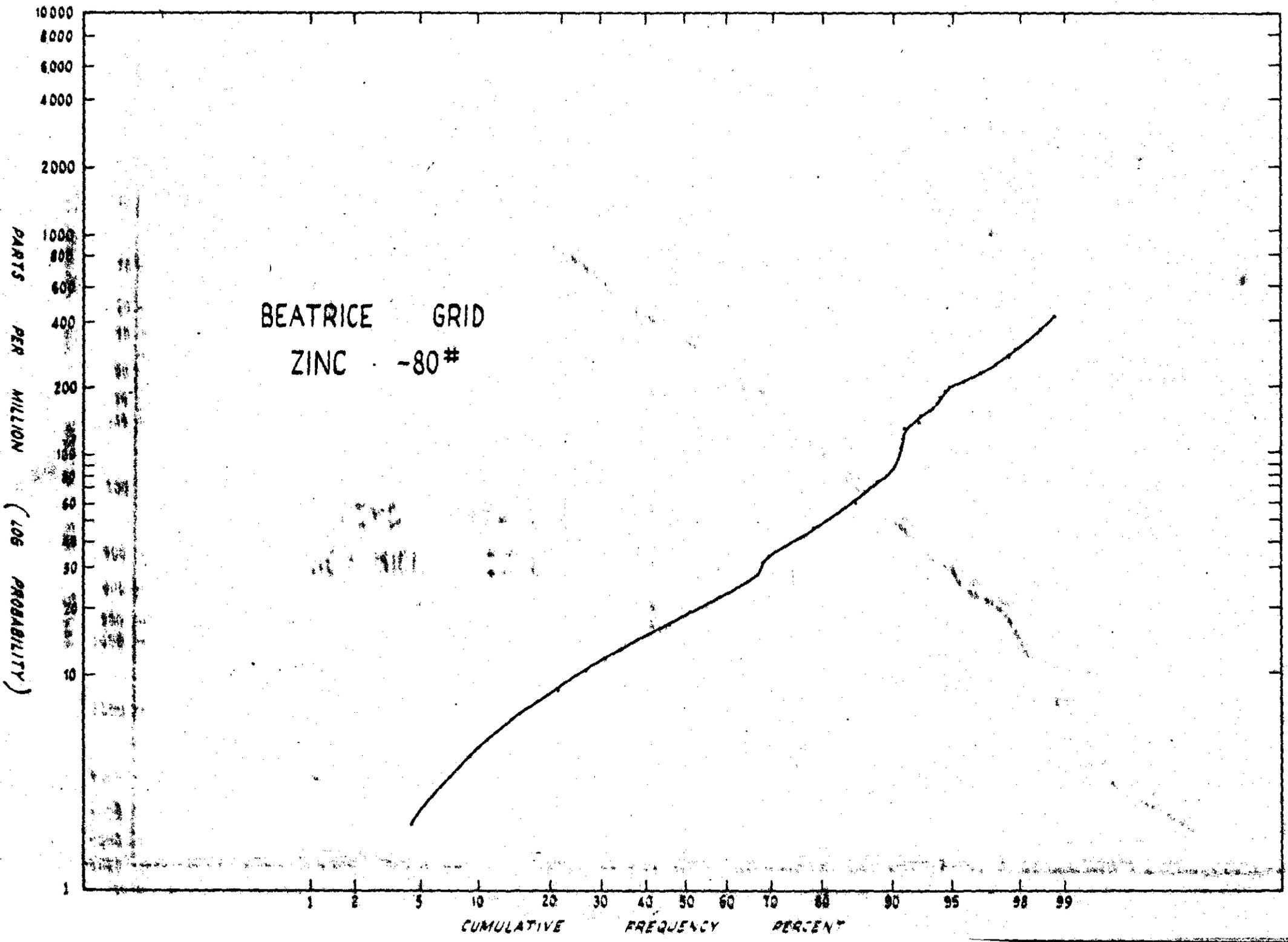


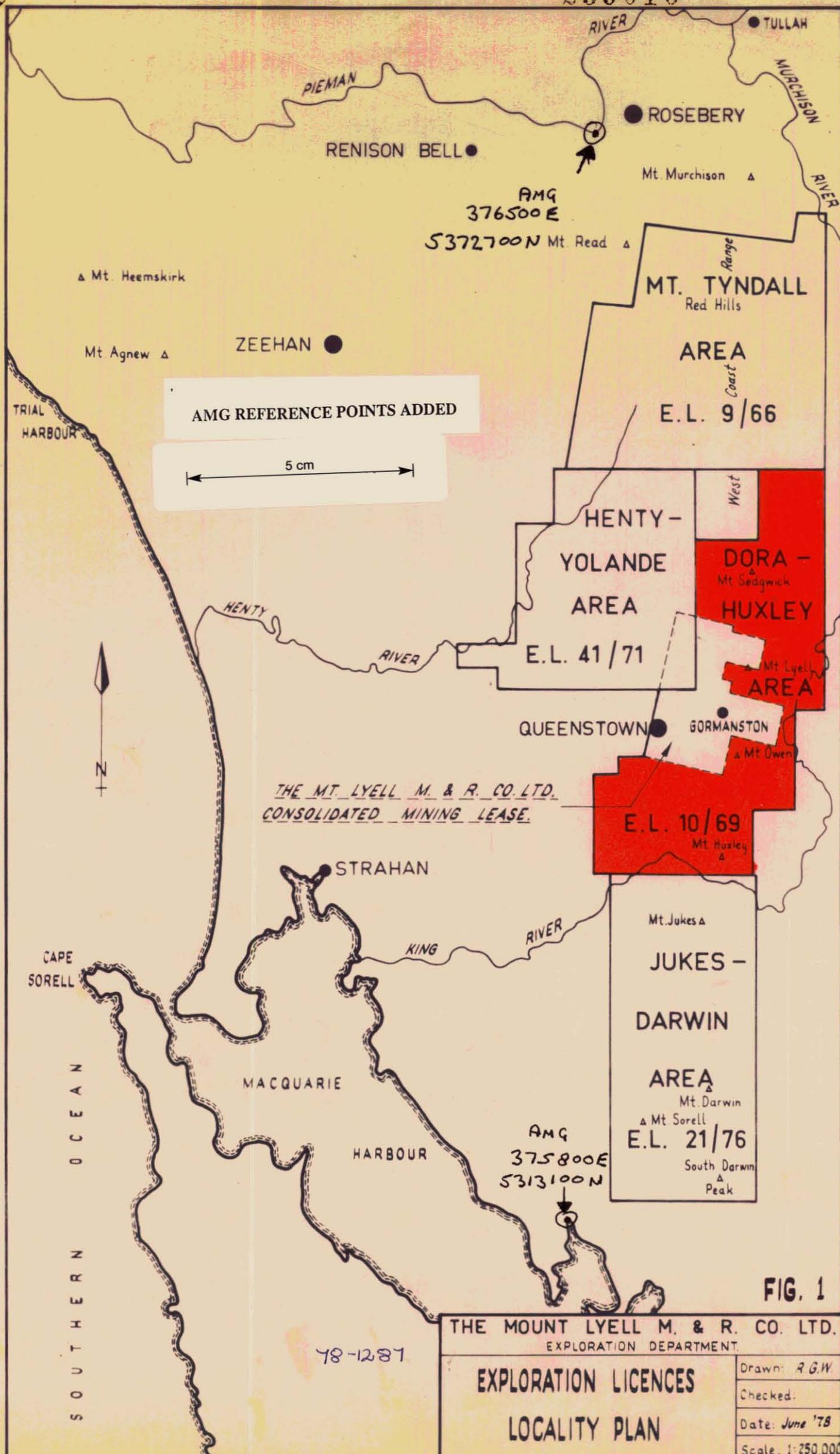
FIG. 7

APPENDIX IIROCK CHIP ASSAYS

<u>Sample</u>	<u>Location</u>	<u>Cu</u>	<u>PB</u>	All ppm <u>ZN</u>	<u>Ag</u>	<u>Mn</u>
Lake Beatrice Grid co-ordinates						
MS 3		139	29	52	< 1	51
BW 115	1500N/2110W	84	565	1200	< 1	22
BW 116	1580N/2130W	85	207	570	< 1	52
BW 154	1230N/2160E	48	25	140	< 1	240
BW 166	1740N/1820E	69	39	150	< 1	650
BW 167	1480N/2190E	49	11	39	< 1	53
BW 176	1080N/Baseline	59	10	40	< 1	133
BW 178	1660N/090W	84	25	64	< 1	353
BW 189	1860N/Baseline	81	90	160	< 1	364
22901	600N/665W	15	90	20	< 1	15
22902	600N/670W	13	6	22	< 1	15
22903	600N/730W	26	20	45	< 1	980
22904	1400N/910W	132	2300	3000	9	790

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THE MT. LYELL M. & R. CO. LTD.
CONSOLIDATED MINING LEASE.

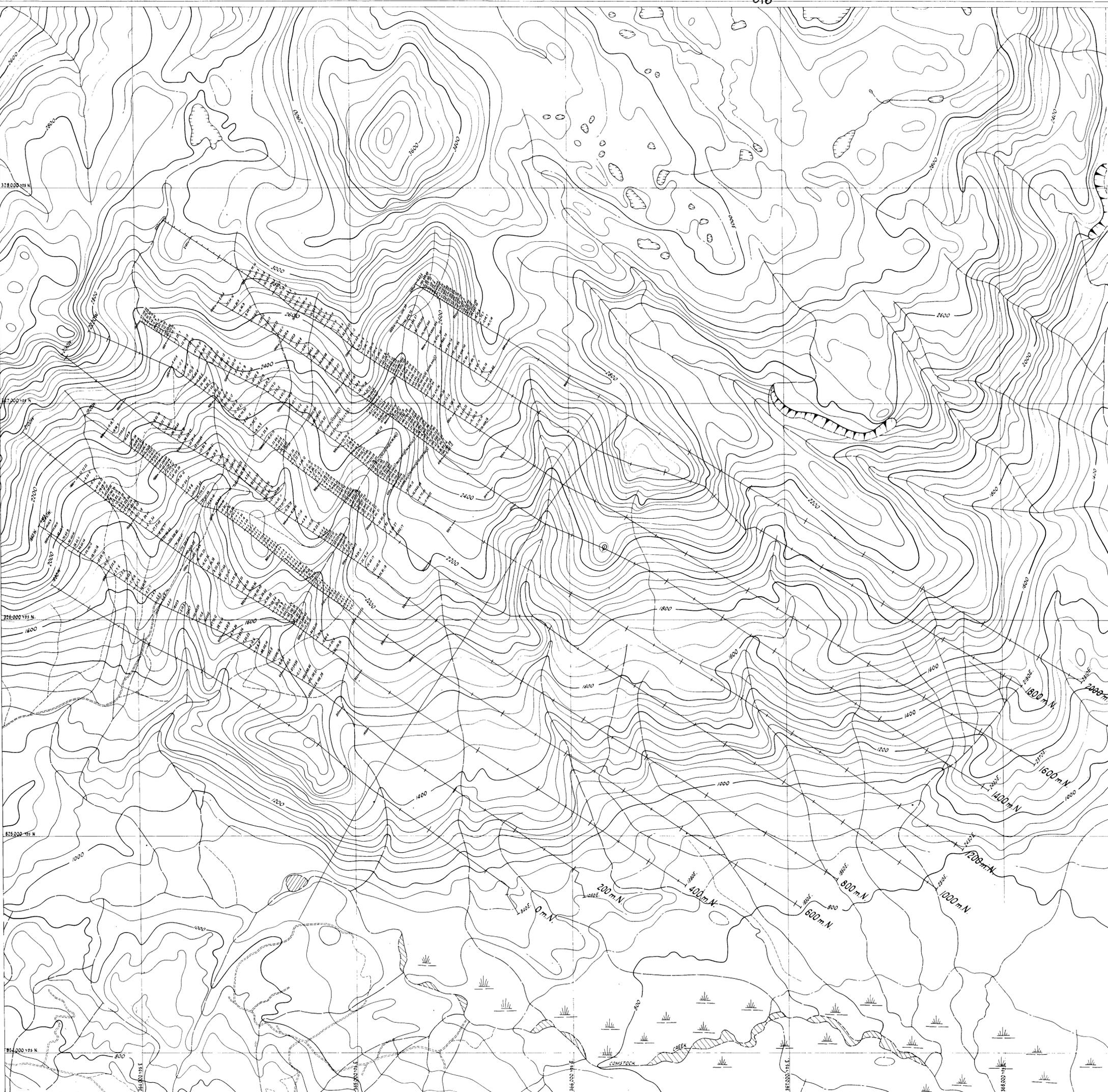
FIG. 1

THE MOUNT LYELL M. & R. CO. LTD.
EXPLORATION DEPARTMENT.

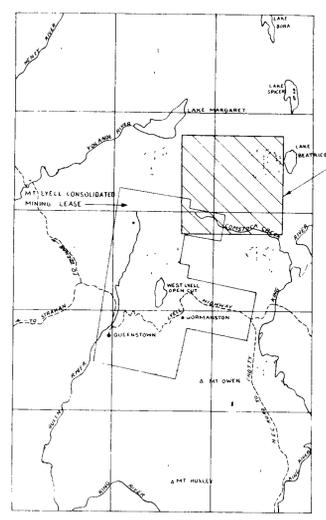
EXPLORATION LICENCES
LOCALITY PLAN

Drawn: R.G.W.
Checked:
Date: June '78
Scale: 1:250,000

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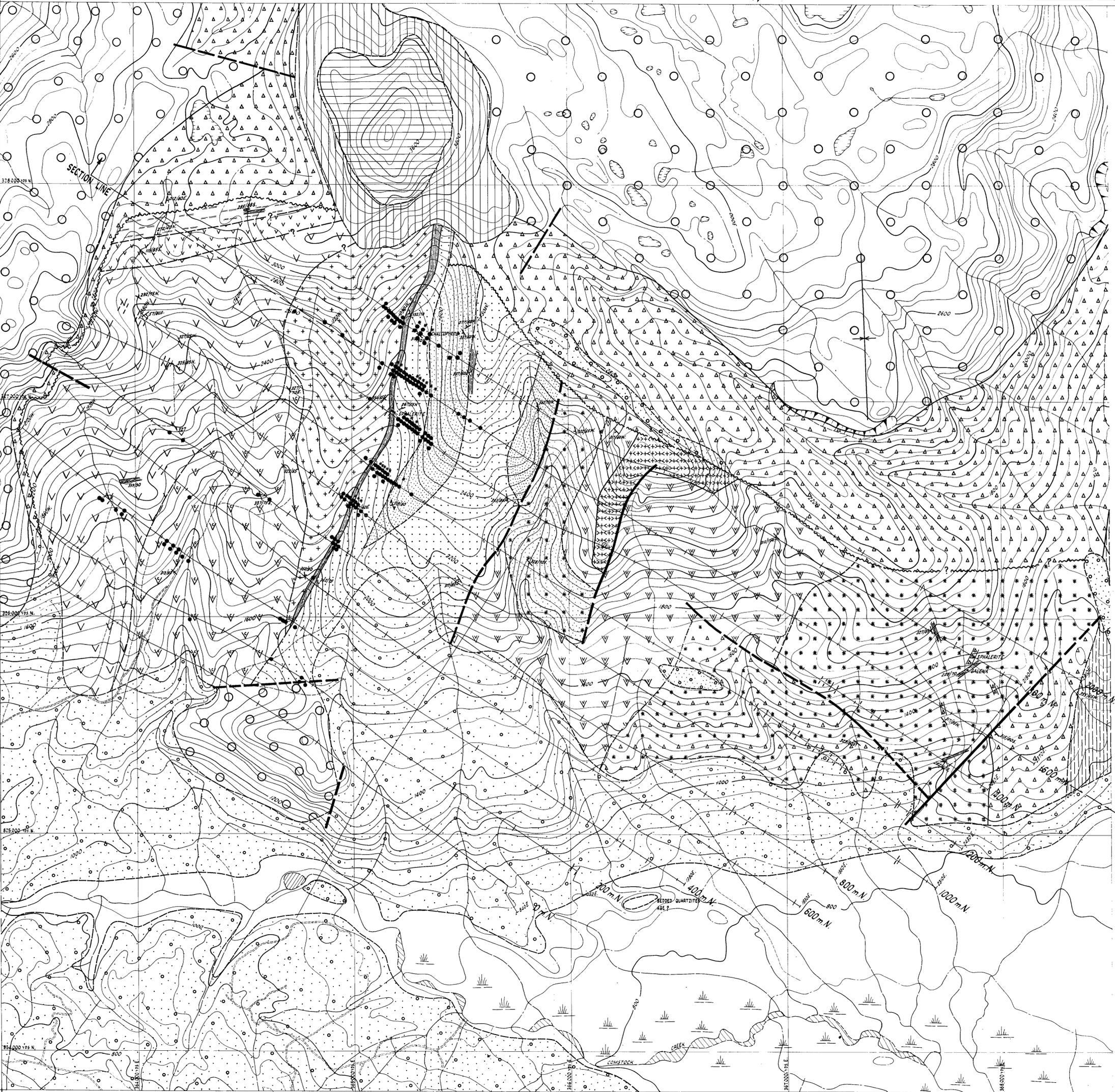
LOCATION



229017
 18-12-87

THE MOUNT LYELL M. & R. COY. LTD.
 GEOLOGICAL DEPARTMENT
 DORA - HUXLEY AREA E.L. 10/69
 BEATRICE GRID 016
 SOIL GEOCHEMISTRY -80 # FRACTION

DRAWN R.M.
 TRACED R.G.W.
 CHECKED
 DATE MAY 1978
 SCALE 1:6000
 FIG. 2



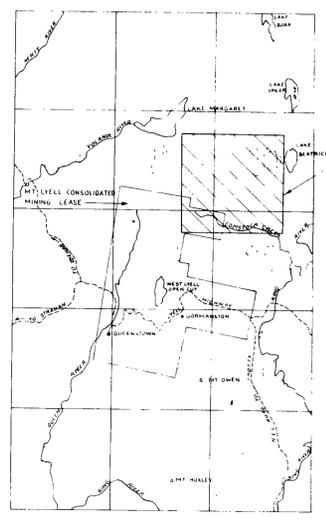
LEGEND

- QUATERNARY
 - ALLUVIUM.
 - GLACIAL MORAINES AND SCREE.
- JURASSIC
 - DOLERITE.
- PERMIAN
 - TILLITE.
- ORDOVICIAN
 - HAEMATITIC CONGLOMERATES/SANDSTONES (OWEN SERIES)
- CAMBRIAN
 - HAEMATITIC CONGLOMERATE, WITH VOLCANOCLASTIC AND QUARTZITIC FRAGMENTS - JUKES CONGLOMERATE.
 - UNCONFORMITY.
- FINE GRAINED SILICEOUS SEDIMENTS.
- ALTERED (CHLORITE, SILICA) FELDSPAR AND/OR QUARTZ PORPHYRITIC FINE - COARSE GRAINED CRYSTAL LITHIC TUFFS, WITH MINOR FINE GRAINED FELSIC LAVAS AND SHALE HORIZONS.
- FELDSPAR AND/OR QUARTZ PORPHYRITIC CRYSTAL TUFFS AND ALTERED FINE - COARSE GRAINED LITHIC TUFFS, WITH OCCASIONAL SHALES.
- PALE ALTERED (SERICITIC SILICA) FINE - MEDIUM GRAINED LITHIC TUFFS, PARTLY PYRITIC, MINOR QUARTZ AND/OR FELDSPAR CRYSTAL TUFFS.
- CHLORITIC FINE - COARSE GRAINED ALTERED LITHIC TUFFS, MINOR CRYSTAL TUFFS.
- BLACK (PYRITIC) SHALES.
- MICACEOUS QUARTZITES AND SHALES.
- QUARTZ PORPHYRITIC FINE GRAINED FELSIC LAVA.
- QUARTZ AND/OR FELDSPAR PORPHYRITIC FELSIC LAVAS WITH INTERCALATED BLACK AND LAMINATED SHALES AND MINOR LITHIC TUFFS.
- ALTERED FINE GRAINED FELSIC LAVAS (HAEMATITIC, SILICEOUS OR CHLORITIC)
- BRECCIATED AND ALTERED FINE GRAINED FELSIC LAVAS, DEVELOPMENT OF HAEMATITE WITH MINOR MAGNETITE AND QUARTZ VEINS.
- MEDIUM - COARSE GRAINED QUARTZ PORPHYRY.
- QUARTZ FELDSPAR PORPHYRY.
- LITHOLOGY BOUNDARY.
- INFERRED BOUNDARY.
- FAULT.
- INFERRED FAULT.
- UNCONFORMABLE LITHOLOGY BOUNDARY.
- SYNCLINE.
- STRIKE AND DIP OF FOLIATION.
- STRIKE AND DIP.
- MAP GRID AREA - A.WALTER, 1976/77.
- DATA OUTSIDE GRID AREA - P.BROPHY, 1975/76.

- GEOCHEMISTRY - 80% FRACTION.
- COPPER ≥ 100 p.p.m.
 - LEAD ≥ 500 p.p.m.
 - ZINC ≥ 100 p.p.m.
 - SILVER ≥ 2 p.p.m.

- GEOPHYSICS.
- CHARGEABILITY > 20 mC.

LOCATION



5 cm

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THE MOUNT LYELL M & R COY. LTD.
 GEOLOGICAL DEPARTMENT
 DORA - HUXLEY AREA E.L. 10/69
 BEATRICE GRID
 ANOMALY COMPILATION

DRAWN A.WALTER.
 TRACED R.G.WILSON.
 CHECKED
 DATE 5/8/78
 SCALE 1:6000

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FIG. 3