OUTOKUMPU EXPLORATION AUSTRALIA PTY LIMITED

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Filename: 241GM009.RT1

PARTIAL RELINQUISHMENT REPORT
EL 14/85 - MT CATTLEY
21/08/85 to 20/08/90

For: Outokumpu Exploration Australia Pty Limited
77 Pacific Highway, NORTH SYDNEY NSW 2060

By: G. McKay

Date: 22 October 1990

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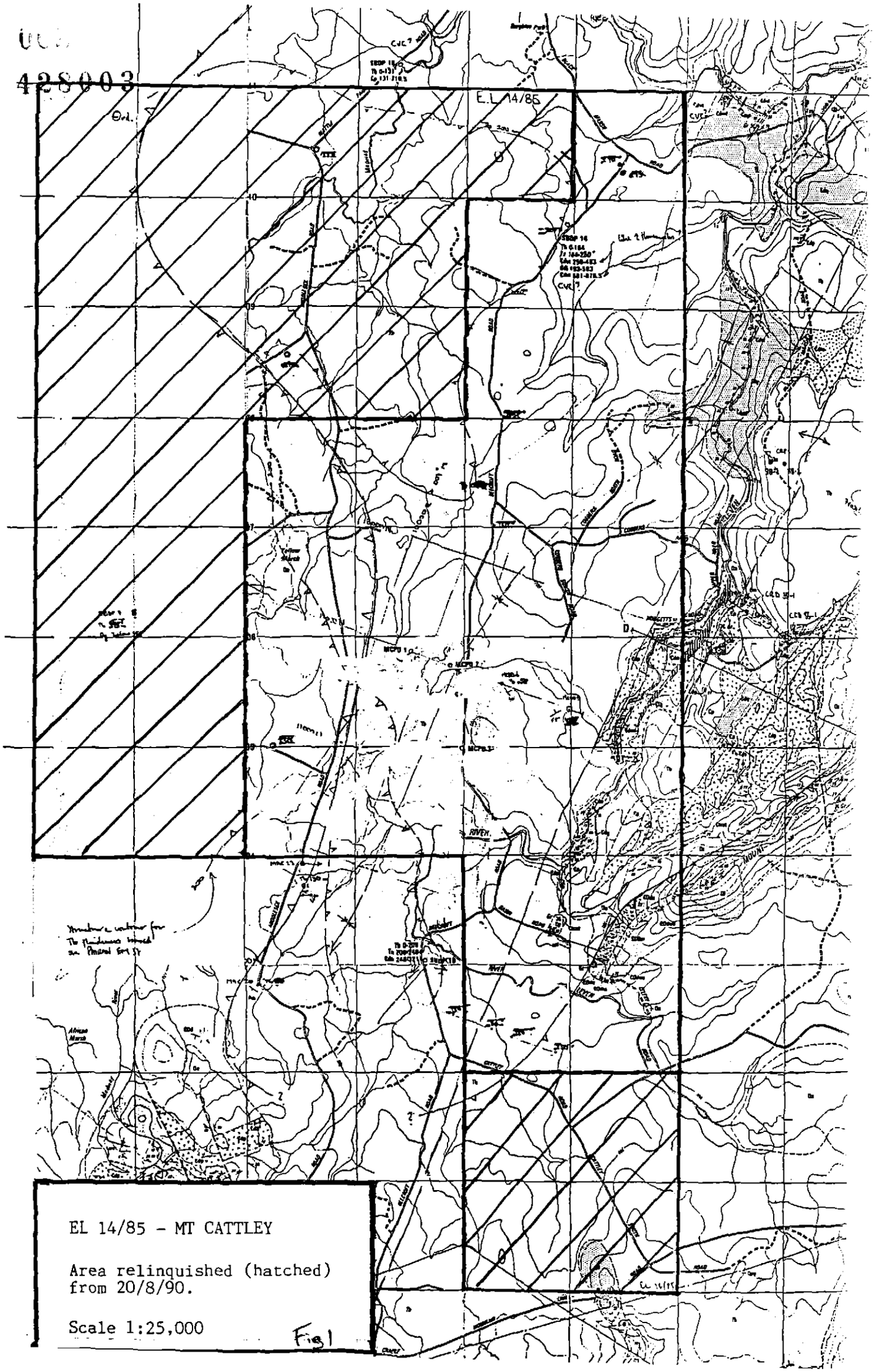


EL 14/85 - MT CATTLEY

Area relinquished (hatched) from 20/8/90.

Scale 1:25,000

Fig 1

1. INTRODUCTION

Exploration Licence 14/85 (Mt Cattley) was granted to Pancontinental Mining Limited in August, 1985. Since July 1988, Outokumpu Exploration Australia Pty Limited has operated the project on behalf of the Joint Venture between the two companies. The original area covered by EL 14/85 of 47 sq km was altered by the Department of Resources & Energy to 50 sq km in March 1990.

As advised by the Department, we have submitted a 50% reduction in the area for renewal of EL 14/85 for year six of the Licence, commencing 20 August, 1990.

Figure 1 shows the reduced area, with 25 sq km relinquished (hatched area) and 25 sq km retained.

2. EXPLORATION PHILOSOPHY

The original objective of the exploration program was the discovery of polymetallic base metal/precious metal volcanogenic massive sulphide deposits of the Que River - Hellyer type.

3. EXPLORATION SUMMARY

August 1985 - August 1986

Reconnaissance fieldwork was undertaken to allow planning of the detailed exploration of the licence.

Reconnaissance mapping at 1:20,000 scale and geochemical sampling of Leven River drainage was completed. Some mapping was undertaken in the southern section of the area of relinquishment, but no samples were collected in any part of the area of relinquishment.

A wide spaced grid (1 km spacing) was established over the south-central portion of the EL (Figure 2) including five cross lines, four of which extended into the area of relinquishment.

Between March and April 1986 a SIROTEM survey was undertaken over the gridded area in order to:-

1) determine the thickness of the basalt over the area considered most prospective,

2) to search for conductive ore bodies beneath the basalt, and

3) to search for conductive geological units beneath the basalt. The portion of the survey which extended into the area of relinquishment revealed the thickest basalt coverage thinning to the east.

A drilling programme was subsequently proposed, although no drilling was carried out in the relinquished area.

August 1987 - August 1988

Following the completion of the drilling program at Mt Cattley, a comprehensive review of the results of previous EM geophysical surveys carried out at was undertaken and a new survey grid defined (Figure 3). The new survey grid did not include any part of the area of relinquishment.

August 1988 - August 1989

The 1988/89 exploration program did not involve the area relinquished.

4. CONCLUSIONS: DISTRIBUTION OF PROSPECTIVE SEQUENCE

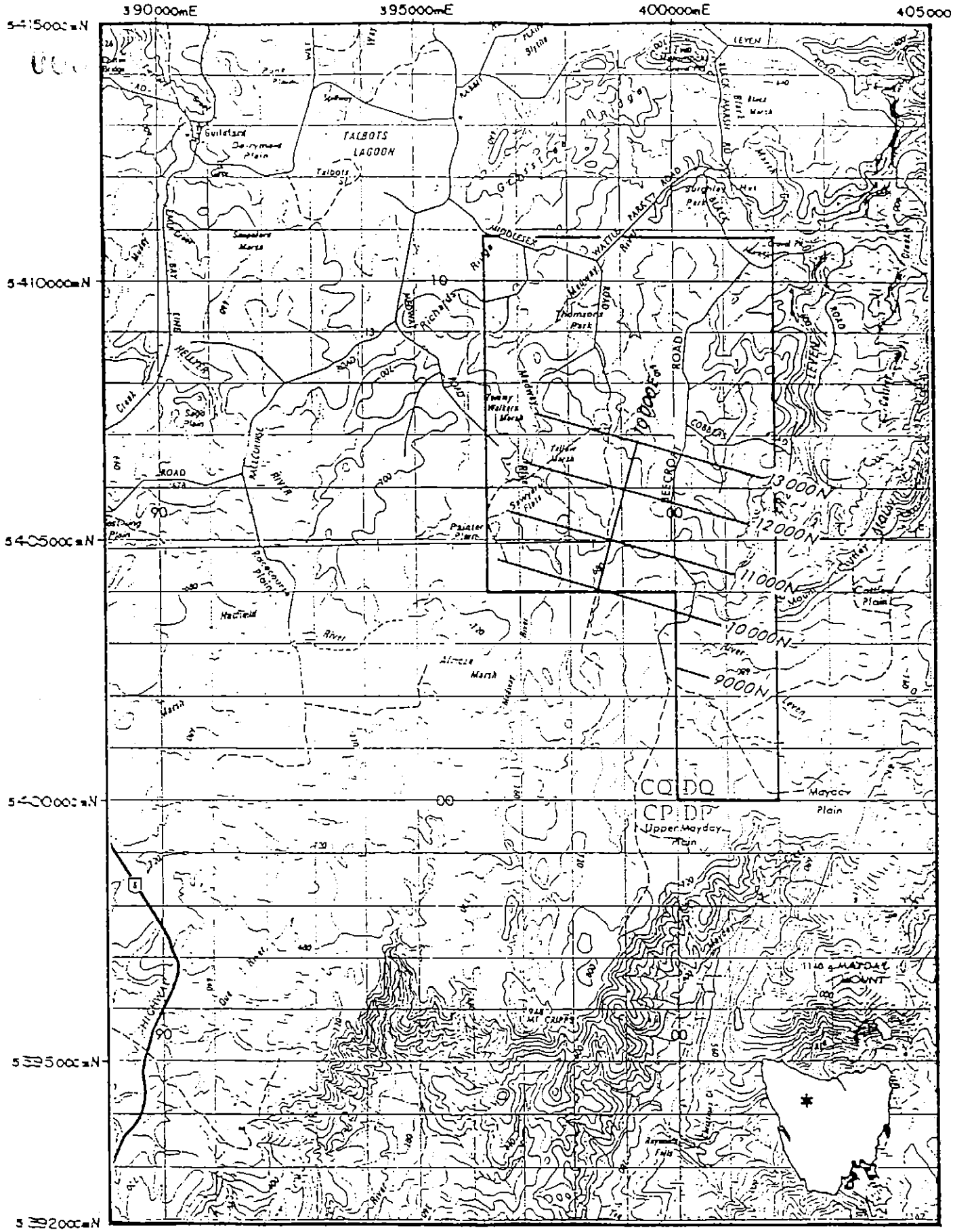
The area relinquished, which is composed of two smaller areas totalling 25 sq km, is mostly covered by a thick layer of Tertiary basalt (~300m) over an Ordovician-Devonian sedimentary sequence.

Outokumpu has liased with landholders regarding all work carried out at Mt Cattley. There has, however, been no rehabilitation necessary for exploration conducted in the area of relinquishment.

5. BIBLIOGRAPHY

Herrmann, W. (1986). NOTES ON THE GEOLOGY OF THE MT CATTLEY AREA, EL 14/85, TASMANIA for Pancontinental Mining Limited.

Wilson, D.R. (1986). EL 14/85 MT CATTLEY, TASMANIA, ANNUAL REPORT, 21/8/85 - 20/8/86 for Pancontinental Mining Limited.



GRID LOCATION PLAN

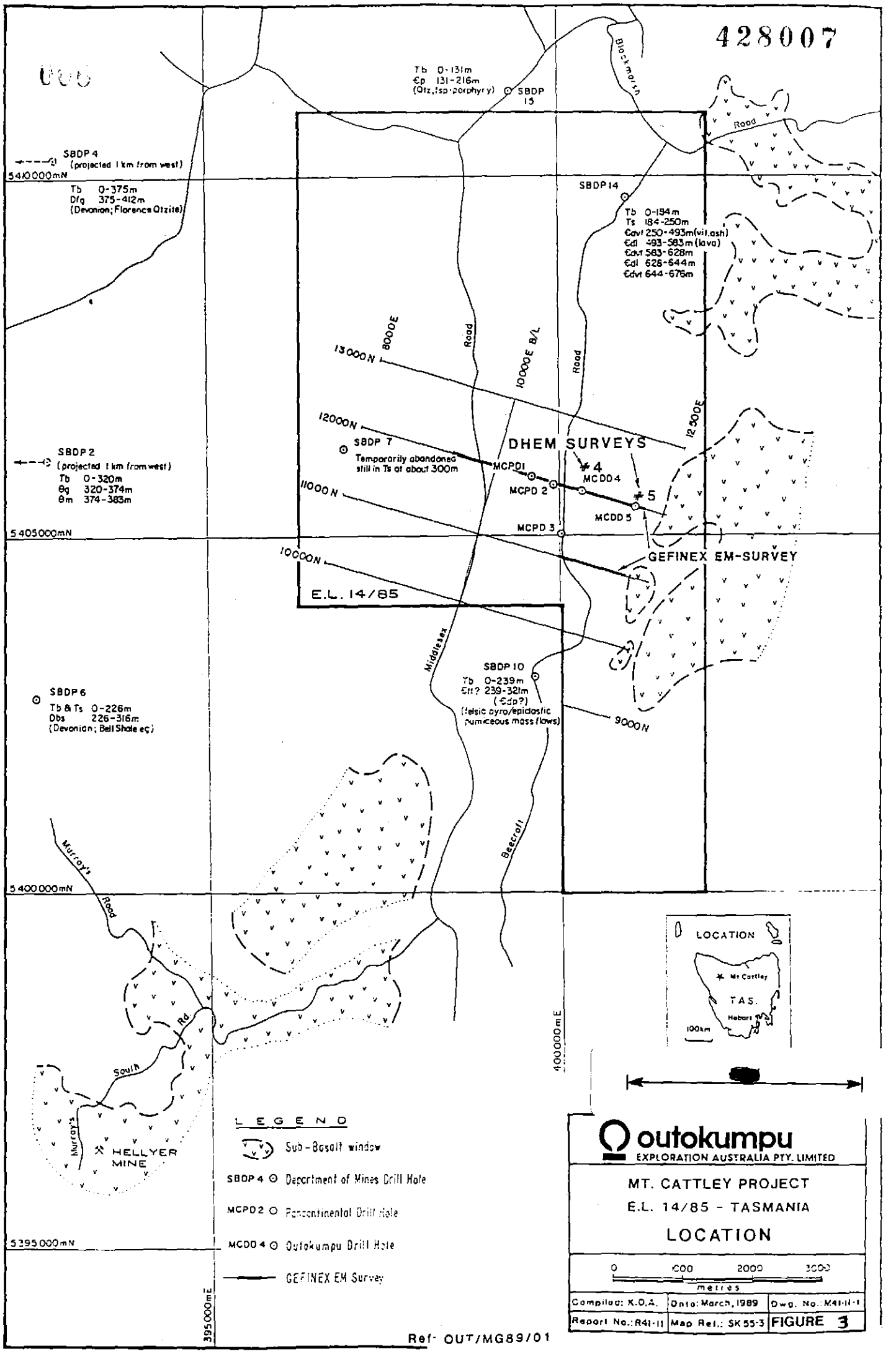
MOUNT CATTLEY E.L. 14/85 - TASMANIA

5 cm

Scale 1:100 000

4 1 0 2 4 6

KILOMETRES


428007
Tb 0-131m
€p 131-216m
(Qtz,fsp-porphyry)
SBDP 15
Blackmans Rd
SBDP 4
(projected 1 km from west)
5410000mN
Tb 0-375m
Dfg 375-412m
(Devonian; Florence Qtzite)
SBDP14
Tb 0-184m
Ts 184-250m
€dvt 250-493m(vit.ash)
€dl 493-583m(lava)
€dvt 583-628m
€dl 628-644m
€dvt 644-676m
Road
8000E
13000N
10000E B/L
12000N
12500E
SBDP 2
(projected 1 km from west)
Tb 0-320m
θg 320-374m
θm 374-383m
SBDP 7
Temporarily abandoned
still in Ts at about 300m
DHEM SURVEYS
MCPD1
#4
MCDD4
MCPD 2
#5
MCDD5
11000N
MCPD 3
5405000mN
GEFINEX EM-SURVEY
10000N
E.L. 14/85
Middlesex
SBDP 10
Tb 0-239m
Ts? 239-321m
(€dp?)
(felsic pyro/epidastic
pumiceous mass flows)
9000N
SBDP 6
Tb & Ts 0-226m
Dbs 226-316m
(Devonian; Bell Shale eq)
Murray's Road
5400000mN
Beecroft
LOCATION
Mt Cattley
TAS.
Hobart
100km
400000mE
South Rd
Murray's
HELLYER MINE
LEGEND
Sub-Basalt window
SBDP 4 Department of Mines Drill Hole
MCPD 2 Pancontinental Drill Hole
MCDD 4 Outokumpu Drill Hole
GEFINEX EM Survey
5395000mN
395000mE
Ref: OUT/MG89/01
outokumpu
EXPLORATION AUSTRALIA PTY. LIMITED
MT. CATTLEY PROJECT
E.L. 14/85 - TASMANIA
LOCATION
0 1000 2000 3000
metres
Compiled: K.O.A.
Date: March, 1989
Dwg. No.: M41-11-1
Report No.: R41-11
Map Ref.: SK55-3
FIGURE 3

428008

OUTOKUMPU EXPLORATION AUSTRALIA PTY LIMITED

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90-3196

PARTIAL RELINQUISHMENT REPORT
EL 14/85 - MT CATTLEY
21/08/85 to 20/08/90
VOLUME 2 OF 2

For: Outokumpu Exploration Australia Pty Limited
77 Pacific Highway, NORTH SYDNEY NSW 2060

By: G. McKay

Date: 22 October 1990

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APPENDIX 1

Interpretation of Mt Cattley Sirotem Data

1. Introduction

Between 19 March and 10 April 1986, McSkimming Geophysics surveyed 26.8 line km of 200m loop size Sirotem over Pancontinental's Mt Cattley EL in N.W. Tasmania (see location Figure 1). The survey had three objectives:

1. To determine the thickness of the basalt over the area considered most prospective
2. To search for conductive orebodies beneath the basalt and
3. To search for conductive geological units beneath the basalt.

The 1 km grid line spacing was designed to quickly determine the area where basalt thickness is less than 100m. A future detailed survey would only survey this area, of <100m basalt thickness, for a conductive orebody.

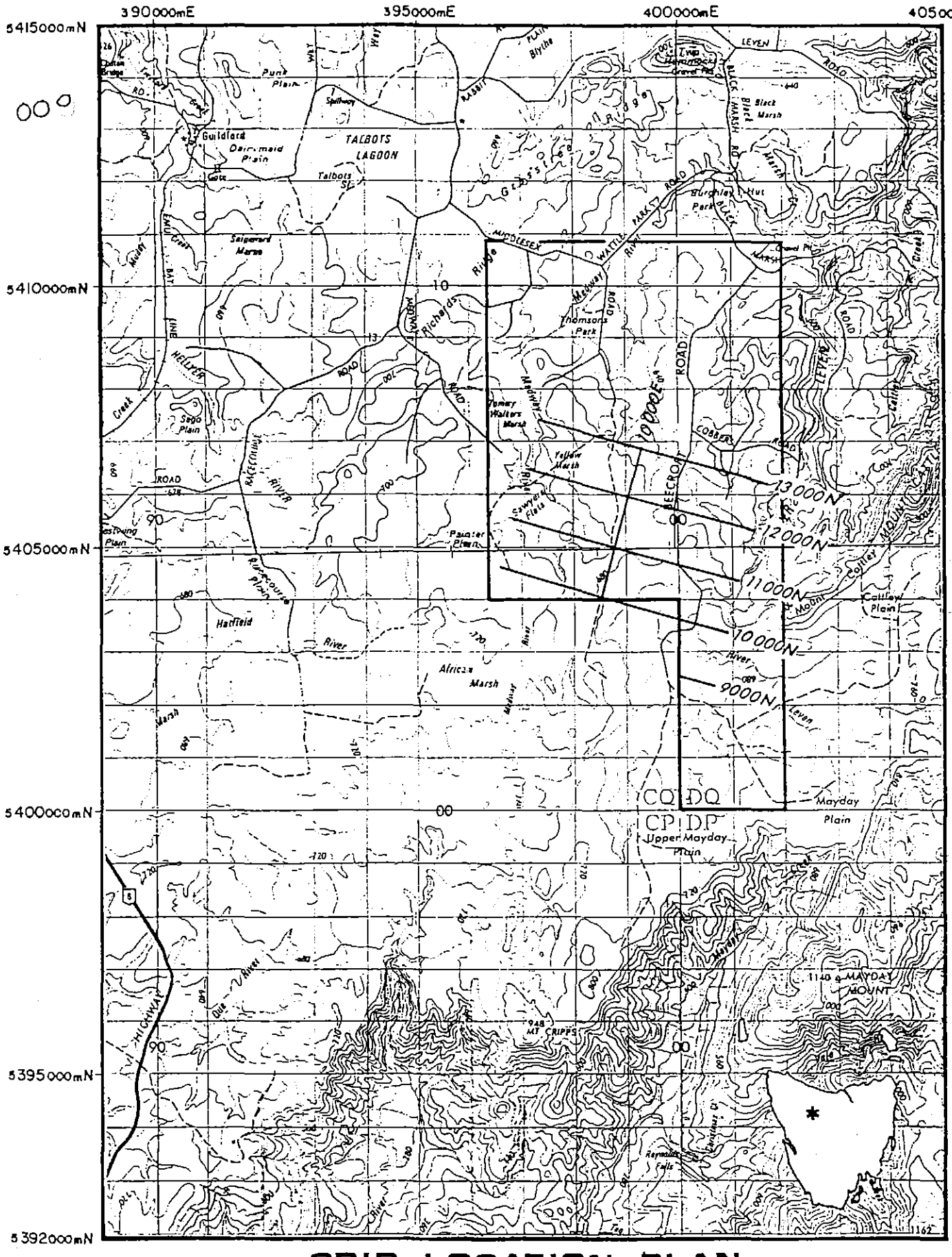
2. Survey Details

From previous company reports and personal communication, the basalt was expected to have an apparent resistivity in the range of 10-100 ohm metres, the Mt Reid Volcanics 200-10,000 ohm metres and a Hellyer type orebody <10 ohm metres. Access to the area is good and the average topographic variation is approximately 20m. Accordingly, a 200m moving loop, medium power, early time plus standard time Sirotem survey was selected. Readings were taken every 200m with a remote vector receiver in the middle of the loop. The ramp turn off time was regularly noted to assist interpretation.

Five, 1 km separated, approximate E-W, lines plus an approximate N-S road was surveyed to produce 138 soundings (see Figure 1). The data was stored on field cassettes and supplied to Pancontinental on a 9 track tape. The data was then edited and the early time and standard time readings merged for each station.

3. Interpretation

The data was interpreted with the aid of transient electromagnetic programs called "GRENDL" and "PLASI" (these programs were developed by the CSIRO under AMIRA sponsorship).



GRID LOCATION PLAN

MOUNT CATTLEY E.L. 14/85 - TASMANIA

Scale 1:100 000

2 1 0 2 4 6

KILOMETRES

5 cm

428010

FIGURE 1

3.1. Basalt Thickness

Initially apparent resistivities for each transient decay were calculated. This data provided a guide for the correct starting model for each inversion using program "GRENDL" (the inversion program "GRENDL" calculates the best fit model to the field data given a reasonably good starting model). After much experimentation with different models, all the data was run through the inversion program using 2 different models. Many further models and inversions were run on data where the original two models gave a poor result. The various inversion results were analysed at each station and an estimate of basalt thickness plotted on a 1:10,000 grid plan. The estimated accuracy in each thickness is also plotted at each station (most are within ± 10%). Where the accuracy is poor, (>±20%) it means that there are possibly strong lateral changes in the geology affecting the data.

Plate 1 shows the plotted basalt thickness contoured at 50m intervals.

The depths range from a maximum of 310m in the west to 0m in the east. From basement outcrop in the east, the basalt appears to rapidly thicken to between 200-250m. This suggests paleo topographic control - perhaps from more resistive acid volcanics to a less resistive sedimentary facies (Western Sequence Mt Reid Volcanics?).

On the two northern lines (12000N and 13000N) there is a local marked thinning of the basalt to < 100m. This area could overly prospective volcanics. There are no conductors that might represent orebodies evident in the data. This area should be drill tested to confirm the basalt thickness interpretations and to identify the sub-basalt geology. If both the thickness and geology are favorable, then I recommend infill T.E.M. to search for a conductive orebody beneath the < 100m basalt area.

On line 10,000N there is a small zone of basalt near 100m in thickness. This area should also be drill tested to confirm the basalt thickness and to identify the geology.

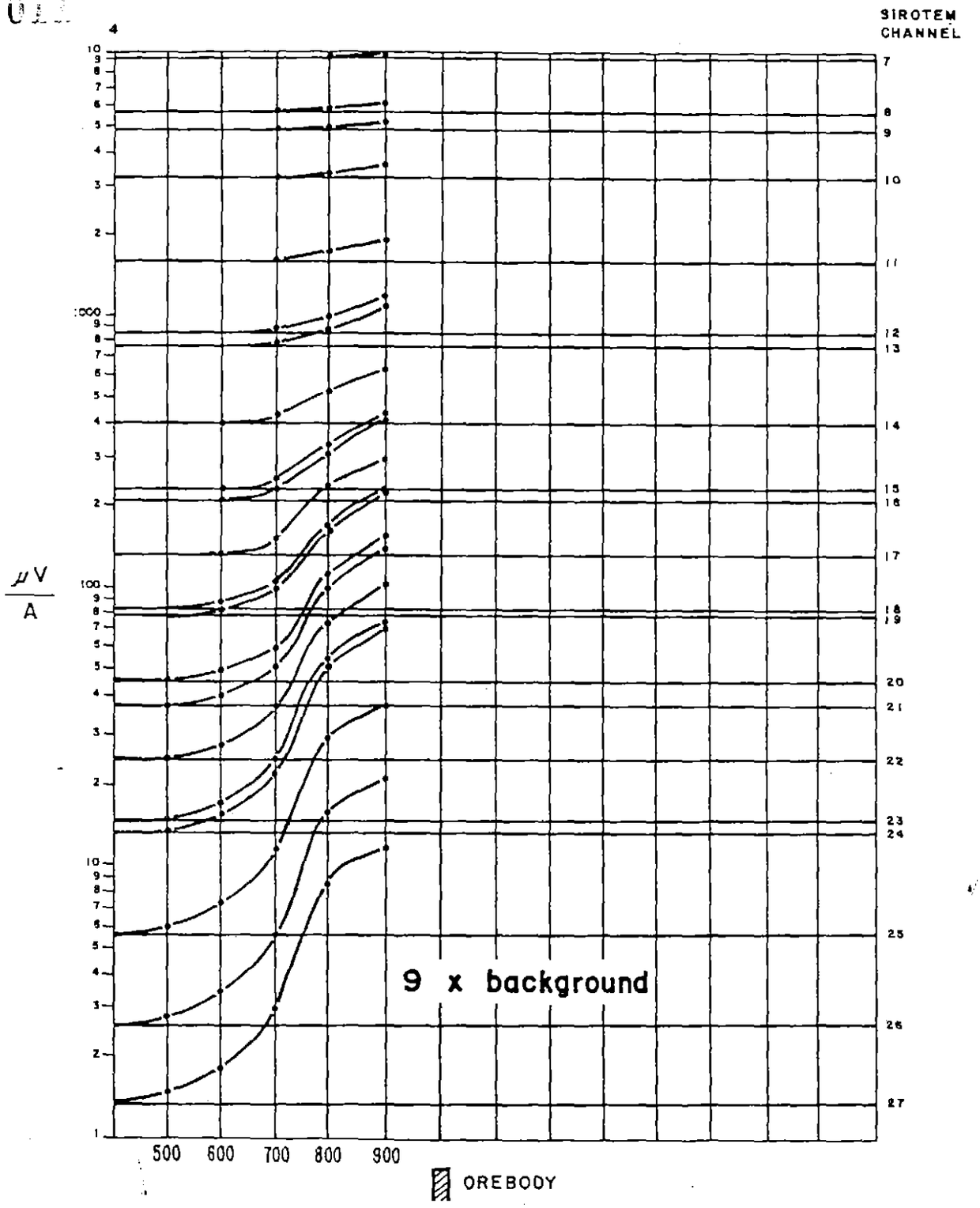
Recommended drill holes:

	Grid Coordinates	Targets
1.	12000N 10100E	Basalt 110m, geology
2.	12000N 10500E	Basalt 60m, geology
3.	12000N 10800E	Basalt 110m, geology

Possible additional holes:

4.	12000N 11500E	Basalt 90m, geology
5.	10000N 10000E	Basalt 100m, geology
6.	17000N on Beecroft Rd (450N of 11000N)	Basalt 65m, geology

428012

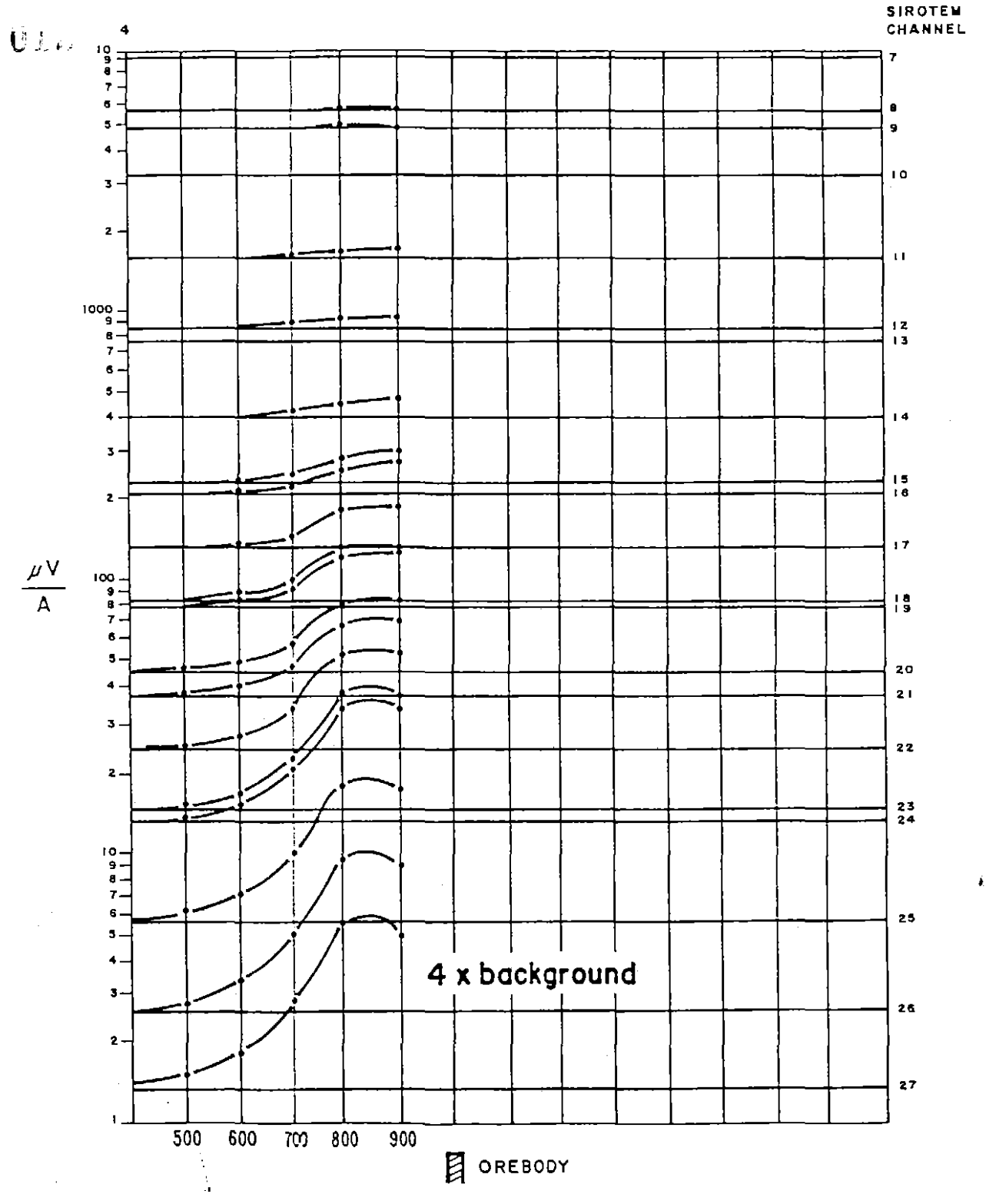


ρ_1 = 40 Ωm ρ_2 = 5000 Ωm thickness of upper layer = 100 m
(GRENDL PROGRAMME)

1200m x 200m x 25m = 15 mt ∂t = 50S, dip = 90°, plunge = 0°
(PLASI PROGRAMME)

TWO LAYER HALFSPACE AND OREBODY AT 100m

FIGURE 2



ρ_1 = 40 Ωm ρ_2 = 5000 Ωm

thickness of upper layer = 100 m

(GRENDL PROGRAMME)

1200m x 200m x 25m = 15mt

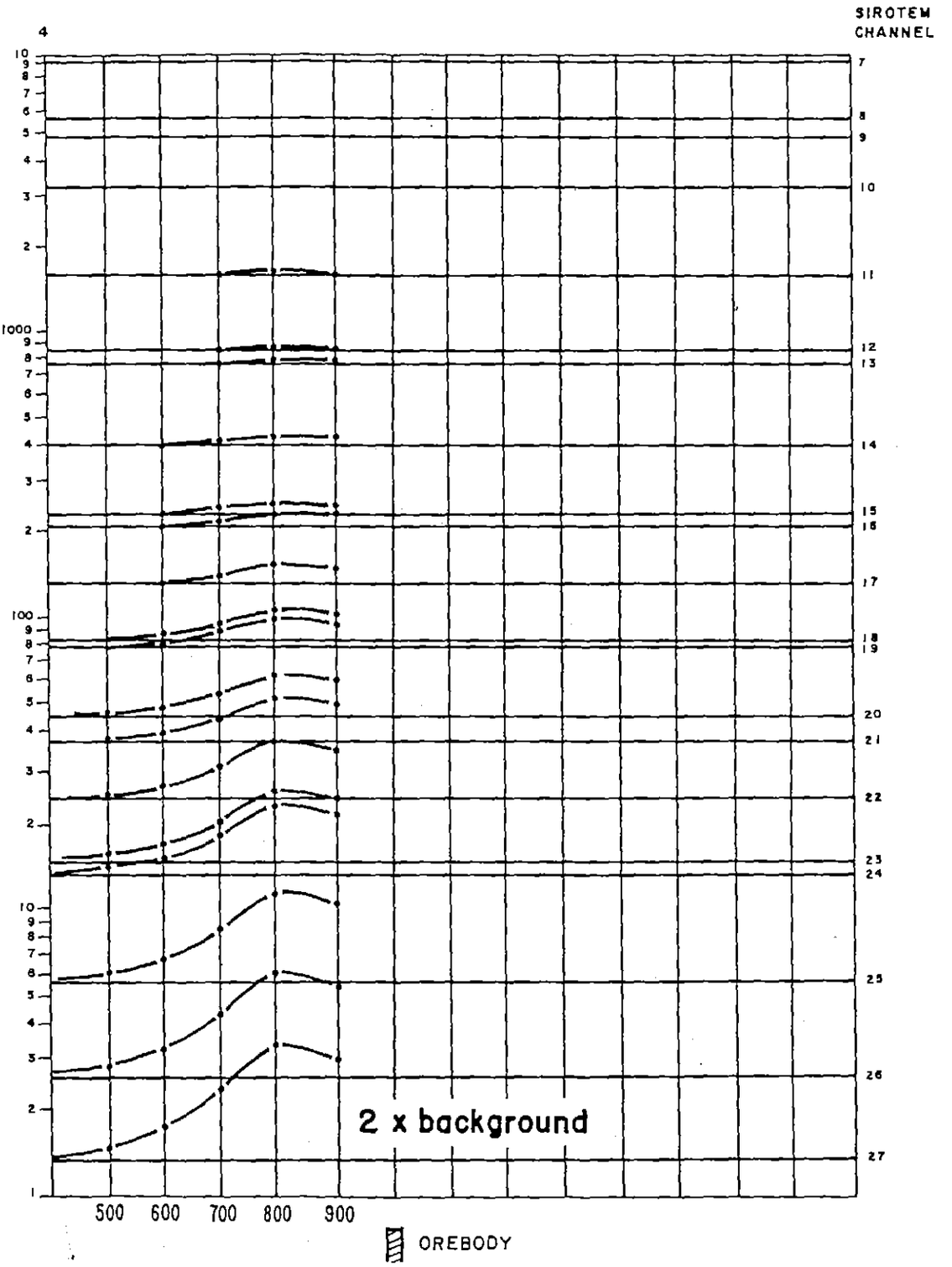
∂t = 50S, dip = 90°, plunge = 0°

(PLASI PROGRAMME)

TWO LAYER HALFSPACE AND OREBODY AT 150m

FIGURE 3

428014



ρ_1 = 40 Ωm ρ_2 = 5000 Ωm 1200m x 200m x 25m = 15 mt

thickness of upper layer = 100 m δt = 50 S, dip = 90°, plunge = 0°

(GRENDL PROGRAMME) (PLASI PROGRAMME)

TWO LAYER HALFSPACE AND OREBODY AT 200m

FIGURE 4

3.2. Sub-Basalt Conductors

There are no significant conductors interpreted to lie beneath the basalt. This is partly because the basalt is generally 200-250m thick and therefore effectively screens any deeper conductor.

3.3. Bedrock Apparent Resistivities

The sub-basalt apparent resistivity resulting from the "GRENDL" inversions were contoured and are presented on Plate 2. These apparent resistivities are not very accurate but may be a guide to variations in the bedrock resistivities and hence lithologies. Acid volcanics would be expected to be resistive and sediments more conductive than the volcancics. Thus the higher resistivity zones on Plate 2 may correspond with acid volcanics and the rest correspond with sediments.

4. Recommendations

The interpreted basalt thickness relies heavily on the interactive "GRENDL" inversions. Drill holes are necessary to check this interpretation and to identify the prospectivity of the sub-basalt geology. The 5 drill holes recommended in Section 3.1. are necessary to answer these questions.

3857

s 411000 m N
395000 m E
396000 E
397000 E
398000 E
399000 E
400000 E
401000 E
402000 E
403000 m E
s 410000 N
s 409000 N
s 408000 N
s 407000 N
s 406000 N
s 405000 N
s 404000 N
s 403000 N
s 402000 N
s 401000 N
s 400000 m N

Beercroft

• 240 ± 20
• 240 ± 20
250

• 209 ± 73
• 212 ± 10
• 232 ± 20

• 310 ± 30
• 290 ± 30
300 m
• 260 ± 40
• 260 ± 25
• 230 ± 20
• 220 ± 30
• 260 ± 30
250m

• 280 ± 20
• 260 ± 20
• 330 ± 20
300 m
• 270 ± 40
• 280 ± 40
• 280 ± 20
• 260 ± 25
• 260 ± 25
250 m
200m

E.L. 14 / 85

10000 E
• 230 ± 10
• 220 ± 40
• 240 ± 40
• 250 ± 40
200 m
150 m
• 120 ± 10
100 m
150 ± 5 •

13000 N
12000 N

Interpretation based on "GRENDL" inversion of early time and standard time Sirotem data

SURVEY PARAMETERS

Medium power Sirotem
200 m loop size
Remote vector receiver in centre of loop
Ramp time typically 140 μsec
Surveyed March 19 - April 10, 1986 by McSkimming Geophysics

CONTOURS

Contours are interpreted basalt thickness in metres.
200 ± 50 - basalt thickness ± range in metres

RECOMMENDED DRILLHOLES

↑
1-5

428016

90-3196.

PANCONTINENTAL MINING LIMITED
PANCON
EXPLORATION DIVISION

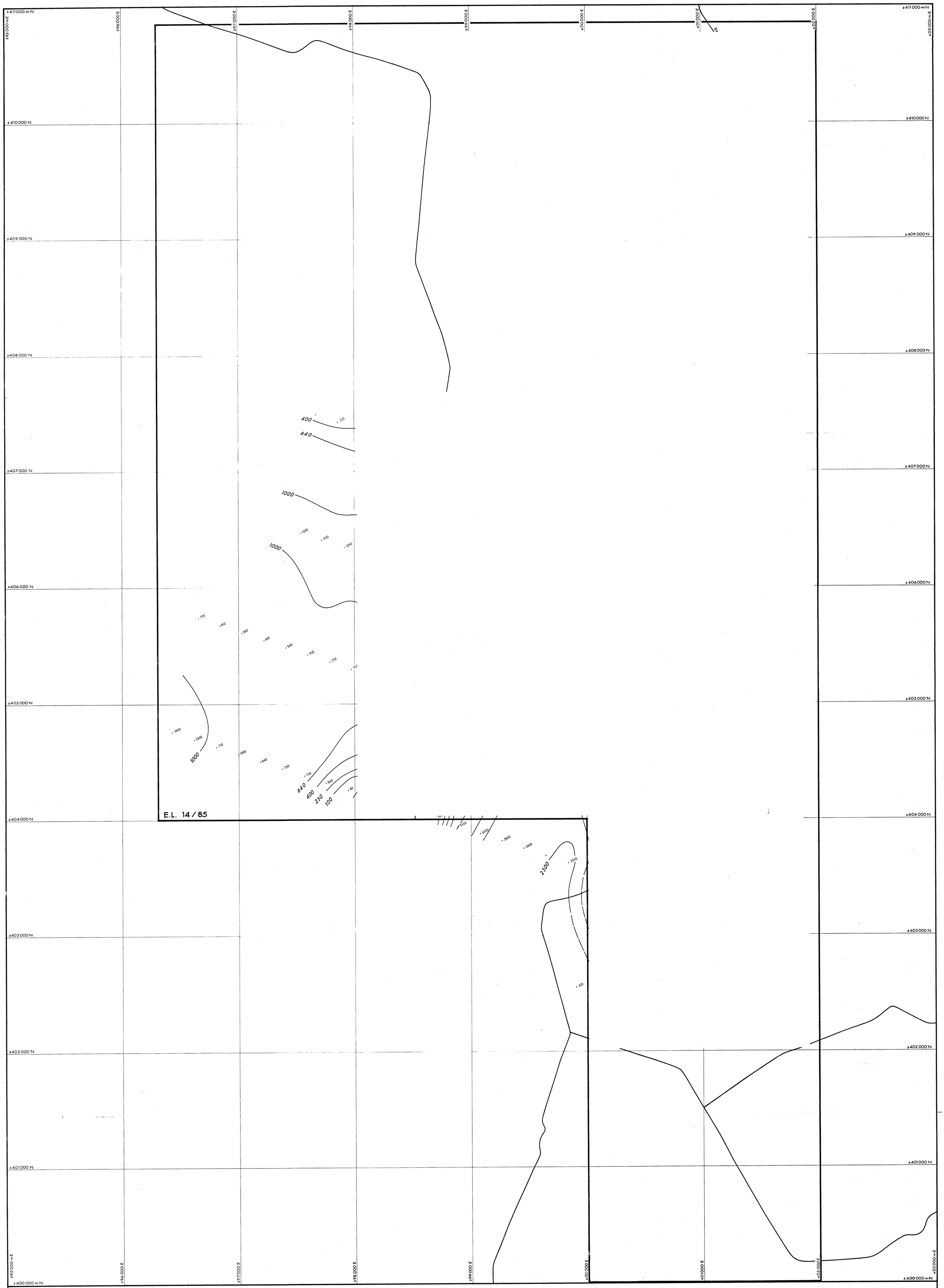
MT. CATTLEY PROJECT
EL 14/85 - TASMANIA

INTERPRETED BASALT THICKNESS

SCALE 1:10000
0 200 400 600 800 1000
METRES

Compiled D.Wilson	Date June, 1986	Dwg. Nº 36/E/2
Report Nº 86/35	Map Ref. SK 55-3	PLATE 1

5 cm



Interpretation based on "GRENDL" inversion of early time and standard time Sirotem data. Accuracy generally poor.

CONTOURS

Logarithmic contours based on 100, 160, 250, 400, 640, 1000 cycle. 710 - bedrock apparent resistivity from "GRENDL" inversion bedrock.

428017

90-3196.1

PANCONTINENTAL MINING LIMITED
EXPLORATION DIVISION

MT. CATTLEY PROJECT
EL 14/85 - TASMANIA

INTERPRETED BEDROCK
APPARENT RESISTIVITIES

SCALE 1:10000
0 200 400 600 800 1000
METRES

Compiled D.Wilson	Date June, 1986	Dwg. Nº 36/E/3
Report Nº	Map Ref. SK 55-3	PLATE 2

5cm