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THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED

EXPLORATION LICENCE 9/66

ANNUAL REPORT

1978-79

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SUMMARY

Exploration to locate economic Cu-Pb-Zn-Ag-Au deposits in the Cambrian Mt. Read Volcanics continued on E.L. 9/66 during the 1978-79 year. Detailed exploration including 6 diamond drill holes was centred on the White Spur, Henty River, Beatrice and Clark Valley grids, while reconnaissance stage exploration continued in other areas. Outcropping disseminated galena-sphalerite mineralisation was located on the Beatrice and Henty River grids, but diamond drilling results indicate that both occurrences are sub-economic.

During the year four Exploration Licences held by The Mount Lyell Mining and Railway Company Limited were amalgamated (E.L.'s 9/66, 10/69, 41/71, 21/76), and together with an additional 15 sq. km block, comprise the current E.L. 9/66 of 594 sq. km.

Exploration expenditure during 1978-79 was $421,380, bringing the total expenditure on the area now included in E.L. 9/66 since 1967 to $2,223,967. Of this total, Getty Oil Development Company Limited has contributed $1,163,688 under the current joint venture agreement.

Exploration proposed for the 1979-80 year includes both the evaluation of new and partly tested targets by diamond drilling, and the location and definition of significant anomalies in reconnaissance surveys. Compared to the 1978-79 programme, diamond drilling expenditure will increase from 24% to 39% of the total budget, with metres drilled increasing by 51%. Proposed expenditure for the 1979-80 programme is $ 460,140.

1. INTRODUCTION

1.1 EXPLORATION COMPLETED 1978-79

During the 1978-79 year (29.6.78 to 27.6.79), exploration programmes designed to locate economic Cu-Pb-Zn-Ag-Au deposits continued on E.L. 9/66 (Figure 1). These programmes ranged from reconnaissance surveys to detailed evaluation and testing of anomalous zones and outcropping sulphide mineralisation by diamond drilling (Figure 2, Table 1). Total exploration expenditure during the year was $421,380.

Geological mapping, geochemical sampling and induced polarisation and ground magnetic surveys were completed on the White Spur, Henty River, Beatrice and Clark Valley grids. Six diamond drill holes totalling 1,941.5 m tested targets on the White Spur, Henty River and Beatrice grids. Significant intersections included 12 m grading 4.22% Pb, 1.84% Zn and 16 g/t Ag (D.D.H. HR 2, Henty River) and 2 m grading 2.66% Pb, 5.05% Zn and 22 g/t Ag (D.D.H. MS 1, Beatrice).

A detailed review and evaluation of previous exploration in the Howard's Anomaly area resulted in the definition of a major anomalous zone which will be investigated during the 1979-80 year. In addition, a low-level aeromagnetic survey was carried out over the NW section of the licence area, and 1:20,000 scale colour aerial photography was flown over approximately 70% of the licence area. The services of a consultant geochemist were employed to maximise the effectiveness of geochemical exploration techniques.

Diamond drilling comprised 24% of the 1978-79 exploration expenditure and was completed at a unit drilling cost of $52.52/m. Helicopter usage totalled 52 hours 7 minutes at an all-inclusive unit cost of $375/hour.

1.2 PROPOSED EXPLORATION PROGRAMME AND BUDGET 1979-80

Exploration programmed for 1979-80 is detailed in Section 3 and

includes a significant percentage of expenditure on diamond drilling. Eight holes and an extension to a previous drill hole, totalling 2,930 m, will be drilled on the White Spur, Howard's Anomaly, Henty River and Beatrice grids to test combined geochemical and geophysical targets in favourable geological environments (Figure 3).

Track cutting to extend the Howard's Anomaly and Henty River grids, and to establish the Garfield River grid will be carried out. In addition geological mapping and geochemical and/or geophysical surveys will be used to define targets on the Howard's Anomaly, Henty River, Madam Howard, Beatrice and Garfield River grids. Approximately 4 km of four wheel drive access tracks will be constructed to provide access for diamond drilling on the Henty River and Beatrice grids.

A reconnaissance stream sediment sampling programme will be carried out in the lower drainage areas of the Henty, Yolande and Langdon Rivers to define areas of potential. A detailed review of previous exploration in the Anthony Creek-Lake Spicer belt will be completed to evaluate the potential of the volcanic sequence lying east of the Tyndall Range.

A budget of $460,140 has been planned for the 1979-80 exploration programme. A 5-year programme outlining annual exploration programmes for E.L. 9/66 during the period 1979-1984 is also presented in Section 3. These programmes emphasise the high potential of the licence area and the long-term approach to exploration in this complex and difficult area.

1.3 TENURE

The exploration programmes and expenditure reported herein for the 1978-79 year are for the area of 594 sq. km encompassed by E.L. 9/66 at 27th June, 1979. This licence area incorporates four previous exploration licences and an exploration licence application, all held by The Mount Lyell Mining and Railway Company Limited, which were amalgamated into a single licence (E.L. 9/66) on 5th December, 1978. These licences are as follows:

Licence No.	Name	Area (Sq. km)	Date Granted
E.L. 9/66	Mt. Tyndall	174	5. 2.67
E.L. 10/69	Dora-Huxley	132	5.12.69
E.L. 41/71	Henty-Yolande	129	4. 8.71
E.L. 21/76	Jukes-Darwin	144	1. 9.76
E.L.A. 23/78	Lake Mary	15	-
E.L. 9/66 (amalgamated)		594	5.12.78

The Lake Mary area, located immediately north of Lake Margaret and underlain by Owen Conglomerate and Gordon Limestone, was a vacant block at the intersection of E.L.'s 9/66, 10/69 and 41/71. It was applied for when ironstone floaters were located along the north shore of Lake Margaret in September 1978 (see Section 2.6.5).

During the year the Mines Department has made two minor alterations to the boundary of the licence. Immediately west of Queenstown, a short 3.2 km section of the boundary now runs due North to join the E-W boundary of former E.L. 41/71 immediately south of the Madam Howard area. Previously this boundary coincided with a section of the western boundary of the Mt. Lyell Consolidated Mining Lease (15M/75). The second alteration is located east of Lake Dora at the intersection of the eastern boundaries of former E.L.'s 9/66 and 10/69. Here the northern section of the eastern boundary is displaced 155 metres east of the southern section.

In March, 1979, the South West Conservation Area was proclaimed. As shown in Figure 2, the eastern and southern sections of E.L. 9/66

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TABLE 1

Exploration Completed - 1978-79

	ACCESS		GEOCHEMISTRY				GEOPHYSICS			DIAMOND DRILLING	
	Track cutting Line-km	Road Construction km	Soil samples	Stream sediments	Water samples	Rock chip samples	Induced polarisation Line-km	Ground magnetics Line-km	Airborne magnetics Line-km	D.D.H.	Metres drilled
WHITE SPUR	7.30	-	504	-	-	40	8.70	17.30	-	1	382.0
HOWARDS ANOMALY	-	-	15	-	-	24	-	-	-	-	-
HENTY RIVER	20.14	-	790	34	18	170	8.14	8.14	-	2	601.5
BEATRICE	0.90	2.4	572	37	5	109	9.05	-	-	3	958.0
JUKES-DARWIN	12.35	-	485	6	-	7	8.60	8.60	-	-	-
MISCELLANEOUS	5.40	-	119	-	-	48	-	-	261	-	-
TOTAL	46.09	2.4	2485	77	23	398	34.49	34.04	261	6	1941.5

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comprising 51% of the licence area now lie within this conservation zone. To date exploration programmes on the licence area have not been affected by this changed land classification.

1.4 PROGRESSIVE EXPLORATION EXPENDITURE 1967-1979

During 1978-79 a total of $421,380 was spent on exploration programmes in the licence area. This brings the total expenditure by Mt. Lyell and its joint venture partners on current and previous exploration licences within the amalgamated area since exploration commenced in 1967 to $2,223,967 at 27th June, 1979. The distribution of this expenditure between previous and current exploration licences is tabulated below.

TABLE 2

E.L. 9/66 Exploration Expenditure 1967-79

E.L.	AREA (SQ. km)	DATE GRANTED	PERIOD OF EXPENDITURE	EXPENDITURE
9/66	174	5. 2.67	5. 2.67 to 13.12.78	$1,258,134
10/69	132	5.12.69	5.12.69 to 13.12.78	$ 214,788
41/71	129	4. 8.71	4. 8.71 to 13.12.78	$ 295,568
21/76	144	1. 9.76	1. 9.76 to 13.12.78	$ 162,948
9/66 amalgamated	594	5.12.78	13.12.78 to 27. 6.79	$ 292,529
TOTAL EXPENDITURE			5. 2.67 to 27. 6.79	$2,223,967

Expenditure by Getty Oil Development Co. Ltd. under the terms of the current Mt. Lyell-Getty Oil and Mt. Lyell-Getty Oil-Consolidated Gold Fields Australia Limited exploration joint ventures on E.L. 9/66 since 20th May, 1976, totalled $1,163,688 at 27th June, 1979.

During 1978/79, the expenditure on the Tyndall area (Mt. Lyell-Getty Oil Development Co. Ltd.-Consolidated Gold Fields Australia) was $171,713, and on the Sedgwick-Darwin area (Mt. Lyell-Getty Oil Development Co. Ltd.) was $249,667, totalling $421,380 for the amalgamated E.L. 9/66. Expenditure on the area covered by the Mt. Lyell-Getty Oil Development Co. Ltd.-Consolidated Gold Fields Australia joint venture (the new Tyndall area) since 5.2.67 totalled $1,138,910 at 27.6.79. This area incorporates the former E.L. 9/66.

2. EXPLORATION COMPLETED 1978-79

2.1 WHITE SPUR GRID (A. C. Walter)

2.1.1 North East Area

1. Introduction

Two diamond drilling targets were outlined in E.L. 9/66 Mt. Tyndall Annual Report 1977-78. Further field mapping and a ground magnetic survey were done to further define the drilling targets.

One diamond drill hole, WSP 1, was drilled to 382.0 m without intersecting any significant base metal mineralisation.

Exploration completed during 1978-79 on both the north-eastern and western sections of the grid is listed in Table 3.

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TABLE 3

White Spur Grid - Exploration Details 1978-79

Line	EIP	Magnetics	Soil Geochem.	No. of Samples	Track Cutting
N					
27.5	3000 - 1800W and 0 - 2800E				3000 - 1800W 0 - 2800E
28.5	3500W -- 0 -- 2100E				3500W -- 2100E
29.5	2900W -- 0 -- 1600E				2900W -- 1600E
30	2800W -- 1600E				
30.5	2800W -- 0 -- 1700E				2800W -- 1700E
31.5	2300W -- 0 -- 500E				2300W -- 500E
32.5	1800W -- 0 -- 800E		1800W -- 800E	50	1800W -- 800E
33.5		1900W -- 0 -- 600E		51	
34.5		2200W -- 0		44	
36		2000W - 400W			
36.25		2900W -- 600W		41	
36.5		3100W -- 1100W		36	
37.5		3600W -- 1300W		47	
		3900E -- 5900E			
38.5		4000W -- 1700W		47	
		3900E -- 5700E			
39			3100W -- 4000W	8	
39.5		3800W -- 1900W		39	
		3700E -- 5400E			
40.5		3700W -- 2500W		25	
		3500E -- 5500E			
41.5		3800W -- 2400W		29	
		3500E -- 5600E			
42			3400W -- 3800W	9	
42.5		3400W -- 1300W		40	
		5000E -- 6000E			
43			4000E -- 5800E	38	
TOTAL	28400' (8700 m)	56800' (17300 m)	47300' (14400 m)	504	24000' (7300 m)

2. Geology

The diamond drilling target area consists of two major tuffaceous shale-fine grained tuff zones. These occur in a sequence of fine-coarse grained feldspar crystal lithic (+ welding) tuffs, tuffaceous shales, minor fine grained sericitic tuffs and fine-medium grained basaltic intrusives (Figure 4).

Minor fine grained pyrite was identified within the major shale unit, but no base metal minerals were observed. Further rock chip samples assayed only very low Cu-Pb-Zn values.

3. Geophysics

The intermediate lines L37.5N to 42.5N were surveyed with ground magnetics (11,000'). No new anomalies were located, but the survey defined the major anomaly on L36N 1650W (up to 500 γ above background) as occurring within the major shale unit (Scintrex Pty. Ltd., Report Tas-062c, June 1979) see Figure 5.

The recontoured chargeability, resistivity and ground magnetics data for the north-east area of the grid is included in this report (Figures 6, 7 and 8).

Geophysical surveys associated with diamond drill hole WSP 1 are discussed below.

4. Diamond Drilling

One diamond drill hole was completed at 382.0 m by Associated Diamond Drillers at a cost of $51.37/metre. Drilling was on a one 10 hour shift/day basis, and the operators worked from a caravan on site. The penetration rate was 29.4 m/drilling shift using a Mindrill 10L drilling rig with NQ wireline equipment. The hole was collared on 8th March and completed on 20th March, 1979.

D.D.H. WSP 1: bearing: 77° magnetic,
inclination: -60°,
collar: 70' south of L38.5N 4750E,
depth: 382.0 m.

Purpose: To test the twin EIP chargeability anomalies and the corresponding resistivity drop to about 1,500 ohm m, on line L38.5N 5050E and 5500E, with a co-incident magnetic anomaly at 5500E. Soil geochemical results are spotty with a broad low order Cu-Pb-Zn anomaly corresponding with the shale unit and the adjacent crystal lithic tuff (Figure 9).

The stratigraphic sequence to be tested was considered to be the same as the Rosebery Pb-Zn orebody, with the laminated tuffaceous shale possibly corresponding with the mineralised horizon.

Lithology Summary:

0-41.1 m: medium grained feldspar (calcite) crystal lithic tuff, in part welded. Minor pyrite (pyrrhotite) < 1%.

41.1-82.9 m: laminated and slumped tuffaceous shales, minor fine grained calcitic tuffs. Minor pyrite and pyrrhotite, to 2%.

82.9-104.2 m: fine grained vitric tuffs and tuffaceous shales; calcitic with minor pyrite, to 2%.

104.2-140.0 m: medium and coarse grained feldspar crystal lithic (vitric) tuffs, calcitic, part welded. Minor pyrite, to 1%.

140.0-204.3 m: fine grained vitric lithic tuffs and tuffaceous shales; generally calcitic, minor pyrite-pyrrhotite (to 2%), rare sphalerite and galena.

204.3-239.0 m: medium-coarse grained lithic (feldspar) crystal tuffs, minor fine grained vitric crystal lithic tuffs, generally calcitic, minor pyrite-pyrrhotite (to 3%).

239.0-239.2 m: fault. Veining with minor sphalerite, chalcopyrite, pyrite.

239.2-254.0 m: fine grained crystal vitric tuff + alteration; generally calcitic; minor pyrite (to 1%) with rare sphalerite and galena.

254.0-264.0 m: fine-medium grained altered tuff; sericitic, siliceous, with minor pyrite to 2%.

264.0-321.3 m: fine-medium grained vitric and crystal vitric tuffs; variable calcite.

321.3-382.0 m: sequence of fine-coarse textured feldspar phyric ash flow tuffs.

Assay Summary:

138.0-146.0 m: 8 m of 0.26% Zn, including 2 m at 0.62% Zn,
239.0-241.0 m: 2 m of 0.76% Zn,
252.0-254.0 m: 2 m of 0.63% Zn, 0.12% Pb.

Results:

A downhole EIP log was completed from 28-137 m (hole blocked) which adequately explained the chargeability anomaly centred on L38.5N 5050E, corresponding with fine grained vitric tuffs at 93.65-100.65 m containing up to 2% pyrite over 2 m (Figure 10).

The down-dip projection of the surface chargeability response centred at about 5500E ± 100' occurs between 239-264 m (vitric and vitric crystal tuffs and altered tuff with up to 2% over 2 m). ".... should the pyrite show the same enhanced chargeability it does between 93.65-100.65 m (65 mv/v c.f. 36 mv/v at surface) then what has been intersected in the hole does explain the chargeability anomaly located on surface.

Also it must be assumed that the up-dip section contains disseminated pyrrhotite (or magnetite) to account for the increase in magnetic field over this EIP anomaly." (A. W. Howland-Rose, 1979).

The drill core was logged with a magnetic susceptibility meter which located weakly magnetic zones closely corresponding with visible pyrrhotite, but which did not explain the surface magnetic profile.

The stratigraphic sequence was adequately tested and the two chargeability anomalies explained without encountering

any significant base metal mineralisation.

Following the discouraging results from WSP 1, the second proposed diamond drill hole was not drilled (planned to test the same sequence as WSP 1 about 800' north).

2.1.2 Western Area

1. Geochemistry

Rock chip sampling was carried out in association with field mapping, and a representative suite of rocks was assayed for Cu, Pb, Zn, Ag and Mn. All rocks assayed returned very low values (Cu, Pb and Zn generally < 200 ppm, Ag < 2 ppm), with the best assay of 140 ppm Cu, 545 ppm Pb, 840 ppm Zn, 3 ppm Ag, 120 ppm Mn in a fine grained altered tuff containing visible pyrite (2%) within a sequence of shales and crystal tuffs (150' south of L39N 300E).

Soil geochemical sampling continued on intermediate lines from L32.5N to 42.5N. The results are variable, but generally low. Further soil sampling is required, and the final interpretation of results will be undertaken when the programme has been completed (see Figure 11).

2. Access

Intermediate lines were cut in the south-west section of the grid from L32.5N to L27.5N, to reduce line spacing to a nominal 300'. Total footage was 7.3 km, cut by G. Mullinson and crew.

3. Geophysics

An EIP gradient array survey was done on the intermediate lines L27.5N to 32.5N by Scintrex Pty. Ltd. (Report Tas-062c June 1979). The results provided a greater definition of the numerous chargeability anomalies.

Further interpretation will be undertaken with the analysis of the geochemical data.

A ground magnetometer survey was conducted over the intermediate lines L27.5N to 42.5N to provide correlation with the EIP data and known geology.

4. Geology

Geological mapping of the western section of the grid was completed (Figure 4).

The main areas of interest, both geochemically and geophysically, occur within a sequence of black-grey shales grading to medium grained mainly volcaniclastic graywackes.

The shales vary in character from black slightly graphitic shales with 0-5% pyrite locally, to barren tuffaceous shales and siltstones. No base metal sulphides have been observed in these rocks. Graded bedding, small scale scouring and flame structures are common within laminated shale sequences.

The shales commonly overlie medium-coarse grained crystal

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lithic tuffs or fine grained ash flow tuffs with a sharp contact, and grade upwards into a sequence of alternating shales and fine-medium grained graywackes.

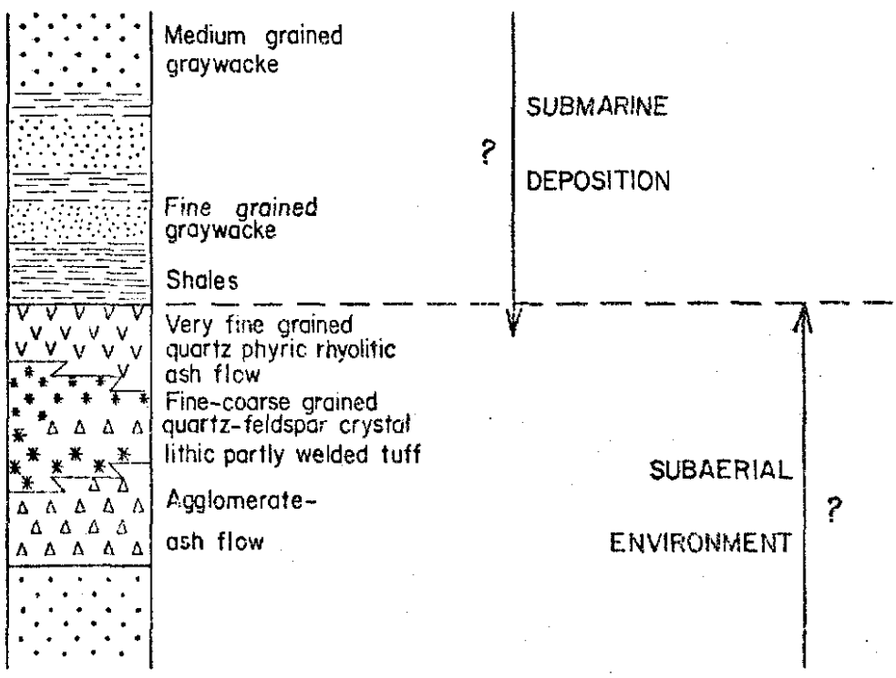
The graywacke unit is generally fine-medium grained with occasional coarse grained beds. Clasts are generally of volcanic origin, usually fine grained tuffaceous material with variable amounts of eroded feldspar crystals and minor quartz, and small mica flakes in a pelitic matrix. The rocks are commonly well bedded, with occasional grading and scour structures. Intercalations of black and tuffaceous shales become less common towards the top of the unit.

Occasional bands contain up to 5% pyrite often associated with sericite, but pyrite is generally absent from these rocks. No base metal sulphides have been observed within these rocks. The upper contact with medium-coarse grained crystal-lithic tuffs is generally sharp, with evidence of sediment instability within the rocks immediately below the contact.

A common lithological succession occurs within the White Spur grid area. Agglomerates, possibly ash flows, become finer and grade into feldspar quartz crystal lithic tuffs. These in turn become finer until a rapid transition to fine to very fine quartz (feldspar) phyric vitric (crystal) rhyolitic ash flows occurs. These rocks may be crudely banded and contorted with a cherty or quartzitic appearance.

The fine ash flows are frequently overlain by a succession of shales and fine grained graywackes, which may grade into medium-coarse grained volcaniclastic graywackes.

This succession provides a large-scale method of determining facings within this volcanic environment.



The base-metal values within the shales and graywackes are generally low (< 200 ppm Cu, Pb, Zn). The soil geochemistry is difficult to interpret due to differing soil and sample types, but metal values are generally low. The shale horizons are consistently higher than the other rock types.

Good contrast chargeability anomalies occur within the shale-graywacke sequence suggesting that they can contain significant quantities of sulphides (graphitic shales have not been observed on surface).

One of the major shale horizons was adequately tested by diamond drill hole WSP 103 (RTAE, 1962) drilling a coincident SP/EM anomaly on L34.5N 500W (Mt. Lyell grid). The target corresponds with the southern tail of the gradient array EIP anomaly W 15 and the northern end of anomaly W 13 (Scintrex, June 1978).

The anomaly was explained by disseminated pyrite (with minor pyrrhotite) in dark grey shales and minor graywackes: 84' (26 m) assaying 3.9% pyrite. No significant base metal values were recorded, nor were base metal sulphides recorded in the drill log.

This black shale horizon was also costeaned by Mt. Lyell in 1978, about 900' north of WSP 103, with negative results.

The RTAE report on their geophysical investigations at White Spur (McCarthy et. al., 1960) identifies a coincident EM-gravity anomaly at approximately L37N 3200W (Mt. Lyell grid). This zone corresponds with a "primary interest" gradient array EIP anomaly (W 18, Scintrex, June 1978), and with scattered anomalous soil geochemical results.

This anomaly occurs within the main graywacke sequence; it may correspond with a shale horizon within the sequence.

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2.2 HOWARD'S ANOMALY (G. W. Drake)

2.2.1 Introduction

A considerable amount of exploration was carried out in the Howard's Anomaly area by Rio Tinto between 1957 and 1962, and by The Mount Lyell Mining and Railway Company Limited from 1967 to 1975. Five diamond holes were drilled during the latter programme. Because the area was thought to still have considerable exploration potential, a study was undertaken towards the end of the 1978-79 field season to review and re-evaluate the large amount of exploration data which had amassed. This study appears as Section 2.2.2.

During 1978-79 field work involved the relocation, inspection and preliminary sampling of several previously reported mineral occurrences, viz. Tyndall Mine, Line 30N pit, and the anomalous hematite-barite occurrence on line 20+200N. This work is detailed in Section 2.2.3.

A recommended exploration programme is presented in Section 2.2.4. Line clearing and repegging has commenced in preparation for this programme.

It is interesting to note that a NNW trending alignment of creeks in the Howard's Anomaly area is visible on the Landsat imagery as a significant lineament. The lineament includes the fault-controlled mineralisation of the Tyndall Mine, and a zone of sheared volcanic rocks between L25N and L15N which contains at least one major IP axis and the hematite-barite occurrence on L20N + 200'N. The lineament appears to correspond with a geological boundary traditionally regarded as the base of the Tyndall Group; it probably represents a major fault.

2.2.2 Previous Work

1. Introduction

Rio Tinto Australian Exploration Pty. Ltd. carried out an exploration programme which included the northern half of the Howard's Anomaly area from 1957 to 1962. Their work included gridding, a Turam survey, mapping, I.P. soil geochemistry, ground magnetics, aeromagnetics and gravity, but no drilling was done.

Work conducted by Mount Lyell included gridding, soil geochemistry, I.P., ground magnetics, mapping, minor VHEM, a short trial soil mercury gas traverse, and the drilling of five diamond drill holes. This programme commenced in 1967 and continued until 1974-75; no exploration has been carried out since then.

2. Gridding

Rio Tinto established an imperial pace-and-compass grid extending north from near Line 19 of Mount Lyell's later grid with lines every 400' bearing approximately 065° (mag.) and pegged every 100' (see Figure 12). Actual distances between pegs along lines are sometimes irregular and unreliable. The uncertain positioning of this grid relative to the present Mount Lyell grid considerably decreases the value of the detailed exploration by Rio Tinto.

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In 1967 Mount Lyell constructed an imperial chain-and-compass grid with even-numbered lines (only) bearing 090° (mag.) at roughly quarter-mile intervals; the main road through the area is the base line (Figure 12). Howard's Anomaly is taken in this report to extend from Line 10 to Line 30. Across the main zone of interest parallel subsidiary lines were cut 100-400' north and south of lines 10, 12, 14, 16, 18, 20, 22, 24 and 28 (Figure 12). Intermediate lines 19, 21 and 23 were also cut across this zone.

In 1974 lines 15, 17 and 25 were established. It should be noted that these lines have a different origin (east of the road) to that of earlier lines.

3. Geology

The earliest reference to this area is a description of the Tyndall Mine workings by Twelvetrees (Ref. 12). A prospector's letters dated 1903 also briefly describe the workings.

Rio Tinto carried out rough mapping at 1:4800(?) scale along grid lines and major creeks with minimal subdivision of lithologies.

The earliest Mount Lyell mapping was apparently by Newnham in 1969-70 (Mt. Lyell map code Tyn. 1/101, 2/101). it was conducted by traverses, mostly along tracks and major creeks over a large portion of the area. As no legend appears on these maps and notations are minimal, the usefulness of this work is very limited.

A 1:6000 scale map of the northern half of Howard's Anomaly by Wells in 1974 (Tyn. 2/201) is interpretive and only distinguishes between Queenstown Pyroclastics and Comstock Tuff. It is probably based on mapping by Newnham.

Craven (written notes, February 1974; Tyn. 1/102) mapped the southern half of Howard's Anomaly which lies within Tyndall Sheet 1 at 1:6000 scale, however his notes refer to features of the Comstock Tuff as far north as Newton Creek. The mapping is largely factual and coverage is quite good considering the access difficulties; the accompanying notes are quite useful.

Within Howard's Anomaly, mapping by Basset at 1;6000 scale in 1974 (notes and hand-sketched map) is confined to a traverse along Newton Creek. His notes are moderately detailed.

Mapping by Corbett (Geological Survey) at 1:6000 scale (Tyn. 2/202) covers the northern half of the area but appears to be largely interpretive; no outcrop geology is shown and only the boundary between Queenstown Pyroclastics and "Comstock Tuff Formation" is marked.

Outcrop mapping of the entire Howard's Anomaly area at 1:6000 scale by Stevens-Hoare in 1974 (Tyn. 1/103, 2/102) was largely by traverses along grid lines and Newton Creek. This appears to be the only attempt to systematically map the grid lines. His lithologic description by symbols is over-simplistic and inadequate and makes correlation of outcrops near impossible. There are also numerous drafting errors in the symbols. Stevens-Hoare's 1975 interpretive geology of the area (Tyn. 1/202, 2/203)

is probably based almost entirely on this mapping; the Queenstown Pyroclastics and Tyndall Group are subdivided into a number of sub-units. This interpretation suffers by neglecting to take account of cross-faulting which has probably offset lithologies near Newton Creek.

Generally, geological mapping of the Howard's Anomaly area has been hampered by poor exposure due to glacial overburden (especially in the southern sector); much of the remainder is covered by dense scrub and forest. Lithologies appear to have limited strike extent and cross-faulting probably complicates the picture. In short, unravelling the geology is difficult over much of the area.

Four costeans were made in 1969 to improve geological exposure on or adjacent to lines 22, 20 + 200S, 16, and 18 (Figure 13). The 1971-72 Annual Report (p25) mentions the construction of three costeans totalling 1600' but no locations are given. The costean on line 21 is one of these; the cutting in the track near Line 23 (adjacent to Tyndall Creek) could be another. Some costeaning has been unsuccessful because of the depth to bedrock but, in other places, costeans have provided valuable exposure. Further use could be made of this technique in suitable areas.

4. Geochemistry (see Appendix A and Figure 13)

Rio Tinto carried out soil sampling over their grid lines, apparently at 50' intervals, using field dithizone assaying. Only locations of anomalous samples are indicated on their plan; anomalous samples are only rated as "low", "medium," or "high". There is no indication of which elements are anomalous, elements assayed, size fraction analysed, or soil type or horizon. These results are therefore of little value. A very small number of rock grab sample assays which are reported includes a hematitic gossan sample from line 6000 S with 1.5% Pb and 0.5% Zn; an adjacent sample contained 15.8% barite (Ref. 2).

Reconnaissance soil sampling was carried out by Mount Lyell along the original even-numbered lines (Tyn. 1/301, 1/302, 1/303, 2/301, 2/302, 2/303), followed by more detailed sampling over the geophysically and geochemically anomalous zone on and adjacent to lines 20 and 22 (Tyn. 2/311). Soil samples were also taken along three north-south traverses between lines 26 and 28 near the Tyndall Mine. Both "A" and "B-C" horizons were sampled where possible but there is no record of which size fraction was assayed. The nature of the soil - whether glacial or residual - is shown on other plans (Tyn. 1/305, 2/305). Detailed soil sampling ("C" horizon where possible) was later conducted along all lines, odd and even, between lines 17 and 25 inclusive (Tyn. 1/306, 2/306). The soil type and horizon are noted and usually two soil fractions were assayed. Both fractions seem to have been equally useful in detecting anomalies although in a few anomalous C horizon samples the Cu values are alarmingly low in the -80 fraction relative to the -10/+80 fraction.

Soil geochemistry at Howard's Anomaly is limited in applicability by the widespread distribution of glacial cover, particularly in the southern half. "A" horizon Cu, Pb, Zn geochemistry of glacial soils does not reflect that of the underlying bedrock. Cu, Pb and Zn were the only

elements assayed in these surveys; perhaps other elements and/or other geochemical techniques may be more successful in overcoming the problem of glacial overburden. A sampling interval along grid lines of 50' is probably the most cost-effective; it is easily conceivable that the earlier sampling at 200' or even 100' intervals could have overlooked significant mineralisation.

Approximately 17 stream sediment samples were taken in 1967-68 and analysed for Cu, Pb and Zn, (Tyn. 1/301, 1/302, 1/303, 2/301, 2/302, 2/303) (Figure 13); there is no record of the sampling technique or the size fraction assayed.

Trenches A and B (see Figure 13) were rock chip and soil sampled at 50' intervals and assayed for Cu, Pb and Zn (Tyn. 2/311).

In 1973 Scintrex conducted a trial soil mercury gas survey on a 500' traverse near Trench A (Ref. 7). Weakly anomalous values obtained near a "gossan" exposed in this costean suggest that this technique could be useful, although results elsewhere indicate it is of limited applicability.

5. Geophysics

(i) I.P. Surveys (see Appendix B and Figure 14)

In 1962 McPhar completed dipole-dipole I.P. on eight lines for Tio Tinto including two lines to the immediate south of their initial grid. Copies of the pseudo-sections have recently been obtained from E.Z.

Reconnaissance frequency domain dipole-dipole I.P. was carried out for Mount Lyell on all even-numbered lines in 1967-68 (Ref. 5). This was followed by more detailed surveys on and/or adjacent to all lines except line 26N.

In 1973/74, subsequent to a brief review of previous work done by McPhar (Ref. 6), Scintrex checked anomalies on lines 22N, 22N+200'S, 22N+200'N and 28N by gradient array I.P. A detailed gradient array survey was then carried out on lines 15N to 26N inclusive (Ref. 10). Schlumberger electrical soundings were made on I.P. anomalies on lines 16N, 18N, 22N and 23N. In April 1974 a detailed re-interpretation and 'integration' of all McPhar and Scintrex I.P. data plus ground magnetic data and Rio Tinto Turam and gravity data was undertaken by J. L. Irvine, a consultant geophysicist (Ref. 9). Scintrex later conducted a detailed north-south pole-dipole traverse over a previously detected I.P. anomaly on line 23N at 1750W which was not explained by D.D.H. H.A.3 (Ref. 8).

A compilation of anomalies is given in Table 4.

(ii) Aeromagnetics

An aeromagnetic survey flown over the Mt. Read Volcanics between Queenstown and Rosebery by Rio Tinto in 1959 included Howard's Anomaly. Irvine (Ref. 9) presented a geological interpretation of

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this survey at 1":1 mile but this is too broad-scale to be of much use.

(iii) Ground Magnetics (see Appendix C and Figure 15)

Rio Tinto conducted ground magnetic surveys (instrument type unknown) near the Tyndall Mine and over the main Turam anomaly south of Newton Creek (Ref. 4). A distinct magnetic response was obtained near, and along strike from, the Tyndall Mine. This could have been partly due to scrap iron.

In 1967/68 Mount Lyell made a ground magnetic survey on all even-numbered lines with a Sharpe vertical fluxgate magnetometer. Lines 15N to 26N inclusive were later surveyed with a proton precession magnetometer.

The contact of the basal unit of the Tyndall Group and the overlying Comstock Tuff (as interpreted by Stevens-Hoare in Tyn. 2/203) gives a strong magnetic response on all lines from 15N to 26N. Overall, the proton precession magnetic survey shows fairly good correlation between lines and the technique therefore gives a useful indication of lithological strike.

(iv) Turam (see Figure 12)

A ground E-M survey of their gridded area was undertaken by Rio Tinto using a dual frequency horizontal loop-Turam - in 1957-58. Plans are presented of equal phase difference contours and equiratio contours for the lower frequency only (440 Hz) (Ref. 4). All anomalies are interpreted as being due to shears, possibly water-filled.

(v) VHE-M

A VHE-M survey was conducted on lines 12N and 16N by Mt. Lyell using a McPhar unit with maximum coil separation of 400' (giving 130-160' depth penetration under ideal conditions) at 100' stations. This survey appears to have had very limited success due to poor field technique and was subsequently abandoned.

(vi) Gravity

Gravity surveys were conducted by Rio Tinto near Tyndall Mine and over the main Turam anomaly south of Newton Creek. Results appear as Bouger gravity profiles (Ref. 4).

6. Drilling (see Appendix D)

Of the five diamond holes drilled by Mt. Lyell in the area, four (effectively three - Tyn. 1, Tyn. 3, HA 1/2) tested the upper unit of the Queenstown Pyroclastics, and one (HA 3) tested the basal unit of the Tyndall Group. All holes tested I.P. anomalies and all, except Tyn. 3, had coincident or near-coincident soil geochemical anomalies (Figure 12). No significant Cu-Pb-Zn mineralisation was intersected. The pyritic black shales intersected in Tyn. 1 and Tyn. 3 were not encountered in HA 1/2 which was drilled approximately along strike from the former two holes.

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TABLE 4

HOWARD'S ANOMALY ANOMALY COMPILATION

	GEOPHYS. IP *	GEOCHEM.	COMMENTS
L16N 300-400E x	D-D	-	) Costean + DDH Tyn. 3
700E	D-D GA(950W+)	-	) 2 bl sh with sig. py.
17N 50W-550E	GA (950-1250W+)	low order Cu Pb Zn soil	"
18N 200W-200E	D-D GA (1400-1500W+)	low order Cu Pb Zn soil at 200E	Trench C; ? py bl sh.
19N 750W	GA	low order Pb soil	? southern ext. of haem-barite zone and/or? HA 3 zone
950W, 1250W	GA)		Corresponds with HA 2 py zones.
1450-1650W	GA)		
1850W	GA		? northern ext of Tyn. 3 bl sh.
20N + 200'S	D-D	low Zn (Pb) soil	Trench A: mod Cu
1800-1900W			Pb Zn; HA 2 ctg py
			and minor Cu Pb Zn
20N 1500W -	D-D GA	low Pb soil	HA 2 zone?
1700W			
20N+200'N 1300W	-	Zn soil	Haem-barite zone, or
			south ext HA 3 zone
1800-1900W		Pb Zn soil	HA 2 zone
21N 1300-1400W	-	mod order Cu Pb Zn soil	Haem-barite zone?
1800-2400W	G.A.	Zn soil	HA 2 py zone
22N+200'S 1450W	D-D	Pb Zn soil	Major IP axis, HA 3
1900W	D-D		Major IP axis, same as
			HA 2?
L22N 1350-1500W	D-D GA	High Cu Pb Zn soil	HA 3 zone? (800' north)
1900-2000W	D-D	Zn soil	) HA 2 zone? (1800' south)
2150W	GA		)
2200-2550	D-D GA		
L22N+200N 1600W		Zn soil	HA 3 zone
L23N 1650W	G.A.		HA 3 section
1800W		moderate Cu Pb Zn soil	HA 3 section?
L24N 1450W	G.A.		HA 3 zone?
2300W	D-D		nth ext of HA 2 zone? (3500' sth)
2600-2700W	D-D GA		
L25N 1900W	GA		nth ext of HA 3 zone
L26N 3900-4200W	D-D		

* D-D Dipole-dipole; McPhar Survey 1967-68
G.A. Gradient array; Scintrex Survey 1973-74

x All eastings/westings cited use Bradshaw's road as the Base Line.

\+ 1973-74 geophysical grid references.

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HA 3 provided no obvious explanation for the target I.P. anomaly. This anomaly could possibly arise from the large amounts of hematite in volcanics intersected by the hole, but this explanation appears unlikely. No downhole I.P. logging was carried out and the hole is now blocked by caving.

2.2.3 Exploration During 1978-79

In order to carry out additional geochemical soil sampling and ground magnetic surveys (as recommended in Section 2.2.4) sections of seven grid lines within the Howard's Anomaly area (lines 20-26N) were recut and, where necessary, repegged using co-ordinates of the 1974 grid (see Section 2.2.4). Line 25N was also extended 900' to the west. This programme of line clearing is not yet complete.

The Tyndall Mine workings near line 28N were relocated and roughly mapped at 1:500 scale. They comprise two shafts, now water-filled, an adit, a 40 m trench and four shallow pits. The mineralisation occurs as galena, pyrite, chalcopyrite, tetrahedrite-tennantite and sphalerite in a milky quartz vein approximately one metre wide within quartz-feldspar porphyritic lavas. The trench lies on this vein which trends at 315° (mag.). Assays of ore from dumps adjacent to the trench and the two shafts are given in Appendix E.

The purpose of the adit, which was driven at least 15 m towards the southwest away from the mineralised vein, is uncertain. Deep sludge prohibits entry to the adit but rock chip (semi-channel) samples of tuffaceous rocks from the wall near the adit mouth are strongly anomalous in Pb; Zn and, to a lesser extent, Cu and Ag are also anomalous:

Sample Number	Interval	Cu(ppm)	Pb(ppm)	Zn(ppm)	Ag(g/t)	Mn(ppm)	Lithology
30701	1.5 m	70	3200	860	2	180	Crystal lithic tuff.
30702	2.7 m	120	1150	230	2	330	Crystal tuff.

A sample of massive and "veinlet" ironstone in sheared crystal tuff from the shallow pit 8 m WSW of the adit mouth was slightly anomalous:

30704 120 ppm Cu, 440 ppm Pb, 280 ppm Zn, 2 g/t Ag, 6000 ppm Mn.

"A" and "C" horizon soil samples taken adjacent to the adit mouth (samples numbers 30725, 30726, 30727, 30729) are anomalous in Pb and Cu (see Appendix E). Although the relative hot and cold extractable metal values indicate that scavenging has occurred, the low Pb and Cu values of nearby samples with comparable Mn and Fe contents suggest a close source for the scavenged Pb and Cu. This is supported by the anomalous rock chip samples from near the adit mouth. Twelvetrees (1901) states that a cross-cut west from the southern shaft intersected "a little galena and copper ore" in the tuffaceous schists so it seems likely that the adit, which was apparently developed later, was testing the same zone further up-dip.

The old prospecting pit near line 30N (see Figure 12) was relocated and the dump sampled. The pit is sunk on sheared, silicified (?) andesite with veinlets of quartz and siderite and lies within a strike-sheared zone at least 40 m wide. Minor pyrite and trace galena and chalcopyrite occur as disseminations and in veinlets. Four rock chip samples from the dump averaged:

30712-15: 100 ppm Cu, 550 ppm Pb, 550 ppm Zn, 2 g/t Ag, 1.2% Mn.

A sample of silicified andesite from a smaller pit 20 m to the north-west assayed:

30716: 700 ppm Cu, 1150 ppm Pb, 210 ppm Zn, 11 g/t Ag, 760 ppm Mn.

Samples (numbers 30717, 30718) from outcrops in the general vicinity were also weakly anomalous in Pb and Zn.

A hematitic gossan sample assaying 1.5% Pb and 0.5% Zn and a nearby sample assaying 15.8% barite were reported by King (1961) in the vicinity of 4800S, 1400W (Rio Tinto grid). The pits dug by Rio Tinto at this location were relocated and sampled:

	Cu(ppm)	Pb(ppm)	Zn(ppm)	Ag(g/t)	Mn(%)	Fe(%)	*Ba(ppm)
30719	380	3150	2200	0.7	40.0	12.7	1300
30720	190	300	30	26	0.24	10.4	5200
30721	560	9100	2800	5	25.0	26.0	3.4%

* acid extractable Ba only - does not include barite.

2.2.4 RECOMMENDED EXPLORATION

Introduction

Nearly all geophysical and geochemical anomalies occur in the uppermost unit of the Queenstown Pyroclastics and the basal unit of the Tyndall Group. Previous exploration has largely concentrated on this zone to the north of Line 18 because of the problem of glacial cover to the south of this. This southern extension would have similar exploration potential if methods can be found to overcome this difficulty.

Previous soil sampling surveys do not give complete coverage of the main zone of interest and further soil sampling is required. Extension of the ground magnetic survey to the south may help elucidate the geology in this area. Line clearing and re-pegging and minor line cutting will therefore be necessary. Further detailed mapping and possibly costeaning may be required in critical areas following assessment by inspection and soil sampling.

The Rio Tinto grid lines and the original even-numbered Mount Lyell grid lines are in a very poor state: few pegs are still standing and no co-ordinate markings remain. Furthermore, the positions on plans of these lines and, to a lesser extent, of 1974 grid lines appear to be idealised. In areas of particular interest, the Rio Tinto and early Mount Lyell grid lines should be re-established and peg positions noted relative to 1974 lines where appropriate. The line positions of all three generations of gridding need to be plotted accurately.

Line Clearing

Lines to be pegged/re-pegged every 100':

	Co-ords.	Priority
Line 10	3000-4000E	4
Line 12	2500-3500E	4
Line 14	2000-2800E	4
Line 16	1000-2000E	3
Line 18	1200-1500E	4

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Line	20	00-1500W	1 (completed)
Line	21	00-1500W	1 (completed)
Line	22	800-2000W	1 (completed)
Line	23	1300-3000W	2 (completed)
* +	24	1600-3200W	2 (completed)
* +	25	1600-2300W	2 (completed)
* +	26	00-3500W	2 (completed)

* Clear line from road unless there is easier alternative access.
\+ Co-ords. with road as 00.

Line Cutting

Lines to be pegged every 100':

	Co-ords.	Priority
+ Line 15	1900-2500E	4
+ 17	1300-1700E	4
25	2300-3200W	2 (completed)

\+ Co-ords. with road as 00.

Soil Sampling

Samples should be taken at 50' intervals from "C" horizon wherever possible and the -80 fraction assayed for Cu, Pb, Zn, Ag.

	Co-ords.	Priority
Line 16	1000-1800E	3
20	300-1500W	1
21	400-1500W	1
22	800-2000W	1
+ 23	1300-1600W	2
24	1600-3200W	2
+ 25	1900-3200W	2
26	1300-3500W	2

\+ Co-ords. with road as 00.

Ground Magnetics

The magnetic survey should be extended to the south to follow the magnetic high near the contact of the basal unit of the Tyndall Group and the overlying Comstock Tuff. This would help elucidate geology beneath the glacial overburden and may identify cross-faults.

	Co-ords.	Priority
Line 10	3000-4000E	4
12	2500-3500E	4
14	2000-2800E	4
+ 15	1900-2500E	4
16	1500-2000E	4
+ 17	1300-1700E	4
18	1200-1500E	4

\+ Co-ords. with road as 00.

Geology

Most of the area of interest is covered by dense forest and scrub which makes comprehensive detailed mapping impractical. Mapping is also hampered by extensive areas of glacial overburden. However, further mapping along creeks would usefully add to earlier mapping and thus improve the interpretive geology. Remapping of tracks and grid lines in critical areas may also assist.

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The occurrence reported by Rio Tinto of a hematitic "gossan" assaying 1.5% Pb, 0.5% Zn and 15.8% barite requires detailed examination and sampling. Costeaning may be required.

The geological setting of the Tyndall Mine needs to be elucidated - detailed mapping, rock chip sampling of old workings, soil sampling, and possibly a limited ground magnetic survey are recommended (Rio Tinto noted a magnetic response over and along strike from the mine). Several anomalous stream sediment values up and downstream of the mine workings should be followed up.

Exploration should be directed towards locating sulfides in the country rocks adjacent to the mineralised quartz vein, on the basis that stratiform ore in these rocks may have been the source of the metals in the vein.

A small pit approximately one kilometre northwest of the Tyndall Mine is reported as showing Pb mineralisation (Boniwell, 1959, p3) and Cu mineralisation (King, 1960, p3). This occurrence should be inspected and sampled. If significant mineralisation is indicated, detailed exploration will be required and consideration should be given to extending the area of interest north to include this occurrence.

Geological logging of HA 3, Tyn. 1 and Tyn. 3 core is inadequate; all five diamond drill holes should be relogged. All unassayed core should be assayed for Cu, Pb, Zn S at least to give a greater understanding of base metal variation across the lithological sequence. Mn assays for all core would probably also be valuable. The three costeans of unknown location (Annual Report 1971-72) should be located, and mapped and sampled where appropriate.

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2.3 HENTY RIVER GRID (R. M. D. Meares)

2.3.1 Introduction

Exploration completed on the Henty River grid during 1978-79 included diamond drilling of extensions to the disseminated galena-sphalerite mineralisation cropping out on lines 1N and 4N, and the cutting of northern and southern grid extensions to define and evaluate the favourable andesite/shale contact along strike from the outcropping mineralisation. Geological mapping and soil geochemical sampling were completed on the grid extensions, and a gradient array I.P. and ground magnetic survey was carried out on the central and northern sections of the grid. In addition geological mapping of outcrops in the banks of the Henty River and minor tributaries, and a stream sediment sampling survey of these tributaries were completed.

D.D.H. HR 1, testing the northern extension of the line 4N mineralisation, was terminated before reaching the target zone. D.D.H. HR 2, testing the northern extension of the main sulphide zone exposed in the adits between lines 1N and 2N, intersected disseminated and veinlet galena-sphalerite mineralisation within andesitic lithic tuffs assaying 4.22% Pb, 1.84% Zn and 16 g/t Ag over 12.0 m (152.5-164.5 m).

Exploration completed on the northern grid extension confirmed that the favourable andesite/shale contact trends NNW across the complete length of the grid. Three combined soil geochemical/chargeability/magnetic anomalies on lines 5N, 7N and 10N were located within the eastern margin of the andesitic sequence.

Geological mapping on the southern grid extension outlined a sequence of felsic tuffs. No soil, rock chip or stream sediment geochemical anomalies were located within this felsic sequence.

Details of track cutting, soil geochemical and geophysical programmes completed during 1978-79 are presented in Table 5.

2.3.2 Access

A total of 20.14 km of track cutting was completed during 1978-79, including 15.565 km of grid lines pegged at 25 m spacing, and 4.575 km of extensions to the eastern and western baselines running along each bank of the Henty River. The northern grid extension from lines 4N to 13N with a line spacing of 100 m was confined to the western side of the river, while on the southern grid extension (lines 1S-16S) line spacing increased from 100 m in the northern section (lines 1S to 6S) to 200 m in the less prospective southern section (lines 6S to 16S). Eastern extensions of lines 6S, 10S and 16S were cut from the Henty River to Bradshaw's Road to provide reconnaissance coverage over the felsic sequence east of the Henty Fault.

As for the original imperial grid pegged in 1977-78, no slope corrections were used during the pegging, but the peg locations shown on all Henty River plans have been slope-corrected to allow for the 30° slope of the sides of the gorge. The Henty River grid is tied-in to the East and West Tyndall grids as HR line 2N is a westerly continuation of ET line 2N, and HR lines 8N and 13N are the re-numbered eastern ends of WT lines 4N and 6N.

As road access into the gorge is near impossible, a combined campsite-helipad-drill site was cleared on the eastern river bank opposite the adits between lines 1N and 2N, and a tent

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camp was established from December, 1978 to early June, 1979. The camp was re-supplied by a Hookway Aviation Bell Jetranger 206B helicopter from Queenstown (flying time 10 minutes), with occasional heavy loads being up-lifted from clearings along Howard's and Bradshaw's Roads. A flying fox capable of carrying two men was established across the Henty River immediately north of the camp.

2.3.3 *Geology and Mineralisation*

1. Introduction

Outcrop mapping along and adjoining grid lines, and along the banks of the Henty River and its tributaries, is shown in Figures 16 and 17. Figure 18 shows the interpretative geology for the northern half of the grid from lines 4S to 13N, and is based on both outcrop data and rock chips in C-horizon soil samples. An interpretive geology plan has not been prepared for the southern half of the grid (lines 4S to 16S) due to the scarcity of outcrop data (in part resulting from the wider line spacing) and the monotonous nature of the predominantly felsic volcanic sequences present.

The Henty Fault zone, which crosses the grid in a NNE-SSW orientation and runs beneath the bed of the Henty River, juxtaposes an eastern sequence of foliated felsic ash-flow tuffs with minor agglomerates and shales, against a western volcano-sedimentary sequence.

In the south this western sequence is composed of felsic and minor andesitic tuffs which in the north are flanked to the east by a sequence of andesitic tuffs, agglomerates and minor lava flows. Small zones of disseminated and veinlet galena-sphalerite mineralisation located to date occur either within the eastern margins of this andesitic unit or within the adjoining basal light green-grey unit of a sequence of hematitic tuffaceous shales, which occurs immediately west of the Henty Fault in the northern half of the grid.

2. Eastern Sequence

Felsic vitric and crystal-vitric(-lithic) ash-flow tuffs locally welded with chloritic fiamme present, comprise the bulk of this sequence which includes both felspar and felspar-quartz phyric varieties. An agglomeratic variety cropping out on line 2N includes both vitric and black shale clasts in an ash-flow matrix, and is bounded on the east by a body of coarse grained quartz(-felspar) porphyry. Minor black shale outcrops, and float on lines 4N, 1N, 0O and 6S, indicate the presence of thin shale lenses in the sequence.

Identifiable bedding or primary layering is only observed in the shale lenses, and in outcrops of bedded vitric ash-fall tuffs exposed in the lower section of the creek immediately south of line 4N. Here localised erosional contacts and graded bedding in several of the tuff beds indicate that the sequence faces and steeply dips NE. Cleavage throughout this eastern sequence strikes 300-330° magnetic and dips subvertically.

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TABLE 5

Henty River Grid Exploration Details 1978-79

LINE NUMBER	TRACK CUTTING		SOIL GEOCHEMISTRY		GRADIENT ARRAY I.P. AND GROUND MAGNETICS	
	INTERVAL	LENGTH	INTERVAL	NO. OF SAMPLES	INTERVAL	LENGTH
13N	1500E-2940E	1440 m	1500E-2925E	72	2300E-2950E	650 m
12N	2300E-3000E	700 m	2300E-3000E	53	2300E-3000E	700 m
11N	2300E-3000E	700 m	2300E-3000E	48	2300E-3000E	700 m
10N	2400E-3000E	600 m	2400E-3000E	45	2400E-3000E	600 m
9N	2500E-3000E	500 m	2500E-3000E	35	2500E-3000E	500 m
8N	2300E-2925E	625 m	2300E-2925E	43	2500E-3000E	500 m
7N	2600E-3000E	400 m	2600E-3000E	33	2600E-3000E	400 m
6N	2600E-3000E	400 m	2600E-3000E	33	2600E-3000E	400 m
5N	2600E-3000E	400 m	2600E-3000E	33	2600E-3000E	400 m
2S	2600E-3000E	400 m	2600E-3000E	33		
3S	2600E-3000E	400 m	2600E-3000E	33		
4S	2600E-3000E	400 m	2600E-3000E	17	ALSO	
5S	2600E-3000E	400 m	2600E-3000E	17	LINES 1S,00,1N	
6S	2000E-3000E	1000 m	2000E-3000E	41	2N, 3N, 4N	
	3200E-4150E	950 m	3200E-4175E	40	EACH 2000'E-3000'E	
8S	2400E-3000E	600 m	2400E-3000E	25	AND 3200'E-4000'E	3292 m
10S	2400E-3000E	600 m	2400E-3000E	25		
	3200E-4200E	1000 m		-		
12S	2000E-3000E	1000 m	2000E-3000E	41		
14S	2000E-3000E	1000 m	2000E-3000E	41		
16S	2000E-3000E	1000 m	2000E-3000E	41		
	3200E-4250E	1050 m	3200E-4225E	41		
WESTERN BASELINE '3000E'	4N-13N 1S-2075S	900 m 1975 m		- -		
EASTERN BASELINE '3200E'	4N-6N 1S-16S	200 m 1500 m		- -		
	TOTAL LENGTH	20.14 km	TOTAL	790	TOTAL LINE LENGTH	8.14 km

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3. Western Sequence

A thick unit of poorly bedded purple hematitic tuffaceous shales and siltstones with minor lenses of sandy 'greywacke' and light grey-green tuffaceous shale forms the most easterly unit of this sequence and is truncated by the Henty Fault. Chloritic smears along the cleavage and chlorite and quartz-chlorite veinlets and segregations are common. This unit strikes N-S in the central section of the grid swinging to NNW in the northern section, reaching a maximum thickness of approximately 300 m on line 13N. Bedding dips subvertically to steeply west, and although no facing information was observed in outcrops, facing data from both D.D.H. HR 1 and HR 2 indicates that this unit is overturned as it faces east and generally dips very steeply west.

Light green to grey tuffaceous shales, with minor lenses of fine grained andesitic vitric tuff and finely interbedded grey shale and siltstone, form a continuous narrow unit varying between 50 m and 100 m thick to the west of and adjoining the hematitic shale unit. Further west, a thick unit of andesitic tuffs, agglomerates and lavas apparently stratigraphically underlies the tuffaceous shale sequences and varies in thickness from 250 m in the northern section of the grid to less than 100 m in the central section south of line 4N, where it appears to lens out and become intercalated with a sequence of felsic tuffs. This unit is characterised by the presence of microscopic to macroscopic felspar phenocrysts set in a foliated chloritic matrix. The morphological nature of these phenocrysts, the presence of lithic clasts, and the primary volcanic textures have been used to differentiate lavas from tuffs and agglomerates. Within the andesitic lavas, which may be aphanitic to porphyritic, the felspar phenocrysts are typically euhedral and commonly occur as intergrown aggregates or clusters of crystals. The crystals may be randomly oriented or vaguely aligned suggesting flow-banding. Some phenocrysts are zoned and twinning has been observed. Sericite has replaced many of the felspar phenocrysts, which are now set in a foliated groundmass of smaller felspar crystals, chlorite and sericite.

Andesitic tuffs and agglomerates are characterised by the presence of lithic fragments of andesitic composition, but both felsic volcanic and shale fragments are commonly present. Broken felspar phenocrysts form the crystal component of these tuffs. Where diagnostic criteria of the above nature are not present in an andesitic rock, it has simply been termed an 'andesite' on the outcrop geology plans. Identifiable hornblende phenocrysts have not been observed in andesitic lithologies in the field, although small chloritised crystalline fragments observed in thin section may be altered hornblende crystals.

Primary vitroclastic textures, locally developed in some of the andesitic lithic tuffs and brecciated tuffaceous shales hosting mineralisation in three separate areas, suggest an ash-flow origin for at least part of the andesitic sequence. These locations are the line 4N mineralisation, the lower part of the mineralised zone intersected in D.D.H. HR 2 (160.5-164.5 m), and in a floater of andesitic lithic tuff assaying 0.22% Zn but lacking any visible sulphides located on line 13N at 2200E. As this vitroclastic texture has not been observed elsewhere

in the andesitic sequence, it may have a spatial if not genetic association with the mineralisation.

Large, in part spherical, structures up to 2 m in diameter in sheared amygdaloidal andesitic lavas intersected in the lower part of D.D.H. HR 2 may be pillows suggesting that some of the andesitic volcanism may have been submarine. Microdolerite outcrops on line 8N and floaters between lines 5N and 6N indicate the presence of possibly sub-volcanic intermediate to basic intrusions within the andesitic extrusive sequence.

A sequence of dominantly felsic tuffs with minor andesitic tuffs occurs to the west of the andesitic sequence in the northern section of the grid, is intercalated with this sequence in the central section, and occurs as a facies equivalent of the andesitic sequence in the southern section. Medium grained felsic felspar-phyric crystal-vitric(-lithic) tuffs characterised by a high proportion of equidimensional felspar crystals in a greenish foliated chloritic matrix predominate over felsic vitric tuffs. Float of green-grey laminated tuffaceous shales is present on line 12S at 2460E, and dolerite outcrops and microdolerite float occur on lines 5S and 6S respectively.

As indicated previously, outcrop on the southern section of the grid is extremely sparse and the only lithological contact that can be inferred extends across lines 12S, 14S and 16S running parallel to and 250 m west of the Henty River. The sequence to the east of the contact comprises light grey felsic tuffs extending to the Henty River, while west of the contact light orange-brown C-horizon rock chips in soil auger holes and limited outcrop and float information suggest a mixed felsic to intermediate tuffaceous sequence.

4. Henty Fault Zone

The Henty River follows the Henty Fault zone trending NNE-SSW across the grid, and in the northern section outcrops of purple hematitic tuffaceous shales to the west of the fault and buff felsic vitric tuffs to the east of the fault in the river banks permit accurate location of the fault plane. South of line 2S similar felsic volcanic sequences occur on either side of the fault making location of the fault on lithological differences difficult.

In outcrop the fault is expressed as a variable zone up to 50 m wide of shearing and brecciation, with localised sericitisation and minor quartz veining in the brecciated country rocks. In D.D.H. HR 1 the fault plane is expressed by a 60 cm wide fractured quartz vein with smears of pyrite, and dips west at 80°. The movement on the fault is interpreted from regional data to be west block north (i.e. dextral).

A major regional fault such as the Henty Fault can be expected to have many associated second-order faults, and although four sets of WNW-ESE trending secondary faults were interpreted to occur in the central portion of the grid (see pages 10-11, E.L. 41/71 1977-78 Annual Report), only one of these faults has been confirmed by more recent data. This sinistral fault crosses line 4N at a low angle just west of the line 4N mineralised outcrops and has a horizontal displacement of approximately 80 m.

5. Surface Mineralisation

Details and assays of disseminated and veinlet galena-sphalerite mineralisation in sericitised light green tuffaceous shales exposed in the No. 1 and No. 2 adits and on line 4N were reported in the E.L. 41/71 1977-78 Annual Report. Additional mineralisation and old workings located during 1978-79 include (i) a N-S striking 60 m x 2 m wide zone of similar mineralisation to the above zones, located in outcrops in the eastern bank of the Henty River, immediately SE of the main zone exposed in and south of the adits on the opposite bank; (ii) a small outcrop of disseminated galena-sphalerite in andesite in the bed of creek 24206 (Figure 19) and located 30 m S of line 3N, 2650E; and (iii) a 32 m long adit adjoining line 6S, 3875E, driven through barren felsic tuffs to intersect small barren quartz veins in a minor shear zone.

Representative bulk chip samples from single outcrops of the east bank mineralisation and from additional sampling of the line 4N mineralisation assayed as follows:

Location	Sample No.	Cu %	Pb %	Zn %	Ag g/t	Zn Ratio
East bank	24384	<0.01	4.00	2.75	15	41
East bank	24423	<0.01	0.45	0.01	<2	2
Line 4N, pod D1	24319	0.01	3.80	1.60	35	30
Line 4N, pod D1	24320	0.01	4.60	1.95	29	30
Line 4N, pod D2	24321	<0.01	3.50	3.45	32	50
Line 4N, pod D2	24322	<0.01	3.40	3.60	31	51
Line 4N, pod D3	24323	<0.01	0.36	2.65	3	88
Line 4N, floater	24324	<0.01	0.92	4.30	9	82
Average of samples	24319-23	<0.01	3.78	2.65	26	41

Pods D1 to D3 are narrow elongate 10-20 cm wide zones of disseminated and veinlet galena-sphalerite mineralisation within a single 20 m x 20 m outcrop of sericitised and brecciated tuffaceous shales and andesitic tuffs with sparsely disseminated galena. Individual pods are aligned parallel to the intense cleavage and no primary layering was observed in these outcrops.

2.3.4 Geochemistry

1. Soil Geochemistry

The soil geochemical sampling programme completed over lines 1S to 4N in 1977-78 was extended to cover the northern and southern grid extensions in 1978-79. A total of 790 B/C horizon samples were collected and the -80 mesh fraction was dried and analysed by A.A.S. for Cu, Pb, Zn, Ag and Mn. The interval of each line sampled is shown in Table 5, and the raw data is presented in Figures 19 and 20. Sample spacing for lines 5N to 13N was dominantly 12.5 m with low priority sections being sampled at 25 m, while on the southern grid extension the sample spacing was 25 m, except on lines 2S and 3S where the spacing was 12.5 m.

The strong Cu-Pb-Zn-Ag-Mn anomaly defined in 1977-78 associated with the mineralisation exposed in the adits and cropping out on line 4N, extends with variable strength from lines 5N to 13N and is open to the north. This anomaly varies from 20 to 60 m wide and closely follows the andesite/green tuffaceous shale contact,

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along which the mineralisation occurs on and south of line 4N. Consequently this anomaly is of major significance and is strongest on line 5N (max. soil values of 295 ppm Cu, 0.38% Pb, 0.28% Zn, 12 g/t Ag) with other peaks in the anomalous zone on line 7N (0.14% Pb, 750 ppm Zn, 4 g/t Ag) and line 10N (.810 ppm Pb, 0.17% Zn, 2 g/t Ag). Details of this anomalous zone are shown in Table 6 and its relationship to induced polarisation and ground magnetic anomalies is whown in Figure 26.

No significant soil geochemical anomalies were located on the southern grid extension, confirming the barren nature of the dominantly felsic tuffaceous sequence, lacking both andesitic and tuffaceous shale sequences.

TABLE 6

Henty River Soil Geochemical Anomalies 1978-79

LINE NUMBER	INTERVAL (mE)	TYPE	MAXIMUM VALUES (ppm)				RATING	POSSIBLE SOURCE LITHOLOGY
			Cu	Pb	Zn	Ag		
5N	2825-2900	Cu,Pb,Zn,Ag	295	3800	2830	12	v.strong	andesite or green tuffaceous shales
	2912-2975	Cu,Pb,Zn	210	965	960	2	moderate	down-slope migration of above anomaly
6N	2662-2687	Pb	95	1040	380	< 2	moderate	andesite
	2825-2837	Cu,Pb,Zn,Ag	400	1400	630	3	strong	andesite
7N	2712-2762	Pb,Zn,Ag	74	1380	750	4	strong	andesite
8N	2587-2600	Pb,Zn,Ag	92	600	835	3	weak	andesite
9N	2687-2737	Cu,Zn,Ag	200	280	840	4	weak	andesite or green tuffaceous shales
10N	2512-2575	Cu,Pb,Zn	130	810	1700	2	strong	andesite
11N	2425-2450	Pb	63	1180	260	2	moderate	andesite
12N	2350-2412	Cu,Zn	160	230	500	2	weak	andesite
13N	2375-2425	Cu	157	200	330	2	weak	andesite or green tuffaceous shales

2. Rock Chip Geochemistry

During 1978-79, a total of 170 rock chip samples collected during geological mapping were analysed for Cu, Pb, Zn, Ag and Mn with some being analysed for S, Au, Fe, Co, Ni in addition. These results are tabulated in Appendix F and are shown in Figures 21 and 22 which also show the location of petrological samples. These figures and the appendix include data for both the 1977-78 and 1978-79 seasons. Adit sampling results are presented in Appendix G.

Assay results for the east bank and line 4N mineralisation are reported in Section 2.3.4. Assays for other significant rock chip values are tabulated below.

Sample No.	Location	Cu%	Pb%	Zn%	Ag(g/t)	Lithology
24163	13N, 2200E	0.01	0.01	0.22	3	andesite floater
24174	8N,2587E	0.02	0.07	0.52	<2	f.g. andesite
24188	6N,2825E	0.01	0.13	0.04	<2	m.g. andesite
24347	5N,2825E	<0.01	0.03	0.10	<2	felsic tuff
24349	5N,2837E	<0.01	0.97	0.09	3	tuffaceous shale
24437	Henty River,4N	0.10	<0.01	<0.01	<2	felsic tuff
24454	Creek N of 2N	<0.01	0.39	<0.01	<2	andesite + Gn

No outcropping mineralisation has been located between lines 5N and 13N, although anomalous Pb, Zn and Ag values have been detected in outcrops within the soil geochemical anomaly on lines 5N, 6N and 8N. The andesitic floater at line 13N, 2200E assaying 0.22% Zn has the characteristic vitroclastic texture and carbonate alteration of the line 4N and D.D.H. HR 2 mineralisation and occurs up-slope from the combined soil geochemical/induced polarisation anomaly. Either this floater was derived from a nearby possibly mineralised source on or near line 13N by natural processes, or else it was carried to its present location by the old prospectors, possibly from the line 4N mineralised outcrops or from some other mineralised outcrops that have not been located in the current programme.

3. Stream Sediment Geochemistry

An orientation stream sediment sampling programme was carried out sampling the minor tributaries to the Henty River on both sides of the gorge between 2075S and 13N. A total of 34 samples (24201-24234) were collected along this 3 km length of the gorge, and each sample was analysed by A.A.S. for Cu, Pb, Zn, Mn, Fe and Co following splitting into these four fractions and digestions:

(i) - 80 fraction, total aqua regia digestion
(ii) - 80 fraction, cold HCl extraction
(iii) - 20+80 fraction, hydroxylamine hydrochloride digestion of Mn-and Fe-oxides
(iv) hand-picked Mn- and Fe-oxide coated pebbles, hydroxylamine hydrochloride digestion.

Results are shown in Figures 19 and 20 for the -80 fraction total digestion values for Cu, Pb and Zn, and complete analyses for all four techniques are tabulated in Appendix H. One sample from a creek containing exposed mineralisation was 24234 which assayed 60 ppm Cu, 0.27% Pb, 0.21% Zn in the -80 fraction total digestion. This sample has been deleted from the following table, and is from the creek immediately south of the line 4N mineralisation.

Stream Sediment Statistics, -80 Fraction, Total Digestion

	Cu(ppm)	Pb(ppm)	Zn(ppm)	Mn(ppm)	Fe %	Co(ppm)
Mean	18	59	115	3720	2.56	21
Range	3-55	14-430	17-450	80-3.7%	0.7-6.8%	3-100

The only significant anomalies occur in creeks draining the area of the major soil geochemical anomaly and joining

the Henty River between lines 2N and 7N. Sample 24233 assayed 55 ppm Cu, 430 ppm Pb and 450 ppm Zn, and comes from the creek crossing the soil anomaly between lines 6N and 7N. Sample 24207 from the next creek north, crossing the soil anomaly between lines 9N and 10N was not anomalous.

4. River Water Geochemistry

A programme of water sampling on the Henty River was conducted from August 1978 to April 1979 to establish the background geochemical levels of the river water. This will enable monitoring of water quality during any future exploration and mining activities within the Henty River drainage basin.

Sampling was at approximately four weekly intervals from three sample points: (a) the Zeehan Highway bridge crossing, (b) 8 km upstream immediately south of the Henty River grid line 1N, (c) 11 km further upstream at the Henty Camp. All river heights refer to markers on a bridge pylon on the Zeehan Highway.

Results are tabulated in Appendix I, and the following components were determined:

(i) all samples - pH, total dissolved solids, total suspended solids, Cu, Pb, Zn, Fe;

(ii) some samples - Mn, Ag, Cd, SO_4, Cl, F.

The results indicate that the river is clean compared with the currently accepted international water quality standards, and that exploration carried out during the 1978-79 season had no effect on the river water. It was found that when the river level rose due to heavy rains the water became slightly more acid. This may be due to the flushing out of humic and other acids from the soil profile.

2.3.5 Geophysics

1. Induced Polarisation-Gradient Array Survey

Scintrex Pty. Ltd. carried out an EIP gradient array survey over the northern half of the grid from lines 1S to 13N during two periods - 26th June to 8th July, 1978 and 10th to 18th January, 1979. The line intervals covered in this survey totalling 8.14 line kilometres are listed in Table 5 and Figures 23 and 24 present the chargeability and resistivity contour plans respectively. Scintrex Report Tas-062B describes and interprets the results of the survey in detail. Equipment used included a 2.5 km transmitter and IPR-8 receivers. The grid was read in two blocks with current electrodes positioned on line 2N for the southern block and on HR line 8N and ET line 6N for the northern block. Potential electrode spacings used were 50 ft. (lines 1S to 4N and 25 m (lines 5N to 13N).

The survey defined an elongate NNW-trending zone of strong chargeability averaging 30 m wide extending from lines 1N to 13N, and occurring on or adjacent to the favourable andesite/tuffaceous shale contact. Within this chargeable zone, strong anomalies were recorded on lines 1N, 5N, 7N and 10N (Table 7). Chargeability and resistivity back-

ground levels for the main lithological units are tabulated below.

	Andesitic Sequence		Tuffaceous Shale		Felsic Volcanics
	L1S-9N	L10N-13N	L1S-9N	L10N-13N	E of Henty Fault
Chargeability (mv/v)	12	12	18	18	15
Resistivity (ohm-metresx10^3)	5-10	3	7-15	10	7-10 in west 3-5 in east

The change in background resistivity north of line 9N in both the andesitic and tuffaceous shale sequences may represent a northward facies change in both these units. Geological mapping of these units did not detect such a facies change. The only section of the favourable contact that co-incided with background variations of the induced polarisation characteristics of the rocks was between lines 9N and 11N where background resistivities dropped sharply from around 10,000 ohm-metres east of the contact to 3,000 to 5,000 ohm-metres west of the contact.

TABLE 7

Henty River Induced Polarisation Anomalies

LOCATION	CHARGEABILITY(mv/v)		RESISTIVITY (ohm-m)	MAGNETIC ANOMALY	MAX DEPTH TO SOURCE	INTERP. DIP OF SOURCE	POSSIBLE SOURCE LITHOLOGY
	ANOMALY	BACKGROUND					
1N,2975E	26	10	4,000	none	< 70 m	-	Gn-Sp in adits
5N,2812E	26	16	10,000	400 ɣ	< 50 m	E	andesite or tuff. shales
7N,2687E	26	18	9,000	100 ɣ	< 50 m	W	andesite
10N,2575E	31	16	5,000	900 ɣ	< 50 m	W	andesite

Only the line 1N anomaly has any associated change in resistivity; this drops from a background level of 7,000 ohm-metres to 4,000 ohm-metres. Also this is the only chargeability anomaly lacking an associated magnetic anomaly. The Scintrex report suggests that although magnetite and/or pyrrhotite may contribute to the anomalies on lines 5N, 7N and 10N, these magnetic minerals are not the only source of the chargeability responses.

Although the main mineralised zone exposed in the adits has a co-incident chargeability-resistivity anomaly, both the line 4N mineralisation and the D.D.H. HR 2 mineralisation have no identifiable geophysical response, although all three zones are similar in sulphide mineralogy, grain-size, textures, gangue mineralogy and host lithology.

A second chargeable zone extends from lines 5N to 13N located 30 to 60 m west of the Henty River and is underlain by purple hematitic tuffaceous shales immediately west of the Henty Fault. This zone is strongest on line 12N (2962E) where maximum chargeability reaches 32 mv/v against a background of 18 mv/v. This anomaly has no associated soil geochemical response and is probably caused by disseminated pyrite or graphite in the shales.

The main western chargeable zone crosses line 13N at 2350E where a 27 mv/V response against a background chargeability of 18 mv/V is interpreted to have an east dipping source with a maximum depth of 50 m. This anomaly on this line was originally located by a McPhar dipole-dipole survey using a 300 ft. electrode spacing in 1968, on West Tyndall line 6N (now re-pegged as Henty River line 13N). The dipole-dipole data indicates that the depth to the source of the anomaly is at least 30 m.

The significance of the relative peaks of the main chargeable zone being located on lines 5N, 7N and 10N is enhanced by the fact that the strongest anomalies in the major soil geochemical anomaly also occur on lines 5N, 7N and 10N, as shown on Figure 26. The co-incidence of the zones of anomalous chargeability and soil geochemistry with the favourable andesite/tuffaceous shale contact is of major significance.

2. Ground Magnetic Survey

In conjunction with the gradient array survey, Scintrex Pty. Ltd. carried out a total field ground magnetic survey from 10th to 18th January, 1979. Henty River lines 1S to 13N were surveyed, as well as East Tyndall line 6N from the Henty River to Bradshaw's Road (3200E to 4100E). The survey indicated that the strong chargeability anomalies on lines 5N, 7N and 10N have associated magnetic anomalies, and that each of the major lithological units has a characteristic magnetic signature.

East of the Henty Fault the monotonous sequence of felsic ash-flows is characterised by a very flat magnetic background of around 62,550 gammas. The contact between the andesitic sequence and the tuffaceous shales between lines 4N and 10N co-incides with a change from erratic magnetics varying between 62,600 and 62,700 gammas to the west over the andesites, to a flat background to the east of 62,580 gammas over the tuffaceous shales. Facies variations in the purple hematitic tuffaceous shales north of line 9N suggested earlier on the basis of resistivity contrasts is supported by an increasing magnetic gradient within this unit north of line 9N.

The WNW-trending sinistral fault crossing line 4N is supported by the displacement of two small magnetic anomalies on line 4N relative to their position on line 3N. No geological evidence was obtained to explain a narrow linear zone of co-incident magnetic anomalies and low resistivity trending NNW from the Henty River at line 1S, 3000E to line 5N, 2600E. This zone may reflect a fault or may be a series of en-echelon magnetic lenses within the volcanics.

As the Henty Fault runs beneath the river bed for most of the area covered by the grid, it was traversed on only 3 of the 15 grid lines surveyed (lines 1S, 00, 1N). On these lines the fault had no characteristic induced polarisation or magnetic response or contrast.

2.3.6 Diamond Drilling

1. Introduction

Two diamond drill holes totalling 601.5 m were drilled by Associated Diamond Drillers to test extensions to the

mineralisation exposed in the adits and on line 4N. Drilling commenced on 13th February, 1979, and was completed on 4th May, 1979 at direct unit costs of $54.73/m and $50.85/m for D.D.H.'s HR1 and HR 2 respectively. Machine breakdowns and an inexperienced drilling crew resulted in HR 1 being drilled over a period of eight weeks.

As there is no road access to the grid, the drill sites were hand-cleared by contractors and the drill rig (Mindrill F30), drill rods and all supporting fuel and equipment were transported in slings and nets by a Bell Jetranger 206B helicopter. Rig shifts were completed in 4-5 hours flying time with an additional hour's flying to fly out the drill core at the completion of each hole. The two-man drilling crew stayed at the Henty River tent camp and walked to the drill site each day. The drilling equipment was flown a distance of 3.5 km into the drill sites from a helipad at the intersection of Howard's Road with West Tyndall grid line 16N.

2. D.D.H. HR 1

Collar Location:		HR 0615 m N, 3200 m E
Collar R.L.	:	132 m A.S.L.
Bearing	:	240° magnetic
Inclination	:	-55°
Hole Length	:	371.0 m
Commenced	:	13th February, 1979
Completed	:	10th April, 1979

The hole was designed to test the northern extension of the outcropping line 4N mineralisation, beneath line 5N, on which there is a combined strong chargeability/very strong soil geochemical/moderate sharp magnetic anomaly occurring along strike from the line 4N mineralisation. Prospecting along adjacent to line 5N before drilling commenced did not locate any outcropping mineralisation, although an apparently unmineralised chip sample from an outcrop of light green tuffaceous shales in the centre of this combined anomaly assayed 0.97% Pb and 3 g/t Ag. The hole was terminated before reaching the target zone when the Mindrill F30 drill rig was unable to push the hole further than 371.0 m. At this point the hole had flattened to -12°. Two minor zones of disseminated galena-sphalerite mineralisation occurred in andesitic welded ash-flow tuffs and agglomerates at 346.0 and 366.0 m respectively (HR 1 profile Figure 27).

Summary of HR 1:

0-8.0 m:	Overburden
8.0-74.7 m:	Fine grained felsic vitric? ash-flow tuff, with disseminated pyrite, trace chalcopyrite
74.7-98.1 m:	Strongly sheared and sericitised felsic vitric tuff, increasing quartz veining down hole
98.1-98.7 m:	HENTY FAULT - massive quartz vein, trace pyrite
98.7-104.5 m:	Strongly sheared and sericitised tuffaceous shales, trace chalcopyrite
104.5-328.4 m:	Purple hematitic tuffaceous shales and minor greywackes
328.4-332.0 m:	Fine grained andesitic felspar crystal-vitric tuff, trace pyrite

332.0-338.8 m:	sheared interbedded grey siltstone and shale
338.8-341.9 m:	shear zone with quartz-galena-sphalerite-pyrite veinlet
341.9-347.5 m:	fine to medium grained andesitic felspar crystal-vitric welded ash-flow tuff with disseminated pyrite, trace sphalerite-galena-chalcopyrite
347.5-365.5 m:	medium grained andesitic lithic-vitric tuff (non-welded), trace pyrite, sphalerite-galena-chalcopyrite
365.5-371.0 m:	Andesite agglomerate, welded ash-flow matrix, minor sphalerite-galena-pyrite segregations

HR 1 assays:

The complete drill hole (8.0-371.0 m) was split and assayed in lengths varying from 1.5 m to 6.0 m with assay lengths controlled by lithological boundaries. Elements analysed by A.A.S. were Cu, Pb, Zn, Ag, Fe and Mn. Total S was also determined for each sample. The only significant intersections were:

344.5-347.5 m (3.0 m): 0.02% Cu, 0.02% Pb, 1.12% Zn, <2 g/t Ag, 0.6% S
362.5-367.0 m (4.5 m): 0.01% Cu, 0.15% Pb, 0.39% Zn, <2 g/t Ag, 0.2% S

3. D.D.H. HR 2

Collar Location:		HR 0175 m N, 3200 m E
Collar R.L.	:	126 m A.S.L.
Bearing	:	297° magnetic
Inclination	:	-52°
Hole Length	:	230.5 m
Commenced	:	26th April, 1979
Completed	:	4th May, 1979

The hole was designed to test the northern extension of the disseminated galena-sphalerite mineralisation exposed in the No. 1 and No. 2 adits and cropping out on the western river bank south of the No. 1 adit. The drill section was located 100 m north of northern end of the exposed mineralisation, which is hosted by foliated fine grained light green tuffaceous shales at surface. The hole intersected 12.0 m of disseminated and veinlet galena-sphalerite mineralisation in silicified and sericitised andesitic lithic tuffs and agglomerates. Minor disseminated galena-sphalerite-pyrite mineralisation extended for 9 m up-hole and 4.5 m down-hole from the mineralised zone, which is interpreted to have a true width of 5-6 m (HR 2 profile Figure 28).

The HR 2 intersection occurs within the andesitic sequence, approximately 50 m west of it's eastern margin. Consequently the relationship of this zone to the mineralisation exposed in the adits 100 m south and within the western margin of the light green tuffaceous shales is problematical. Either both zones represent parts of the same sulphide body which transgresses the contact, or each represents a separate small en-echelon sulphide lens within a broad transgressive zone of sulphide lenses. The latter interpretation is favoured due to the occurrence of the east bank mineralisation in an en-echelon

relationship to the main adit mineralisation, with all three zones forming a series of NNW-trending en-echelon lenses. Also the grossly stratabound nature of each separate lens in relation to it's enclosing host rocks, the lack of any identifiable NNW-trending structural zone and the finely disseminated nature of the sulphide mineralisation tend to support the second interpretation. The controlling factor on the en-echelon relationship of the sulphide lenses is not known.

Comparing the HR 1 and HR 2 drill core lithologies and geochemistry indicates that HR 2 penetrated 50 m into the andesitic sequence before intersecting the sulphide zone, while HR 1 was terminated after only 25 m into the andesitic sequence. The mineralisation intersected in HR 1 to date does not reflect the intensity of the combined chargeability/magnetic/soil geochemical/rock chip geochemical anomaly at surface 300 m above the drill section. The soil geochemical anomaly at this point is the strongest on the grid, being stronger than the anomaly on line 4N adjacent to exposed galena-sphalerite mineralisation. Consequently the source of this combined anomaly is interpreted to be less than 50 m west across section from the end of HR 1.

Summary of HR 2:

0-3.0 m:	Overburden
3.0-9.8 m:	Fine grained andesite lava
9.8-10.15 m:	Quartz vein, disseminated pyrite
10.15-18.15 m:	Sericitised purple hematitic tuffaceous shales, disseminated pyrite
18.15-35.5 m:	Fault zone-sheared sericitised lavas and shales, disseminated pyrite, trace chalcopyrite
35.5-41.5 m:	Sheared grey siltstones and shales
41.5-43.9 m:	Fault zone-quartz vein
43.9-58.4 m:	Fine to medium grained felsic quartz-felspar crystal-vitric tuff, trace pyrite
58.4-81.4 m:	Interbedded grey tuffaceous shale-siltstone-greywacke, trace pyrite
81.4-108.7 m:	Fine to medium grained andesitic quartz-felspar crystal-vitric(-lithic) tuff
108.7-112.7 m:	Interbedded grey siltstones and shales
112.7-115.0 m:	Fine to medium grained andesitic crystal-vitric tuff
115.0-120.6 m:	Interbedded grey siltstones and shales
120.6-136.5 m:	Andesite agglomerate, disseminated pyrite
136.5-143.5 m:	Fine to medium grained andesite lava, trace pyrite
143.5-150.9 m:	Andesite agglomerate, minor pyrite, sphalerite-galena
150.9-152.5 m:	Fine to medium grained andesite lava, trace pyrite, galena
152.5-167.5 m:	Main sulphide zone: Andesitic lithic-vitric-crystal tuff with local vitroclastic texture; segregations, disseminations and veinlets of galena-sphalerite (mainly in matrix to clasts and phenocrysts), trace pyrite, chalcopyrite; locally strongly sericitised and silicified.
167.5-170.0 m:	Medium grained andesite lava, trace sphalerite-galena-pyrite
170.0-173.4 m:	Fine grained andesite lava, trace pyrite

173.4-221.0 m: Amygdaloidal andesite lava with possible pillow structures

221.0-230.5 m: Fine grained intermediate intrusive, trace pyrite-galena-sphalerite

HR 2 assays:

The complete drill hole (3.0-230.5 m) was split and assayed in 1.5 m sections except for the main sulphide zone which was split and assayed in 1.0 m sections. Assay intervals were controlled by lithological boundaries and Cu, Pb, Zn, Ag, Fe and Mn were analysed by A.A.S. Total S was determined for each sample. Significant intersections are as follows:

Interval	Length	Cu %	Pb %	Zn %	Ag g/t	S %
136.5-152.5 m	16.0 m	0.01	0.16	0.18	4.8	0.15
152.5-164.5 m	12.0 m	0.01	4.22	1.84	16.0	1.63
164.5-169.0 m	4.5 m	<0.01	1.54	0.40	3.8	0.42

In addition, Au was determined by fire assay in the following higher grade sections - 157.5 to 158.5 m, 158.5 to 159.5 m, 159.5 to 160.5 m, 160.5 to 161.5 m, and 166.5 to 167.5 m. All Au assays were < 0.1 g/t. Also Hg was determined using Lowder Geosciences gold film mercury detector for three representative sections of the mineralised zone with the following results: 157.5 to 158.5 m (580 ppb), 161.5 to 162.5 m (1350 ppb) and 164.5 to 165.5 m (26 ppb). These results suggest that Hg has a closer association with Zn than Pb.

4. Downhole E.I.P. Surveys

Attempts to log both drill holes using a three-array logger with an 'a' spacing of 2.5 m were largely unsuccessful. HR 1 was logged from the bottom of the casing at 102.0 m to 287.5 m where excessive flattening of the hole stopped the logging device. The 185.5 m section of the hole successfully logged was entirely within the unit of purple hematitic tuffaceous shales and minor greywackes. Down the hole resistivity increased from 5,000 ohm-metres to 50,000 ohm-metres while chargeability varied erratically from 8 to 63 millivolts per volt. No geological reason for these trends is apparent. HR 2 could not be logged due to collapse of the hole just beyond the bottom of the casing at approximately 60 m.

2.3.7 Conclusions

1. A broadly conformable zone of combined soil geochemical and chargeability anomalies with a strike length of 1.4 km and open to the north, occurs on or adjoining the eastern margin of a sequence of andesitic tuffs, agglomerates and lavas in the Henty gorge.

2. Four lenses of disseminated galena-sphalerite mineralisation have been located along the southernmost 400 m of this favourable zone; three of these outcrop, and the fourth was intersected in D.D.H. HR 2. The three outcropping occurrences have dimensions of approximately 50 m by 3-10 m while the HR 2 intersection has a true width of approximately 5-6 m. As tabulated below, the bulk grade of these lenses is fairly consistent, varying

between 4.50% and 6.75% combined Pb + Zn, with Ag in the range 15-26 g/t. No Au was detected in any of these lenses.

Lens	No. of samples	Pb %	Zn %	Ag g/t	Au g/t
Line 4N	7	2.95	2.79	26	< 0.1
D.D.H. HR 2	12	4.22	1.84	16	< 0.1
No. 1 Adit	8	2.88	1.61	15	< 0.1
East bank	1	4.00	2.75	15	< 0.1

3. Although these lenses are too small and too low grade to be of economic potential, they indicate the significance of the eastern margin of the andesitic sequence for mineralisation, and indicate that the anomalies along the favourable contact to the NNW on lines 5N, 7N and 10N are of major significance.

References:

1. Amdel (1978): Petrology Report No. GS 19/79: "Description of volcanic rocks and mineralised samples."

2. Howland-Rose (1979): Geophysical Surveys over the West Henty (Henty River) Grid. Scintrex Report Tas-062B, June, 1979.

3. Meares (1978): E.L. 41/71 (Henty-Yolande) Annual Report, 1977-78.

2.4 BEATRICE GRID (M. J. Hutton)

2.4.1 Introduction

Exploration on the Beatrice grid during 1978-79 involved completion of the soil sampling programme over the western half of the grid, EIP geophysics and three diamond drill holes in the Mt. Sedgwick Anomaly Zone (Figure 29).

The diamond drilling programme and surface outcrops exposed by road works indicate patchy low-grade sphalerite-galena mineralisation in lithic and vitric tuffs and sheared black shales in an area east of Itat Creek between lines LB 1400N and 1600N. The best drill hole intersection was 2 m at 7.7% combined Pb-Zn in D.D.H. MS 1/111-113 m.

Gradient array EIP surveys over the NW sector of the grid confirmed the existence of anomalously high chargeabilities underlying the area of the Sedgwick Porphyry body. The chargeability highs terminate abruptly on their western edges at a creek which marks a strong curved photolineament and may represent a faulted boundary to the body. Electrical soundings indicate a chargeable "layer" at a depth of about 115 m beneath LB 1600N/1162W and about 60 m beneath LB 1800N/1700W.

2.4.2 Access

A 2.4 km road was constructed between September 26, 1978 and January 5, 1979, to allow vehicular access to the Mt. Sedgwick Anomaly zone. Bad weather and boggy ground terminated the road works at approximately LB 1850N/950W. A steep rocky knoll immediately north of line LB 1400N required blasting to enable vehicles to proceed north to line LB 1600N. This blasting provided good exposures of black shales and lithic

tuffs which contain patches of sphalerite-galena mineralisation.

A walking track was cut from the road at LB 1100N up the ridge to LB 2000N to enable easier access to the NW sector of the grid.

2.4.3 Geology

1. Mt. Sedgwick Anomaly Zone

Road works and trenches revealed good exposures of mineralised volcanics and black shales between LB 1400N and LB 1850N.

A 5 m trench at LB 1610N/920W exposed fine-grained bedded vitric tuffs with disseminated fine-grained sphalerite. Bedding strikes roughly north with subvertical dips. Immediately west of the trench, in Itat Creek, were outcrops of sheared black shales with veinlet galena and disseminated and veinlet pyrite mineralisation. Further exposures along the creek and in drill core show that Itat Creek follows a major shear zone which disappears under glacial boulder clays south of LB 1400N.

In the eastern road between LB 1400N/835W and LB 1580N/810W are light green vitric tuffs, often with flattened pumice fiamme, interbedded with minor lithic tuffs and shales. Patchy mineralisation within these tuffs include fine-grained disseminated sphalerite-pyrite and veinlet galena-sphalerite. Foliations strike N to NNW and dip vertically to steeply W. Bedding strikes roughly N with steep W dips. Small-scale folding is apparent in some exposures.

In the western road between LB 1420N/890W and LB 1560N/840W are grey lithic tuffs, cherty vitric tuffs and black shales. Patches of sphalerite occur in the lithic tuffs as discrete masses and within lithic clasts. Galena-sphalerite grains within quartz-calcite veins are widespread but are mostly found in the vicinity of LB 1480N/890W. Foliations and bedding strike about NW with variable dips due to faulting and folding.

In the landslip at LB 1800N/930W, and the road to the north, are strongly cleaved black shales and minor fine-grained vitric tuffs. Pyrite disseminations and layers are common.

2. Sedgwick Porphyry

The main Sedgwick Porphyry body extends from Itat Creek to a small curved creek that marks a strong photolineament and which crosses the grid lines at LB 1800N/2010W, LB 1600N/1865W and LB 1400N/1530W (Figure 29). To the north the porphyry is overlain by Permian tillite and Jurassic dolerite which forms the peak of Mt. Sedgwick. To the south it disappears beneath talus and glacial scree.

Within this body are massive and layered units of green to pink quartz-feldspar porphyries with occasional biotite flakes, often replaced by chlorite, and aphanitic felsic groundmass which commonly shows a strong positive K-stain. The layering resembles flow-layering but there is no clear evidence to distinguish between ash-flows or lavas. The pink variety occurs mostly in the eastern half of the body

whereas in the western half green-grey varieties are dominant. Both occurred in MS 1 as distinct alternating layers.

Quartz phenocrysts are usually 2 to 4 mm + in size with resorbed edges and embayments. Blebs of chlorite are common within the quartz. Feldspar phenocrysts are usually smaller but greater in number and are mostly subhedral sericitically-altered albite. Phenocrysts make up 30-40% of the rock and are set in a microfelsitic devitrified groundmass of sericitised fine anhedral feldspar.

Foliations are virtually absent but thick sub-horizontal quartz-chlorite veins are ubiquitous. Bedding, as defined by the layering, is quite variable but mostly strikes NE to NW with steep dips.

Minor sphalerite-pyrite disseminations and/or magnetite grains have been found in some porphyry samples.

3. NW Area

The inferred fault at the western edge of the main Sedgwick Porphyry body contains a thin black shale unit at LB 1790N/2005W. Elsewhere the fault is covered by stream gravels.

Immediately west of the fault are green, pink and brown quartz-feldspar porphyries which are petrologically similar to the Sedgwick Porphyry. However, interbedded with these rocks are coarse to very coarse agglomerates, conglomerates and lithic tuffs which are composed of clasts of porphyry, cherty volcanics and black shales. Layering is more pronounced than for the main body and occasionally exhibits cross-cutting erosional relationships. Such an occurrence at LB 1400N/2135W indicates a west facing for the sequence. Bedding generally strikes N with steep W dips but locally medium-scaled folding is apparent.

Further west of the porphyries are interbedded lithic tuffs, finely bedded ash-fall tuffs, felsic lavas and vitric tuffs. Some specimens from this sequence contain minor fine-grained disseminations of pyrite-sphalerite-galena. Several units resemble those found in the Mt. Sedgwick Anomaly Zone.

Overlying this sequence are very coarse-grained conglomerates and lithic tuffs, which have been correlated with the Dora Conglomerate (Brophy, 1976), followed by coarse hematitic conglomerates which are characteristic of the Jukes Conglomerate of the Tyndall Group.

2.4.4 Geochemistry

1. Soils

The soil sampling programme over the western part of the Beatrice grid was completed in 1978-79. As with the 1977-78 sampling the C-horizon was sampled wherever possible but due to steep slopes, glacials, skeletal or boggy soils, A or B horizons had to be taken. At several sites two or three horizons were sampled to ascertain the base metal distribution within the soil profile. In general Cu and Pb showed a strong tendancy to be concentrated in organic-rich A horizons.

The major soil geochemical anomaly zone detected in 1977-78 (Mt. Sedgwick Anomaly Zone) was found to continue north on lines LB 1800N and LB 2000N, giving it a length of 1200 m + and a maximum width of about 300 m (Figure 29, Sheet 10/304). In residual soils on lines LB 1400N to LB 2000N anomalous B and C-horizon samples exist between Itat Creek and the ridge to the east. In soils overlying thick glacial deposits on lines up to LB 1200N anomalous values straddle Itat Creek and taper off to the south. Marshall (1979) suggested that the anomalous glacial samples are due to a covered mineralised source and not due to glacial smearing of the mineralisation which occurs between LB 1400N and LB 1600N.

Figures 30 to 32 show the Cu, Pb and Zn distributions for B/C horizon samples over the glacials and residual soils of the M.S.A.Z. (A horizon samples have been omitted because of the organic scavenging effect). Mean and peak values are given in Table 8.

TABLE 8

M.S.A.Z. Soil Assays, B/C Horizons

	Cu ppm * Mean; Peak	Pb ppm * Mean; Peak	Zn ppm * Mean; Peak
Glacials	22; 200	138; 4600	63; 345
Residuals	24; 210	166; 7300	26; 760

* Mean values taken from Figures 30 to 32

Forty-five samples from lines LB 1400N and LB 1600N were assayed for arsenic content by XRF at Renison Limited. Arsenic values closely followed Pb values, the highest being 220 ppm As at LB 1600N/915W, against a background of 40 ppm As.

A few local low-order soil anomalies, mostly single-element, occur over the Sedgwick Porphyry body. In some cases the high values may be due to organic concentration but one zone, LB 2000N/1695W-1920W, contains consistently high Zn assays, up to 290 ppm Zn against a background of the order of 20 ppm Zn, and above-background Pb values. Within this zone the Porphyry is overlain by a thin scree cover of Jurassic dolerite, Permian tillite, Owen Conglomerate and Sedgwick Porphyry. The high values are not derived from this scree as other scree-covered areas have background soil assays. Base metal distributions are given in Figures 33 to 35.

The volcanics west of the Sedgwick Porphyry do not have significant soil assays despite the presence of minor amounts of base-metal sulphides.

2. Rock Chips

During 1978-79, 109 rock chip samples were assayed for Cu, Pb, Zn, Ag, Mn ± S, Au, Fe, Co (Appendix J), the majority of them coming from the Mt. Sedgwick Anomaly Zone (Figure 36, Sheet 10/303).

A series of pits and trenches were dug near sites of highly anomalous soil assays, on lines LB 1200N, 1400N and 1600N, to uncover any mineralised sources of the soil anomalies. At LB 1610N/920W a 5 m trench revealed a bedded sequence of altered fine-grained vitric tuffs with disseminated and bedded sphalerite-pyrite and minor galena-arsenopyrite mineralisation. The average assay of two bulk samples was 365 ppm Cu, 0.105% Pb, 2.52% Zn and 4 ppm Ag (see Table 9).

In Itat Creek immediately west of the trench were outcropping sheared black shales with disseminated and veinlet pyrite-galena-sphalerite mineralisation. The average of five samples was 620 ppm Cu, 1.79% Pb, 1.62% Zn and 45 ppm Ag.

Road works between LB 1400N and 1600N revealed patchy disseminated and veinlet sphalerite-galena mineralisation in vitric and lithic tuffs. Blasting operations between LB 1420N/890W and LB 1500N/890W exposed mineralised lithic tuffs and black shales which were chip sampled on a 5 m sampling interval. The average assay value for the 80 m road section was 65 ppm Cu, 0.22% Pb, 0.34% Zn and 3.7 ppm Ag. The best interval was between LB 1485N-1490N which assayed 90 ppm Cu, 0.63% Pb, 0.57% Zn and 9 ppm Ag.

In the eastern road between LB 1400N/835W and LB 1580N/810W light green vitric tuffs contain patches of disseminated and veinlet sphalerite-galena. The average assay of 11 samples was 250 ppm Cu, 1.28% Pb, 1.60% Zn and 6 ppm Ag, but this is not representative of the entire section which would have an ~~average~~ median value close to the western road chip sampling.

Twenty-two Sedgwick Porphyry samples were assayed, giving an average of 103 ppm Cu, 54 ppm Pb, 100 ppm Zn, 430 ppm Mn and 1.14% Fe. The best sample was F745 which assayed 320 ppm Cu, 270 ppm Pb, 410 ppm Zn, 840 ppm Mn and 3% Fe. This sample was a floater of green feldspar-quartz porphyry containing minor disseminated pyrite-sphalerite-chalcopyrite-galena.

3. Stream Sediments

An orientation stream sediment sampling programme was commenced along Itat Creek and Porphyry Creek to determine the best reconnaissance stream sampling method (Figure 37). Four methods were employed:

1. -80# stream sediments, total digestion
2. -80# stream sediments, cold extraction (cx)
3. Hydroxylamine/HCl digestion of Mn- and Fe-oxides in -20# + 80# stream sediments and Mn-oxide wad
4. Panned concentrates of stream sediments.

The criteria for evaluating what can be regarded as an appropriate reconnaissance exploration method are:

(a) High anomaly/background contrast with no overlap
(b) Consistent background values
(c) A slow fall-off in anomalous values downstream from the source area, so that mineralised areas can be detected well down-stream.

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TABLE 9

1978-79 Rock Chip Sampling Areas

Location	No. of Samples	Cu ppm Ave, Range	Pb % Ave, Range	Zn % Ave, Range	Ag ppm Ave, Range
Trench LB 1610N/920W, Hand-picked	12	316,95-770	0.11,0.06-0.18	1.98,0.24-9.0	3.2, 1-7
Trench LB 1610N/920W, Bulk	2	365,330-400	0.10,0.08-0.13	2.52,2.2-2.85	4, 3-5
Itat Creek Shales. LB 1600N/925W	5	620,350-940	1.79,0.52-3.19	1.62,0.42-3.55	45, 20-62
Western road. 80 m chip section	16	65,30-120	0.22,0.43-0.63	0.34,0.04-0.65	3.7, 1-9
Western road. Hand-picked	7	221,50-560	0.38,0.23-0.66	0.81,0.22-1.60	2.5, 0-4
Eastern road. Hand-picked	11	250,50-460	1.28,0.05-4.10	1.60,0.12-3.4	6, 0-11
Sedgwick Porphyry	22	103,25-370	54ppm,10-270ppm	100ppm,10-410ppm	NOT ASSAYED

Roadworks upstream from LB 1200N on Itat Creek contaminated the stream sediments samples, and assay values were only about 25% of those from samples collected in 1975-76 (SS 43 and 44). Despite this contamination several techniques were considered to have fulfilled the above requirements in detecting the mineralisation in the Itat Creek area in contrast to the background values obtained from Porphyry Creek. They are listed below in a rough order of merit:

1. -20# + 80# hydroxylamine/HCl digestion, Zn/Co ratio
2. -80# Zn - cx Zn
3. -20# + 80# hydroxylamine/HCl digestion, Zn/(Mn+Fe) ratio
4. -80# Zn
5. -80# cx Zn
6. -80# Cu - cx Cu
7. -80# Pb - cx Pb
8. possibly -80# Cu and -80# Pb

Panned concentrates of stream sediments show a sharp fall-off downstream from mineralisation and may be useful in pin-pointing mineralised sources in anomalous streams as a follow-up to the initial sampling. This technique involves panning a constant volume of sediment (say, half a prospecting dish) to a constant volume of concentrate (about one tablespoonful). The concentrate was split, half going to assay and half retained for microscopic examination.

Results of this sampling programme are given in Appendix K.

2.4.5 Geophysics

1. Introduction

Scintrex Pty. Ltd. carried out EIP gradient array, down-hole three-array, Schlumberger array, dipole-dipole and

pole-dipole surveys over sections of the Beatrice grid between 3 December, 1978, and 9th January, 1979. The various surveys are given below:

(a) Gradient array extensions - LB 2000N/2085W-1515W
- LB 1800N/2055W-1395W
- LB 1600N/2265W-1185W
- LB 1400N/2385W-1215W

(b) Detailed gradient array - LB 2000N/1215W-605W
- LB 1800N/1385W-605W
- LB 1600N/1195W-605W
- LB 1400N/1255W-605W
- LB 1200N/1045W-455W
- LB 1000N/1045W-455W

(c) Pole-dipole-Line 1 (Western road) LB 1320N-1700N
-Line 2 (Eastern road) LB 1340N-1640N

(d) Dipole-dipole - LB 1600N/940W-820W

(e) Schlumberger soundings - SX-1 LB 1600N/1162W (N-S expansion)
- SX-2 LB 1800N/1700W (E-W expansion)

(f) Downhole EIP - MS 1 21 m - 327 m
- MS 2 46 m - 299 m
- MS 3 20 m - 325 m

(g) Gradient array check - LB 1600N/1695W-735W

2. Gradient Array Extensions

The gradient array survey over the NW grid extension used a 30 m reading interval with current electrodes positioned at LB 1700N/800W and LB 1700N/2500W approximately (see Figures 38 and 39).

A high chargeability zone was recorded over the Sedgwick Porphyry body on all four grid lines. On LB 1800N and LB 1600N the western edge of the high zone is marked by a sharp drop in chargeability of about 40 mV/V + to a background of around 6 mV/V. This edge coincides with the strong curved photolineament referred to under section 2.4.3.2 of this report. The western edge on LB 1400N is more gradual but also coincides with the photolineament which intersects the line at 1530W on a low angle. LB 2000N did not cross the western edge of the chargeability high. Resistivities within the zone are slightly lower than for those to the west, indicating a disseminated source in a resistive host.

Two minor chargeability peaks occur at LB 1400N/2235W and LB 1600N/2145W and probably relate to shale horizons.

3. Detailed Gradient Array

The purpose of this survey was to more accurately resolve the geophysical characteristics of the Mt. Sedgwick Anomaly Zone using a 10 m potential dipole. Current electrodes were placed at LB 1800N/400W and LB 1800N/1400W for lines LB 2000N, 1800N and 1600N; and at LB 1200N/250W and LB 1200N/1250W for lines LB 1400N, 1200N and 1000N.

Compared with the original reconnaissance survey of 19th

June, 1977, the detailed survey gave much greater resolution and often resolved separate chargeability maxima where only one was inferred previously. "Shoulders" on the reconnaissance array were shown to be of greater importance on the finer spacing (e.g. LB 1400N/865W).

All lines show a significant chargeability high coincident with or immediately west of Itat Creek. This high is enclosed by an abnormally low chargeability rock unit to the east and one of just higher than normal background to the west. Resistivity readings over this high show that the source is disseminated and not conductive.

The most likely source for high chargeabilities corresponding with Itat Creek are pyritic black shales which outcrop in the creek. However, anomalies on lines LB 1200N, 1400N and 1600N extend well west of the creek and known shale outcrops. A possible source for these highs are disseminated sulphides in the Sedgwick Porphyry.

4. Pole-Dipole

Two pole-dipole traverses were carried out along the roads between LB 1320N and LB 1700N to ascertain the chargeability and resistivity responses of exposed mineralisation and black shales.

Line 1 (LB 1320N-1700N, Figure 40) traversed the western road, crossing LB 1400N at 890W and LB 1600N at 840W. High chargeabilities (40 mV/V +) were recorded between LB 1375N and LB 1580N which is a zone underlain by mineralised lithic tuffs and black shales. Resistivities are high, indicating a disseminated source. The chargeable source comes close to the surface and shows little structural variation within the zone, except perhaps an inference that beneath LB 1560N the rocks are less chargeable and more resistive than for the surface layer.

Line 2 (LB 1340N-1630N, Figure 41) traversed the eastern road, crossing LB 1400N at 835W and LB 1600N at 810W. Chargeabilities between LB 1380N and LB 1560N are lower than for Line 1 and correspond with chargeability minima from the gradient array surveys. Between LB 1420N and LB 1460N a layering in the chargeability was observed, suggesting a surface layer of 20 m ± with a lesser chargeability (16 mV/V) than the material at depth (40 mV/V). The values at depth are similar to those in the central section of Line 1 and may indicate an easterly plunge to the chargeable (?sulphide) source.

5. Dipole-Dipole, Line LB 1600N

Dipole-dipole between 820W and 940W on LB 1600N (Figure 42) shows that the chargeable source between 925W and 960W lies within 20 m of the surface (black shales outcrop in Itat Creek at 925W). Between 860W and 900W the depth to source is of the order of 40 m to 60 m. No significant chargeability features were recorded east of 860W.

6. Schlumberger Soundings

Two Schlumberger array electrical soundings were carried out over the Sedgwick Porphyry body to determine the depth to the source of the high chargeability anomaly. The method of interpretation assumes horizontal layering

and no lateral or longitudinal inhomogeneities.

SX-1 had the potential electrodes centred at LB 1600N/1162W with the current electrodes expanding out in roughly a N-S direction a maximum of 400 m. The depth to the chargeable horizon has been assessed to be 115 m ± in a zone of lesser resistivity than the surface material.

SX-2 was centred at LB 1800N/1700W with current electrodes expanding to a maximum of 300 m along LB 1800N. A best guess puts the depth to the chargeable source at 60 m ± 10 m within a less resistive zone.

The decay form on all readings implies a finely disseminated source. Both soundings show a relatively resistive, low chargeability upper layer underlain by less resistive more chargeable material.

7. Downhole Three-Array

Diamond drill holes MS 1, MS 2 and MS 3 were logged using a three-array, a= 2.5 m spacing moved at 2.5 m intervals. Results of the surveys are given in the Diamond Drilling section, 2.4.6.2 of this report.

8. Gradient Array Check, Line LB 1600N

On the original reconnaissance survey a broad chargeable zone of about 26 milliseconds was recorded, commencing at about LB 1600N/900W and open to the west. Maxima were recorded at 945W (33 ms.), 975W (32 ms.) and 1155W (33 ms.) with a minimum at 1065W (22 ms.).

The detailed gradient array confirmed the anomalies between 900W and 1025W of the original survey but between 1055W and 1200W chargeability values dropped to around 18 ms. (26 mV/V). The two distinct resistivity minima observed in the first survey were not repeated in the detailed survey.

The closer-spaced detailed array may have had a limited penetration due to the proximity of the current electrode (at LB 1800N/1400W) and so a check line was run using a much greater current dipole (approximately 2 km).

The chargeability anomalies at 945W and 975W were confirmed with similar amplitudes to the first survey. However, the anomaly at 1155W had "disappeared" and a broad low of about 14 ms (20 mV/V) was recorded between 1095W and 1260W. Careful study of the data failed to explain this occurrence.

2.4.6 Diamond Drilling

1. Drilling

Three diamond drill holes were drilled by Associated Diamond Drillers in the Mt. Sedgwick Anomaly Zone between 8th December, 1978, and 23rd February, 1979. The total of 958 m was drilled at an average cost of $52.80/m. All three holes were designed to test soil geochemical anomalies and exposed mineralisation between LB 1400N and LB 1600N.

138052

MS 1: Collar - LB 1610N/750W
R.L. - 755 m
Bearing - 304° true
Inclination - -60°
Length - 329.1 m
Machine - Mindrill F30
Commenced - 8.12.78.
Completed - 20.12.78

This hole was designed to test for mineralisation under soil anomalies on LB 1600N. A strong swing to the north resulted in drilling at a low angle to strike. Two minor zones of mineralisation were encountered (see Figure 43, Sheet 10/501 for drill profile).

Summary:

0-4.0 m:	Scree
4.0-13.7 m:	Light brown-grey vitric-lithic tuff
13.7-19.4 m:	Grey coarse-grained lithic-vitric tuff
19.4-68.4 m:	Green-grey fine-grained vitric tuff with fine-grained disseminated SPHALERITE-GALENA-PYRITE between 60.5-68.4 m
68.4-96.0 m:	Grey fine to coarse-grained vitric-lithic tuff
96.0-97.1 m:	Grey-brown fine-grained siltstone/tuff
97.1-98.5 m:	Grey-green coarse-grained lithic-vitric tuff
98.5-111.0 m:	Grey-brown fine-grained siltstone/tuff
111.0-113.0 m:	Dark green chloritised lithic tuff/breccia with SPHALERITE-GALENA-PYRITE-(CHALCOPYRITE) mineralisation
113.0-196.7 m:	Grey-brown coarse to fine-grained lithic-vitric tuff
196.7-199.5 m:	Green fine-grained tuff and black shale
199.5-206.3 m:	Black shale and calcareous siltstone
206.3-236.7 m:	Grey cherty shale and black shale
236.7-243.1 m:	Green lithic-vitric tuff
243.1-245.0 m:	Sheared black shale
245.0-245.5 m:	Brecciated tuff and black shale
245.5-248.9 m:	Green/buff vitric-crystal tuff
248.9-270.9 m:	Sheared black shale
270.9-329.1 m:	Green/pink quartz-feldspar porphyry (?crystal tuff).

Assays:

62.0-68.0 m - 6.0 m @ 0.01% Cu, 1.15% Pb, 1.87% Zn, 6 ppm Ag
111.0-113.0 m - 2.0 m @ 0.14% Cu, 2.65% Pb, 5.05% Zn, 22 ppm Ag

MS 2:

Collar - LB 1270N/800W
R.L. - 655 m
Bearing - 065° true
Inclination - -61°
Length - 301 m
Machine - Mindrill F30
Commenced - 3.1.79
Completed - 27.1.79

This hole was designed to test the southern extension of mineralisation exposed in road cuttings north of LB 1400N. Only minor mineralisation was encountered (see Figure 44, Sheet 10/505 for drill profile).

138053

Summary:

0-25.8 m:	Glacial scree
25.8-36.3 m:	Sheared black shale
36.3-38.1 m:	Foliated green quartz-feldspar porphyry
38.1-39.4 m:	Black shale
39.4-43.3 m:	Sheared quartz-feldspar porphyry
43.3-44.2 m:	Black shale
44.2-50.2 m:	Sheared, foliated quartz-feldspar porphyry
50.2-63.9 m:	Black shale
63.9-65.6 m:	Green-grey lithic-vitric tuff
65.6-79.25 m:	Black shale
79.25-84.65 m:	Grey vitric tuff
84.65-87.3 m:	Black shale
87.3-133.9 m:	Interbedded lithic-vitric and vitric tuffs
133.9-138.9 m:	Red-brown fine-grained lavas and chert
138.9-146.7 m:	Grey-brown fine-grained vitric tuffs
146.7-154.4 m:	Red to green fine-grained lavas and chert
154.4-293.9 m:	Interbedded fine-grained vitric tuffs and lithic-vitric tuffs
293.9-301.0 m:	Interbedded fine-grained vitric tuffs and lithic-vitric tuffs
293.9-301.0 m:	Red to brown fine-grained lavas and cherts.

Assays:

60.0-63.9 m - 3.9 m @ 0.01% Cu, 0.59% Pb, 0.78% Zn, 8.5 ppm Ag
72.0-79.25 m - 7.25 m @ 0.34% Pb, 0.66% Zn, 5.4 ppm Ag

MS 3:

Collar - LB 1393N/890W
R.L. - 675 m
Bearing - 060° true
Inclination - -56°
Length - 328 m
Machine - Mindrill 10L
Commenced - 5.2.79
Completed - 23.2.79

This hole was designed to test for depth extensions to mineralisation exposed in road cuttings north of LB 1400N. Only low-grade mineralisation was encountered (see Figure 44, Sheet 10/505 for drill profile).

Summary:

0-10.4 m:	Scree
10.4-32.7 m:	Grey coarse to fine-grained lithic-vitric tuff
32.7-36.5 m:	Sheared limestone breccia
36.5-45.9 m:	Light grey-green fine-grained vitric-lithic tuffs
45.9-46.3 m:	Sheared black shales
46.3-50.3 m:	Altered fine-grained vitric tuff
50.3-51.3 m:	Interbedded black shale and fine-grained vitric tuffs
51.3-111.6 m:	Interbedded fine-grained vitric tuffs, coarse-grained lithic-vitric tuffs and calcareous tuffs
111.6-117.4 m:	Green altered vitric tuffs
117.4-121.1 m:	Light brown to red vitric tuffs/lavas
121.1-121.5 m:	Red cherty siliceous lavas/altered tuffs
121.5-127.5 m:	Light brown to green vitric tuffs
127.5-156.4 m:	Green altered vitric tuffs
156.4-160.0 m:	Mottled green/pink lithic-vitric tuff

138054

160.0-196.8 m: Green to light brown fine-grained vitric tuffs
196.8-197.3 m: Red cherty siliceous lava/altered tuff
197.3-286.0 m: Green-grey fine-grained vitric tuff
286.0-290.6 m: Light brown cherty vitric tuff
290.6-295.6 m: Dark green to brown fine-grained vitric tuff
295.6-328.0 m: Altered pink to red siliceous lava

Assays:

111.6-118.6 m - 7.0 m @ 0.02% Cu, 0.48% Pb, 0.62% Zn, 4.7 ppm Ag
126.6-128.6 m - 2.0 m @ 0.02% Cu, 0.35% Pb, 0.70% Zn, 8 ppm Ag
134.0-148.0 m - 14.0 m @ 0.01% Cu, 0.45% Pb, 0.67% Zn, 4 ppm Ag
175.0-185.0 m - 10.0 m @ <0.01% Cu, 0.41% Pb, 0.72% Zn, 3.5 ppm Ag

As is typical in acid volcanic environments it is difficult to draw strong correlations between drill holes apart from the red siliceous lavas of MS 2 and MS 3. A suite of 38 drill core samples were sent to Central Mineralogical Services for petrological work. Report CMS 79.3.28 summarises the lithologies as dacitic to rhyolitic or locally trachytic tuffs and associated lavas with modes of deposition fluctuating from subaqueous to subaerial.

Mineralisation was mostly fine-grained disseminations and/or thin veinlets of sphalerite-pyrite-galena. Occasionally coarser-grained sulphides occurred in quartz-calcite veins. Sphalerite layers often parallel bedding and may have had a syngenetic origin. In MS 3/10.4-32.7 m lithic clasts contain fine sphalerite, indicating erosion of preconsolidated mineralised rocks. On the other hand, galena is almost always associated with veins, commonly in altered zones, thus indicating a later hydrothermal phase of mineralisation which introduced galena and remobilised sphalerite.

2. Downhole EIP

The three drill holes were logged using a three-array a = 2.5 m spacing moved at 2.5 m intervals. MS 1 and MS 2 were logged on 2-3rd February, 1979, and MS 3 was logged on 26th February, 1979. Significant features of the downhole surveys are given in Table 10.

2.4.7 Conclusions

Exploration of the Beatrice grid in 1978-79 evaluated two major zones of potential economic base metal mineralisation.

In the Mt. Sedgwick Anomaly Zone trenches and road cuttings revealed patchy disseminated and veinlet sphalerite-galena-pyrite mineralisation as the source of anomalous soil geochemical values on lines LB 1400N and LB 1600N. Detailed geophysics and diamond drilling within this area failed to locate substantial deposits beneath the surface exposures. However, among the three drill holes the extent and grade of mineralisation increases from south to north and with anomalous geochemical values on both line LB 1800N and LB 2000N there still exists a possibility of economic mineralisation in this area.

138055

TABLE 10

Downhole EIP; MS 1, MS 2 and MS 3

DEPTH	CHARGEABILITY mV/V	RESISTIVITY ohm-metres	ROCK TYPE/MINERALISATION
MS 1			
50-70 m	22-35	2000-3500	Vitric tuffs with f.g. disseminated sphalerite-pyrite-galena
82-96 m	16-22	3700-7000	Lithic tuff with minor pyrite disseminations
113 m	25.5	1700	Highly altered breccia with veinlet and disseminated sphalerite-galena-pyrite
120-190 m	8	2500 increasing to 6000	Unmineralised lithic-vitric tuffs
195-274 m	25-86	Background 1500. 123 ohm-m at 229m	Mostly pyritic black shales
276 m	50	3500	Contact zone between shales and porphyry pyrite-arsenopyrite veins
280-327 m	24 decreasing to 10	5000-20000	Sedgwick porphyry with minor sulphides in quartz-calcite veins
MS 2			
47-93 m	22-79, mostly 50	700-4000 Background 1500	Mostly pyritic black shales
95-257 m	5-14, mostly 8	2000-6300 Background 2500	Poorly mineralised volcanics
260-280 m	4-6	400-1000	Highly broken sheared tuffs
280-300 m	10-25 Peak at 288 m	2000 increasing to 6000	Tuffs and hematitic lavas
MS 3			
20-63 m	22-54	1200-8000	Lithic tuffs and black shales
65-108 m	6-14	2300-5000	Vitric and lithic tuffs
110-120 m	6-27	2000-3000	Altered tuffs with sphalerite-galena-pyrite
125-150 m	12-24	1400-2500	Altered tuffs, patchy mineralisation
150-170 m	4-9	1500-3000	Tuffs
170-208 m	7-19	800-2500	Tuffs and lavas
210-260 m	2-7	900-2500	Fine-grained vitric tuffs
270-328 m	10-31, peak at 309 m	3000-100000	Fine-grained tuffs and siliceous lavas

138056

The Sedgwick Porphyry body still remains an enigma. Geophysical surveys continued to record anomalously high chargeability responses which were in sharp contact with low chargeability rocks on the western edge of the body. Electrical soundings inferred the chargeable source occurs at depth (60 m +) beneath low chargeability rocks. The nature of this source is unknown but despite the limited geochemical anomalies over the porphyry it must be regarded as a prime drilling target on the strength of the geophysical responses.

References

1. Brophy P. (1976) - E.L. 10/69 Dora Huxley Annual Report 1975-76.

2. Howland-Rose A. W. (1979) - Electrical geophysical surveys over the Beatrice Grid, Scintrex Report Tas 062A, April 1979.

3. Marshall N. J. (1979) - Geochemical Exploration for base metals, West Coast Tasmania, Consultant's Report for The Mount Lyell Mining and Railway Company Limited.

4. Cowan D. (1979) - CMS Report 79/3/28, Petrology of 38 drill core samples from MS 1, MS 2 and MS 3.

2.5 JUKES-DARWIN (M. J. Hutton)

2.5.1 Clark Valley

1. Introduction

Exploration objectives for the Clark Valley in 1978-79 were detailed evaluation of the three anomalous zones as defined in the 1977-78 Jukes-Darwin Annual Report (Sect. 2.2.5). These objectives were accomplished through soil sampling, gradient array EIP and total field magnetics surveys along nine intermediate grid lines and three southern extension grid lines on a 200 m spacing.

Results of these surveys show that Zone I extends from line CV08N/3350E to line CV06S/3450E: Zone II is restricted to between CV12N/2775E and CV04S/2475E, associated with black shales; Zone III extends from CV28N/4125E to CV42N/4225E.

Zones I and III occur in an environment of high potential for base metal deposits.

2. Access

The four-wheel-drive road from the Kelly Basin Road to the southern end of Darwin Plateau was upgraded by bulldozer in mid December, 1978.

Intermediate grid lines totalling 5,300 m and a southern grid extension consisting of three 200 m spaced grid lines totalling 3,850 m were cut by contract track cutters in early January, 1979. Details of the track cutting are given in Table 11.

3. Geochemistry

Soils

Detailed sampling has revealed that A-horizon samples are generally enriched in base metals, especially Cu and Pb, relative to B and C-horizons (Figures 49 to 51). This is probably due to organic concentration and adsorption on to humus particles. As a result several "anomalous" A-horizon samples from the 1977-78 programme have been down-graded in importance.

Results of the 1978-79 sampling programme have further defined the geochemical anomalous zones I and III with two possible Zone II anomalies (Table 12, Figure 45, Sheet 33/302).

Rocks :

Seven rock chip samples from the Clark Valley were assayed in 1978-79 and the results are given in Appendix L. The only significant result was sample number 30015, which consisted of a few pebbles of limonitic gossan from the creek at CV04S/2445E, which assayed 95 ppm Cu, 290 Pb, 1150 Zn, 3 Ag, 50% Fe and 175 ppm Co. 15.4% of the sample was acid insoluble.

Stream Sediments :

Three stream sediments from creeks draining Zone III were assayed in -80# and -200# fractions. Results are given in Appendix M.

In general the -200# fraction gave higher assays. By comparison with the E.Z. stream sediment sampling of 1974-75 the three samples are slightly anomalous in Pb but are within the range of values recorded by E.Z. for creeks in the general area.

Three samples of Mn coated stream pebbles were assayed by the hydroxylamine/HCl Mn-digestion method of Carpenter, et al (1978) and Marshall (1979), and results are given in Appendix M.

4. Geophysics

Gradient Array EIP:

Scintrex carried out EIP gradient array and total field magnetics surveys over the additional grid lines during January and February, 1979. This work and the original surveys carried out in 1978 were collated in report Tas-062A, May, 1979 (Figures 46 and 47).

Zones of interest located during 1979 are as follows:

ZONE X - CV02S/3485E. A significant chargeability anomaly (38 mV/V) with accompanying high resistivities (3000 ohm-m) indicating a disseminated source. This zone appears on the eastern end of a soil geochemical anomaly.
- CV 04S/3412E and 3462E. Two single station anomalies of 28 mV/V and 29 mV/V respectively.
- CV06S/3425E-3500E. A broad (or multiple) chargeable source (31 mV/V) in a relatively resistive host (2000 ohm-m).

ZONE C - CV10N/3362E. A minor chargeability peak of 26 mV/V associated with a resistivity minima of about 2500 ohm-metres may be correlated with

138058

TABLE 11

Clark Valley Track-cutting, 1978-79

Line	From	To	Length	Totals	
06S	2600E	3600E	1000 m		
04S	2450E	3600E	1150 m		SOUTHERN
02S	2500E	3600E	1100 m		EXTENSION
Baseline	CV00	CV06S	600 m	3850 m	
02N	2600E	3600E	1000 m		
06N	2600E	3625E	1025 m		
10N	2600E	3600E	1000 m		
14N	2600E	3000E	400 m		INTERMEDIATE
26N	3900E	4300E	400 m		GRID LINES
30N	4000E	4300E	300 m		
34N	4000E	4400E	400 m		
38N	4025E	4400E	375 m		
42N	4000E	4400E	400 m	5300 m	
Access track	CV10N/3600E	CV06S/3550E	1600 m		
Access track	CV30N/4025E	CV42N/4000E	1600 m	3200 m	

Total track-cutting 12350 m

TABLE 12

Zones of Anomalous Soil Geochemistry, 1978-79

Line	Interval	Cu ppm Ave;Range	Pb ppm Ave; Range	Zn ppm Ave;Range	Mn ppm Ave; Range
06S	3350E-3400E	23; 13-28	110;20-300	42; 8-95	71; 15-200
04S	3250E-3437E	23; 10-44	70; 25-120	62; 8-120	163;10-340
02S	3325E-3487E	28; 6-50	38; 0-60	42; 8-90	61; 0-180
02N	3325E-3475E	18; 7-34	45; 10-90	24; 12-53	39; 0-85
06N	3312E-3350E	40; 12-60	31; 15-50	14; 2-27	16; 0-30
04S	2475E-2500E	15; 11-19	110;60-160	8; 5-12	27; 15-40
06N	2850E-2875E	25; 3-47	130;50-210	16; 15-17	22; 15-30
30N	4162E-4237E	8; 4-29	81; 10-145	9; 6-14	<10
38N	4312E-4400E	19; 7-40	63; 30-80	23; 10-38	33; 20-60
42N	4150E-4300E	5; 0-20	83; 0-400	35; 3-290	23; 0-90

138059

Zone C on CV08N.
- CV06N/3337E. A broad chargeability anomaly (46 mV/V) associated with a 70% drop in resistivity to 1800 ohm metres.

ZONE D - CV14N/2762E and 2862E. Two minor chargeability maxima of 18 mV/V and 22 mV/V respectively which possibly relate to Zone D on CV12N. Resistivity minima occur 25 m west of both anomalies.

- CV06N/2712E. A chargeability maxima of 29 mV/V associated with a 40% drop in resistivity to 3150 ohm metres.

ZONE I - CV34N/4212E. A sharp 50 mV/V anomaly corresponds with a 45% decline in resistivity to 2500 ohm metres. Pyritic black shales outcrop in the Clark River at 4205E. The form of the resistivity profile suggests a correlation with Zone I at CV32N/4187E.
- CV30N/4162E and 4237E. Two distinct chargeability anomalies of 50 mV/V and 41 mV/V respectively, accompanied by resistivity lows of 2000 ohm metres at 4162E and 2500 ohm metres at 4237E. These anomalies correspond with two units of black shales.
- CV26N/4087E-4262E. Weak chargeability anomalies correlated with Zone I on CV28N.

ZONE M - CV42N/4062E. A sharp, single-station chargeability anomaly of 14 mV/V above background related to Zone M at CV40N/4050E.
- CV38N/4075E. A slight rise in chargeability of 6 mV/V above background.

ZONE L - CV42N/4150E-4375E. Two strong chargeability peaks occur at 4187E (66 mV/V) and 4287E (55 mV/V) in a zone with backgrounds of around 40 mV/V, as opposed to background of 16 mV/V outside the zone. Resistivities drop from 7000 ohm metres outside the zone to 4000 ohm metres at 4262E. Black shales outcrop over much of this zone.
- CV38N/4225E-4300E. Two significant chargeability anomalies occur at 4237E (32 mV/V) and 4287E (34 mV/V) on the eastern flank of a resistivity high centred at 4200E (5400 ohm metres). Pyritic black shales outcrop in the Clark River near 4300E.

Magnetics:

The clear cut change from the "quiet" area to the west and the "noisy" area to the east continues south through the southern extension. As in the 1977-78 surveys this contact roughly corresponds with zones of geochemical and EIP anomalies and probably represents a major lithological/structural change (Figure 48).

5. Conclusions

Results from the 1978-79 field season have further defined the anomalous zones of interest delineated in the 1977-78 Jukes-Darwin Annual Report.

In Zone I (CV08N/3350E to CV06S/3450E) pyritic black shales have been found on line 08N and in the creeks

immediately to the north. The similarity in geophysical response suggests the shale unit extends to line CV06N. From line CV04N to CV06S the underlying rock type is dominantly a chloritised lithic tuff which yields a thick orange clay soil.

Zone II anomalies coincide with occasional outcrops of black shale which probably occur as discontinuous lenses within quartz-phyric tuffs and lavas.

Zone III (CV28N/4125E to CV42N/4225E) is associated with a sequence dominated by units of pyritic black shales and interbedded tuffaceous siltstones. Several outcrops of black shale have been found in the Clark River and its tributaries. To the east of the shales is a conspicuous dark green basaltic lava/intrusive. Pyrite is the only sulphide so far detected although one sample (F470) assayed 0.25% Pb.

Zones I and III occur in a similar stratigraphic position between feldspar-quartz-phyric felsic lavas and tuffs of the "Central Lava Belt", and the quartz-phyric sericitic crystal tuffs and lavas of the "Clark River Volcanics". Hence they mark a major lithological/structural change which could be the boundary between predominantly subaerial ash-flows and lavas of a volcanic pile (Central Lava Belt, Darwin Granite) and flanking subaqueous tuffs, lavas and sediments (Clark River Volcanics). This is a likely environment for precipitation of base metal sulphides from waters charged by volcanic exhalations. High soil assays on lines CV08N and CV28N coincide with fault zones crossing black shale units and may be due to remobilisation and concentration of sulphides along these faults. Alternatively they may act as channelways for base metals to migrate to the surface from mineralisation at depth.

2.5.2 Garfield River

1. Introduction

No additional fieldwork was carried out in 1978-79. A representative suite of 27 rock chip samples, collected during 1977-78, were assayed for Cu, Pb, Zn, Ag and Mn. Eight rock chip samples from the Snake Spur Costean were resubmitted for Pb, Zn, Ag, Mn and Au assays. -10# + 80# fractions of the stream sediments collected during 1977-78 were also submitted for assay using the Hydroxylamine/HCl Mn-digestion method.

2. Geochemistry

Rocks:

No significant base metal values were obtained from the rock chip samples submitted. Sample 30010 from the Snake Spur Costean assayed 17 ppm Ag. Results are given in Appendix L.

Stream Sediments:

The forty stream sediment samples collected in 1977-78 (Figure 52) were digested in a Hydroxylamine/HCl solution and assayed for Cu, Pb, Zn, Mn, Fe and Co as ppm in solution. Because all samples were not of a uniform weight the results were processed to obtain element

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ratios as proposed by Carpenter, et al (1978). There are no outstanding anomalous areas although samples SS 19 and SS 25 have high Zn/Mn + Fe ratios. Results are given in Appendix M.

2.5.3 Bird River Ironstone

1. Introduction

T. B. Moore's track was traced, recut and soil sampled a distance of 625 m from the Kelly Basin Road, where it faded. A small trench, exposing limonitic ironstone and Silurian quartz sandstone, was located beside the track 135 m from the road.

2. Geochemistry

Soils:

Due to the abundance of quartz sandstone scree most soil samples were taken from the Ao horizon. Background assay values were of the order of 20 ppm Cu, 25 ppm Pb, and 20 ppm Zn. Significant assays occur in the first 135 m of the track (Table 13).

TABLE 13

Significant Soil Assays, T.B.M. Track

SITE	Cu ppm	Pb ppm	Zn ppm	Mn ppm	REMARKS
25 m	35	1300	900	730	B horizon
50 m	31	330	180	260	B horizon
100 m	11	200	17	30	Ao horizon
125 m	16	40	85	2500	Ao horizon
135 m	14	120	115	5400	Beside trench

The increase in Pb values towards the Kelly Basin Road led to the suspicion that they were due to some form of contamination. However, subsequent sampling at various sites along the road suggests the values are genuine. During this sampling the site at 25 m was sampled down to 60 cm and returned consistently high assays throughout the profile. This site lies roughly along strike from the trench at 135 m and overlies purple shales.

Rocks:

A sample of ironstone from the trench at TBM/135 m assayed 75 ppm Cu, 110 ppm Pb, 600 ppm Zn, 900 ppm Mn, 22% Fe and 80 ppm Co. 56.8% of the sample was acid insoluble.

3. Conclusions

Results of the soil sampling surveys suggest that the ironstone formations discovered by T. B. Moore may be derived from mineralised shales and sandwiched between quartz sandstones. Further track cutting, sampling and geophysical work are warranted for this area.

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References

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4. Williams R. E. (1975) - E.L. 13/65 and SPL 140, Jukes-Darwin Area. E.Z. Annual Report, 1974-75.

5. Howland-Rose, A. W. (1979) - Scintrex Report Tas 062-A, May, 1979. Clark Valley geophysics.

2.6 GENERAL

2.6.1 Aeromagnetic Survey

In association with the E.Z. Company, a low-level aeromagnetic survey was flown in March, 1978, over the NW section of the licence and adjoining areas to the north held by E.Z. Relevant details of this survey were not reported in the E.L. 9/66 1977-78 Annual Report and will be reported here. The area flown is shown on Figure 2 and was divided into two adjoining sub-areas. The northern block from Mt. Read to Red Hills was flown at 500 m line spacing with costs shared equally between the two companies, while the southern block covering the White Spur-Howard's Anomaly area was flown at 250 m line spacing and was costed in full to Mt. Lyell. The total cost to Mt. Lyell for both sub-areas was $5,425. Details are as follows:

Contractor: Geoex Pty. Ltd.
Aircraft: Bell 206B helicopter
Magnetometer: Varian 4937A Proton Precession with towed bird sensor.
Flight Line Orientation: East-west
Flight Line Spacing: As indicated above
Sensor Ground Clearance: 90 m
Reading Interval: 1 second
Aircraft Speed: 60 knots
Total Line-km Flown: (i) Mt. Read-Red Hills 72 line-km
(ii) White Spur-Howards Anomaly 189 line-km
Navigation Method: 1:10,000 scale aerial photographs
Data Presentation: 1:10,000 scale total intensity contour plans with base level at 62,625 gammas and contour intervals of 10 gammas up to +1000 gammas and 1000 gamma contours above +1000 gammas. Also stacked profiles and flight line plots.

2.6.2 Aerial Photographic Survey

Aerial photographic coverage of approximately 60% of the licence was up-dated when three areas were flown on 19th January, 1979. The areas flown are shown on Figure 2 and include the area west of the Tyndall Range from Basin Lake to Rosebery, the adjoining Beatrice area, and the Jukes-Darwin area. Details are as follows:

Contractor: Tasmanian Lands Department
Photographs: 1:20,000 colour
Project Name: Mt. Lyell Areas F593
Camera Height: 22,300' A.S.L.

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Lens Used: Normal angle 12 inch
Date/Time Flown: 10.20 a.m.-11.45 a.m. 19th January, 1979
No. of Photographs: 7 flight lines - 89 photographs
Cost: $2,914 covering flying and photography costs and including one set of B/W prints but excluding cost of set of colour prints (approximately $600).

	Area	Line Orientation	Run No.	Photo Nos.
1.	Beatrice	NW-SE	3	209-216
2.	Basin Lake to Rosebery	NNE-SSW	4	1-12
			5	13-23
			6	24-36
3.	Jukes-Darwin	N-S	7	160-174
			8	175-190
			9	191-204

2.6.3 Geochemical Consultant

To evaluate the effectiveness of current geochemical exploration techniques and to recommend new methods where applicable, the services of geochemical consultant N. J. Marshall were employed involving two weeks field time on E.L. 9/66 and additional report writing and data compilation and evaluation time. Results of orientation surveys carried out and specific recommendations are reported in "Geochemical Exploration for Base Metals, West Coast Tasmania" by N. J. Marshall (April, 1979) Parts 1 and 2. Methods and approaches resulting from this report currently being evaluated include:

(i) litter and Ao horizon sampling for reconnaissance surveys

(ii) the use of analysing Mn coatings on pebbles in stream sediments

(iii) the use of soil conductivity and -200 mesh fraction Ao horizon sampling over glacial overburden

(iv) various acid extraction techniques for the analysis of routine soil and stream sediment samples

(v) the use of Mn, Fe and Co to detect scavenging in soils

(vi) the use of whole rock geochemistry and pathfinder elements in routine exploration surveys.

2.6.4 Henty-Yolande Reconnaissance

To provide access to follow-up anomalous stream sediment and rock chip samples from surveys conducted during 1971-7 , a total of 5.39 km of flagged access tracks were cut into anomalies on the Henty and Langdon Rivers (Figure 2).

A rock chip sample collected in 1975-76 from outcrops on the north bank of the Henty River approximately half way between Henty River grid line 16S and the highway bridge assayed 1.12% Zn. During 1978-79, a 450 m access track was cut from a point on the highway approximately 200 m north of the Bradshaw's Road turn-off, directly down-slope to the Henty River. From this point access tracks were cut 625 m east and 400 m west along the southern bank of the river. No further work has been conducted to date.

Stream sediment samples anomalous in Pb and Zn were collected in 1973-74 from the upper reaches of the Langdon River and it's tributaries in the section of the river immediately west of Basin Lake. During 1978-79, a 3915 m access track was cut from Bradshaw's Road to the Langdon River (1800 m). downstream along the west bank of the river (1100 m) and back up to a point on Bradshaw's Road approximately 2 km along the road from the commencement point of the track (1015 m). No further work has been conducted to date.

2.6.5 Lake Margaret Ironstone

In September 1978, attention was drawn to floaters of ironstone occurring sporadically along the north shore of Lake Margaret. Only one sample was available and assayed:

Sample No.	Cu (ppm)	Pb %	Zn %	Ag g/t	Mn %
24171	150	0.65	1.14	25	1.34

Follow-up of this significant occurrence has been prevented by high water levels in the lake drowning the level of the shore where the ironstone floaters occur. To protect the ground to the north and north-west of the lake, then vacant, an application for a 15 sq. km Exploration licence (Lake Mary) was lodged, and the area was subsequently granted and amalgamated into the enlarged E.L. 9/66 on 5th December, 1978.

2.6.6 Drill Core Logging - R.Q.D.

Significant information concerning the physical strength and/or inherent weakness of rock bodies, used in the planning and selection of mining methods, stope design and layout etc., is generated during the drilling of each exploration diamond drill hole. A measure of the mechanical strength of a rock body is the Rock Quality Designation (R.Q.D.), which is a measure of the number of natural fractures per unit length of drill core. As splitting of drill core prior to assaying and decomposition of the core during prolonged storage, 'artificially' increase the number of fractures per unit length, the R.Q.D. must be determined during initial logging of the core prior to splitting. Consequently R.Q.D.'s are now calculated for the core from each exploration drill hole on a routine basis and are recorded in the geological drill log. In addition, all exploration drill core is photographed prior to splitting.

The method currently used for determining the R.Q.D. of a rock body is as follows:

(i) each recovered interval is treated as a unit and the R.Q.D. is recorded as a percentage of the total length of solid core sticks greater than 10 cm in length to the full length of the interval drilled (not length recovered).

e.g. length drilled: 3.0 m (45 m-48 m)
length recovered: 2.5 m
total length of sticks greater than 10 cm: 1.0 m
thus R.Q.D. is 1.0/3.0 or 33%.

(ii) only natural breaks are included - breaks caused by drillers fitting the core into core boxes are excluded.

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2.7 EXPLORATION EXPENDITURE 1978-79

During 1978-79 a total of $421,380 was spent on exploration programmes in the licence area. Sub-area totals within the licence for the year were Tyndall $171,713 and Sedgwick-Darwin $249,667. Since 1967, total exploration expenditure on E.L. 9/66 is $2,223,967. Details of 1978-79 expenditure are presented below in Table 14.

TABLE 14

E.L. 9/66 Exploration Expenditure 1978-79

	Cost Area	Expenditure	%
1.	Salaries and Wages	89,546	21.3
2.	Burden Charges	31,164	7.4
3.	Access	56,444	13.4
4.	Geochemistry	22,511	5.3
5.	Geophysics	70,341	16.7
6.	Diamond Drilling	101,016	24.0
7.	Materials	21,271	5.0
8.	Equipment and Facilities	11,954	2.8
9.	General Costs	6,218	1.5
10.	Indirect Charges*	10,915	2.6
	TOTAL	$ 421,380	100.0

* Indirect charges include 6½% of items 1, 2, 4 (Mt. Lyell lab. only), 7, 8.

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3. PROPOSED EXPLORATION PROGRAMME 1979-1980 (K. O. Reid)

3.1 INTRODUCTION

The principal features of the 1979-80 exploration programme are shown in Figure 3 and include:

1. Continued testing of selected target zones by diamond drilling:

   - Henty River Gorge lead-zinc mineralised zone,
   - Mt. Sedgwick lead-zinc mineralised zone, and, adjacent geophysical anomalous zones on the NW section of the Beatrice grid,
   - White Spur area.

2. Preliminary geological and geochemical evaluation of geophysical anomalous zones on the eastern section of the Beatrice grid.

3. Further evaluation of the Howard's Anomaly-Tyndall Mine zone, prior to the selection of drilling targets.

4. Reconnaissance stream sediment sampling and mapping of the Henty-Yolande area.

The proposed drilling programmes are to some extent dependant on results of the coming field season, and hence, may not be completed as currently envisaged.

The total budget estimate for 1979-80 is $460,140. It is anticipated that the current joint venture financing arrangements will come to an end during late October 1979 (early period 5). Subsequent to that time each party to the joint venture will be required to contribute funds on a pro rata basis, relative to equity holding. Total expenditures by the respective parties for 1979-80 will be about:

Getty Oil Development Co. Ltd. (G.O.D.L.)	$ 235 844
Consolidated Gold Fields Australia Ltd. (C.G.F.A.)	$ 56 882
The Mount Lyell Mining and Railway Company Limited	$ 167 414

The main features of the proposed programme are summarised on the accompanying bar charts, while tabulations of the budget estimates are presented for the total programme and for the Mt. Tyndall area (E.L. 9/66A) and Sedgwick-Darwin area (E.L. 9/66B), respectively. A tabulation of unit costs used in the budget estimates is also presented (Table 20). Only brief explanatory budget comments are presented, and consequently the reader is referred to the text of the 1978-79 Annual Report, E.L. 9/66 for supporting information.

To facilitate cost control, a further section presenting data on period cost estimates has been provided.

3.2 PRINCIPAL FEATURES OF THE MT. TYNDALL AREA, E.L. 9/66A, EXPLORATION PROGRAMME

Exploration activities will be concentrated in the Henty River Gorge, Howard's Anomaly-Tyndall Mine and White Spur areas. A total budget of $240,000 is proposed, of which, testing of selected target zones by diamond drilling comprises some 47%.

3.2.1 Diamond Drilling (1900 m)

Henty River Gorge - Two drill holes (HR3 and 4 totalling 950 m) are proposed to test the northern strike extension of the zone of lead-zinc mineralisation and coincident soil geochemical and gradient array I.P. anomalies.

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The targets are located on lines 7N and 10N respectively - $ 57,000

Should an encouraging intersection be obtained in drill hole HR3, it may then be considered necessary to extend drill hole HR1 further to the west. No allowance is made for such a contingency in the current budget estimates.

Howard's Anomaly - Tyndall Mine Zone: Two drill holes (HA4 and HA5, totalling 600 m) have been tentatively proposed to test this zone, but final target selection has not been made at this stage ... $ 36,000

White Spur: One drill hole (WSP2, 350 m) has been allocated to test the strong chargeability anomaly on line 37N. $ 21,000

Total diamond drilling budget (6 holes, 1000 m) $ 114,000

3.2.2 Access related to Diamond Drilling

1. To accomplish the above drilling programme $20,400 has been allocated for road access, site preparation, rig mobilisation/demobilisation and maintenance of supplies by helicopter.

2. Due to the very difficult access to the targets in the Henty Gorge, a combined helipad-drillsite-campsite is required on line 8N (HR3) on the west bank of the Henty River.
   Site preparation, 21 man days: $ 1,700

3. The second drill site (HR 4) will be established on line 10N near the top of the western slopes of the Henty Gorge, following approximately 5 km of vehicular access track from Howard's Road.
   Bulldozer hire: $ 8,000

4. Drill rig mobilisation/demobilisation, and maintenance of supplies to the HR3 drill site will entail 17 hours of helicopter usage.
   Helicopter hire: $ 7,700

5. Two km of access road to the two drill targets in the Howard's Anomaly-Tyndall Mine zone have been scheduled, although the drill targets have not yet been finalised.
   Bulldozer hire: $ 2,000

6. Site preparation for diamond drill hole WSP2, bulldozer hire: $ 1,000

3.2.3 Access - Grid Cutting

1. Approximately 17 km of grid line cutting will be required as a basis for further mapping, geochemical soil and geophysical surveys, of which some 10 km will be undertaken by a contractor.

2. In the Henty River Gorge 2.6 km of cutting will extend lines 9-11N and 5-7N to the western edge of the zone of prospective rocks. $ 800

3. A further 10 km of line cutting will be conducted on the Howard's Anomaly-Tyndall Mine zone, but only about 3 km of this will be contracted. $ 1,000

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4. In the Henty Fault Zone 4 km of cutting is required to permit an applied potential survey to be completed around the massive sulphide body exposed in the costean on line 49N, 1600E. $ 1,200

3.2.4 Geochemistry/Analytical Costs

While the proposed drilling programme totals 2000 m, only 900 m has been scheduled for assay: $ 4,300

Petrography (includes $ 1,000 on HR1 and 2 drill core) $ 2,400

Geochemical soil and rock sample analyses:

Howard's Anomaly	$ 1,150
Henty Gorge	$ 1,000
White Spur	$ 900
Other (unassigned)	$ 1,250
TOTAL	$ 11,000

3.2.5 Geophysics

Only restricted geophysical surveys have been scheduled for the following areas:

Gradient array I.P. - (i) Henty River gorge grid extensions	$ 2,200
- (ii) Howard's Anomaly - Tyndall Mine	$ 6,000
Applied Potential survey - Henty Fault Zone massive sulphide	$ 3,600
Ground Magnetometer Survey - Howard's Anomaly	$ 1,300
Drill hole-chargeability/resistivity logging	$ 2,000
	$15,100

An additional $ 3,000 has been allocated to cover the cost of the White Spur survey report on work conducted during 1978/79.

3.2.6 Materials

The cost of materials ($ 7,800) is based on costs incurred in 1978-79.

3.2.7 Equipment and Facilities

The estimated $6,100 is based on manpower allocation and costs incurred in 1978-79.

3.2.8 General Costs

An amount of $2,700 has been allocated to cover exploration licence renewal charges.

3.3 PRINCIPAL FEATURES OF THE SEDGWICK-DARWIN AREA, E.L. 9/66B, EXPLORATION PROGRAMME

The principal areas of activity on this section of the licence area will be the Beatrice grid, the Henty-Yolande drainage system and the Madam Howard prospect.

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3.3.1 Diamond Drilling (1050 m)

Drilling proposed for 1979-80 comprises about 29% of the estimated budget and is restricted to the western section of the Beatrice grid. Three holes have been proposed (MS4, 5 and 6, totalling 1050 m), of which two holes will test the strong chargeability responses over the apparently barren quartz feldspar porphyry mass on the north-west portion of the grid, and one hole on the northern strike extension of the low grade disseminated galena-sphalerite mineralisation, associated with the Mt. Sedgwick anomalous zone ... $63,000

3.3.2 Access

Two of the proposed drill holes lie high on the south face of Mt. Sedgwick and will require mobilisation, demobilisation and servicing by helicopter (19 hours) ... $ 8,700

Some of this helicopter hire useage may be required to assist in camp establishment and sample pick-up from the geocehmical soil-rock and mapping programme on the eastern section of the Beatrice grid.

Drill site preparation on the NW section of the grid will involve about 18 man days of contract clearing ... $1,500

Bulldozer hire costs for road maintenance and site preparation on the Mt. Sedgwick anomaly zone has been budgetted at $1,200

To facilitate access during the stream sediment-reconnaissance mapping project on the Henty-Yolande drainage system, some 10 km of contract walking track clearing has been allocated ... $3,500

TOTAL	$14,900

3.3.3 Geochemical/Analytical Costs

Drill core assay costs (500 m)	$2,100
Beatrice grid-east, geochemical soil and rock analysis	$1,500
Madam Howard grid, geochemical soil and rock analysis	$ 700
Petrography	$1,000
Henty-Yolande stream sediment-mapping project	$2,300
Mt. Sedgwick anomalous zone	$ 500
Miscellaneous other areas	$3,100
TOTAL	$11,200

3.3.4 Geophysics

The application of geophysical techniques has been confined to a brief (2 day) dipole-dipole survey to assist in drill site location and target definition, and, a 5 day gradient array and ground magnetic survey of the NW extension of the Beatrice grid. $4,000

Electrical drill hole logging $1,200

3.3.5 Materials

The estimated cost of materials ($12,100) is based on costs incurred in 1978-79.

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3.3.6 Equipment and Facilities

The budget allocation of ($9,900) is based on manpower allocation and 1978-79 costs.

3.3.7 General Costs

$6,300 has been budgetted for exploration licence renewal charges.

3.3.8 Comments

A total budget estimate of $109,000 is proposed for the Sedgwick-Darwin area. However, depending on manpower availability and budget commitments further reconnaissance work may be resumed in other areas. One such area is the Currie-Garfield zone to the west of Mt. Darwin, where an initial reconnaissance programme of contract grid cutting (11 km) is required to permit mapping and geochemical soil sampling to proceed, prior to possible I.P. coverage. This programme would require helicopter support, amounting to about 20 hours. The estimated cost of the programme is $18,000. Other projects remaining to be undertaken are summarised in the Five Year Programme 1979/80-1983/84 (Section 4 of this report).

3.4 PERIOD BUDGET COMMENTS

The budget estimates for the preceding programmes have been phased according to the cost period in which the expenditure is expected rather than when the work is scheduled.

3.4.1 Manpower Costs

The work programme is based on the availability of three full time geologists and one geologist part time (approximately 50%), three full time field assistants, two temporary field assistants (periods 7-9), a field foreman and a draftsman. Period variations in salaries and wages, and, burden charges between the two sections of E.L. 9/66 reflect assumed manpower allocations. The estimated expenditure on salaries and wages of $99,900, allows for leave entitlements covered by the burden charges.

In accordance with Section 2, Paragraph 2 of the Joint Operations Accounting Procedure, the basis of burden charges on salaries and wages is as follows:

BURDEN 1 (directly related to basic earnings; wages + Mount Lyell allowance):

	Geologist (%)	Foreman (%) Field Assistant	Draftsmen (%)	Temporary Field Assistants (%)
Annual Leave (A)	8.0	9.4	9.4	8.3
Statutory Holidays (A)	4.0	4.0	4.0	4.0
Long Service Leave (B)	1.7	1.7	1.7	-
Superannuation (B)	17.5	17.5	17.5	-
TOTAL	31.2	32.6	32.6	12.3

BURDEN 2 (directly related to total earnings):

Pay Roll Tax (A)	5.0	5.0	5.0	5.0
Workers Comp. (A)	6.9	6.9	3.0	6.9
TOTAL	11.9	11.9	8.0	11.9

(A) = Burden A;	23.9%	25.3	21.4	24.2
(B) = Burden B;	19.2%	19.2	19.2	-

3.4.2 Equipment and Facilities

An estimated $16,000 has been allocated to cover the cost of Company housing, and, vehicle fuel and servicing. Mount Lyell accommodation charges of $140 per man per period will be charged according to actual manpower allocation.

A charge of 10¢ per kilometre will be made on joint venture vehicles to cover the cost of fuel and routine servicing. Vehicle maintenance, tyres, registration and insurance costs will be direct charges under the materials cost centre.

3.4.3 Indirect Charges

An indirect charge of 6.5% is levied on the following cost centres: salaries and wages, burden charges, Mount Lyell laboratory analytical costs, materials, and equipment and facilities (in accordance with Section 2. 11A of the Joint Venture Operations Accounting Procedure).

3.4.4 Materials

As indicated previously, the estimated materials budget of $19,900 is based on costs incurred in 1978-79.

3.4.5 Detailed Cost Timetable

Mt. Tyndall Area E.L. 9/66A

Period	Cost Centre	Description	$
1	Geochemistry -	HR1 drill core assay	600
	General -	Licence renewal fees	1,300
2	Geochemistry -	HA3 and HR1 drill core assays	700
3	Geochemistry -	Henty Gorge drill core petrography	1,000
	Geophysics -	White Spur report (Scintrex)	3,000
4	Geochemistry -	Howard's Anomaly (200 soils + 50 rocks)	550
	-	Henty Gorge	250
	Access -	Helicopter hire 7 hrs.	3,200
		Howard's Anomaly track cutting 3.2 km	1,000
		Henty Gorge track cutting 2.6 km	800
		HR3 helipad-drill site (21 man days)	1,700
5	Access -	Henty Gorge drill access road 2 km	2,000
		Helicopter hire 3 hrs.	1,500
		Henty Fault Zone track cutting 4 km	1,200
	Geochemistry -	Howard's Anomaly - soil/rock	600
		HR3 drill core assays (100m)	400
	Geophysics -	Henty Gorge I.P. 3.6 km, 4 days	2,200
	Drilling -	HR3 200 m	1,200
6	Access -	Henty Gorge drill access road, 3 km	6,000
		Helicopter hire 7 hrs.	3,000
		Howard's anomaly drill site access, 2 km	2,000

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Period	Cost Centre	Description	$
6	Geochemistry -	HR3 assays, 150 m	600
		White Spur-soils	400
	Geophysics -	HR3 electrical logging	400
		Howard's Anomaly I.P., 10 km	6,000
		Howard's Anomaly magnetic survey	1,300
	Drilling -	HR3, 300 m	18,000
7	Access -	White Spur drill site preparation	1,000
	Geochemistry -	Hall's Creek - Henty Camp, soils	500
	Geophysics -	Henty Fault Zone, applied potential, 6 km	3,600
	General -	Licence renewal fees	1,400
8	Geochemistry -	HR4 assays, 100 m	400
		HR3 petrographic costs	500
	Drilling -	HR4, 200 m	12,000
9	Geochemistry -	HR4 assays, 100 m	400
		HR4 petrographic costs	400
		Miscellaneous	200
	Geophysics -	HR4 electrical logging	400
	Drilling -	HR4 250 m	15,000
		WSP2 100 m	6,000
10	Geochemistry -	WSP2 assays, 200 m	1,200
		HA4 assays, 50 m	300
	Geophysics -	Electric logging HA4, WSP2, HA5	1,200
	Drilling -	WSP2 250 m	15,000
		HA4 200 m	12,000
11	Geochemistry -	HA4 assays 100 m	500
		HA5 assays 100 m	500
	Drilling -	HA4 100 m	6,000
		HA5 300 m	18,000
12	Geochemistry -	Petrographic costs (HA and WSP2)	500
		Miscellaneous soil sampling	200
13	Geochemistry -	Miscellaneous soil sampling	300

Sedgwick-Darwin Area, E.L. 9/66B

1	Geochemistry -	HR2 drill core assays	1,500
	Drilling -	MS3 (outstanding account, 1978-79)	1,000
	General -	Exploration licence fees	2,900
2	Geochemistry -	Miscellaneous soil and rock chip samples	200
3	Geochemistry -	Sedgwick soil sampling	200
4	Geochemistry -	Madam Howard soil sampling	700
		Beatrice East soil sampling	300
5	Geochemistry -	Beatrice East soil sampling	900
6	Access -	Drill site clearing (2 sites, 18 man days)	1,500
		Bulldozer hire, road maintenance and site preparation, MS4	1,200
	Geochemistry -	MS4, assays, 100 m	400
		Miscellaneous	200
7	Access -	Helicopter hire, 7 hrs.	3,200
	Geochemistry -	MS4 assays, 100 m	400
		Sedgwick soil/rock sampling	300
	Geophysics -	NW section Beatrice grid IP survey	4,000
		MS4 electrical logging	400
	Drilling -	MS4, 350 m	21,000
	General -	Exploration licence renewal fees	3,400
8	Access -	Helicopter hire, 7 hrs.	3,200

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Period	Cost Centre	Description	$
		Henty-Yolande contract cutting of access tracks, 10 km	3,500
	Geochemistry -	M.S.5 assays, 150 m	600
	-	Henty-Yolande stream sediment samples	800
	Geophysics -	H.S.5 electrical logging	400
	Drilling -	H.S.5 350 m	21,000
9	Access -	Helicopter hire, 5 hrs.	2,300
	Geochemistry -	MS6 assays, 150 m	600
	-	Stream sediment samples	800
	Geophysics -	MS6, electrical logging	400
	Drilling -	MS6, 350 m	21,000
10	Geochemistry -	Stream sediment samples	500
	-	Petrographic costs (MS4-6)	1,000
11	Geochemistry -	Follow-up soil sampling on stream sediment anomalies	300
	-	Beatrice East soil sampling	300
12	Geochemistry -	Soil sampling	500
13	Geochemistry -	Soil sampling	500

3.5 ACCOUNTING CLASSIFICATIONS

In order to conform with Mount Lyell's internal cost reporting system and to facilitate supervision and reporting on individual joint venture areas, the following acccunting procedures and classifications have been adopted:

Area	Responsibility Number (prefix)
Mt. Tyndall E.L. 9/66A	285
Sedgwick-Darwin E.L. 9/66B	290

Cost Account Suffix No.	Cost Centre	Description
100	LABOUR	Wages - ordinary
101		Wages - overtime
105		Salaries - ordinary
106		Salaries - overtime
191	BURDEN	Includes payroll tax, annual leave, public holidays, workers' compensation, long service leave, superannuation, sick and accident fund.
120	MATERIALS	Includes field operating expenses, consumables
181	ACCESS	Includes contract services for track cutting, access road construction, site preparation, helicopter hire.
182	GEOPHYSICS	Contract services, consultants charges, equipment hire.
183	GEOCHEMISTRY	Geochemical and assay charges, consultants, petrographic and mineragraphic services.
185	DIAMOND DRILLING	Contract drilling services.
186	GENERAL COSTS	Includes Exploration Licence rentals, legal expenses etc. as set out under Section 2, para. 1.6 and 8 of the Joint Venture Operations Accounting Procedure.
187	EQUIPMENT AND FACILITIES	Includes vehicle hire, accommodation expenses.
189	CAPITAL ITEMS	Purchase of major equipment items.

TABLE 15

TIMETABLE OF PRINCIPAL FEATURES OF THE 1979/80 EXPLORATION PROGRAMME, FOR THE MOUNT TYNDALL AREA, E.L. 9/66A

138074

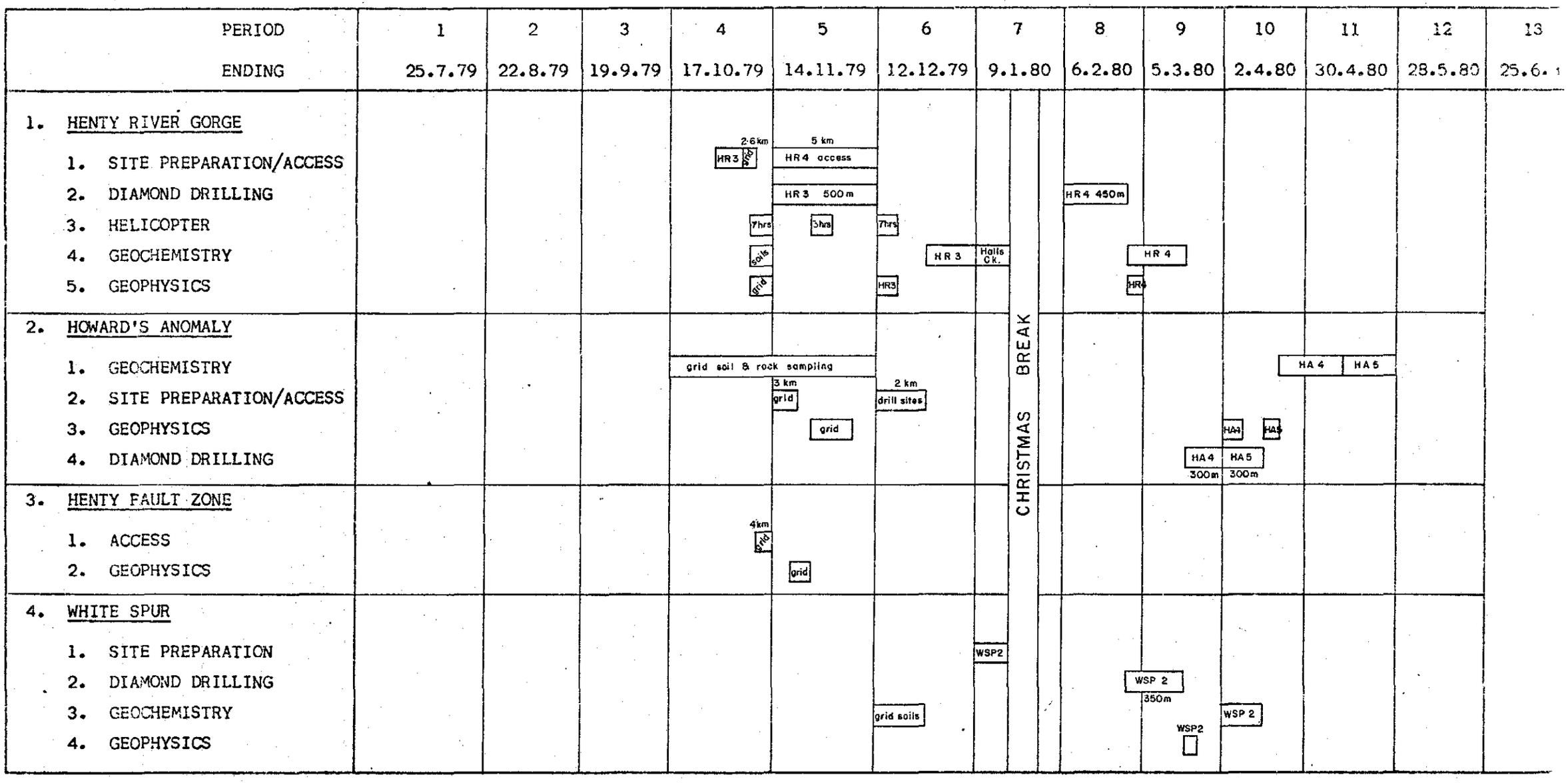

TABLE 16

TIMETABLE OF PRINCIPAL FEATURES OF THE 1979/80 EXPLORATION PROGRAMME, FOR THE SEDGWICK-DARWIN AREA, E.L. 9/66B

138075

PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	13
ENDING	25.7.79	22.8.79	19.9.79	17.10.79	14.11.79	12.12.79	9.1.80	6.2.80	5.3.80	2.4.80	30.4.80	28.5.80	25.6.80
1. BEATRICE-WEST													
1. SITE PREPARATION					MS 5,6 / MS4 dozer								
2. HELICOPTER						MS 5		MS 6					
3. GEOPHYSICS					NW	MS 4		MS5 / MS6					
4. DIAMOND DRILLING						MS4 350 m / MS 5 350m		MS 6 350m					
5. GEOCHEMISTRY							MS 4	MS5 / MS6					
2. BEATRICE-EAST													
1. GEOCHEMISTRY				grid soil & rock sampling									
3. MADAM HOWARD													
1. GEOCHEMISTRY											grid soils		
4. HENTY-YOLANDE STREAMS													
1. ACCESS								10 km tracks					
2. GEOCHEMISTRY									stream sediment sampling				

CHRISTMAS BREAK

TABLE 17

MT. TYNDALL AREA E.L. 9/66A 1979-80 BUDGET ESTIMATES

138076

COST PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL	%
ENDING	25.7.79	22.8.79	19.9.79	17.10.79	14.11.79	12.12.79	9.1.80	6.2.80	5.3.80	2.4.80	30.4.80	28.5.80	25.6.80		
1. SALARIES AND WAGES	4200	4200	2600	3400	3500	4100	2400	2800	2300	2000	1700	2100	2000	37300	15.5
2. BURDEN CHARGES	1700	1300	1100	1400	1500	1800	1000	1100	900	900	800	900	900	15300	6.4
3. ACCESS				6700	4700	11000	1000							23400	9.7
4. GEOCHEMISTRY	600	700	1000	800	1000	1000	500	900	1000	1500	1000	700	300	11000	4.6
5. GEOPHYSICS			3000		2200	7700	3600		400	1200				18100	7.5
6. DIAMOND DRILLING					12000	18000		12000	21000	27000	24000			114000	47.4
7. MATERIALS	1000	600	400	500	1000	1000	800	600	500	500	300	300	300	7800	3.2
8. EQUIPMENT AND FACILITIES	600	800	500	500	600	800	400	400	300	300	300	300	300	6100	2.5
9. GENERAL COSTS	1300						1400							2700	1.1
10. INDIRECT CHARGES	530	500	300	430	500	570	330	340	300	340	270	250	240	4900	2.1
TOTAL	9930	8100	8900	13730	27000	45970	11430	18140	26700	33740	28370	4550	4040	240600	100
COST SPLIT:															
G.O.D.L. (40%)	9930	8100	8900	13730	17000	18388	4572	7256	10680	13496	11348	1820	1616	126836	
C.G.F.A. (30%)					5000	13791	3429	5442	8010	10122	8511	1365	1212	56882	
MOUNT LYELL (30%)					5000	13791	3429	5442	8010	10122	8511	1365	1212	56882	

TABLE 18

SEDGWICK-DARWIN AREA E.L. 9/66B 1979-80 BUDGET ESTIMATES

138077

COST PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	13	TOTAL	%
ENDING	25.7.79	22.8.79	19.9.79	17.10.79	14.11.79	12.12.79	9.1.80	6.2.80	5.3.80	2.4.80	30.4.80	28.5.80	25.6.80		
1. SALARIES AND WAGES	3400	3500	4000	3400	3500	4100	3700	6400	6900	6300	5200	6200	6000	62600	28.5
2. BURDEN CHARGES	1300	1400	1700	1500	1500	1700	1600	2600	2800	2700	2200	2700	2500	26200	11.9
3. ACCESS						2700	3200	6000	2300					14200	6.5
4. GEOCHEMISTRY	1500	400	200	1000	900	600	700	1400	1400	1500	600	500	500	11200	5.1
5. GEOPHYSICS							4400	400	400					5200	2.4
6. DIAMOND DRILLING	1000						21000	21000	21000					64000	29.1
7. MATERIALS	2300	300	600	500	500	1000	1200	1400	1500	700	700	700	700	12100	5.5
8. EQUIPMENT AND FACILITIES	600	600	700	600	600	700	600	1000	900	900	900	900	900	9900	4.5
9. GENERAL COSTS	2900						3400							6300	2.9
10. INDIRECT CHARGES	590	400	470	460	450	520	500	830	880	720	620	710	690	7840	3.6
TOTAL	13590	6600	7670	7460	7450	11320	40300	41030	38080	12820	10220	11710	11290	219540	100
COST SPLIT:															
G.O.D.L. (40%)	13590	6600	7670	7460	2980	4528	16120	16412	15232	5128	4088	4684	4516	109008	
MOUNT LYELL (60%)					4470	6792	24180	24618	22848	7692	6132	7026	6774	110532	

TABLE 19

JOINT VENTURE EXPLORATION BUDGET ESTIMATES 1979-80

(E.L. 9/66 A+B)

138078

	COST PERIOD ENDING	1 25.7.79	2 22.8.79	3 19.9.79	4 17.10.79	5 14.11.79	6 12.12.79	7 9.1.80	8 6.2.80	9 5.3.80	10 2.4.80	11 30.4.80	12 28.5.80	13 25.6.80	TOTAL	%
1.	SALARIES AND WAGES	7600	7700	6600	6800	7000	8200	6100	9200	9200	8300	6900	8300	8000	99900	21.7
2.	BURDEN CHARGES	3000	2700	2800	2900	3000	3500	2600	3700	3700	3600	3000	3600	3400	41500	9.0
3.	ACCESS				6700	4700	13700	4200	6000	2300					37600	8.2
4.	GEOCHEMISTRY	2100	1100	1200	1800	1900	1600	1200	2300	2400	3000	1600	1200	800	22200	4.8
5.	GEOPHYSICS			3000		2200	7700	8000	400	800	1200				23300	5.1
6.	DIAMOND DRILLING	1000				12000	18000	21000	33000	42000	27000	24000			178000	38.7
7.	MATERIALS	3300	900	1000	1000	1500	2000	2000	2000	2000	1200	1000	1000	1000	19900	4.3
8.	EQUIPMENT AND FACILITIES	1200	1400	1200	1100	1200	1500	1000	1400	1200	1200	1200	1200	1200	16000	3.5
9.	GENERAL COSTS	4200						4800							9000	2.0
10.	INDIRECT CHARGES	1120	900	770	890	950	1090	830	1170	1180	1060	890	960	930	12740	2.7
	TOTAL	23520	14700	16570	21190	34450	57290	51730	59170	64780	46560	38590	16260	15330	460140	100
	G.O.D.L.	23520	14700	16570	21190	19980	22916	20692	23668	25912	18624	15436	6504	6132	235844	
	C.G.F.A.					5000	13791	3429	5442	8010	10122	8511	1365	1212	56882	
	MOUNT LYELL					9470	20583	27609	30060	30858	17814	14643	8391	7986	167414	

138079

TABLE 20

EXPLORATION UNIT COSTS - 1979/80 BUDGET

EXPLORATION METHOD	UNIT COST	PRODUCTIVITY
1. TRACK CUTTING		
(i) Line cutting	$300/km	700 m/crew/day
(ii) Drill site clearing	$80/man/day	9-21 man days
2. LABORATORY ANALYSES		
(i) soils	$1.50/sample	)
(ii) stream sediments	$3.00/sample	) Cu, Pb, Zn, Ag, Mn
(iii) rock chips	$4.50/sample	)
(iv) drill core	$6.00/sample	Cu, Pb, Zn, Ag, Mn, S
(v) water samples	$13.00/sample	
3. GEOPHYSICS		
(i) gradient array E.I.P.	$600/km	1 km/crew/day
(ii) drill hole logging	$400/hole	1 hole/day
(iii) ground magnetics	$130/km	3 km/operator/day
4. DIAMOND DRILLING	$60/m (direct drilling cost)	15 m/shift
5. BULLDOZING		
(i) drill sites, costeans	D7 - $30/hr	20 hrs/drill site, costean
(ii) road construction	$6,000/km-steep terrain	20 dozer days/km
	$2,000/km-flat terrain	7 dozer days/km
6. HELICOPTER		
(i) Bell Jetranger 206B	$370/hr	) complete drill rig or
(ii) Squirrel 350B	$450/hr	) camp shift 4-5 hrs.
7. PETROLOGY	$30/sample	

138080

4. FIVE YEAR EXPLORATION PROGRAMME 1979/80-83/84 (K. O. Reid)

The exploration of the Tyndall-Darwin area conducted to date principally comprises a first-pass evaluation. This phase is now well advanced in the Mt. Tyndall area (E.L. 9/66A) and only the far north eastern section (Anthony Creek area) requires reconnaissance cover. The remainder of the licence area (Sedgwick-Darwin area, E.L. 9/66B) is at a less advanced stage of exploration: several large areas are yet to be subjected to preliminary evaluation (L. Beatrice-L. Spicer, Henty-Yolande area, eastern end of Mount Lyell, Queenstown-Mt. Huxley-Garfield belt).

The 5 year programme summarised below (Table 21) assumes maintenance of similar expenditure levels to that of recent years, i.e.circa $450 000-$500 000 p.a.

TABLE 21

E.L. 9/66 FIVE YEAR EXPLORATION PROGRAMME 1979/80-1983/84

YEAR	DATA EVALUATION	RECONNAISSANCE	DETAIL	DRILLING
1979/80	Selina-Dora	Henty-Yolande R.	Howard's Anom. Beatrice East Madam Howard	Howard's Anom. Henty R. Gorge Beatrice-West White Spur
1980/81	Henty Fault Zone-Mt. Read W. Sedgwick - Basin Lake	Anthony Creek Queenstown -Mt. Huxley	Selina-Dora Henty R. North White Spur (central) Henty-Yolande River Madam Howard Garfield R.	Beatrice (E) Madam Howard Howard's Anom.
1981/82	Red Hills	L. Beatrice -L. Spicer	HFZ-Mt. Read Yolande R. E. Mt. Lyell Basin L.-Mt. Lyell	White Spur Henty R. North Beatrice (E) Clark Valley Garfield Valley
1982/83			Owen-Huxley Testing second order anomalies Application of new techniques	Selina-Dora Henty Fault Zone Yolande River Basin Lake Red Hills
1983/84				Owen-Huxley Selina-Dora West Sedgwick Basin Lake Mt. Lyell East

138081

APPENDIX

A. Howard's Anomaly - Soil Geochemical Surveys, 1968-1975

B. Howard's Anomaly - Induced Polarisation Surveys, 1962-1975

C. Howard's Anomaly - Ground Magnetic Surveys, 1967-1974

D. Howard's Anomaly - Diamond Drilling: 1968-1975

E. Howard's Anomaly - Rock Chip Geochemistry, 1978-1979

F. Henty River - Rock Chip Geochemistry

G. Henty River - Adit Sampling Results

H. Henty River - Stream Sediment Geochemistry

I. Henty River - Water Sampling Results

J. Beatrice - Rock Chip Geochemistry, 1978-79

K. Beatrice - Stream Sediment Geochemistry

L. Jukes-Darwin - Rock Chip Geochemistry, 1978-79

M. Jukes-Darwin - Stream Sediment Geochemistry, 1978-79

APPENDIX A

138082

HOWARD'S ANOMALY - SOIL GEOCHEMISTRY: 1968-1975

Line	Co-ords	Year	Horizon	Mesh	Sample Interval	Comments
10	← 5000E	1968	A &/or B-C	?	200'	All samples assayed for Cu, Pb, Zn.
12	← 4400E	1968	A &/or B-C	?	200'	
14	← 3800E	1968	A &/or B-C	?	200'	
16	← 3200E	1968	A &/or B-C	?	200'	
17	*2400W-00	1975	A, B or C	-80 & -10/+80	50'	*Co-ords on
18	← 3000E	1968	A &/or B-C	?	200'	new Geophysic
	1500W- 900E	1975	A, B or C	-80 & -10/+80	50'	Grid
19	1600W- 50W	1975	A, B or C	-80 & -10/+80	50'	
20+200S	2300W-1100W	1969	A &/or B-C?	?	100'	
20	← 1600E	1968/9	A &/or B-C	?	200'/100'	
	2200W-1200W	1975	A, B or C	-80 & -10/+80	50'	
20+200N	2300W-1100W	1969	A &/or B-C?	-80 & -10/+80	100'	
21	2800W-1200W	1975	A, B or C	-80 & -10/+80	50'	
22+200S	2100W-1300W	1969	A &/or B-C?	?	100'	
	2600W-1800W	1974	"B"	-80	50'	
22	← 1400E	1968/9	A &/or B-C	?	200'/100'	
	2600W-1800W	1974	"B"	-80	50'	
	3300W-1800W	1975	A, B or C	-80 & -10/+80	50'	
22+200N	2100W-1300W	1969	A &/or B-C?	?	100'	
	2600W-1800W	1974	"B"	-80	50'	
23	2900W-100E	1975	A, B or C	-80 & -10/+80	50'	
24	← 1200E	1968	A &/or B-C?	?	200'	
	2600W- 400E	1975	A, B or C	-80 & -10/+80	50'	
25	* 2300W- 500W	1975	A, B or C	-80 & -10/+80	50'	
26	← 800E	1968	A &/or B-C	?	200'	
28	← 3000E	1968	A &/or B-C	?	200'	
	3500W-2500W	1974?	"B"?	-80?	50'	
30	← 3600E	1968	A &/or B-C	?	200'	

← denotes "from origin to"

APPENDIX B

HOWARD'S ANOMALY - I.P. SURVEYS: 1962-1975

RTAE Grid:

Line	Co-ords.	Year	Technique	Contractor	Dipole	Comments
400S	2100W-700W	1962	Dip. - Dip.	McPhar	200'	Rio Tinto
2400S	1700W-300W	1962	Dip. - Dip.	McPhar	200'	(Rio Tinto Grid)
3600S	1700W-300W	1962	Dip. - Dip.	McPhar	200'	
4800S	1700W-1700W	1962	Dip. - Dip.	McPhar	200'	
6000S	1900W-500W	1962	Dip. - Dip.	McPhar	200'	
6400S	1550W-850W	1962	Dip. - Dip.	McPhar	100'	
	1700W-300W	1962	Dip. - Dip.	McPhar	200'	
	2050W-50E	1962	Dip. - Dip.	McPhar	300'	
7200S	1450W-750W	1962	Dip. - Dip.	McPhar	100'	
7600S	1350W-650W	1962	Dip. - Dip.	McPhar	100'	
00	2300W-900W	1962	Dip. - Dip.	McPhar	200'	
Mount Lyell Grid:						
10+200S	3300E-4050E	1967-68	Dip. - Dip.	McPhar	100'	
10		1967-68	Dip. - Dip.	McPhar	300'	
10	2400E-3900E	1967-68	Dip. - Dip.	McPhar	200'	
10	700E-2300E	1967-68	Dip. - Dip.	McPhar	200'	
	3300E-4100E	1967-68	Dip. - Dip.	McPhar	100'	
10+200N	3300E-4100E	1967-68	Dip. - Dip.	McPhar	100'	
12+300S	1950E-3200E	1967-68	Dip. - Dip.	McPhar	200'	
12+200S	2000E-2800E	1967-68	Dip. - Dip.	McPhar	100'	
12		1967-68	Dip. - Dip.	McPhar	300'	
12	1600E-2700E	1967-68	Dip. - Dip.	McPhar	200'	
12	2000E-2800E	1967-68	Dip. - Dip.	McPhar	100'	
12+200N	2050E-2800E	1967-68	Dip. - Dip.	McPhar	100'	
12+300N	1900E-2900E	1967-68	Dip. - Dip.	McPhar	200'	
14+300S	100E-2500E	1967-68	Dip. - Dip.	McPhar	300'	
14		1967-68	Dip. - Dip.	McPhar	300'	
15	*2250W-50W	1974	Grad. Array	Scintrex	100'	* New Geophysical Grid
16+200S	1900E-2550E	1967-68	Dip. - Dip.	McPhar	100'	
16+200S	300W-1050E	1967-68	Dip. - Dip.	McPhar	100'	
16+100S	1900E-2700E	1967-68	Dip. - Dip.	McPhar	100'	
16		1967-68	Dip. - Dip.	McPhar	300'	
16	300W-1100E	1967-68	Dip. - Dip.	McPhar	100'	
	300W-1500E	1967-68	Dip. - Dip.	McPhar	200'	
16	2100E-3000E	1967-68	Dip. - Dip.	McPhar	100'	
16	*1850W-50W	1974	Grad. Array	Scintrex	100'	
16	*950W (N-S)	1974	Schlumberger	Scintrex		

Line	Co-ords.	Year	Technique	Contractor	Dipole	Comments
16+100N	1950E-2650E	1967-68	Dip. - Dip.	McPhar	100'	
16+200N	1950E-2600E	1967-68	Dip. - Dip.	McPhar	100'	
16+200N	300W-1050E	1967-68	Dip. - Dip.	McPhar	100'	
17	*2050W-50W	1974	Grad. Array	Scintrex	100'	
18+200S	450W-100E	1967-68	Dip. - Dip.	McPhar	100'	
18		1967-68	Dip. - Dip.	McPhar	300'	
18	600W-1200E	1967-68	Dip. - Dip.	McPhar	200'	
18	2600W-1200W	1967-68	Dip. - Dip.	McPhar	100'	
18	600W-200E	1967-68	Dip. - Dip.	McPhar	100'	
18	*2150W-50	1974	Grad. Array	Scintrex	100'	
18	*1475W (E-W)	1974	Schlumberger	Scintrex		
18+200N	500W-50E	1967-68	Dip. - Dip.	McPhar	100'	
19	*2450W-50W	1974	Grad. Array	Scintrex	100'	
20+200S	2600W-1200W	1967-68	Dip. - Dip.	McPhar	100'	
20		1967-68	Dip. - Dip.	McPhar	300'	
20	600E-1500E	1967-68	Dip. - Dip.	McPhar	100'	
20	1500W-600W	1967-68	Dip. - Dip.	McPhar	100'	
20	2450W-50W	1974	Grad. Array	Scintrex	100'	
20+200N	2600W-1250W	1967-68	Dip. - Dip.	McPhar	100'	
21	2950W-50W	1974	Grad. Array	Scintrex	100'	
22+400S	2500W-1700W	1967-68	Dip. - Dip.	McPhar	100'	
22+200S	3450W-1250W	1967-68	Dip. - Dip.	McPhar	100'	
22+200S	2550W-1700W	1973	Grad. Array	Scintrex	100'	
22		1967-68	Dip. - Dip.	McPhar	300'	
22	3600W-400W	1967-68	Dip. - Dip.	McPhar	400'	
22	2800W-1200W	1967-68	Dip. - Dip.	McPhar	200'	
22	3700W-1100W	1967-68	Dip. - Dip.	McPhar	100'	
22	2650W-1650W	1973	Grad. Array	Scintrex	100'	
22	2950W-50W	1974	Grad. Array	Scintrex	100'	
22	1500W (E-W)	1974	Schlumberger	Scintrex		
22	2150W (E-W)	1974	Schlumberger	Scintrex		
22+200N	3550W-1050W	1967-68	Dip. - Dip.	McPhar	100'	
22+200N	2650W-1750W	1973	Grad. Array	Scintrex	100'	
22+400N	2200W-1550W	1967-68	Dip. - Dip.	McPhar	100'	
23	*3450W-50W	1974	Grad. Array	Scintrex	100'	
23	1750W (N-S)	1974	Schlumberger	Scintrex		
23	1750W (N-S)	1975	Pole - Dipole	Scintrex	100'	
24+200S	2700W-1900W	1967-68	Dip. - Dip.	McPhar	100'	
24		1967-68	Dip. - Dip.	McPhar	300'	
24	2300W-700W	1967-68	Dip. - Dip.	McPhar	200'	
24	3000W-1400W	1967-68	Dip. - Dip.	McPhar	200'	
24	2700W-1900W	1967-68	Dip. - Dip.	McPhar	100'	
24	*3300W-50W	1974	Grad. Array	Scintrex	100'	

Line	Co-ords.	Year	Technique	Contractor	Dipole	Comments
24+200N	2700W-1900W	1967-68	Dip. - Dip.	McPhar	100'	
25	*3050W-50W	1974	Grad. Array	Scintrex	100'	
26		1967-68	Dip. - Dip.	McPhar	300'	
26	*3700W-50W	1974	Grad. Array	Scintrex	100'	
28+200S	3400W-2600W	1967-68	Dip. - Dip.	McPhar	100'	
28		1967-68	Dip. - Dip.	McPhar	300'	
28	3800W-2200W	1967-68	Dip. - Dip.	McPhar	200'	
28	3400W-2600W	1967-68	Dip. - Dip.	McPhar	100'	
28	3350W-2350W	1973	Grad. Array	Scintrex	100'	
28+200N	3400W-2600W	1967-68	Dip. - Dip.	McPhar	100'	
30		1967-68	Dip. - Dip.	McPhar	300'	
30	3800W-2200W	1967-68	Dip. - Dip.	McPhar	200'	
30	3300W-2500W	1967-68	Dip. - Dip.	McPhar	100'	
30	600W-600E	1967-68	Dip. - Dip.	McPhar	200'	
30	00-800E	1967-68	Dip. - Dip.	McPhar	100'	

APPENDIX C

HOWARD'S ANOMALY - GROUND MAGNETICS: 1967-1974

Line	Co-ords	Year	Technique	Station Interval	Comments
10	See Map	1967/68	*VF	100'	*VF = Vertical Fluxgate
12+200S		1967/68	VF	100'	**PP = Proton Precession
12		1967/68	VF	100'	
12+200N		1967/68	VF	100'	
14+200S		1967/68	VF	100'	
14		1967/68	VF	100'	
14+200N		1967/68	VF	100'	
15		1974	**PP	50'	
16		1967/68	VF	100'	
16		1974	PP	50'	
17		1974	PP	50'	
18+200S		1967/68	VF	50'	
18		1967/68	VF	100'	
18		1974	PP	50'	
18+200N		1967/68	VF	50'	
19		1974	PP	50'	
20+200S		1967/68	VF	50'-100'	
20		1967/68	VF	50'-100'	
20		1974	PP	50'	
20+200N		1967/68	VF	50'-100'	
21		1974	PP	50'	
22+400S		1967/68	VF	50'-100'	
22+200S		1967/68	VF	50'-100'	
22		1967/68	VF	50'-100'	
22		1974	PP	50'	
22+200N		1967/68	VF	50'-100'	
22+400N		1967/68	VF	50'-100'	
23		1974	PP	50'	
24		1967/68	VF	100'	
24		1974	PP	50'	
25		1974	PP	50'	
26		1967/68	VF	100'	
26		1974	PP	50'	
28		-	-	-	
30		1967/68	VF	100'	

APPENDIX D

HOWARD'S ANOMALY - DIAMOND DRILLING: 1968-1975

D.D.H.	CO-ORDS.	AZM.	DECL.	T.D.	YEAR	TARGET	RESULTS
TYN. 1	Line 12, 2650E	270° (mag.)	-40°	734'	1968	Strong I.P. anomaly & adjacent Cu-Pb-Zn soil anomaly.	5% Py in black shales - explains I.P. anomaly.
H.A. 1	Line 20+200S, 1650W	250° (mag.)	-55°	450'	1971	I.P. & soil geochem. anomaly; dissem. min^{n} in trench.	Hole abandoned due to excessive flattening.
H.A.2	Line 20+200S, 1650W	250° (mag.)	-58½°	850'	1971	As above.	Several wide zones of dissem. Py in volcanics account for I.P. anomaly.
TYN. 3	Line 16, 1700W *	090° (mag.)	-60°	1200'	1975	Strong I.P. anomaly.	No significant min^{n}. Pyritic black shales account for I.P. anomaly.
H.A. 3	Line 23, 1400W *	270° (mag.)	-60°	800'	1975	Weak-mod. I.P. anomaly & non-coincident soil geochem. anomaly. Surface Mn & barite.	No significant min^{n}. I.P. anomaly unexplained (but black shales intersected 200' east of anomaly).

* Co-ordinates on 1974 grid.

APPENDIX E

ROCK CHIP ANALYSES, HOWARD'S ANOMALY - 1978/79

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe%	Co ppm	Ba ppm	Au g/t	Location	Lithology
[illegible]01	70	3200	860	2	180					Tyndall adit trench	Xtal lithic tuff
30702	120	1150	230	2	330					Tyndall adit trench	Xtal tuff
30703	75	4800	160	2	160					Tyndall adit trench	Xtal lithic tuff
30704	120	400	280	2	6000					Pit near adit	Ironstone in sheared tuff
30705	1.92%	2.65%	1100	165	230				<0.1	Tyndall mine trench	Mineralised quartz
30706	0.75%	1.75%	18.0%	32	180				<0.1	Tyndall mine trench	Mineralised quartz
30707	190	9.0%	30	130	140				<0.1	Sth Tyndall mine	Mineralised quartz
30708	4.0%	2700	2500	330	90				<0.1	Sth Tyndall mine	Mineralised quartz
30709	100	30	20	<2	40					Sth Tyndall mine	Quartz with chlorite
30710	70	570	120	<2	150					Sth Tyndall mine	Lithic xtal tuff
30711	2.0%	8.6%	2.4%	160	30					Tyndall mine trench	Mineralised quartz
30712	80	120	470	<2	15700					Line 30N pit	Andesite + quartz pyrite siderite
30713	100	370	600	2	10000					Line 30N pit	Andesite + quartz pyrite siderite
30714	130	890	600	3	13000					Line 30N pit	Andesite + quartz pyrite siderite
[illegible]15	100	840	540	<2	9200					Line 30N pit	Andesite + quartz pyrite siderite
30716	700	1150	210	11	760					20 m NNW of pit	Silicified sheared andesite
30717	80	250	210	<2	680					90 m SE of pit	Sheared andesite
30718	70	380	600	2	1300					60 m NW of pit	Andesite
30719	380	3150	2200	0.7	40.0%	12.7%		1300		L20 + 200 N pits	Hematite, Mn
30720	190	300	30	26	2400	10.4%		5200		L20 + 200 N pits	Hematite + barite
30721	560	9100	2800	5	25.0%	26.0%		3.4%		L20 + 200 N pits	Mn - hematite
30722	70	120	60	<2	500	3.16%		1700		20 m S. Tyndall adit	Grey shale + py.
30723	60	100	110	<2	2900	5.0%		7000		Ck N of Tyndall adit	Xtal lithic tuff
30724	60	60	20	<2	4200	44.0%		100		Tyndall mine trench	Ironstone
30725*	100	2050	70	<2	6400	12.4%	25			Om above Tyndall adit	Soil - A horizon
30726*	230	430	95	<2	3800	16.4%	30			Om above Tyndall adit	Soil - B-C horizon
30727*	140	220	56	<2	700	9.4%	20			2m WSW adit mouth	Soil - C horizon
30728*	16	40	72	<2	2700	9.0%	55			4m WSW adit mouth	Soil - B-C horizon
30729*	13	450	23	<2	410	2.2%	<5			6m WSW adit mouth	Soil - A horizon
[illegible]30*	14	35	36	<2	1150	5.5%	10			6m WSW adit mouth	Soil - B-C horizon
[illegible]31*	10	30	17	<2	160	3.5%	<5			8m WSW adit mouth	Soil - B-C horizon
30732*	<5	10	9	<2	40	1.7	<5			10m WSW adit mouth	Soil - A-C horizon
30733*	8	20	7	<2	30	0.41	<5			12m WSW adit mouth	Soil - A horizon
30734*	7	20	26	<2	110	3.9%	<5			12m WSW adit mouth	Soil - C horizon

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mn ppm	Fe%	Co ppm	Ba ppm	Au ppm	Location	Lithology
30735*	6	10	11	<2	40	3.0	<5			14 m WSW adit mouth	Soil - C horizon
30736*	<5	30	27	<2	200	3.4	<5			16 m WSW adit mouth	Soil - C horizon
30737*	7	30	13	<2	60	1.0	<5			18 m WSW adit mouth	Soil - A horizon
[redacted]8*	<5	20	18	<2	100	2.4	<5			18 m WSW adit mouth	Soil - C horizon
30739*	7	40	43	<2	240	3.0	10			20 m WSW adit mouth	Soil - C horizon
30725**	63	1700	19	<2	2000	1.1	5			as above	as above
30726**	127	320	24	<2	900	1.05	5				
30727**	46	170	<5	<2	140	0.57	<5				
30728**	10	20	13	<2	730	2.1	20				
30729**	12	420	12	<2	350	0.58	<5				
30730**	<5	20	<5	<2	280	1.2	<5				
30731**	6	25	<5	<2	30	1.1	<5				
30732**	<5	<10	<5	<2	10	0.78	<5				
30733**	7	20	<5	<2	10	0.06	<5				
30734**	<5	<10	<5	<2	10	0.58	<5				
30735**	<5	<10	<5	<2	10	0.54	<5				
30736**	<5	<10	<5	<2	40	0.53	<5				
30737**	<5	25	<5	<2	20	0.14	<5				
30738**	<5	<10	<5	<2	10	0.23	<5				
30739**	<5	25	<5	<2	10	0.46	<5				

(1) Acid extractable, does not include barite.

* Hot acid extraction.

** Cold acid extraction.

APPENDIX F

HENTY RIVER - ROCK CHIP GEOCHEMISTRY

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Mn ppm	Au g/t	S%	Location	Lithology
24114 X	28	10	25	<2	112			1S/2150E	m.g. felsic tuff
24115	43	11	38	<2	174			1S/2400E	m.g. andesitic tuff
24116 X	22	69	162	<2	3750			1S/2550E	f.g. andesite lava
24117 X	82	38	175	<2	330			1S/2920E	Grey siltstone/shale
24118 X	15	14	105	<2	275			1S/3000E	Purple tuffaceous shale
24119	27	12	41	<2	115			1S/3620E	Felsic vitric tuff
24120	17	8	68	<2	250			1S/3750E	m.g. felsic tuff
24121	18	7	15	<2	30			00/2050E	m.g. felsic tuff
24122	97	25	240	<2	1080			00/2200E	f.g. andesite lava
24123 X	15	10	250	<2	390			00/2700E	Porph. andesite lava
24124 X	116	15	175	<2	1230			00/3000E	m.g. andesitic tuff
24125 X	11	4	60	<2	390			00/3600E	m.g. felsic tuff
24126 X	14	7	72	<2	425			00/3650E	m.g. felsic tuff
24127	90	120	86	<2	225			00/4000E	Black shale
24128	16	5	24	<2	60			00/4050E	f.g. and m.g. felsic tuff
24129	43	260	88	<2	590			1N/2750E	f.g. andesite lava
24130	14	28	55	<2	355			1N/3800E	m.g. felsic tuff
24131 X	8	17	41	<2	120			2N/2100E	f.g. felsic tuff
24132	12	4	48	<2	260			2N/2130E	f.g. felsic tuff
24133 X	10	3	53	<2	290			2N/2300E	m.g. felsic tuff
24134 X	21	26	300	<2	1500			2N/2600E	f.g. andesite lava
24135	11	5	11	<2	235			2N/4800E	Quartz-felsp. porphyry
24136 X	32	15	480	<2	2300			3N/2820E	m.g. porph. andesite
24137	16	7	22	<2	700			3N/3660E	Felsic vitric tuff
24138	27	41	270	<2	1670			4N/2000E	f.g. andesite lava
24139	70	28	390	<2	1300			4N/2400E	m.g. andesitic tuff
24140	18	11	19	<2	770			4N/3350E	Felsic vitric tuff
24141	11	8	37	<2	125			4N/3600E	m.g. felsic tuff
24142 X	10	5	38	<2	130			4N/3750E	m.g. felsic tuff
24143	12	4	7	<2	5			4N/4000E	Grey tuffaceous shale
24144	9	7	14	<2	34			4N/4070E	f.g. felsic tuff
24153	85	270	245	0.1f	610	0.1f		4N/2600E	Grey tuffaceous shale
24154	180	2750	2650	3f	1750	0.1f		outside No.1 adit	Green tuffaceous shale
24155	290	4.10%	2.00%	40f	880	0.1f		100'N of 4N/2550E	Green shale + Gn - Sp
24156	240	0.68%	1.31%	6f	480	0.1f		4N/2600E	c.g. andesitic tuff + Py
24162	75	40	72	<2	1400			13N/2050E	Porph. andesite lava
24163 X	115	125	2250	3	6000			13N/2200E	m.g. andesitic tuff

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Mn ppm	Au g/t	S%	Location	Lithology
24164 X	65	45	205	<2	830			13N/2275E	Porph. andesite lava
24165	60	55	205	<2	580			13N/2315E	Grey tuffaceous shale
[illegible]166	40	30	110	<2	480			13N/2350E	Grey tuffaceous shale
24167	25	30	140	<2	950			WT8N/1625E	Purple tuffaceous shale
24168 X	110	30	205	<2	1150			WT8N/1670E	f.g. andesitic tuff
24169	35	30	115	<2	1150			WT8N/1685E	Purple tuffaceous shale
24170	35	25	110	<2	1070			WT8N/1750E	Purple tuffaceous shale
24172	350	16	85	<2	440			13N/2887E	Grey tuffaceous siltstone
24173 x	275	33	103	<2	830			8N/2375E	Microdolerite
24174 X	230	720	5250	<2	1900			8N/2587E	f.g. andesite
24175	215	380	520	<2	5700			8N/2615E	f.g. andesitic tuff
24176	150	110	515	2	3600			8N/2645E	m.g. andesitic tuff
24177	245	56	100	<2	760			8N/2675E	Porph. andesite lava
24178	165	19	60	<2	680			8N/2862E	Purple tuffaceous shale
24180	155	15	245	<2	940			5N/2975E	f.g. andesitic tuff + Gn
24181	360	70	260	<2	1360			5N/2975E	f.g. andesitic tuff
24182	240	30	390	<2	2160			5N/2975E	f.g. andesitic tuff + Gn
24183	125	15	350	<2	1350			5N/2687E	Porph. andesite lava
24184	60	10	120	<2	1770			6N/2970E	Purple tuffaceous silstone
[illegible]185	240	10	130	<2	1470			6N/2940E	f.g. andesitic tuff
24186	140	230	600	<2	1950			6N/2900E	m.g. andesitic tuff
24187	120	175	480	<2	880			6N/2837E	m.g. andesitic tuff
24188	125	1300	370	<2	550			6N/2825E	m.g. andesitic tuff
24189	65	40	185	<2	1630			7N/2970E	f.g. andesitic tuff
24190	90	25	130	<2	1340			7N/2955E	Purple tuffaceous silstone
24191	80	30	95	<2	3400			7N/2945E	Purple tuffaceous silstone
24196	5	<10	25	<2	700			16S/3635E	f.g. felsic tuff
24197	8	<10	20	<2	300			3S/2987E	f.g. felsic tuff
24198	8	<10	75	<2	630			1050S/3000E	m.g. felsic tuff
24199 X+	35	<10	70	<2	450			850S/3000E	Serp. ultrabasic
24301	31	<10	300	<2	1300			790S/3000E	m.g. felsic tuff
24302	2	<10	55	<2	160			525S/3000E	Felsic vitric tuff
24303 X	9	<10	110	<2	1030			380S/3000E	Porphyritic andesite
24304	45	20	170	<2	1140			9N/2670E	Grey tuffaceous shale
24305	15	<10	125	<2	1230			9N/2800E	Purple tuffaceous shale
24306	8	<10	50	<2	400			9N/2865E	Purple tuffaceous shale
[illegible]307 X	25	30	320	<2	2200			10N/2520E	m.g. porph. andesite
24308	20	10	75	<2	1000			10N/2700E	Purple tuffaceous silstone
24309	24	20	100	<2	1040			10N/2785E	Purple tuffaceous silstone
24310	3	<10	90	<2	1350			11N/2975E	Purple tuffaceous silstone
24311	0	<10	65	<2	150			11N/2965E	Purple tuffaceous silstone
24312	8	50	130	<2	740			11N/2775E	f.g. andesite lava + He

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Mn ppm	Au g/t	S%	Location	Lithology
24313	12	10	120	<2	840			11N/2775E	f.g. andesite lava + He
24314	5	10	80	<2	930			11N/2725E	Purple tuffaceous siltst.
24315	80	20	120	<2	780			11N/2712E	f.g. andesite lava
24316 X	70	30	130	<2	1100			11N/2612E	green tuffaceous shale
24317	7	<10	70	<2	600			12N/3000E	Conglomerate
24318	105	20	160	<2	830			12N/2480E	Grey tuffaceous shale
24319	95	3.80%	1.60%	35	600	<0.1f	0.6	) mineralised	Green shale + Gn, Sp
24320	140	4.60%	1.95%	29	600	<0.1f	0.6	) outcrops near	Green shale + Gn, Sp
24321	45	3.50%	3.45%	32	1600	<0.1f	1.2	) 420N/2550E	f.g. andesite + Gn, Sp
24322	40	3.40%	3.60%	31	1700	<0.1f	1.2	)	f.g. andesite + Gn, Sp
24323	80	0.36%	2.65%	3	1400	<0.1f	1.0	)	Green shale + Gn, Sp
24324 X	20	0.92%	4.30%	9	1200	<0.1f	1.0	4N/2600E	m.g. andesitic tuff +Gn, Sp
24336	25	20	50	<2	300			1750S/3000E	Felsic vitric tuff
24337 X	20	30	180	<2	800			1710S/3000E	Felsic vitric tuff + Py
24338	20	20	80	<2	380			1630S/3000E	Felsic vitric tuff + Py
24339 X	25	30	160	<2	580			1585S/3000E	m.g. felsic tuff
24340	25	10	50	<2	470			1580S/3000E	Felsic vitric tuff
24341	25	20	120	<2	550			1560S/3000E	m.g. felsic tuff
24342	15	30	70	<2	880			1050S/3000E	m.g. felsic tuff
24343	25	30	160	<2	1300			830S/3000E	Felsic vitric tuff
24344	25	40	220	<2	1900			790S/3000E	m.g. felsic tuff
24345	10	10	70	<2	1450			520S/3000E	Felsic vitric tuff
24346	20	30	180	<2	1750			380S/3000E	Porphyritic andesite
24347	40	300	1040	<2	2100			5N/2825E	Felsic vitric tuff
24348 X+	150	180	450	<2	1400			530N/2825E	Microdolerite
24349	30	0.97%	930	3	1950			5N/2837E	Grey tuffaceous shale
24350 +	40	230	100	<2	810			4S/2725E	Dolerite
24351	15	140	60	<2	210			4S/2973E	m.g. felsic tuff
24352 X+	30	40	500	<2	1500			5S/2625E	Dolerite
24353	10	10	20	<2	90			5S/2687E	Felsic vitric tuff
24354	70	<10	70	<2	220			5S/3000E	Felsic vitric tuff
24355	30	20	120	<2	1100			6S/2665E	m.g. felsic tuff
24356	60	10	440	<2	1350			6S/2740E	m.g. felsic tuff
24357 X	15	20	140	<2	1000			6S/2885E	m.g. andesitic tuff
24358	70	20	20	<2	650			6S/3727E	m.g. felsic tuff + Py
24359	15	20	<10	<2	490			6S/3727E	Felsic vitric tuff
24360	10	10	270	<2	1000			8S/2945E	m.g. felsic tuff
24361 X	20	20	150	<2	400			12S/2460E	Grey tuffaceous shale
24362 X	20	40	140	<2	610			12S/2535E	m.g. andesitic tuff
24363 X	10	20	60	<2	320			12S/2660E	m.g. felsic tuff
24364 X	10	30	80	<2	2400			14S/2510E	f.g. andesitic tuff

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Mn ppm	Au g/t	S%	Location	Lithology
24365	10	20	120	<2	1000			16S/2660E	f.g. andesitic tuff
24366	5	<10	<10	<2	90			16S/2880E	Felsic vitric tuff
24367	20	0.46%	0.15%	17	1400			080N/3000E	Green tuffaceous shales
24373 X	80	30	150	<2	1550			250N/3000E	m.g. andesitic tuff
24374	50	20	100	<2	1300			290N/3000E	Purple tuffaceous shale
24375 X	150	30	750	<2	1150			360N/3000E	f.g. felsic tuff
24376	80	30	180	<2	1350			5N/3000E	m.g. felsic tuff + Py
24377	60	<10	20	<2	650			520N/3000E	Felsic vitric tuff + Py
24378	110	20	170	<2	2000			660N/3000E	f.g. felsic tuff
24379	30	20	90	<2	430			1205N/3000E	Brecciated shale
24380	80	<10	30	<2	460			420N/3200E	Felsic vitric tuff
24381	80	150	150	<2	4300			150N/3200E	Purple tuffaceous shale
24382	40	60	70	<2	2000			080N/3025E	Grey tuffaceous silstone
24383	200	840	560	<2	3200			060N/3200E	f.g. felsic-tuff
24384	50	4.00%	2.75%	15	2000	<0.1f	1.8%	060N/3200E	Altered shales + Gn, Sp
24385	320	140	190	<2	1100			060N/3200E	Felsic vitric-tuff
24386	80	500	250	<2	1600			020N/3200E	Felsic tuff
24387 X	160	100	120	<2	1500			000N/3200E	m.g. felsic tuff
24388	40	30	110	<2	1600			025S/3200E	Purple tuffaceous siltstone
24389	30	30	40	<2	1700			1S/3200E	m.g. felsic tuff
								CREEK 24206	
24390	130	120	540	<2	600			0'-30'	Grey tuffaceous shales
24391	105	70	780	<2	3400			30'-60'	Grey tuffaceous shales
24392	115	190	840	<2	1750			60'-90'	Grey tuffaceous shales
24393	110	170	880	<2	1550			90'-120'	f.g. andesitic tuff
24394	140	60	640	<2	1800			120'-150'	f.g. andesitic tuff
24395	115	50	530	<2	1480			150'-180'	f.g. and m.g. andesitic-tuff
24396 X	85	120	620	<2	2050			180'-210'	f.g. and m.g. andesitic-tuff
24397	50	50	280	<2	2500			210'-240'	f.g. and m.g. andesitic tuff
24398	90	800	85	<2	1200			240'-270'	f.g. and m.g. andesitic tuff
24399 X	100	420	85	<2	1000			270'-300'	f.g. and c.g. andesites +Gn,Sp
24400	65	700	480	<2	850			300'-330'	f.g. and m.g. andesitic tuff
24401 X	80	120	280	<2	1000			330'-360'	f.g. and m.g. andesitic tuff
24402	70	80	150	<2	730			360'-390'	f.g. andesitic tuff
24403	40	60	140	<2	1000			390'-420'	f.g. andesitic tuff
24404	75	90	560	<2	1950			420'-450'	f.g. and m.g. andesitic tuff
24406	30	<10	45	<2	100			460S,3000E	Felsic vitric tuff
24407	110	<10	30	<2	800			330S,3200E	Felsic vitric tuff
24408	40	<10	25	<2	560			250S,3200E	Felsic vitric tuff
24409	40	<10	30	<2	620			2N,5500E	Felsic vitric tuff
24410 X	25	<10	25	<2	840			2N,5300E	m.g. felsic tuff

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Mn ppm	Au g/t	S%	Location	Lithology
24411 X	20	<10	10	<2	100			2N,5015E	Quartz-felsp. porphyry
24412	20	<10	10	<2	1160			2N,4800E	Quartz-felsp. porphyry
24413	25	<10	<10	<2	170			2N,4685E	Felsic agglomerate
24414	40	<10	<10	<2	170			2N,4600E	Felsic agglomerate
24415	30	<10	<10	<2	300			2N,4600E	Felsic agglomerate
24416)	35	<10	30	<2	1600			2N,4600E	Felsic agglomerate
24417X)								2N,4500E	m.g. felsic tuff + Py
24418	45	<10	80	<2	900			2N,4450E	m.g. andesitic tuff
24419	40	40	25	<2	90			2N,4400E	Agglomerate + shale
24420	15	<10	<10	<2	70			2N,4100E	f.g. felsic tuff
24421	45	370	360	<2	1100			020N,3200E	m.g. felsic tuff
24422	40	170	55	<2	1150			006N,3200E	m.g. felsic tuff
24423 X	32	0.45%	125	<2	1170			004N,3200E	m.g. felsic tuff + Gn
24424	40	40	15	<2	1230			080S,3200E	m.g. felsic tuff
24425	32	10	30	<2	1450			2S,3200E	Felsic vitric tuff
24426	32	<10	13	<2	820			210S,3200E	Felsic vitric tuff
24427	79	<10	26	<2	1360			211S,3200E	Felsic vitric tuff
24428	33	<10	21	<2	2520			245S,3175E	Felsic tuff + Py
24429	23	<10	142	<2	560			2N,3175E	Purple tuffaceous shale
24430 X	176	<10	180	<2	1810			220N,3175E	f.g. andesite
24431	52	<10	182	<2	1700			220N,3180E	Felsic vitric tuff
24432	195	<10	193	<2	1800			250N,3180E	f.g. felsic tuff + Py
24433	63	<10	30	<2	1880			270N,3200E	m.g. felsic tuff
24434	24	<10	25	<2	990			380N,3180E	Felsic vitric tuff
24435	64	<10	74	<2	1720			390N,3325E	Grey tuffaceous shale
24436	21	<10	23	<2	1790			390N,3330E	Felsic vitric tuff
24437	1050	<10	21	<2	190			420N,3180E	Felsic vitric tuff + Py
24438	470	<10	30	<2	460			420N,3160E	Felsic vitric tuff + Py
24439	46	<10	21	<2	680			420N,3140E	Felsic vitric tuff
24440	35	<10	22	<2	1380			430N,3160E	Felsic vitric tuff
24441	24	<10	13	<2	800			510N,3200E	Felsic vitric tuff
24442	26	<10	18	<2	1680			560N,3200E	Felsic vitric tuff + Py
24443	20	<10	22	<2	620			580N,3200E	Felsic vitric tuff
24444	22	<10	90	<2	550			510N,3010E	Felsic vitric tuff + Py
24445	22	<10	225	<2	2000			510N,3000E	Felsic vitric tuff + Py
24446	55	<10	53	<2	1500			590N,3000E	Felsic tuff
24447	120	<10	118	<2	4650			650N,3000E	f.g. felsic tuff + Py
24448 X	170	<10	196	<2	2080			670N,3000E	f.g. andesitic tuff + Gn, Sp
24449	405	<10	140	<2	1230			680N,3000E	f.g. andesitic tuff + Gn, Sp
24450	21	<10	133	<2	730			675N,2950E	Purple tuffaceous siltstone
24451	10	<10	100	<2	1390			430N,3200E	Purple tuffaceous shale

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Mn ppm	Au g/t	S%	Location	Lithology
24452 X	143	<10	560	< 2	1450			360N,3000E	f.g. felsic tuff
24453 X	14	<10	170	< 2	650			250N,3000E	m.g. andesitic tuff
24454 X	17	0.39%	70	< 2	370			Creek 24206-293'	Porph. andesite + Gn, Sp

NOTES: 1. 24448 X indicates petrology sample.

2. f indicates analysis by fire assay.

3. Blank indicates element not assayed.

4. + indicates cobalt and nickel determinations:

	Co (ppm)	Ni (ppm)
24199	15	17
24348	41	29
24350	24	39
24352	25	20

APPENDIX G

HENTY RIVER ADIT SAMPLING

ADIT	WALL	INTERVAL	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Mn ppm	Au g/t
No. 1	NORTH	0'-5'	490	2.75%	3.45%	33	500	<0.1
		5'-10'	280	0.23%	0.38%	3.7	2500	<0.1
		10'-15'	60	430	1080	1.2	1900	<0.1
		15'-20'	40	2.62%	2.33%	12	1300	<0.1
		20' AVERAGE	217	1.41%	1.57%	12.5	1500	<0.1
No. 1	SOUTH	0'-5'	70	8.80%	1.67%	32	1200	<0.1
		5'-10'	320	5.50%	2.15%	25	1000	<0.1
		10'-15'	60	950	1400	2.1	1900	<0.1
		15'-20'	50	3.05%	2.68%	14	1700	<0.1
		20' AVERAGE	125	4.36%	1.66%	18.3	1400	<0.1
No. 2	NORTH	0'-5'	60	0.23%	0.10%	<2	1100	n.d.
		5'-10'	170	0.60%	0.60%	3	2500	n.d.
		10'-15'	210	1.90%	0.32%	17	1450	n.d.
		15'-16'6"	250	0.10%	0.28%	4	2350	n.d.
		16'6" AVERAGE	156	0.84%	0.33%	6.0	1400	n.d.
No. 2	SOUTH	3'-5'	90	0.195%	0.105%	2	800	n.d.
		5'-10'	60	0.215%	0.128%	<2	1200	n.d.
		10'-15'	100	0.48%	2.20%	2	3000	n.d.
		15'-16'6"	440	0.26%	1.80%	7	1950	n.d.
		14'6" AVERAGE	122	0.32%	1.07%	2.7	1900	n.d.
No. 3	NORTH	0'-5'	120	600	1150	<2	1300	n.d.
		5'-10'	180	940	1220	<2	500	n.d.
		10'-15'	90	1140	840	2	1550	n.d.
		15'-20'	85	160	970	2	1300	n.d.
		20'-25'	130	325	610	2	1650	n.d.
		25'-30'	80	170	440	<2	1420	n.d.
		30'-33'	75	150	310	<2	1150	n.d.
		33' AVERAGE	111	518	821	<2	1300	n.d.

ADIT	WALL	INTERVAL	Cu ppm	Pb ppm	Zn ppm	Ag g/t	Mn ppm	Au g/t
No. 3	SOUTH	5'-10'	195	1300	1760	<2	1000	n.d.
		10'-15'	150	600	950	<2	2300	n.d.
		15'-20'	75	120	1300	<2	1130	n.d.
		20'-25'	150	240	520	2	1400	n.d.
		25'-30'	90	50	270	<2	970	n.d.
		30'-33'	115	165	260	<2	1230	n.d.
		28' AVERAGE	130	430	885	<2	1300	n.d.
6S/3875E	NORTH	-7m to -5m	45	<10	15	<2	60	n.d.
		-5m to 0m	25	<10	15	<2	70	n.d.
		0-5m	60	<10	20	<2	100	n.d.
		5-10m	40	<10	25	<2	130	n.d.
		10-15m	75	<10	15	<2	240	n.d.
		15-20m	25	<10	15	<2	420	n.d.
		20-25m	30	<10	15	<2	630	n.d.
		25-30m	25	<10	15	<2	1300	n.d.
		30-32m	30	<10	15	<2	820	n.d.
Quartz veins at 32 m			20	<10	10	<2	940	< 0.1

N.B. No. 1 adit Ag determinations by fire assay, all others by acid digestion/A.A.S.

APPENDIX H

HENTY RIVER - STREAM SEDIMENT GEOCHEMISTRY

G15

		-80 fraction, Total digestion						-80 fraction, Cold digestion					
	SAMPLE NO.	Cu ppm	Pb ppm	Zn ppm	Mn ppm	Fe %	Co ppm	Cu ppm	Pb ppm	Zn ppm	Mn ppm	Fe %	Co ppm
31	24201	30	35	95	400	1.20	6	9	25	30	210	0.14	<5
30	24202	20	25	50	330	1.60	8	8	20	21	190	0.17	<5
29	24203	30	25	90	350	1.85	6	5	15	14	140	0.09	<5
827	24204	50	55	170	1300	3.30	18	6	35	37	640	0.29	7
822	24205	30	40	140	550	1.85	9	5	30	53	280	0.15	<5
818	24206	30	140	360	1500	2.70	17	9	90	175	970	0.28	11
23813	24207	20	69	135	1480	2.70	20	6	54	48	720	0.23	5
816	24208	21	78	176	3.70%	6.80	65	12	17	111	1.00%	1.52	17
817	24209	14	47	110	1.70%	2.10	25	10	18	76	0.62%	0.38	8
820	24210	13	43	85	750	1.70	9	7	41	41	0.55%	0.23	3
821	24211	13	135	71	0.92%	2.70	32	6	110	50	3500	0.37	11
823	24212	18	62	120	0.61%	2.50	25	14	63	92	4100	0.70	14
824	24213	13	50	95	0.46%	3.20	20	8	35	52	2300	0.53	8
825	24214	11	49	98	1700	1.70	14	7	61	75	1500	0.62	11
826	24215	10	41	65	3200	1.80	15	6	45	56	2400	0.44	10
828	24216	17	43	68	2500	2.20	17	6	40	46	1800	0.50	10
832	24217	3	12	17	80	0.73	3	1	12	5	20	0.16	1
33	24218	7	41	49	2800	2.00	12	3	38	26	1500	0.36	7
34	24219	9	30	53	0.70%	2.60	16	7	25	34	3500	0.56	7
35	24220	4	18	47	1100	1.40	8	5	25	29	740	0.30	4
36	24221	4	33	32	900	1.25	6	5	36	16	640	0.23	4
38	24222	9	37	66	2600	2.60	20	2	40	39	1500	0.60	9
39	24223	9	43	69	1800	1.55	10	4	42	44	1200	0.35	6
40	24224	6	19	54	260	0.84	4	3	25	39	250	0.13	3
45	24225	24	30	143	800	3.70	32	9	34	35	430	0.22	9
44	24226	15	33	124	1000	3.50	36	6	31	34	570	0.31	10
43	24227	22	35	135	1000	4.40	30	7	33	34	720	0.30	12
37	24228	29	28	100	650	3.10	15	7	26	39	450	0.26	7
41	24229	10	30	97	1350	1.40	7	9	30	60	1000	0.32	<5
23908	24230	4	14	41	220	0.75	5	1	16	28	140	0.14	2
42	24231	20	30	147	930	3.90	32	7	24	45	500	0.28	7
819	24232	42	160	250	3300	4.25	50	11	110	145	1070	0.38	12
23814	24233	55	430	450	0.90%	6.70	100	13	110	60	1100	0.35	8
15	24234	60	2700	2150	0.62%	5.30	70	30	1900	1200	1500	0.34	12

APPENDIX H (Contd)

	Hand-picked Mn pebbles, Hydrax/HCl						-20+80 fraction, Hydrax/HCl					
SAMPLE NO.	Cu ppm	Pb ppm	Zn ppm	Mn ppm	Fe ppm	Co ppm	Cu ppm	Pb ppm	Zn ppm	Mn ppm	Fe ppm	Co ppm
24201	0.05	0.40	1.04	78	7.3	0.57	0.05	0.21	0.52	15	2.7	0.11
24202	0.10	0.33	0.51	18	4.1	0.28	0.04	0.13	0.57	14	3.0	0.20
24203	0.12	0.69	0.62	19	8.1	0.58	0.04	0.11	0.69	15	2.5	0.13
24204	0.05	0.30	0.77	67	8.1	0.59	0.02	0.10	0.48	19	4.0	0.19
24205	0.04	0.39	2.00	161	9.7	0.73	0.03	0.15	0.61	17	2.0	0.11
24206	0.06	3.70	5.80	105	9.1	0.59	0.02	0.31	2.85	46	3.1	0.28
24207	0.14	1.40	2.84	103	18.5	0.74	0.09	0.84	1.31	47.0	14.4	0.40
24208	0.08	1.06	2.89	481	26.5	0.45	0.00	0.10	1.56	1000	30.5	0.95
24209	0.00	0.16	1.53	1620	13.3	0.62	0.00	0.05	1.46	960	10.0	0.36
24210	0.02	1.48	1.86	108	20.0	0.55	0.01	0.36	1.08	34.1	9.5	0.16
24211	0.11	1.90	0.57	314	36.0	0.97	0.04	1.25	0.27	133	30.0	0.46
24212	0.04	0.31	1.05	170	14.5	0.38	0.02	0.09	1.07	135	11.6	0.32
24213	0.06	0.26	1.12	88.1	9.1	0.14	0.01	0.10	1.18	148	17.5	0.33
24214	0.04	0.76	3.45	159	17.3	0.83	0.02	0.15	1.27	46.5	16.0	0.25
24215	0.08	0.34	0.76	310	27.0	0.74	0.03	0.17	0.69	73.8	9.5	0.25
24216	0.13	0.49	0.57	93.8	17.5	0.42	0.04	0.23	0.45	41.6	15.0	0.23
24217	0.03	0.32	0.07	1.4	48.0	0.02	0.03	0.22	0.12	2.1	33.0	0.03
24218	0.06	0.40	0.68	107	15.0	0.39	0.02	0.20	0.44	43.6	11.3	0.17
24219	0.09	0.27	1.65	461	47.0	0.55	0.03	0.11	1.02	294	30.0	0.38
24220	0.10	0.41	2.97	271	40.0	1.08	0.03	0.15	1.11	50.4	17.0	0.30
24221	0.05	0.96	0.99	167	24.0	0.58	0.02	0.43	0.42	35.6	11.5	0.15
24222	0.05	0.52	3.67	655	62.0	2.35	0.02	0.12	0.58	58.0	17.5	0.33
24223	0.06	0.65	1.40	123	17.5	0.54	0.02	0.23	0.80	45.1	11.0	0.22
24224	0.08	0.33	0.94	39.6	4.4	0.22	0.00	0.11	0.75	11.4	4.8	0.09
24225	0.11	0.17	0.55	92.8	8.7	0.45	0.04	0.20	0.53	18.2	6.5	0.32
24226	0.03	0.29	0.76	66.0	12.0	0.68	0.03	0.22	0.54	33.6	10.7	0.57
24227	0.07	0.38	0.73	52.7	14.0	0.67	0.04	0.13	0.68	26.9	10.5	0.45
24228	0.03	0.19	0.60	24.2	6.7	0.25	0.02	0.09	0.63	18.9	9.0	0.21
24229							0.00	0.06	1.40	75.0	5.0	0.18
24230	0.09	0.47	0.76	114	36.0	0.67	0.04	0.03	0.51	4.1	9.5	0.06
24231	0.05	0.17	0.57	40.5	7.8	0.33	0.05	0.09	0.62	26.7	8.8	0.43
24232	0.32	0.80	0.50	59	12.3	0.47	0.12	0.75	0.45	30.5	12.3	0.32
24233	0.09	4.25	5.0	250	48	2.1	0.01	2.0	2.6	160	52	1.63
24234	0.37	65	59	820	39	8.5	0.00	23	60	220	26	1.87

	Hand-picked Mn pebbles, Hydrax/HCl				-20#+80# fraction, Hydrax/HCl			
SAMPLE NO.	Cu/Mn x 10^3	Pb/Fe x 10^3	Zn/Mn+Fe x 10^3	Zn/Co	Cu/Mn x 10^3	Pb/Fe x 10^3	Zn/Mn+Fe x 10^3	Zn/Co
24201	0.64	54.8	12.2	1.82	3.33	77.8	29.4	4.73
24202	5.56	80.5	23.1	1.82	2.86	43.3	33.5	2.85
24203	6.32	85.2	22.9	1.07	2.67	44.0	39.4	5.31
24204	0.75	37.0	10.3	1.31	1.05	25.0	20.9	2.53
24205	0.25	40.2	11.7	2.74	1.76	75.0	32.1	5.55
24206	0.57	406.6	50.8	9.83	0.43	100.0	58.0	10.18
24207	1.36	75.7	23.4	3.84	1.91	58.3	21.3	3.28
24208	0.17	40.0	5.7	6.42	0.0	3.3	1.5	1.64
24209	0.0	12.0	0.9	2.47	0.0	5.0	1.5	4.06
24210	0.19	74.0	14.5	3.38	0.29	37.9	24.8	6.75
24211	0.35	52.8	1.6	0.59	0.30	41.7	1.7	0.59
24212	0.24	21.4	5.7	2.76	0.15	7.8	7.3	3.34
24213	0.68	28.6	11.5	8.00	0.07	5.7	7.1	3.58
24214	0.25	43.9	19.6	4.16	0.43	9.4	20.3	5.08
24215	0.26	12.6	2.3	1.03	0.41	17.9	8.3	2.76
24216	1.39	28.0	5.1	1.36	0.96	15.3	8.0	1.96
24217	21.43	6.7	1.4	3.50	14.29	6.7	3.4	4.00
24218	0.56	26.7	5.6	1.74	0.46	17.7	8.0	2.59
24219	0.20	5.7	3.3	3.00	0.10	3.7	3.2	2.68
24220	0.37	10.3	9.6	2.75	0.60	8.8	16.5	3.70
24221	0.30	40.0	5.2	1.71	0.56	37.4	8.9	2.80
24222	0.08	8.4	5.1	1.56	0.34	6.9	7.7	1.76
24223	0.49	37.1	10.0	2.59	0.44	20.9	14.3	3.64
24224	2.02	75.0	21.4	4.27	0.0	22.9	46.3	8.33
24225	1.19	19.5	5.4	1.22	2.20	30.8	21.5	1.66
24226	0.45	24.2	9.7	1.12	0.89	20.6	12.2	0.95
24227	1.33	27.1	10.9	1.09	1.49	12.4	18.2	1.51
24228	1.24	28.4	19.4	2.40	1.06	10.0	22.6	3.00
24229					0.0	12.0	17.5	7.78
24230	0.79	13.1	5.1	1.13	9.76	3.2	37.5	8.50
24231	1.23	21.8	11.8	1.73	1.87	10.2	17.5	1.44
24232	5.42	65.0	7.0	1.06	3.93	61.0	10.5	1.41
24233	0.36	88.5	16.8	2.38	0.06	38.5	12.3	1.60
24234	0.45	1666.7	68.7	6.94	0.05	884.6	243.9	32.09

36101

APPENDIX I

HENTY RIVER WATER SAMPLING RESULTS

STATION	HIGHWAY BRIDGE									HENTY GORGE LINE 1N		HENTY CAMP						
DATE	25.8.78	20.9.78	18.10.78	29.11.78 am	29.11.78 pm	18.12.78	25.1.79	1.3.79	19.4.79	29.11.78	25.1.79	25.8.78	20.9.78	18.10.78	29.11.78	25.1.79	1.3.79	19.4.79
River height at Zeehan Highway Bridge (cm)	+ 30	- 23	0	- 60	- 20	- 50	- 50	- 45	- 40	- 60	- 50	+ 30	- 23	0	- 60	- 50	- 45	- 40
pH	5.5	6.2	5.9	6.1	6.3	6.0	6.5	6.2	6.2	6.0	6.0	5.0	6.3	5.3	6.4	6.4	6.2	6.4
T.D.S. (ppm)	40	20	45	45	55	15	60	35	50	60	60	30	20	35	30	50	35	25
T.S.S. (ppm)	< 5	< 5	< 5	<10	35	< 5	< 5	< 5	< 5	<10	< 5	< 5	< 5	< 5	<10	< 5	< 5	< 5
Cu (ppm	0.08	0.02	0.07	0.03	Collected 2 hrs after storm	0.04	0.03	0.03	0.03	0.08	0.02	0.07	0.04	0.03	0.03	0.03	0.02	0.03
Pb (ppm)	< 0.1	< 0.01	0.01	<0.01		0.03	< 0.1	< 0.01	<0.01	0.04	<0.1	< 0.1	< 0.01	0.01	< 0.01	< 0.1	< 0.01	< 0.01
Zn (ppm)	0.03	0.02	0.02	0.03		0.02	< 0.1	< 0.01	0.02	0.08	< 0.1	0.03	0.03	0.02	0.02	< 0.1	< 0.01	0.01
Fe (ppm)	0.3	0.2	0.6	0.2		0.3	0.5	0.36	0.4	0.35	0.5	0.2	0.3	0.3	0.25	0.4	0.36	0.4
Mn (ppm)	0.02	< 0.01	0.02	< 0.01						< 0.01		0.01	< 0.01	0.01	< 0.01			
Ag (ppm)	< 0.1	< 0.01	< 0.01	< 0.01						< 0.01		< 0.1	< 0.01	< 0.01	< 0.01			
Cd (ppm)	< 0.05	< 0.01	< 0.01	< 0.01						< 0.01		< 0.05	< 0.01	< 0.01	< 0.01			
SO4 = (ppm)	< 5	<10	<10	<10						<10		< 5	<10	<10	<10			
Cl - (ppm)	10	<10	10	15						15		15	<10	<10	10			
F - (ppm)	< 0.1	< 0.1	< 0.1	< 0.1						<0.1		< 0.1	< 0.1	< 0.1	<0.1			

APPENDIX J

BEATRICE ROCK CHIP GEOCHEMISTRY

Sample No.	Location LB Grid	Rock Type	Values in ppm unless otherwise shown							%	
			Cu	Pb	Zn	Ag	Mn	Co	Au	S	Fe
22905	1200N/525W	Seric. felsic volc	42	530	180	<1	3900				
22906	1200N/570W	Seric. felsic volc	55	560	285	<1	2180				
22907	1400N/880-900W	Tuffs (20 m channel)	65	300	170	<1	920				
22908/F761	1400N/780W	Tuff	135	410	490	<1	8400				
22909	1400N/840W	Vitric tuff (3 m)	260	450	1000	2	750			0.2	
22910/F748	1400N/840W	Vitric tuff	268	460	1230	2	370			0.4	
22911/F750	1430N/910W	Felsic volcanic	50	2570	2220	3	5100			0.5	
22912/F747	1400N/815W	Vitric tuff (float)	155	740	4350	1	1910			0.4	
22913	1590N/925W	Shale frags (float)	60	700	285	1	1100				
22914	1610N/920W	Vitric tuffs. Bulk 1	400	1250	2.85%	5	2850			4.4	
22915	1610N/920W	Vitric tuffs. Bulk 2	330	840	2.2%	3	1040			2.7	
22916	1800N/930W	Mn-oxide wad	165	2000	4300	2	18%				
22917	1810N/925W	Pyritic shale	90	550	240	<1	1300			2.5	
22918	1480N/900W	Shale + tuff. Bulk	120	2300	4600	<1	2000			0.3	
22919	1510N/860W	Shale	120	2500	7500	2	700			0.5	
22920	1500N/830W	Tuff	350	1.6%	2.95%	8	1100		0.4	2.2	
22921	1480N/900W	Shale. Bulk	200	5900	1.25%	4	500			1.9	
22922	1420-1425N/900W	Lithic tuff. Bulk	110	920	3400	2	2700				
22923	1425-1430N/900W	Lithic tuff. Bulk	120	450	1300	2	2500				
22924	1430-1435N/900W	Lithic tuff. Bulk	50	3200	8000	3	3200				
22925	1435-1440N/900W	Lithic tuff. Bulk	30	2500	3600	2	3500				
22926	1440-1445N/900W	Lithic tuff. Bulk	35	2500	6300	4	3800				
22927	1445-1450N/900W	Lithic tuff. Bulk	30	1600	2150	4	2000				
22928	1450-1455N/900W	Lithic tuff. Bulk	65	430	450	1	2400				
22929	1455-1460N/900W	Tuff. Bulk	80	950	2800	2	2000				
22930	1460-1465N/900W	Tuff. Bulk	110	1100	720	2	2600				
22931	1465-1470N/900W	Black shale. Bulk	35	1350	2300	3	7200				
22932	1470-1475N/900W	Black shale. Bulk	80	5300	6500	6	1000				
22933	1475-1480N/900W	Silicified tuff.Bulk	45	1950	2600	4	2900				
22934	1480-1485N/900W	Silicified tuff.Bulk	45	3350	5600	6	1500				
22935	1485-1490N/900W	Black shale. Bulk	90	6300	5700	9	4800				
22936	1490-1495N/900W	Black shale. Bulk	70	3050	2700	6	4400				
22937	1495-1500N/900W	Black shale. Bulk	40	730	570	3	460				
22938	1600N/1350W	Sedgwick porphyry	40	30	40		50	<10			0.5
22939	1650N/1470W	Sedgwick porphyry	25	30	25		110	<10			1.0
22940	1800N/1800W	Sedgwick porphyry	30	30	45		140	<10			1.25
22941	MSl/328.7 m	Sedgwick porphyry	370	40	50		650	10			1.4
22942	2000N/1350W	Black shale. Bulk	300	2050	8500	<2	40				1.33

Appendix 5,

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Sample No.	Location LB Grid	Rock Type	Values in ppm unless otherwise shown							%	
			Cu	Pb	Zn	Ag	Mn	Co	Au	S	Fe
22943	2000N/1320	Travertine	280	1200	2200		10				1.33
24368	1850N/950W	Black shales. Bulk	45	670	150	2	1.9%				
24369	1810N/900W	Black shales. Bulk	45	2600	6400	2	850				
24370	1830N/920W	Black shales. Bulk	55	630	560	<2	600				
24527	1395N/840W	Mn-oxide wad	85	5600	1650		7.5%	130			12
F732	200N/920W	Porphyry (Float)	150	150	270		250	<10			1.2
F734	500N/1590W	Shale + siltstone	145	55	110	<1	75				
F736	600N/675W	Shale	110	750	500	<1	<200			0.3	
F737	600N/685W	Porphyry	95	40	80		1100	<10			0.7
F740	800N/960W	Porphyry (Float)	110	60	280		950	<10			2.0
F742	1000N/855W	Porphyry (Float)	270	30	140		550	<10			1.8
F743	1000N/870W	Porphyry (Float)	60	20	100		400	<10			0.85
F744	1000N/905W	Porphyry (Float)	50	40	55		500	<10			0.85
F745	1000N/955W	Porphyry (Float)	320	270	410		840	<10			3.0
F751	1610N/925W	Sheared black shale	350	5200	6600	20	1250			2.9	
F752	1600N/1380W	Sedgwick Porphyry	55	20	80		240	<10			1.0
F753	1600N/1500W	Sedgwick Porphyry	150	20	80		400	<10			1.15
F754	1600N/1620W	Sedgwick Porphyry	90	30	135		260	<10			1.6
F755	1800N/800W	Altered tuffs	95	200	740	2	2100			1.6	
F756	1800N/930W	Pyritic shales	165	570	560	<1	2500				
F757	2000N/780W	Porphyry	35	10	15		30	<10			0.3
F759	2000N/930W	Altered tuff	85	125	145	<1	65				
F760	2000N/990W	Grey shale	135	1000	160	4	300			1.5	
F762	1590N/925W	Black shale (Float)	620	3%	4200	57	700		0.6	2.7	
F763	1600N/915W	Altered tuff (Float)	45	530	510	1	3300				
F764	1610N/920W	Altered vitric tuff	95	1400	3900	2	2700		<0.1	1.6	
F765	1800N/615W	Porphyry	95	40	45		150	<10			1.2
F766	1800N/1110W	Sedgwick Porphyry	50	90	70		410	<10			0.7
F767	1800N/1320W	Sedgwick Porphyry	50	20	65		370	<10			1.0
F768	1850N/850W	Fe-Mn-oxide	180	1700	1600		3%	20			28
F769A	1960N/650W	Porphyry	50	20	10		30	<10			0.2
F769B	1960N/650W	Porphyry	70	30	15		300	<10			0.75
F771	1610N/920W	Vitric tuff + shale	325	565	1.37%	2	290			2.8	
F772	1610N/920W	Vitric tuff	540	700	3.1%	3	470			3.1	
F773	1610N/920W	Vitric tuff	175	590	4000	3	620			4.0	
F775	1610N/920W	Vitric tuff	115	580	6500	1	890			1.8	
F777	1610N/920W	Vitric tuff + shale	135	865	2450	2	1130			3.2	
F778	1610N/920W	Vitric tuff	320	560	2.0%	4	550			5.4	
F783	1610N/920W	Vitric tuff	420	2850	2.9%	6	9700			3.4	
F784	1610N/920W	Vitric tuff	260	750	1.2%	3	1240			5.1	
F785	1610N/920W	Vitric tuff	770	1850	9.0%	7	640			6.4	

Sample No.	Location LB Grid	Rock Type	Values in ppm unless otherwise shown							%	
			Cu	Pb	Zn	Ag	Mn	Co	Au	S	Fe
F786	1610N/920W	Vitric tuff	480	1380	1.88%	4	650			3.9	
F787	1610N/920W	Vitric tuff + shale	155	820	6600	2	350			2.2	
F788	1600N/750W	Lithic-vitric tuff	90	490	230	<1	1300			<0.1	
F789	1610N/925W	Black shale	940	3.19%	3.55%	33	340			3.7	
F790	1610N/925W	Black shale	660	1.22%	2.10%	62	1800			1.8	
F791	1600N/930W	Black shale	95	1260	1090	3	790			1.2	
F792	2170N/1080W	Black shale	105	210	310	3	440			0.1	
F793	1610N/925W	Black shale	530	1.02%	1.38%	51	1000			1.4	
F794	1200N/540W	Seric. felsic tuff	150	40	85	<1	145				
F797	1440N/830W	Pyritic shale (Float)	340	1.2%	1.47%	11	520			6.2	
F798	1440N/830W	Vitric tuff	120	5500	5400	5	480		<0.1	1.1	
F799	1440N/830W	Vitric tuff (Float)	95	1700	3000	2	7200			0.6	
F800	1570N/800W	Altered tuff	40	100	230	1	720			0.3	
F801	1530N/810W	Vitric tuff. Bulk	350	1.46%	3.14%	8	2500		0.9	2.3	
F801 b	1530N/810W	Vitric tuff	130	2.1%	6600	6	5000			1.2	
F801 c	1530N/810W	Vitric tuff	1600	2.8%	4.4%	6	1100			4.0	
F801 d	1530N/810W	Vitric tuff	110	2800	3.5%	2	700			2.0	
F801 f	1530N/810W	Vitric tuff	90	1800	4.0%	1	400			2.8	
F801 i	1530N/810W	Vitric tuff	210	5.7%	1.85%	12	2700		0.5	1.8	
F802	1580N/810W	Vitric tuff	50	1700	1400	2	680			0.4	
F806	1450N/830W	Vitric tuff	250	4.1%	2.25%	10	800		0.8	2.1	
F807	1460N/910W	Lithic tuff	140	3000	1.15%	2	4000			1.2	
F808	1550N/820W	Vitric tuff	130	1100	1500	<1	7600			0.2	
F809	1530N/850W	Vitric tuff	360	6600	1.6%	4	800			2.0	
F810	1400N/835W	Vitric tuff	330	1.55%	3.10%	6	1400			2.1	
F811	1460N/830W	Vitric tuff	460	3.15%	3.4%	10	1000		0.7	2.6	
F812	1460N/900W	Lithic tuff	560	3800	3200	2	1300			0.4	
F826	1670N/950W	Sedgwick Porphyry	25	140	115		1450	<10		1.35	
F830	1780N/1770W	Sedgwick Porphyry	80	20	65		280	<10		1.3	
F831	1610N/750W	Vitric tuff (Float)	210	2600	3%	2	3400				

APPENDIX K

BEATRICE STREAM SEDIMENT GEOCHEMISTRY

SAMPLE NUMBER	-80# TOTAL DIGESTION						-80# COLD EXTRACTION					
	ppm					%	ppm					%
	Cu	Pb	Zn	Mn	Co	Fe	Cu	Pb	Zn	Mn	Co	Fe
SS43(1975-76)	145	1110	1130									
SS44(1975-76)	185	906	780									
SS49 = SS61?	48	362	475	1150	13	2.45						
SS50 = SS66?	84	926	1000	5300	15	2.80						
SS51	47	175	144	415	2	1.57						
SS52	44	102	28	105	3	0.77						
SS53	35	105	44	118	4	1.86						
SS54	20	155	160	950	10	1.80	5	90	30	360	<5	0.17
SS55	31	260	290	1600	12	2.15	8	140	58	530	<5	0.17
SS56	42	320	370	3200	16	2.20	22	210	120	1350	<5	0.29
SS57	50	420	370	3600	17	2.40	30	300	130	1600	<5	0.40
SS58	25	280	310	1600	14	2.20	6	160	54	480	<5	0.15
SS59	34	360	320	1900	13	2.50	11	240	67	620	<5	0.25
SS60	28	280	270	1300	13	2.30	8	170	46	420	<5	0.22
SS61 = SS49?	45	600	470	4200	22	2.90	18	400	130	1650	<5	0.40
SS62	52	1500	530	4800	37	3.20	28	1050	200	1450	7	0.51
SS63	127	750	520	15500	98	4.00	102	620	350	5100	30	1.05
SS64	113	440	430	5300	67	3.50	63	380	200	2600	25	0.93
SS65	170	1400	570	17000	118	5.40	142	1200	440	5200	25	1.15
SS66 = SS50?	52	1350	1200	8600	18	3.20	22	780	410	2000	<5	0.20
SS67	35	120	40	1500	8	1.15	23	110	13	680	<5	0.31
SS68	30	140	25	1250	8	1.00	24	140	5	650	<5	0.39
SS69	24	170	26	1350	7	1.00	21	160	5	550	<5	0.29
SS70	15	100	18	680	5	0.80	15	70	<5	260	<5	0.23
SS71	30	160	25	1600	7	1.20	26	130	8	810	<5	0.45
SS72	32	190	26	1850	9	1.65	28	160	5	900	<5	0.69
SS73	24	140	33	1100	7	1.75	22	110	5	540	<5	0.58
SS74	42	180	46	1850	8	1.20	32	160	12	1200	<5	0.52
SS75	20	100	26	380	<5	1.20	16	80	<5	160	<5	0.49
SS76	32	137	64	1140	8	1.42						

APPENDIX K (Contd)

SAMPLE NUMBER	-20# + 80# HYDROXYLAMINE/HCL						PANNED CONCENTRATES					
	ppm in solution						ppm					%
	Cu	Pb	Zn	Mn	Co	Fe	Cu	Pb	Zn	Mn	Co	Fe
SS54/22945	0.10	3.2	1.30	70	0.17	11	12	35	125	330		2.35
SS55	0.10	5.2	7.50	500	0.98	22						
SS56/22946	0.04	2.5	8.70	600	1.00	18	29	85	250	1070		5.14
SS57	0.03	2.5	7.0	570	0.97	21						
SS58/22947	0.15	8.5	5.0	260	0.60	19	26	145	480	1880		8.20
SS59	0.14	11.5	7.3	420	1.00	15						
SS60/22948	0.11	7.2	2.5	120	0.35	13	25	165	420	1430		6.30
SS61/22949	0.11	8.2	5.1	270	0.72	17	29	560	530	1300		5.15
SS62/22951	0.05	17.0	13.5	510	1.60	13	35	190	290	1680		7.70
SS63/22952	0.06	2.0	6.7	550	2.40	11	28	65	210	1770		7.59
SS64/22954	0.11	2.6	5.8	270	2.00	10	40	40	225	1580		6.32
SS65/22953	0.22	8.2	8.0	530	2.65	25	20	120	120	820		2.34
SS66/22950	0.02	11.7	23.0	730	0.58	2	66	750	1120	4860		9.22
SS67/22958	0.12	2.0	0.4	135	0.49	21	11	31	63	134	6	1.59
SS68/22959	0.21	3.1	0.2	60	0.42	22	7	22	59	101	5	1.66
SS69/22960	0.22	4.4	0.1	64	0.37	15	6	29	64	78	5	1.51
SS70/22961	0.21	2.6	0.2	27	0.27	17	6	37	100	114	5	3.38
SS71/22962	0.15	2.2	0.2	73	0.32	25	9	49	53	280	12	2.09
SS72/22963	0.15	1.8	0.1	26	0.15	19	5	36	55	220	12	1.92
SS73/22964	0.16	1.7	0.02	17	0.09	17	5	39	50	360	15	2.05
SS74/22965	0.02	1.0	0.37	200	0.53	15	9	38	57	200	10	1.30
SS75/22966	0.21	2.0	0.1	17	0.14	16	7	38	69	825	32	3.76
x 22955	0.21	3.5	0.1	195	0.55	35						
x 22956	0.00	0.2	0.4	1700	1.16	10						
x 22957	0.00	0.5	1.3	1600	1.74	9						
x 22970	0.09	4.7	52.0	1300	0.45	8						
x 22971	0.12	15.0	7.4	810	0.77	17						
x 24371	0.41	43.0	2.25	2400	10.0	11.5						
x 24526	0.03	14.15	12.50	1560	2.40	9.2						
x 24528	0.09	1.38	0.05	7.6	0.12	8.0						
x 24534	0.03	0.40	0.32	250	1.92	18.8						

x = Mn wad/coated pebbles

APPENDIX K (Contd)

SAMPLE	-80# TOTAL - COLD EXTRACTABLE				HYDROXYLAMINE/HCl DIGEST, RATIOS			
	Cu	Pb	Zn	Mn	Cu/Mn x 10^3	Pb/Fe x 10^3	Zn/Mn+Fe x 10^3	Zn/Co x 10
SS54	15	65	130	590	1.43	291	16.0	76
SS55	23	120	232	1070	0.20	236	14.4	76
SS56	20	110	250	2850	0.07	139	14.1	87
SS57	20	120	240	2000	0.05	119	11.8	72
SS58	19	120	256	1120	0.58	447	17.9	83
SS59	23	120	253	1280	0.33	767	16.8	73
SS60	20	110	224	880	0.92	554	18.8	71
SS61	27	200	340	2550	0.41	482	17.8	71
SS62	24	450	330	3350	0.10	1308	25.8	84
SS63	25	130	170	10400	0.11	182	11.9	28
SS64	50	60	230	2700	0.4	260	20.7	29
SS65	28	200	130	11800	0.42	328	14.4	30
SS66	30	570	790	6600	0.03	5850	31.4	397
SS67	12	10	7	820	0.89	95	2.6	8
SS68	6	0	20	600	3.50	141	2.4	5
SS69	3	10	21	800	3.44	293	1.3	3
SS70	0	30	18	420	7.78	153	4.5	7
SS71	4	30	17	790	2.05	88	2.0	6
SS72	4	30	21	1150	5.77	53	2.2	7
SS73	2	30	28	560	9.41	100	0.6	2
SS74	10	20	34	650	0.10	67	1.7	7
SS75	4	20	26	220	12.35	125	3.0	7
x 22955					1.08	100	0.4	2
x 22956					0.00	20	0.2	3
x 22957					0.00	56	0.8	7
x 22970					0.07	588	39.8	1156
x 22971					0.15	882	9.0	96
x 24371					0.17	4300	0.9	2
x 24526					0.02	1538	8.0	52
x 24528					11.84	173	3.2	4
x 24534					0.12	21	1.19	2

x = Mn wad/coated pebbles

APPENDIX L

JUKES DARWIN ROCK CHIPS 1978-79

SAMPLE NUMBER	LOCATION	ROCK TYPE	Values in ppm unless otherwise shown							%	
			Cu	Pb	Zn	Ag	Mn	Co	Au	S	Fe
30004	Snake Spur	F.g. volcs.	0.37%	40	40	< 2	620			1.9	
30005	Snake Spur	F.g. volcs.	0.96%	30	20	2.3	180		<0.1	1.8	
30006	Snake Spur	F.g. volcs.	1.05%	30	40	1.6	300		<0.1	1.7	
30007	Snake Spur	F.g. volcs.	0.79%	40	30	1.3	300		< 0.1	1.3	
30008	Snake Spur	F.g. volcs.	1.04%	40	20	1.5	230		< 0.1	2.2	
30009	Snake Spur	F.g. volcs.	0.29%	30	20	< 2	120			0.8	
300	Snake Spur	F.g. volcs.	0.63%	40	40	17	410			0.4	
30011	Snake Spur	F.g. volcs.	0.03%	40	40	< 2	450			0.0	
30012	CV24N/4127E	Pyritic breccia	0.07%	60	70	< 2	120			2.2	
30013	TBM/135	Limonitic ironstone	75	110	600	< 2	900	80			22
30014	CV34N/4205E	Pyritic tuff	100	125	65	< 2	20	<10			2.8
30015	CV04S/2445E	Limonitic pebbles	95	290	1150	3	1.12%	175			50
30016	CV42N/4000E	Quartz-hmt vein	100	<10	20	< 2	130	15			15
30017	CV34N/4205E	Black shale	130	320	110	2	230	10			3.0
30018	CV42N/4200E	Black shale	110	80	170	< 2	190	15			3.2
30019	CV140N/3600E	Black shale	120	15	125	< 2	800	20			7.2
30020	CV04S/2445E	Black shale	125	20	10	< 2	20	10			1.05
F526	GRA/402	Qtz xl. tuff	55	3	1	<1	10				
F527	GRB/720	Xl. tuff	220	14	12	<1	90				
F528	GRB/800	Grey shale	84	50	65	<1	340				
F532	GRQ/800	Int. tuff	260	130	480	2	980				
F533	GRD/1320	Qtz xl. tuff	31	6	5	<1	10				
F534	GRJ/350	Alt. xl. tuff	40	3	0	<1	15				
F535	GRJ/838	F.g. tuff	68	12	20	<1	80				
F536	GRJ/845	F.g. tuff	90	10	125	<1	150				
F537	GRJ/925	Lithic tuff	90	20	63	1	620				
F538	GRJ/1070	Alt. lith. tuff	130	15	120	< 1	1400				
F540	GRS/480	F.g. tuff	70	20	67	< 1	590				
F541	GRF/050	Fsp. xl. tuff	58	48	17	< 1	185				
F542	GRF/965	Breccia	100	36	70	1	140				
F543	GRF/1200	Lithic tuff	56	16	20	< 1	120				
F545	GRF/1225	Lithic tuff	52	15	15	< 1	110				
F548	GRH/425	Qtz xl. tuff	88	12	7	< 1	95				
F554	GR1	Lithic tuff	58	30	70	<1	510				
F556	GR11	Qtz xl. tuff	38	27	30	<1	175				
F565	GR43	F.g. tuff/lava	53	5	32	<1	380				
F566	GR55	Black shale	67	50	75	<1	190				

SAMPLE NUMBER	LOCATION	ROCK TYPE	Values in ppm unless otherwise shown							%	
			Cu	Pb	Zn	Ag	Mn	Co	Au	S	Fe
F568	GR63	Pyritic tuff	80	16	240	1	75				
F573	GR70	Breccia	80	28	75	2	500				
F575	GR71	Black shale	43	80	46	1	70				
F576	GR72	Black shale	47	35	15	<1	55				
F577	GR72	Qtz xl. tuff	45	18	22	<1	155				
F582	GR80	Xl-lith. tuff	37	6	4	<1	55				
F584	GR83	Qtz xl. tuff	52	22	23	<1	135				

Samples 30004-30012 were assay for Cu and S in 1977-78.
Samples 30005-30008 Ag and Au determined by fire assay.
Samples 30013-30020 collected in 1978-79.
All other samples collected in 1977-78.

APPENDIX M

JUKES-DARWIN STREAM SEDIMENTS

LOCATION	-80# ppm				%	-200# ppm				%
	Cu	Pb	Zn	Mn	Fe	Cu	Pb	Zn	Mn	Fe
CV26N/4080E	10	30	16	640	1.5	17	40	38	1050	2.1
CV42N/4200E	12	50	15	330	0.85	12	40	19	190	0.75
CV4170N/4450E	26	40	23	1300	1.7	38	60	58	1700	2.1
TBM/625 m						4	<10	5	10	

HYDROXYLAMINE/HCl DIGESTION. ppm in solution

SAMPLE	Cu	Pb	Zn	Mn	Co	Fe
GARFIELD RIVER AREA -10#+80# SEDIMENTS						
SS2 (238 71)	0.07	0.17	0.25	0.20	0.00	5.77
SS5 72	0.14	0.32	0.29	0.69	0.00	9.24
SS6 73	0.00	0.23	0.68	108.0	0.85	20.9
SS7 74	0.01	0.16	0.26	0.48	0.00	4.76
[illegible] 75	0.00	0.37	0.40	4.35	0.00	12.7
SS9 76	0.00	0.15	0.17	6.50	0.00	8.00
SS10 77	0.02	0.36	0.50	0.44	0.00	65.0
SS11 78	0.02	0.22	0.06	0.07	0.00	2.32
SS12 79	0.08	0.38	0.25	0.38	0.00	15.0
SS13 80	0.00	0.31	0.22	0.19	0.00	9.38
SS14 81	0.01	0.14	0.07	0.23	0.00	2.39
SS15 82	0.00	0.07	0.08	0.14	0.00	3.35
SS16 83	0.00	0.16	0.10	35.5	0.12	5.34
SS17 84	0.00	0.20	0.12	370.0	1.27	41.0
SS18 85	0.00	0.20	0.14	6.20	0.00	4.25
SS19 86	0.00	0.06	0.14	0.60	0.00	0.93
SS20 87	0.00	0.41	0.25	585.0	0.96	28.0
SS21 88	0.00	1.15	0.33	114.0	0.67	32.6
SS22 89	0.13	0.27	0.17	14.3	0.00	8.21
SS23 90	0.00	0.14	0.20	2.15	0.00	8.38
SS24 91	0.00	0.38	0.99	26.3	0.44	7.80
[illegible] 92	0.01	0.25	0.57	0.49	0.00	6.85
SS26 93	0.00	0.24	0.56	2.05	0.00	12.9
SS27 94	0.01	0.29	0.39	0.73	0.00	11.2
SS28 95	0.02	0.28	0.46	0.12	0.00	14.8
SS29A 96	0.00	0.22	0.18	0.46	0.00	5.75
SS29B 97	0.07	0.30	0.14	1.39	0.00	6.92
SS30 98	0.00	0.36	1.42	8.50	0.00	19.7
SS31 99	0.00	0.17	0.14	0.86	0.00	6.50
SS32 900	0.00	0.15	0.10	0.55	0.00	5.01
SS33 901	0.00	0.06	0.09	0.12	0.00	6.38
SS35 902	0.00	0.08	0.05	0.35	0.00	5.17
SS36 903	0.01	0.16	0.10	0.44	0.00	12.2
SS37 904	0.00	0.20	0.05	2.80	0.00	7.28
SS38 905	0.00	0.16	0.13	2.53	0.00	10.0
SS39 906	0.00	0.14	0.04	2.81	0.00	2.83
SS40 907	0.00	0.36	0.12	31.4	0.29	13.7
CLARK VALLEY Mn-COATED PEBBLES						
CV10N/2640E	0.06	0.29	0.13	11.5		7.0
CV10N/2740E	0.02	0.07	0.04	1.0		1.5
CV26N/4080E	0.00	0.20	0.32	2900		15.5

APPENDIX M (Contd)

HYDROXYLAMINE/HCl DIGESTION, RATIOS

SAMPLE	Cu/Mn x 10^3	Pb/Fe x 10^3	Zn/Mn+Fe x 10^3
GARFIELD RIVER -10#+80# STREAM SEDIMENTS			
SS 2	350	29	42
SS 5	203	35	29
SS 6	0	11	5
SS 7	21	34	50
SS 8	0	29	23
SS 9	0	19	12
SS 10	45	5	8
SS 11	286	95	25
SS 12	211	25	16
SS 13	0	33	23
SS 14	43	59	27
SS 15	0	21	23
SS 16	0	30	2
SS 17	0	5	0
SS 18	0	47	13
SS 19	0	64	91
SS 20	0	15	0
SS 21	0	35	2
SS 22	9	33	8
SS 23	0	17	19
SS 24	0	49	29
SS 25	20	36	78
SS 26	0	19	37
SS 27	14	26	33
SS 28	167	19	31
SS 29 A	0	38	29
SS 29 B	50	43	17
SS 30	0	18	50
SS 31	0	26	19
SS 32	0	30	18
SS 33	0	9	14
SS 35	0	15	9
SS 36	23	13	8
SS 37	0	27	5
SS 38	0	16	10
SS 39	0	49	7
SS 40	0	26	3
CLARK VALLEY Mn COATED PEBBLES			
CV10N/2640E	5	41	7
CV10N/2740E	20	47	16
CV26N/4080E	0	13	0

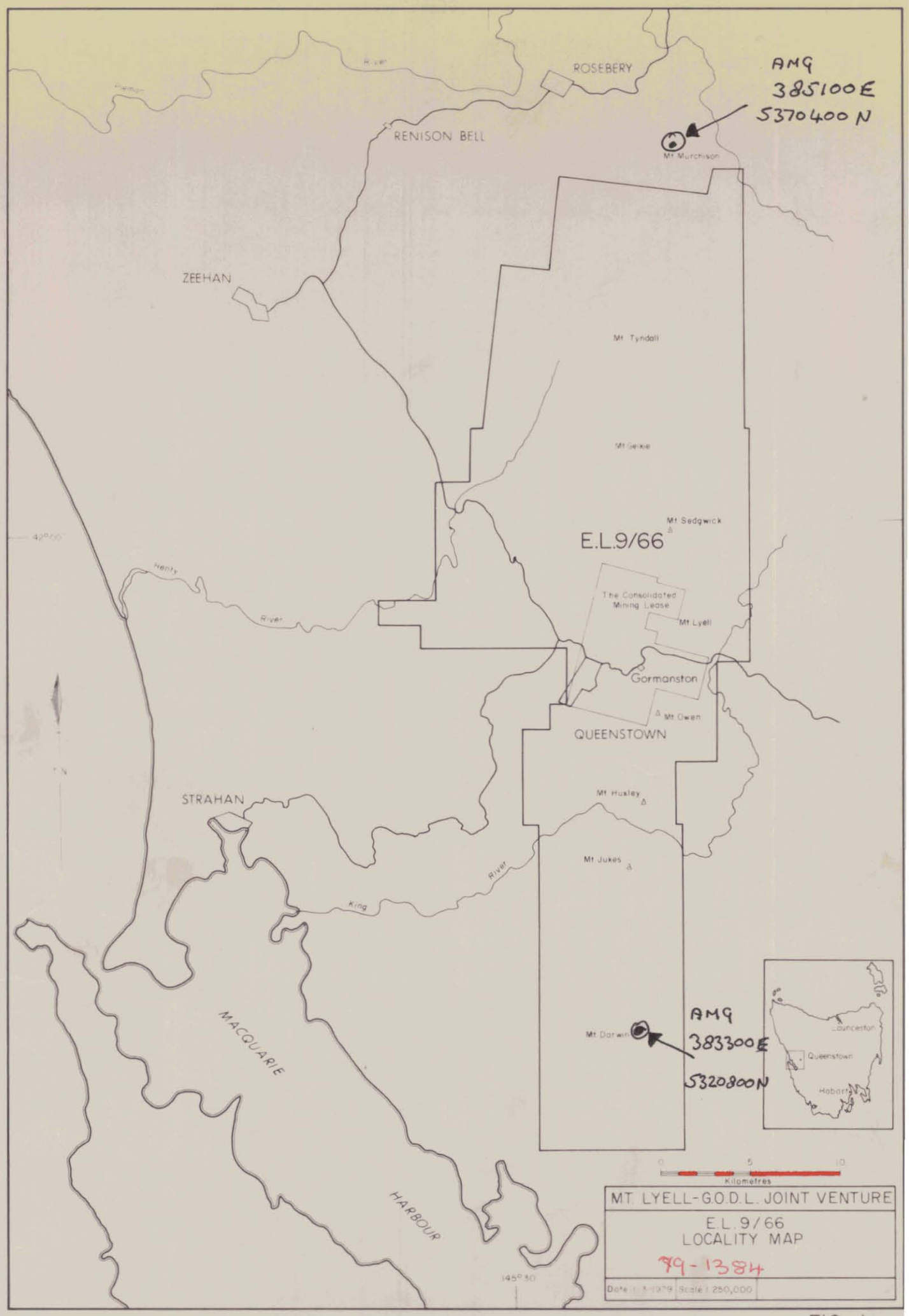
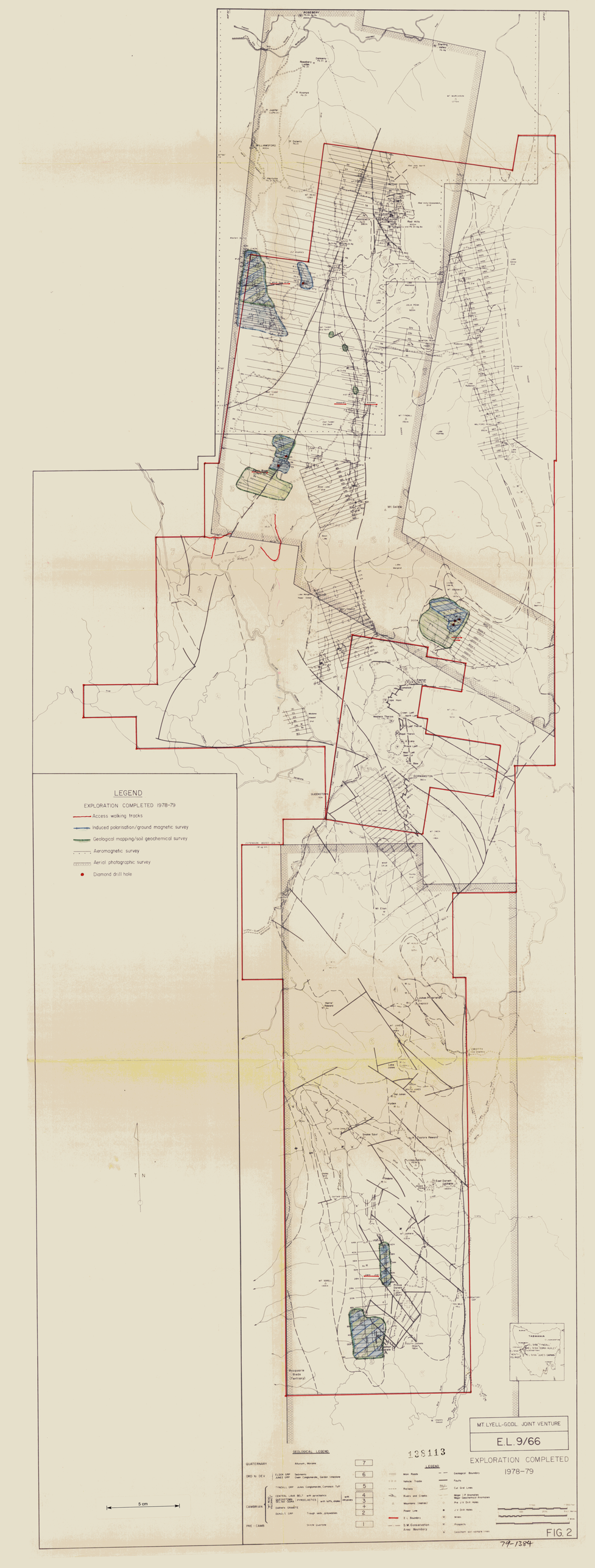


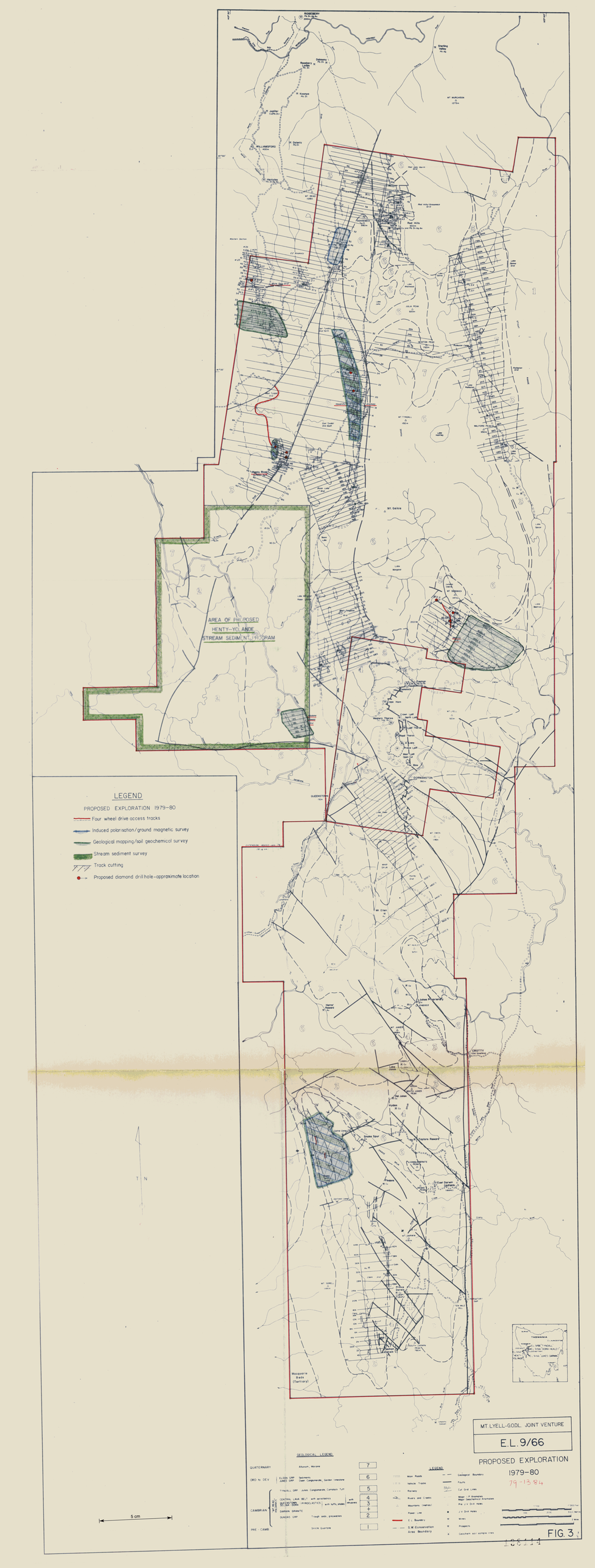
FIG. 1

AMG REFERENCE POINTS ADDED

5 cm

138112


ROSEBERY
Rosebery Lease
Dolcoath
Mt Dundas
Mt Kosmos
Mt Owen
Mt Darwin
SPRINGFORD
Mt Huxley
Mt Read
Red Hills
Mt Lyell
Mt Sedgwick
Mt Tyndall
Mt Gelkie
QUEENSTON
Queenston
Mt Owen
Mt Jukes
Mt Farrell
Mt Darwin
Mt Sorell
Macquarie Heads (Tertiary)
LEGEND
EXPLORATION COMPLETED 1978-79
Access walking tracks
Induced polarisation/ground magnetic survey
Geological mapping/soil geochemical survey
Aeromagnetic survey
Aerial photographic survey
Diamond drill hole
T N
5 cm
GEOLOGICAL LEGEND
QUATERNARY
ORD to DEV
ELDON GRP
JUKES GRP
TYNDALL GRP
CENTRAL LAVA BELT
CAMBRIAN
DUNDAS GRP
PRE-CAMB
Alluvium, Moraine
Sediments
Dacite Conglomerate, Gordon Limestone
Jukes Conglomerate, Comstock Tuff
with persistents
PYROCLASTICS
with tuffs, shales
with rhyolites
Trough beds, greywackes
Shore Quartzite
7
6
5
4
3
2
1
LEGEND
Main Roads
Vehicle Tracks
Railway
Rivers and Creeks
Mountains (metres)
Power Line
E.L. Boundary
S.W. Conservation Area Boundary
Geological Boundaries
Faults
Cut Grid Lines
Major I.P. Anomalies
Major Geochemical Anomalies
Pre J.V. Drill Holes
J.V. Drill Holes
Mines
Prospects
Geochem soil sample lines
TASMANIA
MT. LYELL
SHEET TYNDALL
SHEET DORE HILLS
SHEET JUKES (SPRING)
MT. LYELL-GODL JOINT VENTURE
E.L. 9/66
EXPLORATION COMPLETED
1978-79
138113
FIG. 2
79-1384



GEOLOGICAL LEGEND

QUATERNARY	Alluvium, Moraine	7
ORD to DEV	FLOOD GRP / JUKES GRP: Sediments, Owen Conglomerate, Gordon Limestone	6
	TYNDALL GRP: Jukes Conglomerate, Comstock Tuff	5
CAMBRIAN — MT READ VOLCANICS	CENTRAL LODE BELT: with porphyries	4
	FOOTWALL SERIES: PYROCLASTICS with tuffs, shales	3
	DARWIN GRANITE	2
	DUNDAS GRP: Trough beds, greywackes	1
PRE - CAMB	Shirley Quartzite	

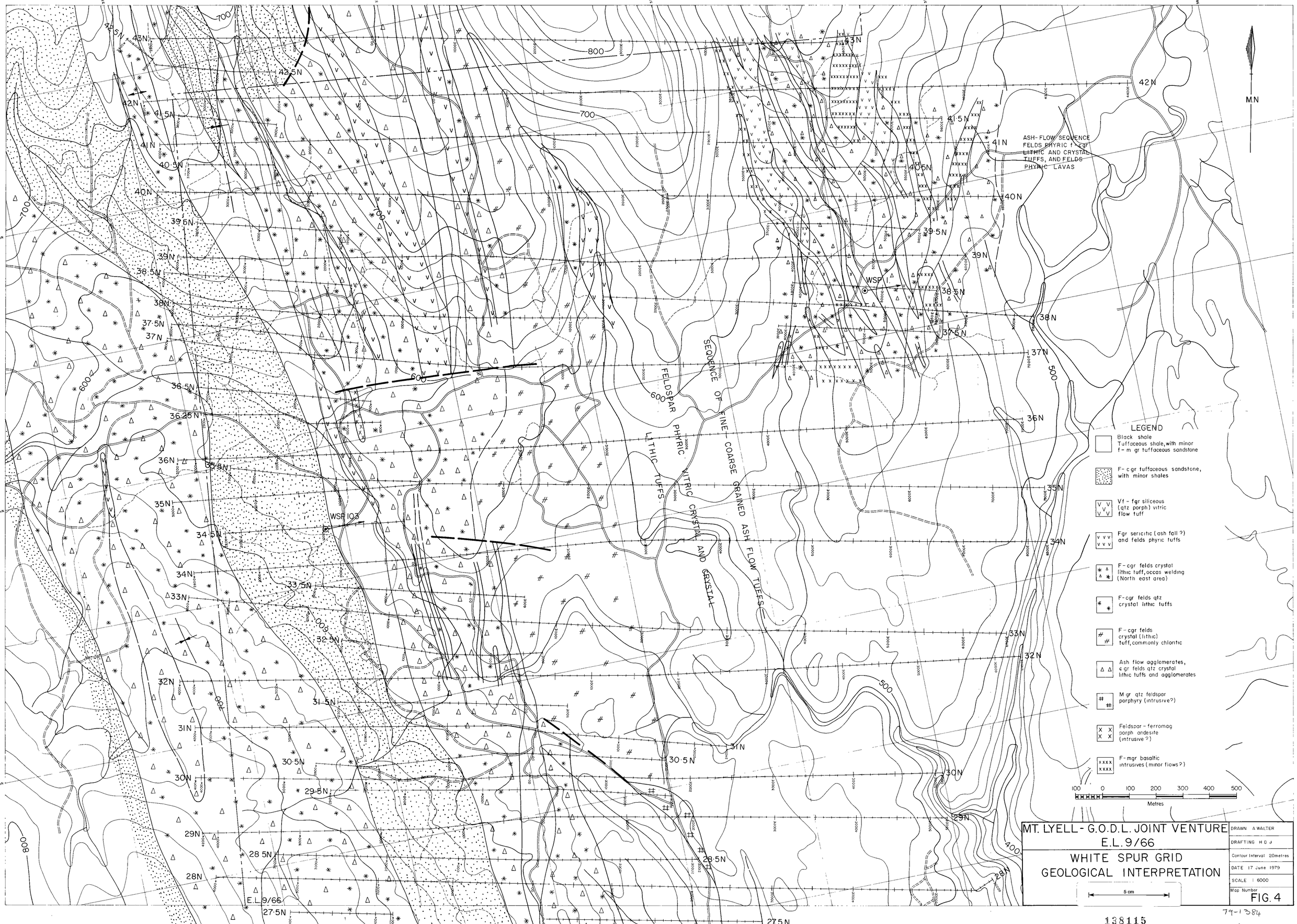
MT. LYELL-GODL JOINT VENTURE

E.L. 9/66

PROPOSED EXPLORATION
1979-80
79-13-84

FIG. 3

160114



138115

79-1384

M.N

LEGEND

- IP CHARGEABILITY >32.5 m
- IP RESISTIVITY <700 ohm/m
- X PEAK OF MAGNETIC ANOMALY >800γ ABOVE BACKGROUND
- TREND OF CHARGEABILITY ANOMALY PEAKS
- TREND OF MAGNETIC ANOMALY PEAKS
- RTAE TURAM ANOMALY TREND (1960) (approx position)

SOIL GEOCHEMICAL ANOMALY

- Cu > 100ppm
- Pb > 200ppm
- Zn > 200ppm

- COSTEAN
- DIAMOND DRILL HOLE WSP1 MT LYELL WSP 103 RTAE

100 0 100 200 300 400 500
Metres

MT. LYELL - G.O.D.L. JOINT VENTURE
E.L. 9/66

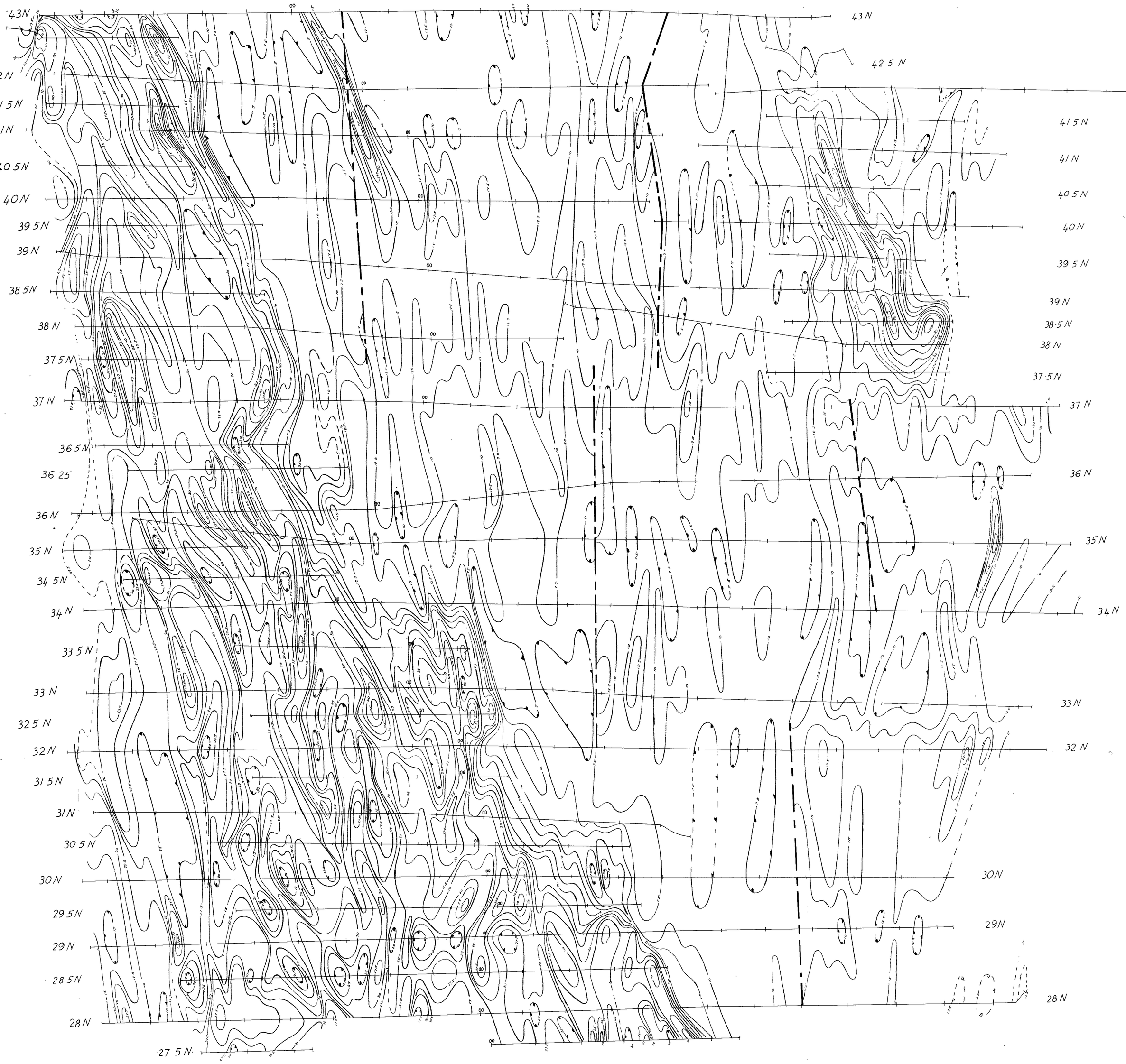
WHITE SPUR GRID
GEOPHYSICAL & GEOCHEMICAL
ANOMALY COMPILATION

DRAWN	A WALTER
DRAFTING	H D J
Contour Interval	20metres
DATE	17 June 1979
SCALE	1 6000
Map Number	FIG.5

5 cm

79-1384

123116



NOTE Contours in milliseconds

MOUNT LYELL MINING & RAILWAY COMPANY LTD

WHITE SPUR GRID

NEAR QUEENSTOWN - TAS

GRADIENT ARRAY EIP SURVEY

CHARGEABILITY CONTOUR PLAN

SURVEYED & COMPILED BY
SCINTREX

NOV/JAN '78/'79

79-138

SCALE 1 6000

Job N° TAS-062 Sht 1 of 1 PLATE 1

138117

FIG 6

5 cm

MOUNT LYELL MINING & RAILWAY COMPANY LTD.

WHITE SPUR GRID

NEAR QUEENSTOWN - TASMANIA

GRADIENT ARRAY EIP SURVEY

RESISTIVITY CONTOUR PLAN

SURVEYED & COMPILED BY

SCINTREX

NOV/JAN 78/79

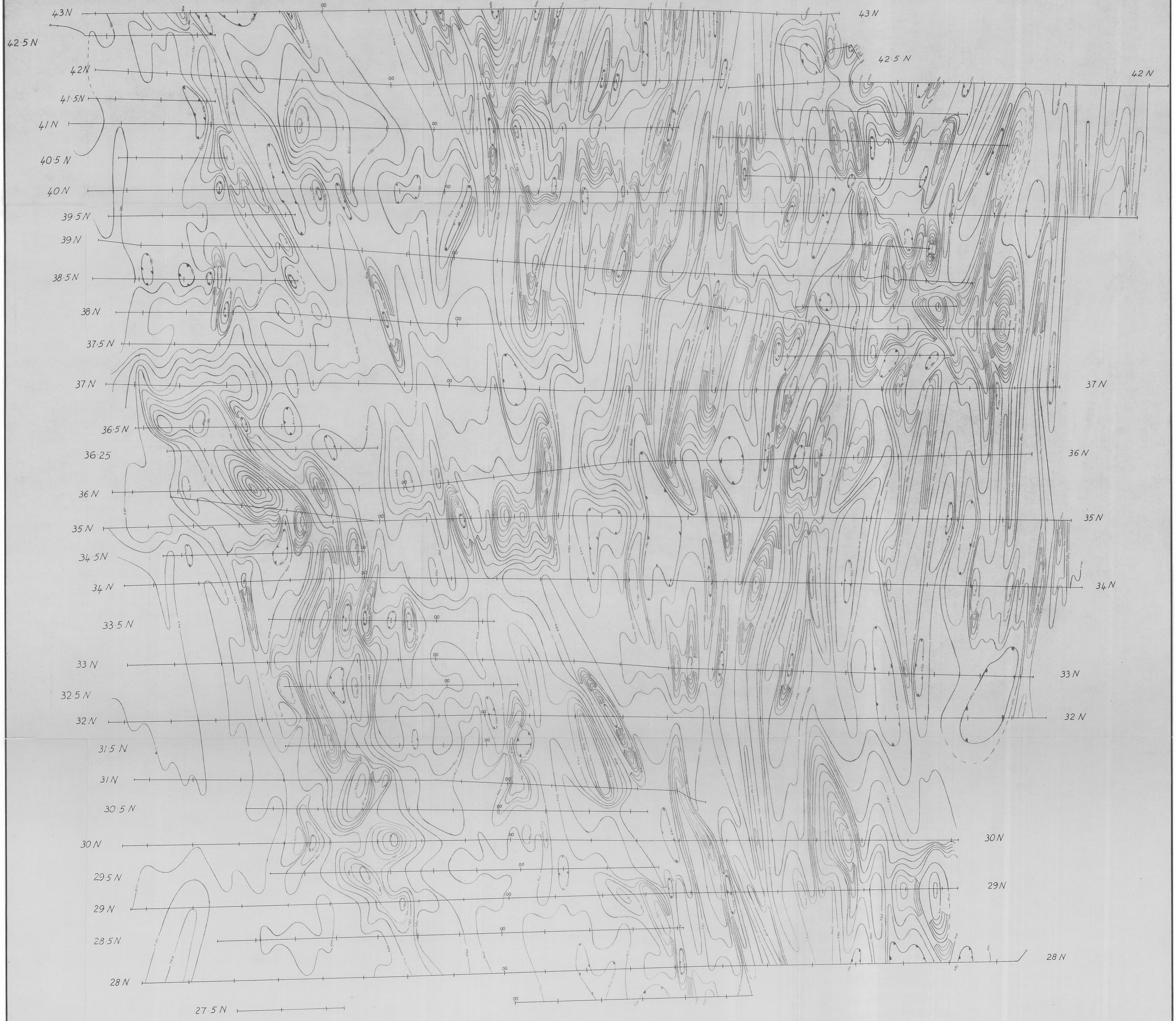
79-1384

128118

SCALE 1 6000

Job N° TAS-062 Sht 1 of 1 PLATE 2

FIG.7



5 cm

Legend

For total magnetic field
add 62,000 gammas to all values

MOUNT LYELL MINING & RAILWAY COMPANY LTD

WHITE SPUR GRID

NEAR QUEENSTOWN - TASMANIA

TOTAL MAGNETIC FIELD SURVEY CONTOUR PLAN

SURVEYED & COMPILED BY
SCINTREX

NOV/JAN '78/79

138119

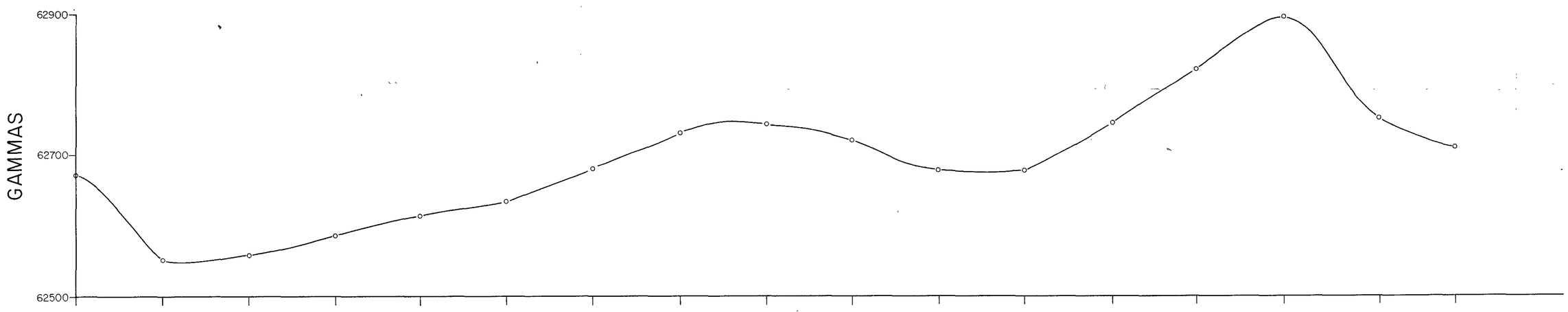
79-138h

SCALE 1:6000

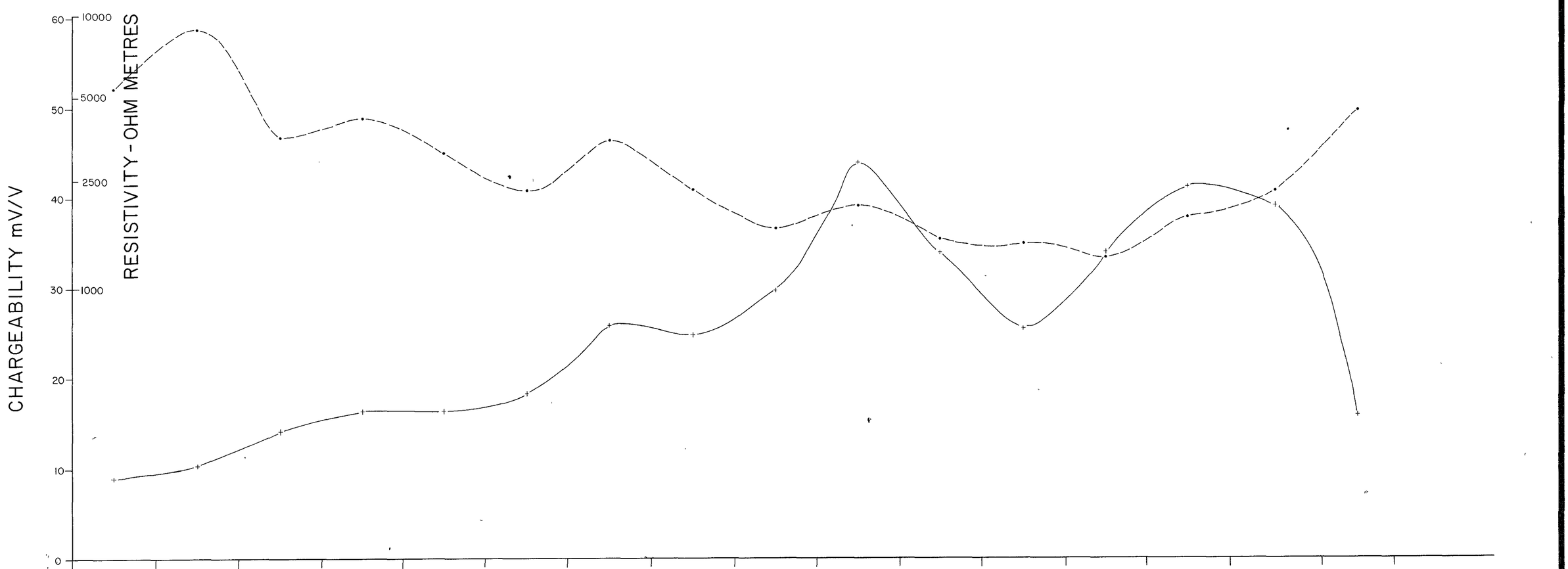
Job Nº TAS-062 Sht 1 of 1 PLATE 3.

FIG.8

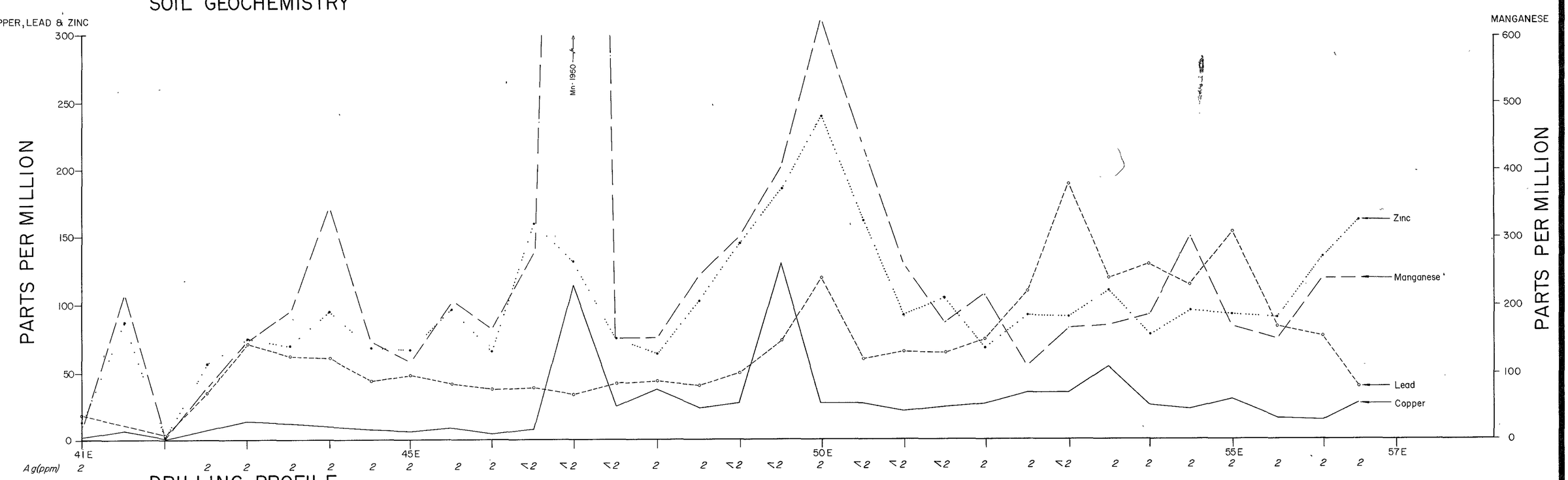
TOTAL MAGNETIC FIELD



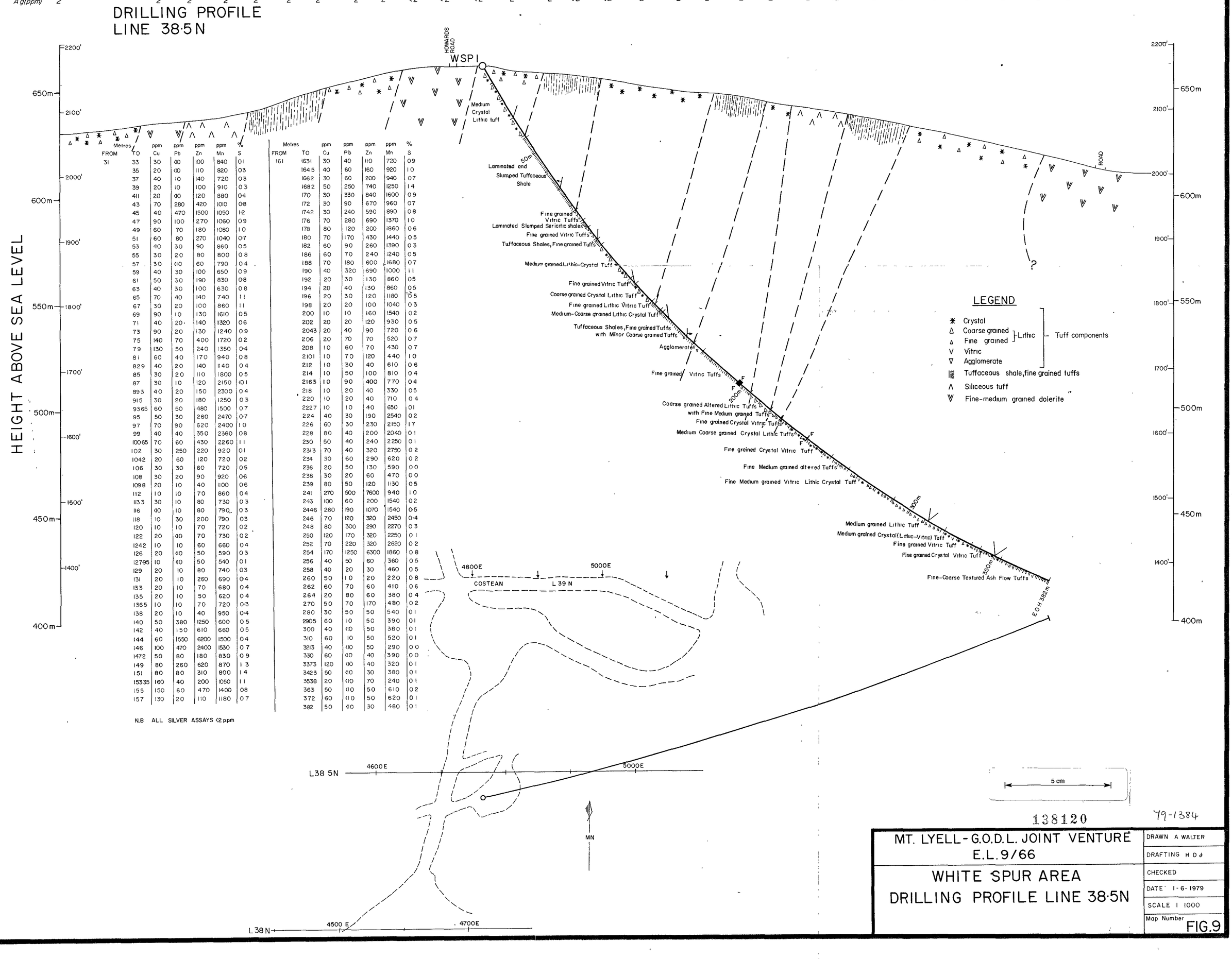
E.I.P. GRADIENT ARRAY



SOIL GEOCHEMISTRY



DRILLING PROFILE
LINE 38·5N



Metres FROM	TO	ppm Cu	ppm Pb	ppm Zn	ppm Mn	% S
31	33	30	40	100	840	01
	35	20	40	110	820	03
	37	40	10	140	720	03
	39	20	10	100	910	03
	411	20	40	120	880	04
	43	70	280	420	1010	08
	45	40	470	1500	1050	12
	47	90	100	270	1060	09
	49	60	70	180	1080	10
	51	60	80	270	1040	07
	53	40	30	90	860	05
	55	30	20	80	800	08
	57	30	40	60	790	04
	59	40	30	100	650	09
	61	50	30	190	830	08
	63	40	30	100	630	08
	65	70	40	140	740	11
	67	30	20	100	860	11
	69	90	10	130	1610	05
	71	40	20	140	1320	06
	73	90	20	130	1240	09
	75	140	70	400	1720	02
	79	130	50	240	1350	04
	81	60	40	170	940	08
	829	40	20	140	1140	04
	85	30	20	110	1800	05
	87	30	10	120	2150	01
	893	40	20	150	2300	04
	915	30	20	180	1250	03
	9365	60	50	480	1500	07
	95	50	30	260	2470	07
	97	70	90	620	2400	10
	99	40	40	350	2360	08
	10065	70	60	430	2260	11
	102	30	250	220	920	01
	1042	20	60	120	720	02
	106	30	30	60	720	05
	108	30	20	90	920	06
	1098	20	10	40	1100	06
	112	10	10	70	860	04
	1133	30	10	80	730	03
	116	40	10	80	790	03
	118	10	30	200	790	03
	120	10	10	70	720	02
	122	20	40	70	730	02
	1242	10	10	60	660	04
	126	20	40	50	590	03
	12795	10	40	50	540	01
	129	20	10	80	740	03
	131	20	10	260	690	04
	133	20	10	70	680	04
	135	20	10	50	620	04
	1365	10	10	70	720	03
	138	20	10	40	950	04
	140	50	380	1250	600	05
	142	40	150	610	660	05
	144	60	1550	6200	1500	04
	146	100	470	2400	1530	07
	1472	50	80	180	830	09
	149	80	260	620	870	13
	151	80	80	310	800	14
	15335	160	40	200	1050	11
	155	150	60	470	1400	08
	157	130	20	110	1180	07

Metres FROM	TO	ppm Cu	ppm Pb	ppm Zn	ppm Mn	% S
161	1631	30	40	110	720	09
	1645	40	60	160	920	10
	1662	30	60	200	940	07
	1682	50	250	740	1250	14
	170	30	330	840	1600	09
	172	30	90	670	960	07
	1742	30	240	590	890	08
	176	70	280	690	1370	10
	178	80	120	200	1860	06
	180	70	170	430	1440	05
	182	60	90	260	1390	03
	186	60	70	240	1240	05
	188	70	180	600	1680	07
	190	40	320	690	1000	11
	192	20	30	130	860	05
	194	20	40	130	860	05
	196	20	30	120	1180	05
	198	20	20	100	1040	03
	200	10	10	160	1540	02
	202	20	20	120	930	05
	2043	20	40	90	720	06
	206	20	70	70	520	07
	208	10	60	70	430	07
	2101	10	70	120	440	10
	212	10	30	40	610	06
	214	10	50	100	810	04
	2163	10	90	400	770	04
	218	10	20	40	330	05
	220	10	20	40	710	04
	2227	10	10	40	650	01
	224	40	30	190	2540	02
	226	60	30	230	2150	17
	228	80	40	200	2040	01
	230	50	40	240	2250	01
	2313	70	40	320	2750	02
	234	30	60	290	620	02
	236	20	50	130	590	00
	238	30	20	60	470	00
	239	80	50	120	1130	05
	241	270	500	7600	940	10
	243	100	60	200	1540	02
	2446	260	190	1070	1540	05
	246	70	120	320	2450	04
	248	80	300	290	2270	03
	250	120	170	320	2250	01
	252	70	220	320	2620	02
	254	170	1250	6300	1860	08
	256	40	50	60	360	05
	258	40	20	30	460	05
	260	50	10	20	220	08
	262	60	70	60	410	06
	264	20	80	60	380	04
	270	50	70	170	480	02
	280	30	50	50	540	01
	2905	60	10	50	390	01
	300	40	40	50	380	01
	310	60	10	50	520	01
	3213	40	40	50	290	00
	330	60	40	40	390	00
	3373	120	40	40	320	01
	3423	50	40	30	380	01
	3538	20	40	70	240	01
	363	50	40	50	610	02
	372	60	40	50	620	01
	382	50	40	30	480	01

N.B ALL SILVER ASSAYS <2 ppm

138120

79-1384

MT. LYELL - G.O.D.L. JOINT VENTURE E.L. 9/66	DRAWN A WALTER
	DRAFTING H D J
WHITE SPUR AREA	CHECKED
DRILLING PROFILE LINE 38·5N	DATE 1-6-1979
	SCALE 1 1000
	Map Number FIG.9

Line 30N Pit

Tyndall Mine

Newton Creek

DDH HA3

Trench B

Trench

Hematite-barite occurrence

DDH HA1&2

Trench A

Creek

Trench C

Tyndall

DDH TYN3

Trench D

DDH TYN1

30N
28N
26N
25N
24N
23N
22N
21N
20N
19N
18N
17N
16N
15N
14N
12N
10N

00
400S
800S
1200S
1600S
2000S
2400S
2800S
3200S
3600S
4000S
4400S
4800S
5200S
5600S
6000S
6400S

RIO TINTO GRID

MT LYELL GRID

Rio Tinto (Mc Phar) 1962, Dipole-Dipole.

Mt Lyell (Mc Phar) 1967-68, Dipole - Dipole.

Mt Lyell (Scintrex) 1973-74, Gradient Array

Mt Lyell (Scintrex) 1974, Schumberger Electrical Soundings

Mt Lyell (Scintrex) 1975, Pole - Dipole

TN M.N

5 cm

MT LYELL - G O D L JOINT VENTURE

HOWARDS ANOMALY

I.P. COVERAGE

79-1384

SCALE 1"=500'	DATE 2-5-79	AUTHOR G D	FIG. 14

138121

30N

Line 30N Pit

00

400S

800S

28N

Tyndall Mine

1200S

1600S

2000S

26N

2400S

2800S

25N

3200S

3600S

Newton Creek

24N

4000S

DDH HA3

23N

4400S

4800S

Trench B

5200S

22N

5600S

Trench

21N

6000S

Hematite-barite occurrence

Rio Tinto Grid

6400S

20N

DDH HA182

Trench A

Creek

19N

Trench C

Mt Lyell Grid

18N

17N

Tyndell

DDH TYN3

16N

Trench D

15N

14N

DDH TYN1

12N

10N

GEOCHEMICAL COVERAGE

Soil

Rio Tinto 1958, 100' intervals

Mt. Lyell 1967-68, 200' intervals, A & /or B-C horizon; Cu, Pb, Zn

Mt. Lyell 1969, 100' intervals; A & /or B-C horizon ?, Cu, Pb, Zn

Mt. Lyell 1975, 50' intervals, A, B or C horizon, Cu, Pb, Zn, -80 & -10/+80

Stream Sediments

Mt Lyell 1967-68

T.N M.N

133122

5 cm

MT LYELL – G O D L. JOINT VENTURE

HOWARDS ANOMALY

GEOCHEMICAL COVERAGE

79-1384

SCALE 1"=500'	DATE 2-5-79	AUTHOR G D	FIG. 13

Line 30N Pit

Tyn. ii

Tyndall Mine

Tyn. iii

QP iv

Newton Creek

Tyn. i

DDH HA3

QP iv

Trench B

Trench

Hematite + barite occurrence

DDH HA182

Trench A

Tyn. iii

Creek

Tyn. i

Trench C

QP iii

QP iv

Tyndall

DDH TYN3

Trench D

DDH TYN1

30N
28N
26N
25N
24N
23N
22N
21N
20N
19N
18N
17N
16N
15N
14N
12N
10N

00
400S
800S
1200S
1600S
2000S
2400S
2800S
3200S
3600S
4000S
4400S
4800S
5200S
5600S
6000S
6400S

RIO TINTO GRID
MT LYELL GRID

T.N M.N

LEGEND

- Anomalous soil geochem (1975-80** & -10**/+80**) } Cu ≥50 ppm, Pb ≥100 ppm or Zn ≥100 ppm
- Anomalous soil geochem (1967-69) }
- Anomalous stream sediment geochem (1967-68) – Cu≥50 ppm, Pb≥50 ppm or Zn≥100 ppm
- Magnetic high (total field) – >500 γ contrast
- Magnetic high (vertical field)
- I.P anomaly (dipole-dipole) – P.F.E >6%, >4·5%
- I.P. anomaly (gradient array) – chargeability >25 msec, >20 msec
- I.P anomaly (pole-dipole) – chargeability >25 msec.
- Resistivity low – $\frac{\rho a}{2\pi}$ <150 ohm ft
- Turam anomaly (coincident ratio & phase diff anomalies) – approx position
- Major I.P axis

INTERPRETIVE GEOLOGY (after N.P.S-H, 1975)

Tyndall Group

- Tyn iii — Comstock tuffs, agglomerates, tuffs
- Tyn. ii — Autobrecciated qtz-feld lavas
- Tyn i — Hematatic crystal tuffs, carbonates, magnetite-rich lavas.

Queenstown Pyroclastics:

- QPiv — Intermed. pyroclastics, siltstones, shales, carbonates, minor acid volcanics
- QPiii — Intermed. lavas & intrusives

128113

5 cm

MT LYELL – G.O.D.L. JOINT VENTURE

HOWARDS ANOMALY

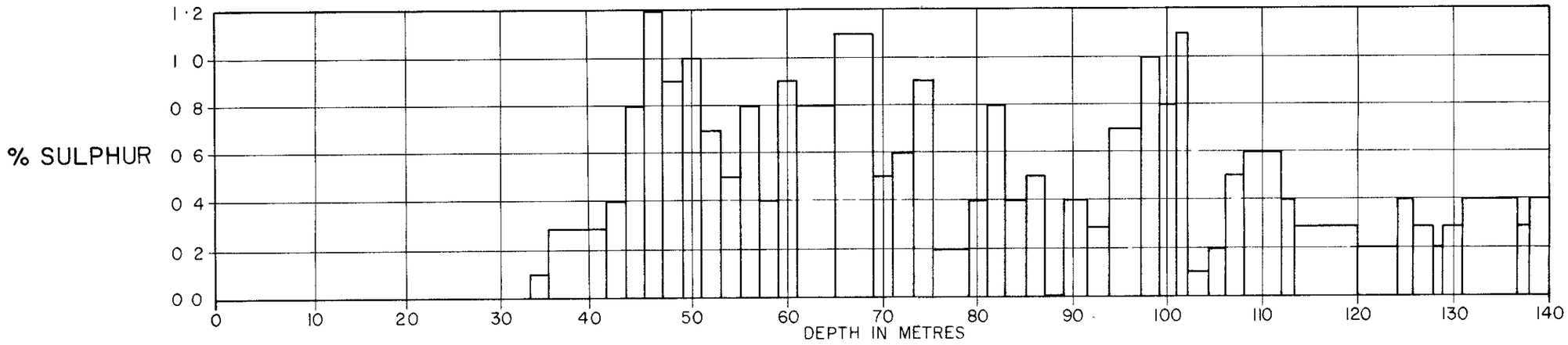
GEOPHYSICAL & GEOCHEMICAL ANOMALIES 79-1386

SCALE 1"=500'	DATE 2-5-79	AUTHOR	FIG. 12

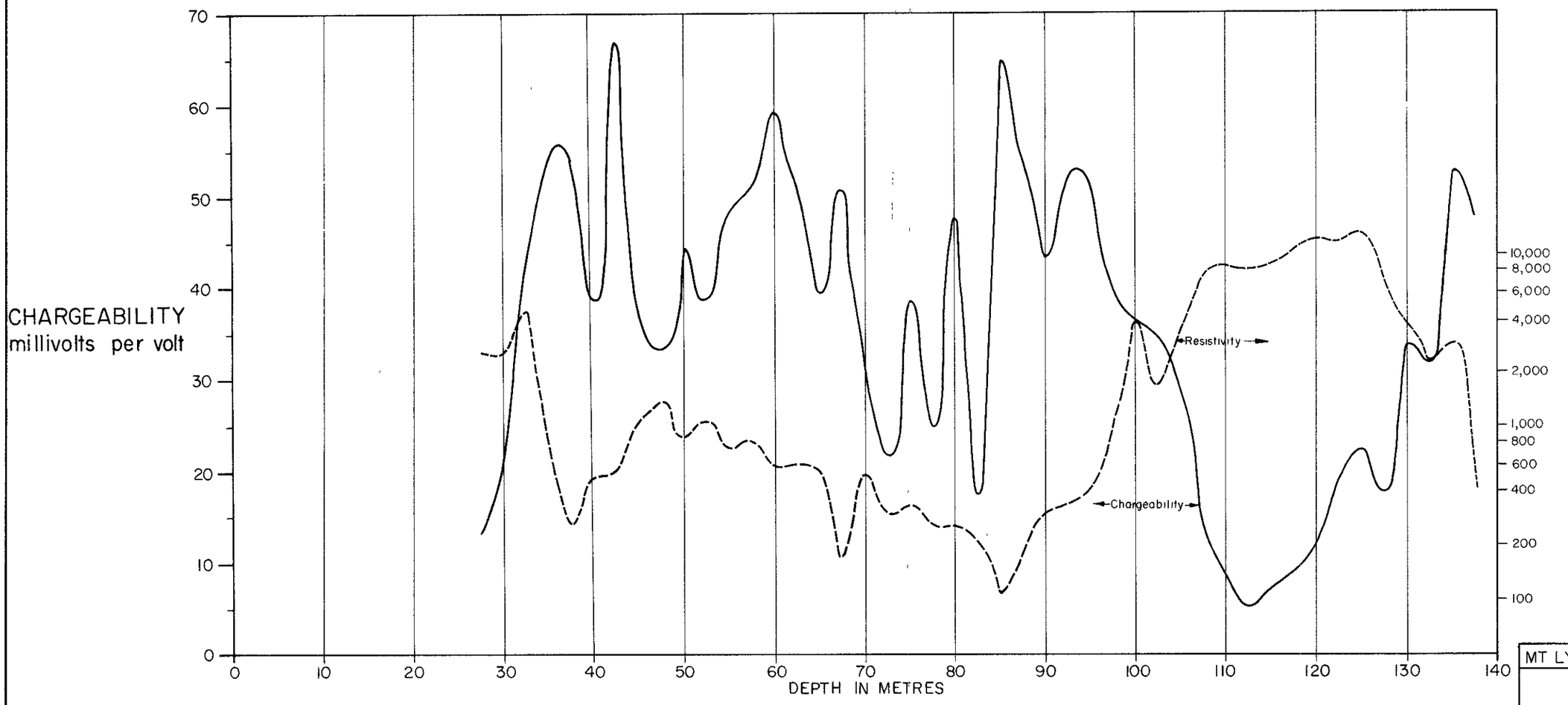
M.N
LEGEND
4-WD Access
Buildozed logging access
Degraded bulldozer track; Walking track
Soil Geochemistry -80 #
Mo
Ag
Zn
Pb
Cu
Ni
Co
100 0 100 200 300 400 500
Metres
MT. LYELL - G.O.D.L. JOINT VENTURE
E.L. 9/66
WHITE SPUR GRID
SOIL GEOCHEMISTRY - 80 #
5 cm
79-1384
DRAWN A WALTER
DRAFTING H D J
Contour Interval 20metres
DATE 17 June 1979
SCALE 1 6000
Map Number
FIG. II

138124

DRILL HOLE ASSAYS – % SULPHUR



CHARGEABILITY & RESISTIVITY



138125

79-1384

MT LYELL-GOD L JOINT VENTURE		
D D H WHITE SPUR I		
DOWN HOLE E I P		
LOG		
Date 5-8-79	Author A Walter	FIG 10

30N

Line 30N Pit

00

400S

800S

28N

Tyndall Mine

1200S

1600S

2000S

26N

2400S

2800S

25N

3200S

Newton Creek

3600S

24N

4000S

DDH HA3

23N

4400S

4800S

Trench B

5200S

22N

5600S

21N

Trench

6000S

Hematite-barite occurrence

6400S

20N

DDH HA182

Trench A

Creek

19N

Trench C

18N

17N

Tyndall

DDH TYN3

16N

TN MN

GROUND MAGNETIC COVERAGE

—·—·—	Rio Tinto 1959?,	100' stations
———	Mt Lyell 1967–68?, Fluxgate (vertical field),	100' stations
·····	Mt Lyell 1967–68?, Fluxgate (vertical field),	50' stations
– – – –	Mt Lyell 1975; Proton precession (total field),	50' stations

15N

14N

DDH TYN1

12N

10N

138126

5 cm

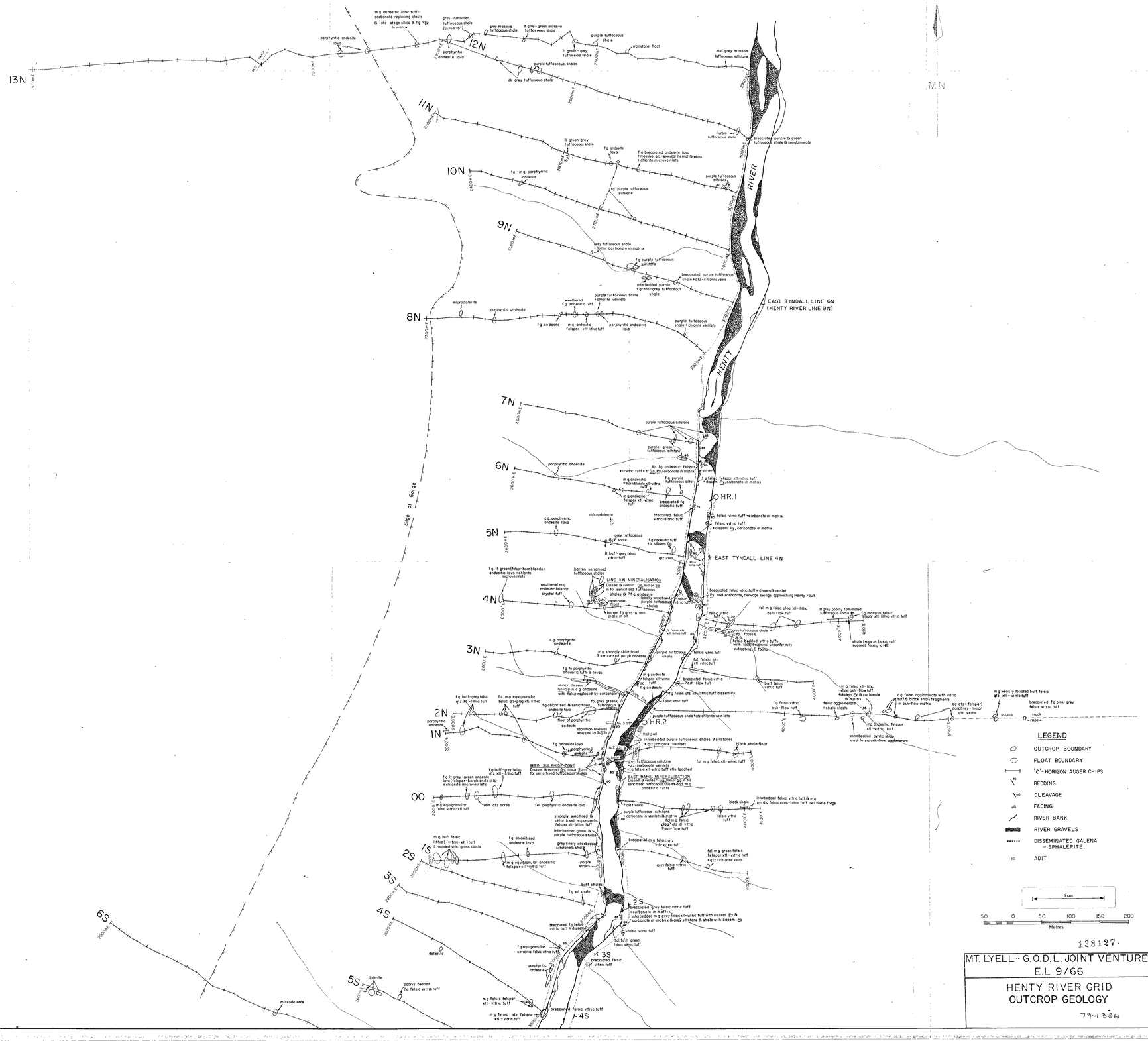
MT. LYELL – G O D.L JOINT VENTURE

HOWARDS ANOMALY

GROUND MAGNETIC COVERAGE

79-1384

SCALE 1"=500'	DATE 2-5-79	AUTHOR G D	FIG. 15



138127

SHEET 1 of 2

MT. LYELL – G.O.D.L. JOINT VENTURE E.L. 9/66	DRAWN R Mecrea
	DRAFTSMAN H.D.#
HENTY RIVER GRID OUTCROP GEOLOGY	DATE 1-7-1979
	SCALE 1:2500
79-4384	FIG. 16

1S 2S 3S 4S 5S 6S 7S 8S 9S 10S 11S 12S 13S 14S 15S 16S 17S 18S 19S 20S 2075S

RIVER

HENTY

BRADSHAWS ROAD

MN

dolerite

poorly bedded f.g felsic vitric tuff

microdolerite

m.g. feldsp. felspar xtl - vitric - lithic tuff

felsic vitric tuff

brecciated felsic vitric tuff

m.g andesitic felspar xtl vitric tuff

m.g felsic felspar xtl vitric tuff

felsic vitric tuff

serpentinised ultrabasic floater

fal felsic vitric tuff

m.g. felsic felspar xtl - lithic - vitric tuff

f.g felsic felspar xtl - vitric tuff

shale float in creek

black shale?

m g felsic tuff

brecciated m.g felsic xtl-vitric tuff + disseminated Py

f g grey felsic vitric tuff

f g felsic vitric tuff

barren felsic vitric tuffs + barren 10cm wide qtz - carbonate vein at E end

m.g. andesitic tuff

floaters of andesite and purple shale in creek bed

LT. ORANGE - BROWN FELSIC - INTERMEDIATE C-HORIZON CHIPS

green - grey laminated tuffaceous shale

m.g andesitic qtz - felspar xtl - vitric lithic ash-flow tuff

m g felsic felspar xtl - vitric tuff

intermittent outcrop

f.g. grey equigranular sericitic andesitic tuff + carbonate in matrix

LT. GREY FELSIC C-HORIZON CHIPS

f.g grey equigranular sericitic andesitic tuff + carbonate in matrix

m.g felsic felspar xtl-lithic - vitric tuff + f.g. felsic vitric tuff, local disseminated Py

f.g. buff - pink felsic vitric tuff

brecciated felsic vitric tuff + disseminated Py

felsic vitric tuff

brecciated felsic vitric tuff + disseminated Py

brecciated felsic vitric tuff

f.g. buff felsic felspar xtl - vitric tuff

edge of gorge

top of cliff

LEGEND

- OUTCROP BOUNDARY
- FLOAT BOUNDARY
- 'C' - HORIZON AUGER CHIPS
- BEDDING
- CLEAVAGE
- FACING
- RIVER BANK
- RIVER GRAVELS
- DISSEMINATED GALENA - SPHALERITE.
- ADIT

5 cm

50 0 50 100 150 200 Metres

SHEET 1
SHEET 2

138128

SHEET 2 of 2

MT. LYELL - G.O.D.L. JOINT VENTURE
E.L. 9/66

HENTY RIVER GRID
OUTCROP GEOLOGY

79-1384

DRAWN R Meares
DRAFTSMAN H D J
DATE 1-7-1979
SCALE 1:2500

FIG. 17

LEGEND

WEST OF HENTY FAULT

- Purple hematitic tuffaceous shales and siltstones
- Foliated grey-green tuffaceous shales
- Andesitic lavas, tuffs & agglomerates, fine grained to felspar porphyritic, minor microdolerite intrusions
- Felsic ash-fall tuffs; vitric to vitric-lithic-crystal, qtz-plag phyric
- sequence dips west but faces east; listed in stratigraphic order
- Disseminated & veinlets galena-sphalerite

EAST OF HENTY FAULT

- Felsic ash-flow vitric and crystal-vitric tuff, plag-qtz phyric; minor tuffaceous shale lenses
- Felsic ash-flow agglomerate; vitric and black shale clasts
- Black shale
- Quartz(-felspar) porphyry intrusive
- sequence dips and faces east

- Inferred geological boundary
- Inferred fault
- Major fault zone.

SHEET 1
SHEET 2

50 0 50 100 150 200
Metres

138129 SHEET 1 of 2

MT. LYELL - G.O.D.L. JOINT VENTURE E.L. 9/66	DRAWN R Meares
	DRAFTSMAN H D J
HENTY RIVER GRID INTERPRETIVE GEOLOGY	DATE 1-7-1979
	SCALE 1:2500
5 cm 79-13 Sht	FIG. 18

MT. LYELL - G.O.D.L. JOINT VENTURE

E.L. 9/66

HENTY RIVER GRID

SOIL & STREAM SEDIMENT

GEOCHEMISTRY

FIG. 19

79-1884

DRAWN: R. Martin

DRAFTSMAN: M.D.H.

DATE: 1-7-1979

SCALE: 1:2500

SHEET 1 of 2

1381.30

SHEET 1

SHEET 2

0 50 100 150 200

Metres

5 cm

STREAM SEDIMENT GEOCHEMISTRY

– 80# TOTAL DIGESTION

2420F Sample Number

0.1/0.5% Cu, Pb, Zn (ppm)

LEGEND

SOIL GEOCHEMISTRY (– 80#, B/C HORIZONS)

Mn, Zn, Cu, Pb, Ni, Co, Ag, As, Sb, Bi, Mo, Sn, W

Detection limit 5 ppm

Cu, Pb, Zn, Ni, Co, Ag, As, Sb, Bi, Mo, Sn, W

Detection limit 10 ppm

Mn

Detection limit 50 ppm

HENRY RIVER

BRADSHAWS ROAD

MN

24204 30,26,170

24215 10,41,65

24216 11,43,68

24205 30,25,90

24202 28,27,93

24201 30,31,86

24217 3,12,17

24218 7,41,49

24219 9,30,53

24220 4,18,47

24221 4,33,32

24222 3,37,66

24223 9,43,69

24224 5,19,54

24225 24, 30, 43

24226 15,33,64

24227 22,30,76

24228 29,28,100

24229 10,30,97

24230 4,14,41

24231 20,30,47

23826

23708

1S 2S 3S 4S 5S 6S 7S 8S 9S 10S 11S 12S 13S 14S 15S 16S 17S 18S 19S 20S 2075S

LEGEND

SOIL GEOCHEMISTRY (- 80#, B/C HORIZONS)

Mo, As, Zn, Pb, Cu, Ni, Ag, Sb, Bi (ppm)

N S (cross-cut)

STREAM SEDIMENT GEOCHEMISTRY

- 80#, TOTAL DIGESTION

24207 Sample Number
6,19,54 Cu, Pb, Zn (ppm)

138131

23826 – 23845 Feature No Gaps
+ 23708

SHEET 1
SHEET 2

50 0 50 100 150 200
Metres
5 cm

SHEET 2 of 2

MT. LYELL - G.O.D.L. JOINT VENTURE E.L. 9/66	DRAWN R Meares
	DRAFTSMAN H.D.A
	DATE 1-7-1979
HENTY RIVER GRID SOIL & STREAM SEDIMENT GEOCHEMISTRY 79-1384	SCALE 1:2500
	FIG. 20

138132

SHEET 1 of 2

MT. LYELL - G.O.D.L. JOINT VENTURE E.L. 9/66	DRAWN R Meares
	DRAFTSMAN H.O.#
HENTY RIVER GRID ROCK CHIP GEOCHEMISTRY AND PETROLOGY LOCATIONS 79-1384	DATE 1-7-1979
	SCALE 1:2500
	FIG.21

1S 2S 3S 4S 5S 6S 7S 8S 9S 10S 11S 12S 13S 14S 15S 16S 17S 18S 19S 20S 2075S

RIVER HENTY

BRADSHAWS ROAD

24357 ★ 15,20,140
24356 60, 10, 480
24355 90, 80, 130
24354 70, 110, 70
24406 30, 100, 45
24353 80, 10, 20
24352 ★ 30, 90, 200 ETCH 70N
24302,345 2, 10, 35 20, 10, 170
24360 10, 10, 870
24301, 346 15, 110, 300 25, 40, 280
24345 20, 30, 80
24199 ★ 35, 60, 70 ETCH, 170
24342 15, 20, 70
24198 8, 100, 75
24361 ★ 20, 20, 80
24362 ★ 20, 40, 140
24363 ★ 10, 20, 80
24364 ★ 70, 30, 80
24365 10, 20, 40
24366 2, 10, 10
24339 ★ 25, 30, 120
24340 ★ 25, 110, 200
24338 90, 20, 80
24337 ★ 90, 30, 180
24336 25, 20, 50 25, 20, 50
24186 5, 410, 25
24358 70, 20, 20
24359 IN 85, 10
24326-344 (9 channel samples) average 19/10, 17, 1 Opt Ag
24335 (qtz vein) 20, 410, 10, 1 Cu 19/14 g, 2.0 g/t Au
Adit

MN

LEGEND

24159 70, 28, 390 — sample number Cu, Pb, Zn (ppm)

24162 ★ Petrology sample

OUTCROP BOUNDARY

FLOAT BOUNDARY

5 cm

50 0 50 100 150 200 Metres

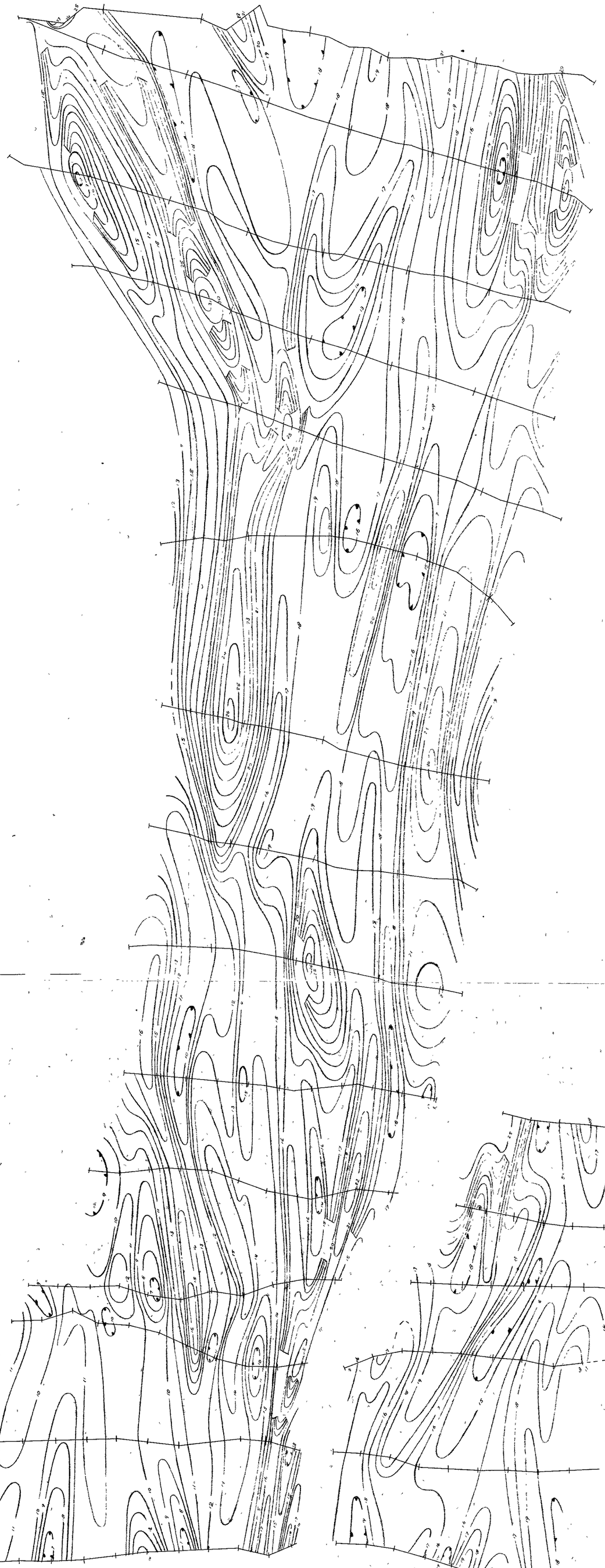
SHEET 1

SHEET 2

138133 SHEET 2 of 2

MT. LYELL - G.O.D.L. JOINT VENTURE E.L. 9/66	DRAWN R Meares
	DRAFTSMAN H D J
	DATE 1-7-1979
HENTY RIVER GRID ROCK CHIP GEOCHEMISTRY AND PETROLOGY LOCATIONS	SCALE 1:2500
	FIG. 22

79-1584



00

/S

MOUNT LYELL MINING & RAILWAY COMPANY LTD.

WEST HENTY GRID

NR QUEENSTOWN - TASMANIA

GRADIENT ARRAY EIP SURVEY
CHARGEABILITY CONTOUR PLAN

138134

SURVEYED & COMPILED BY
SCINTREX

5 cm

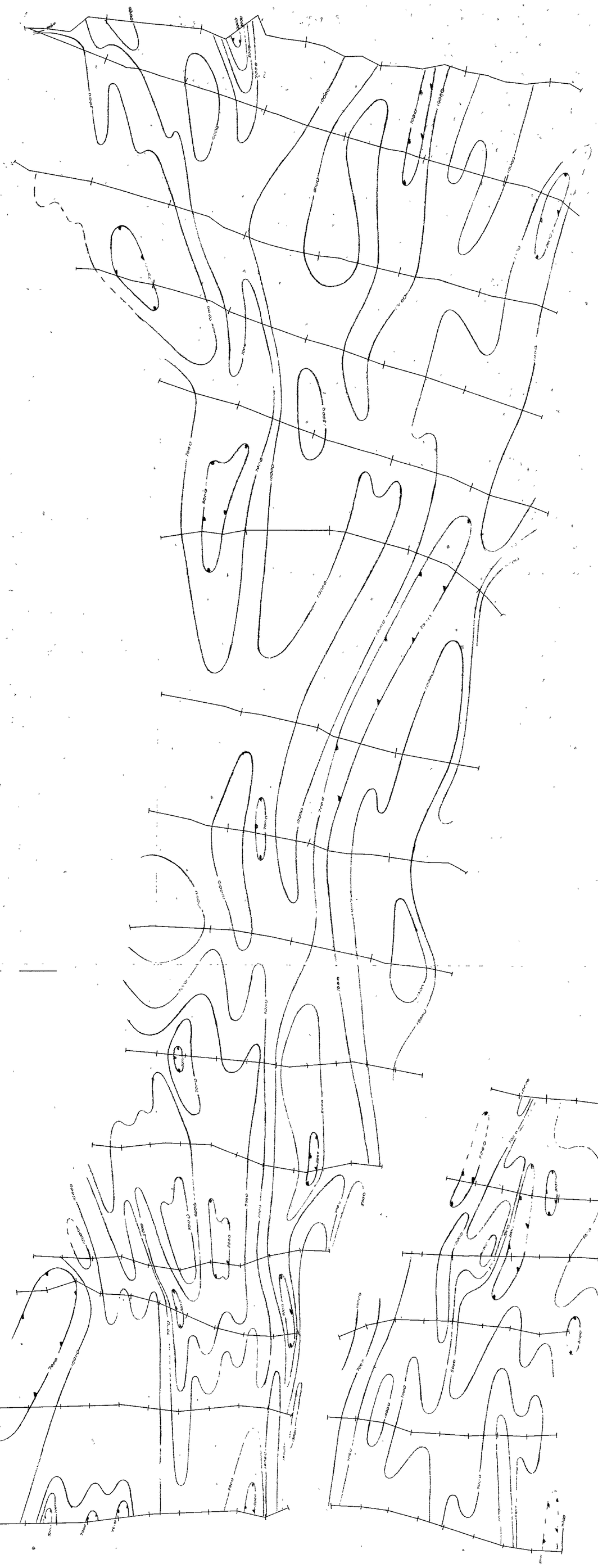
JUNE 1978 (TAS-054)
NOV '78 & JAN '79 (TAS-062)

SCALE 1:2500

Job N° TAS-062 (-054) Sht 1 of 1 PLATE 1

79 L384

FIG.23



MOUNT LYELL MINING & RAILWAY COMPANY LTD

WEST HENTY GRID

NR. QUEENSTOWN - TASMANIA

GRADIENT ARRAY EIP SURVEY

RESISTIVITY CONTOUR PLAN

138135

SURVEYED & COMPILED BY
SCINTREX

JUNE 1968 (TAS-054)
NOV '78 & JAN '79 (TAS-062)

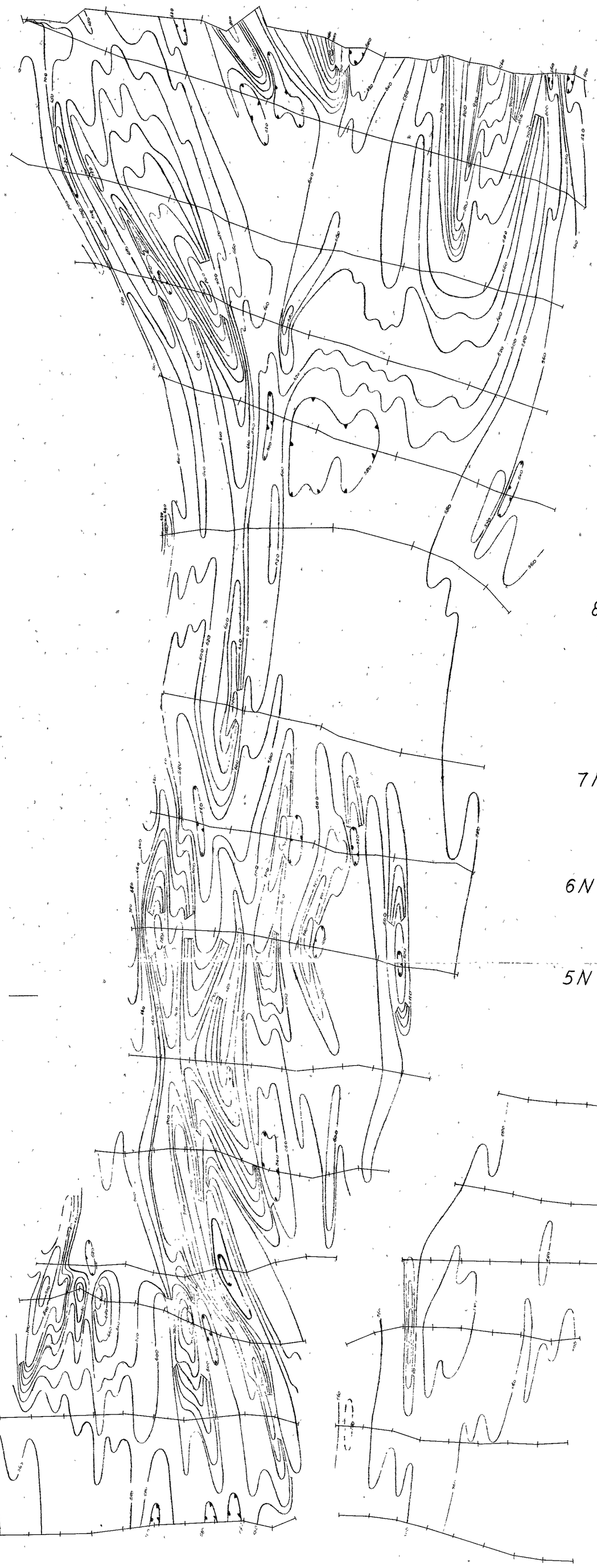
SCALE 1 2500

5 cm

Job N° TAS-062 (054) Sht 1 of 1 PLATE 2

79-1384

FIG. 24



Note

For total magnetic field add 62000 gammas to all values

5 cm

MOUNT LYELL MINING & RAILWAY COMPANY LTD

WEST HENTY GRID

NR QUEENSTOWN - TASMANIA

TOTAL MAGNETIC FIELD SURVEY
CONTOUR PLAN

SURVEYED & COMPILED BY
SCINTREX

JANUARY 1979

138136

SCALE 1 2500

Job Nº TAS-062 Sht 1 of 1 PLATE 3

79-1384

FIG. 25

13N
12N
11N
10N
9N
8N
7N
6N
5N
4N
3N
2N
1N
00
1S
2S
3S
4S
5S
6S

andesitic lithic tuff flooded with carbonate replacing clasts assayed 0.22% Zn,3g/t Ag

outcrop of andesitic crystal-vitric tuff assayed 0.135% Pb

outcrop of felsic tuff assayed 0.10% Zn

outcrop of green tuffaceous shale assayed 0.37% Pb,3g/t Ag

outcrop of felsic vitric tuff assayed 0.10% Cu

outcrop of andesite + dissem Cu + Sp assayed 0.39% Pb

outcrop of fg andesite assayed 0.52% Zn

PROPOSED HR4

PROPOSED HR 3

HR.1

HR 2

HENTY RIVER

approximate position - edge of gorge

extension

strike

20g/t Au

No. 3 adit

No. 2 adit

No. 1 adit

Portal

Camp

access track

MN

LEGEND

SOIL GEOCHEMISTRY (B/C HORIZONS)

- Ag ≥ 2ppm
- Zn ≥ 500ppm
- Pb ≥ 500ppm
- Cu ≥ 100 ppm

INDUCED POLARISATION (Gradient Array)

- Chargeability ////// 20 mv/v
- 20 mv/v contour
- Resistivity \\\\\\\ < 3000ohm-metre

GROUND MAGNETICS (Proton Precession)

- Magnetic axis XXXXX > 62,900 gammas

MINERALISATION

- Disseminated galena-sphalerite

DIAMOND DRILL HOLES

- Completed
- Proposed

5 cm

50 0 50 100 150 200

Metres

SHEET

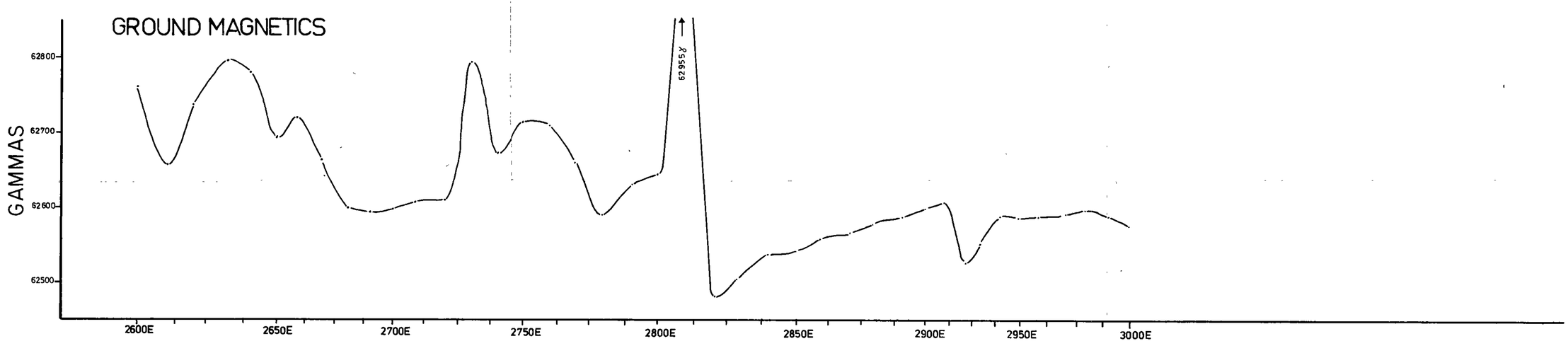
SHEET 2

138137

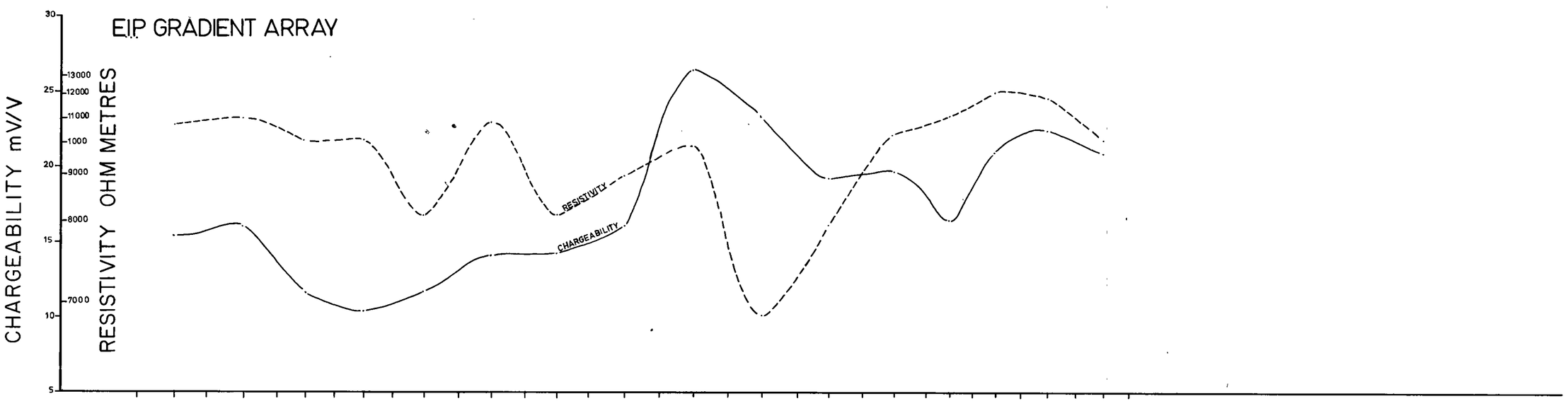
SHEET 1 of 2

MT. LYELL - G.O.D.L. JOINT VENTURE E.L. 9/66	DRAWN R Magres
	DRAFTSMAN H D J
HENTY RIVER GRID ANOMALY COMPILATION	DATE 1-7-1979
	SCALE 1:2500
79-1284	FIG. 26

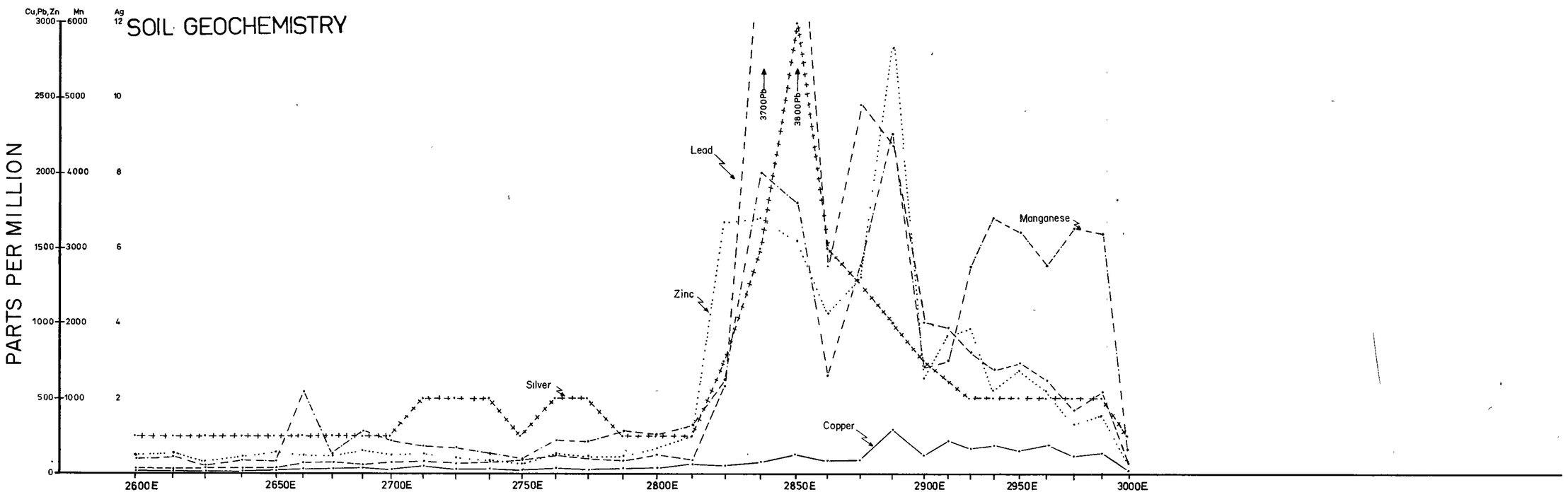
GROUND MAGNETICS



EIP GRADIENT ARRAY

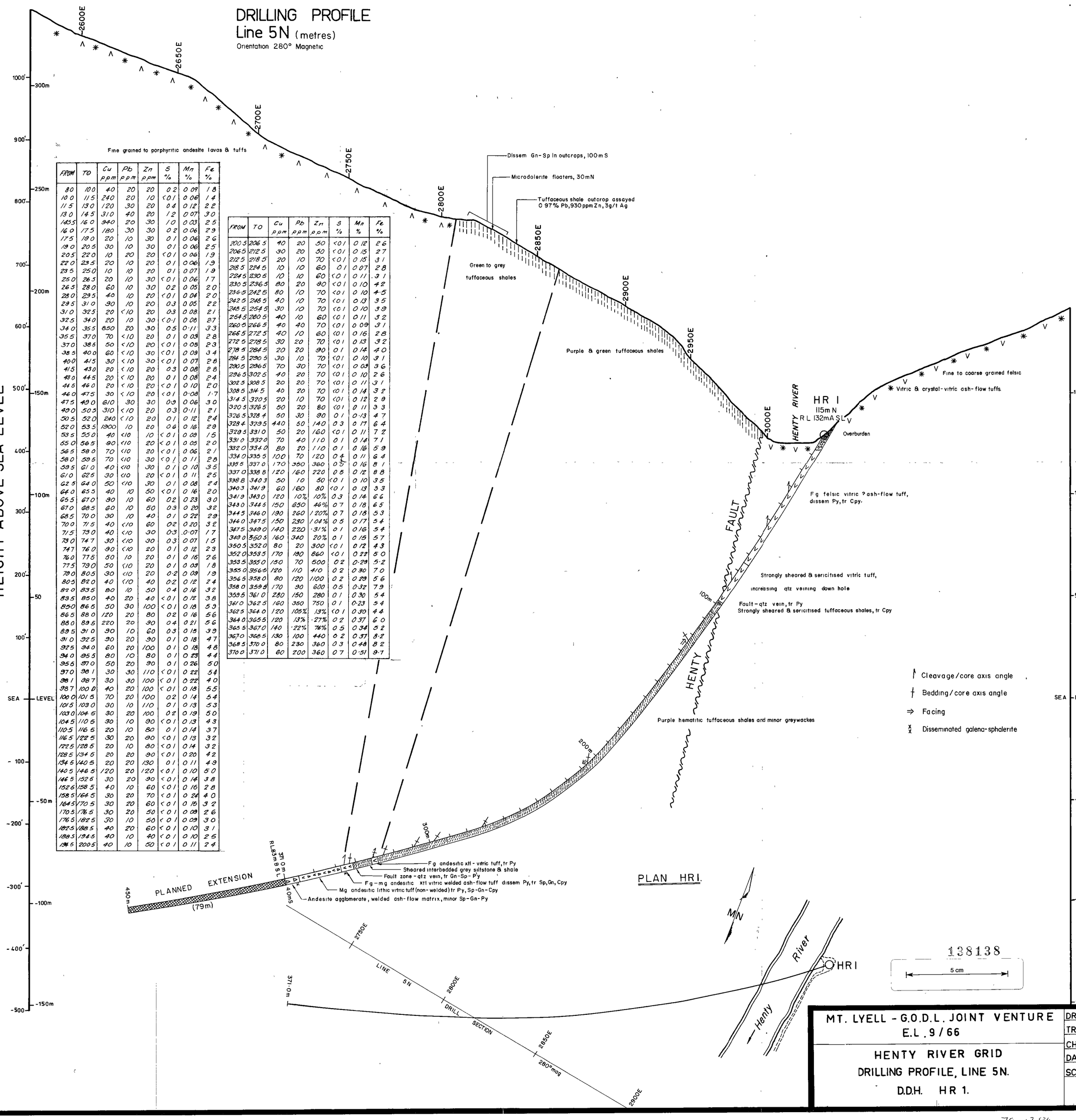


SOIL GEOCHEMISTRY



DRILLING PROFILE
Line 5N (metres)

Orientation 280° Magnetic



FROM	TO	Cu ppm	Pb ppm	Zn ppm	S %	Mn %	Fe %
80	100	40	20	20	02	009	18
100	115	240	20	10	<01	006	14
115	130	120	30	20	04	012	22
130	145	310	40	20	12	007	30
1455	160	940	20	30	10	003	25
160	175	180	30	30	02	006	29
175	190	20	10	30	01	006	26
190	205	30	10	30	01	006	25
205	220	10	20	20	<01	006	19
220	235	20	10	20	01	006	19
235	250	10	10	20	01	007	19
250	265	20	10	30	<01	006	17
265	280	60	10	30	02	005	20
280	295	40	10	20	<01	004	20
295	310	90	10	20	03	005	22
310	325	20	<10	20	03	008	21
325	340	20	10	30	<01	008	27
340	355	850	20	30	05	011	33
355	370	70	<10	20	01	003	28
370	385	50	<10	20	<01	005	23
385	400	60	<10	30	<01	009	34
400	415	30	<10	30	<01	007	28
415	430	20	<10	20	03	008	28
430	445	20	<10	20	01	008	24
445	460	20	<10	20	<01	010	20
460	475	30	<10	20	<01	008	17
475	490	610	30	30	09	006	30
490	505	310	<10	20	03	011	21
505	520	240	<10	20	01	012	24
520	535	1900	10	20	06	016	29
535	550	40	<10	10	<01	009	15
550	565	90	<10	20	<01	005	20
565	580	70	<10	20	<01	006	21
580	595	70	<10	30	<01	011	28
595	610	40	<10	30	01	010	35
610	625	30	<10	20	<01	011	25
625	640	50	<10	30	01	008	24
640	655	40	10	50	<01	016	20
655	670	90	10	60	02	023	30
670	685	60	10	50	03	020	32
685	700	30	10	40	01	022	29
700	715	40	<10	60	02	020	32
715	730	40	<10	30	03	007	17
730	747	30	<10	30	03	007	15
747	760	90	<10	20	01	012	23
760	775	50	10	20	01	016	26
775	790	50	<10	20	01	009	18
790	805	30	<10	20	02	009	19
805	820	40	<10	40	02	012	24
820	835	80	10	50	04	016	32
835	850	40	20	40	<01	012	38
850	865	50	30	100	<01	018	53
865	880	120	20	80	02	016	56
880	895	220	20	90	04	021	56
895	910	90	10	60	03	015	39
910	925	90	20	90	01	018	47
925	940	60	20	100	01	018	48
940	955	80	10	80	01	023	44
955	970	50	20	90	01	026	50
970	981	30	30	110	<01	022	54
981	987	30	30	100	<01	022	40
987	1000	40	20	100	<01	018	55
1000	1015	70	20	100	02	014	54
1015	1030	30	10	110	01	013	53
1030	1045	30	20	100	02	019	50
1045	1105	30	10	90	<01	013	43
1105	1165	20	10	80	01	014	37
1165	1225	30	20	90	<01	013	32
1225	1285	20	10	80	<01	014	32
1285	1345	20	20	90	<01	020	42
1345	1405	20	20	130	01	011	49
1405	1465	120	20	120	<01	010	50
1465	1525	30	20	90	<01	014	38
1526	1585	40	10	60	<01	016	28
1585	1645	30	20	70	<01	026	40
1645	1705	30	20	60	<01	016	32
1705	1765	30	20	50	<01	009	26
1765	1825	30	10	50	<01	009	30
1825	1885	40	20	60	<01	010	31
1885	1945	40	10	40	<01	010	25
1945	2005	40	10	50	<01	011	24

FROM	TO	Cu ppm	Pb ppm	Zn ppm	S %	Mn %	Fe %
2005	2065	40	20	50	<01	012	26
2065	2125	30	20	50	<01	015	27
2125	2185	20	10	70	<01	015	31
2185	2245	10	10	60	01	007	28
2245	2305	10	10	60	<01	011	31
2305	2365	80	20	90	<01	010	42
2365	2425	80	10	70	<01	010	45
2425	2485	40	10	70	<01	013	35
2485	2545	30	10	70	<01	010	39
2545	2805	40	10	60	<01	011	32
2605	2665	40	40	70	<01	009	31
2665	2725	40	10	60	<01	016	28
2725	2785	30	20	70	<01	013	32
2785	2845	20	20	90	01	014	40
2845	2905	30	10	70	<01	010	31
2905	2965	70	30	70	<01	003	36
2965	3025	40	20	70	<01	010	26
3025	3085	20	20	70	<01	011	31
3085	3145	40	20	70	<01	014	32
3145	3205	20	10	70	<01	012	29
3205	3265	50	20	80	<01	011	33
3265	3284	50	30	90	01	013	47
3284	3295	440	50	140	03	017	64
3295	3310	50	20	160	<01	011	72
3310	3320	70	40	110	01	014	71
3320	3340	80	20	110	01	016	59
3340	3355	100	70	120	04	011	64
3355	3370	170	380	360	05	016	81
3370	3388	120	160	220	05	012	88
3388	3403	50	10	50	<01	010	35
3403	3419	60	160	80	<01	013	33
3419	3430	120	10%	10%	03	014	66
3430	3445	150	650	46%	07	018	65
3445	3460	190	260	120%	07	018	53
3460	3475	150	230	104%	05	017	54
3475	3490	140	220	·31%	01	016	54
3490	3505	160	340	20%	01	015	57
3505	3520	80	20	300	<01	012	43
3520	3535	170	190	860	<01	022	50
3535	3550	150	70	500	02	029	52
3550	3565	120	110	410	02	030	70
3565	3580	80	120	1100	02	029	56
3580	3595	170	90	600	05	032	79
3595	3610	280	150	280	01	030	54
3610	3625	160	350	750	01	023	54
3625	3640	120	105%	13%	<01	030	44
3640	3655	120	13%	·27%	02	037	60
3655	3670	140	·22%	76%	05	034	52
3670	3685	130	100	440	02	037	82
3685	3700	80	230	360	03	048	82
3700	3710	60	200	360	07	051	97

MT. LYELL - G.O.D.L. JOINT VENTURE E.L. 9/66	DRAWN. R MEARES TRACED. P RIMMER CHECKED DATE. 7/3/79. SCALE. 1/1000
HENTY RIVER GRID DRILLING PROFILE, LINE 5N. D.D.H. HR 1.	1/505

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FIG. 27

GROUND MAGNETICS

GAMMAS: 62900, 62700, 62500, 62300, 62100

63109γ

2000E 2200E 2400E 2600E 2800E 3000E 3200E 3400E 3600E

E.I.P. GRADIENT ARRAY

CHARGEABILITY- millivolts per volt: 20, 15, 10, 5, 0

RESISTIVITY- ohm metres: 20000, 10000, 9000, 8000, 7000, 6000, 5000, 4000, 3000, 2000, 1000

Chargeability

Resistivity

SOIL GEOCHEMISTRY

PARTS PER MILLION — Cu, Pb, Zn: 1200, 1000, 800, 600, 400, 200, 0 — Mn: 3000, 2500, 2000, 1500, 1000, 500

Pb 1800

Manganese

Lead

Zinc

Copper

N.B. All Ag < 2ppm

DRILLING PROFILE LINE 2N (imperial)

Orientation 270° Magnetic

1000' 300m 900' 250m 800' 200m 700' 150m 600' 100m 500' 50m 400' 0 300' -50m 200' -100m 100' -150m SEA LEVEL -100' -150m -200' -300' -400' -500'

2000E 2100E 2200E 2300E 2400E 2500E 2600E 2700E 2800E 2900E 3000E 3100E 3200E 3300E 3400E 3500E 3600E 3700E

Porphyritic andesite lava

Fine to coarse grained felsic vitric and crystal-vitric ash-fall tuffs.

Fine grained to porphyritic andesite lavas & tuffs

Prospectors campsite

Minor dissem Gn-Sp in creek 50m N

No. 3 adit 20mS

HR2 25m SW RL 126m ASL

HENTY RIVER

Overburden

Fg andesite lava

Qtz vein, dissem Py

Sericitised purple tuffaceous shales, dissem Py

Fault zone - sheared sericitised lava & shales, dissem Py, tr Cpy

Sheared grey siltstones & shales

Fault zone - qtz vein

Fg-m g felsic qtz-felsp xtl-vitric tuff, tr Py

Interbedded grey tuffaceous shale-siltstone -greywacke, tr Py

Fg-m g andesitic qtz-felsp xtl-vitric(-lithic) tuff

Interbedded grey siltstones & shales

Andesitic xtl-vitric tuff

Interbedded grey siltstones & shales

Andesite agglomerate, dissem Py

Fg-m g andesite lava, tr Py

Andesite agglomerate, minor Py, Sp-Gn

Fg-m g andesite lava, tr Py, Gn

Andesitic lithic-vitric-xtl tuff, segregations-dissem Ga-Sp, tr Py, Cpy

M-g andesite lava, tr Sp-Gn-Py

Fg andesite lava, tr Py

Amygdaloidal andesite lava with ? pillows

Fg intermediate intrusive, tr Py-Gn-Sp

Green & grey tuffaceous shales

Purple tuffaceous shale

Fine to coarse grained felsic vitric & crystal-vitric ash-flow tuffs

100m 200m 230.5m RL 35m BSL 52m N

FROM	TO	Cu	Pb	Zn	Ag	S	Mn	Fe
		ppm	ppm	ppm	g/t	%	%	%
30	45	<100	<100	100		02	0 12	58
45	60	<100	<100	100		<01	0 14	63
60	75	<100	<100	<100		<01	0 16	61
75	98	<100	<100	200		<01	0 13	61
98	1015	<100	<100	<100		08	0 07	41
1015	115	<100	<100	100		01	0 07	64
115	130	<100	<100	100		02	0 09	53
130	145	<100	<100	<100		<01	0 09	58
145	160	<100	<100	<100		<01	0 09	51
160	1815	<100	<100	<100		<01	0 12	48
185	190	600	<100	<100		<01	0 17	60
190	205	200	<100	100		<01	0 17	67
205	220	<100	<100	<100		03	0 10	67
220	235	<100	<100	<100		01	0 11	59
235	250	<100	<100	<100		01	0 12	55
250	265	<100	<100	100		<01	0 19	66
265	280	200	<100	100		<01	0 26	86
280	295	<100	<100	100		<01	0 24	86
295	310	<100	<100	100		02	0 20	88
310	325	<100	<100	100		04	0 12	60
325	340	<100	<100	100		<01	0 12	62
340	355	<100	<100	<100		<01	0 15	52
355	370	<100	<100	100		<01	0 17	70
370	385	<100	<100	100		<01	0 20	72
385	400	<100	<100	<100		<01	0 11	68
400	415	<100	200	<100		<01	0 15	72
415	430	<100	200	<100		<01	0 17	80
430	439	<100	100	<100		<01	0 20	103
439	460	<100	<100	<100		01	0 13	68
460	475	100	100	<100		<01	0 16	83
475	490	100	<100	100		<01	0 14	67
490	505	100	<100	100		<01	0 15	66
505	520	100	<100	200		<01	0 12	74
520	535	100	400	600		<01	0 13	80
535	550	100	300	400		<01	0 15	71
550	565	400	<100	200		01	0 22	114
565	584	100	200	100		<01	0 21	50
584	595	<100	400	300		03	0 32	56
595	610	<100	200	400		09	0 18	64
610	625	<100	400	400		06	0 21	67
625	640	100	200	400		02	0 20	72
640	655	100	<100	200		03	0 12	75
655	670	200	200	300		03	0 17	75
670	685	<100	300	400		08	0 19	68
685	700	100	100	300		02	0 11	77
700	715	<100	<100	200		<01	0 14	64
715	730	200	<100	100		<01	0 14	60
730	745	<100	400	200		02	0 16	57
745	760	100	400	300		<01	0 14	84
760	775	200	100	300		02	0 11	73
775	790	<100	<100	200		08	0 22	67
790	805	<100	<100	300		09	0 18	69
805	820	<100	<100	300		07	0 15	66
820	835	<100	<100	100		<01	0 16	40
835	850	100	<100	200		<01	0 10	46
850	865	100	100	200		01	0 15	55
865	880	100	300	500		<01	0 14	57
880	895	100	200	300		<01	0 13	60
895	910	<100	<100	200		<01	0 11	56
910	925	<100	<100	200		01	0 10	46
925	940	<100	<100	200		<01	0 13	44
940	955	<100	<100	200		<01	0 10	56
955	970	<100	<100	200		<01	0 15	55
970	985	<100	<100	200		<01	0 14	61
985	1000	<100	<100	200		<01	0 14	56
1000	1015	<100	<100	200		<01	0 14	56
1015	1030	<100	<100	300		<01	0 12	56
1030	1045	<100	<100	300		<01	0 10	45
1045	1060	<100	<100	200		<01	0 09	44
1060	1075	200	<100	200		<01	0 15	54
1075	1087	100	<100	200		<01	0 17	60
1087	1105	200	<100	200		01	0 13	68
1105	1127	100	200	300		03	0 16	65
1127	1150	<100	400	300		<01	0 16	49
1150	1165	100	200	400		02	0 08	74
1165	1180	100	200	200		05	0 12	76
1180	1195	100	200	300		03	011	89
1195	1206	100	200	200		07	0 10	78
1206	1225	100	200	300		03	0 24	75
1225	1240	<100	300	400		01	0 23	38
1240	1255	100	200	400		01	0 41	57
1255	1270	<100	200	300		05	0 48	62
1270	1285	100	<100	300		01	0 61	70
1285	1300	100	<100	300		02	0 54	102
1300	1315	<100	100	600		02	0 55	97
1315	1330	100	<100	400		<01	0 59	100
1330	1345	100	<100	300		02	0 67	84
1345	1365	100	100	700		<01	0 50	87
1365	1375	200	<100	400	3	02	0 42	96
1375	1390	200	<100	200	4	01	0 34	81

All Ag (g/t) < 2 except where noted

FROM	TO	Cu	Pb	Zn	Ag	S	Mn	Fe
		ppm	ppm	ppm	g/t	%	%	%
1390	1405	200	700	600	4	01	0 30	56
1405	1420	300	600	400	3	01	0 26	54
1420	1435	200	300	300	6	<01	0 37	59
1435	1450	<100	400	190	5	01	067	100
1450	1465	<100	120	130	5	01	0 50	104
1465	1480	<100	77%	68%	3	05	0 59	70
1480	1495	<100	38%	38%	6	03	0 66	102
1495	1509	100	160	260	5	01	0 65	93
1509	1525	200	110	115	3	01	0 45	63
1525	1535	100	258%	150%	3	11	0 50	138
1535	1545	130	152%	0.57%	4	05	060	101
1545	1555	140	219%	0 65%	5	07	050	83
1555	1565	140	515%	138%	13	15	0 60	94
1565	1575	150	1.95%	0 69%	3	07	040	69
1575	1585	50	N70%	1.51%	48	26	030	20
1585	1595	40	6 49%	1.90%	13	19	020	14
1595	1605	70	3.36%	2.37%	18	17	030	40
1605	1615	80	3 73%	3 00%	22	22	030	83
1615	1625	70	6.16%	3 45%	23	28	040	80
1625	1635	140	4 65%	2.78%	16	23	040	74
1635	1645	110	1.16%	2.27%	6	16	040	111
1645	1655	70	0.14%	0.10%	<2	01	040	68
1655	1665	60	1.50%	0.56%	4	05	050	76
1665	1675	100	4.14%	0 80%	8	10	050	70
1675	1690	<100	0.37%	0.19%	3	01	038	55
1690	1700	<100	900	900	2	01	044	89
1700	1720	<100	200	300		<01	037	64
1720	1735	<100	100	400		02	039	85
1735	1750	<100	<100	200		<01	028	59
1750	1765	100	<100	300		01	037	57
1765	1780	<100	<100	200		01	028	55
1780	1795	210	270	170		<01	021	43
1795	1810	100	510	3700		03	022	48
1810	1825	100	110	1480		<01	026	59
1825	1840	80	250	2400		01	041	72
1840	1855	110	140	380		01	034	62
1855	1870	90	80	1060		01	040	79
1870	1885	280	150	460		01	029	74
1885	1900	120	130	780		01	030	53
1900	1915	130	150	1450		02	023	50
1915	1930	100	340	2300		01	024	37
1930	1945	80	460	730		01	023	36
1945	1960	90	300	900		<01	028	28
1960	1975	160	370	140		<01	023	26
1975	1990	120	170	170		<01	022	28
1990	2005	140	320	430		<01	024	31
2005	2020	130	470	720		<01	030	41
2020	2035	130	570	240		01	031	44
2035	2050	110	300	620		<01	033	42
2050	2065	130	500	370		<01	044	60
2065	2080	110	870	700		01	033	42
2080	2095	110	900	250		<01	030	47
2095	2110	100	590	420		<01	030	39
2110	2125	150	400	370		01	032	52
2125	2140	120	510	250		01	037	49
2140	2155	90	430	260		<01	030	36
2155	2170	70	190	180		01	027	37
2170	2185	110	150	550		<01	031	52
2185	2200	70	220	230		01	045	65
2200	2210	60	40	130		01	039	77
2210	2230	80	30	220		01	049	82
2230	2245	70	20	300		01	067	125
2245	2260	60	60	270		01	043	77
2260	2275	70	60	310		01	043	89
2275	2290	60	40	250		01	041	80
2290	2305	70	40	250		01	053	92

PLAN HR2

N mag

230.5m

dissem Gn-Sp in c-g andesite

Creek 24206

Flying Fox

River

2400E 2500E 2600E 2700E 2800E 2900E 3000E 3200E 3300E 3400E

LINE 2N

DRILL SECTION 270° mag.

No. 3 adit

HR2

HELIPAD

Henty

No. 2 adit

Dissem Gn-Sp in fol lt green tuffaceous shales

No. 1 adit

CAMP

↑ Cleavage / core axis angle

† Bedding / core axis angle

⇒ Facing

x x Disseminated galena-sphalerite

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MT. LYELL - G.O.D.L. JOINT VENTURE

E.L. 9/66

HENTY RIVER GRID
DRILLING PROFILE, LINE 2N
D.D.H. HR2

1/506

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FIG. 28

MT SEDGWICK
1147m

post-Cambrian rocks and Tyndall Group (Upper Cambrian)

Sedgwick Porphyry

Mt Sedgwick Anomaly Zone

Extent of Tyndall Group (Upper Cambrian) and post-Cambrian rocks

Owen Conglomerate (Ordivician)

Comstock Valley covered with Pleistocene glacials and Recent alluvials

PORPHYRY CREEK

COMSTOCK CREEK

LEGEND

SOIL GEOCHEMISTRY

A Horizon · B, C Horizons

- Ag ≥ 2 ppm
- Zn ≥ 100 ppm
- Pb ≥ 300 ppm
- Cu ≥ 100 ppm

E.I.P. GEOPHYSICS – RECONNAISSANCE GRADIANT ARRAY

Chargeability /////////\ >20 milliseconds

Resistivity \\\\\\\\/ <1000 ohm-metres

(L.B 20N/1215W – 750W Detailed Gradient Array)

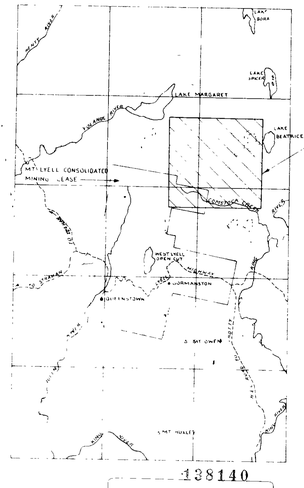
Major E.I.P. trends

Diamond Drill Holes

T M

N

LOCATION



138140

5 cm

MT. LYELL-G.O.D.L. JOINT VENTURE.
GEOLOGICAL DEPARTMENT

E.L. 9/66.

BEATRICE GRID

ANOMALY COMPILATION

FIG. 29

DRAWN	M.H.
TRACED	P.R.
CHECKED	
DATE	AUG' 79
SCALE	1:6000

10/304

79-1384

BEATRICE MSAZ

Copper - 80#

'B' & 'C' HORIZON

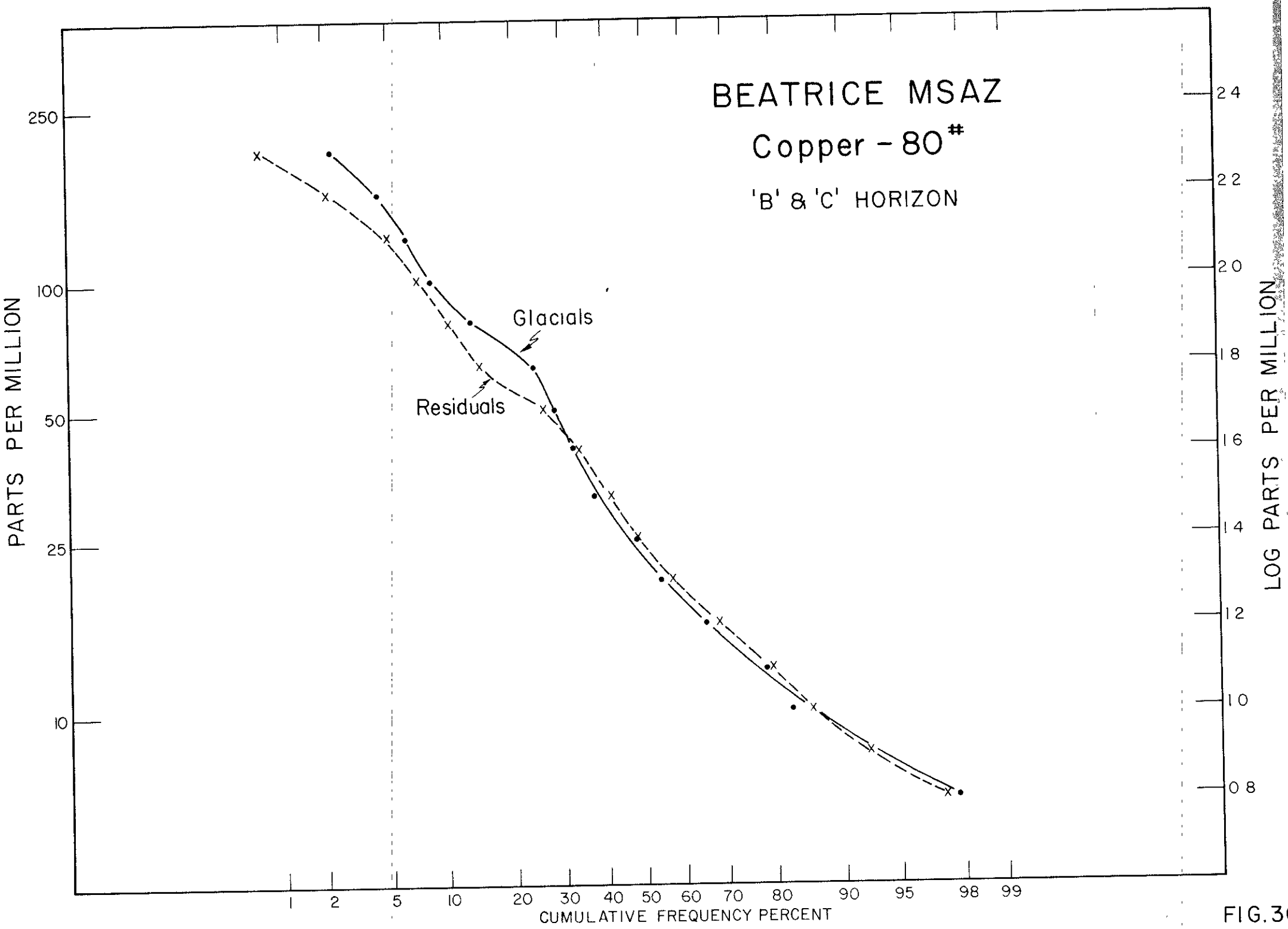


FIG. 3C

79-1384

138141

BEATRICE MSAZ
Lead - 80
'B' & 'C' HORIZON

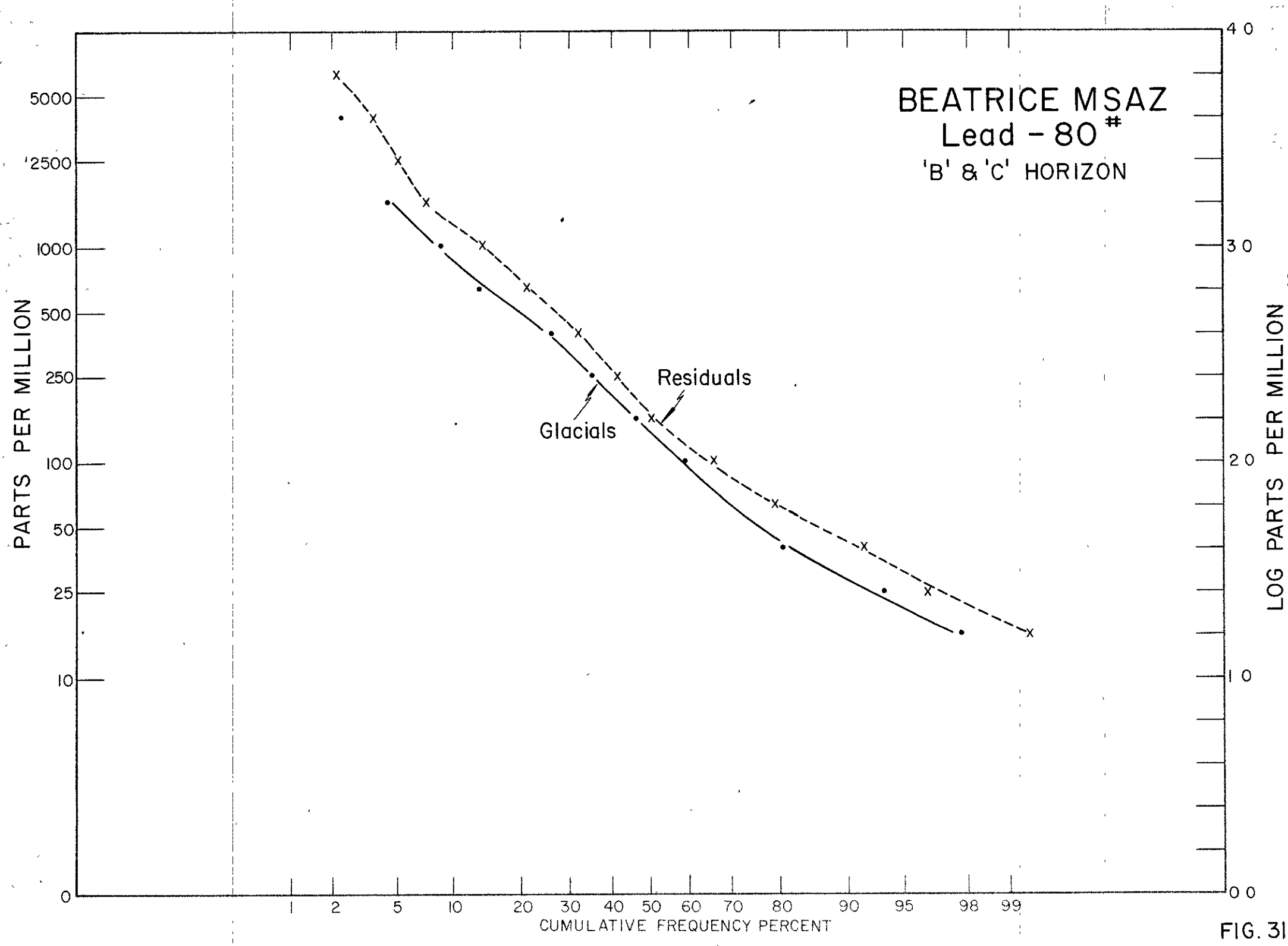


FIG. 31

49-1384

138142

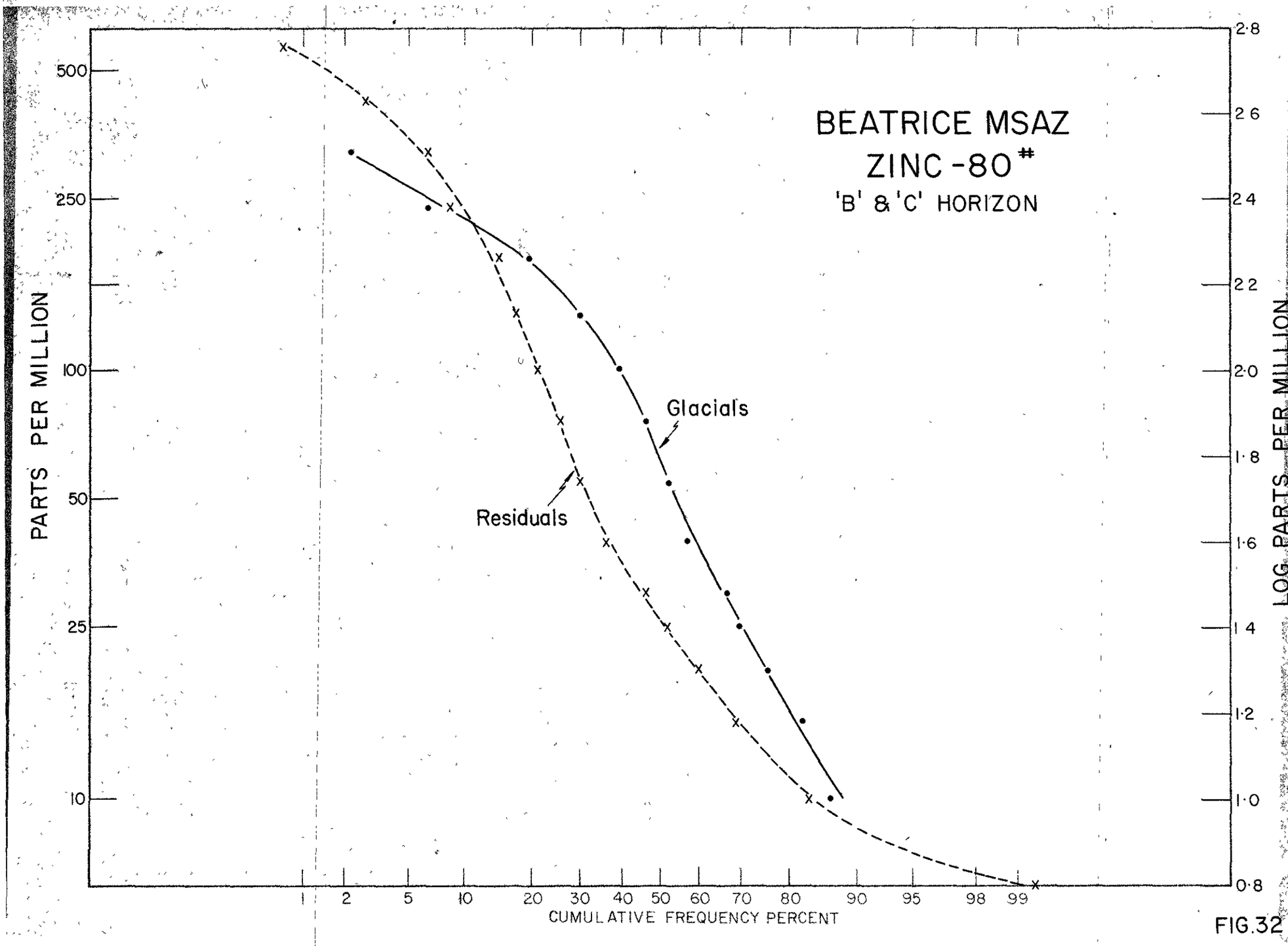


FIG.32

49-1384

138143

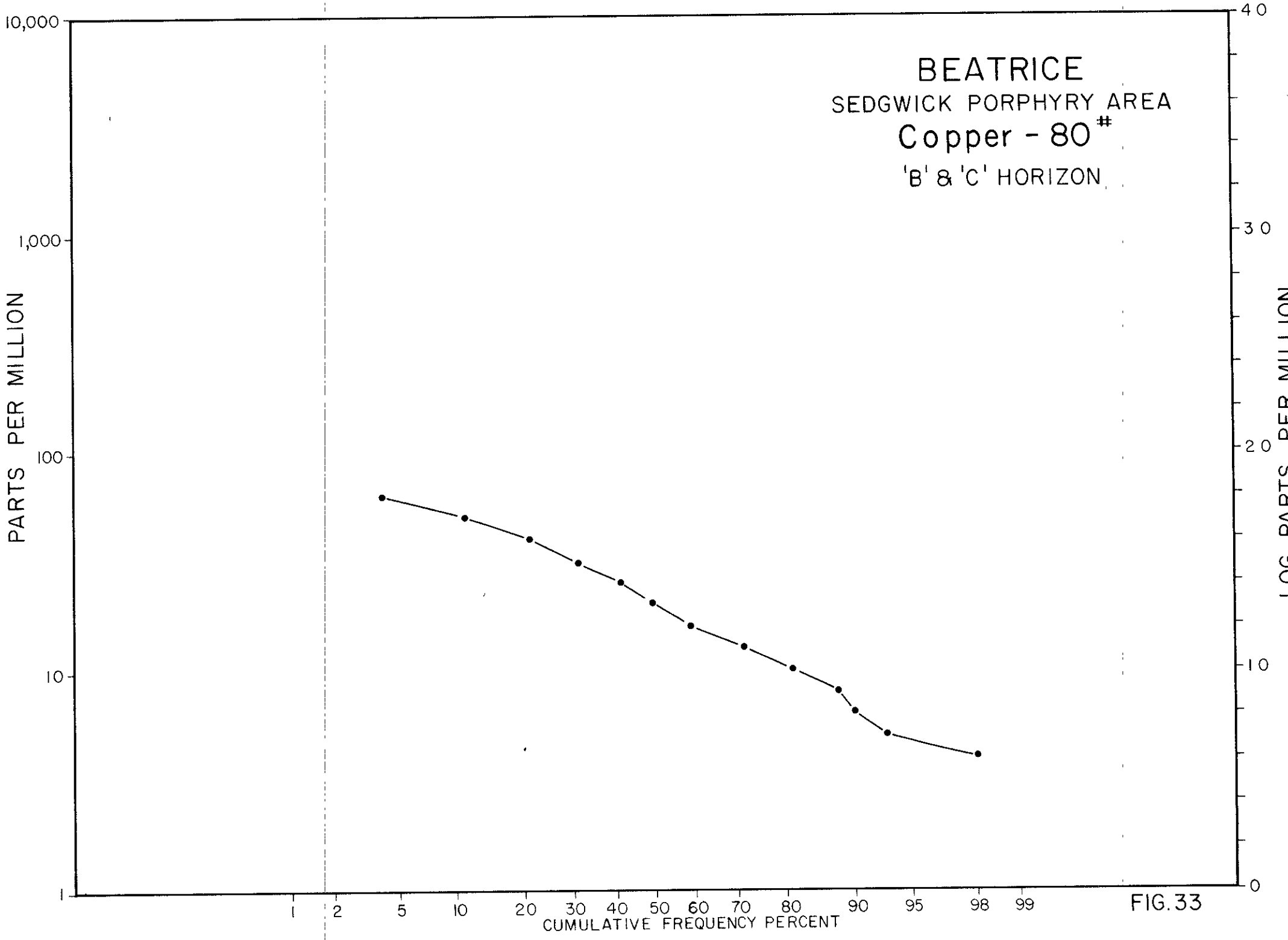


FIG. 33

79-1384

138144

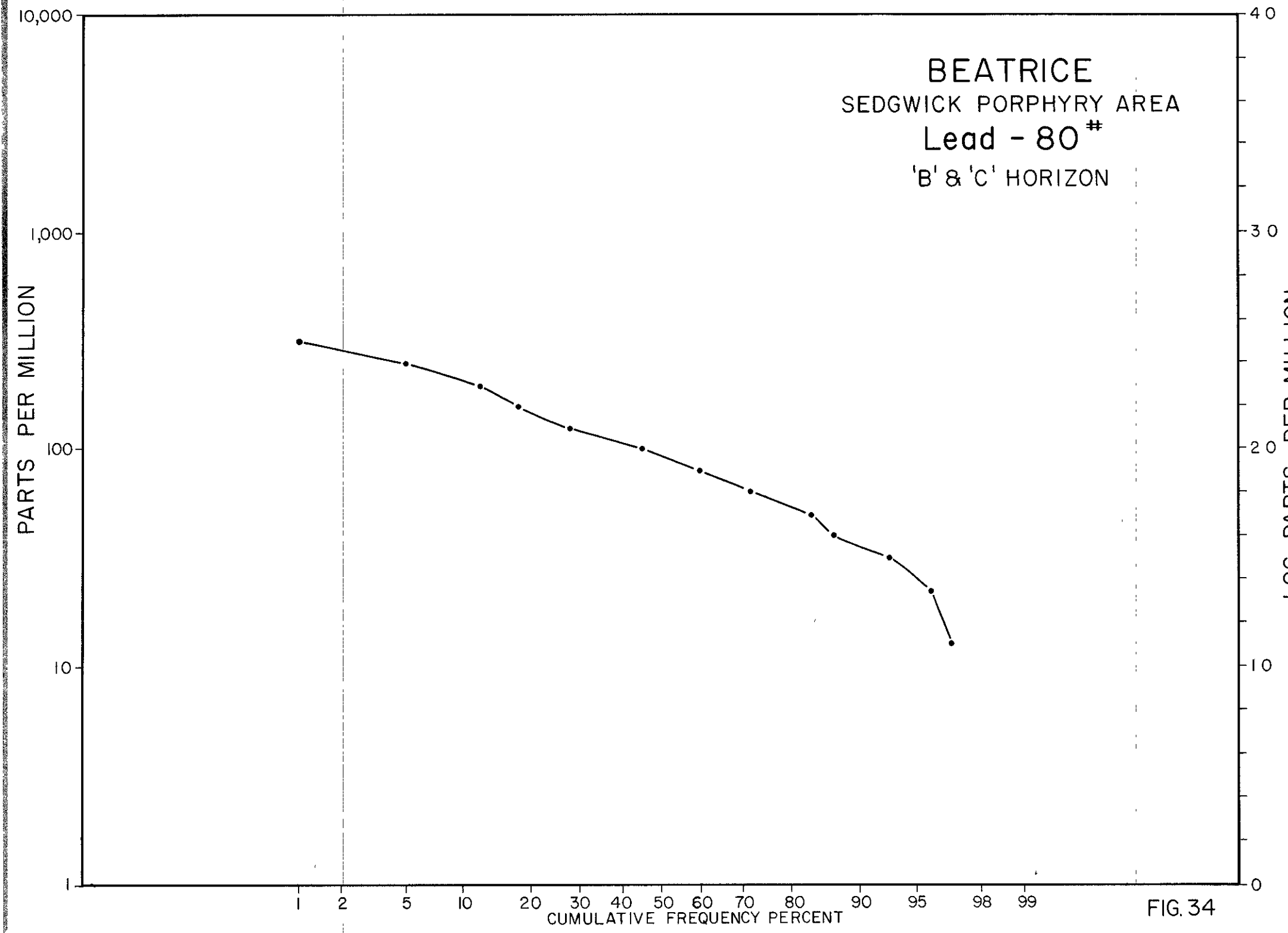


FIG. 34

79-1384

138145

BEATRICE
SEDGWICK PORPHYRY AREA
ZINC - 80#
'B' & 'C' HORIZON

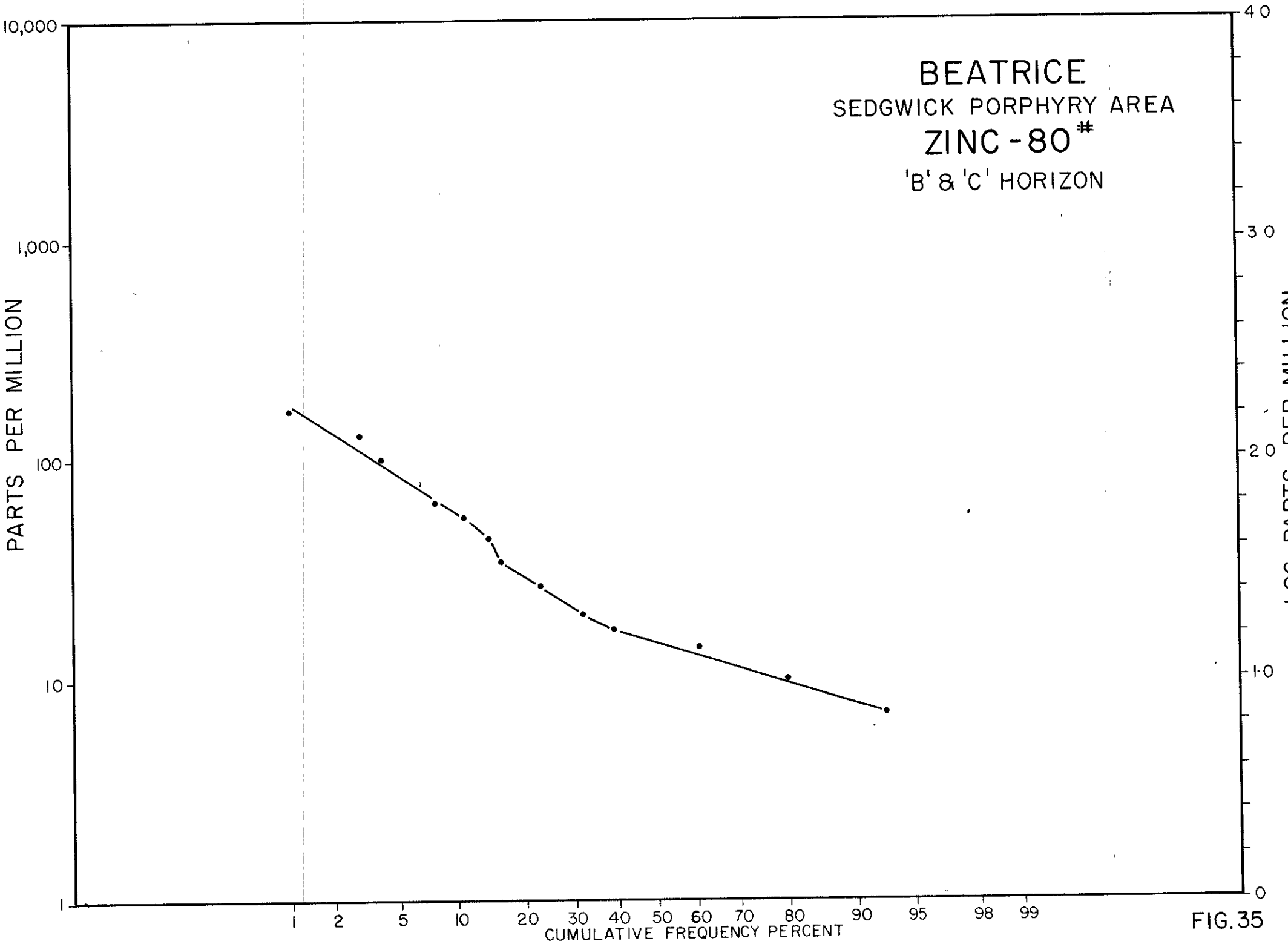
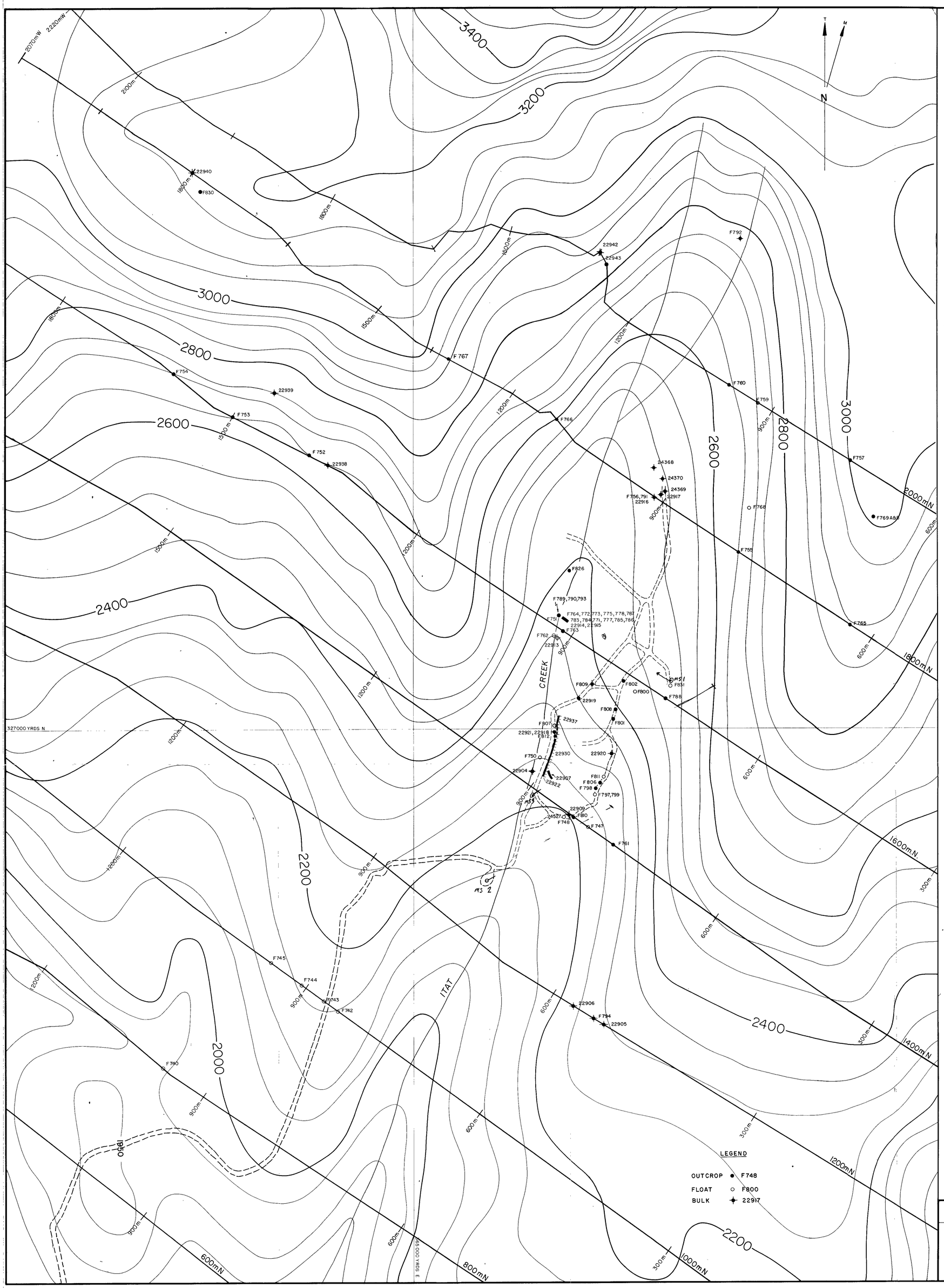


FIG. 35

49-1384

138146



Sample No	Rock Type	Cu	Pb	Zn	Ag	Mn	S%	Au	Fe%
22904	Black Shale	132	2300	3000	9	790			
22905	Seric. Felsic Volc	42	530	180	<1	3900			
F734	Seric. Felsic Volc	150	40	85	<1	145			
22906	Seric Felsic Volc	55	560	285	<1	2180			
F761	Alt Tuff	135	410	490	<1	8400			
F747	Seric Vitric Tuff (Float)	155	740	4350	1	1910	0.4		
F748	Alt Tuff	268	460	1230	2	370	0.4		
22909	Alt Tuff (3m Channel)	260	450	1000	2	750	0.2		
22907	Felsic Volc (20m Channel)	65	300	170	<1	920			
F750	Felsic Volc	50	2570	2220	3	5100	0.5		
22913	Shale Pragments	60	700	285	1	1100			
F762	Shale (Float)	620	3%	4200	57	700	2.7	0.6	
F783	Alt Tuff (Float)	45	530	510	1	3300			
F751	Shale - sheared	350	5200	6600	20	1250	2.3		
F764	Alt Tuff	95	1400	3900	2	2700	1.6	<0.1	
F772	Alt Tuff	540	700	3.1%	3	470	3.1		
F773	Alt Tuff	175	590	0.4%	3	620	4.0		
F775	Alt Tuff	115	580	0.65%	1	890	1.8		
F778	Alt Tuff	320	560	2.0%	4	550	5.4		
F783	Alt Tuff	420	2850	2.9%	6	9700	3.4		
F784	Alt Tuff	260	730	1.2%	3	1240	5.1		
22914	Bulk trench sample	400	1250	2.85%	5	2850	4.4		
22915	Bulk trench sample	330	840	2.2%	3	1040	2.7		
F755	Alt Tuff	95	200	740	2	2100	1.6		
F756	Shales	185	570	560	<1	2500			
22916	Surface Mn	185	2000	4300	2	18%			
F759	Alt Tuff with Fe-Ox	85	125	145	<1	65			
F760	Shale	135	1000	160	4	300	1.5		
F788	Fg. Volc	30	430	230	<1	1300			
F771	Alt Tuff and Shale	325	585	1.37%	2	290	2.8		
F777	Alt Tuff and Shale	135	885	2450	2	1180	3.2		
F785	Alt Tuff and Shale	770	1950	3.0%	7	640	0.4		
F786	Alt Tuff and Shale	480	1380	1.85%	4	650	3.3		
F787	Alt Tuff and Shale	155	820	0.66%	2	350	2.2		
F785	Shale	940	3.19%	3.55%	33	340	3.7		
F780	Shale	660	1.11%	2.10%	62	1800	1.8		
F793	Shale	530	1.02%	1.38%	51	1000	1.4		
F791	Shale	35	1260	1090	3	790	1.2		
F792	Shale	105	210	310	3	440	0.1		
22917	Py Shale	30	550	240	<1	1300	8.5		
F 797	Py Shale	340	1.2%	1.47%	11	580	6.2		
F 789	Fg Tuff	35	1700	3000	2	7200	0.6		
F 800	Alt Tuff	40	100	130	1	720	0.3		
F 802	Alt Vitric Tuff	50	1700	1400	2	680	0.4		
F 798	Alt Vitric Tuff	120	5500	5400	5	480	1.1	<0.1	
F801	Alt Vitric Tuff	350	1.46%	3.14%	8	2500	2.3	0.9	
F808	Tuff	130	1100	1500	<1	7600	0.2		
22921	Shale	200	5900	1.2%	4	800	1.9		
22918	Shale and Tuff	120	2300	4600	<1	2000	0.3		
22919	Shale	120	2500	7500	2	700	0.5		
F 803	Tuff	340	6200	1.6%	4	800	2.0		
F807	Tuff	140	3000	1.15%	2	4000	1.2		
F810	Tuff	330	1.5%	3.10%	6	1400	2.1		
F812	Tuff	560	3800	3200	2	1300	0.4		
F801b	Tuff	130	2.1%	6600	6	5000	1.2		
F801d	Tuff	110	2800	3.5%	2	700	2.0		
F801f	Tuff	90	1800	4.0%	1	400	2.8		
F801c	Tuff	1600	2.8%	4.4%	6	1100	4.0		
F806	Tuff	250	4.1%	2.25%	10	800	2.1	0.8	
F811	Tuff	460	3.15%	3.4%	10	1000	2.6	0.7	
F801	Tuff	210	5.7%	1.85%	12	2700	1.8	0.5	
22920	Tuff	350	1.6%	2.35%	8	1100	2.2	0.4	
F788	Fe-Mg Oxide concretion	180	1700	1600		3%			28.0
24527	Mn WAD	85	5600	1650		7.5%			12.0
F830	Porphyry	80	20	65		230			1.3
F742	"	270	30	140		550			1.8
F745	"	320	270	410		840			3.0
F753	"	190	20	80		400			1.15
F740	"	110	60	280		350			2.0
F734	"	30	30	135		260			1.6
F765	"	35	40	45		150			1.2
F831	Fg. Tuff/Shale	210	2600	3%	2	3400			
F769A	Porphyry	50	20	10		30			0.2
F769B	"	70	30	15		300			0.75
F752	"	55	20	80		240			1.0
F757	"	35	10	15		30			0.3
F744	"	50	40	55		500			0.85
F743	"	60	20	100		400			0.85
F766	"	50	30	70		410			0.7
F767	"	50	20	65		370			1.0
22938	"	40	30	40		50			0.5
22939	"	25	30	25		110			1.0
22940	"	30	30	45		140			1.25
F826	"	25	140	115		1450			1.35
22941	" (MS1 328.7 metres)	370	40	50		650			1.4
24368	Black shales	45	670	150	2	1.9%			
24369	Black shales	45	2600	6400	2	850			
24370	Black shales	55	630	560	<2	600			
22932	Lithic Tuff	110	920	3400	2	2700			
22923	" "	120	450	1300	2	2500			
22924	" "	50	3200	8000	3	3200			
22925	" "	30	2500	3600	2	3500			
22926	" "	35	2500	6300	4	3800			
22927	Charty Tuff and Shale	30	1600	2150	4	2000			
22928	Lithic-Vitric Tuff	65	430	450	1	2400			
22929	" " "	80	950	2800	2	2000			
22930	F.G. Tuff	110	1100	720	2	2600			
22931	F.G. Tuff and Shale	35	1350	2300	3	7200			
22932	" " " "	80	5300	6500	6	1000			
22933	" " " "	45	1950	2600	4	2900			
22934	Vitric-Lithic Tuff	45	3350	5[illegible]	6	1500			
22935	Vitric Tuff and Shale	90	6300	5700	9	4800			
22936	Lithic-Vitric and Tuff	70	3050	2700	6	4400			
22937	" " " "	40	730	570	3	460			
22942	Black Shale	300	2050	8500	<2	40			1.33
22943	Travertine	280	1200	2200		<10			6.0

138147

Y9-1384

5 cm

FIG. 36

MT. LYELL - G.O.D.L. JOINT VENTURE

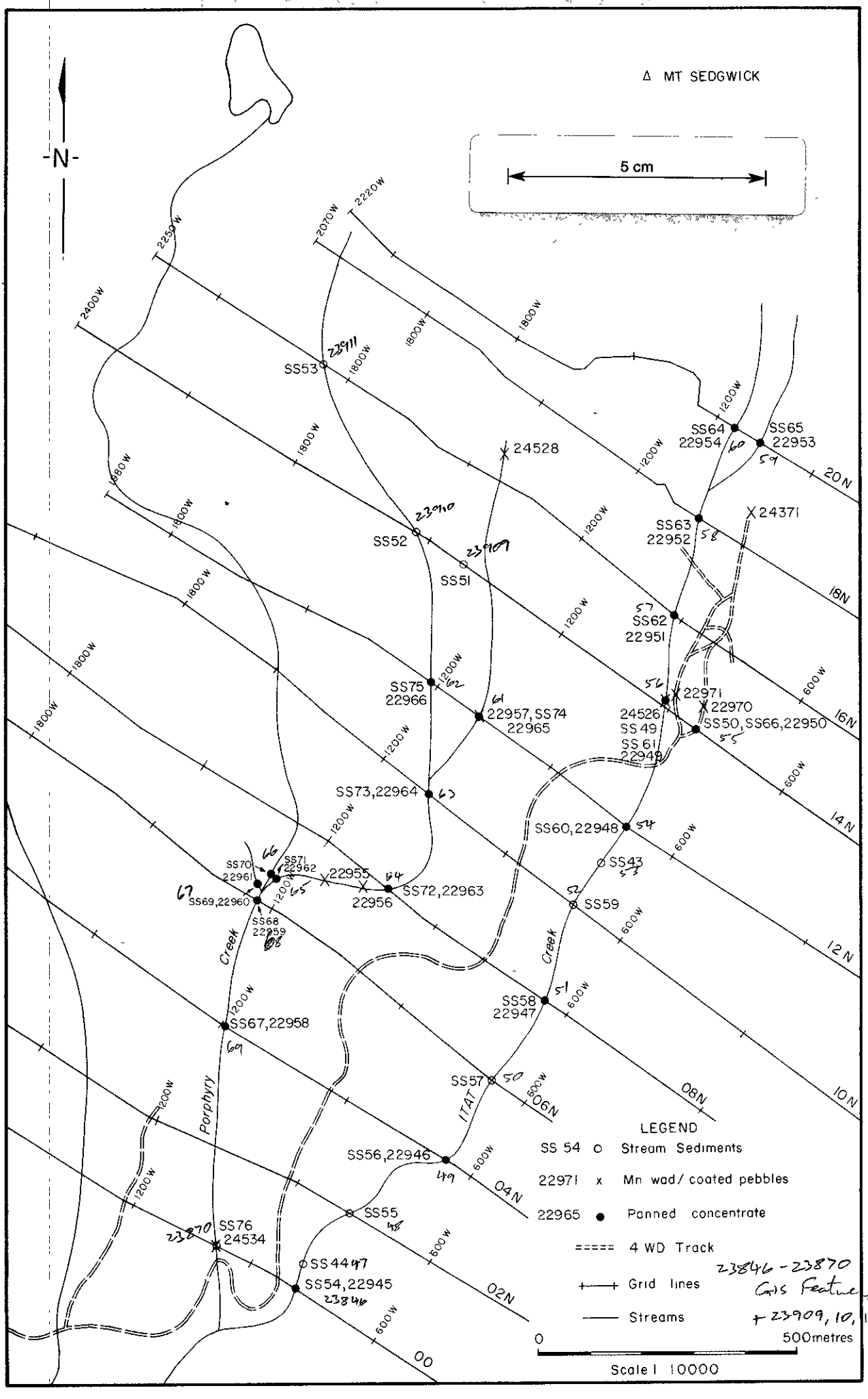
BEATRICE GRID

MT. SEDGWICK ANOMALY ZONE

ROCK CHIP ASSAYS

DRAWN MH
TRACED MH
CHECKED
DATE DEC 1978
SCALE 1" 2000
C I 50 feet

10/303



BEATRICE ORIENTATION STREAM SEDIMENT SAMPLE LOCATIONS.

23846 - 23870
GAS Feature #
+ 23909, 10, 11

79-1384

138148

FIG. 37

NOTE 1979 work read in millivolts per volt but adjusted to correspond with original contours (in milliseconds)

LEGEND

Chargeability contours in milliseconds

Gradient block boundary

MOUNT LYELL MINING & RAILWAY COMPANY LTD.

BEATRICE GRID

(NR.) QUEENSTOWN-WEST COAST TASMANIA

ELECTRICAL INDUCED POLARIZATION SURVEY
GRADIENT ARRAY
CHARGEABILITY CONTOUR PLAN

5 cm

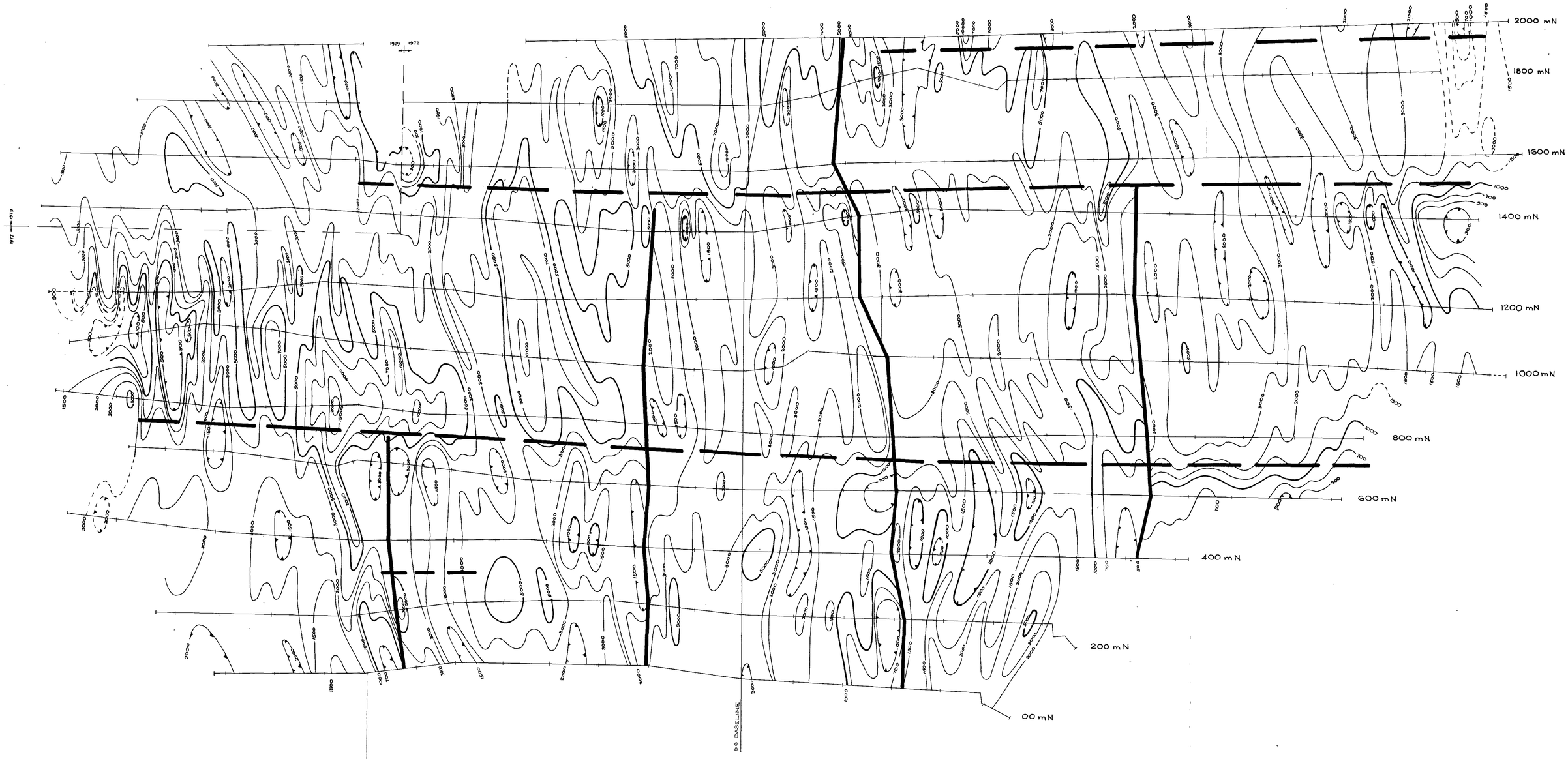
SURVEYED & COMPILED BY
SCINTREX PTY., LTD,

FEBRUARY 1977
Revised APRIL 1979

240 180 120 90 60 30 00 120 240 (metres)

138149
79-1384

JOB Nº TAS-035-D. Sheet 1 of 1 PLATE FIG.38



LEGEND :

Resistivity contours in ohm-metres

Gradient block boundary

MOUNT LYELL MINING & RAILWAY COMPANY LTD.

BEATRICE GRID

(NR.) QUEENSTOWN - WEST COAST TASMANIA

ELECTRICAL INDUCED POLARIZATION SURVEY

GRADIENT ARRAY

RESISTIVITY CONTOUR PLAN

5 cm

SURVEYED & COMPILED BY

SCINTREX PTY., LTD.

FEBRUARY 1977

Revised APRIL 1979

128150

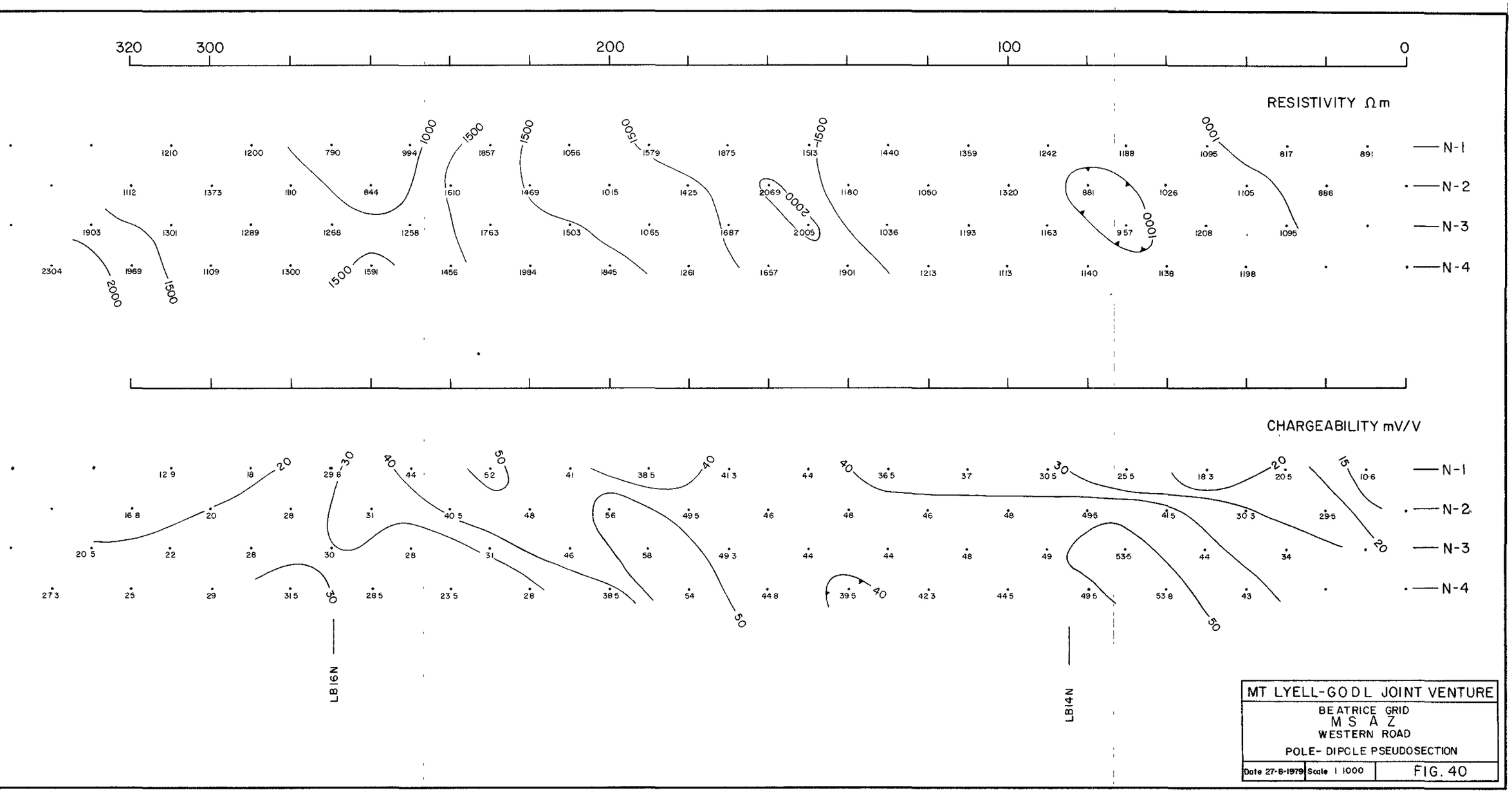
79-1384

240 180 120 90 60 30 00 120 240 (metres)

JOB Nº TAS-035-D Sheet 1 of 1 PLATE

TAS-062 PLATE 4

FIG.39



MT LYELL-GODL JOINT VENTURE

BEATRICE GRID
M S A Z
WESTERN ROAD

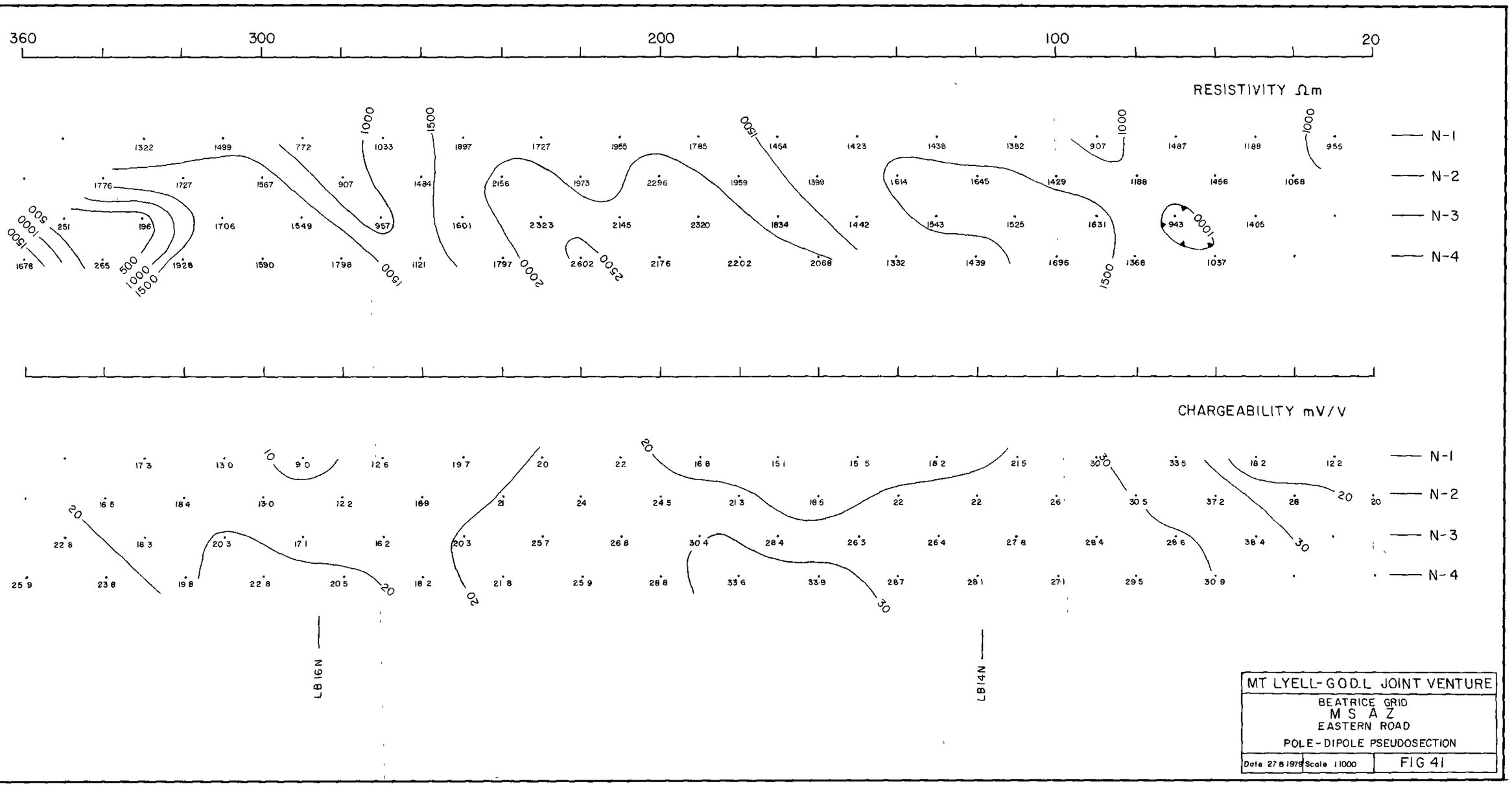
POLE- DIPOLE PSEUDOSECTION

Date 27-8-1979	Scale 1 1000	FIG. 40

79-1384

5 cm

138151



MT LYELL-GOD.L JOINT VENTURE

BEATRICE GRID
M S A Z
EASTERN ROAD

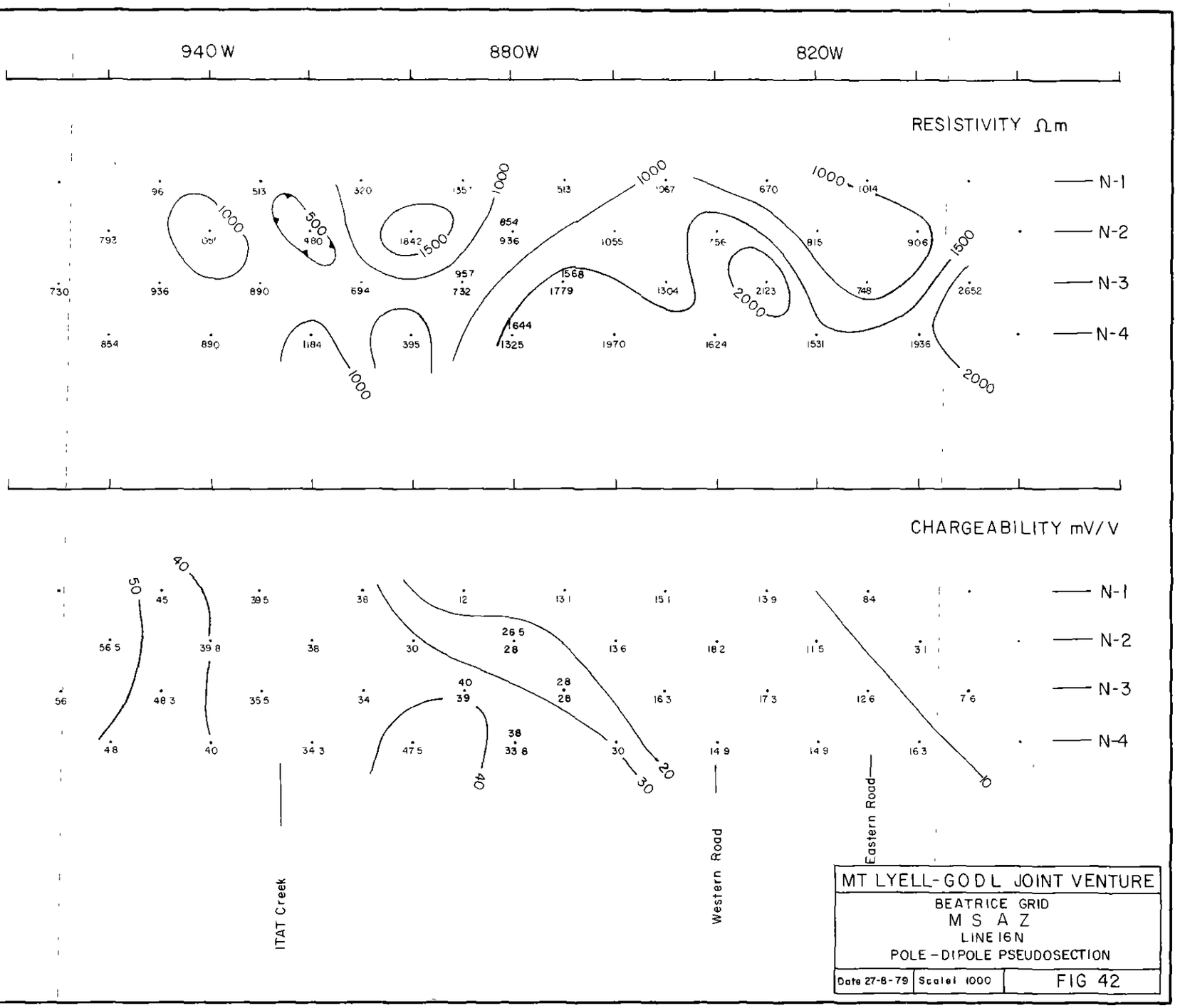
POLE-DIPOLE PSEUDOSECTION

Date 27 8 1979 | Scale 1:1000 | FIG 41

79-1384

5 cm

138152



5

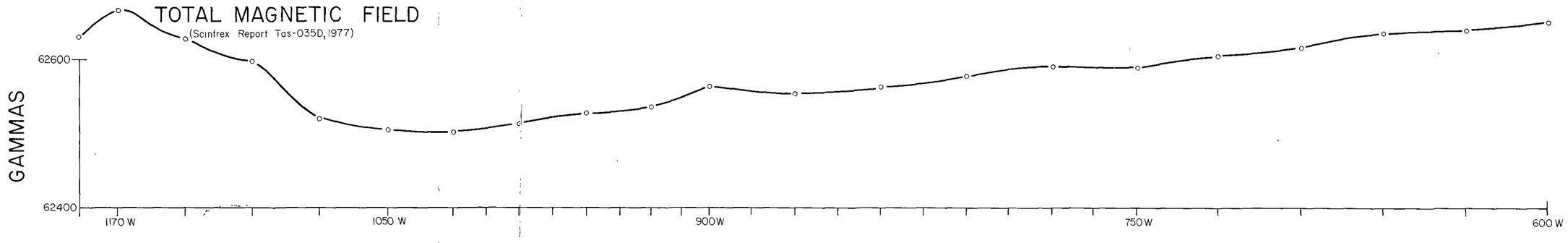
79-1384

5 cm

138153

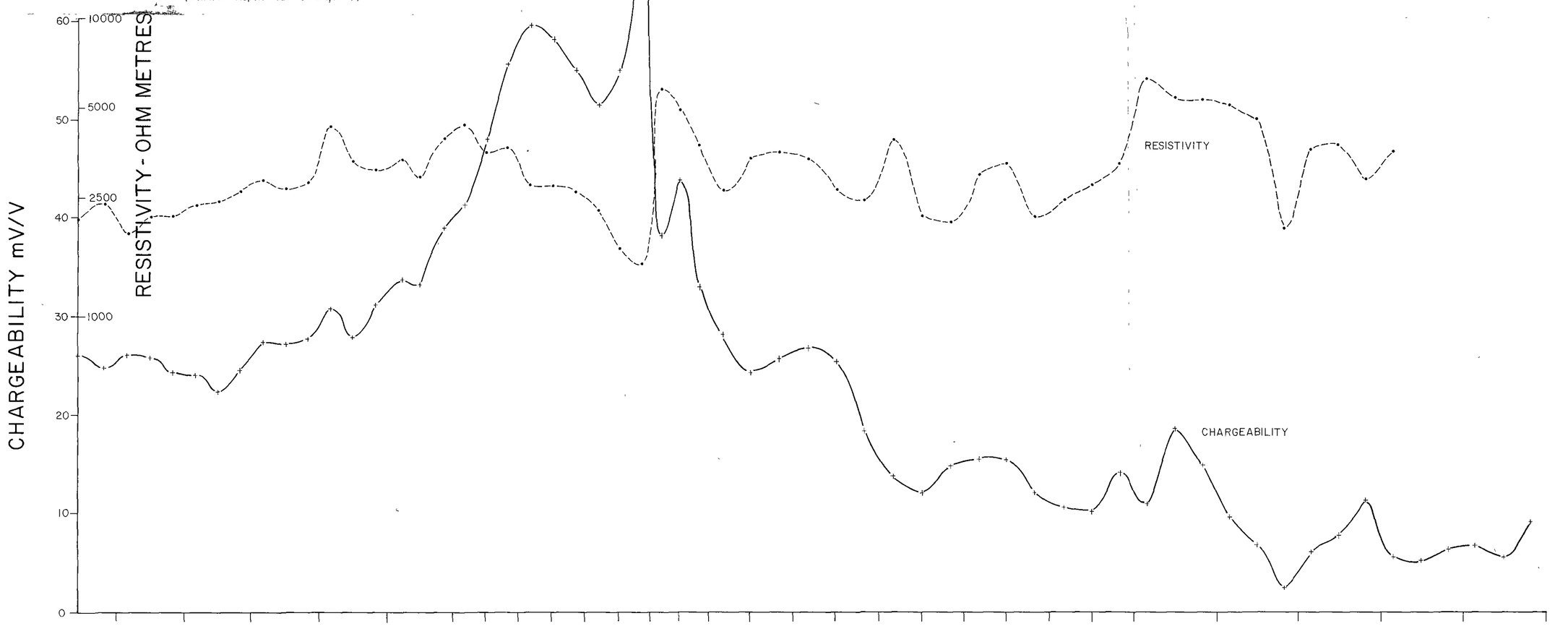
TOTAL MAGNETIC FIELD

(Scintrex Report Tas-035D, 1977)

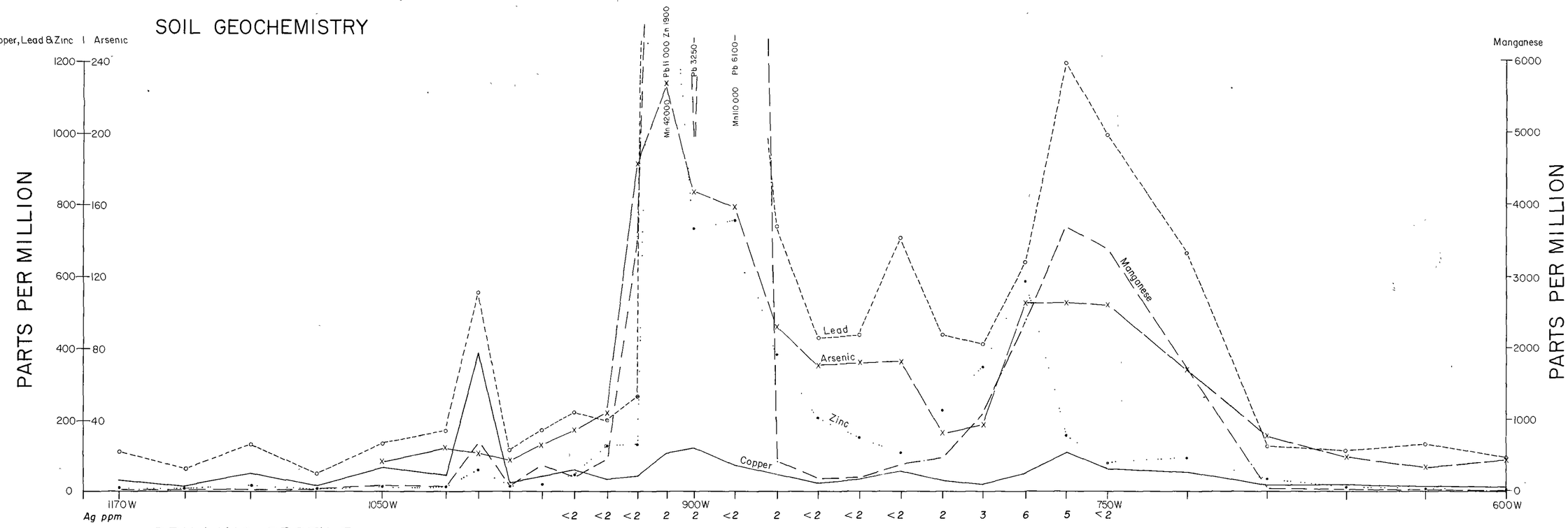


E.I.P. GRADIENT ARRAY

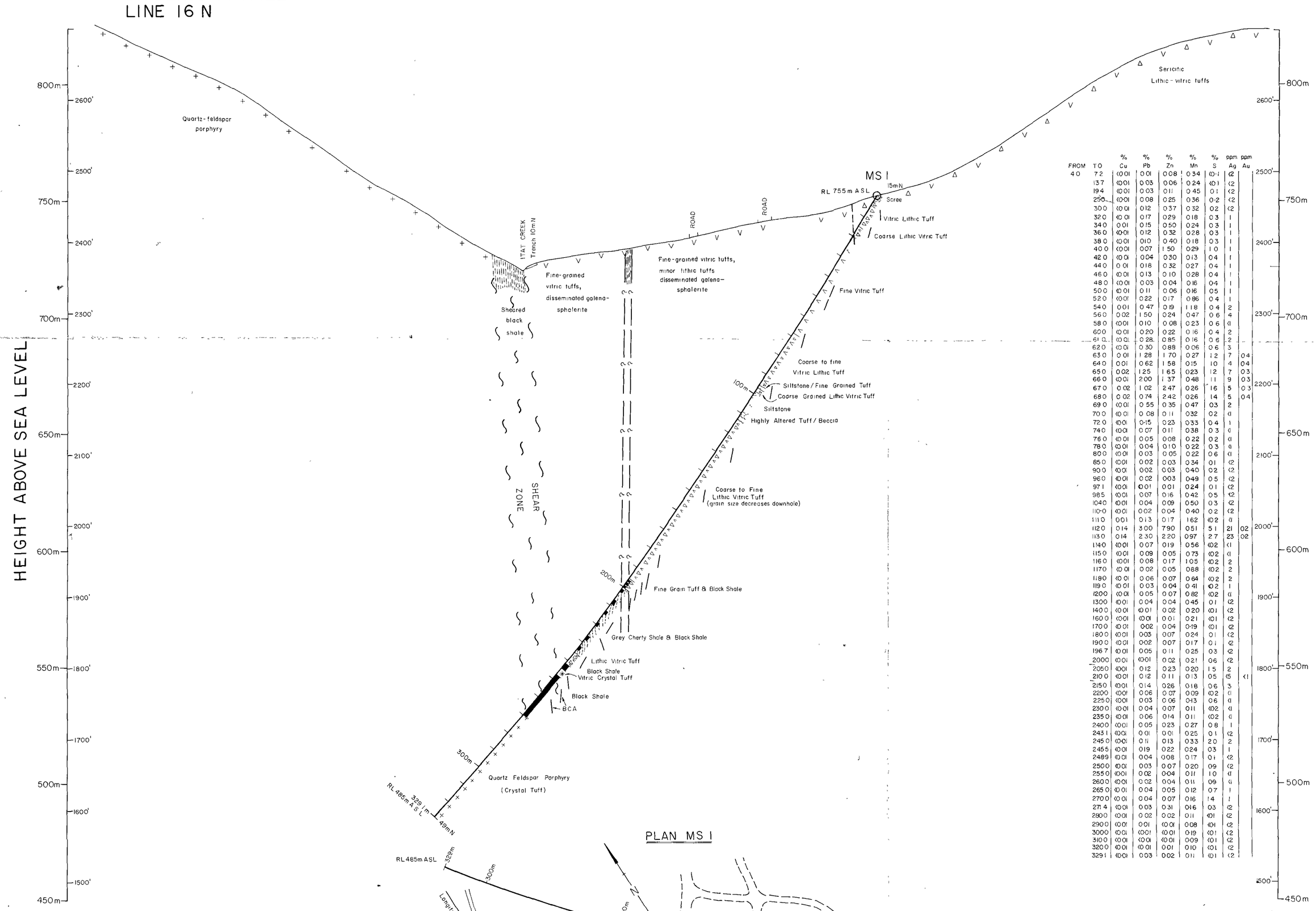
(Scintrex Report Tas-062A, 1979)



SOIL GEOCHEMISTRY

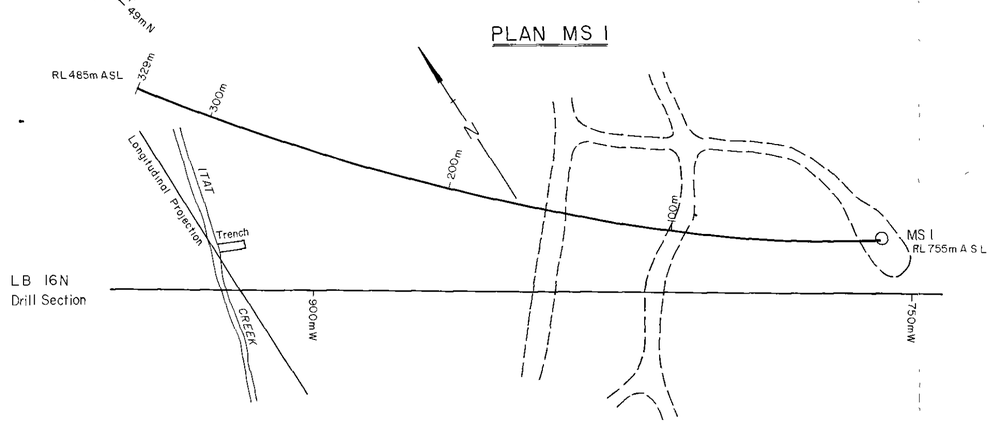


DRILLING PROFILE LINE 16 N



FROM	TO	% Cu	% Pb	% Zn	% Mn	% S	ppm Ag	ppm Au
40	72	<0.01	0.01	0.08	0.34	<0.1	<2	
	137	<0.01	0.03	0.06	0.24	<0.1	<2	
	194	<0.01	0.03	0.11	0.45	0.1	<2	
	250	<0.01	0.08	0.25	0.36	0.2	<2	
	300	<0.01	0.12	0.37	0.32	0.2	<2	
	320	<0.01	0.17	0.29	0.18	0.3	1	
	340	0.01	0.15	0.50	0.24	0.3	1	
	360	<0.01	0.12	0.32	0.28	0.3	1	
	380	<0.01	0.10	0.40	0.18	0.3	1	
	400	<0.01	0.07	1.50	0.29	1.0	1	
	420	<0.01	0.04	0.30	0.13	0.4	1	
	440	0.01	0.18	0.32	0.27	0.4	1	
	460	<0.01	0.13	0.10	0.28	0.4	1	
	480	<0.01	0.03	0.04	0.16	0.4	1	
	500	<0.01	0.11	0.06	0.16	0.5	1	
	520	<0.01	0.22	0.17	0.86	0.4	1	
	540	0.01	0.47	0.19	1.18	0.4	2	
	560	0.02	1.50	0.24	0.47	0.6	4	
	580	<0.01	0.10	0.08	0.23	0.6	<1	
	600	<0.01	0.20	0.22	0.16	0.4	2	
	610	<0.01	0.28	0.85	0.16	0.6	2	
	620	<0.01	0.30	0.88	0.06	0.6	3	
	630	0.01	1.28	1.70	0.27	1.2	7	0.4
	640	0.01	0.62	1.58	0.15	1.0	4	0.4
	650	0.02	1.25	1.65	0.23	1.2	7	0.3
	660	<0.01	2.00	1.37	0.48	1.1	9	0.3
	670	0.02	1.02	2.47	0.26	1.6	5	0.3
	680	0.02	0.74	2.42	0.26	1.4	5	0.4
	690	<0.01	0.55	0.35	0.47	0.3	2	
	700	<0.01	0.08	0.11	0.32	0.2	<1	
	720	<0.01	0.15	0.23	0.33	0.4	1	
	740	<0.01	0.07	0.11	0.38	0.3	<1	
	760	<0.01	0.05	0.08	0.22	0.2	<1	
	780	<0.01	0.04	0.10	0.22	0.3	<1	
	800	<0.01	0.03	0.05	0.22	0.6	<1	
	850	<0.01	0.02	0.03	0.34	0.1	<2	
	900	<0.01	0.02	0.03	0.40	0.2	<2	
	960	<0.01	0.02	0.03	0.49	0.5	<2	
	971	<0.01	<0.01	0.01	0.24	0.1	<2	
	985	<0.01	0.07	0.16	0.42	0.5	<2	
	1040	<0.01	0.04	0.09	0.50	0.3	<2	
	1100	<0.01	0.02	0.04	0.40	0.2	<2	
	1110	0.01	0.13	0.17	1.62	<0.2	<1	
	1120	0.14	3.00	7.90	0.51	5.1	21	0.2
	1130	0.14	2.30	2.20	0.97	2.7	23	0.2
	1140	<0.01	0.07	0.19	0.56	<0.2	<1	
	1150	<0.01	0.09	0.05	0.73	<0.2	<1	
	1160	<0.01	0.08	0.17	1.05	<0.2	2	
	1170	<0.01	0.02	0.05	0.88	<0.2	2	
	1180	<0.01	0.06	0.07	0.64	<0.2	2	
	1190	<0.01	0.03	0.04	0.41	<0.2	1	
	1200	<0.01	0.05	0.07	0.82	<0.2	<1	
	1300	<0.01	0.04	0.04	0.45	0.1	<2	
	1400	<0.01	<0.01	0.02	0.20	<0.1	<2	
	1600	<0.01	<0.01	0.01	0.21	<0.1	<2	
	1700	<0.01	0.02	0.04	0.19	<0.1	<2	
	1800	<0.01	0.03	0.07	0.24	0.1	<2	
	1900	<0.01	0.02	0.07	0.17	0.1	<2	
	1967	<0.01	0.05	0.11	0.25	0.3	<2	
	2000	<0.01	<0.01	0.02	0.21	0.6	<2	
	2050	<0.01	0.12	0.23	0.20	1.5	2	
	2100	<0.01	0.12	0.11	0.13	0.5	6	<1
	2150	<0.01	0.14	0.26	0.18	0.6	3	
	2200	<0.01	0.06	0.07	0.09	<0.2	<1	
	2250	<0.01	0.03	0.06	0.43	0.6	<1	
	2300	<0.01	0.04	0.07	0.11	<0.2	<1	
	2350	<0.01	0.06	0.14	0.11	<0.2	<1	
	2400	<0.01	0.05	0.23	0.27	0.8	1	
	2431	<0.01	0.01	0.01	0.25	0.1	<2	
	2450	<0.01	0.11	0.13	0.33	2.0	2	
	2455	<0.01	0.19	0.22	0.24	0.3	1	
	2489	<0.01	0.04	0.08	0.17	0.1	<2	
	2500	<0.01	0.03	0.07	0.20	0.9	<2	
	2550	<0.01	0.02	0.04	0.11	1.0	<1	
	2600	<0.01	0.02	0.04	0.11	0.9	<1	
	2650	<0.01	0.04	0.05	0.12	0.7	1	
	2700	<0.01	0.04	0.07	0.16	1.4	1	
	2714	<0.01	0.03	0.31	0.16	0.3	<2	
	2800	<0.01	0.02	0.02	0.11	<0.1	<2	
	2900	<0.01	0.01	<0.01	0.08	<0.1	<2	
	3000	<0.01	<0.01	<0.01	0.19	<0.1	<2	
	3100	<0.01	<0.01	<0.01	0.09	<0.1	<2	
	3200	<0.01	<0.01	0.01	0.10	<0.1	<2	
	3291	<0.01	0.03	0.02	0.11	<0.1	<2	

PLAN MS I



79-1384

138154

FIG. 43

MT LYELL - G.O.D.L. JOINT VENTURE
E L 9/66

M HUTTON

HD4

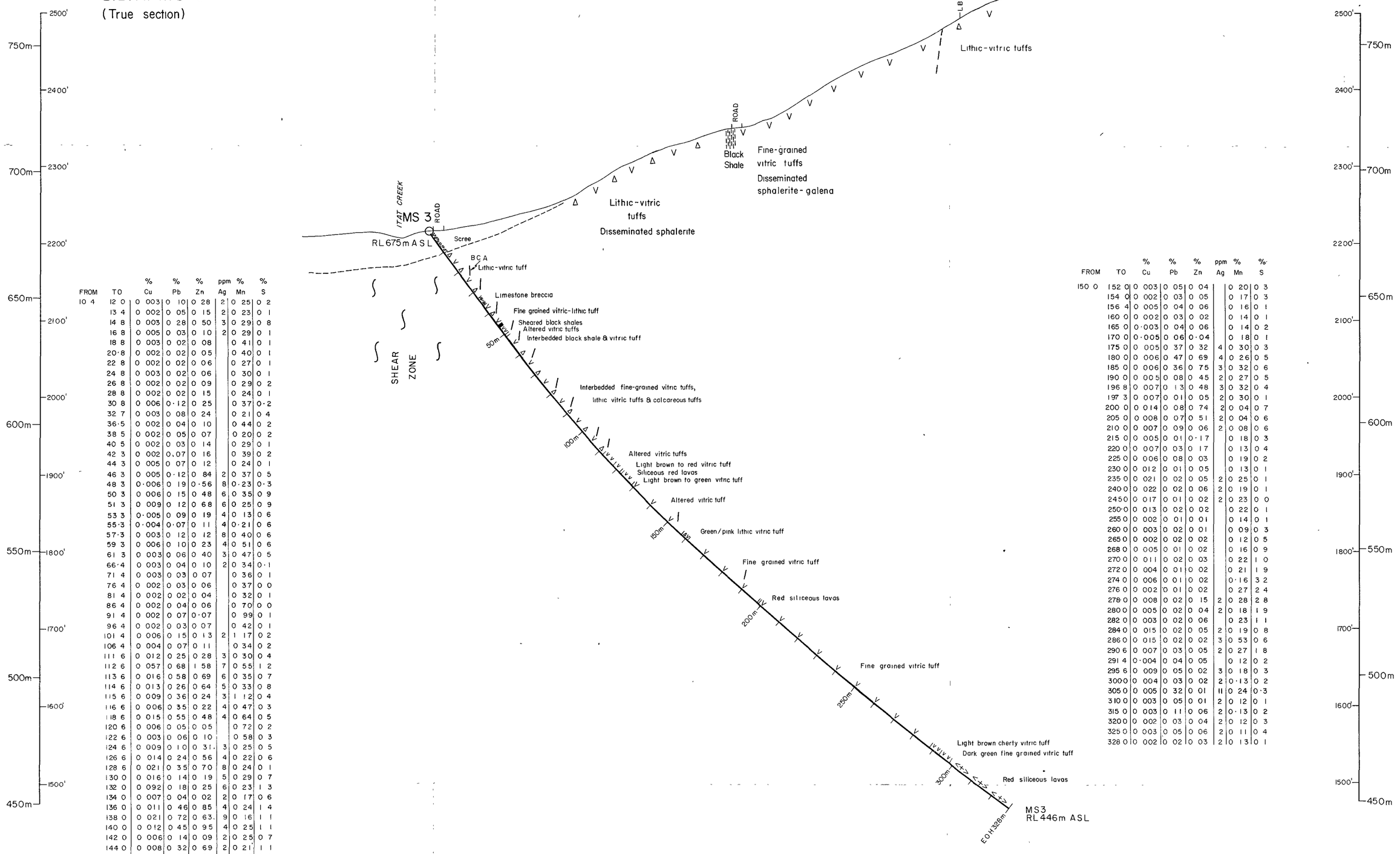
BEATRICE GRID
MT. SEDGWICK ANOMALY ZONE

10-5-1979

DRILLING PROFILE LINE 16N

10/501

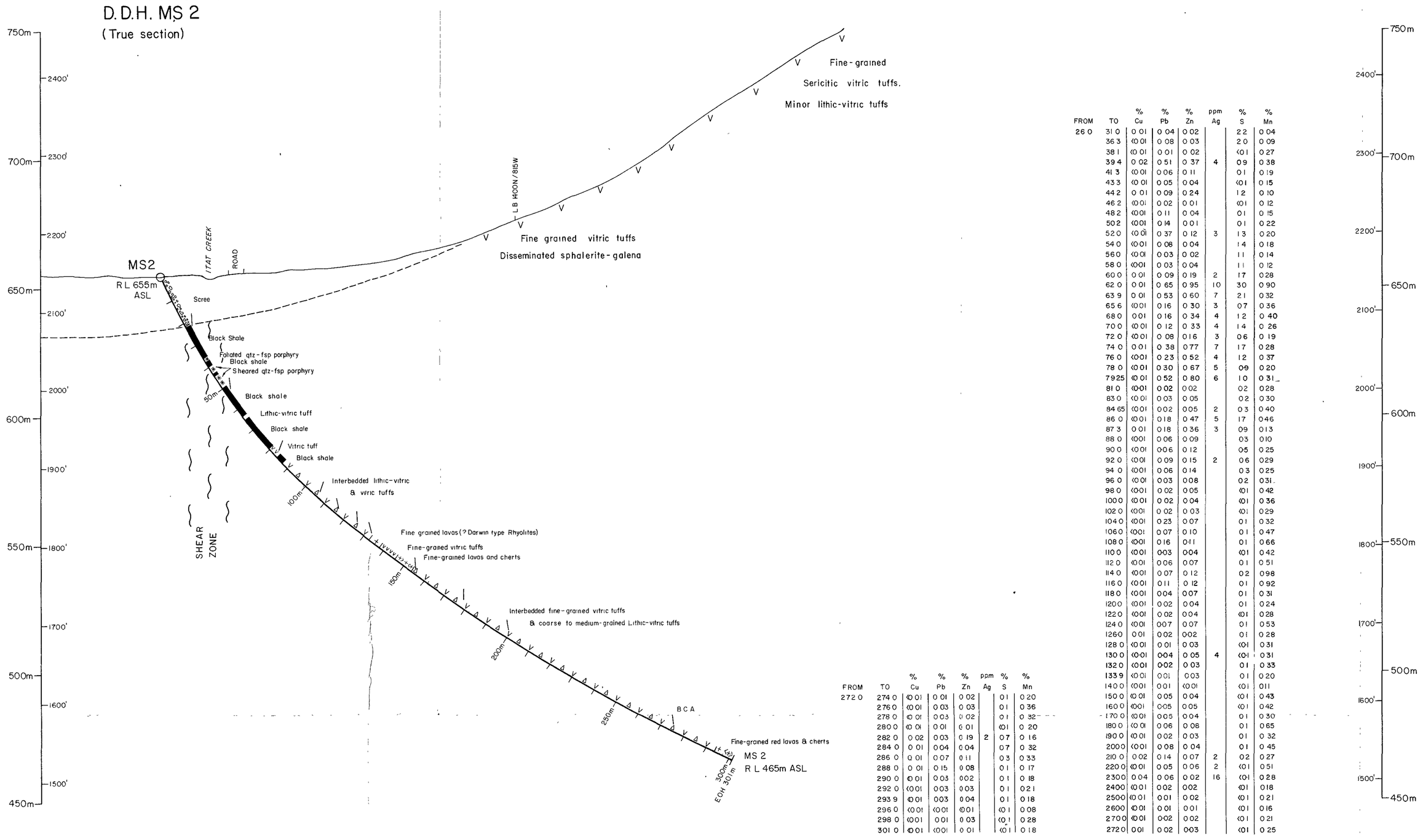
DRILLING PROFILE
D.D.H. MS 3
(True section)



FROM	TO	% Cu	% Pb	% Zn	ppm Ag	% Mn	% S
10 4	12 0	0 003	0 10	0 28	2	0 25	0 2
	13 4	0 002	0 05	0 15	2	0 23	0 1
	14 8	0 003	0 28	0 50	3	0 29	0 8
	16 8	0 005	0 03	0 10	2	0 29	0 1
	18 8	0 003	0 02	0 08		0 41	0 1
	20·8	0 002	0 02	0 05		0 40	0 1
	22 8	0 002	0 02	0 06		0 27	0 1
	24 8	0 003	0 02	0 06		0 30	0 1
	26 8	0 002	0 02	0 09		0 29	0 2
	28 8	0 002	0 02	0 15		0 24	0 1
	30 8	0 006	0·12	0 25		0 37	0·2
	32 7	0 003	0 08	0 24		0 21	0 4
	36·5	0 002	0 04	0 10		0 44	0 2
	38 5	0 002	0 05	0 07		0 20	0 2
	40 5	0 002	0 03	0 14		0 29	0 1
	42 3	0 002	0,07	0 16		0 39	0 2
	44 3	0 005	0 07	0 12		0 24	0 1
	46 3	0 005	0·12	0 84	2	0 37	0 5
	48 3	0·006	0 19	0·56	8	0·23	0·3
	50 3	0 006	0 15	0 48	6	0 35	0 9
	51 3	0 009	0 12	0 68	6	0 25	0 9
	53 3	0·005	0 09	0 19	4	0 13	0 6
	55·3	0·004	0·07	0 11	4	0·21	0 6
	57·3	0 003	0 12	0 12	8	0 40	0 6
	59 3	0 006	0 10	0 23	4	0 51	0 6
	61 3	0 003	0 06	0 40	3	0 47	0 5
	66·4	0 003	0 04	0 10	2	0 34	0·1
	71 4	0 003	0 03	0 07		0 36	0 1
	76 4	0 002	0 03	0 06		0 37	0 0
	81 4	0 002	0 02	0 04		0 32	0 1
	86 4	0 002	0 04	0 06		0 70	0 0
	91 4	0 002	0 07	0·07		0 99	0 1
	96 4	0 002	0 03	0 07		0 42	0 1
	101 4	0 006	0 15	0 13	2	1 17	0 2
	106 4	0 004	0 07	0 11		0 34	0 2
	111 6	0 012	0 25	0 28	3	0 30	0 4
	112 6	0 057	0 68	1 58	7	0 55	1 2
	113 6	0 016	0 58	0 69	6	0 35	0 7
	114 6	0 013	0 26	0 64	5	0 33	0 8
	115 6	0 009	0 36	0 24	3	1 12	0 4
	116 6	0 006	0 35	0 22	4	0 47	0 3
	118 6	0 015	0 55	0 48	4	0 64	0 5
	120 6	0 006	0 05	0 05		0 72	0 2
	122 6	0 003	0 06	0 10		0 58	0 3
	124 6	0 009	0 10	0 31	3	0 25	0 5
	126 6	0 014	0 24	0 56	4	0 22	0 6
	128 6	0 021	0 35	0 70	8	0 24	0 1
	130 0	0 016	0 14	0 19	5	0 29	0 7
	132 0	0 092	0 18	0 25	6	0 23	1 3
	134 0	0 007	0 04	0 02	2	0 17	0 6
	136 0	0 011	0 46	0 85	4	0 24	1 4
	138 0	0 021	0 72	0 63	9	0 16	1 1
	140 0	0 012	0 45	0 95	4	0 25	1 1
	142 0	0 006	0 14	0 09	2	0 25	0 7
	144 0	0 008	0 32	0 69	2	0 21	1 1
	146 0	0 007	0 72	0 81	4	0 25	1 0
	148 0	0 007	0 32	0 65	2	0 23	0 8
	150 0	0 007	0 09	0 63	2	0 19	0 7

FROM	TO	% Cu	% Pb	% Zn	ppm Ag	% Mn	% S
150 0	152 0	0 003	0 05	0 04		0 20	0 3
	154 0	0 002	0 03	0 05		0 17	0 3
	156 4	0 005	0 04	0 06		0 16	0 1
	160 0	0 002	0 03	0 02		0 14	0 1
	165 0	0·003	0 04	0 06		0 14	0 2
	170 0	0·005	0 06	0·04		0 18	0 1
	175 0	0 005	0 37	0 32	4	0 30	0 3
	180 0	0 006	0 47	0 69	4	0 26	0 5
	185 0	0 006	0 36	0 75	3	0 32	0 6
	190 0	0 005	0 08	0 45	2	0 27	0 5
	196 8	0 007	0 13	0 48	3	0 32	0 4
	197 3	0 007	0 01	0 05	2	0 30	0 1
	200 0	0 014	0 08	0 74	2	0 04	0 7
	205 0	0 008	0 07	0 51	2	0 04	0 6
	210 0	0 007	0 09	0 06	2	0 08	0 6
	215 0	0 005	0 01	0·17		0 18	0 3
	220 0	0 007	0 03	0 17		0 13	0 4
	225 0	0 006	0 08	0 03		0 19	0 2
	230 0	0 012	0 01	0 05		0 13	0 1
	235 0	0 021	0 02	0 05	2	0 25	0 1
	240 0	0 022	0 02	0 06	2	0 19	0 1
	245 0	0 017	0 01	0 02	2	0 23	0 0
	250·0	0 013	0 02	0 02		0 22	0 1
	255 0	0 002	0 01	0 01		0 14	0 1
	260 0	0 003	0 02	0 01		0 09	0 3
	265 0	0 002	0 02	0 02		0 12	0 5
	268 0	0 005	0 01	0 02		0 16	0 9
	270 0	0 011	0 02	0 03		0 22	1 0
	272 0	0 004	0 01	0 02		0 21	1 9
	274 0	0 006	0 01	0 02		0·16	3 2
	276 0	0 002	0 01	0 02		0 27	2 4
	278 0	0 008	0 02	0 15	2	0 28	2 8
	280 0	0 005	0 02	0 04	2	0 18	1 9
	282 0	0 003	0 02	0 06		0 23	1 1
	284 0	0 015	0 02	0 05	2	0 19	0 8
	286 0	0 015	0 02	0 02	3	0 53	0 6
	290 6	0 007	0 03	0 05	2	0 27	1 8
	291 4	0·004	0 04	0 05		0 12	0 2
	295 6	0 009	0 05	0 02	3	0 18	0 3
	300 0	0 004	0 03	0 02	2	0·13	0 2
	305 0	0 005	0 32	0 01	11	0 24	0·3
	310 0	0 003	0 05	0 01	2	0 12	0 1
	315 0	0 003	0 11	0 06	2	0·13	0 2
	320 0	0 002	0 03	0 04	2	0 12	0 3
	325 0	0 003	0 05	0 06	2	0 11	0 4
	328 0	0 002	0 02	0 03	2	0 13	0 1

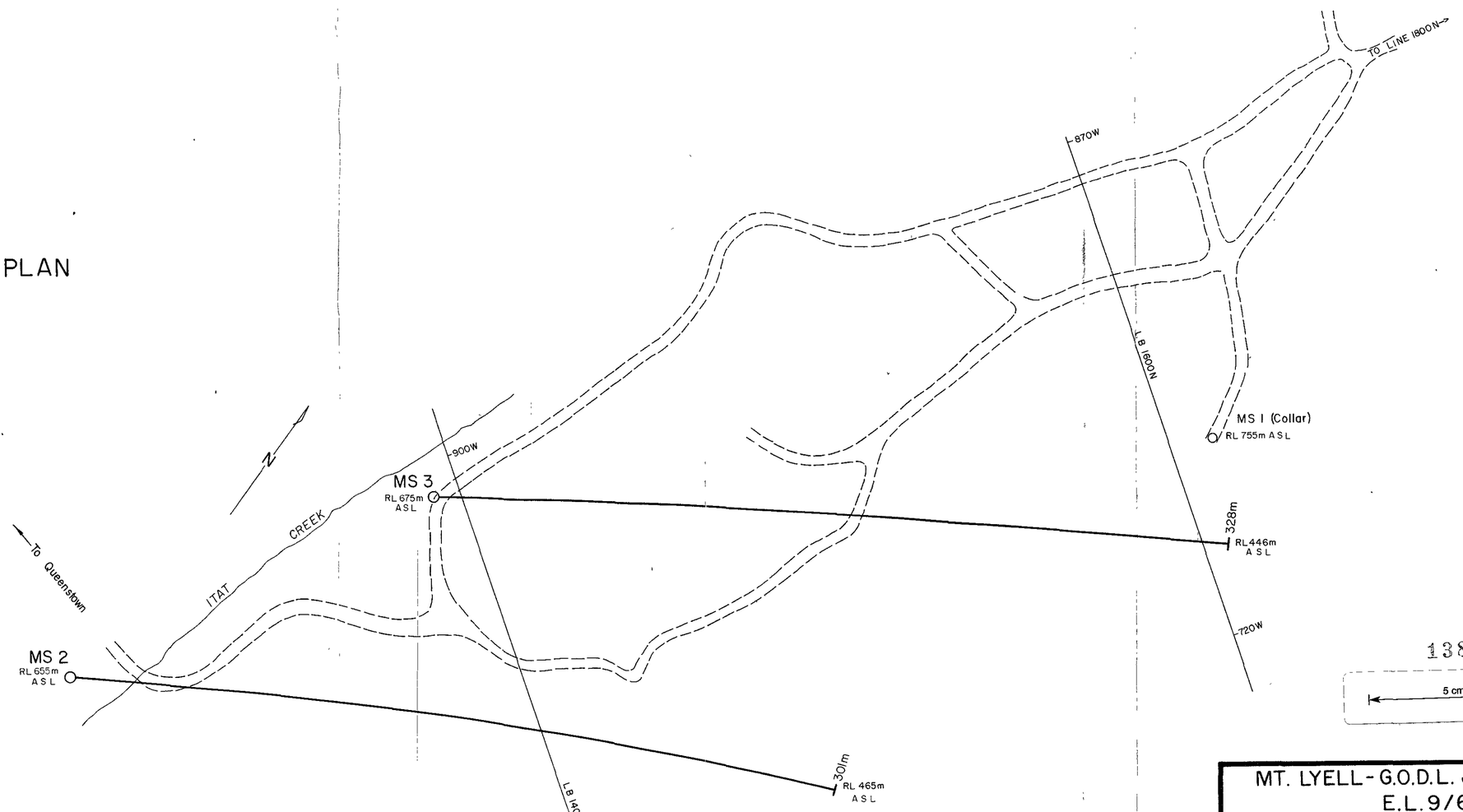
DRILLING PROFILE
D.D.H. MS 2
(True section)



FROM	TO	% Cu	% Pb	% Zn	ppm Ag	% S	% Mn
26 0	31 0	0 01	0 04	0 02		2 2	0 04
	36 3	<0 01	0 08	0 03		2 0	0 09
	38 1	<0 01	0 01	0 02		<01	0 27
	39 4	0 02	0 51	0 37	4	0 9	0 38
	41 3	<0 01	0 06	0 11		0 1	0 19
	43 3	<0 01	0 05	0 04		<01	0 15
	44 2	0 01	0 09	0 24		1 2	0 10
	46 2	<0 01	0 02	0 01		<01	0 12
	48 2	<0 01	0 11	0 04		0 1	0 15
	50 2	<0 01	0 14	0 01		0 1	0 22
	52 0	<0 01	0 37	0 12	3	1 3	0 20
	54 0	<0 01	0 08	0 04		1 4	0 18
	56 0	<0 01	0 03	0 02		1 1	0 14
	58 0	<0 01	0 03	0 04		1 1	0 12
	60 0	0 01	0 09	0 19	2	1 7	0 28
	62 0	0 01	0 65	0 95	10	3 0	0 90
	63 9	0 01	0 53	0 60	7	2 1	0 32
	65 6	<0 01	0 16	0 30	3	0 7	0 36
	68 0	0 01	0 16	0 34	4	1 2	0 40
	70 0	<0 01	0 12	0 33	4	1 4	0 26
	72 0	<0 01	0 08	0 16	3	0 6	0 19
	74 0	0 01	0 38	0 77	7	1 7	0 28
	76 0	<0 01	0 23	0 52	4	1 2	0 37
	78 0	<0 01	0 30	0 67	5	0 9	0 20
	79 25	<0 01	0 52	0 80	6	1 0	0 31
	81 0	<0 01	0 02	0 02		0 2	0 28
	83 0	<0 01	0 03	0 05		0 2	0 30
	84 65	<0 01	0 02	0 05	2	0 3	0 40
	86 0	<0 01	0 18	0 47	5	1 7	0 46
	87 3	0 01	0 18	0 36	3	0 9	0 13
	88 0	<0 01	0 06	0 09		0 3	0 10
	90 0	<0 01	0 06	0 12		0 5	0 25
	92 0	<0 01	0 09	0 15	2	0 6	0 29
	94 0	<0 01	0 06	0 14		0 3	0 25
	96 0	<0 01	0 03	0 08		0 2	0 31
	98 0	<0 01	0 02	0 05		<01	0 42
	100 0	<0 01	0 02	0 04		<01	0 36
	102 0	<0 01	0 02	0 03		<01	0 29
	104 0	<0 01	0 23	0 07		0 1	0 32
	106 0	<0 01	0 07	0 10		0 1	0 47
	108 0	<0 01	0 16	0 11		0 1	0 66
	110 0	<0 01	0 03	0 04		<01	0 42
	112 0	<0 01	0 06	0 07		0 1	0 51
	114 0	<0 01	0 07	0 12		0 2	0 98
	116 0	<0 01	0 11	0 12		0 1	0 92
	118 0	<0 01	0 04	0 07		0 1	0 31
	120 0	<0 01	0 02	0 04		0 1	0 24
	122 0	<0 01	0 02	0 04		<01	0 28
	124 0	<0 01	0 07	0 07		0 1	0 53
	126 0	0 01	0 02	0 02		0 1	0 28
	128 0	<0 01	0 01	0 03		<01	0 31
	130 0	<0 01	0 04	0 05	4	<01	0 31
	132 0	<0 01	0 02	0 03		0 1	0 33
	133 9	<0 01	0 01	0 03		0 1	0 20
	140 0	<0 01	0 01	<0 01		<0 1	0 11
	150 0	<0 01	0 05	0 04		<0 1	0 43
	160 0	<0 01	0 05	0 05		<0 1	0 42
	170 0	<0 01	0 05	0 04		0 1	0 30
	180 0	<0 01	0 06	0 08		0 1	0 65
	190 0	<0 01	0 02	0 03		0 1	0 32
	200 0	<0 01	0 08	0 04		0 1	0 45
	210 0	0 02	0 14	0 07	2	0 2	0 27
	220 0	<0 01	0 05	0 06	2	<0 1	0 51
	230 0	0 04	0 06	0 02	16	<0 1	0 28
	240 0	<0 01	0 02	0 02		<0 1	0 18
	250 0	<0 01	0 01	0 02		<0 1	0 21
	260 0	<0 01	0 01	0 01		<0 1	0 16
	270 0	<0 01	0 02	0 02		<0 1	0 21
	272 0	0 01	0 02	0 03		<0 1	0 25

FROM	TO	% Cu	% Pb	% Zn	ppm Ag	% S	% Mn
272 0	274 0	<0 01	0 01	0 02		0 1	0 20
	276 0	<0 01	0 03	0 03		0 1	0 36
	278 0	<0 01	0 03	0 02		0 1	0 32
	280 0	<0 01	0 01	0 01		<0 1	0 20
	282 0	0 02	0 03	0 19	2	0 7	0 16
	284 0	0 01	0 04	0 04		0 7	0 32
	286 0	0 01	0 07	0 11		0 3	0 33
	288 0	0 01	0 15	0 08		0 1	0 17
	290 0	<0 01	0 03	0 02		0 1	0 18
	292 0	<0 01	0 03	0 03		0 1	0 21
	293 9	<0 01	0 03	0 04		0 1	0 18
	296 0	<0 01	<0 01	<0 01		<0 1	0 08
	298 0	<0 01	0 01	0 03		<0 1	0 28
	301 0	<0 01	<0 01	0 01		<0 1	0 18

PLAN



138155

5 cm

79-1384

FIG. 44

MT. LYELL - G.O.D.L. JOINT VENTURE E.L. 9/66	DRAWN. M HUTTON DRAFTING H D J.
BEATRICE GRID MT SEDGWICK ANOMALY ZONE DRILLING PROFILES D.D.H - MS 2 & 3	CHECKED DATE 1-6-1979 SCALE. 1 1000 Map Number 10/505

MT. LYELL - G.O.D.L. JOINT VENTURE		33/302
	CLARK VALLEY GRID	
	ANOMALY COMPILATION	
DRAWN M.H.		
TRACED R.G.W.		
CHECKED		
DATE 16:8:'78		
SCALE 1:6,000		

FIG. 45

138156

5 cm

MAGNETIC NORTH
TRUE NORTH
VARIATION 1°E

LOCATION MAP

MAJOR FAULTS

PYRITIC BLACK SHALE HORIZONS

RESISTIVITY

CHARGEABILITY

GEOPHYSICS - E1P GRADIENT ARRAY ANOMALIES

GEOCHEMISTRY
Cu >50 ppm.
Pb >50 ppm.
Zn >30 ppm.
Ag >ppm.
HORIZON
A
B,C HORIZON

LEGEND

- Old workings
- Alluvial Gold workings
- 4 WD Access Track
- Walking Track
- 20m peg spacing Grid lines

ZONE I

ZONE II

ZONE III

BASELINE 3000E

CLARK

RIVER

SLATE SPUR

CAMP

SOUTH DARWIN PEAK

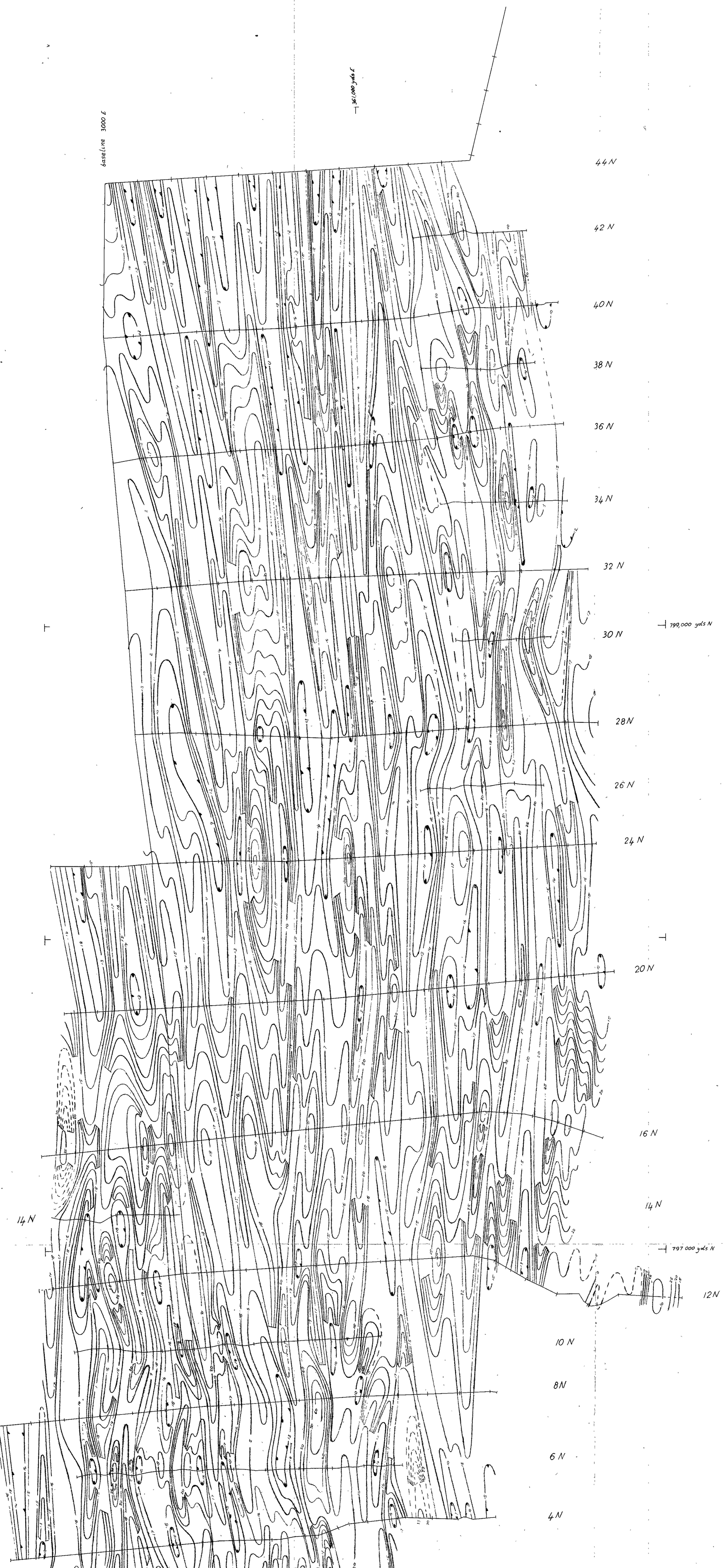
MT DARWIN

DARWIN PLATEAU

Tosmom Dorman

Humpty Dumpty

Cu Prince Dorman



MOUNT LYELL MINING & RAILWAY COMPANY

CLARK RIVER GRID

NEAR QUEENSTOWN - TASMANIA

GRADIENT ARRAY
ELECTRICAL INDUCED POLARIZATION SURVEY

REVISED

CHARGEABILITY CONTOUR PLAN

INCORPORATING EXTENSIONS & INFILL LINES

SURVEYED & COMPILED BY
SCINTREX

JAN-FEB 1978 (TAS-054)
JAN-FEB 1979

138157

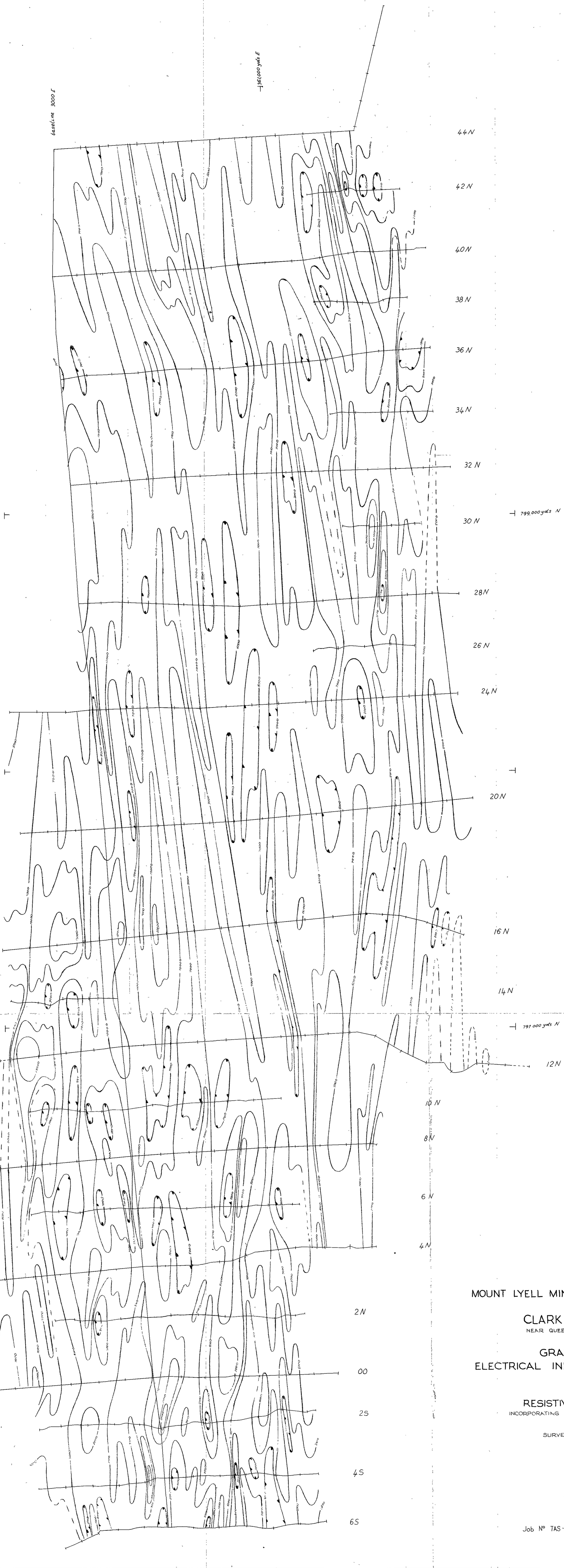
5 cm

SCALE 1 6000

79-1384

Job N° TAS-062-A | Sht 1 of 1 | PLATE 1

FIG.46



MOUNT LYELL MINING & RAILWAY COMPANY

CLARK RIVER GRID

NEAR QUEENSTOWN – TASMANIA

GRADIENT ARRAY
ELECTRICAL INDUCED POLARIZATION SURVEY

REVISED

RESISTIVITY CONTOUR PLAN

INCORPORATING EXTENSIONS & INFILL LINES

138158

SURVEYED & COMPILED BY
SCINTREX

JAN - FEB 1978 (TAS-054)
JAN - FEB 1979

5 cm

SCALE 1 6000

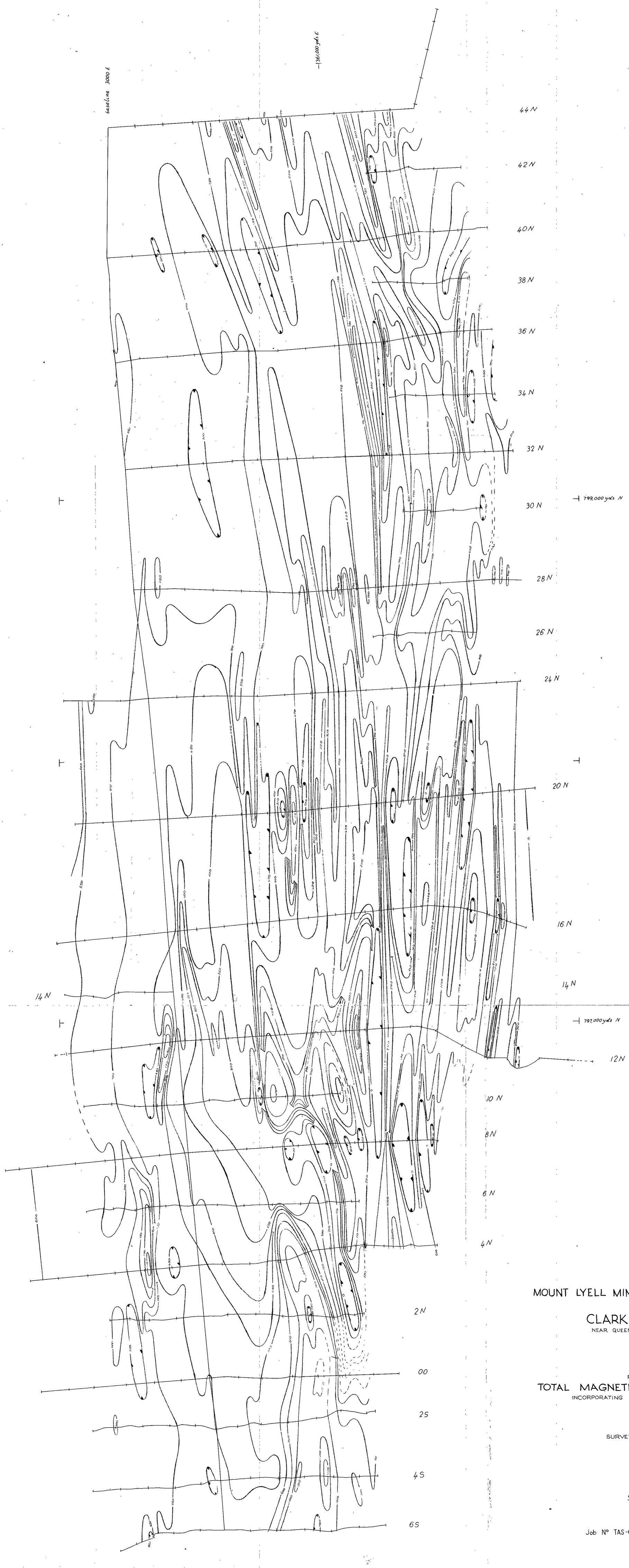
79-1384

Job N° TAS-062-A

Sht 1 of 1

PLATE 2

FIG.47



MOUNT LYELL MINING & RAILWAY COMPANY LTD.

CLARK RIVER GRID

NEAR QUEENSTOWN - TASMANIA

REVISED

TOTAL MAGNETIC FIELD CONTOUR PLAN

INCORPORATING EXTENSIONS & INFILL LINES

5 cm

SURVEYED & COMPILED BY
SCINTREX

JAN - FEB 1978 (TAS-054)
JAN - FEB 1979

128159

79-1384

SCALE 1 6000

Job Nº TAS-062-A Sht 1 of 1 PLATE 3

FIG. 48

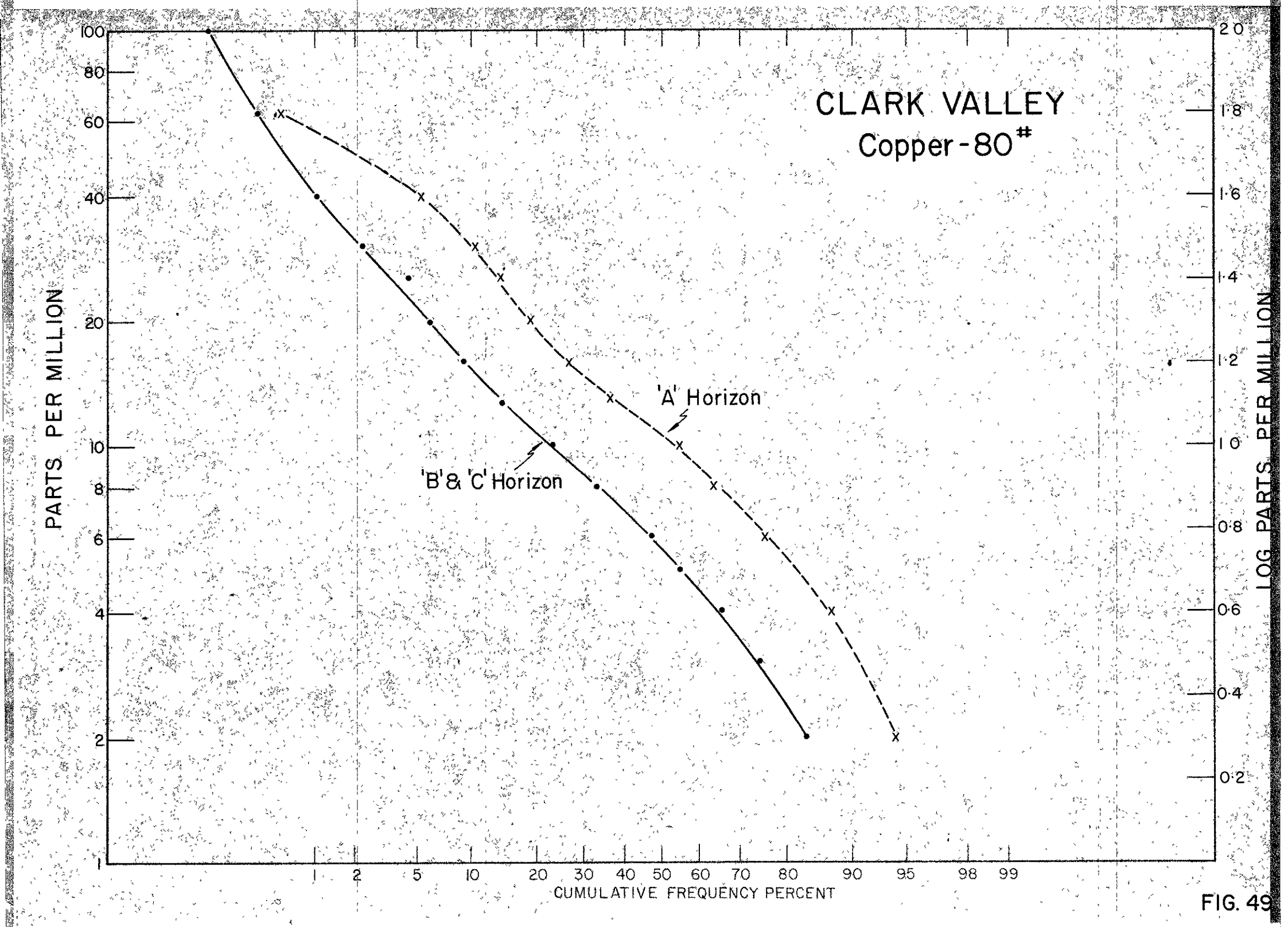


FIG. 49

79-1384

138160

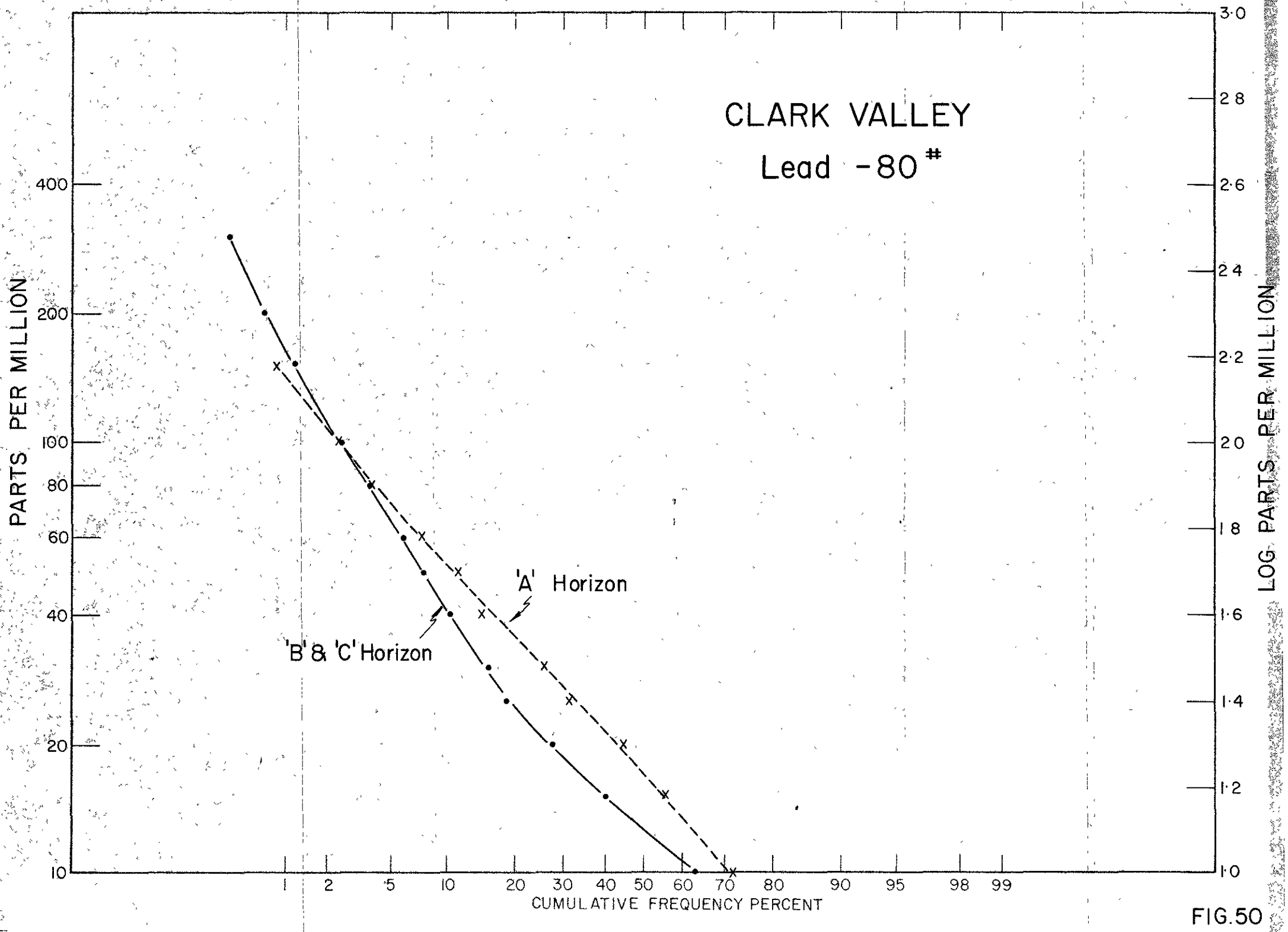


FIG.50

79-1384

138161

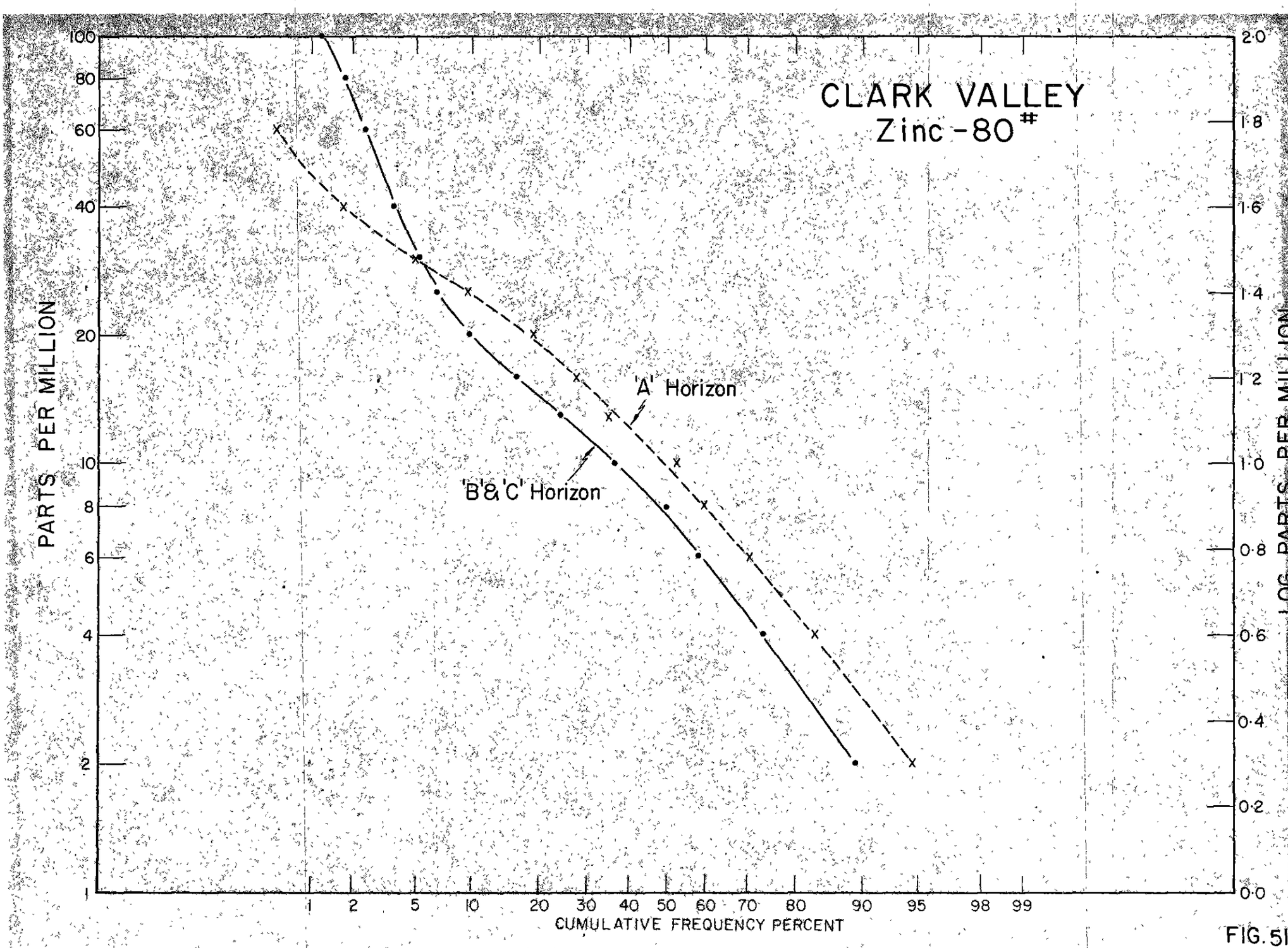
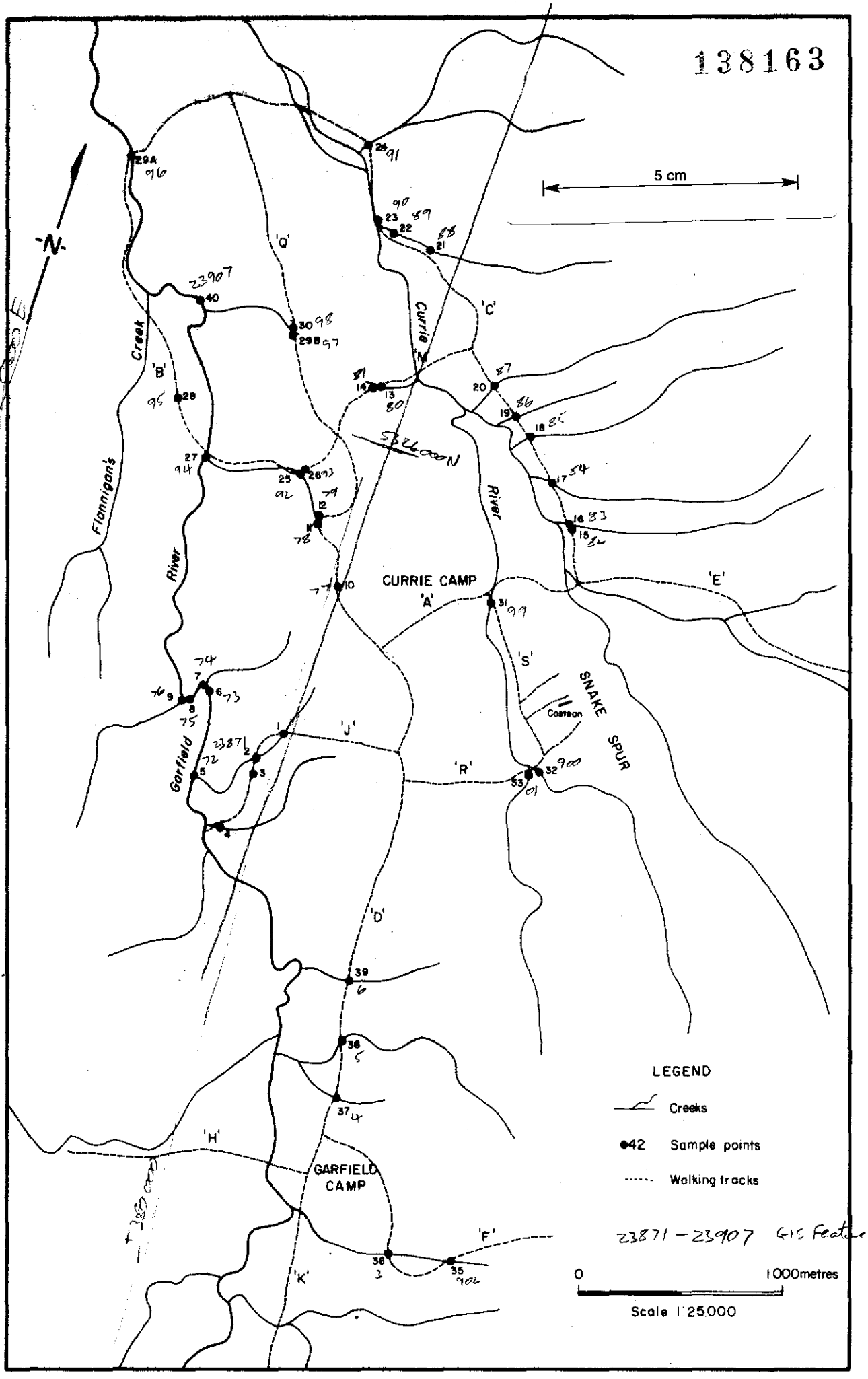


FIG. 51

79 - 1385

138162



GARFIELD RIVER STREAM SEDIMENT
SAMPLE LOCATIONS.

79-1384

FIG 52