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667001

THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

E.L. 4/77 - HIGHCLERE

Progress Report on Exploration During the Period

March 1980 - August 1982

82-1878

Author: J.J. Lawton

Report No: 08-1069

Date : 14/9/82

Copy No : 1

Distribution:
1. Department of Mines
2. Comalco, Melbourne
3. BXHE/AHO
4. BXH/Devonport

SUMMARY

This report outlines exploration of E.L. 4/77 performed by The Shell Company of Australia Limited from March, 1980, when Shell became joint venture partners with the Licence holder, Comalco Limited, to the present.

As operators of the Joint Venture, Shell continued exploration initiated by Comalco, aimed at locating tin - tungsten mineralization associated with the intrusion of the Devonian Housetop Granite, similar in style to the Moina tin - tungsten deposit and the Kara tungsten mine. Both of these deposits have a strong magnetic signature.

Modelling of aeromagnetic anomalies was used to penetrate the extensive Tertiary basalt cover. However, the high susceptibility of some basalt and the high remanent component of the basalt magnetisation made modelling of the Guide River basalt valley structure and Highclere magnetite skarn difficult. A ?Cambrian carbonate sequence initially located at Buckby, was tested along strike for massive sulphide tin mineralization with negative results.

Exploration was re-directed towards conductive mineralization in early 1982 when an INPUT survey was flown over a 8 km x 8 km block covering the western margin of the Housetop Granite. This programme is currently in progress.

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667003

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- 1B : Guide River Anomaly PDH GRD 1

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- 2A : Buckby Prospect DDH BD 8
- 2B : Guide River Anomaly PDH GRD 1
- 2C : Highclere Iron Prospect PDH H 1

PLANS

PLAN NO.	TITLE	SCALE
D/MQ 03/030	E.L. 4/77 Highclere, Geology	1: 50 000
D/MQ 03/052	Residual Aeromagnetic Contours	1: 50 000
D/MQ 03/015	Buckby Prospect, Line 300 S, Geology, Geochemistry, Magnetics & IP	1: 2 500
D/MQ 03/017	Guide River Ground Magnetic Profiles	1: 2 500
D/MQ 03/018	Guide River Ground Magnetic Contours	1: 2 500
D/MQ 03/039	Guide River Anomaly Line 6000 E, Geology, Geochemistry & Geophysics	1: 2 500
D/MQ 03/019	Highclere Prospect, Ground Magnetics	1: 2 500
D/MQ 03/023	Highclere Prospect, Ground Magnetic Contours	1: 2 500
D/MQ 03/022	Highclere Prospect, Geology	1: 2 500
D/MQ 03/027	Highclere Prospect, Soil Geochemistry (Tin, Tungsten)	1: 2 500
D/MQ 03/028	Highclere Extended Grid Magnetic Profiles, Lines 2400N, 2800N, 3200N	1: 2 500

1.0 INTRODUCTION

1.1 General

The Highclere Exploration Licence is located in north west Tasmania approximately 25 km southwest of Burnie, and surrounds E.L. 17/68 held by Tasminex N.L., owners of the Kara scheelite deposit (Refer Fig. 1).

Land use is split between pastoral and forestry interests, enabling ready access to all parts of the licence.

Ridgley is the sole township within the licence.

1.2 Tenement Status

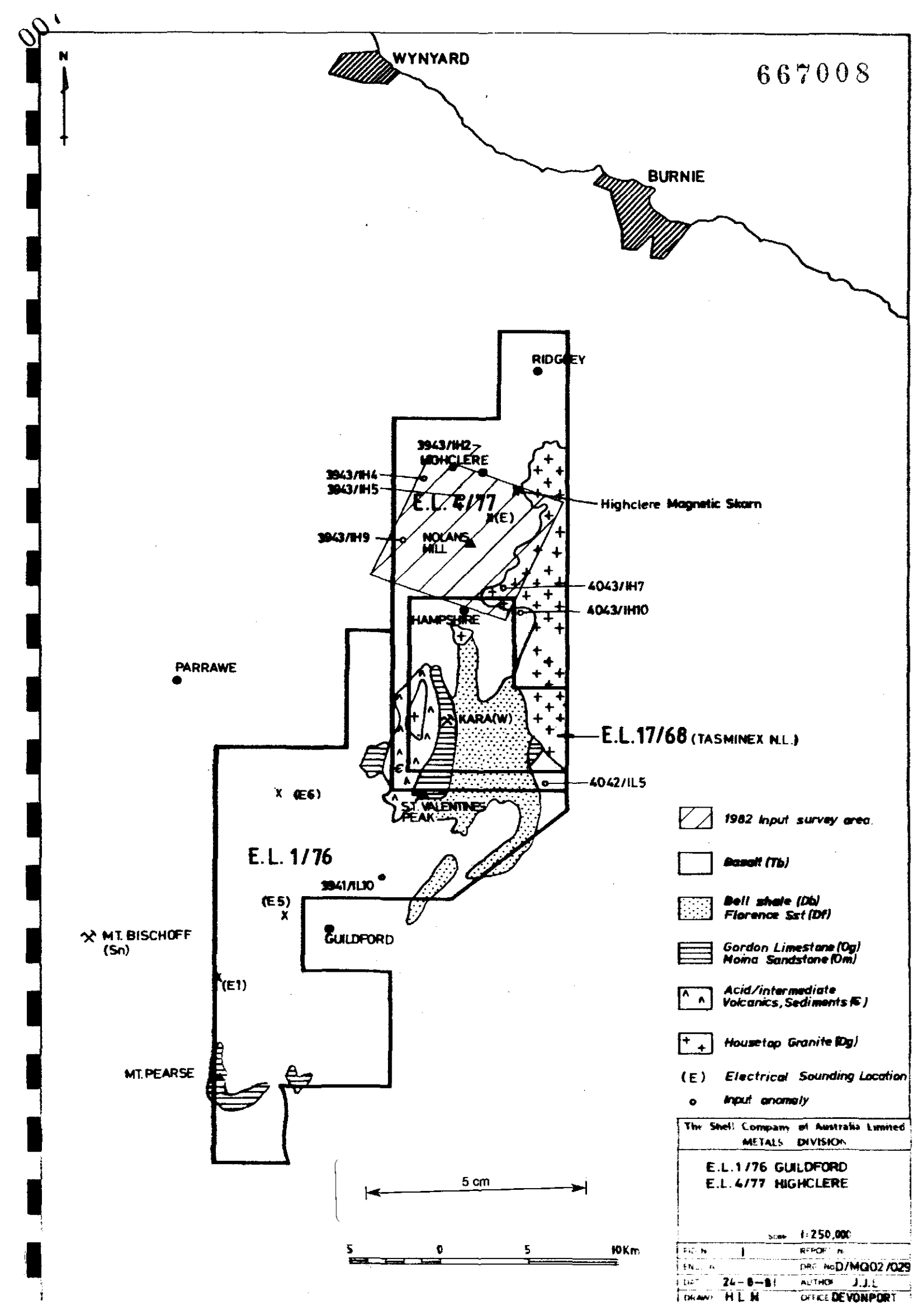
The Highclere licence E.L. 4/77 of 147 sq. km. was granted to Comalco Limited in June, 1977. All holdings in the area are Crown Land.

A Joint Venture agreement between Comalco Limited and The Shell Company of Australia Limited was finalised in March, 1980, giving Shell the right as operator to earn a 50% interest in the property. This equity was earnt by Shell during the first half of 1981, after which both parties contributed equally to exploration expenditure.

In June, 1982, Comalco gave notice of its intention to dilute within the Housetop Joint Venture, of which the Highclere licence forms part.

1.3 Previous Investigations

Investigations prior to Comalco have been outlined by Askins (1978).



The Shell Company of Australia Limited
METALS DIVISION

E.L.1/76 GUILDFORD
E.L.4/77 HIGHCLERE

Scale 1:250,000

FIG. No	1	REPORT No	
ENCL. No		DRG. No	D/MQ02/029
DATE	24-8-81	AUTHOR	J.J.L
DRAWN	H.L.M	OFFICE	DEVONPORT

Comalco acquired the Highclere Licence after exhaustive exploration of the Moina fluorite-rich magnetite skarns associated with the Dalcoath Granite. Exploration was aimed at Moina-style mineralization, or Kara-style scheelite bearing magnetite skarns.

Consequently, exploration of the licence was primarily directed at assessing aeromagnetic anomalies.

The main areas of Comalco's exploration effort were:

St. Valentine's Grid
Kingsclere Grid
Buckby Prospect
Highclere Iron Deposit
Hanstein Grid

1.4 Exploration Approach

When Shell became operators of E.L. 4/77 in 1980, the direction of exploration established by Comalco was maintained. Magnetite bearing skarns were primary targets, although sulphide skarns as observed at Buckby were gaining in importance.

Because of the extensive Tertiary basalt cover over the licence an airborne magnetic/radiometric programme was flown to cover the licence. Much of Shell's exploration has attempted to penetrate the basalt.

In late 1981 exploration was directed towards locating conductive, rather than magnetic, bodies. This programme is currently in operation.

2.0 GEOLOGICAL SETTING

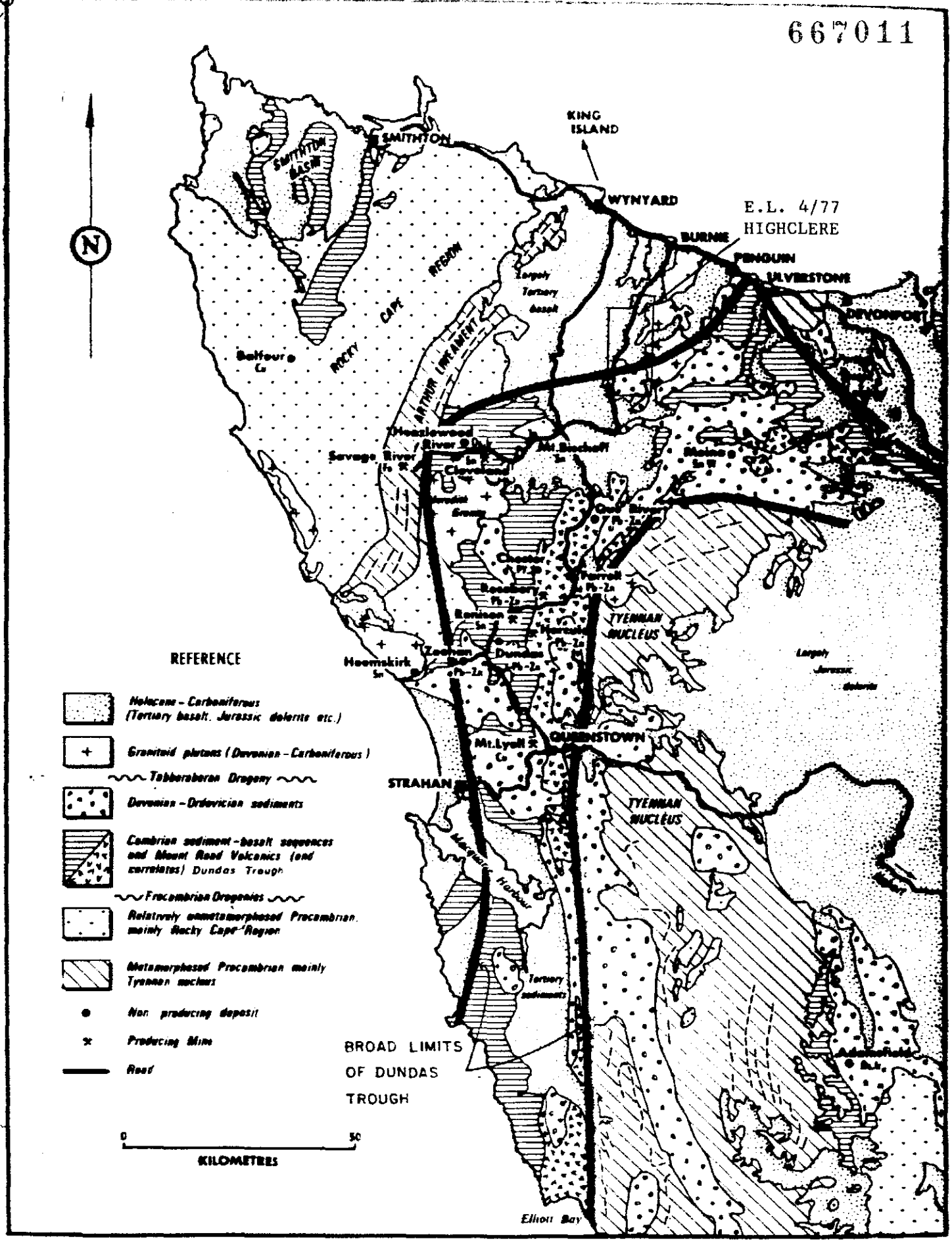
Exploration Licence 4/77 is covered by the Burnie 1:250 000 geological sheet and the Burnie and St. Valentine's (unpublished) 1:63 360 geological sheets. Plan D/MQ 03/030 is a compilation of geology from current and previous investigations.

The Highclere Licence extends over the western contact zone of the Devonian Housetop Granite, intrusive into the Precambrian Burnie Formation siltstones of the Rocky Cape Block (Refer Fig. 2). In the southern portion of the licence the Housetop Granite intrude Ordovician and Devonian limestones and sandstones indicative of shallow marine and shelf sedimentation.

A presumed thin Cambrian (?Dundas Group) sequence of dolomitic limestone, dolomitic limestone conglomerate, chert, and some acid volcanics, siltstone and ultramafics has been intersected in drilling at Buckby (see Section 3.2).

The Devonian Housetop Granite is a pale adamellite. Tin-tungsten-fluorine mineralization in the area is associated with this granite. Greisenization occurs at Cranes Tin Prospect (Collins, 1980) and south of Hampshire (Askins, 1978). The Kara scheelite mine occurs where an apophysy of the Housetop Granite (or later stage differentiate) intruded the basal section of the Ordovician Gordon Limestone.

Much of the area is covered by Tertiary basalt flows of highly variable thickness.



5 cm

REGIONAL GEOLOGY

NORTH WEST TASMANIA

(Modified from Williams, Solomon & Green, 1976)

FIG. 2

3.0 ECONOMIC GEOLOGY

3.1 Aeromagnetic/Radiometric Survey

Immediately Shell entered into joint venture with Comalco, a regional helicopter-borne magnetic/radiometric survey was flown by Geometrics.

Residual magnetic contours for the Highclere licence are shown on Plan D/MQ 03/052.

Consultant geophysicist G.O. Dickson interpreted the data and recommended ground work for several airborne magnetic anomalies (Dickson, 1981). He concluded that the magnetic character of the area is controlled by topography and does not necessarily reflect structural trends. In some cases the present drainage cuts across Tertiary basalt valleys.

Because of the extensive basalt cover it was considered magnetite skarn to be a more suitable target than sulphide replacement bodies.

3.2 Buckby Prospect

Comalco carried out extensive ground work on this prospect including geological mapping, rock and soil sampling, ground magnetics, IP and diamond drilling prior to joint venturing the property with Shell (Askins, 1978).

The sequence consists of ?Dundas Group pyrrhotite-bearing dolomitic limestones, dolomitic-limestone-conglomerate and chert, minor acid volcanics, siltstone and lithic tuff, intruded by altered granite.

012

66/1013

AIRBORNE GEOPHYSICS
(EM, MAG, etc)

GEOLOGY
& TOPOGRAPHY

2200W 2000W 1800W 1600W 1400W 1200W

APPARENT CHARGEABILITY.

N
1- 7.7 12.4 29.2 19.2 38 44 26.5 5.6
2- 7.1 10.1 20.2 35 38.5 26 1.6 22.2 5
3- 5.4 8.4 20 22 -8.5 94 -12.6 5.6 18.7 7
4- 8 20.1 24.2 39 49 32.5 -4.5 3.5 17.3 8.6
5- 21.5 22.4 43.5 32 34 -19.5 -5 8.2 17.8
6- 23 35 4.9 18.2 13.2 6.7 6

2200W 2000W 1800W 1600W 1400W 1200W

APPARENT RESISTIVITY.

N
1- 371 1448 1192 3427 1798 3677 587 148
2- 222 243 171 288 512 3738 229 168
3- 363 254 268 327 26 484 297 173 261 258
4- 411 236 480 398 2084 4218 102 191 388 382
5- 397 371 479 647 5073 119 119 291 488
6- 572 489 684 N.R. 166 140 152 308

Contractor : SCINTREX
Date : 29-7-80
Timing : 2 SEC
Transmitter :
Receiver : IPR8 3B6126
Integration time :
Array : DIPOLE DIPOLE
Dipole length : 100 Metres

5 cm

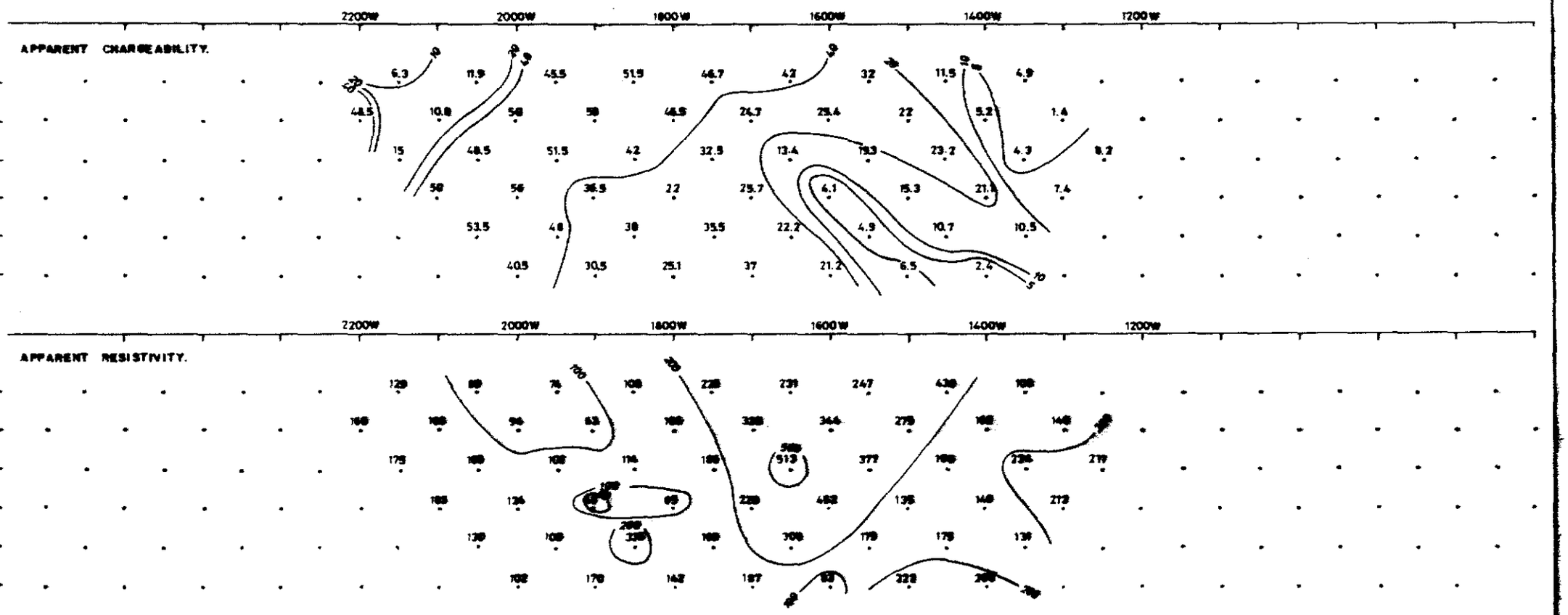
IP / RESISTIVITY SURVEY
E.L. 4/77 HERCLERC
BICKBY PROSPECT
LINE 100 S

Fig 3

AIRBORNE GEOPHYSICS
(EM, MAG, etc.)

013
66/1014

GEOLOGY
& TOPOGRAPHY



Contractor :
Date : 30-7-69
Timing : 2 SEC
Transmitter :
Receiver :
Integration time :
Array : DIPOLE DIPOLE
Dipole length : 100 M

5 cm

IP / RESISTIVITY SURVEY
E. L. 4/7F HIGHLEIGH
BUCKBY PROSPECT
LINE 28S

Fig 4.

Metasomatism has variously altered the sediments to pyrrhotite-diopside-phlogopite skarns and magnetite-diopside-phlogopite skarns.

Comalco drilling results were not encouraging, although the along strike extensions of this carbonate horizon remained untested.

Shell re-established and extended the Comalco grid. A mise-a-la-masse survey was carried out on Comalco drill-hole KD 6 to locate extensions of sulphide mineralization, and Scintrex carried out two dipole-dipole IP lines across the Buckby skarn (Refer Figs. 3 and 4).

A diamond drillhole, DDH BD 8, was sited at 300 S/1850 W, 200 m south of Comalco's pyrrhotite skarn intersections in DDH's KD 4, 5 and 6 on line 100 S. The drillhole was inclined 60^{o} E to intersect a 59 msec chargeability source, a 1000 nT ground magnetic anomaly, a soil geo-chemical anomaly (255 ppm Cu, 50 ppm Sn and 1120 ppm F) and the granite contact (Refer Plan D/MQ 03/ 015).

Results of the drilling are presented in Appendix 2A. Massive pyrrhotite and magnetite skarns are not developed in DDH BD 8. Consequently Sn and W values are uniformly low. A suite of petrological samples (Appendix 1A) suggested that some of the massive diopside skarns were formed from 'skarnised ultramafics'. The serpentinite intersected in the drillhole was considered to have originally been a dunite.

The surface chargeability anomaly (59 msec) was explained by downhole logging (Appendix 2A): 60 - 100 msec charge-abilities were associated with the diopside-pyrrhotite skarn.

A later max-min EM survey along line 300 S (Refer Fig. 5) failed to locate a significant conductor and generally reflected lithologies. However a chargeability/resistivity anomaly known to exist to the west was not covered due to strong cultural effects.

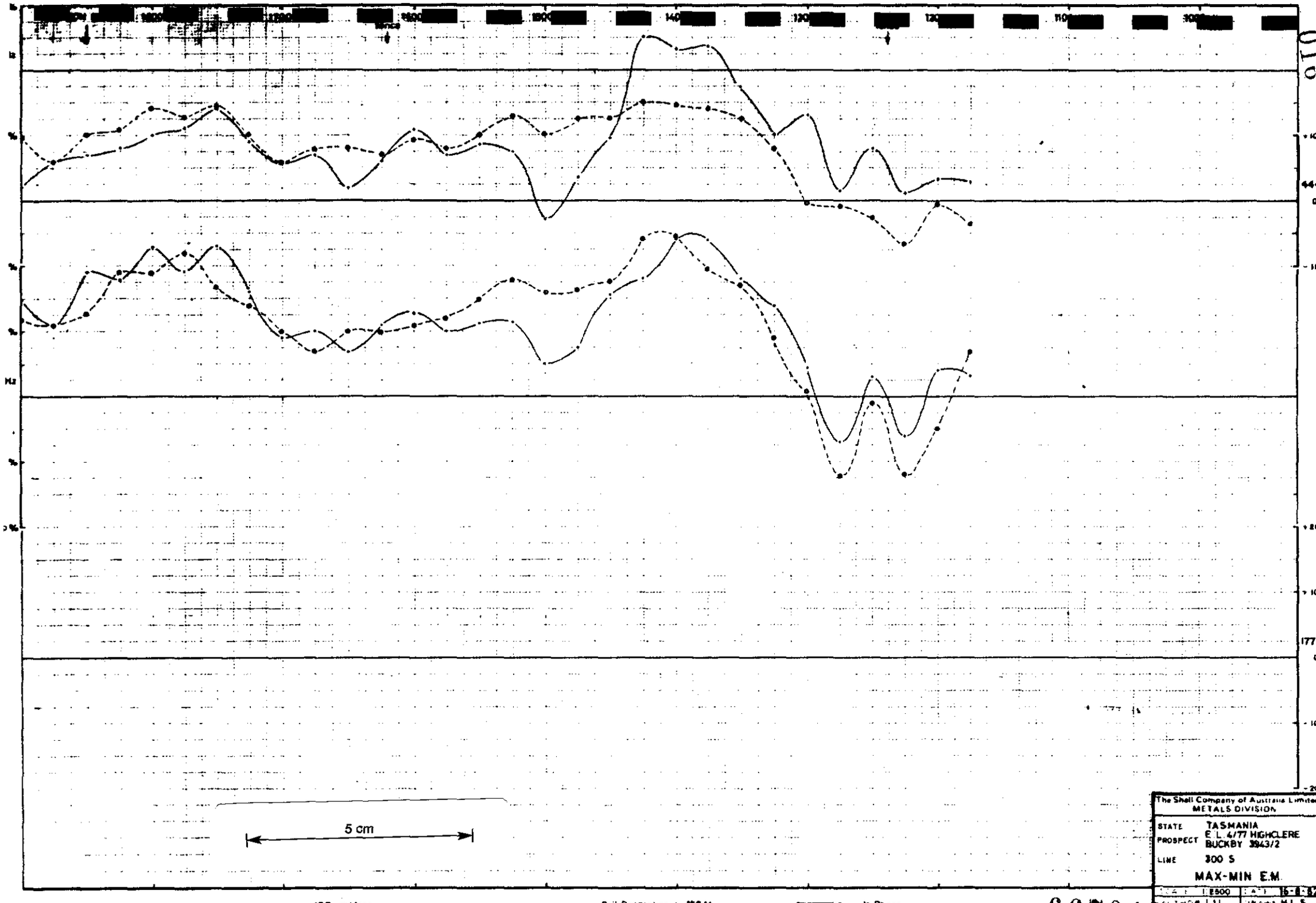
3.3 St. Valentine's Prospect

The St. Valentine's Prospect is located approximately 1 km northeast of St. Valentine's Peak in the southern strip of the licence. A thin magnetite skarn is developed in the basal section of the Ordovician Gordon Limestone, similar to the Kara scheelite deposit. The prospect was located and explored by Comalco (Weste, 1979), and will be dealt with only briefly here.

Shell assessed the Comalco ground and drillhole data to determine whether sufficient tonnage could be expected to warrant further work. Consultant G.O. Dickson modelled the ground magnetic data and concluded that the skarn horizon is very thin. The Comalco drillhole SV 1 magnetite-garnet-pyrite skarn intersection of 2.5 m true width with average magnetic susceptibility of 52 000 x 10^{-6} cgs units, adequately explained the 3000 nT ground magnetic anomaly.

3.4 Guide River Anomaly

The Guide River aeromagnetic anomaly was selected by consultant geophysicist G.O. Dickson (1981). Modelling of the anomaly suggested a buried valley feature, but the modelled susceptibility of the basalt would have to be far greater than anything previously measured.


016
+10%
444 H
0
-10%
+20%
+10%
1777
0
-10
-20
5 cm
100 metres
Coil Separation = 150 M
In Phase
Out of Phase
66701
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METALS DIVISION
STATE TASMANIA
PROSPECT E.L. 4/77 HIGHCLERE
BUCKBY 3943/2
LINE 300 S
MAX-MIN E.M.
SCALE 1:500
DATE 16-8-82
AUTHOR J.J.L
DRAWN M.L.S
OFFICE AHO
REPNo
DRG No DMO03/53
FIG No 5

Gridding, magnetics, soil sampling and mapping were carried out across the anomaly. (Refer Plans D/MQ 03/017, 018). The ground magnetic anomaly of 2000 nT was modelled as a triangular shaped basalt filled valley with an apex of 300 m and a magnetic susceptibility of 12 000 x 10^{-6} cgs units. As basalt outcrop in the area exhibited susceptibilities of less than 500 x 10^{-6} cgs units, doubt arose as to the anomaly's source. Gravity along line 6000 E was also modelled (Refer Plan D/MQ 03/039, Fig. 6) as a valley fill structure.

A percussion drillhole PDH GRD 1 sited at 6000 E/3625 N, was drilled to a depth of 200 m. 118 m of Tertiary basalt overly Precambrian Burnie Formation carbonaceous (pyritic) fine grained sandstones and siltstones. (Appendices 1B, 2B).

The highest susceptibility readings (15000 - 2000 x 10^{-6} cgs units were recorded over a 15 m interval near the base of the basalt sequence. Downhole resistivity logging (Appendix 2B) accurately located basalt flow-tops or sediment interbeds.

Later regional work (Clarke, 1981) showed that the basalt at Guide River was strongly remanently magnetised with a Koenigsberger ratio (Q) of 71.

Two soil geochemical anomalies at 5600 E/3200 N and 5600 E/ 3400 N of 100 ppm W and 90 ppm W respectively could not be repeated.

3.5 Highclere Iron Prospect

The Highclere magnetite skarn has been extensively explored in the past by the Tasmanian Mines Department, Anzeco (Brandt 1974) and Comalco (Askins, 1978).

018

667019

N 0007

3800 N

3600 N

3400 N

0 mgal

-1.0

-2.0

5 cm

200M

150M

strike length=1000M

p = 0.2

surface

x—x Terrain corrections to circle F (~900M)
(circle G makes difference ~0.01mgal)

•—• Basalt valley model

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E.L. 4/77 HIGHCLERE

GUIDE RIVER GRAVITY
MODELLING— LINE 6000E

TERRAIN CORRECTED
BOUGUER DENSITY 2.5

SCALE 1:2500	DATE 23-9-82
AUTHOR G.O.	DRAWN H.L.S
OFFICE Devonport	REP. No
DRG. No. D/M003/55	FIG No. 6

The skarn occurs as a 450 m x 100 m roof pendant within the western margin of the Housetop Granite.

It was considered that the tungsten potential of the skarn had not been sufficiently tested by previous Mines Dept. and Anzeco drilling, which had failed to penetrate the water table. Shell regriddedthe ironstone and carried out ground magnetics, geological mapping, and soil and rock sampling (Refer Plans D/MQ 03/019, 023, 022, 027).

The ground magnetic data was modelled as an upward facing triangle in cross section, with a 200 m base and 50 - 80m height. The granite contact was interpreted as dipping northeast.

The soil geochemical values outline a 250 m x 150 m zone of anomalous Sn and W coincident with the ironstone outcrop (Refer Plan D/MQ 03/027). Highest values are 500 ppm Sn and 185 ppm W.

Gravity was surveyed along line 4850 N (Fig. 7) which supported the ground magnetic modelling.

A percussion drillhole, PDH H 1, was sited at 4850 N/2100 E where ground magnetic, soil geochemistry (Sn, W), gravity and chargeability (Comalco, Askins, 1978) anomalies coincide.

The vertical drillhole intersected 44 m of hematite/magnetite skarn and 4 m of pyroxene skarn before reaching the Housetop Granite (Appendix 2C).

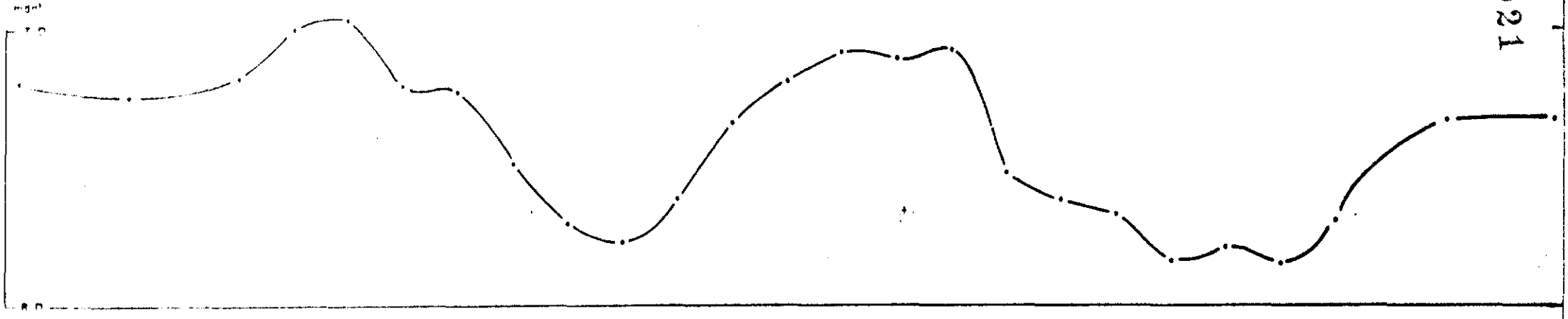
The trace element geochemistry is summarized as follows:

	Sn	W	Ba	Cu	Pb	Zn	Mo	%F
Skarn $\bar{x}$ (ppm)	135	115	10	158	75	138	37	0.01
Granite $\bar{x}$ (ppm)	27	21	208	49	16	56	9.5	0.03

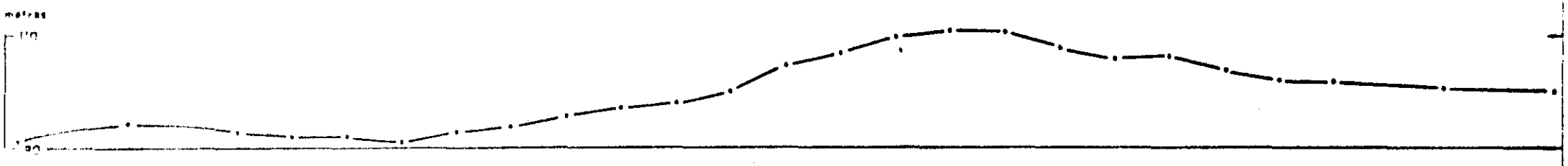
No Ag, Bi, Ni or Ba were recorded in the skarn.

1900E 2100E 2300E

GRAVITY



ELEVATION



5 cm

The Shell Company of Australia Limited
METALS DIVISION

HIGHCLERE
LINE 4850N
BOUGUER GRAVITY
(ρ=2·5)

SCALE 1:2500	DATE Nov 81
AUTHOR S Oates	DRAWN AS
OFFICE AMD	REP.No.
DRG.No.MG03/1008	FIG.No. 7

The measured susceptibilities were higher than modelled (10 m over 20 000 x 10^{-5} SI units) and readily explains the thinner than expected skarn unit.

3.6 Highclere - Buckby Trend

The Highclere - Buckby trend (or Highclere - extended grid) was established to explore the northern extension of skarn/carbonate lithologies located at Buckby (Fig. 8).

Initially ground magnetics were used to locate possible magnetic skarn horizons. As can be seen (Refer Plan D/MQ 03/028), the only anomaly to be located was a north trending zone corresponding to the airborne magnetic survey and interpreted as a basalt valley.

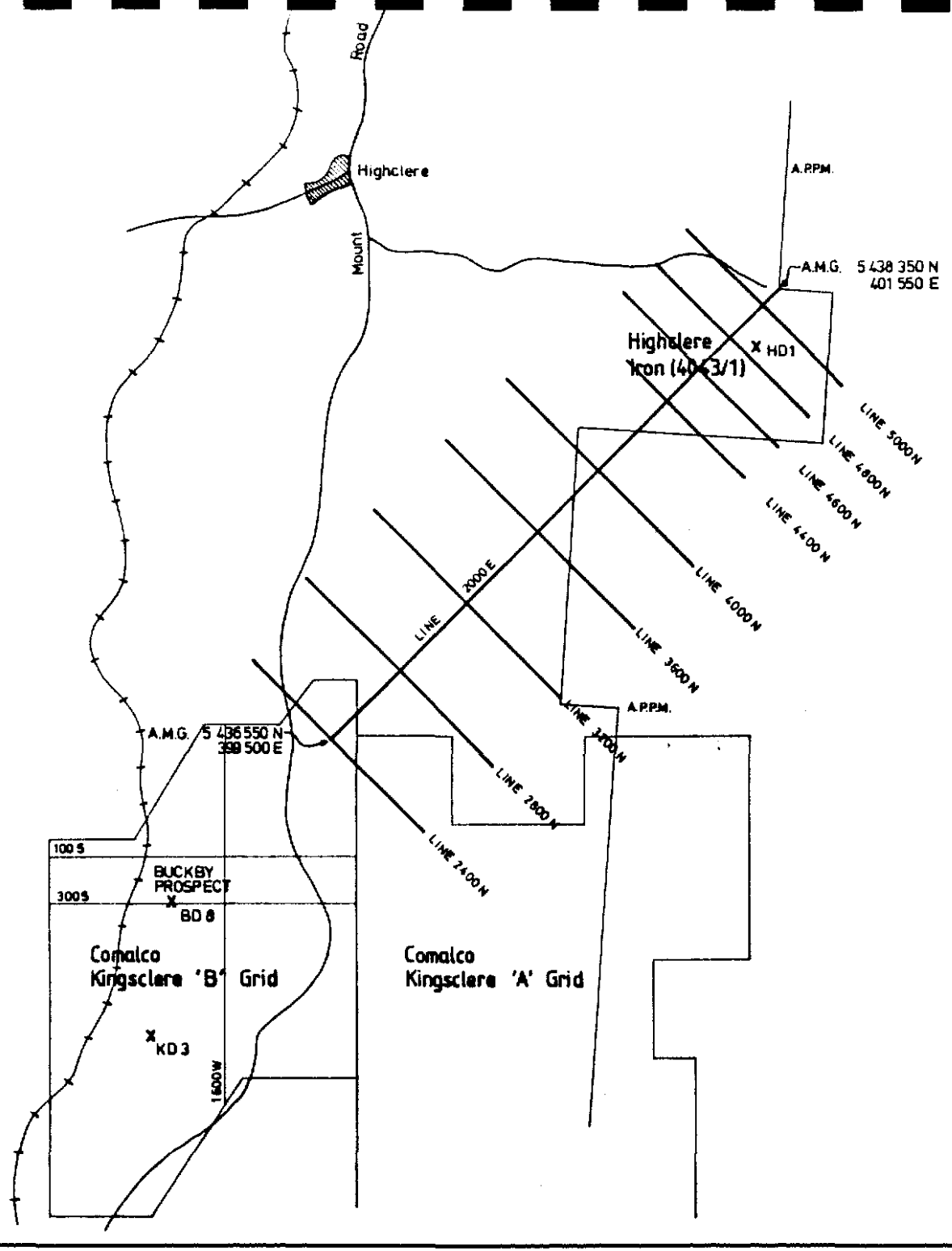
Dipole-dipole IP/resistivity was used to locate possible bedrock conductors (Figs. 9-15). Three end-of-line anomalies were followed up with self-potential:

Line 2800 N	1000 E - 2000 E
3600 N	1000 E - 1600 E
2000 E	2000 N - 2600 N

No significant SP anomalies were located, suggesting that the original IP anomalies were either spurious or due to culture.

Gravity along line 2800 N (Fig. 16) readily shows that the grid is on the western margin of the Housetop Granite.

An electrical sounding was made centred on 2000 E/3200 N (Fig. 17) indicating a thick basalt cover with a high resistivity surface zone overlying Housetop Granite, with no discernable granite-basalt contrast.



The Shell Company of Australia Limited METALS DIVISION			
E.L. 4/77 HIGHCLERE HIGHCLERE - EXTENDED GRID			
SCALE	1:20 000	DATE	13-11-81
AUTHOR	J.J.LAWTON	DRAWN	H.L.H.
OFFICE	DEVONPORT	REP No.	
DRG No	DV M203/038	FIG No	8

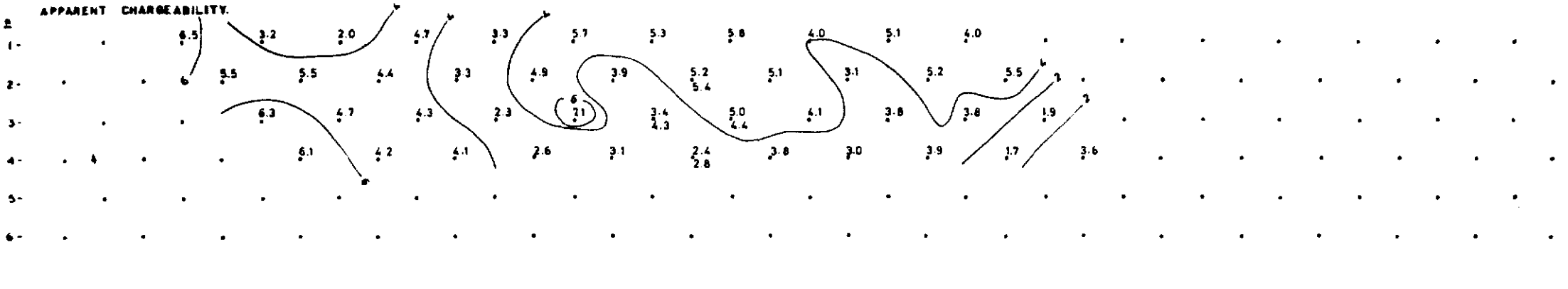
AIRBORNE GEOPHYSICS
(E.M., MAG, etc)

023
661024

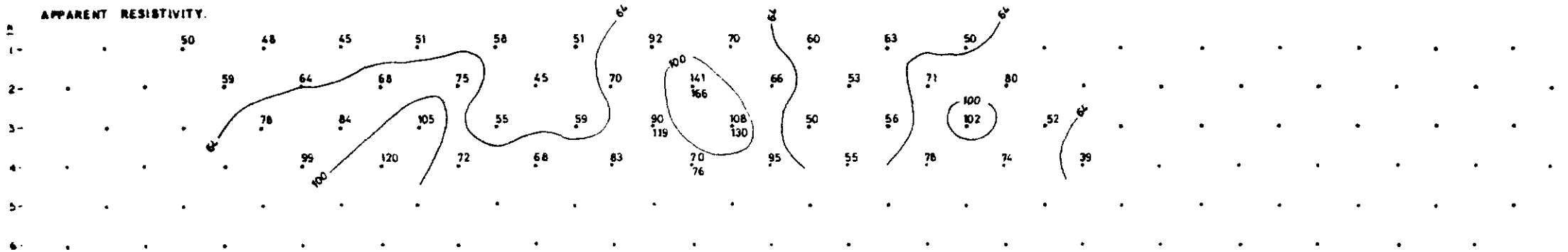
GEOLOGY
TOPOGRAPHY

1700 E 1800 E 2000 E 2200 E 2400 E 2600 E

APPARENT CHARGEABILITY.



APPARENT RESISTIVITY.



Contractor : SCINTREX
Date : 12-10-81
Timing : 2 SEC
Transmitter : IPC 2.5KW
Receiver : IPR 10 708103
Integration time :
Array : DIPOLE - DIPOLE
Dipole length : 100 M

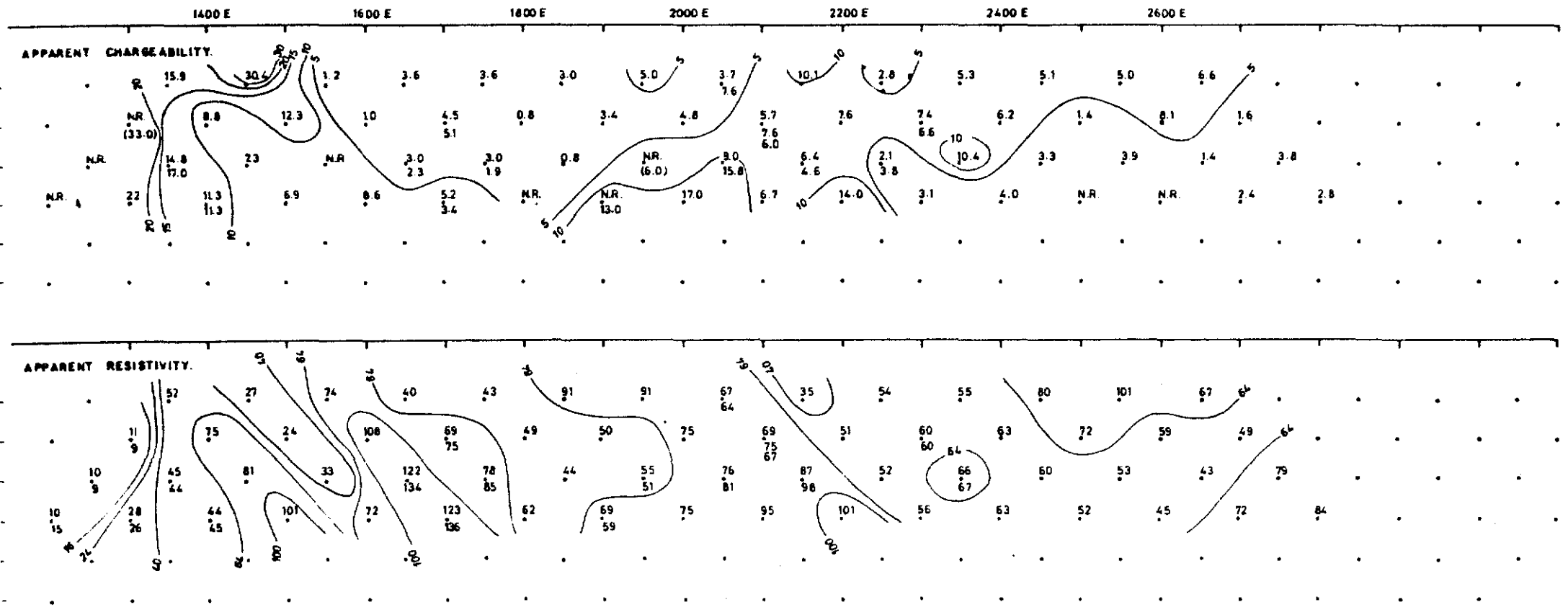
Fig. 9.

The Shell Company of Australia Limited
MINERALS DIVISION
IP / RESISTIVITY SURVEY
E.L. 4/77 HIGHCLERE
LINE 2400 N
12-11-81
DA400305
SCINTREX

AIRBORNE GEOPHYSICS
(EM, MAG, etc)

024
66/025

GEOLOGY
TOPOGRAPHY



Contractor : SCINTREX
Date 9-10-81
Timing : 2 SEC
Transmitter : IPC 2.5KW
Receiver : IPR 10 708103
Integration time :
Array : DIPOLE-DIPOLE
Dipole length : 100 M

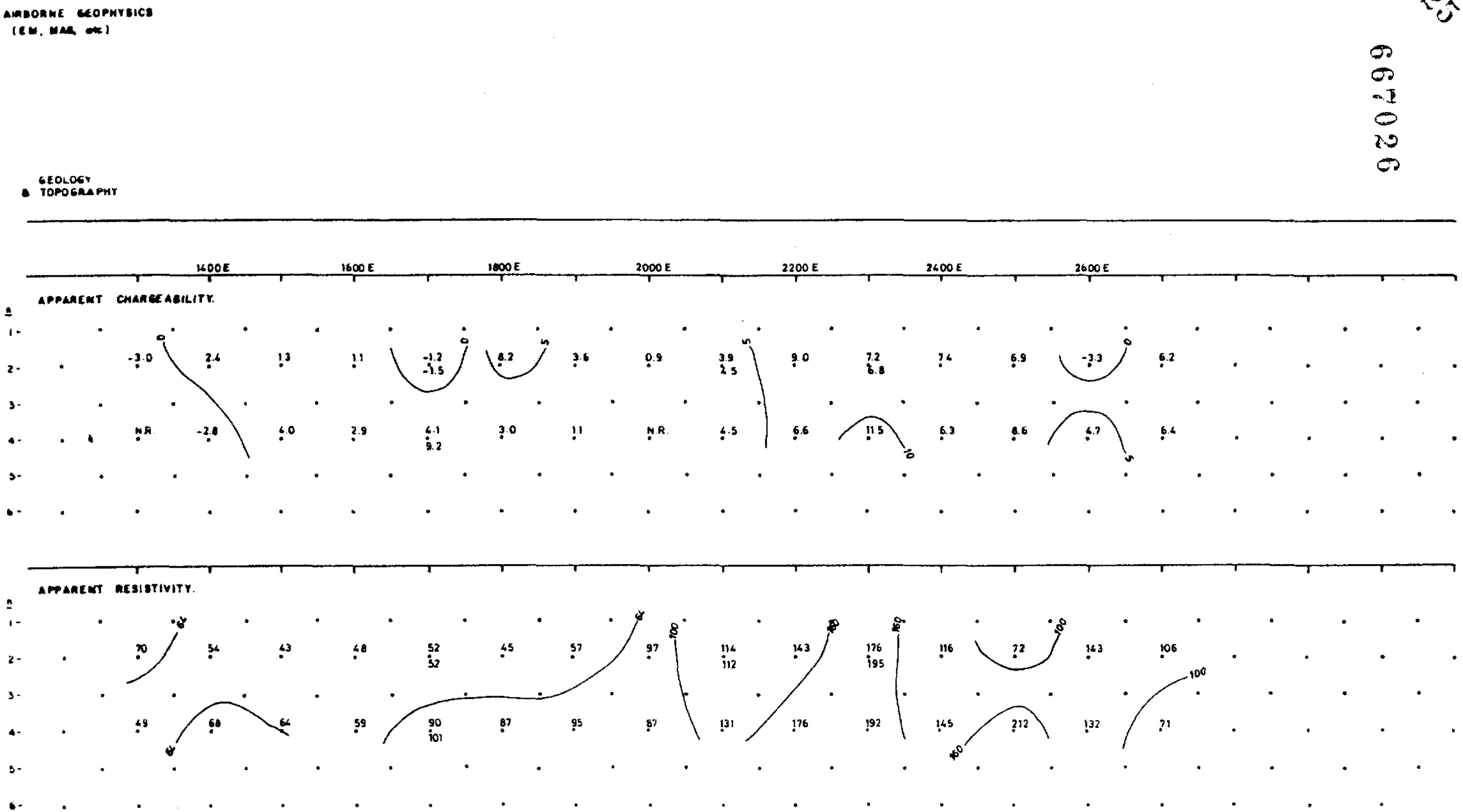
Fig. 10

IP / RESISTIVITY SURVEY
E L 4/77 HIGHCLERE
LINE 2800 N

13-11-81
H L H
SCINTREX
DEVONPO

025

667026



Contractor : SCINTREX
Date : 16-10-81
Timing : 2 SEC
Transmitter : IPC 2.5KW
Receiver : IPR 10 708103
Integration time :
Array : DIPOLE - DIPOLE
Dipole length : 100 M

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METALS DIVISION

IP / RESISTIVITY SURVEY
E.L. 4/77 HIGHCLERE
LINE 3200 N

D/M003/
13-11-81
SCINTREX

AIRBORNE GEOPHYSICS
(EM, MAG, etc)

026

66021

GEOLOGY
TOPOGRAPHY

1400 E 1600 E 1800 E 2000 E 2200 E 2400 E 2600 E 2800 E

APPARENT CHARGEABILITY.

n
1
2
3
4
5
6

14.4 3.8 3.3 3.7 4.5/3.2 3.6 5.5 4.4 3.7/3.3 6.6 12.2/11.7 8.3 3.9 4.5 3.7
15.3 3.2 3.4 4.4 3.6/4.7 4.8 5.9 4.4 6.9 9.5 7.7 5.6 9.2 12.9 3.7

APPARENT RESISTIVITY.

n
1
2
3
4
5
6

48 51 60 57 68/72 86 67 99 121/152 152 123/148 166 157 221 127
58 66 60 65 84/82 89 106 106 168 186 146 164 205 138 229

Contractor : SCINTREX
Date : 17-10-81
Timing : 2 SEC
Transmitter : IPC 2.5KW
Receiver : IPR 10 708103
Integration time :
Array : DIPOLE-DIPOLE
Dipole length : 100 M

IP / RESISTIVITY SURVEY
E L 4777 HIGHCLERE
LINE 3600 N

12
17-11-81
M L H

LIMBORNE GEOPHYSICS
(EM, MAG, etc)

GEOLOGY
& TOPOGRAPHY

1400 E 1600 E 1800 E 2000 E 2200 E 2400 E 2600 E 2800 E

APPARENT CHARGEABILITY.

	1400 E	1600 E	1800 E	2000 E	2200 E	2400 E	2600 E	2800 E
1								
2	9.9	6.2	7.1	3.8	3.3 / 2.3	4.4	4.0	6.0	4.7 / 2.2	4.6	2.0 / 2.3	2.8	2.8	6.8	4.1
3								
4	9.5	9.2	5.0	3.5	4.2 / 2.6	3.5	3.7	2.5	3.4	1.2	6.2	3.4	4.6	N.R.	
5								
6								

APPARENT RESISTIVITY.

	1400 E	1600 E	1800 E	2000 E	2200 E	2400 E	2600 E	2800 E
1								
2	175	100	85	87	70 / 71	54	101	76	84 / 79	102	116 / 104	105	46	112	101
3								
4	121	128	145	122	100 / 94	127	101	130	117	139	289	69	137	137	
5								
6								

Contractor	SCINTREX
Date	19 - 10 - 81
Timing	2 SEC
Transmitter	IPC 2.5 KW
Receiver	IPR-10 708103
Integration time	
Array	DIPOLE-DIPOLE
Dipole length	100 M

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METALS DIVISION

IP / RESISTIVITY SURVEY
E.L 4777 HIGHCLERE
LINE 4000 N

No. 13
Date 13-11-81
Drawn H.L.H
Drg. No. DAM003/03
Surveyed SCINTREX
Checked DEVENISH

AIRBORNE GEOPHYSICS
(EM, MAG, etc)

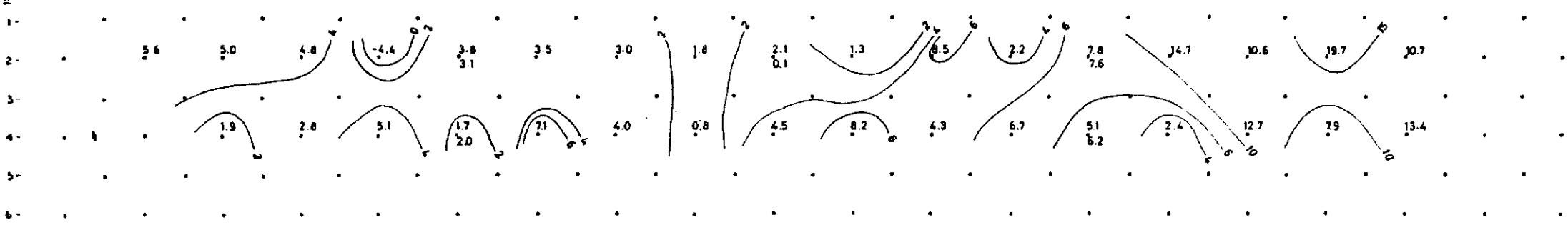
028

620699

GEOLOGY
& TOPOGRAPHY

3500 N 3600N 3800 N 4000 N 4200 N 44000 N 4600 N 4800 N 5000 N

APPARENT CHARGEABILITY.



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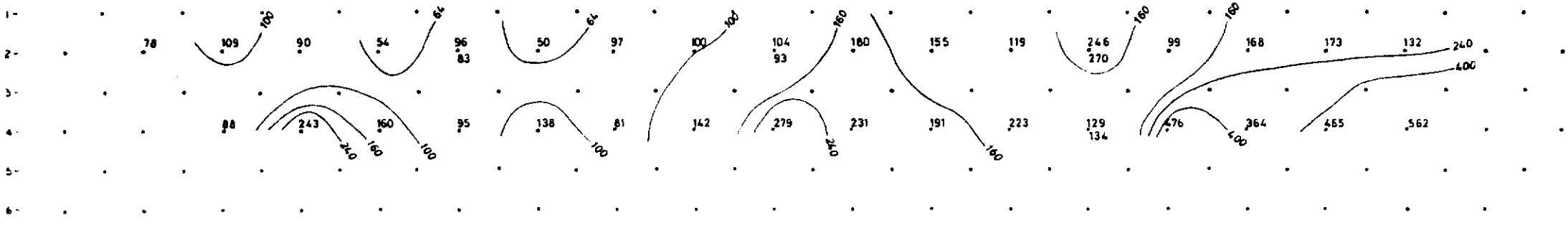

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Date : 23-10-81
Timing : 2 SEC
Transmitter : IPC 2.5KW
Receiver : IPR10 708103
Integration time :
Array : DIPOLE-DIPOLE
Dipole length 100 M

The Shell Company of Australia Limited
MINING DIVISION

IP / RESISTIVITY SURVEY
E L 4/77 HIGHCLERE
BASE LINE 2000 E

12-11-81

AIRBORNE GEOPHYSICS
(E.M., MAG, etc.)

029

66'030

GEOLOGY
& TOPOGRAPHY

2000 N | 2200 N | 2400 N | 2600 N | 2800 N | 3000 N | 3200 N | 3400 N | 3600 N | 3800

APPARENT CHARGEABILITY

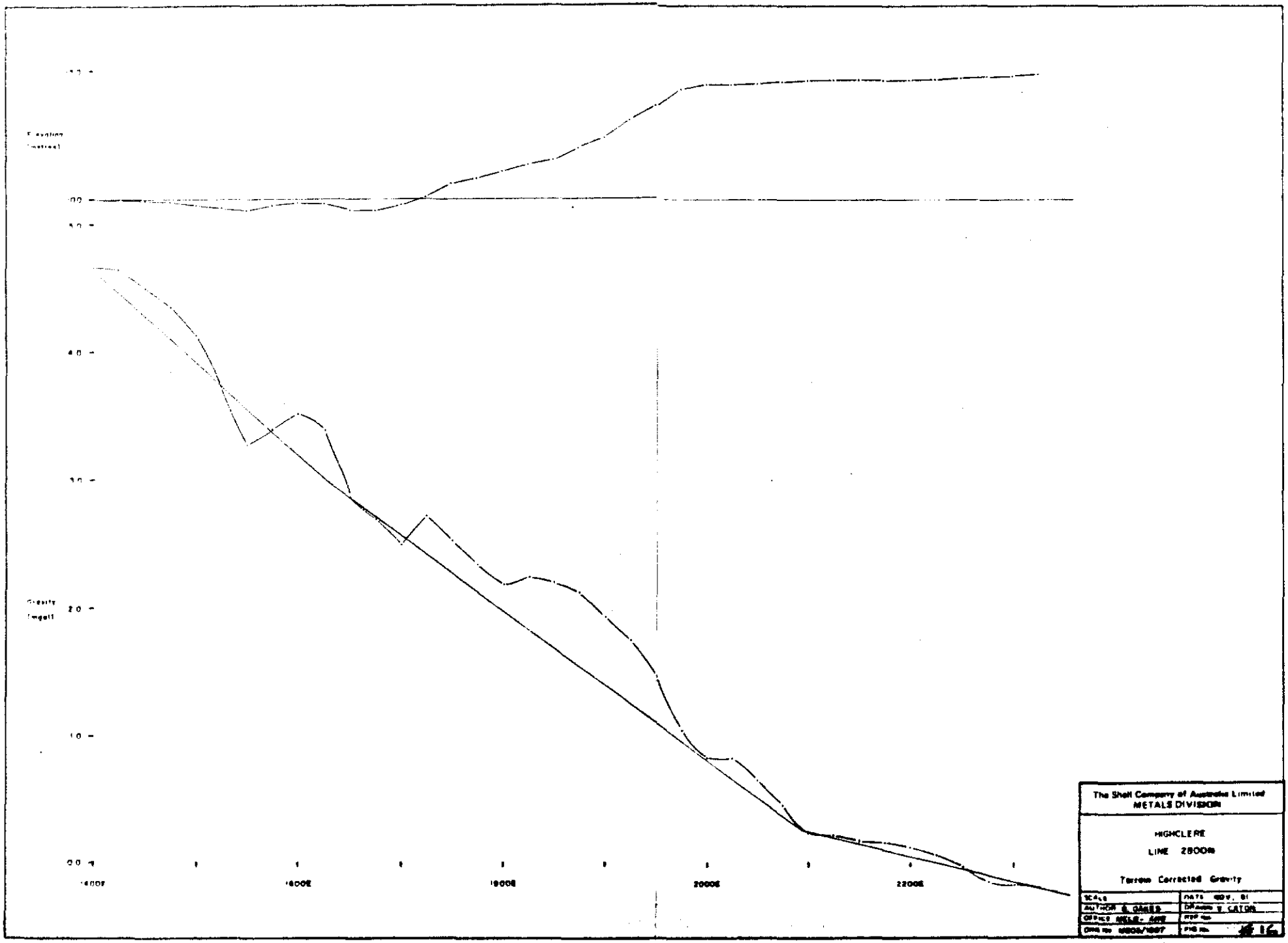
APPARENT RESISTIVITY

Contractor : SCINTREX
Date : 22-10-81
Timing : 2 SEC
Transmitter : IPC 2.5KW
Receiver : IPR 10 708103
Integration time :
Array : DIPOLE - DIPOLE
Dipole length : 100M

The Shell Company of Australia Limited
METALS DIVISION

IP / RESISTIVITY SURVEY
E.L 4/77 HIGHCLERE
BASE LINE 2000 E

Scale 1:5
Drawing No. D/HC063
Date 11-11-81
Surveyed SCINTREX
Drawn DEVINE

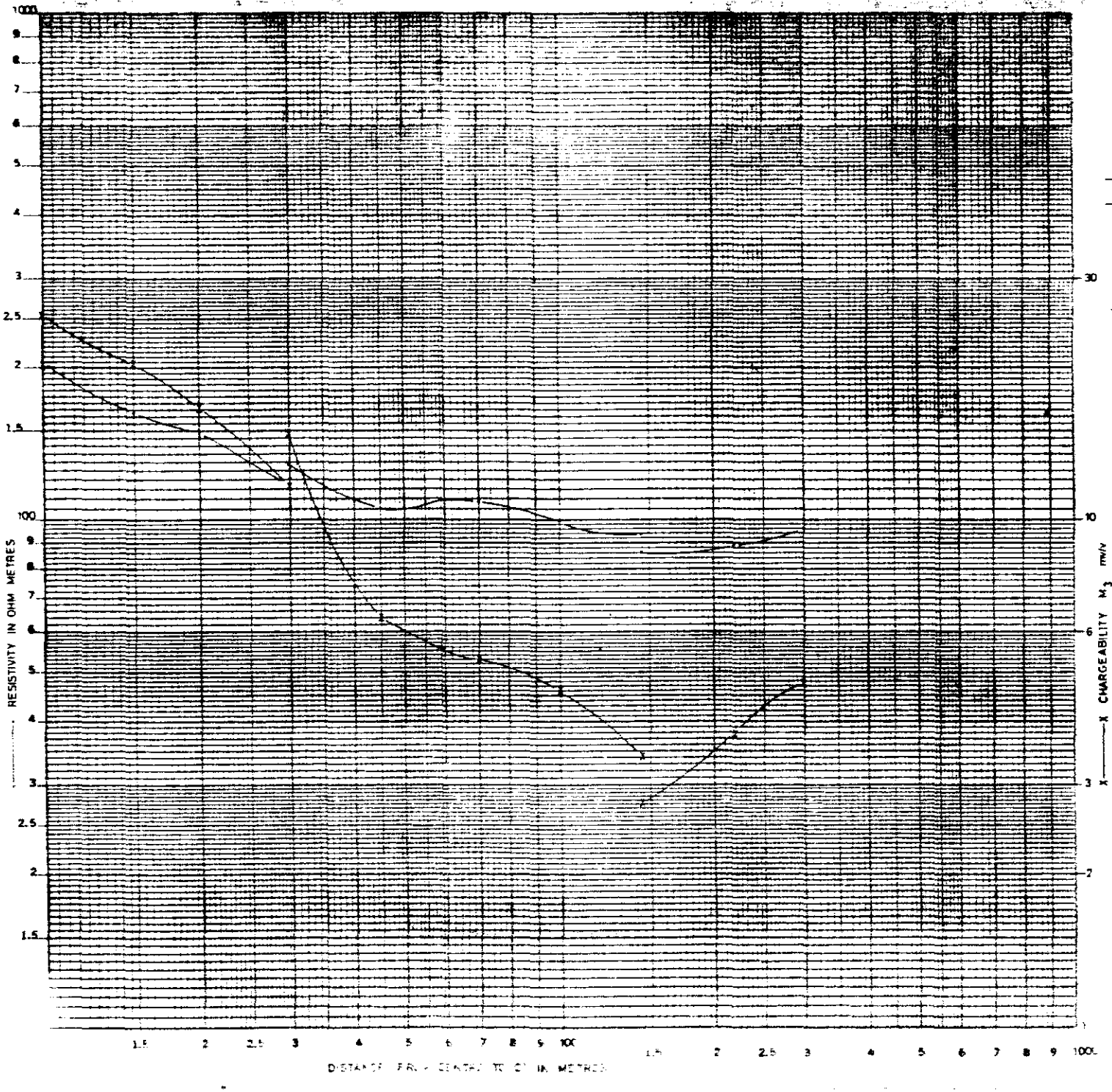


The Shell Company of Australia Limited
METALS DIVISION

HIGHCLERE

LINE 28000N

Terrain Corrected Gravity



0

229.4 m — 8.4 Metres

87.5

159 (?)

98.5

Fig. 17.

The Shell Company of Australia Limited
METALS DIVISION

E.L. 4777 HIGHCLERE

LINE 2000E
1700N

Resistivity & Chargeability

3.7 INPUT Survey

An INPUT survey was contracted to Geoterrex in January, 1982 and represents the second stage of exploration over the Highclere Licence - a transition from searching for mineralization with a strong magnetic signature, to conductive bodies.

The area covered was a 8 km x 8 km block in the Highclere - Hampshire area (Fig. 1). Flight line spacing was 300 m nominal and mean terrain clearance 120 m. The survey was designed to test the mineralised ?Cambrian sequence adjacent to the western contact of the Housetop Granite ('Buckby trend').

A report covering interpretation of the airborne data by Geoterrex was received in May, 1982. Ten anomalies were selected for ground followup consisting of mapping, magnetics, max-min EM and dipole-dipole IP/resistivity to discriminate between lithological conductors (e.g. black shales) and massive sulphide bodies.

Anomalies have been rated according to channel response, possible cultural effects, configuration and magnetic association. Most of the anomalies lie within the belt of Precambrian Burnie Formation (Refer Plan D/MQ 03/030) in the northwest of the licence.

This programme is currently in progress and will be reported fully at a later date.

4.0 CONCLUSIONS & RECOMMENDATIONS

It is considered unlikely that magnetite skarn of significant tonnage exists beneath Tertiary basalt cover on the western margin of the Housetop Granite within the Highclere Licence.

The Tertiary basalt cover has a highly variable character making modelling of magnetic, VLF and max-min EM data, difficult. The INPUT survey flown in January, 1982 and currently being followed up, aims at locating conductive massive sulphide mineralization. The future of continued exploration in the Highclere licence probably depends upon the results of this work.

Two regional programmes have been initiated. Firstly, a regional stream sediment sampling programme of the Housetop Granite is in progress to determine the greisen tin potential of the granite, and secondly a regional gravity survey is in process to locate granite apophyses away from the Housetop Granite.

These programmes are at an early stage.

J.J. LAWTON
Senior Geologist

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APPENDIX 1

PETROLOGICAL REPORTS

APPENDIX 1A

BUCKBY PROSPECT DDH BD 8

037

667038

Central Mineralogical Services

39 Beulah Road
Norwood, S.A. 5067
Telephone 42 5659

Mr. I. Buchhorn
Geologist
The Shell Co. of Aust. Ltd.
Metals Division
P.O. Box 860
DEVONPORT / TAS. 7310

27th April, 1981

REPORT CMS 81/3/51

YOUR REFERENCE:	Sample Despatch No. ~~MZ02~~/IB/23 MZ03
DATE RECEIVED:	26th March, 1981
SAMPLE NOS.:	1354 - 1362
SUBMITTED BY:	I. Buchhorn
WORK REQUESTED:	Petrology

for H.W. Fander, M. Sc.

Copy to:
Mr. P. Askins
The Shell Co. of Aust. Ltd.
Metals Division
G.P.O. Box 872K
MELBOURNE / VIC. 3001

REPORT CMS 81/3/51

Notes:

Nine specimens were received for petrological examination and are briefly described in the accompanying table.

The bulk of this suite comprises contact-metamorphic/metasomatic rocks with medium- to high-grade assemblage, particularly diopsidic types. Primary lithologies are generally poorly resolvable, but included breccias and labile psammopelitic sediments. Some of the metasomatic rocks are relatively featureless in terms of relict features. These tend to be characterised by relatively magnesian assemblages suggestive of skarnised ultramafics.

This interpretation tends to be confirmed by specimen No. 1359 which is an orthodox serpentinised dunite (with relict primary chromite). It should be pointed out, however, that certain (particularly humite-bearing) metasomatic assemblages, as represented here by 1361, are prone to secondary serpentinisation, but may also ultimately represent altered serpentinites. This trend is reflected in 1358, where a secondary serpentinite rock has developed from a diopside-tremolite skarn. This chicken and egg-like paragenetic problem maybe resolved in some cases on the basis of Cr and Ni assay data.

Subordinate facies represented comprise a weakly tourmalinised mica hornfels (metapsammite) and a mildly greisened porphyritic microgranite with affinities to the N.W. Tasmanian Devonian "tin granites".

D. Cowan, B. Sc.

[redacted] No.	Cla[redacted]catic[redacted] Com[redacted]ion [redacted]	Fa[redacted]	[redacted]ccess[redacted]	[redacted]nts [redacted]
1354 (Drill log sample (T.S. 36500) No. 1228)	Diopsidic Skarn. Fine-grained diopside and fine to ultrafine tremolite in varying proportions, disseminated pyrrhotite, fine cloudy sphene, sparse, colour-variable schorl.	Relict angular/subangular breccia textures, patchy relict "basaltic" microtextures.	Sparse prehnite and later chabazite veinlets. Rare, very fine chalcopyrite.	Metasomatised breccia with poorly defined basalt/microgabbro clasts. No detectable cassiterite, but traces conceivablymasked by sphene.
1355 (Drill log sample No. 1246)	Phlogopite-Diopside Rock. Pale phlogopite with subordinate microgranular to spongy, semi-massive aggregates of diopside. Disseminated pyrrhotite.	Fine- to medium-grained, semi-"nodular", wrigglite-like.	Traces magnetite, serpentinous chlorite, late veinlets calcite.	Wrigglite-like features appear to represent relics of nodular-textured (or ?fossiliferous) limestone facies.
1356 (Drill log sample No. 1253)	Phlogopite-Diopside-epidote Rock. Pale phlogopite and microgranular diopside in varying proportions, subordinate to minor epidote-clinozoisite, thinly disseminated pyrite.	Similar to 1354; relict, poorly sorted, gritty to sandy clastic fabric.	Rare microscopic garnets ("andradite").	Metasomatised labile gritty sediment. Only recognisable clasts are amygdaloidal basic intermediate volcanic. Similar alteration paragenesis to 1355
1357 (Drill log sample No. 1256)	Altered Skarn. Angular clasts phlogopitic, microcrystalline diopside skarn, cemented extensively, veined/corroded by K-spar-tremolite-calcite aggregates. Sparse pyrite.	Poorly sorted tectonic style of brecciation. Faint fine silty clastic textures in clasts.	Minor traces epidote, fine cloudy sphene.	Primarily a diopsidic, skarnised labile pelite, brecciated, with secondary tremolitic assemblage. Pyrite in part secondary after pyrrhotite.
1358 (Drill log sample No. 1282)	Altered Skarn. Coarse diopside and tremolite corroded/replaced by secondary pale phlogopite, serpentine, Mg-chlorite.	Serpentinite-like with late stress, microfracturing.	Late veinlets calcite. Minor traces magnetite, pyrite.	Retrogressive "serpentinisation" of coarse, granular to subradiating-textured diopside-tremolite rock (?skarnised ultramafic).
1359 (Drill log sample No. 1284)	Serpentinite. Serpophitic serpentine and Fe-Mg chlorite. Conspicuous ultrafine "exsolved" opaques. Disseminated fine-grained sulphide, metallic opaques. Sparse asbestiform ?tremolite veinlets.	Fine-scale, olivine-derived mesh-textures. Incipiently sheared.	Traces magnesite (thin selvedges on asbestiform veinlets), relict primary chromite.	Serpentinised, fine-grained, granula dunite. Opaques of hypogene character may warrant mineragraphic examination on basis of assay data.
1360 (Drill log sample No. 1292)	Mica Hornfels. Recrystallized quartz with subordinate, but variable titaniferous biotite, minor feldspar, disseminated titaniferous schorl, pyrrhotite (extensively pyritised).	Relict, coarse millimetric-scale, fine psammitic/pelitic banding.	Sparse late calcite veinlets. Minor traces relict detrital zircon, apatite.	Albite-epidote facies hornfelsed arkosic to quartzitic psammite/pelite intercalation. Mildly tourmalinised/sulphidised.
1361 (Drill log sample No. 1299)	Clinohumite-Minnesotaite Rock. Random Fe-talc flakes with irregular zones granular clinohumite, minor intergrown tremolite. Disseminated magnetite.	Medium-grained. Lamellar-twinned clinohumite, colour-zoned talc.	Sparse clots of spinel (pleonaste) associated with magnetite.	Skarn-type paragenesis. Fe-Mg silicate assemblage possibly a reflection of altered serpentinite, alternately "dolomite".
1362 (Drill log sample (T.S. 36508) No. 1305)	Sericitised Porphyry. Quartz and extensively sericitised albite, weakly seri-cite-calcite-stained microperthite phenocrysts in similarly altered quartzofeldspathic groundmass.	Medium- to fine-grained, granitic, trend granophyric.	Leucoxenised opaques. Minor secondary quartz, muscovitised biotite.	Porphyritic alkali microgranite, slightly biotitic, with affinities to e.g. the Pine Hill Porphyry. Alteration of greisening style, but not marked.

040

667041

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Mr. I. Buchhorn
Geologist
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Metals Division
P.O. Box 860
DEVONPORT / TAS. 7310

12th May, 1981

REPORT CMS 81/3/51
Supplement

YOUR REFERENCE:	Sample Despatch No. MZ02/IB/23
DATE RECEIVED:	26th March, 1981
SAMPLE NOS.:	1359
SUBMITTED BY:	I. Buchhorn
WORK REQUESTED:	Mineralogy

H.W. Fander, M. Sc.

Copy to:
Mr. P. Askins
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MELBOURNE / VIC. 3001

REPORT CMS 81/3/51

Supplement

At the request of I. Buchhorn, a polished section was prepared from specimen 1359 to examine the opaque mineralogy.

Mineragraphic examination reveals the "metallic" material detected under the stereobinocular to comprise fine-grained, intimate intergrowths of magnetite and pyrite with minor traces of closely intergrown marcasite. The magnetite is of relict primary character and locally mantles chromite. Pyrite (and marcasite) are secondary after "hypogene" pyrrhotite pseudomorphing subskeletal intergrowths composite with magnetite.

The Ni-assay can be attributed, in part at least, to very thinly disseminated clots (maximum 45 μ, typically << 20 μ) of violarite, which occur as discrete to composite (with pyrite, rarely marcasite) patches and crude films. Distribution is similarly in close association with magnetite and, although there are no relics or characteristic pseudomorphous structures, it is evident that violarite is secondary ("supergene") after discrete and exsolved particles of pentlandite.

Observed (i.e. detectable) violarite appears insufficient to account for total assay Ni. Possibly, subordinate Ni is present in chlorite and/or the pyrrhotite-pseudomorphous secondary pyrite.

D. Cowan, B. Sc.

APPENDIX 1B

GUIDE RIVER ANOMALY PDH GRD 1

043

667044

Central Mineralogical Services

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Telephone 42 5659

Mr. J.J. Lawton
Senior Geologist
The Shell Co. of Aust. Ltd.
Metals Division
P.O. Box 860
DEVONPORT / TAS. 7310

5th August, 1982

REPORT CMS 82/7/24

YOUR REFERENCE:	Sample Despatch No. 4096/MQ03/JJL/79
DATE RECEIVED:	15th July, 1982
SAMPLE NOS.:	2665, 2677, 2691
SUBMITTED BY:	J.J. Lawton
WORK REQUESTED:	Petrology

H.W. Fander, M. Sc.

REPORT CMS 82/7/24

Three percussion-chip samples were received for petrological examination; thin-sections were prepared, using a special technique, and the samples are briefly described below. Only one dolerite chip was recognised in the entire number of chips examined.

2665 (T.S. 42813)
Eighteen chips were mounted and sectioned; all of them are dark, carbonaceous and weakly pyritic sediments belonging to the same lithological unit, and may be classified as carbonaceous, micaceous fine sandstones, ranging into siltstones.

The framework generally consists of angular to splintery small (silt- to fine-sand size) quartz particles, subparallel muscovite flakes, with scattered lithic, feldspathic and biotitic grains, and a matrix/cement of fine quartz, clay, carbonaceous matter, and minor carbonate; pyrite is present sporadically. The rock is moderately-sorted and -sized, with distinct bedding.

The siltstones/shales are more micaceous/argillaceous, and one of the chips is a fine-grained carbonate rock with clays, micas and carbonaceous matter.

2677 (T.S. 42814)
Of the twenty chips mounted and sectioned, only one is an olivine-dolerite, regarded as Tertiary; all the other chips are sediments, ranging from carbonaceous siltstones and shales into carbonaceous sandstones. A single chip of vein material was seen; this consists of quartz, chlorite, siderite and traces of chalcopyrite.

The sediments are lithologically similar to, and correlatable with, the rocks in 2665, though finer-grained on the whole - 2665 consists mainly of sandstones, and 2677 mainly of siltstones.

2691 (T.S. 42815)
Fourteen chips were mounted and sectioned. All are carbonaceous clastic sediments ranging from siltstones to feldspathic sandstones and are correlatable with 2665. The finer-grained rocks show slump-structures and soft-sediment deformation/brecciation. Microfractures are filled with carbonaceous veinlets. Some of the coarser-grained rocks contain interstitial chlorite, probably of diagenetic origin. The rocks are thoroughly indurated, but not metamorphosed.

H.W. Fander, M. Sc.

APPENDIX 2

DRILLHOLE LOGS

APPENDIX 2A

BUCKBY PROSPECT DDH BD 8

047

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

Hole No : DDH BD 8

PROJECT : HIGHCLERE

LOCATION CODE : MQ 03

COLLAR CO-ORDINATES : 300S/1850W

COLLAR R.L. :

LOCATION : BUCKBY

MAP/PHOTO REFERENCE : 5435900mN 399000mE

DATE STARTED	16-11-80	HOLE SIZE		FROM	TO	TOTAL	CORE STORAGE	DEVONPORT
DATE FINISHED	8-12-80	NON CORE					NO OF TRAYS	
TOTAL DEPTH	272.20m						SAMPLE STORAGE	
LOGGED BY	I.J. Buchhorn	CORE					ASSAY LAB.	ANALABS/AMDEL
CONTRACTOR	A.D.D.						ASSAY REPORTS	
RIG								
DRILL CREW	M. Blight N. Bellinger	CASING					MIN. & PET. LAB.	C.M.S.
							MIN. & PET. REPORTS	
		CASING LEFT	NQ	0	6m	6m		

HOLE SURVEY DATA

INSTRUMENT :

DEPTH	INSTRUMENT INCL.	INSTRUMENT AZ.	ACID ETCH INCL.	ACID ETCH AZ.	REMARKS
COLLAR	060	083			
163.3m	057	080			
269.0m	055	089			

GRAPHIC / LETTER SYMBOL LOGGING KEY

STRUCTURE / ALTERATION CODE

- B BEDDING
- J JOINTING
- C CLEAVAGE
- F FOLIATION
- sh SHEARING
- q QUARTZ VEINS
- O OXIDATION

DRILLING SUMMARY :

667048

[redacted] SHEET COMPILATION OF [redacted] MINERALISATION. - [redacted] DRILLS DRILLING [redacted]

PROJECT: HIGHCLERE - BUCKBY

DIAMOND DRILL LOG - SAMPLING RECORD

HOLE NO: DDH BD8

048

From	To	Interval (m)	Core Rec'd	% Rec	Sample No.	Compos No.	Assays Sn	W	CaF2 %	Cu	Pb	Zn	Mo	Au	Magnetic Susceptibility x10⁻⁵ SI Ag	Bi	Ni		% Estimates cpy	py	po	Core Angles				Alt	T.S P.S	Description
0·0	15·0	15·0	2·00	13														10										Yellow-brown completely weathered basalt & basaltic soil.
15·0	19·90	4·90	1·50	30	1217		9	<10		115	30	80	1·5		<0·5	<1	135	10-100										Dk grey diopside skarn, minor talc weathered to clay.
19·90	21·34	1·44	1·30	90	1218	C1	<3	<10	0·66	30	<5	15	1·5	-	<0·5	<1	85	30		tr	tr							Brecciated, fine laminated - massive diopside skarn, trace calcite & pyrite in fractures (tr po)
21·34	23·94	2·60	2·38	92	1219		6	<10		155	<5	30	5		<0·5	<1	70	200-600		2	5							Brecciated, fine laminated diopside skarn v.f.g. disseminated po, py
23·94	27·10	3·16	3·10	98	1220	C2	4	<10	0·65	80	5	30	4	-	<0·5	<1	70	100		1	1							Diopside skarn breccia, extensive chloritic shearing, c.g. euhedral py on fractures, v.f.g. disseminated po.
27·10	30·48	3·38	3·30	98	1221	C3	24	40	0·12	100	15	65	2	-	1	10	25	100-200		1	1							Brecciated diopside skarn, dissem. v.f.g. po, py. c.g. py joint coating euhedral 1-2mm.
30·48	31·69	1·21	1·21	100	1222		38	30		80	15	55	5		<1	10	20	100-300		1	1							Diopside skarn, dissem. v.f.g. (<0·5mm) po py. Moderate hairline calc-argillic veining 0·5-5%. c.g. blk sulphides (chalcocite?) assoc. with py blebs.
31·69	34·55	2·86	2·86	100	1223	C4	20	10	0·20	85	15	60	3	-	<1	10	35	100-300		2	1							Finely laminated, cherty crystal dolomitic mudstone, dissem. v.f.g. py (0·1-0·5mm & subhedral po, recrystallised py.
34·55	37·30	2·75	2·75	100	1224	C5	20	<10	0·08	90	10	30	2	0·05	<1	10	35	50-250		2								Fine laminated pyritic diopside skarn, dissem. 0·1-1mm anhedral py blebs, possibly dolomitic.
37·30	41·50	4·20	4·20	100	1225		14	25		60	15	42	2		<1	10	30	100-300		2	1							Fine laminated pyritic diopside skarn 1-20mm bdd possibly dolomitic. Strong hairline polyg. fractures occassionally with py, po. Po increases downward.
41·50	43·70	2·20	2·04	93	1226		20	<10		245	5	90	<1		<0·05	<1	50	200-450		2	8							Massive diopside - pyrrhotite skarn. Variable py, po 1-5mm blebs.
43·70	46·00	2·30	2·30	100	1227		25	<10		175	<5	35	17		<0·05	2	45	400-800		1	10							" " " " 1-10mm po blebs. 45·5m "limestone conglomerate" Carbonate fragments in skarn.
46·00	49·00	3·00	3·00	100	1228	C6	45	<10	0·45	165	<5	20	1	-	<0·05	<1	45	400-1000	tr	1	10							Massive diopside - pyrrhotite skarn. po irregular aggregates, interconnected veinlets tr chalcopyrite.
49·00	50·40	1·40	1·40	100	1229		25	<10		315	<5	25	6·5		<0·05	<1	65	200-800		2	5							Massive diopside-pyrrhotite skarn. 1-10mm irregular po aggregates, minor py blebs. 50·1m "conglomerate". Py assoc. with c.g. crystalline calcite. Probably acc. amphibole.
50·40	56·10	5·70	5·70	100	1230	C7	<3	<10	0·62	30	<5	20	3	-	<0·05	<1	80	100-200		1	1							Light pink-brown, mottled & brecc. diop. skarn (possibly cherty dolomitic), strong polyg. fractures often py coated. Minor dissem. py, po mainly as micro veinlets. 54·2m fragments are cherty 2-10mm matrix light grey pyritic.
56·10	58·60	2·58	2·58	100	1231	C8	25	<10	1·09	165	<5	25	2·5	-	<0·05	<1	50	300-900	tr	1	8							Conglomeratic diopside-pyrrhotite skarn, frags. subrounded 2-10mm possible diffusion effect although definite chert & limestone pebbles occur.
58·60	61·62	2·94	2·94	100	1232		6	<10		80	<5	15	5·5		<0·05	<1	50	50-200		tr	1-2							Diopside-quartz skarn becoming "breccia-conglomerate", cherty to base, dissem. po blebs, variable.
61·62	63·12	1·50	1·50	100	1233		15	<10		380	<5	25	2		<0·05	<1	60	800-1200		3	8							Massive diopside-po skarn, blebs & veinlets po-py irregular intergrowths with diopside
63·12	66·71	3·59	3·59	100	1234	C9	10	<10	0·39	70	<5	15	170	-	<0·05	1	100	200-600		2	4							Subrounded grey chert fragments (2-30mm) in grey-yellow cherty diopside (?) matrix, dissem. py, po, py-microveinlets associated with grey chert, common diopside-po skarn bands transitional to chert - lenticular banding pervasive, core angles increasing to 75°.
66·71	68·20	1·49	1·49	100	1235		<3	<10		65	5	10	6·5		<0·05	1	100	200-600		1	4							Diopside-po skarn, irregular convoluting v.f. yellow dissem. fluorescene at 67·5m, 68·1m minor conglomerate fragments including soft clayey yellow "pebbles", dark color possibly carbonaceous, probably not biotite.
68·20	75·08	6·88	6·88	>100	1236		4	200		170	10	130	5		7	10	55	200-400		1	2							Lentic banded "conglomeratic" chert & grey diopside-po skarn - clasts probably from soft sediments, disruption of chert bands (2-20mm) / yellow bands "softer" probably clayey, grey bands diopside rich, contain pyrrhotite, very minor grey chert bands.
75·08	76·70	1·62	1·62	100	1237	C10	4	20	0·12	110	10	36	3	0·05	<1	10	25	100-500		tr	1							Conglomeratic cherty diopside-pyrrhotite skarn, pyrrhotite v.f. (<0·3mm) dissem. po veinlets.
76·70	78·27	1·57	1·57	100	1238		14	90		75	20	75	4		2	10	25	10-20		tr	tr							Brecciated cherty diopside skarn, probably fault zone.
78·27	79·75	1·48	1·48	100	1239		10	20		70	10	20	4		<1	10	25	200-400		1	1							Banded yellow clayey "chert" & grey diopside-qtz skarn, 1-20mm banding, dissem. v.f. py, po, minor quartz rich bands, strong yellow fluores. associated with yellow "chert" - probably metasomatic altered interbanded calcareous sandstone (qtz-diopside skarn) & clayey chert.
79·75	82·02	2·27	2·27	100	1240		6	30		90	10	20	5		<1	10	30	200-400		1	1							As above, but yellow fluorescent mineral only minor.
82·02	85·20	3·18	3·18	100	1241	C11	20	<10	0·64	170	<5	25	5·5	-	<0·05	<1	60	400-1600		1-5	5-15							Massive diopside-po skarn / 83·4 brown cherty fragments in skarn, sulphides 1-5mm interlocking aggregates (blebs) po-py-diopside.
85·20	87·92	2·72	2·72	100	1242		7	<10		155	5	30	5		<0·05	<1	80	50-400		2-4	5							Massive diopside-po skarn, becoming cherty / 85·25, 56·1 10cm zones, massive coarse euhed py, relative py increase wrt po.
87·92	90·14	2·22	2·22	100	1243		18	<10		70	10	38	12		<1	10	35	5-30		2	1							Massive dolomitic chert, v.f. (<0·5mm) dissem. py-po, variable diopside, commonly "brecciated", dark grey subrounded 5mm chert fragments in light grey diopside skarn matrix.

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[redacted] SE [redacted] COMP [redacted] OF [redacted] RALI [redacted] D. - [redacted] LS D [redacted] ON [redacted]

PROJECT: HIGHCLERE - BUCKBY

DIAMOND DRILL LOG - SAMPLING RECORD

HOLE NO: DDH BD8

From	To	Interval	Core Rec'd	% Rec	Sample No.	Composite No.	Assays Sn	W	CaF_2 %	Cu	Pb	Zn	Mo	Au	Magnetic Susceptibility x 10^{-5} S.I. Ag	Bi	Ni		% Estimates cpy	py	po	Core Angles				Alt	P.S	T.S	Description
90·14	92·50	2·36	2·36	100	1244	C12	42	380		65	10	36	47		<1	10	10	60-70		tr	tr								Massive diopside-dolomite skarn, "mottled" calcite aggregates, 1-2% po-py basal 30cm, trace cp / 91·2 trace galena blebs, 3mm.
92·50	93·84	1·34	1·34	100	1245		14	15	0·58	300	5	40	8	0·05	<1	10	20	45		5	2								Massive dolomitic diopside skarn, dissem. po-py "conglomeratic" sulphide skarn diffusion texture with light grey diopside "pebbles" fringed by black biotite (?) metasomatized argilite? py as blebs & microveinlets 0·5-3mm, also remobilized 5mm veins & 2mm euhed crystals.
93·84	95·57	1·65	1·73	95·6	1246	C13	100	<10	3·04	485	<5	75	1	-	<1	<1	60	1000 - 15,000	5	10-15								Pyrrhotite-magnetite bearing dolomite conglomerate, coarse mag-po blebs associated with light grey diopside "pebbles" in dark biotitic matrix, trace cp associated with po "pebbles" of magnetite-pyrrhotite assoc. with dark matrix.
95·57	98·38	2·81	2·81	100	1247		210	<10		360	5	65	0·5		<1	<1	65	100-700	2	5								Pyrrhotite-biotite bearing, dolomitic limestone conglomerate, common diopside, minor tremolite needles / trace coarse (1-3mm) scheelite, epidote to base.
98·38	102·80	4·42	4·42	100	1248		6	<10		60	25	120	1		<1	20	35	10	tr									Dolomitic limestone conglomerate, subrounded limestone fragments (1-40mm) in calc-phlogopite (-talc) matrix, common epidote alteration of limestone fragments / clasts unsupported in argillac matrix.
102·80	105·60	2·80	2·80	100	1249	C14	14	<15	0·29	20	10	60	6	-	<1	10	25	10	1-2									Brecciated & altered brown cherty shale, min. conglomerate band, medium shear & brecc., biotite throughout (contact metamorph.) dissem. py blebs ore veinlets / 104·8 limestone conglomerate band, 10cm.
105·60	109·10	3·50	3·50	100	1250		<4	<10		55	30	110	4		<1	10	50	5	1-2									Dolomitic limestone conglomerate, subrounded limestone fragments in argillac (phlog-biot?) matrix, fragments typically 1cm / epidote alteration of limestone clasts / v.f. dissem. py in matrix.
109·10	110·75	1·65	1·65	100	1251		4	<10		38	10	38	6		<1	10	20	10-15	2									Massive cherty dolomite to dolomitic quartzite / 109·1 - 109·3 10% dissem. py blebs / dissem. 1-2mm py blebs pervasive / 110·6 5cm chert conglomerate band 5-10mm pebbles.
110·75	116·70	5·95	5·70	95·8	1252	C15	4	15	0·29	30	15	50	6	-	1	10	20	10-20	1-2									Dolomitic limestone conglomerate, limestone fragments in biotite-calc-quartz matrix, more indurated, less altered than overlying conglomerate, common cherty biotite quartzite bands, min. limestone bands (<1·0cm), occassional chert conglomerate / strongly fractured especially cherty quartzites / 113·0 - 113·2 10% dissem. v.f. py associated with cherty quartzite, epidote assoc. with py.
116·70	121·15	2·50	4·45	56·2	1253	C16	10	<10	0·90	45	15	135	3	-	<1	<1	55	10	1-2									Dolomite conglomerate, subrounded 2-10mm dol (-epidote) fragments in biotite phlog. matrix / strongly altered brecciated.
121·15	122·74	1·59	1·59	100	1254		6	<10		15	5	80	0·5		<1	<1	45	50-250	1									Wh. massive dolomite, trace disseminated v.f. (0·5mm) magnetite, common vuggy leaching associated with fracture zones at 122·1, 122·3
122·74	126·70	2·40	3·96	60·6	1255	C17	7	<10	0·38	10	<5	55	2	-	<1	<1	75	10	1-2									Strongly brecciated, py veined chert, possibly silty, extensive tension gash veining (pyrite, with pervasive chlorite coating) / chert occ. v.f. (<0·5mm) laminations / py microveinlets, occassional disseminated py.
126·70	131·10	1·90	4·40	43·2	1256	C18	<3	<10	0·86	10	<5	40	1	-	<1	<1	40	10	1-3									Conglomeratic chert (interformational), weakly dolomitic, minor phlog-biot-qtz. matrix rich conglomerate / pyrite rich zones, microveinlets & disseminated.
131·10	137·00	4·10	5·90	69·5	1257	C19	10	<10	0·43	35	<5	75	2·5	-	<1	1	70	5	1-4									Dolomitic conglomerate, dolomite fragments in friable sugary calc-phlog-qtz matrix source of fragments "intraform. dolomites" such as 121·15 - 122·74 / dissem. f epidote in matrix / pyrite v.f. (<0·05mm) restricted to matrix / 132·7 - 133·2 wh. dolomitic chert / chlorite common from 133·1, associated with microfraction.
137·00	139·90	1·10	1·90	51·9	1258		9	<10		10	<5	50	1		<1	<1	60	10-300	2-4									Conglomeratic biotite quartzite, py & mag. disseminated in basal 50cm, probably diopside bearing / py 0·5-1·0mm disseminated euhed blebs & veinlets / fragments upto 3cm, include 1cm chert & light grey diopside (?) (altered dolomite) (minor epidote associated with pyrite)
139·90	143·50	0·70	4·60	15·7	1259		<3	<10		115	5	30	1·5		<1	<1	55	5-20	1									Massive dolomitic chert-quartzite, dissem. v.f. euhed py (0·5mm) minor chlorite-epidote alteration along fractures.
143·50	148·20	1·05	4·70	22·3	1260		<3	<10		40	<5	80	1·5		<1	<1	70	5-20	1-2									Pebbly sericite-chlorite conglomerate, fragments of completely argillized dolomite matrix intense alteration to very soft phlog-chlor-talc assemblage, dissem. v.f. euhed py (<0·5mm) minor epidote.
148·20	152·85	2·05	4·65	44·1	1261	C20	5	<10	0·73	20	5	35	1	-	<1	<1	70	5	1									Mauve conglomerate cherty quartzite, subrounded 2-10mm chert fragments, diffusely gradational into cherty matrix (through recrystalization), py joint coating & as dissem. blebs & microveinlets / minor chloritic alteration / minor irregular dolomite zones (diffuse 1-4cm) often assoc. py, coarse euhed.
152·85	153·70	0·65	0·85	76·5	1262		<3	<10		30	5	95	2·5		<1	1	55	5-10	4-8									Strongly altered, brecc. chloritic conglomerate, phlog-biotite-qtz matrix, chert fragments strongly pyritic, v.f. euhed blebs, pervasive, often epidote association.
153·70	155·90	2·10	2·20	95·5	1263		4	<10		35	10	90	1·5		<1	<1	55	5-20	2									Dolomitic conglomerate, ovoid chert dolomite fragments in phlog-qtz-(dol.) matrix, pervasive epidote alteration of fragments / clasts 5-30mm, always ovoid, often zoned, metasomatic effect.

Sheet 2 of 5 Sheets

049

69-10-50

[redacted] THE SHELL COMPANY OF AUSTRALIA LTD. - METALS DIVISION [redacted]

PROJECT: HIGHCLERE - BUCKBY

DIAMOND DRILL LOG - SAMPLING RECORD

HOLE NO: DDH 808

050

From	To	Interval (m)	Core Rec'd	% Rec	Sample No.	Composite No.	Assays Sn	W	CaF2 %	Cu	Pb	Zn	Mo	Au	Magnetic Susceptibility x 10^{-6} S.I. Ag	Bi	Ni		% Estimates cpy	py	po	Core Angles				Alt	T.S P.S	Description
155·90	157·10	0·25	1·20	20·8	1264	C21	<3	<10		35	5	40	0·5		<1	<1	50	20		tr								Intensely brecciated, pink cherty quartzite, breccia surfaces pyrite coated
157·10	161·23	2·40	4·13	58·1	1265		<3	<10		45	10	65	0·5		<1	<1	45	20-50		1-2								Quartzose conglomerate, chert fragments in qtz-phlog. matrix, becoming dolomitic from 160·3, 160·83 - 161·23 massive white dolomite, strong chlorite alteration, variably pebbly / epidote absent.
									0·73					-														
161·23	165·35	3·69	4·12	89·6	1266		<4	<10		60	5	80	3		<1	10	20	25-60		1								Quartzose conglomerate, altered chert & dolomite fragments in quartz phlog. matrix, minor dissem. pyrite, epidote / well developed phlog. tending to foliated / minor late stage brecciation with py-chlor. veinlets between fragments eg 162·6 / fragments often zoned, common dissem. mag. & py, occassional epidote with sulphides / minor pebbles & pyrite in basal 20cm of conglomerate cycle - possibly a common trend, reflects increased dolomite fragments (intraformational) at base of erosional cycle
						C22																						
									0·37					-														
165·35	167·00	1·65	1·65	100	1267		<4	30		60	5	360	3	-	<1	10	20	10-100		<1	tr							Phlog. dolomite, common mag. (dissem.) & chlorite (-talc) alternated with shears / diffuse mottled alteration, light green, probably phlog. & v.f. dissem. epidote, common dissem. f. py / coarse py blebs & veinlets associated with chlor. alt / from UV, dolomite is fragmentary, remobilized aggregates
167·00	169·68	2·63	2·68	98·1	1268		<4	<10		30	10	100	6		<1	10	10	10-200		1-2	1							Phlogopitic dolomite as above, with increased magnetite-chlorite alteration & increased dissem. py (-po) blebs, magnetite occurs as 0·5-2mm blebby aggregates / dolomite re-mobilized, brecciated aggregates (UV) / note in view of light green color of alteration may be sericite instead of phlogopite / phlog. (or sericite?) alt. is intense, upto 40% of dolomite occurs as irregular veinlet network
						C23																						
									0·37					-														
169·68	173·09	3·41	3·41	100	1269		<4	15		30	10	110	8		<1	10	65	10-60		1-2								Dolomitic conglomerate, ovoid chert, dolomite fragments / in bn. phlog.-qtz matrix black-green chlorite microveinlets in matrix / poss. 40% 2-30mm clasts, subrounded diffuse, recrystal. into matrix / min. epidote alteration, 1-3mm blebs, minor black-green chlorite veinlets, matrix to clasts / 172·54 coarse mag. blebs (2mm) in 1cm veinlet 45° c/a
173·09	175·05	1·80	1·86	91·8	1270		6	<10		40	5	65	<1		<1	<1	340	10-20		2								Chloritic shear zone - intensely brecciated & sheared dolomitic conglomerate to chert-matrix phlog. altered to blue-green chlorite (occ. transitional) / strong network inter-connect py veinlets / strong incip. phlog. alteration of dol. congl.-chert country rock (dolomitic) chert, minor phlog. alteration, intense brecc. veined with py.-magnetite-chlorite vn selvedge / angular, in-place fragments average 3-15mm, always vein margin
175·05	178·68	3·63	3·63	100	1271		<3	<10		70	10	55	2·5		<1	<1	160	100-350		2	tr							
						C24			0·53					-														
178·68	188·62	1·94	1·94	100	1272		65	<10		170	<5	75	<1		<1	<1	410	20-200										Strong chlorite shearing, altered phlog.-qtz matrix conglomerate, 15% subrounded 5-20mm chert pebbles, other clasts strong phlog. alteration / chlorite, shearing related to underlying serpentinite / 179·9 - 180·3 conglomerate, strong mag-po-py alteration, sulphides 0·5-2mm blebs, total 5% / alteration very strong, original pebbles (dol.?) mainly apparent as diffuse light grey phlog. mottling in a brown (biotite, phlog.?) matrix / overall green oder probably a phlog (seric) variant, chlorite restricted to discrete shears.
180·62	181·85	1·19	1·23	96·7	1273		15	<10		120	<5	110	<1		<1	<1	1800	4000-10000		1	1							Phlogopite serpentinite, minor bands of hybrid "conglomerate" - serpentinite rock / serpentinite, v.f., dense, massive black rock, v.f. dissem. magnetite, often mag. bands / irregular microveinlets py dolomite
						C25			3·14					-														
181·85	182·60	0·75	0·75	100	1274		190	<10		240	<5	75	<1		<1	<1	330	2000-4000		1	2							(Dolomitic) phlogopite matrix conglomerate, strongly developed brown phlogopite matrix, associated sutured contacts between clasts - recrystalization? / dissem. v.f. (<0·05mm) magnetite / 65% 2-10mm subrounded chert & dolomite fragments, complete alteration.
182·60	184·90	2·30	2·30	100	1275		200	<10		35	<5	75	<1		<1	<1	150	30-80		tr								(Dolomitic) phlogopite matrix conglomerate. Common bands of serpentinite (up to 10cm) and chlorite alteration / strong brown phlog. alteration, diffuse clast-matrix contact, occas. chert fragments to 2cm, clasts mainly light grey altered dolomite / minor dissem. po-py associated with serpentinite bands.
						C26			4·62					-														
184·90	186·80	1·90	1·90	100	1276		170	<10		80	<5	80	<1		<1	<1	185	2000-4000		1	2-4							Strongly sheared phlogopite conglomerate, strong magnetite metasomatism (v.f. mag. dissem.) / fragments 2-30mm subrounded chert / dolomite
186·80	188·00	1·20	1·20	100	1277		160	<10		250	<5	110	<1		<1	<1	430	10000-30000		1	8							Chloritized phlogopite conglomerate, strong pyrrohtite-magnetite metasomatism, dissem. v.f. magnetite, pyrrohtite / chlorite blue-green, mainly clast alteration / trace chalcopy. blebs associated with pyrrhotite
188·00	191·65	3·65	3·65	100	1278		10	<10		90	<5	140	0·5		<1	<1	1700	500-3000		1	2-8							Massive serpentinite, intense dolomite vein, polygonal network, minor chert bands (remnant sediment) 0·5-3cm, phlog. altered / pyrrhotile - 10mm blebs and veinlets, pervasive v.f. dissem. dolomite-phlog. veins, 0·1-10mm, variable zones intense coarse phlog. alteration especially associated with dolomite veining.
						C27			2·82					-														
191·65	192·65	1·00	1·00	100	1279	C28	4	55		160	10	85	7		11	10	85	10		1								Brecciated chert, slightly dolomitic, dissem. veinlet, py in fracture, chloritic joint and shear
									0·20					-														
192·65	194·73	1·70	2·06	81·7	1280		10	<10		30	<5	110	6		<1	10	600	10-60		1	1							Strongly altered dolomite congl. (relic dolomitic congl. clasts) with subrounded interband massive chloritic serpentinite / very strong phlog. alteration in dolomitic congl. including clasts / congl. clast-rich, 30% 2-15mm subrounded dolomite matrix chlorite rich (green) due to serpentinites / med. py microveinlets pervasive.

Sheet 3 of 5 Sheets

F.G.1.69

From	To	Inter'l (m)	Core Rec'd	% Rec	Sample No.	Compos No.	Assays Sn	W	CaF %	Cu	Pb	Zn	Mo	Au	Magnetic Susceptibility x 10^{-5} SI Ag	Bi	Ni		% Estimates cpy	py	po	Core Angles				Alt	T.S P.S	Description
194·73	198·20	3·44	3·47	99+	1281		<4	10		70	5	110	3		<1	10	1500	2000–2500		<1	2-4							Black and light grey serpentinite subrounded light grey-green dolerite bands, dissem. v.f. pyrrhotite magnetite / possibly originally pyxite, no relic olivine or plag. / white spots, possibly altered plag, now phlogopite / serpentinite lacks normal bl-gn color and waxy lustre / dolomite appears to be alteration effect, strong shear & phlog association eg. 196·2 – 196·5, phlog. crs. platelets up to 8mm. / early stage phlog. – dol. shears cross cut by higher angle, late stage dol joints (<1mm).
						C29			1·05					–														
198·20	200·65	1·50	2·45	61·2	1282		<4	20		36	10	70	2		<1	10	600	10–100		–	–							Light grey green dolomite – phlogopite rock, strong dol.'s phlog. veining, irregular low angle veining / very irregular contact of overlying serp. with dol – phlog. – dol–phlog embayed into serp, small fragments serp (1cm) rafted into dol–phlog i.e. dol–phlog. late stage, selvedge of white dol. around serp. 1–10mm, then into crs (15mm) plates of phlog. with dol. / phlog. common as radiating 10mm sheets of spinifex texture.
						C30			1·75					–														
200·65	204·00	3·25	3·35	97·0	1283		4	<10		70	5	160	6		<1	10	1900	1000–500		<1	1-2							Very fine dark grey massive serp. v.f. dol. veining pervasive, dissem. py–po <1mm blebs, minor phlog. alteration, serp. appears 'cherty' / 202·1 20cm zone massive coarse phlog. alteration.
204·00	208·00	4·00	4·00	100	1284	C31	4	<10		120	5	130	5		<1	20	2100	3500–5000		2	1							Very fine dark grey massive serp. as above, minor asbestos v.f. dissem py–po blebs, <1mm up to 4% v.f. cherty appearance, soft, probably altered / minor diffuse zones of grey–yellow phlog. alteration.
									0·74					0·05														
208·00	212·00	4·00	4·00	100	1285		<4	45		150	10	150	3		<1	10	2300	5000–1000		3-6	10							Very dark grey massive serp. as above decreasing dol. veins moderate pyritic, v.f. dissem. blebs / low angle phlog. alteration zones at 208·0 – 208·5.
212·00	216·00	4·00	4·00	100	1286		6	<10		30	10	170	7		<1	<10	1700	1000–800		tr	1							Very fine black serpentinite, dol. vein pervasive, dissem. 1–3mm flakes phlog. decrea. sulphides, minor asbestos microveinlets / 214·2 – 214·4 massive light grey yellow heavy calc–silicate (possibly pyroxene?) dissem coarse (1–2mm) magnetite blebs.
216·00	218·80	2·80	2·80	100	1287		8	<10		70	5	120	2		<1	10	2000	1000–800		1	1							Very fine black serpentinite as above, base of dissem po–py / 218·3 – 218·7 1cm coarse phlog. alt. vein, undulating, variable low c/a (0–10) / diffuse zones phlog. alteration pervasive.
218·80	223·14	4·34	4·34	100	1288	C32	<4	<10		55	5	140	8		<1	10	2200	4500–3000		1	<1							Very fine grey serpentinite, visible sulphides decreasing dissem. v.f. py., v.f. mag. microveinlets / 222·2 – 222·7 zone strong phlog–dol. alteration c/a 30° vers phlog. plates, interconnect phlog. veinlets v.f. dol. / dissem. po increase from 221 / minor zones of irregular, diffuse phlog. alteration.
									0·78					–														
223·14	225·95	2·81	2·81	100	1289		12	10		95	5	140	6		<1	10	2200	3000–6000		1-2	<1							Very fine black serpentinite, common phlog. alteration zones, commonly developed grey mineral, phlog–plag? / 223·4 – 223·6 massive phlog–dol. alteration, coarse brown and light green phlog. plates, coarse crystal, white dol. fragments dark grey serp. / dissem. py blebs, minor po as interlocking aggregates and veinlets.
225·95	228·58	2·63	2·63	100	1290		4	<10		50	<5	50	<1		<1	1	620	200–1000			0-4							Intemely altered phlog–talc rock, minor remnant dol. congl. clasts, congl. becoming better developed away from serp. contact / irregular po development as bands (max 1cm) dissem. & veinlets, minor dissem. mag. bands / From 227·0 easily recognised dol. congl., white phlog–dol clasts (1–20mm) in brown phlog. matrix / from 227·4, massive po aggregates common, associated with light green talc "ovoids", altered dol. clasts?
						C33			1·90					–														
228·58	229·60	1·02	1·02	100	1291		65	<10		200	<5	235	1		<1	1	245	200–600			6							Diopside – phlog – pyrr. skarn, pyrr as 1–3mm bleby aggregates.
229·60	231·20	1·60	1·60	100	1292		<3	<10		70	<5	30	3		<1	<1	175	20–80		1								Strongly brecc. cherf, chlor. & py platelets on shear planes, trace dissem. v.f. py.
231·20	232·76	1·56	1·56	100	1293		100	<10		120	5	110	0·5		<1	<1	170	20–40			1-2							Dolomitic congl., intensive shear & brecc., chloritized, matrix phlogopite.
232·76	235·59	2·83	2·83	100	1294	C34	50	<10		160	5	95	<1		<1	<1	135	80–350		2	2							Diopside–dol. (–pyrr–py) skarn, 0·5–3mm blebs py–po, minor py veinlets / remnant diffuse pebbly textures, altered white dolomite clasts, often with sulphide assoc. / 233·8 20cm zone shearing & calc. vein.
									1·33					–														
235·59	238·86	3·27	3·27	100	1295		4	45		70	25	180	6		1	10	60	10–50		1-2								Grey yellow chert & fine pink–mauve sst. dissem. v.f. py, strongly sheared, calcite veining concord. to bedding / 235·59 – 236·6 dissem. mag.
238·86	243·60	4·74	4·74	100	1296		6	45		80	40	200	1		1	10	100	80–200		tr								Brecciated & sheared grey–mauve fine cherty biotitic sst, minor magnetite veining & dissem, variably calc, including fine calcite veining, disrupted "lumpy" bedding, 2–20mm / From 242·0 becoming grey yellow chert with orgillac biotitic bands.
243·60	248·70	4·60	4·60	100	1297	C35	6	20		75	10	80	5		2	10	170	40–150		1								Interlaminated my chert & fine grey biotitic sst, biotite contact metamorphic effect, especially as selvedge at chert–sst band contacts, v.f. dissem & veinlet py, possibly syngenetic, especially in chert bands / white biotite sst, "brecciate & invade" chert, "sst" probably phlogopite rich / From 245, phlogopite alteration, pervasive sst, softer towards base, sst med. crs., occassional qtz. granules.
									0·25					–														
248·70	249·76	1·56	1·56	100	1298		16	15		70	15	70						40–100										Grey poorly banded chert, lenticular bedding, including intraformational brecc. and congl. / remobilized, cross–cutting, brown biot–phlog. irregular py veinlets throughout / 249·3 trace scheelite assoc. with amph–biot–py alteration veins in chert.

THE SHELL COMPANY OF AUSTRALIA LTD. - METALS DIVISION

PROJECT: HIGHCLERE - BUCKBY

DIAMOND DRILL LOG - SAMPLING RECORD

HOLE NO: DDH BD8

052

From	To	Interval (m)	Core Rec'd	% Rec	Sample No.	Compos No.	Assays Sn	W	CaF_2	Cu	Pb	Zn	Mo	Au	Magnetic Susceptibility $\times 10^{-5}$ SI Ag	Bi	Ni		% Estimates cpy	py	po	Core Angles				Alt	T.S P.S	Description
249·76	251·75	1·99	1·99	100	1299	C36	40	<10	3·64	20	10	135	1	-	<1	<1	60	1000 - 50000			tr							Magnetite-tremolite-phlogopite skarns, coarse tabular tremolite crystals, variable actinolite (light & dark green fibrous mineral) especially towards base /mag. massive blebs up to 8mm
251·75	253·94	2·19	2·19	100	1300	C37	14	<10	0·45	28	16	50	7	-	1	10	55	20-50		1								Upper grey diop skarn with breec. chert bands & actinolite, becoming massive pink & grey (pyritic, diopside) chert, basal 80 cm cherty dolomite, dissem. f. py blebs/granite contact strong fracturing, possibly fault contact, no granite veining of host chert although strong recrystallization.
253·94	257·60	3·66	3·66	100	1301		4	80		38	30	100	1		3	10	15	2										Pink Fine-med. QF granite, phenocryst 1-5mm, no mica, minor 1-2mm qtz. vein / no alteration apart from cloudy chloritic-sericite alteration of feldspar & chlor. alteration of joints/occassional qtz. (& kspar) phenocrysts to 10mm, weakly porphyritic texture
257·60	262·10	4·50	4·50	100	1302	C38	8	70	0·08	36	20	60	4	-	2	10	5	5										Pink porph. QF granite as above, increased qtz vein, bleaching and chloritic-epidote alteration associated with fracturing, minor sericite zones / 257·6-258·0 massive qtz vein, barren/granite, tending to porph. anhedral 10mm qtz phen. in pink feldspar rich matrix, common green sericite alt. plag. phenocrysts.
262·10	263·66	1·56	1·56	100	1303		6	25		14	5	30	6		1	20	<5	5										Light grey green QF granite, phyllic (ser-chlor) alteration, minor calc. alteration as veinlets, plag. complete alt to yellow waxy sericite, groundmass v.f. s sericite alt., no mica, pink feld, soft, yellow alteration / diffuse zones of unaltered pink grey remnants.
263·66	266·91	3·25	3·25	100	1304		4	55		22	15	38	2		1	20	5	100-550										Pink porphyry QF granite, variable dissem. mag. 1-3mm blebs 1-2% chloritized biotite, pink feld. & white plag unaltered/occ. ovoid pink kspar with white feld. inclusions/finer grained (1-3mm) to base.
266·91	269·20	2·29	2·29	100	1305	C39	14	30	0·08	14	55	120	4	-	2	10	5	2										Light yellow-green-grey QF granite, yellow-green sericite alteration, qtz veining & shearing, diffuse zones (c/c = 0-10) replacing pink gr. no mica / kspar replaced to gn. sericite, all plag. alt to yellow-green-white sericitised feld. minor relic fresh feld. / vuggy actinolite-qtz. in joint fractures.
269·20	272·20	3·00	3·00	100	1306		12	40		28	25	55	5		1	10	<5	5-15										Pink porph QF granite, pink fine felsic matrix, phenocrysts ≤5mm, mainly anhedral qtz. / qtz greisen vein 271·0-272·2m, barren / yellow green sericite replaces plag. phenocrysts / trace bbl (-biotite?) : no mica / minor bleaching & silification adjacent veins, also white bleaching adjacent bbl veins

Sheet 5 of 5 Sheets

30 of 99

053

SHELL COMPANY OF AUSTRALIA LTD.

Geophysical Log

667054

PAGE ... OF ... PAGES

DIAMOND DRILL HOLE N° : BD-8

PROJECT	: BUCKBY	STATE	: TASMANIA
ANOMALY N°	:	GRID COORDS	:
INCLINATION	:	AZIMUTH	:
DATE DRILLED	:	TOTAL DEPTH	:
CASING	:		

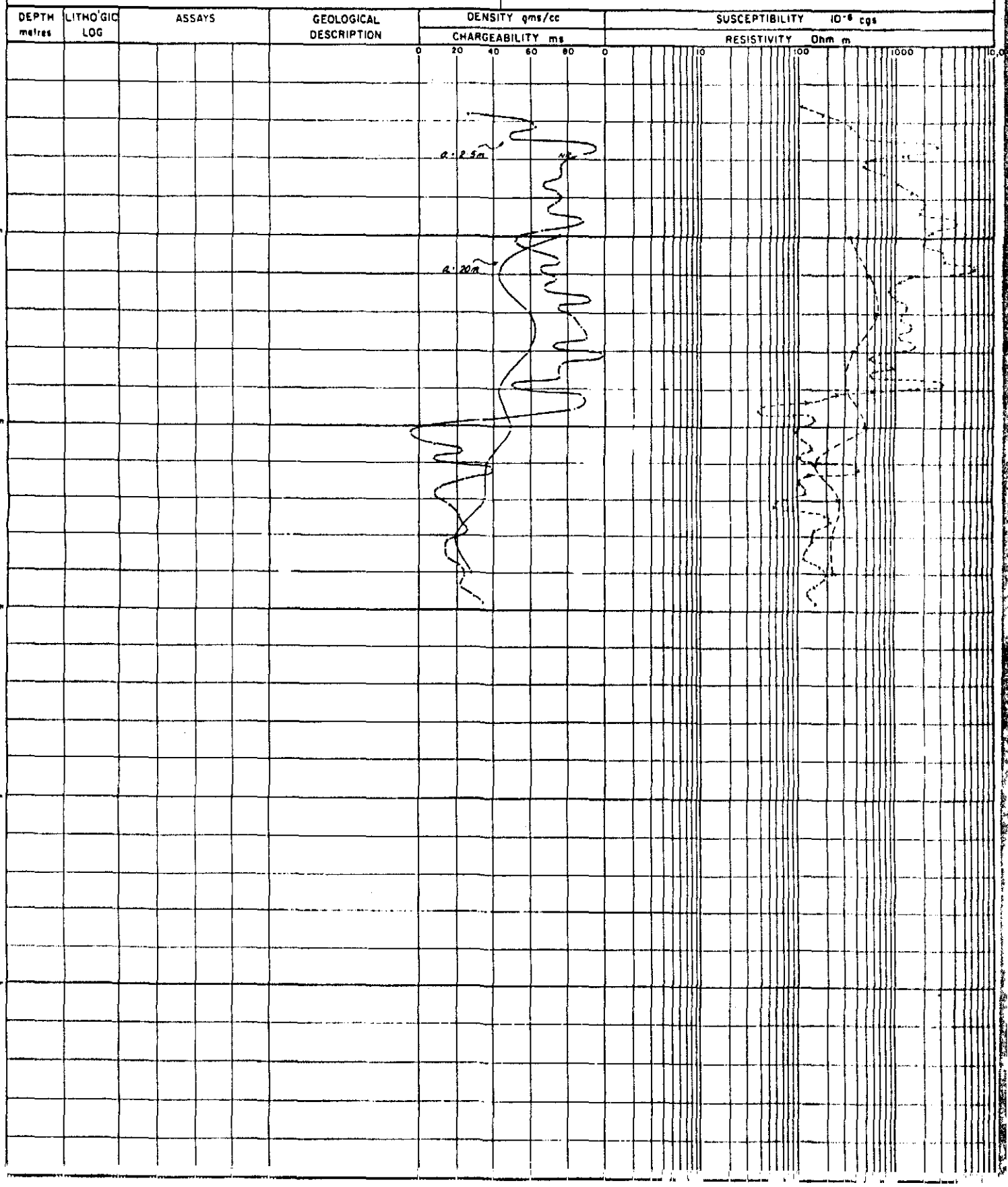
GROUND GEOPHYSICAL ANOMALIES :

IP / RESISTIVITY LOGGING —

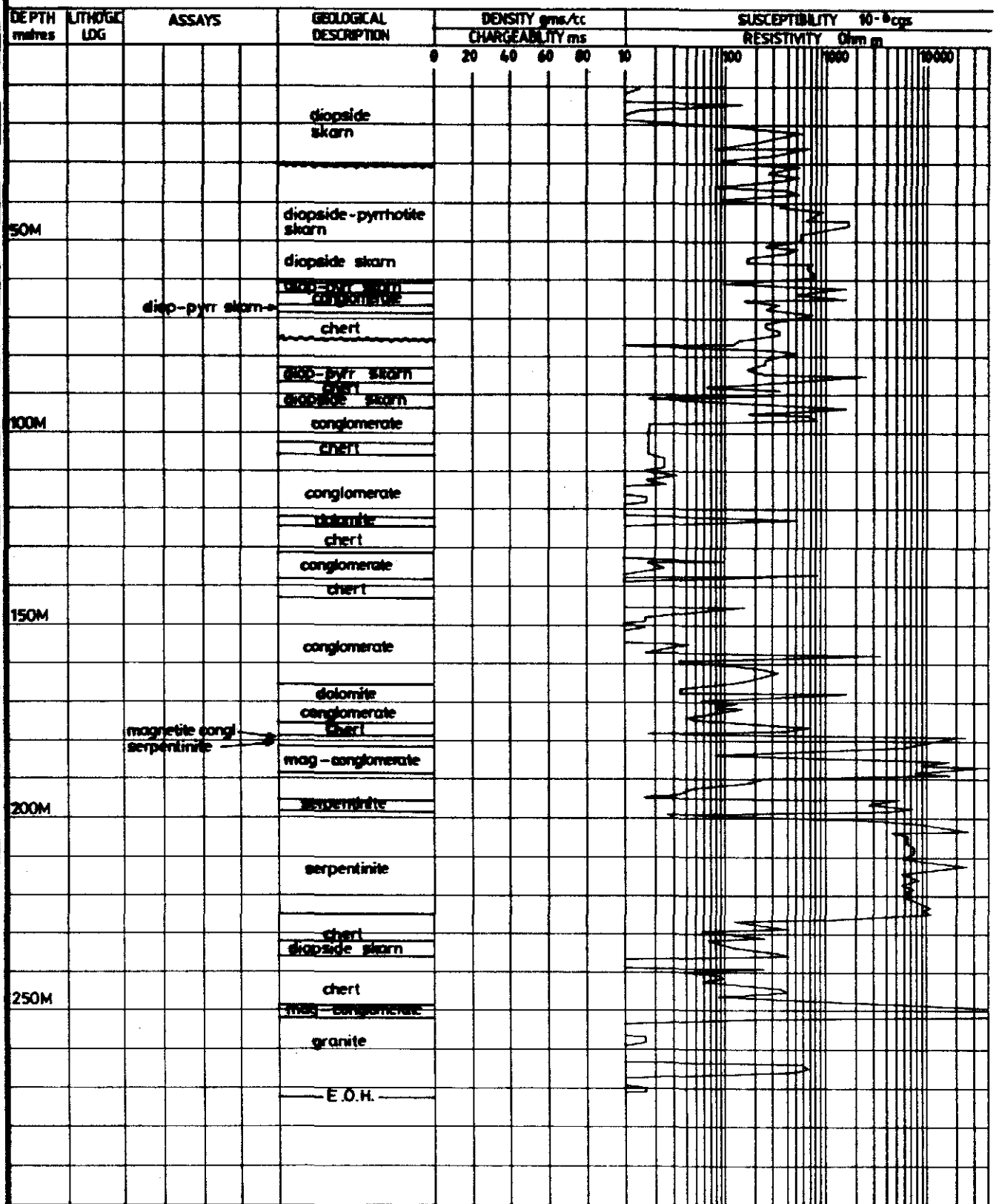
CONTRACTOR	: SCINTREX	DATE LOGGED	: 16.12.81
ARRAY	: 3-ARRAY	ELECTRODE SPACINGS	: 2.5m, 20m

SUSCEPTIBILITY LOGGING

BY : DATE LOGGED :



667055



The Shell Company of Australia Limited
METALS DIVISION

E.L. 4/77 HIGHCLERE
BUCKBY PROSPECT
DIAMOND DRILL HOLE
No. BD 8

SCALE	DATE 16-8-82
AUTHOR J.J.L.	DRAWN H.L.S.
OFFICE DEVONPORT	REP.No.
DRG No DMD0754	FIG No

APPENDIX 2B

GUIDE RIVER ANOMALY PDH GRD 1

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

056

PROJECT : HIGHCLERE

Hole No : PDH GRD 1

COLLAR CO-ORDINATES : 6000E/3625N

LOCATION CODE : MQ 03

COLLAR R.L. :

LOCATION : GUIDE RIVER

MAP/PHOTO REFERENCE : 5 433 800mN 396 000mE

DATE STARTED	19-6-81	HOLE SIZE		FROM	TO	TOTAL	CORE STORAGE	DEVONPORT
DATE FINISHED	26-6-81	NON CORE					Nº OF TRAYS	
TOTAL DEPTH	200m						SAMPLE STORAGE	
LOGGED BY	J.J. LAWTON	CORE					ASSAY LAB.	COMLABS
CONTRACTOR	G. SPAULDING						ASSAY REPORTS	
RIG	MAYHEW 1000							
DRILL CREW	G. WEBBER N. SUTTON	CASING					MIN. & PET. LAB.	C.M.S.
							MIN. & PET. REPORTS	
		CASING LEFT	6" PVC	0	6m	6m		

HOLE SURVEY DATA

INSTRUMENT :

DEPTH	INSTRUMENT INCL.	INSTRUMENT AZ.	ACID ETCH INCL.	ACID ETCH AZ.	REMARKS
COLLAR					

GRAPHIC / LETTER SYMBOL LOGGING KEY

STRUCTURE / ALTERATION CODE

B BEDDING
J JOINTING
C CLEAVAGE
F FOLIATION
sh SHEARING
q QUARTZ VEINS
O OXIDATION

DRILLING SUMMARY :

66705?

[redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] HL [redacted] CO[redacted]Y OF [redacted]TRA[redacted]TD. [redacted] AL[redacted] STO[redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted]

PROJECT: HOUSETOP J.V. HIGHCLERE E.L. GUIDE RIVER — DIAMOND DRILL LOG - SAMPLING RECORD — HOLE NO. GRD 1

057

From	To	Interval (m)	Core Rec'd	% Rec.	Sample No.	Composite No.	Assays: Sn	W	Ni	Cu	Pb	Zn	Cd	Bi	Susceptibility	% Estimates	Core Angles	Alt.	T.S. P.S.	Description
0	2				2601										450					50% soil, 50% weathered - fresh basalt (Tb)
2	4				2602										700					Dk green grey massive fresh basalt
4	6				2603										450					" " " (contam. ≤5%)
6	8				2604										450		Flow Top			Amyg basalt (qz chalcedony) + minor yellow-brown ?sl st.
8	10				2605										350					As above with less amygdales and sediment.
10	12				2606										300					Fresh massive basalt, minor amygdales.
12	14				2607										400					Fresh dark grey-black basalt, minor amyg trace contam
14	16				2608										450					" " " "
16	18				2609										400					As above with increasing amygdales.
18	20				2610										300					Predom. massive dk grey-black basalt, qz veining, minor amyg
20	22				2611										200					Massive dk green grey basalt with minor amyg. (zeolite)
22	24				2612										200					" " " "
24	26				2613										200					As above with Fe alteration
26	28				2614										500					" "
28	30				2615										400					" "
30	32				2616										250		Flow Top			Amyg basalt (qz calcite) and yellow white siliceous sediments (sl st?)
32	34				2617										700					Massive & amyg basalt with minor sediment (contam.?)
34	36				2618										600					Strongly amyg basalt (amyg generally ≈1mm)
36	38				2619										200					Amyg basalt (as above) with some massive basalt.
38	40				2620										300					Massive basalt & some amyg basalt. Tr. Fe
40	42				2621										300					Massive basalt with some amyg
42	44				2622										350					" " " (Tr. Fe)
44	46				2623										350					Massive basalt with minor amyg (Tr. Fe)
46	48				2624										450					" " Fe alteration
48	50				2625										450					" " " (amyg)
50	52				2626										500					" " "
52	54				2627										400					" " "
54	56				2628										500					" " "
56	58				2629										500					" " "
58	60				2630										450					" " "
60	62				2631										300					" " "
62	64				2632										350					" " "
64	66				2633										300					" " " increasing Fe alteration
66	68				2634										400		Flow Top			Strongly weathered amyg basalt. Minor fresh massive basalt
68	70				2635										2000					" " " " & fresh massive basalt
70	72				2636										1500					Predom. fresh (amyg.) basalt. Fe weathering, qz veining
72	74				2637										550					Fresh massive basalt. Minor Fe weathering, qz veining
74	76				2638										750					" " " Tr. amyg. Fe weathering, qz veining
76	78				2639										750					" " " Minor Fe weathering, qz veining
78	80				2640										800					" " " " " "
80	82				2641										1000					" " " " " "
82	84				2642										850					Fresh massive basalt. Tr. to minor Fe weathering
84	86				2643										250					As above with minor yellow sl st
86	88				2644										160					Equal proportions of yellow sl st & massive fresh basalt. Minor Fe.
88	90				2645										300					Predom. massive fresh basalt with minor Fe weathering. Contam.
90	92				2646										500					Massive fresh basalt. Minor Fe. Much contamination Tr sediment from top of hole
92	94				2647										950					" " " Tr Fe
94	96				2648										1500					" " " "
96	98				2649										1500					" " " " " "
98	100				2650										2000					" " " " " "
100	102				2651										2000					Dk grey-blk f.g. massive basalt. Fresh
102	104				2652										1500					" " " "
104	106				2653										1500					" " " " (Tr amyg.)
106	108				2654										2000					" " " "
108	110				2655										850					" " " "
110	112				2656										600					" " " "
112	114				2657										500					Predom. massive basalt as above. Minor brown sl st
114	116				2658										750					Fresh & weathered basalt & minor brown sl st or f.g. sst
116	118				2659										450		Pebbles			Weathered basalt with small (≈1cm) basalt, ?chert, f.g. sst pebbles, qz
118	120				2660										250					" " " "
120	122				2661		≤4	≤10	55	58	10	30	≤1	≤4	200					Predom. dk grey ?slate or mudstone. Tr. small pebbles

66705

[redacted] THE [redacted] COMPANY OF [redacted] STRA[redacted] TD. [redacted] TAL [redacted] ISIO[redacted]

PROJECT: _____

DIAMOND DRILL LOG - SAMPLING RECORD

HOLE NO: GRD 1

056

From	To	Interval (m)	Core Rec'd	% Rec.	Sample No.	Comps. No.	Assays Sn	W	Ni	Cu	Pb	Zn	Cd	Bi	Susceptibility	% Estimates	Core Angles	T.S Alt.	P.S	Description
122	124				2662										60					Predom. dk. grey ? slate or mudstone. Tr. small pebbles.
124	126				2663		8	<10	48	35	26	310	≤1	≤4	40					Dark grey ?slate and micaceous ?siltstone bands. Minor qtz. veining. Tr. py veining
126	128				2664										40					" " " "
128	130				2665		8	<10	46	55	28	315	≤1	≤4	55					Dark grey slate. Micaceous bands.
130	132				2666										30					Dark grey mudstone (cleavage)
132	134				2667		8	15	120	60	24	130	<1	<4	300					Predom. dk grey basalt and minor mudstone.
134	136				2668										40					" " " "
136	138				2669		4	<10	42	45	55	155	≤1	<4	35					" " " "
138	140				2670										30					" " " "
140	142				2671		10	<10	100	70	34	140	≤1	≤4	200					Dark grey mudstone & amyg. basalt
142	144				2672										30					" " (Tr. amyg. basalt)
144	146				2673		10	<10	75	60	22	110	≤1	≤4	85					Dark grey amyg. basalt and minor mudstone.
146	148				2674										25					Dark grey mudstone and minor basalt (amyg) Tr pyrite
148	150				2675		<4	10	65	55	42	85	<1	≤4	200					Predom. massive basalt with minor vesicles (minor mudstone)
150	152				2676										150					Massive & amyg. basalt & mudstone
152	154				2677		6	10	48	60	22	85	≤1	≤4	30					Dark grey mudstone (Tr. basalt) Tr. pyrite
154	156				2678										60					" " with some coarser grained layers
156	158				2679		8	15	46	65	16	80	<1	≤4	45					" " "
158	160				2680										30					" " "
160	162				2681		12	<10	48	42	24	100	<1	≤4	50					" " "
162	164				2682										80					" " "
164	166				2683		8	<10	44	60	28	115	≤1	<4	30					" " "
166	168				2684										85					f.g. sediments or basalt with minor mudstone. Basalt contamination
168	170				2685		10	<10	42	36	32	110	≤1	≤4	85					" " " "
170	172				2686										40					Predom. dk grey mudstone with minor f.g? sediments.
172	174				2687		6	10	42	46	28	110	<1	≤4	20					Dark grey mudstone
174	176				2688										25					"
176	178				2689		4	<10	48	50	36	130	<1	≤4	55					"
178	180				2690										25					"
180	182				2691		<4	15	50	65	100	310	<1	≤4	75					" Tr. pyrite
182	184				2692										50					"
184	186				2693		6	15	50	80	42	150	≤1	≤4	45					"
186	188				2694										50					"
188	190				2695		6	<10	48	60	22	100	<1	≤4	45					"
190	192				2696										40					"
192	194				2697		4	25	46	65	70	160	≤1	≤4	45					"
194	196				2698										25					"
196	198				2699		6	15	50	65	28	115	≤1	≤4	35					"
198	200				2700										25					"

66059

059

SHELL COMPANY OF AUSTRALIA LTD.

Geophysical Log

667060

DIAMOND DRILL HOLE N° : GRD-1

PROJECT	: GUIDE RIVER	STATE	TASMANIA
ANOMALY N°	: 3943/1	GRID COORDS	6000 E 3625 N
INCLINATION	: VERTICAL (Percussion Hole)	AZIMUTH	:
DATE DRILLED	: AUGUST 1981	TOTAL DEPTH	: 200 m
CASING	:		

GROUND GEOPHYSICAL ANOMALIES : MAG., GRAVITY

IP / RESISTIVITY LOGGING —

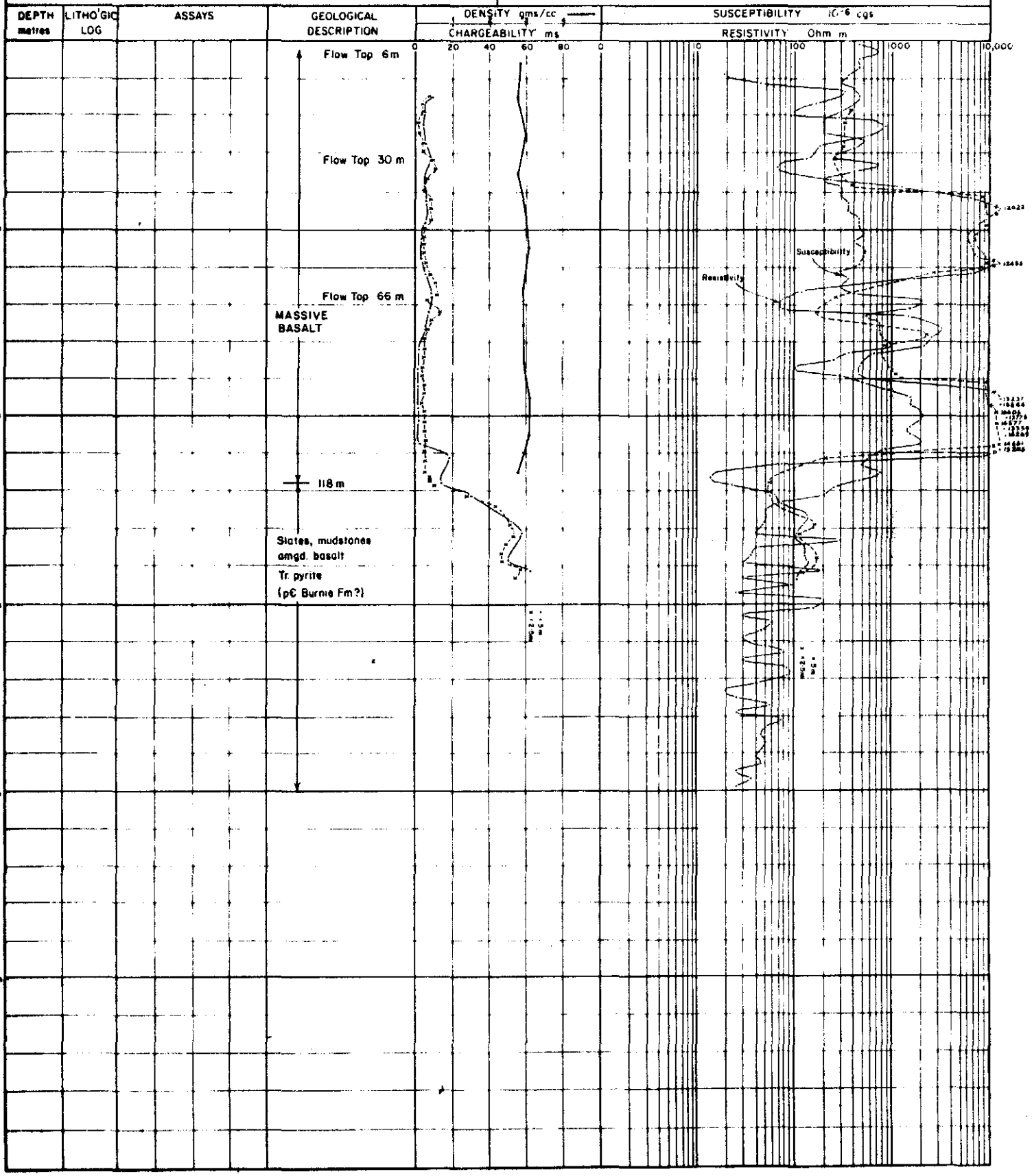
CONTRACTOR	: SCINTREX	DATE LOGGED	: 25-07-81
ARRAY	: 3 ARRAY	ELECTRODE SPACINGS	: 2.5 m / 5 m

SUSCEPTIBILITY LOGGING

BY	: SHELL, DEVONPORT	DATE LOGGED	:

DENSITY LOGGING

BY	: ANALABS (2 m Samples)	DATE LOGGED	: DEC 1981



DRG. No. MQ03/1008

APPENDIX 2C

HIGHCLERE IRON PROSPECT PDH H 1

The Shell Company of Australia Limited
METALS DIVISION

DRILL LOG SHEET

Hole No : PDH H 1

PROJECT : HIGHCLERE

LOCATION CODE : MQ 03

COLLAR CO-ORDINATES : 2100E/485ON

COLLAR R.L. :

LOCATION : HIGHCLERE IRON

MAP/PHOTO REFERENCE : 5438200mN, 401400mE

DATE STARTED	23-2-82	HOLE SIZE		FROM	TO	TOTAL	CORE STORAGE	DEVONPORT
DATE FINISHED	25-2-82	NON CORE					Nº OF TRAYS	
TOTAL DEPTH	102m						SAMPLE STORAGE	
LOGGED BY	P.A. RUXTON	CORE					ASSAY LAB	COMLABS
CONTRACTOR	G. SPAULDING						ASSAY REPORTS	
RIG	MAYHEW 1000							
DRILL CREW	G. Webber/N. Sutton	CASING					MIN & PET LAB	
							MIN. & PET REPORTS	
		CASING LEFT	6"	0	22	22		

HOLE SURVEY DATA

INSTRUMENT :

DEPTH	INSTRUMENT INCL.	INSTRUMENT AZ.	ACID ETCH INCL.	ACID ETCH AZ	REMARKS
COLLAR					

GRAPHIC/LETTER SYMBOL LOGGING KEY

STRUCTURE / ALTERATION CODE

B BEDDING
J JOINTING
C CLEAVAGE
F FOLIATION
SH SHEARING
Q QUARTZ VEINS
G GRADATION

DRILLING SUMMARY :

061

667062

THE SHELL COMPANY OF AUSTRALIA LTD. - METALS DIVISION

PROJECT: HIGHCLERE — DIAMOND DRILL LOG - SAMPLING RECORD — HOLE No.: FDH 4

From	To	Interval	Core Rec'd	% Rec.	Sample No.	Comp. No.	Assays: As	Sb	Hg	Cu	Pb	Zn	Ni	Ag	Susceptibility x 10^{-6} S.I.	Ba	% Est. Mag.	Core Angles	Alt	T.S P.S	Description
0	2.0				4001		250	280	0.02	210	120	150	95		60						Ironstone soil predom. hematite/limonite.
2.0	4.0				4002		340	56	0.02	125	100	200	42		100						Ironstone soil as above.
4.0	6.0				4003		270	90	0.02	135	120	170	55		75						Hematite nodules.
6.0	8.0				4004		200	125	0.01	120	100	200	65		250						Predom. hematite nodules with some limonite.
8.0	10.0				4005		185	80	0.02	145	120	180	46		180						Hematite nodules with limonite rims.
10.0	12.0				4006		185	65	0.01	170	120	160	40		400						Red/purple hematite pisoliths.
12.0	14.0				4007		175	80	0.02	190	120	150	50		470						Hematite pisoliths with massive hematite cores.
14.0	16.0				4008		210	65		150	110	140	38		800						Hematite pisoliths with black cores.
16.0	18.0				4009		170	30		105	100	100	36		1200						Hematite pisoliths, some with qz or coarse hem./magnetite cores.
18.0	20.0				4010		200	25	0.02	130	120	110	26		2300						Hematite pisoliths as above.
20.0	22.0				4011		85	45	0.02	130	100	100	32		4100			WATER TABLE			Magnetite + hematite (massive)
22.0	24.0				4012		60	30	0.02	165	80	110	24		5400						Predom. magnetite (+ hematite)
24.0	26.0				4013		46	60	0.02	100	36	90	20		5300						Ironstone with some qz.
26.0	28.0				4014		60	330	0.02	125	38	110	28		5800						Magnetite ironstone with ~40% f.g. qz.
28.0	30.0				4015		80	340	0.04	175	55	160	28		6600						Predom. magnetite ironstone, some qz.
30.0	32.0				4016		85	380	0.02	260	70	170	36		4500	15					Magnetite ironstone as above.
32.0	34.0				4017		60	110	0.02	125	40	110	55		20000	15					Coarse magnetite (fresh). Some qz and vugs.
34.0	36.0				4018		65	70	0.04	95	20	80	24		36000						Coarse magnetite and minor limonite.
36.0	38.0				4019		50	55	0.04	105	20	90	20		31000						Predom. massive, crystaline magnetite, minor limonite and hematite.
38.0	40.0				4020		65	50	0.04	90	22	100	14		38000	10					Predom. magnetite with minor hematite and qz.
40.0	42.0				4021		80	50	0.04	340	26	160	16		32000	35					Predom. euhedral magnetite with minor qz. vugs.
42.0	44.0				4022		40	65	0.06	260	20	180	18		9000	35					Predom. magnetite, minor qz. some clay material (brown/red).
44.0	46.0				4023		40	45	0.04	155	32	170	10		3700	195					Clay and magnetite give way to green pyroxene skarn. Minor granite chips.
46.0	48.0				4024		48	20	0.04	120	38	160	8		4700	180					Pyroxene skarn. 70% pyx + qz + feld. (No magnetite)
48.0	50.0				4025		40	15	0.04	75	26	100	8			200					Pyroxene skarn/granite contact. Sample predom. granite.
50.0	52.0				4026		18	20	0.02	44	10	80	6		1900	175					Altered granite, minor pyroxene skarn.
52.0	54.0				4027		24	25	0.04	38	12	80	8		1900	200					Predom. granite with some pyroxene skarn, ironstone and magnetite.
54.0	56.0				4028		18	20	0.02	40	6	42	12		550	230					Predom. granite (Tr. sulphide?)
56.0	58.0				4029		22	30	0.02	100	10	80	10		2000	195					Granite, alteration of feldspar? Minor ironstone.
58.0	60.0				4030		14	20	0.02	46	8	60	8		900	230					Granite, with increasing magnetite.
60.0	62.0				4031		14	40	0.02	42	16	70	10	1	880	170					Granite, alteration of plag? (blue green)
62.0	64.0				4032		36	30	0.02	75	20	60	12	1	1100	125					Altered granite with some Fe present (blue)
64.0	66.0				4033		70	40	0.04	130	80	90	8		670	130					Fresher (harder) altered granite (blue)
66.0	68.0				4034		70	25	0.02	75	16	65	10		610	210					Altered granite (greisen?) (green, blue feld.) Hard.
68.0	70.0				4035		70	45	0.06	105	16	90	14	1	610	95					Hard less altered granite, biotite, pink K feld.
70.0	72.0				4036		28	20	0.04	48	10	42	14		620	290					Fresher granite as above.
72.0	74.0				4037		28	10	0.04	42	12	38	18	1	1100	330					Hard fresh granite.
74.0	76.0				4038		18	10	0.06	30	8	28	8	1	950	300					Hard pink granite. Some green plag. and Fe.
76.0	78.0				4039		20	20	0.06	32	10	28	6	1	440	290					Granite as above.
78.0	80.0				4040		10	10	0.08	22	12	24	6	1	280	290					Altered granite = epidote, argillitization. Trace pyrite, magnetite.
80.0	82.0				4041		18	15	0.04	16	10	24	6	1	300	310					Strongly altered granite = clay.
82.0	84.0				4042		55	20	0.10	30	70	50	18	1	1400	330					Strongly altered granite (green, blue) Trace pyrite, asp_y?
84.0	86.0				4043		24	20	0.10	24	30	40	24	1	1200	290					Transition, from alteration zone to fresh granite (P_y in alteration)
86.0	88.0				4044		16	≤10	0.12	18	12	28	8	1	740	140					Moderate fresh, unaltered granite.
88.0	90.0				4045		8	15	0.16	16	12	22	14	1	720	160					Fresh pink unaltered granite.
90.0	92.0				4046		10	15	0.10	16	10	28	16	1	900	130					Fresh pink unaltered granite.
92.0	94.0				4047		8	10	0.08	14	6	24	≤4	1	480	105					Slightly altered (green) granite (P_y)
94.0	96.0				4048		6	15	0.04	14	4	20	6	1	300	165					Alteration zone.
96.0	98.0				4049		8	20	0.02	18	10	20	<4	1	440	140					Alteration zone (green) no pink K feld. or sulphides.
98.0	100.0				4050		14	15	0.02	16	12	20	<4	1	280	240					Predom. green alteration zone grading to fresh pink hard granite.
100.0	102.0				4051		16	≤10	0.06	16	8	18	<4		250	180					Fresh pink-red granite.

Bi below detection level

062

66/063

063

667064

SHELL COMPANY OF AUSTRALIA LTD.

Geophysical Log

DIAMOND DRILL HOLE N° :

PROJECT	: HIGHCLERE	STATE	: TASMANIA
ANOMALY N°	:	GRID COORDS	: 2100 E / 4850 N
INCLINATION	: 90°	AZIMUTH	:
DATE DRILLED	: 23-2-82	TOTAL DEPTH	: 102M
CASING	:		

GROUND GEOPHYSICAL ANOMALIES :

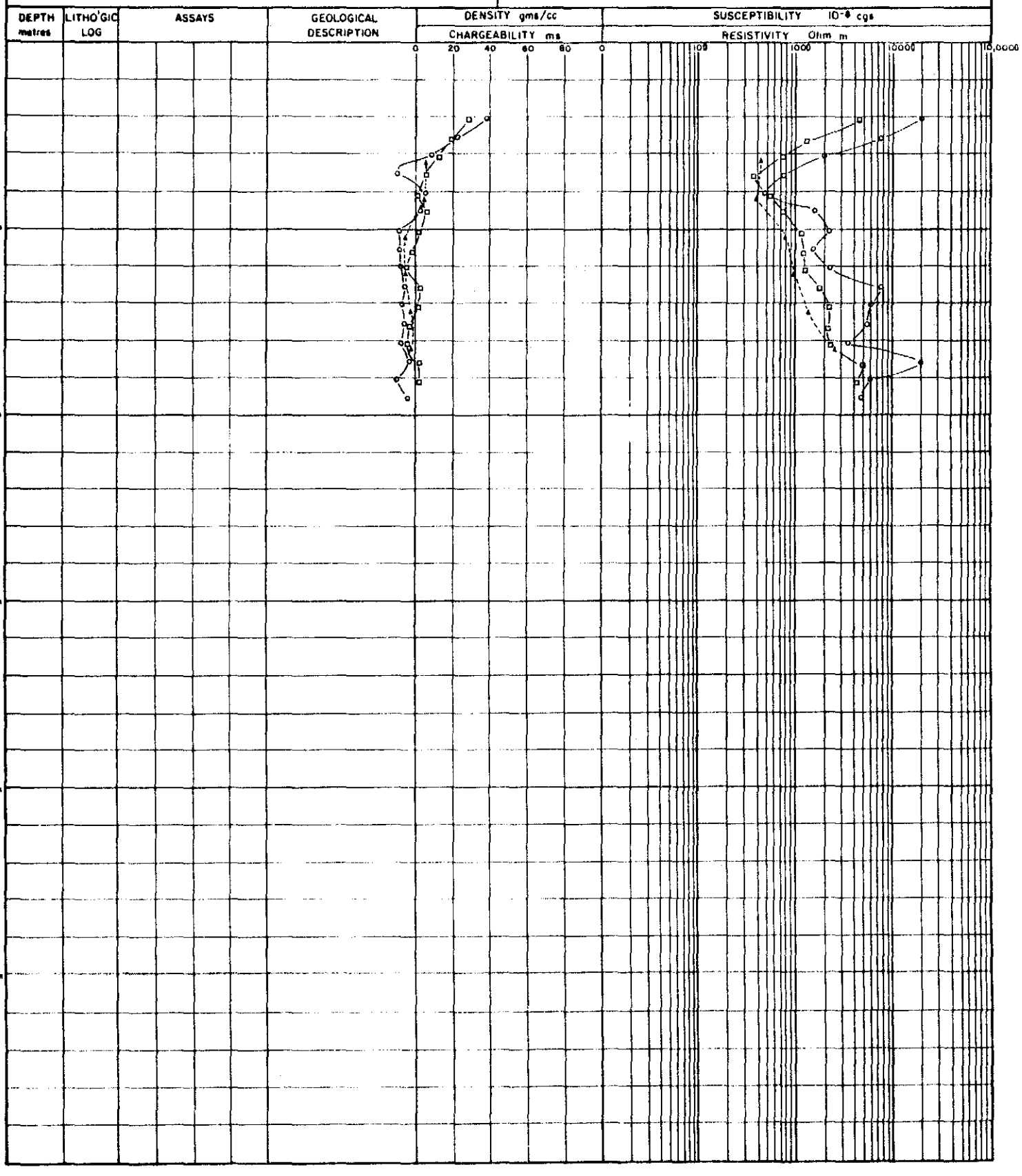
IP / RESISTIVITY LOGGING —

CONTRACTOR	: P. BURNHEIM	DATE LOGGED	: 16-4-82
ARRAY	: 3 ARRAY	ELECTRODE SPACINGS	: o 3M SEPARATION, □ 6M SEPARATION, ▲ 12M SEPARATION

SUSCEPTIBILITY LOGGING

BY :

DATE LOGGED :



LEGEND

Quaternary
- Alluvium
- Talus

Permo-Carboniferous
- Sandstone, siltstone, tillite

Devono-Silurian
- Bell shale
- Florence sandstone
- Magnetite rich skarn

Ordovician
- Limestone
- Sandstone
- Conglomerate

Cambrian
- Limestone, mudstone
- Acid/intermediate volcanics and sediments

Igneous Rocks
- Tertiary basalt
- Devonian granite - Housetop granite

KEY
- Highway
- Road
- River
- Emu Bay Railway
- • (E) Electrical sounding location
- x Drill hole location
- Landsat interpretation (Huntings)

390000 E
400000 E
410000 E
5440000 N
5430000 N
5420000 N

RIDGLEY
PET RESERVOIR
MOUNT ROAD
RIVER
20/3943/IH1
20/3943/IH2
HIGHCLERE
20/3943/IH4
PET
ROAD
HIGHCLERE IRON (4043/1)
BD1
20/3943/IH5
EMU
20/3943/IH6
BUCKBY PROSPECT
x BD 8
MOUNT
NOLANS HILL
20/3943/IH10
20/3943/IH8
x GRD1
20/4043/IH7
CRANES PROSPECT (Sn)
ROAD
20/4043/IH9
WATONE
HAMPSHIRE
UPPER
LAKE KARA
ROAD
KARA
ROAD
RIVER
BLYTHE
ROAD
MOUNT HOUSETOP
EMU
RIVER
GUILFORD
E.L. 17/68
BD
COMPANION HILL
ST. VALENTINES PEAK
F

N

667065

The Shell Company of Australia Limited METALS DIVISION	
E.L. 4/77 HIGHCLERE GEOLOGY	
5 cm	
Scale 1:50 000 2425	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ03/030
DATE 15-10-81	AUTHOR J.J. LAWTON
DRAWN H.L.H.	OFFICE DEVONPORT

The Shell Company of Australia Limited
METALS DIVISION

E.L. 4/77 HIGHCLERE
RESIDUAL AEROMAGNETIC
CONTOURS

5 cm

82-1775

SCALE 1:50000	DATE 16-8-82
AUTHOR J.J. LAWTON	DRAWN
OFFICE DEVONPORT	REP. No.
ENCL No.	DRG No. D/M003/052

Thousand metres
0 1 2 3

667066

410 000 E

390 000 E

5 450 000 N

5 440 000 N

5 430 000 N

5 420 000 N

HIGHCLERE
IRON 404311

KARA EAST
(W)

BUCKBY
PROSPECT

GUIDE RIVER
ANOMALY

E.L. 17/68

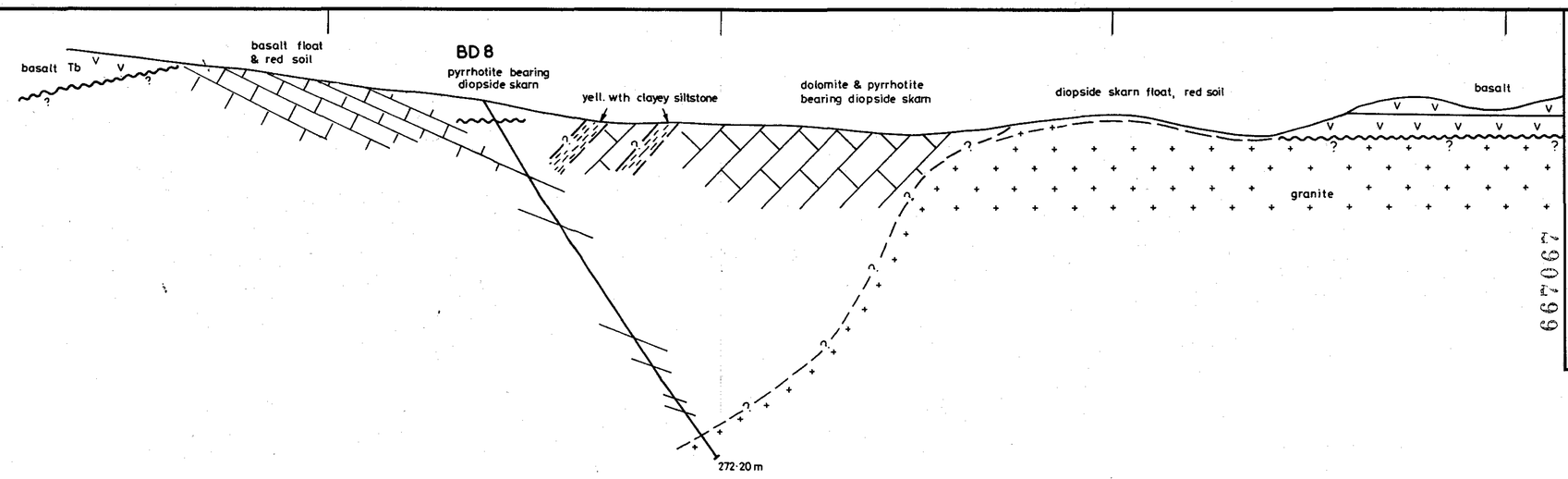
KARA
(W)

A Survey by Geometrics Int. Corp. for The Shell Co. of Aust 1980

B Survey by Siegel Assoc. Aust. P/L for Aerial Reconnaissance Corporation Co 1973

C Survey by Geoex P/L for McIntyre Mines (Aust.) P/L 1978

TOPOGRAPHY (approximate)
GEOLOGY



RL
400m
300m
200m
100m

2300W 2200W 2100W 2000W 1900W 1800W 1700W 1600W 1500W 1400W 1300W 1200W 1100W 1000W

66706

5 cm

The Shell Company of Australia Limited
METALS DIVISION

HIGHCLERE E.L. 4/77

BUCKBY PROSPECT
LINE 300 S
GEOLOGY, GEOCHEM., MAGNETICS & I.P.

Scale : 1:2500 2427

FIG. No.	
REPORT No.	
ENCL. No.	DRG. No. D/MQ 03/015
DATE 21 - 10 - 80	AUTHOR I. J. BUCHHORN
DRAWN O. HEDDITCH	OFFICE DEVONPORT

SOIL GEOCHEMISTRY

x Sn ppm
• Cu ppm
o F ppm

Sn Cu: 150, 140, 130, 120, 110, 100, 90, 80, 70, 60, 50, 40, 30, 20, 10, 0
F: 400, 350, 300, 250, 200, 150, 100, 50

255Cu
1120F

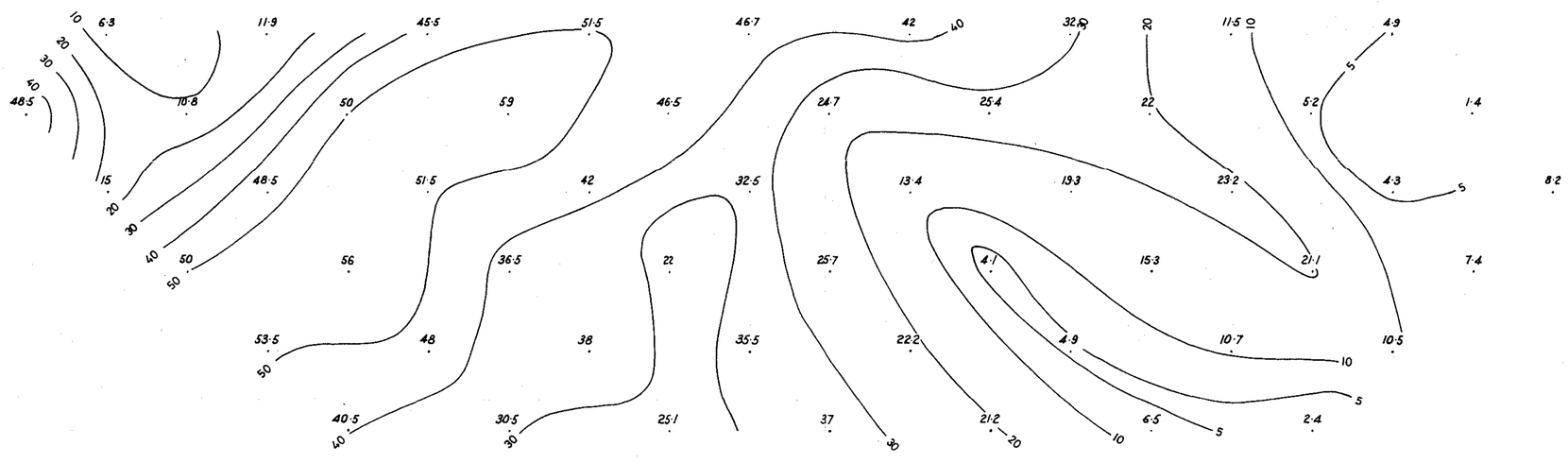
2400W 2300W 2200W 2100W 2000W 1900W 1800W 1700W 1600W 1500W 1400W 1300W 1200W 1100W 1000W

PROTON PRECESSION MAGNETICS (nT)

63000
62500
62000

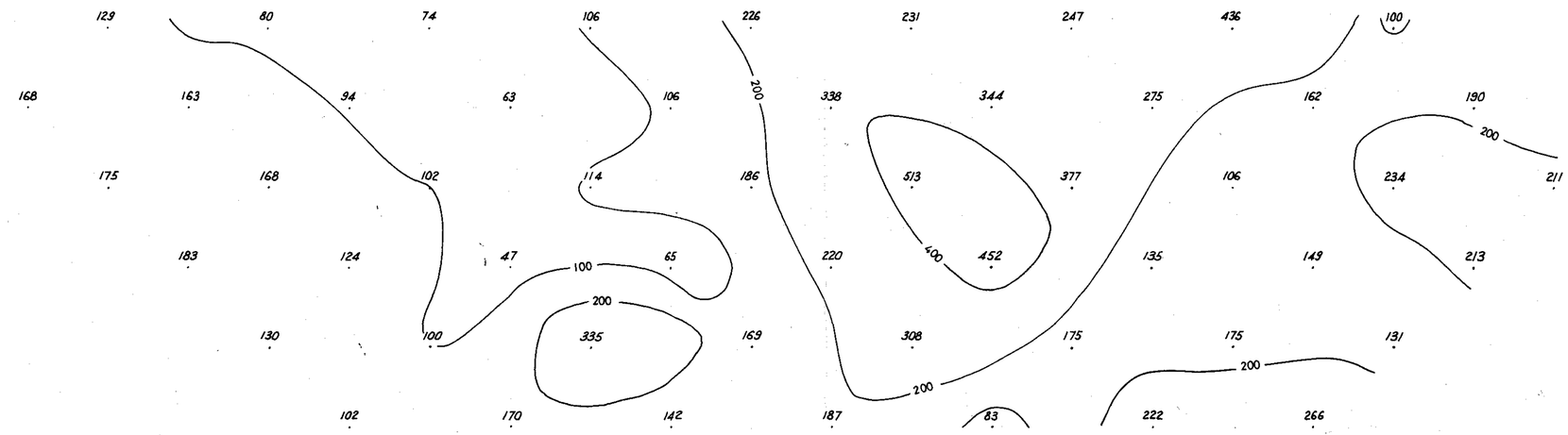
magnetic peak
soil geochem. peak

APPARENT CHARGEABILITY



APPARENT RESISTIVITY

Timing : 2 sec.
Array : dipole dipole
Dipole length: 100 m



2400W 2300W 2200W 2100W 2000W 1900W 1800W 1700W 1600W 1500W 1400W 1300W 1200W 1100W 1000W

ROAD TRAVERSE
APPROX. 5800 E

62000nT

LINE 6000 E

62000nT

LINE 6200 E

62000nT

LINE 6400 E

62000nT

3000 N 3100 N 3200 N 3300 N 3400 N 3500 N 3600 N 3700 N 3800 N 3900 N 4000 N 4100 N 4200 N 4300 N 4400 N

N

1000nT

5 cm

667068

0 100 200M

The Shell Company of Australia Limited
METALS DIVISION

HIGHCLERE E.L. 4/77
GUIDE RIVER 3943/1
GROUND MAGNETIC PROFILES

82-1878 Scale 1cm = 250nT / 1:2500 2423

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MG03/017
DATE 19-5-81	AUTHOR I.J. BUCHHORN
DRAWN H.L.H.	OFFICE DEVONPORT

433000 N | 433200 N | 433400 N | 433600 N | 433800 N | 434000 N | 434200 N | 434400 N | 434600 N | 434800

395600 E

395800 E

396000 E

396200 E

396400 E

Closure inferred from airborne magnetics.

PDH GRD1

Closure inferred from airborne magnetics

N

667069

0 100 200M

5 cm

The Shell Company of Australia Limited
METALS DIVISION

HIGHCLERE E.L. 4/77
GUIDE RIVER 3943/1
GROUND MAGNETIC CONTOURS

Contour Interval = 500nT
Scale 1:2500

2429

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ03/018
DATE 1-6-81	AUTHOR I. J. BUCHHORN
DRAWN H.L.H.	OFFICE DEVONPORT

3300 N | 3400 N | 3500 N | 3600 N | 3700 N | 3800 N | 3900 N | 4000 N | 4100 N | 4200 N | 4300 N

0 — 100 — 200 M

66 17 70

The Shell Company of Australia Limited METALS DIVISION	
E.L. 4/77 HIGHCLERE GUIDE RIVER ANOMALY LINE 6000 E GEOLOGY, GEOCHEMISTRY, & GEOPHYSICS	
FIG No 82-1815	Scale 1 2500
ENCL No	REPORT No 2430
DATE 11-12-81	DRG No D/MQ03/039
DRAWN H L H	AUTHOR J.J LAWTON
	OFFICE DEVONPORT

5 cm

120 Metres
100 Metres
80 Metres

Topography
Subsurface/Surface Geology
Downhole I.P.
Susceptibility

PDH GRD1

V V *Tertiary basalt*

Precambrian Burnie Formation Carbonaceous (pyritic) micaceous fine sandstones to siltstones

0 20 40 60 80
Chargeability (Msec)

10 100 1000 10000
Susceptibility ($\times 10^{-6}$ CGS)

Ground Magnetics Profile & Surface Susceptibility

Susceptibility units = 10^{-6} cgs units
Instrument = SM 5
Averaged readings on float
Where outcrop, measurement indicated by o/c

200 300 200 400 o/c 200 200 300 200 100 300 200 400 200 300 400 100 100 100 100 0 100 300 500 300 100 100 100 0 100 100 200

63 000 nT
62 000 nT
61 000 nT

Gravity

BOUGUER DENSITY = 2 2

-11 47
-12 27
-13 07
-13 87
(Mgal) -14 67

3300 N | 3400 N | 3500 N | 3600 N | 3700 N | 3800 N | 3900 N | 4000 N | 4100 N | 4200 N | 4300 N

1500 E
1600 E
1700 E
1800 E
1900 E
2000 E
2100 E
2200 E
2300 E
2400 E
2500 E

N W
62000nT
S E

LINE 4400N
LINE 4500N
LINE 4600N
LINE 4700N
LINE 4800N
LINE 4850N
LINE 4900N
LINE 5000N

NOTE : EXPANDED LINE SEPARATION
LINE DIRECTION = 135° T.N.

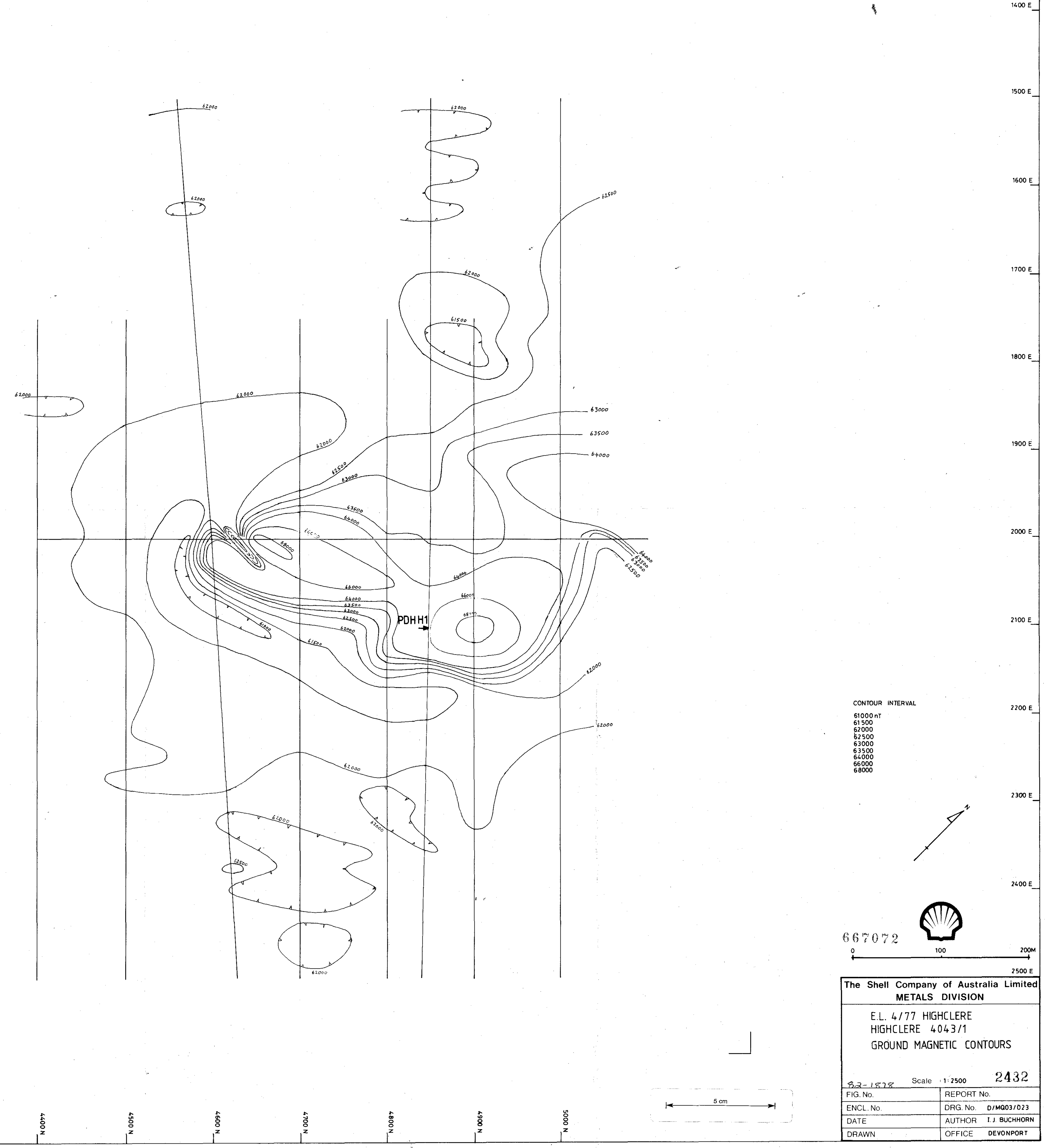
0
100
200M

5 cm

9846

667071

The Shell Company of Australia Limited METALS DIVISION	
E.L. 4/77 HIGHCLERE HIGHCLERE 4043/1 GROUND MAGNETICS STACKED PROFILES	2431
82-1578 Scale HORIZONTAL 1:2500 VERTICAL 1cm = 250nT	
FIG No	REPORT No
ENCL No	DRG No D/M003/019
DATE 5-6-81	AUTHOR I J BUCHHORN
DRAWN H L H	OFFICE DEVONPORT



CONTOUR INTERVAL

61000 nT
61500
62000
62500
63000
63500
64000
66000
68000

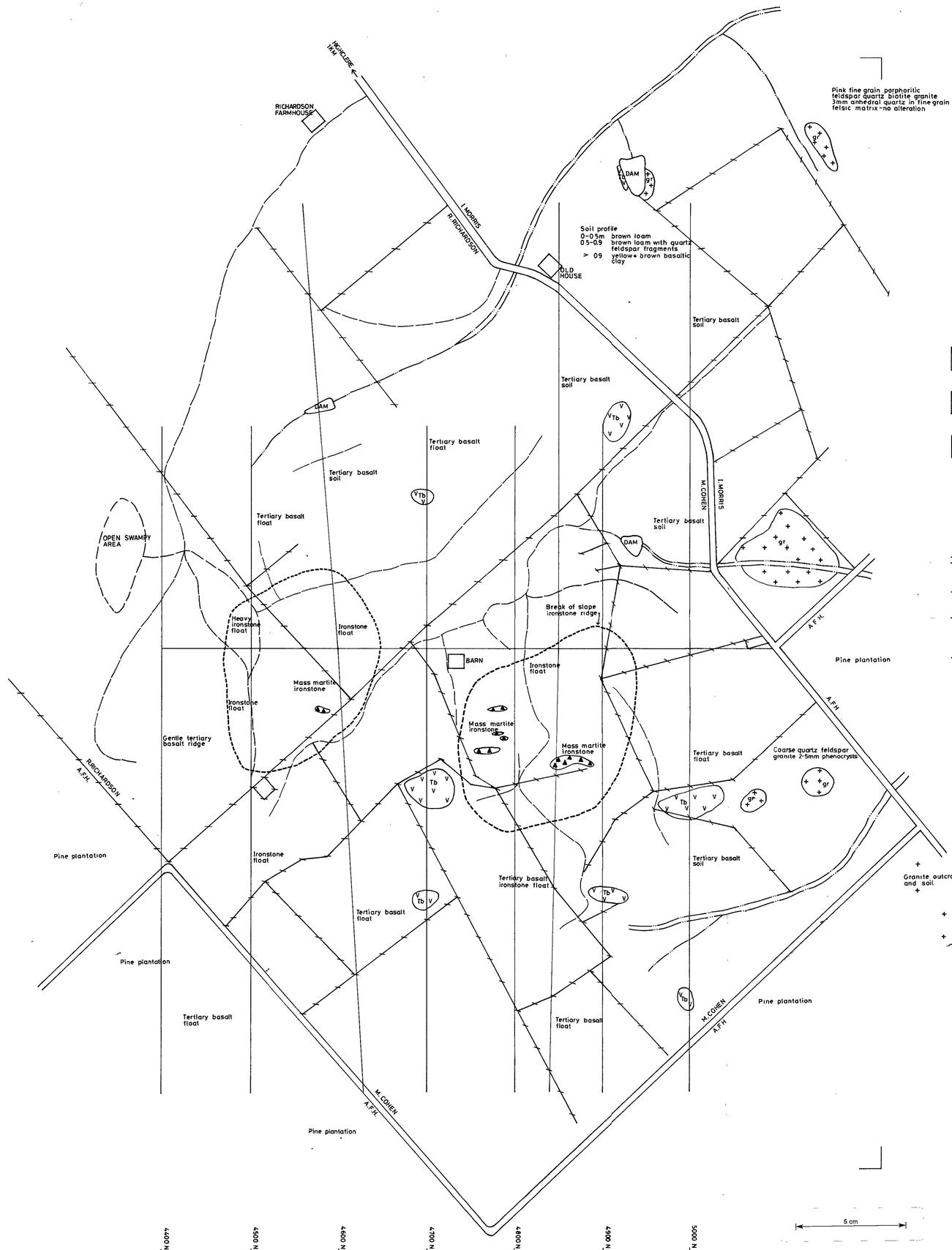
667072

The Shell Company of Australia Limited
METALS DIVISION

E.L. 4/77 HIGHCLERE
HIGHCLERE 4043/1
GROUND MAGNETIC CONTOURS

82-1878 Scale 1:2500 2432

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ03/023
DATE	AUTHOR I.J. BUCHHORN
DRAWN	OFFICE DEVONPORT



LEGEND

- TERTIARY BASALT
- MAGNETITE SKARN — fine grained crystalline aggregates of martite with subordinate limonite, traces of anthonite weathered scheelite
- DEVONIAN GRANITE — coarse grained quartz-feldspar granite, minor mica, occasional fine grained porphyritic (roof phase ?) variants
- OUTCROP BOUNDARY
- LIMIT OF FLOAT (with respect to ironstone)
- GRADED ROAD
- FARM TRACK
- FENCE
- RIVER

667073

0 100 200M

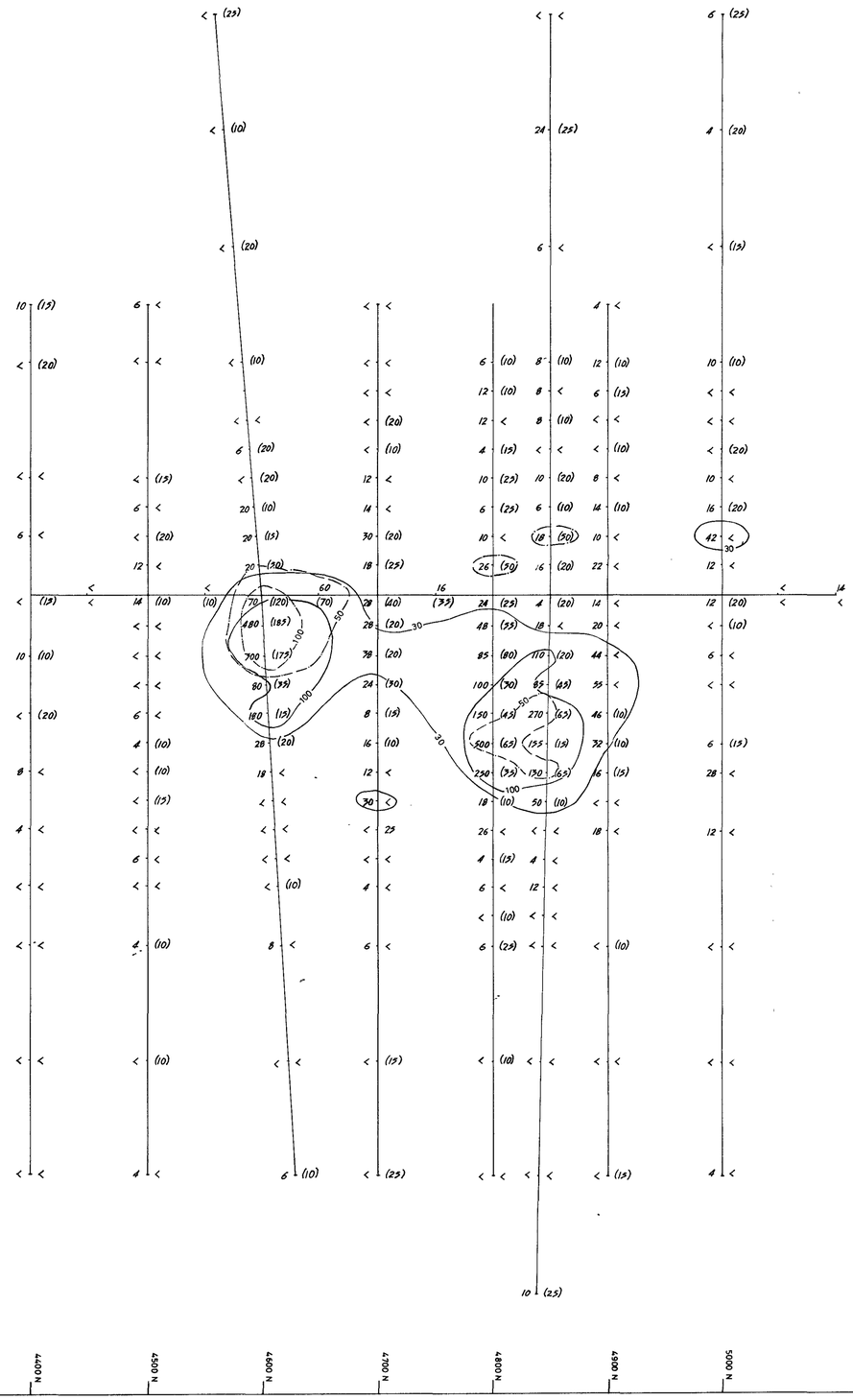
The Shell Company of Australia Limited
METALS DIVISION

E.L. 4/77 HIGHCLERE
HIGHCLERE 4043/1
GEOLOGY

2433

32-1378. Scale 1 2500

FIG No	REPORT No
ENCL No	DRG No D/MG03/022
DATE 11-6-81	AUTHOR T J BUCHHORN
DRAWN H L H	OFFICE DEVONPORT

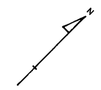


NOTE: Analyses in ppm.

< Denotes below detection limit.

Sn ——

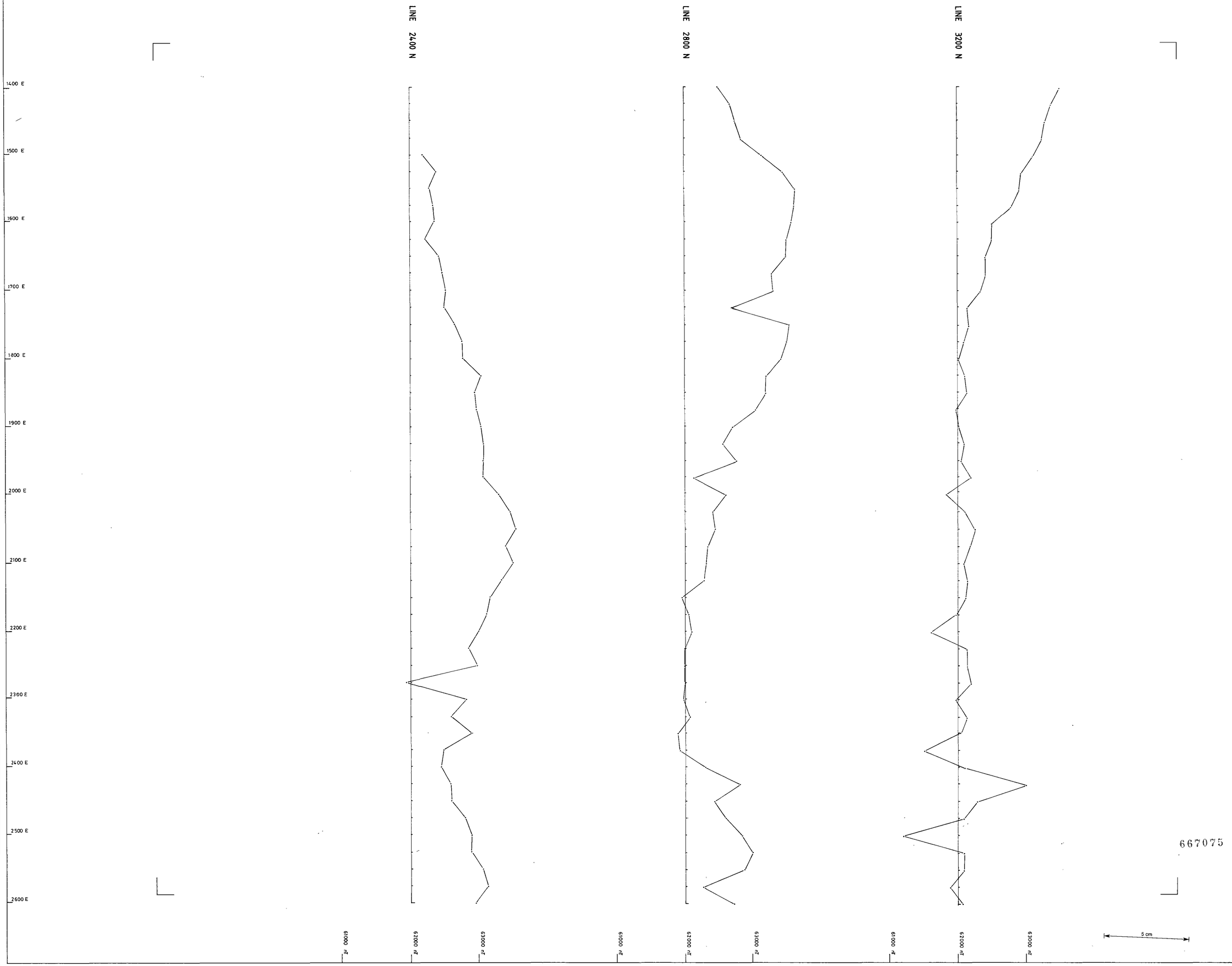
(W) —·—·—



0 100 200M

667074

The Shell Company of Australia Limited METALS DIVISION	
E.L. 4/77 HIGHCLERE HIGHCLERE 4043/1 SOIL GEOCHEMISTRY (TIN, TUNGSTEN,)	
82-1578. Scale 1 2500	2434
FIG No	REPORT No
ENCL No	DRG No D/MQ03/027
DATE	AUTHOR I J BUCHHORN
DRAWN H L H	OFFICE DEVONPORT



667075

The Shell Company of Australia Limited
METALS DIVISION

E.L. 4/77 HIGHCLERE

HIGHCLERE — EXTENDED GRID
MAGNETIC PROFILES
LINES 2400N, 2800N, 3200N 2435

BR-1878. Scale 1cm = 250nT VERTICAL
1 2500 HORIZONTAL

FIG No	REPORT No
ENCL No	DRG No D/MQ03/028
DATE 25-8-81	AUTHOR J J LAWTON
DRAWN H L H	OFFICE DEVONPORT