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THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

E.L. 8/77 - RIANA

Progress Report on Exploration During the Period

1/8/81 to 1/7/82

21 SEP 1982

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Report No: 08-1064

Date : 1/7/82

Copy No : 1

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1. Department of Mines
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 4. BXH/Devonport

AMG REFERENCE POINTS ADDED

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SUMMARY

This report outlines exploration by the Shell Company of Australia Limited in conjunction with the Commonwealth Aluminium Corporation Limited across E.L. 8/77 - Riana located approximately 6 km south of Burnie, NW Tasmania during the period 1/8/81 to 1/7/82.

Ground follow-up of aeromagnetic anomalies continued on the Laurel Creek West/Loyetea magnetic trend and in the northern portion of the Licence.

Holes were drilled at Laurel Creek West, Cuprona and Natone to test geophysical targets outlined by ground follow-up of airborne magnetic anomalies.

An Input survey was flown over the north eastern margin of the Housetop Granite in an effort to locate conductive skarn deposits. Six anomalies were outlined, four on Riana E.L. 8/77 and two on the adjacent Hayes Peak licence 14/80.

The majority of effort to date has been put into the follow-up of a combined Input and aeromagnetic anomaly at Natone. Pyrrhotite skarns in limestone were discovered during the drilling of a strong IP anomaly.

A stream sediment survey is in progress to locate greisen style Sn-W deposits and mineralized skarns related to the Housetop Granite.

A regional gravity survey has been undertaken and this will aid in the search for granite cupolas and clearly define the edge of the Housetop Granite. The overall shape of the batholyth should also be clarified.

1.0 RECONNAISSANCE WORK - GENERAL

1.1 Regional Gravity Survey

A regional gravity survey covering part of the Riana licence was recently completed and results are being evaluated. The aim of the survey was to locate blind granite cupolas at the margins of the Housetop Granite and to clarify the overall shape of the granite batholith. Preliminary data suggests that the granite is laccolith shaped with steep contacts.

1.2 Stream Sediment Survey

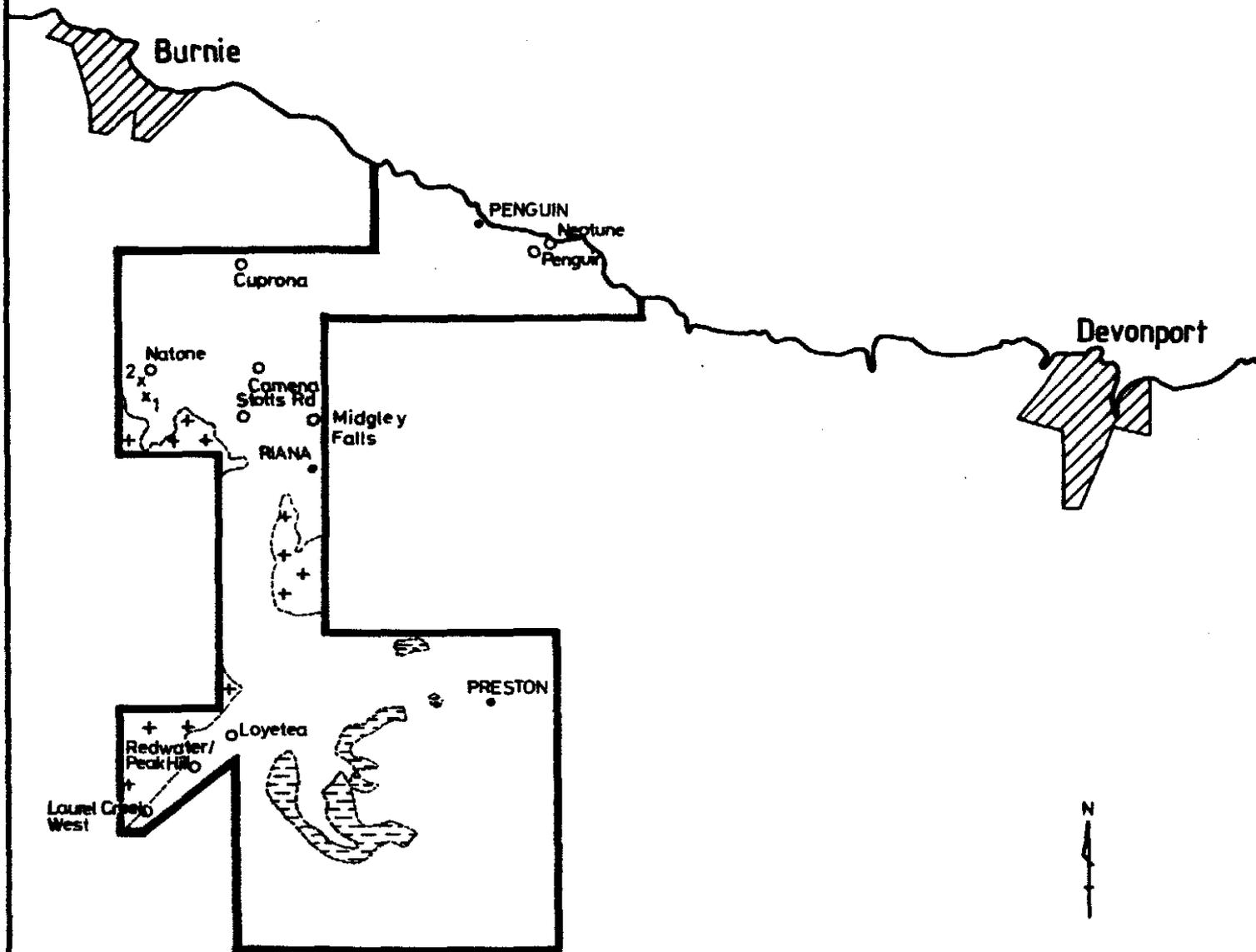
A regional stream sediment sampling programme is underway across the margins of the Housetop granite. This survey will be an extension of a survey currently being undertaken over the Housetop granite on the adjacent Hayes Peak licence. The survey is designed to locate greisen-style Sn-W deposits and mineralized marginal skarns. In areas of granite outcrop a -10# fraction is being collected and assayed for Sn, W, Mo, Cu, Pb, Zn, As, Fe and Mn following the results from an orientation survey over Crane's Tin Prospect located on Highclere, E.L. 4/77. At the granite margins a -20# to +80# fraction will be assayed for Sn, W, Mo, Bi and a -80# fraction for Cu, Pb, Zn, As, Fe, Mn and Ni. Panned concentrates will be collected at each sample site and assayed for Sn and W.

1.3 Aeromagnetic Follow-up - Stotts Road/Midgley Falls

Single ground magnetic traverses were completed across the Stotts Road (4143/3) and Midgley Falls (4144/3) aeromagnetic anomalies (Refer Fig. 1 and Plans D/MQ 04/077 & 082). Both anomalies occur over Tertiary basalts with magnetic susceptibilities of $400 - 1000 \times 10^{-6}$ and $100 - 300 \times 10^{-6}$ cgs units respectively.

721009

BASS STRAIT



ANOMALY NAMES & NUMBERS

Neptune	4244/2
Penguin	4244/1
Cuprona	4144/1
Natone	4044/1
Camena	4144/2
Stotts Road	4143/3
Midgley Falls	4144/3
Loyetea	4042/2
Redwater/Peak Hill	4142/1
Laurel Creek West	4042/1

LEGEND

-  Gordon Limestone
-  House-top Granite
-  Aeromagnetic Anomalies

MOINA

NATONE

- x1 PDH NT1
- x2 PDH NT2

5 cm

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
SELECTED AERO-MAGNETIC ANOMALIES

SCALE 1:250,000	DATE 18-8-81
AUTHOR L.D.B.	DRAWN H.L.H.
OFFICE Devonport	REP.No.
DRG No D/M004/067	

2.0 SOUTH EASTERN MARGIN OF THE HOUSETOP GRANITE

Work reported by Comalco (Weste, 1979) and Shell (Banwell, 1981) on a zone of aeromagnetic anomalies between Laurel Creek West and Loyetea, on the south-eastern margin of the Housetop Granite (Refer Fig. 1 and Plan D/MT 24/024) continued this year.

2.1 Laurel Creek West (4042/1)

A percussion drill hole collared at 2225 N/2275 E was drilled on the Laurel Creek West grid to explain a ground magnetic anomaly at the Gordon Limestone/Housetop Granite contact. Ten metres of barren magnetite skarn was intersected at the limestone/granite contact between 48 m and 58 m depth. The magnetic skarn was clearly the source of the ground magnetic anomaly with magnetic susceptibilities of upto $100\ 000 \times 10^{-6}$ cgs units. Maximum assay values include 310 ppm Sn, 60 ppm W, 55 ppm Cu, 350 ppm Pb, 360 ppm As and 490 ppm Zn (Refer Appendix 1). The hole bottomed in granite at 120 m depth.

2.2 Redwater North (4142/9)

Two reconnaissance lines of ground magnetics and soil sampling over the Redwater North aeromagnetic anomaly were completed. (Refer Plans D/MQ 04/072 & 076). Both responses were flat. Grid lines covered Tertiary basalt, Roland conglomerate and sandstone with susceptibilities of 150 to 250×10^{-6} cgs units for the basalts and 0 to 10×10^{-6} cgs units for the Ordovician sediments.

2.3 Loyetea (4142/2)

Four additional lines were cut extending the Loyetea Grid to the east and west (lines 1500 E, 1700 E, 2900 E and 3100 E) (Refer Plans D/MQ 04/070 & 071). Ground magnetic

readings were taken every 10 m in an attempt to close off the anomalies. Tertiary basalt and Cambrian volcanics were mapped on the grid, the latter with magnetic susceptibilities of 2000 to 15 000 x 10⁻⁶ cgs units. A short line of gravity was completed over line 3000 E (Refer Fig. 2) but no clear anomaly was detected.

2.4 Peak Hill Farm (4142/1)

The Peak Hill Farm anomaly is covered by the Redwater Grid. A line of gravity on 5400 N produced no response although the survey line should be extended (Refer Fig. 3) to completely cover the anomaly.

2.5 Conclusions & Recommendations

Exploration to date has uncovered magnetite skarns associated with the Redwater and Laurel Creek West aeromagnetic anomalies. Maximum Sn and W values are:

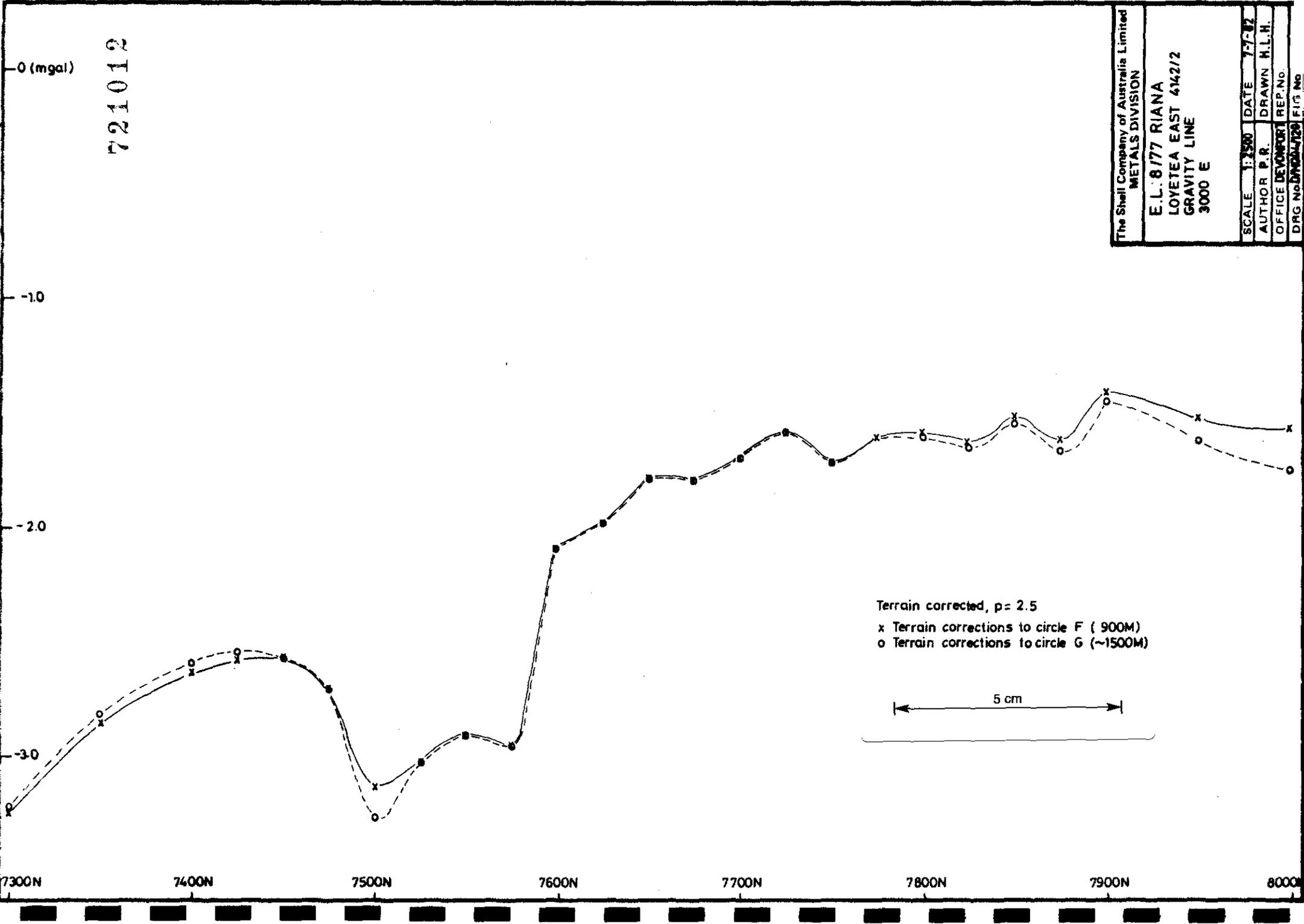
Drill Hole	Intersection of Magnetite Skarn	Maximum	
		Sn ppm	W ppm
DDH RED 1	58.72 - 60.70 (1.98m)	130	10
	77.25 - 78.00 (0.75m)	70	30
DDH RED 2	26.05 - 40.5 (14m)	430	760
DDH RED 3	No magnetite skarn	-	-
DDH RD 4	No magnetite skarn	-	-
DDH RD 5	167.80 - 168.20 (0.40m)	320	25
	162.96 - 164.03 (1.07m)	450	50
PDH LCW 1	48 - 58 (10m)	310	25

(Holes RED 1, 2, 3 were drilled by Comalco, refer Weste, 1979. Holes RD 4, RD 5 and LCW 1 were drilled by Shell).

The magnetic anomalies drilled represent the largest of about 24 magnetic highs in a belt stretching from Blythe River to Loyetea.

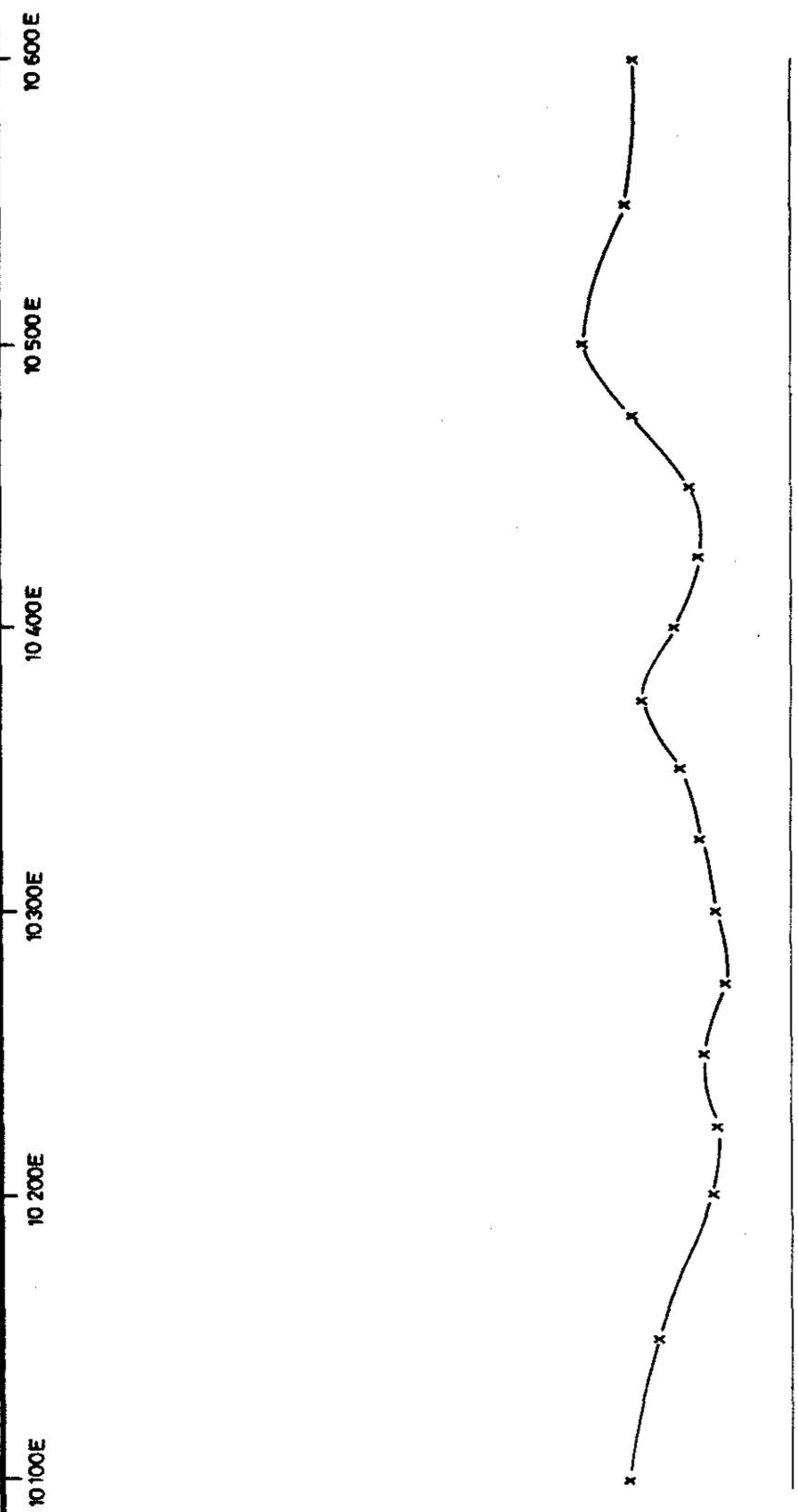
Figure 2

721012



The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA LOYETEA EAST 4142/2 GRAVITY LINE 3000 E	
SCALE 1:1500	DATE 7-7-72
AUTHOR P.R.	DRAWN H.L.H.
OFFICE DEVONPORT	REP. No.
DRG No. D1904/729	FIG. No.

721013



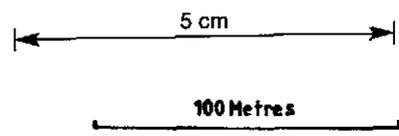
2.0 —

1.0 —

0 —
(mgal)

(Terrain corrected, $p = 2.5$)

x Terrain corrections to circle F (~900M)



The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA PEAK HILL FARM LINE 5400 N GRAVITY	
SCALE 1:2500	DATE 6-7-82
AUTHOR P.R.	DRAWN H.L.H.
OFFICE DEVONPORT	REP.No.
DRG No D/M04/110	FIG No

In the Redwater/Laurel Creek West area, intersection widths of magnetite skarn are thin and assay values low. In this region magnetite skarns appear to form thin skins on the limestone/granite contact and the possibility of locating a mineralized skarn with sufficient tonnage of interest to Shell is considered remote.

3.0 NORTHERN MARGIN OF THE HOUSETOP GRANITE

3.1 Geological Setting

Rocks on the northern margin of the Housetop Granite include sandstones, shales and basic volcanics/intrusives of the Precambrian Burnie Formation, Cambrian ironstones, silicified sediments and limestones, Ordovician conglomerates and sandstones covered by a veneer of Tertiary sediment and basalt. (Refer Plan D/MQ 04/104). The intrusion of the Housetop Granite during the Devonian produced contact metamorphic effects in Precambrian sediments with the formation of corderite and andalusite, alteration in Precambrian volcanics and the introduction of metasomatic fluids into subcropping Cambrian limestones around Natone. Additional metamorphic effects include the remobilization of iron and further silicification particularly around Natone.

Two copper prospects are hosted in Precambrian shales at Natone and Cuprona and are associated with the same north-east trending stratigraphy - Precambrian shales to the west, Cambrian Ironstones and Ordovician conglomerate to the east. The full significance of this trend is not known.

3.2 Aeromagnetic & Input Surveys

Three aeromagnetic anomalies have been followed up in this area, Camena, Cuprona and Natone. (Refer Fig. 1).

An Input survey was flown in January, 1982 across the northern margin of the Housetop granite (Refer Fig. 4) to cover these three aeromagnetic features and the north eastwards trending Cambrian ironstones and sediments. Six anomalous areas were defined (Refer Appendix 2), four on Riana and two on Hayes Peak. One priority 1 anomaly was defined by Geotrex coincident with the Natone aeromagnetic anomaly, in addition to one priority 2 and two priority 3 localities. Followup of IR2 and IR3 (Natone) is in progress.

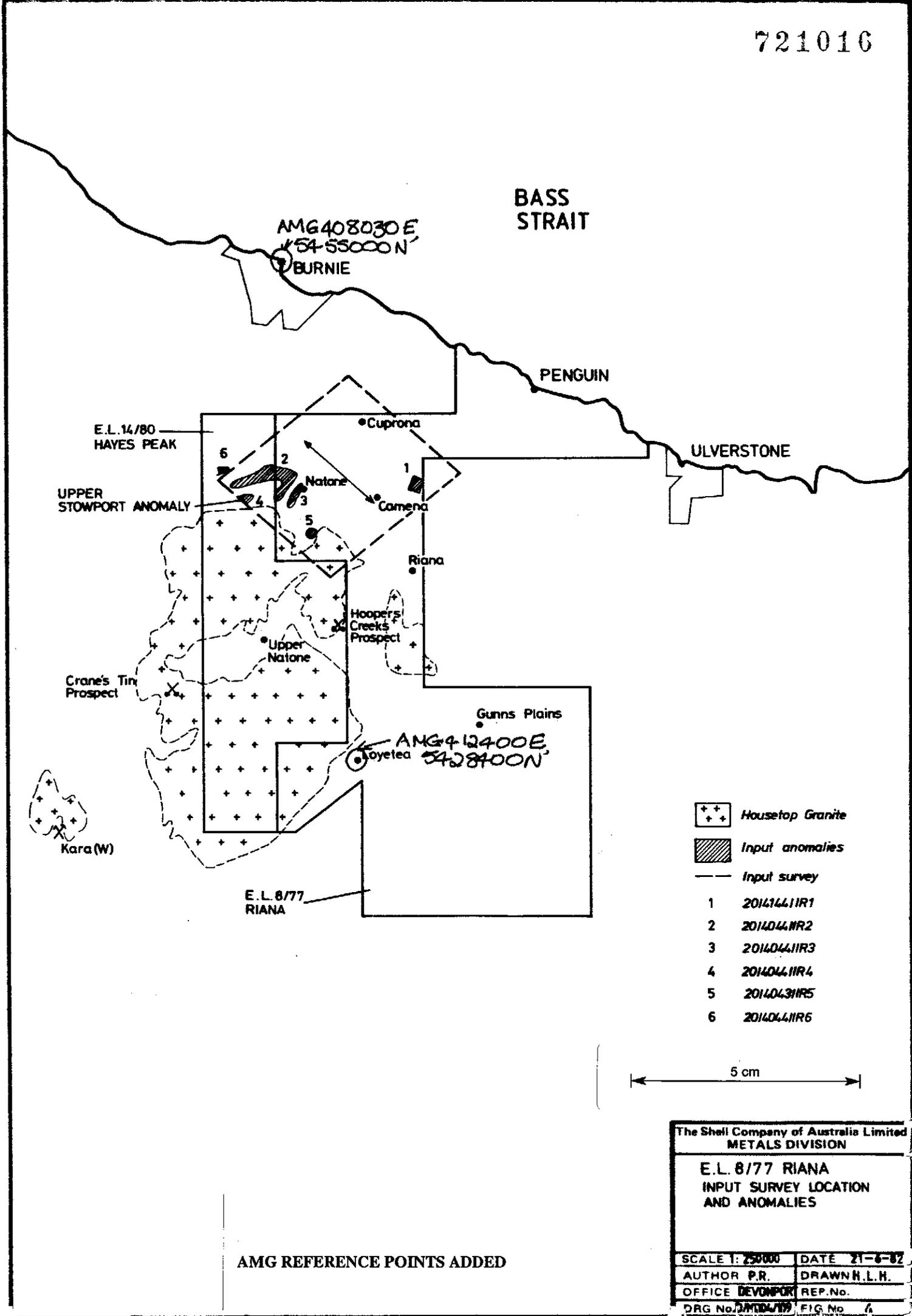
3.3 Camena - Anomaly 4144/2

Recent modelling of the Camena aeromagnetic feature suggests a single body with magnetic susceptibilities of about $20\,000 \times 10^{-6}$ cgs units at a depth greater than 500 m. A basic body perhaps of Tertiary age is suggested. (Refer Appendix 3).

3.4 Cuprona - Anomaly 4144/1

The Cuprona aeromagnetic feature was not picked up by the Input survey. Previous ground followup involved gridding, ground magnetics, soil sampling and remanent magnetic studies (Banwell, 1981). A vertical percussion hole sited on the top of a basalt-covered hill at approximately 2050 N 1675 E was designed to test this magnetic feature. The hole intersected 132 m of basalt, 14 m of Tertiary alluvium and passed into shales of the Precambrian Burnie Formation (Refer Appendix 4). The hole was stopped at 200 m depth. Down hole IP was attempted but failed.

A single line of gravity along line 2100 N was completed and modelled. (Refer Fig. 5). It was concluded that the aeromagnetic anomaly represents a basalt hill.



E.L. 14/80
HAYES PEAK

UPPER
STOWPORT ANOMALY

Crane's Tin
Prospect

Kara (W)

E.L. 8/77
RIANA

AMG 408030 E
54 53000 N
BURNIE

BASS
STRAIT

PENGUIN

ULVERSTONE

Cuprona

Natone

Camena

Riana

Hoopers
Creeks
Prospect

Upper
Natone

Gunns Plains

AMG 412400 E
54 28100 N
TAYTEA

-  Housetop Granite
-  Input anomalies
-  Input survey
- 1 20140411R1
- 2 20140411R2
- 3 20140411R3
- 4 20140411R4
- 5 20140431R5
- 6 20140411R6

5 cm

AMG REFERENCE POINTS ADDED

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA INPUT SURVEY LOCATION AND ANOMALIES	
SCALE 1: 250000	DATE 21-6-82
AUTHOR P.R.	DRAWN H.L.H.
OFFICE DEVONPOR	REP.No.
DRG No. 20140411R	FIG No. 4

3.5 Natone/Input Anomaly IR2/Upper Stowport Anomalies

A small stream sediment sampling survey to determine regional background values and to locate Sn-W or Cu-Pb-Zn mineralization was conducted adjacent to the Housetop Granite on the Riana and Hayes Peak licences. (Refer Plans D/MQ 04/086, 096 - 100 inc.). No significant anomaly was outlined. Panned concentrates, -20# to +80# and -80# fractions were also assayed.

3.6 Natone - Anomaly 4044/1 & 4044/IR3

A coincident aeromagnetic and Input anomaly rated priority 1 occurs immediately south of Natone (Refer Figs. 1 & 4).

The area was previously investigated by Minops who completed a ground magnetic survey, an IP survey and drilled three diamond holes into magnetic targets (Refer Plan D/MQ 04/064). These three holes, NDDH 1, NDDH 2 and NDDH 3 have been relogged, quartered and assayed (Refer Appendix 5 and Figs. 6, 7 and 8). Intersections of ironstone in these holes are characterized by anomalous:

W	upto	85	-	210 ppm
Cu	upto	310	-	2000 ppm
Zn	upto	350	-	6900 ppm
Hg	upto	0.1	-	0.35 ppm
As	upto	145	-	1250 ppm
Sb	upto	20	-	250 ppm
Bi	upto	12	-	65 ppm
Mn	upto	80 ppm	-	1.90 %

Silicified siltstones, shales and metasomatized limestones in the holes contain upto 20 - 30% disseminated pyrrhotite-pyrite with values of:

Cu	upto	100 - 240 ppm
Zn	upto	120 - 280 ppm
Hg	upto	0.15 - 0.30 ppm
Sb	upto	14 - 22 ppm

and low order Sn-W assays are recorded.

Figure 5

721018

0.0 (mgal)

-1.0

-2.0

-3.0

1500E

1600E

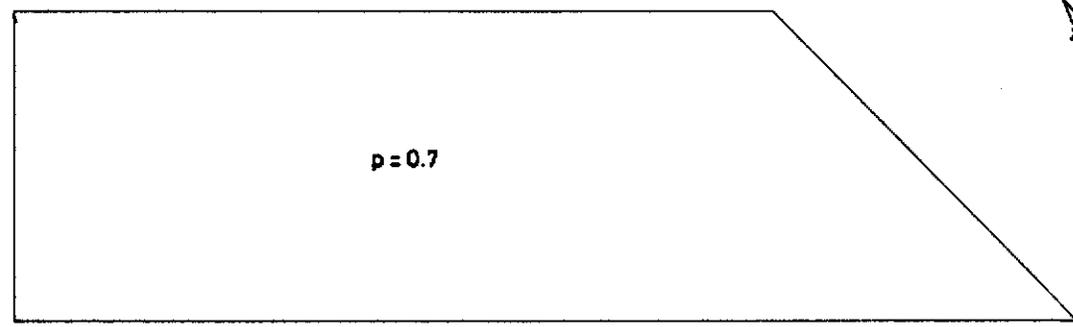
1700E

1800E

1900E

2000E

120M



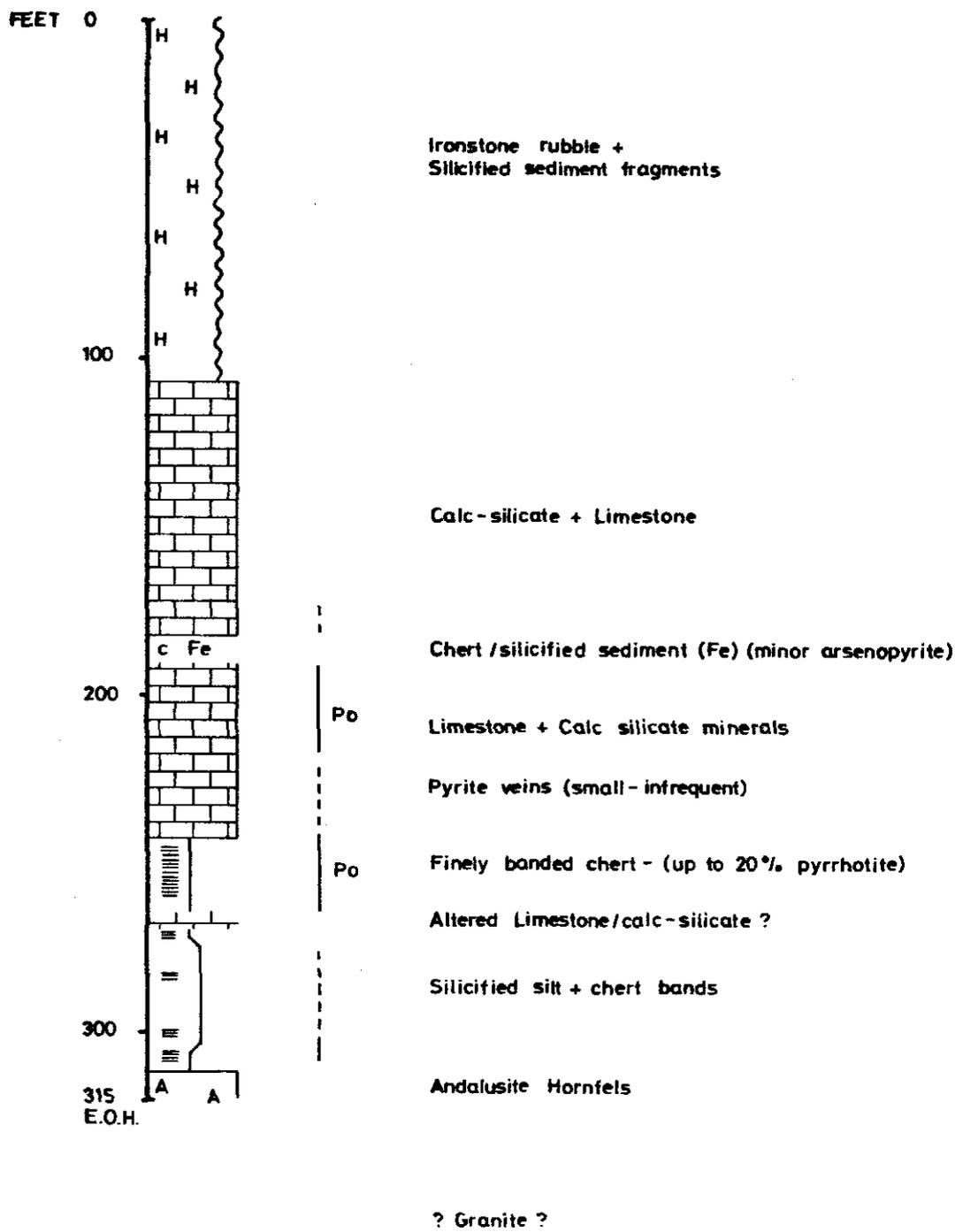
5 cm

(Terrain corrected, $\rho = 2.5$)

- x—x Terrain corrections to circle F (~900M)
- o---o Terrain corrections to circle G (~1500M)
- GRAV3 Model (strike length = 400M)

The Shell Company of Australia Limited			
METALS DIVISION			
E.L. 8/77 RIANA			
CUPRONA 4/44/1			
GRAVITY PROFILE			
LINE 2100N			
SCALE	1:2500	DATE	7-7-77
AUTHOR	P.R.	DRAWN	H.L.H.
OFFICE	DEVONPORT	REP. NO.	
FIG. NO.	01/001/77/01	FIG. NO.	

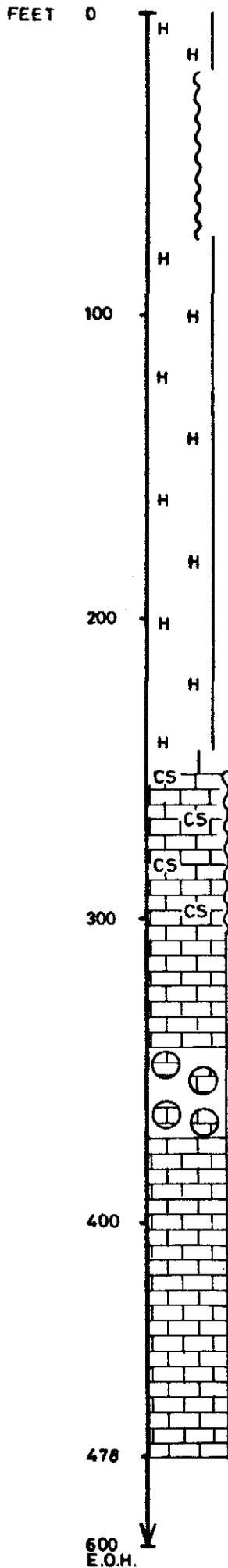
721019



The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE - NDDH 1 (Minops) SUMMARY LOG	
SCALE	DATE 1-4-82
AUTHOR P.R.	DRAWN H.L.H.
OFFICE DMH	REP.No.

ORG No. 27/10/10/10/10

721020



Ironstone

Unconsolidated sediments (Tertiary)

Hematite-rich ironstone (+Limonite)

Black sediment (+ Py)

Weathered actinolite-bearing sediment (Po inferred)

Some Po
Po Rare
↓
Po Rich

Altered limestones calc-silicate minerals common.

Less common

Po Rare

Marble

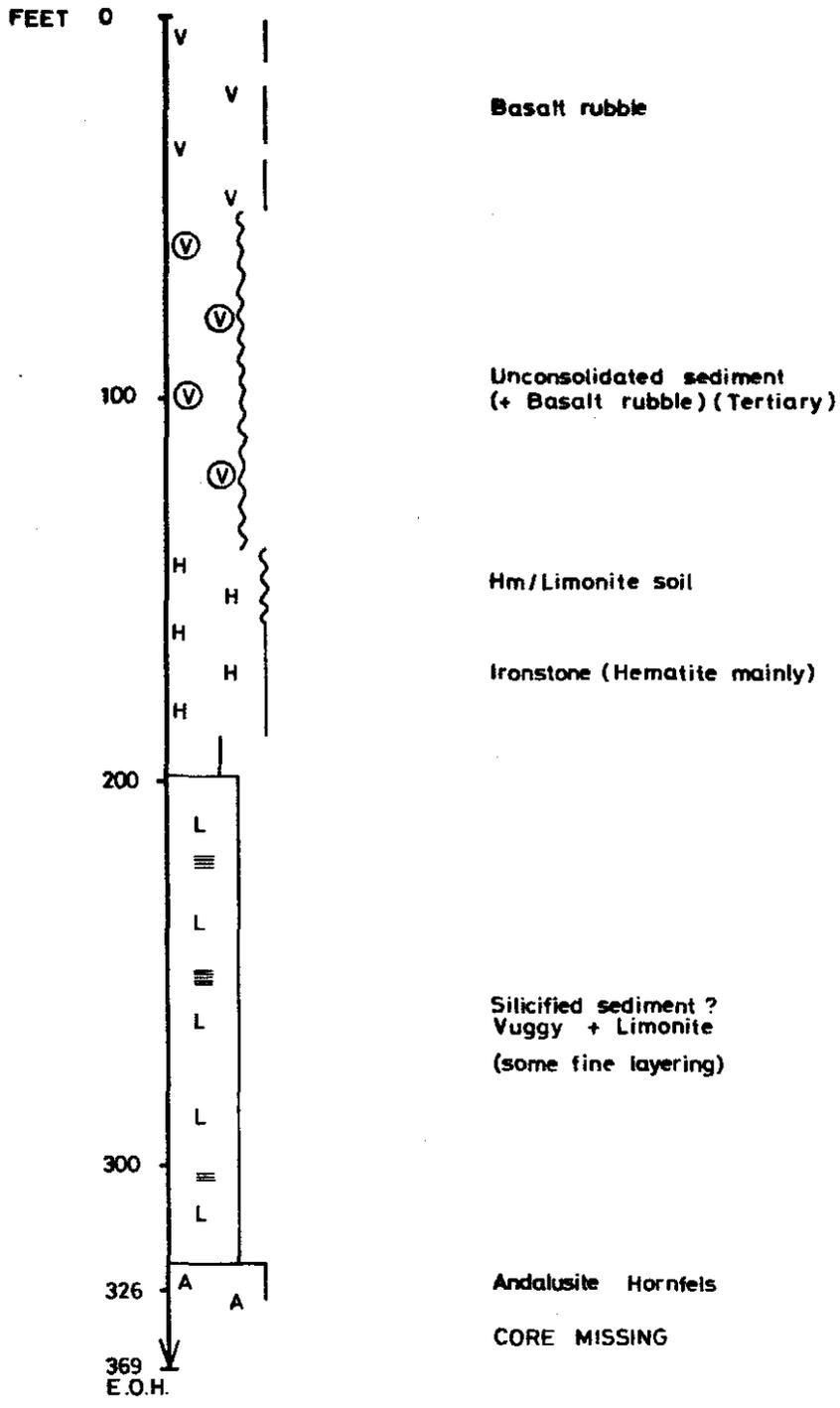
Po = Pyrrhotite
Py = Pyrite

CORE MISSING

600
E.O.H.

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE - NDDH 2 (Minops) SUMMARY LOG	
Scale	
FIG No	REPORT No
ENCL No	DRG No D/M004/08
DATE 1-4-82	AUTHOR P.R.
DRAWN H I H	OFFICE ZIMM

721021



The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE — NDDH 3 (Minops) SUMMARY LOG	
Scale	
FIG No	REPORT No
ENCL. No	DRG No. D/M004/00
DATE 1-4-82	AUTHOR P.R.
DRAWN H.L.H.	OFFICE DMH

A grid was placed over the northern end of the Minops IP/magnetic trend and extended to cover the Rutherford Copper prospect. Further extensions across the western side of the Minops trend and over Input anomaly 4044/IR2 were completed (Refer Plans D/MQ 04/083 & 087). Complete coverage of the Minops trend has not been possible because of opposition by Mr. W. Shepherd, a local farmer.

3.6.1 Geological Mapping

The grid was mapped at both 1:2 500 and 1: 5 000 scales. (Refer Plans D/MQ 04/085 & 103). Geological mapping was problematical due to the lack of outcrop and complex geology.

3.6.2 Soil Sampling

Soil sampling was extended over the whole Natone grid and contoured. (Refer Plans D/MQ 04/092, 110 & 111). The southern part of the grid was slightly anomalous in

Sn	upto	85 ppm
W	upto	60 ppm
Cu	upto	350 ppm
Zn	upto	130 ppm

Line 8500 NE was also soil sampled but the basalt cover was not penetrated. (Refer Plan D/MQ 04/065).

3.6.3 Ground Magnetics

A 3000 nT ground magnetic anomaly was located and contoured on the main grid. Magnetic profiles have been drawn up for the western grid extensions on lines 8500 NE, 1320 N, 7450 NE and 1650 N. (Refer Plans D/MQ 04/088, 091, 065, 106, 108 and 105).

3.6.4 Metal Factor Contours & IP

Minops IP data was evaluated and expressed as Metal Factor Contours. (Refer Plan AHO/MQ 04/1006). Three lines of IP were completed over on lines 2700 N, 1800 N and 8500 NE using a 50 m dipole; dipole spacing. (Refer Plans D/MQ 04/107, 066 & 065).

3.6.5 Max-Min EM

Max-Min EM was completed over the grid and contoured (Refer Plan AHO/MQ 04/1015) using a 200 m coil spacing and a 50 m station distance. An additional line 1250 E on the main grid and a 100 m coil spacing with 25 m pegs used on line 8500 NE (Refer Appendix 6).

3.6.6 Self Potential

An SP survey was completed on the grid and contoured. (Refer Plan AHO/MQ 04/1016).

3.6.7 VLF - EM

Lines 3000 N, 2800 N, 2700 N, 2600 N, 2400 N, 2100 N, 8500 NE and 1800 N were surveyed using VLF techniques. (Refer Appendix 7).

3.6.8 Gravity

Two lines of gravity over 1800 N and 8500 NE were measured and surveyed. (Refer Plans D/MQ 04/066 & 065).

3.6.9 Sirottem TEM

An experimental Sirottem TEM survey was completed on lines 1800 N and 8500 NE using a mobile loop and lines 2500 N, 2600 N, 2700 N and 2800 N using a fix loop method. (Refer Appendix 8).

3.6.10 Drill Targets

From all this work two drill targets were defined:

1. PDH NT1 at 8500 NE 1350 N (inclined 60° to grid N).
2. PDH NT2 at 1750 N 1250 E (inclined 70° to 030°).

Magnetic, gravity and IP modelling was carried out on each location (Refer Appendix 6). PDH NT1 was sited on a coincident, magnetic, max-min EM, SP, IP, gravity, VLF and Sirottem anomaly. (Refer Plan D/MQ 04/065). PDH NT2 formed a combined max-min EM, SP, IP, Sirottem EM and gravity target slightly offset from an intense magnetic feature (Refer Plan D/MQ 04/066).

3.6.11 Drilling Results

Lithologies, assays and petrological studies from both holes are detailed in Appendix 9 and summarized below.

3.6.11.1 PDH NT1

PDH NT1 intersected 50 m of basalt, 58 m of pyrrhotite-pyrite bearing dolomite skarn and 66 m of laminated, metasomatized limestones (Refer Fig. 9). The skarned dolomite contains upto 60% sulphides in a 35 m long zone between 70 and 108 m depth. The intersection averages 25 - 30% disseminated pyrrhotite-pyrite. Assay results unfortunately give low order Sn (46 ppm) and W (15 ppm) maximums. Petrological results indicate the presence of serpentinite probably associated with metasomatic alteration of the dolomite.

Figure 9

121025

1450 N

1400 N

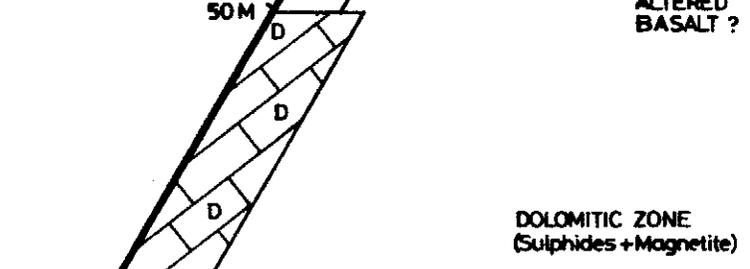
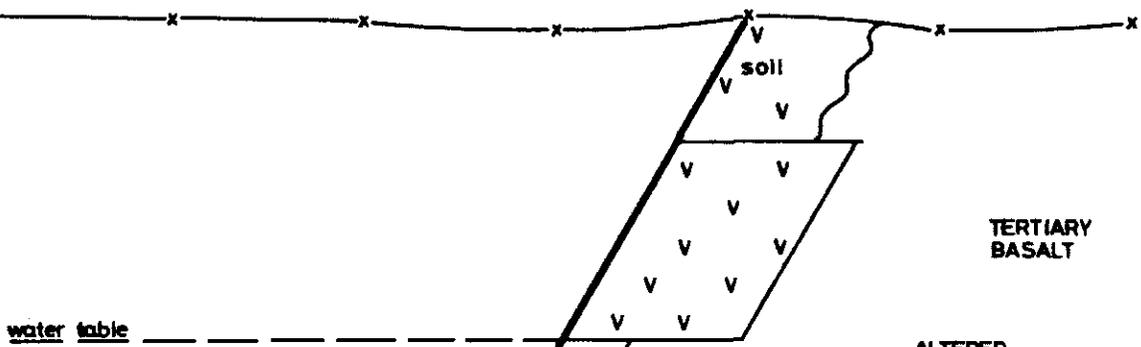
1350 N

1300 N

NORTH

SOUTH

120
110
100
90



MARBLE
(Calc-silicate
minerals + sulphides)

SULPHIDES

50 100 %

35% Po

65% Po

35% Po

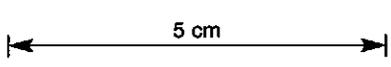
150M

BEDDING
STRIKE, E-W
DIP 30°-40° N

173.59M
END OF
HOLE

DIAMOND
CORING

200M



The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
PLOT OF PDH NT1
LINE 8500NE

SCALE 1:1000	DATE 10-5-82
AUTHOR P.R.	DRAWN H.L.H.
OFFICE Devonport	REP.No.
DRG No D/MQ04/102	

Downhole structural studies suggest that the laminated limestone unit at the base of the hole strikes east-west and dips 30° to 40° N. A less likely possibility of an east-west strike and vertical to 80° S dip arises from slight ambiguities in the core orientation and Eastman Camera surveys.

Downhole sirotem TEM was completed on this hole to a depth of 135 m (Refer Appendix 8).

3.6.11.2 PDH NT2

PDH NT 2 passed through 152.88 m of black pyritic shales probably belonging to the Burnie Formation (Refer Fig. 10). The shales contain intraformational breccias and are extensively fractured. Core orientation and Eastman Camera surveys gave two possible bedding orientations, 010° 85° W or 350° 70° E, the former represents a more geologically reasonable dip and strike. Contact metamorphic effects are indicated by the presence of spotted shales containing cordierite and andalusite and metasomatic alteration minerals tremolite, phlogopite and pyrrhotite in veins.

3.6.12 Conclusions & Recommendations

Further work is planned at Natone to follow up geologically favourable horizons and to test geophysical anomalies.

3.7 Input Anomaly 20/4044/IR2

Input anomaly IR 2 straddles the Riana-Hayes Peak boundary and was rated priority 2 for follow-up by Geoterrex (Refer Appendix 2). It has a synclinal shape with its axis parallel to the regional strike of Tabberabberan folding and plunges at about 50° to the southwest.

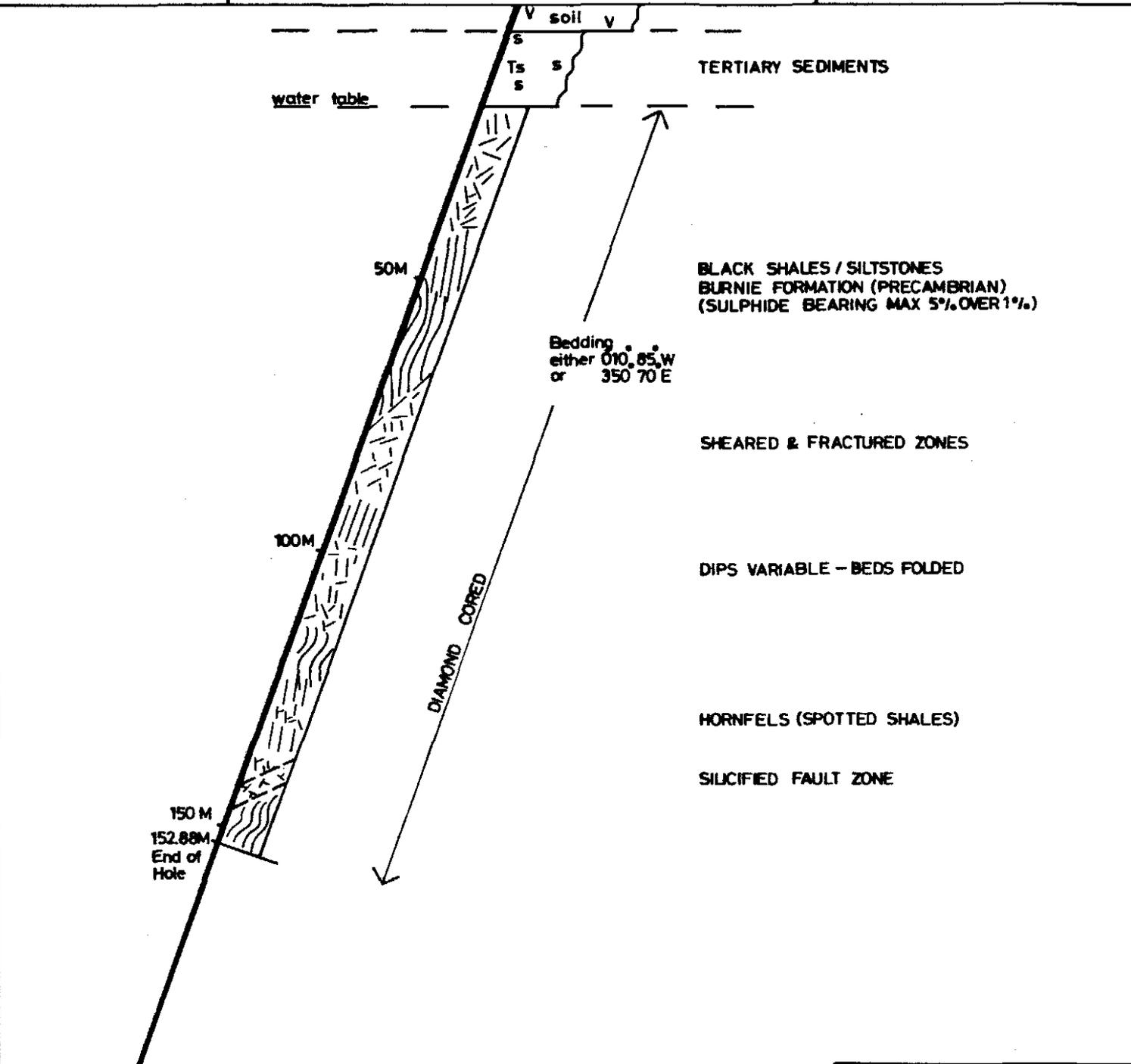
721027

NORTH EAST 030°

SOUTH WEST

1800N

1700N



BLACK SHALES / SILTSTONES
 BURNIE FORMATION (PRECAMBRIAN)
 (SULPHIDE BEARING MAX 5% OVER 1%)

Bedding
 either 010 85 W
 or 350 70 E

SHEARED & FRACTURED ZONES

DIPS VARIABLE - BEDS FOLDED

HORNFELS (SPOTTED SHALES)

SILICIFIED FAULT ZONE

150 M
 152.88M
 End of Hole

DIAMOND CORED

200M

5 cm

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA PLOT OF PDH NT2 LINE 1250E	
SCALE 1:1000	DATE 10-5-82
AUTHOR P.R.	DRAWN H.L.H.
OFFICE <i>Davenport</i>	REP.No.
DRG No D/MQ04/101	

This anomaly is covered by the westward extensions of the Natone grid, lines 1320 N, 7450 NE and 1650 N. The 1650 N line was placed in a relatively culture-free position to reduce extraneous geophysical noise. The Input anomaly produced a flat ground magnetic and gravity response but gave a Max-Min EM and SP anomaly on Line 1650 N. (Refer Plan D/MQ 04/105). The discovery of a graphitic, pyritic black shale near this anomaly suggests that it is a lithological response.

4.0 CONCLUSIONS & RECOMMENDATIONS

Airborne magnetic and Input surveys have been flown over Riana and stream sediment samples collected. Further work will include the follow up of Input anomalies by ground EM and geochemistry. Follow up over aeromagnetic anomalies will be undertaken with ground magnetics, soil sampling and ground EM. IP surveys will be conducted over the most favourable zones.

Stream geochemical results will be followed up with rock chip sampling, mapping and gridding.

Geological mapping along the Laurel Creek West/Redwater/Loyetea trend will aid in the re-evaluation of aeromagnetic follow up in this area.

Exploration will continue at Natone to define geophysical and geological targets in the search for Sn and W mineralization north of the Housetop Granite.

P.A. RUXTON
Exploration Geologist

REFERENCES

- BANWELL, L.D., (1981): Progress on Exploration Licence 8/77, Riana during the period 1/1/80 to 31/7/81. Unpubl. Shell Company Rep. No. 08-1063.
- WESTE, G., (1979): E.L. 8/77 - Riana. Report on all investigations to December, 1979. Unpubl. Comalco Ltd. Report.

APPENDIX 1

DRILL HOLE DATA - LAUREL CREEK WEST

Percussion Drill Hole PD 1

From	To	Inter'l (m)	Core Rec'd	% Rec'd	Sample No	Comp No	Assays						Magnetic Susceptibility		% Estimates	Core Angles		All	T.S. P.S.	Description
							Sn ppm	W ppm	Cu ppm	Pb ppm	Zn ppm	Au ppm								
0	2				5801		12	20	14	28	32	10								Clayey soil
2	4				5802		12	55	20	40	80	<.05								Clayey soil - with some rock fragments, limestone skarn (?)
4	6				5803		10	85	16	32	90	<.05								Clayey soil
6	8				5804		6	20	26	55	350	<.05								Clayey soil
8	10				5805		<.4	25	30	38	670	<.05								Clayey soil
10	12				5806		<.4	25	26	26	1020	<.05								Limestone - with some skarn (epidote + chlorite) and secondary calcite
12	14				5807		<.4	35	8	12	270	<.05								Limestone
14	16				5808		6	20	16	20	540	<.05								Limestone
16	18				5809		<.4	20	16	20	530	<.05								Limestone
18	20				5810		4	25	14	22	410	<.05								Limestone
20	22				5811		<.4	25	10	20	300	<.05								Limestone
22	24				5812		<.4	10	6	16	230	<.05								Limestone
24	26				5813		<.4	10	12	18	195	<.05								Limestone
26	28				5814		<.4	10	8	16	120	<.05								Limestone
28	30				5815		<.4	15	6	24	115	<.05								Limestone
30	32				5816		<.4	<.10	2	26	65	<.05								Limestone
32	34				5817		<.4	<.10	4	36	70	<.05								Limestone
34	36				5818		<.4	10	6	24	125	<.05								Limestone
36	38				5819		<.4	<.10	4	22	90	<.05								Limestone
38	40				5820		4	<.10	4	20	115	<.05								Limestone
40	42				5821		4	<.10	6	22	100	<.05								Limestone - with some diopside (?) skarn
42	44				5822		6	<.10	4	16	105	<.05								Limestone
44	46				5823		<.4	<.10	55	350	290	<.05								Limestone - with magnetite & calc-silicate skarn
46	48				5824		34	10	20	120	490	<.05								Limestone
48	50				5825		270	25	75	20	380	<.05								Magnetite skarn - with minor limestone & calc-silicates
50	52				5826		180	<.10	18	16	195	<.05								Magnetite skarn
52	54				5827		100	<.10	12	8	150	<.05								Magnetite skarn
54	56				5828		310	15	10	10	100	<.05								Magnetite skarn
56	58				5829		170	25	6	14	130	<.05								Transition from magnetite skarn to granite
58	60				5830		10	10	2	10	40	<.05								Granite
60	62				5831		12	10	6	14	175	<.05								Granite
62	64				5832		6	<.10	4	12	70	<.05								Granite
64	66				5833		6	20	10	20	380	<.05								Granite
66	68				5834		6	60	8	22	240	<.05								Granite
68	70				5835		4	10	4	14	105	<.05								Granite
70	72				5836															Granite
72	74				5837															Granite
74	76				5838	5861	8	15	6	16	170	<.05								Granite
76	78				5839															Granite
78	80				5840															Granite
80	82				5841															Granite
82	84				5842															Granite
84	86				5843	5862	14	15	6	20	200	<.05								Granite
86	88				5844															Granite
88	90				5845															Granite
90	92				5846															Granite
92	94				5847															Granite
94	96				5848	5863	8	10	6	20	155	<.05								Granite
96	98				5849															Granite
98	100				5850															Granite

721031

From	To	Inter'l (m)	Core Rec'd	% Pack	Sample No	Comp No	Assays						Weighted Assays/Ratio	
							Fe %	Bi ppm	As ppm	Ag ppm	Mo ppm	Ni ppm		
0	2				5801	2.20	<4	10	1	4	24			
2	4				5802	11.5	<4	48	<1	<4	32			
4	6				5803	22.5	<4	30	<1	<4	55			
6	8				5804	6.50	<4	18	<1	<4	85			
8	10				5805	7.80	<4	18	1	<4	175			
10	12				5806	4.85	<4	16	1	4	330			
12	14				5807	2.65	<4	16	2	4	150			
14	16				5808	2.70	<4	12	1	4	130			
16	18				5809	2.60	<4	10	1	4	170			
18	20				5810	2.50	<4	9	1	<4	110			
20	22				5811	1.30	<4	10	1	<4	70			
22	24				5812	1.00	<4	5	<1	<4	32			
24	26				5813	2.00	<4	6	<1	<4	48			
26	28				5814	1.30	<4	3	<1	4	32			
28	30				5815	0.30	<4	2	1	<4	28			
30	32				5816	0.50	<4	2	<1	<4	16			
32	34				5817	0.45	<4	2	1	<4	16			
34	36				5818	1.00	<4	5	2	<4	36			
36	38				5819	0.80	<4	3	1	<4	28			
38	40				5820	0.65	<4	2	1	<4	32			
40	42				5821	1.35	8	6	2	<4	20			
42	44				5822	1.00	12	4	4	<4	28			
44	46				5823	1.80	<4	6	2	<4	24			
46	48				5824	5.35	<4	12	2	<4	20			
48	50				5825	19.5	32	80	<1	<4	28			
50	52				5826	21.0	24	300	4	4	16			
52	54				5827	26.5	8	360	<1	4	16			
54	56				5828	18.0	12	30	<1	<4	12			
56	58				5829	5.80	<4	30	4	<4	32			
58	60				5830	1.05	<4	12	1	16	8			
60	62				5831	1.65	<4	14	<1	150	44			
62	64				5832	1.00	<4	8	<1	36	16			
64	66				5833	2.30	8	12	1	4	105			
66	68				5834	2.20	<4	8	<1	4	50			
68	70				5835	1.15	<4	14	<1	8	20			
70	72				5836									
72	74				5837									
74	76				5838	5861	1.10	<4	10	<1	12	40		
76	78				5839									
78	80				5840									
80	82				5841									
82	84				5842									
84	86				5843	5862	2.10	<4	12	<1	75	48		
86	88				5844									
88	90				5845									
90	92				5846									
92	94				5847									
94	96				5848	5863	1.80	<4	10	<1	14	36		
96	98				5849									
98	100				5850									

From	To	Inter'l (m)	Core Rec'd	% Rec'd	Sample No	Comp No	Assays						Weighted Assays/Ratios						
							Fe %	Bi ppm	As ppm	Ag ppm	Mo ppm	Ni ppm							
100	102				5851														
102	104				5852														
104	106				5853	5864	0.35	<4	8	<1	8	24							
106	108				5854														
108	110				5855														
110	112				5856														
112	114				5857														
114	116				5858	5865	1.30	<4	8	<1	12	24							
116	118				5859														
118	120				5860														

721034

APPENDIX 2

INPUT Anomaly descriptions from Riana & Hayes Peak

Part of a Geoterrex Report to the
Shell Company of Australia Limited

The INPUT data from the Riana survey shows a mixture of responses, including extensive broad regions of high conductivity, large highly conductive bedrock features with identifiable structure, potential massive sulphide occurrences and many cultural responses.

As for the Highclere area, geology and aeromagnetic maps indicate that the majority of the area is covered by tertiary basalts. The INPUT data reflects this, as can be seen by the broad conductive areas which extend from the southern to the northern boundary.

Within these areas, some of the strongest (and hence most conductive) 6 channel responses have been delineated and discussed (eg zone 20/4144/IR1). Again it must be stressed that no assumption regarding the possible association of sulphides with the most conductive response has been made (as can be seen from the priority usually given to these zones), but should further geological/geochemical evidence be acquired these zones may assume a greater importance.

Unfortunately, there are many cultural responses which interfere with the ground response to an extent where anomaly boundaries become uncertain (eg: 20/4044/IR3) and any source geometry information becomes disguised. Also there are responses which are characteristic of culture but occur just a little too far away from obvious culture on the tracking film to be dismissed outright (eg: 20/4043/IRS).

Zone 20/4044/IR2 is a very interesting area due to its high conductivity and structure inferred from the INPUT data. Whilst INPUT data is certainly not definitive about the absolute magnitude

of conductor dip, it is often possible to gain a firm impression of the dip direction. In the case of this zone it is certain that the conductor has some dip and the inferred directions suggest it may be part of a synformal structure. The major implication of this interpretation is to reduce the likelihood of massive sulphides being the source of the response and to suggest a very conductive unit being responsible such as carbonaceous material.

ZONR 20/4144/IR1Priority 3

Line 125.1	Fiducial 381406	Ratio 31.0/5.0
	to	
Line 122.1	Fiducial -	Ratio ---

Anomalies

Shape	:	Broad and symmetric
Amplitude	:	Large
Decay Rate	:	Moderate - slow
Cultural Signs	:	None
Mag Association	:	None

Conductor:

Dimensions	:	600 metres wide, 1.0 kilometres long, open at both ends
Strike	:	North East

Location: Cultivated fields

Remarks:

This zone represents the strongest 6 channel response from within the broadly conductive zone related to the basalt cover. The best individual response occurs on line 123.1 at fiducial 375864. This zone broadens considerably to the north east and south west where the 6 channel response no longer stands out strongly against the generally conductive background, hence the open zone boundaries.

Recommendations:

The determination of the source and its geometric/geophysical properties is very difficult in cases such as this where the object is to discriminate between changes in the "overburden" and real bedrock sources. Therefore, ground follow up would require either a deep penetration, discriminatory system or some geochemical techniques.

ZONE 20/4044/IR2Priority 2

Line 108.1	Fiducial 575928	Ratio 30.0/9.0
	Fiducial 575890 to	Ratio 29.0/8.0
Line 102.1	Fiducial 559800	Ratio 10.0/1.5

Anomalies:

Shape	:	Dependent on flight direction
Amplitude	:	Moderate
Decay Rate	:	Slow
Cultural Signs	:	None
Mag Association	:	None

Conductor:

Dimensions	:	2.4 kilometres long, horseshoe shaped
Strike	:	North East

Location: Cultivated Plateau

Remarks:

The shape and position of the INPUT anomalies indicates that the source of this zone has discernable structure, which has significant implications when considering the geological nature of the source. The dependence of the plotted peak position upon flight direction (a phenomena well displayed from lines 104 to 106) indicates that both limbs of the zone are dipping. The direction of dip may be found from the channel 1 to 6 peak effect on individual anomalies. The most westerly limb shows strong channel 1 to 6 peak offsets on lines 104.1NW, 106.1 NW and 108.1 NW which suggests that these lines were flown up dip. Lines 107.1SE, 106.2SE, 104.2SE and 103.1SE shows no such peak offsets, suggesting these lines were flown down dip. However, Line 105.1SE has peak offsets akin to an updip response and 105.2NW has no offsets as shown on the other downdip lines.

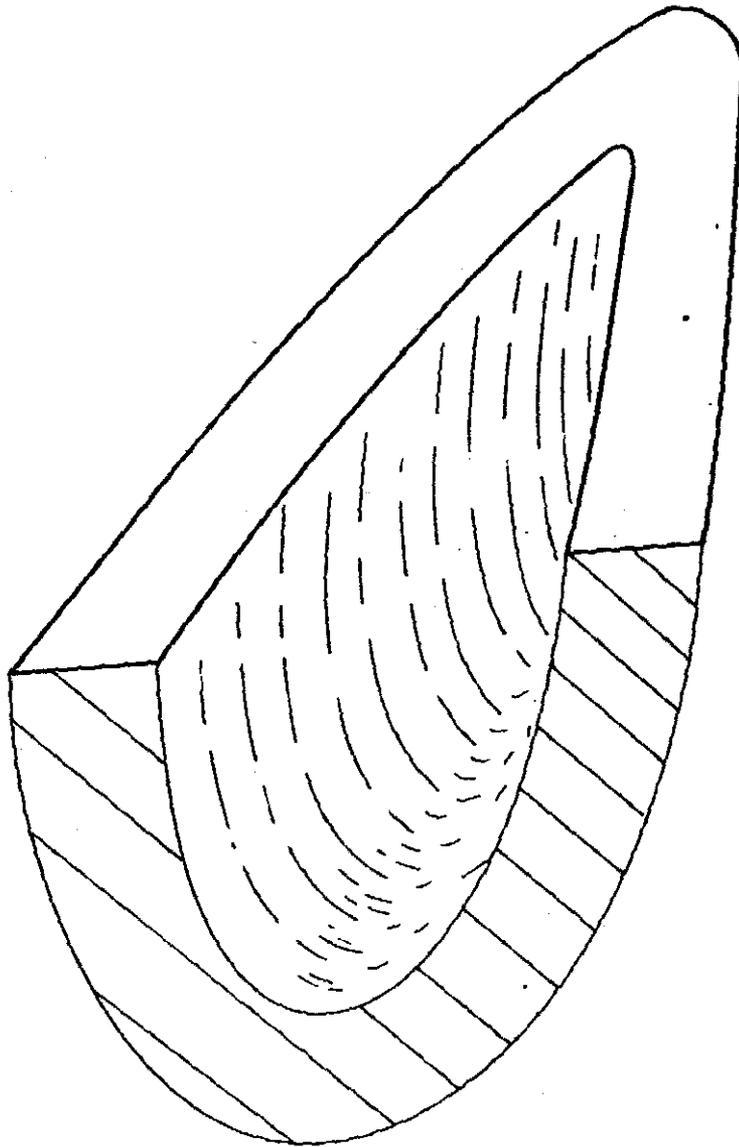
The easterly limb exhibits very little dip information other than the anomaly plotting position being dependent on direction. The responses on Lines 104.1NW, 105.2NW show no channel 1-6 peak offset, implying a down dip response. Lines 105.1SE, 106.2SE and 107.1SE have responses with channel 1-6 peak offsets implying an updip response. Again, there are two lines which don't fit in with this interpretive scheme; Line 104.2SE shows no channel 1-6 peak offset which is inconsistent with the other lines flown. SE and Line 106.1NW which shows peak offsets when you would not expect to see them if the response is from a down dip direction.

Therefore, the INPUT data suggests that the westerly limb dips towards the south east and the easterly limb dips towards the north west. A plausible geological structure consistent with these dips and the ever decreasing distance between limbs to the north east would be a syncline cut an oblique angle as shown in the figure.

The implication of such a structure are to downgrade the importance of this zone as a high priority sulphide target since the structure implies that the same geological unit is the source of both responses. This being the case, the slow decay and high conductivity is more likely to be representative of a carbonaceous unit rather than sulphides.

Recommendations

Ground follow up is recommended to best determine the structure and the form of the source.



- LINE 108.1

- LINE 102.1

Figure 1 - Possible geometry of 20/4043/IR2

ZONE 20/4043/IR5Priority 3

Line 1042

Fiducial 354240

Ratio 12.51

Anomalies: Shape : Very narrow & symmetric
Amplitude : Moderate
Decay Rate : Moderate - Fast
Cultural Signs : Farm houses
Mag Association : None

Conductor: Dimensions : 200 metres wide
Strike : --

Location: Farmhouses and paddocks

Remarks:

This anomaly appears to be cultural, yet examination of the tracking film places the peak some 100 metres away from the evident culture (houses etc). For this reason there is some doubt as to the source of the anomaly. There does not appear to be any similar anomaly on line 104.1 (which crosses 104.2 near the fiducial range we are looking at.)

Recommendations:

Follow up is required to determine whether the culture is the only source present.

TABLE 2. SUMMARY OF SELECTED CONDUCTORS - RIANA AREA

<u>Priority 1</u>	<u>Priority 2</u>	<u>Priority 3</u>
20/4044/IR3	20/4044/IR2	20/4144/IR1
20/4044/IR4	20/4044/IR6	20/4043/IR5
		∇

APPENDIX 3

Aeromagnetic Modelling of the Camena Anomaly 4144/2

MEMO

DATE 28th June, 1982.

FROM DMN/Devonport

TO DMH/Devonport (P. Ruxton)

Re: CAMENA AEROMAGNETIC MODELS

I have tried some MAGMOD modelling of the aeromagnetic data on line 233E, over the Camena anomaly. The main aim of this modelling was to determine if a body at less than 300 metres depth could be the cause of the anomaly, given that a deeper body is unlikely to be of economic interest to us. (Nb. all depths referred to here are with respect to flight elevation - depth beneath the surface will be roughly 70 metres less).

Four models are attached, for bodies at depths of 200, 300, 750 and 1000 metres (roughly). It can be seen that only the deeper two bodies give a reasonable fit to the observed data. From this it appears that the body causing the anomaly is not less than 300 metres deep, and probably greater than 500 metres deep. It is conceivable that the source is shallower, but it would then need to have an unusual shape and be very large (certainly greater than 1 km square in plan view). Such a large body is also unlikely to be of economic interest.

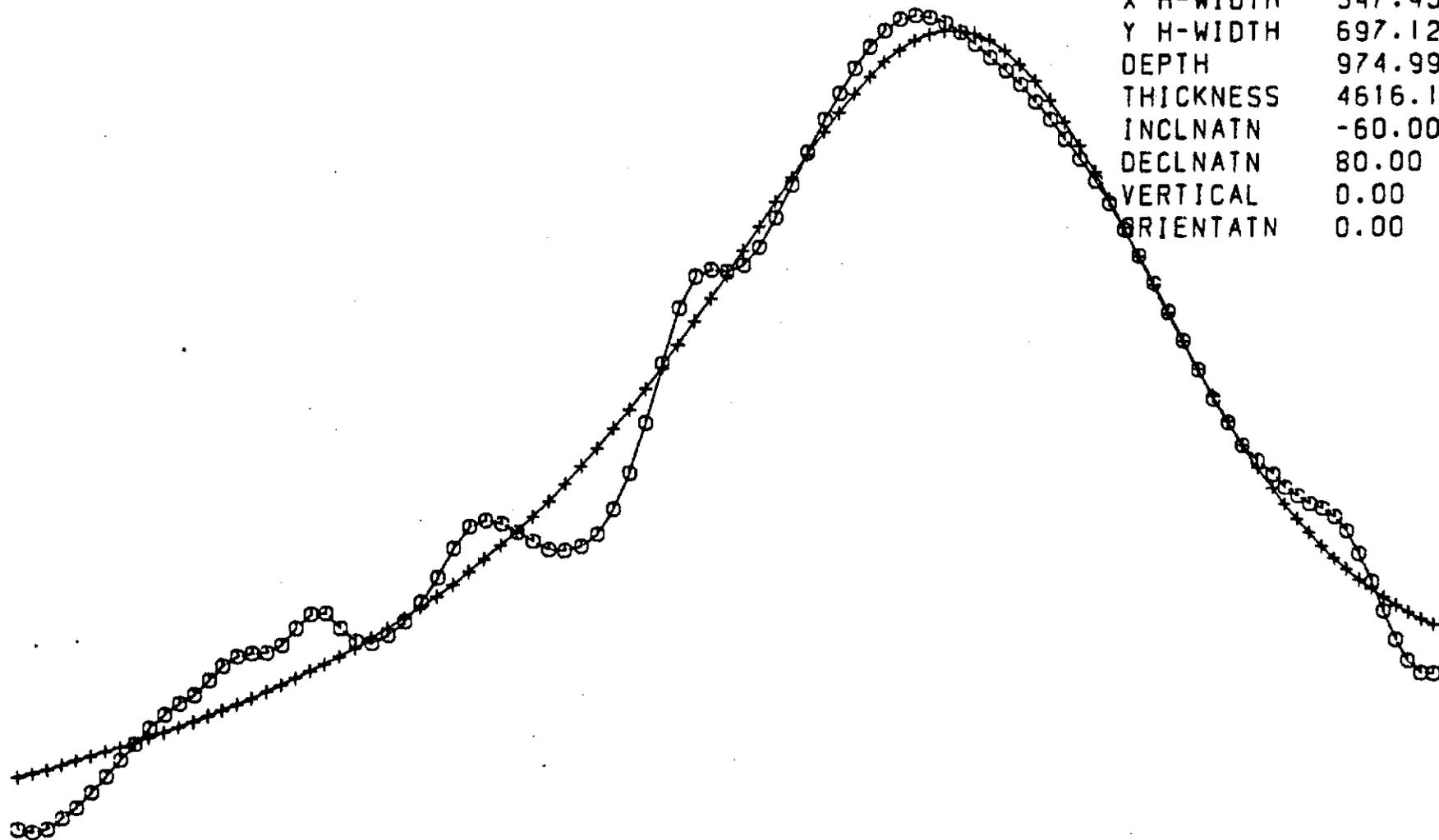
The most likely explanation for the anomaly is an ultrabasic plug of susceptibility of the order of $20,000 \times 10^{-6}$ cgs and depth greater than 500 metres. No further work is recommended on this anomaly.

CAMENA AEROMAG MODEL

O OBSERVED
 + MODELLED

721049

DIP 133.05
 BASE LEVEL 2647.18
 X SLOPE 0.04
 Y SLOPE 0.00
 X POSITION 12469.47
 Y POSITION 1705.17
 X H-WIDTH 347.45
 Y H-WIDTH 697.12
 DEPTH 974.99
 THICKNESS 4616.19
 INCLNATN -60.00
 DECLNATN 80.00
 VERTICAL 0.00
 ORIENTATN 0.00

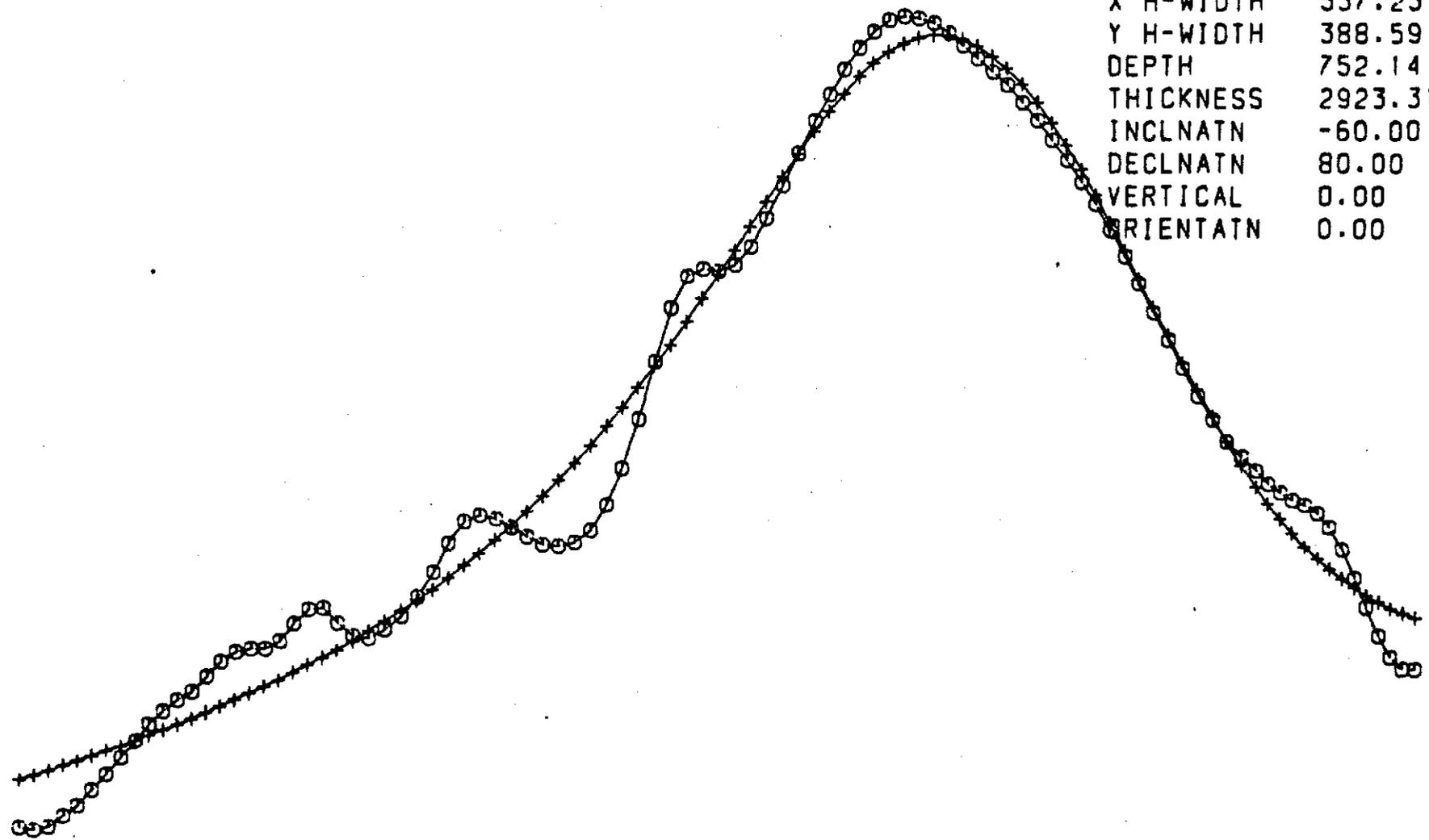


910.00 960.00 1020.00 1080.00 1140.00 1200.00 1260.00 1320.00 1380.00 1420.00

CAMERA AEROPHOTO MODEL

○ OBSERVED
+ MODELLED

IP	1.95
BASE LEVEL	2676.76
X SLOPE	0.05
Y SLOPE	0.00
X POSITION	12545.54
Y POSITION	1551.44
X H-WIDTH	537.25
Y H-WIDTH	388.59
DEPTH	752.14
THICKNESS	2923.31
INCLNATN	-60.00
DECLNATN	80.00
VERTICAL	0.00
ORIENTATN	0.00



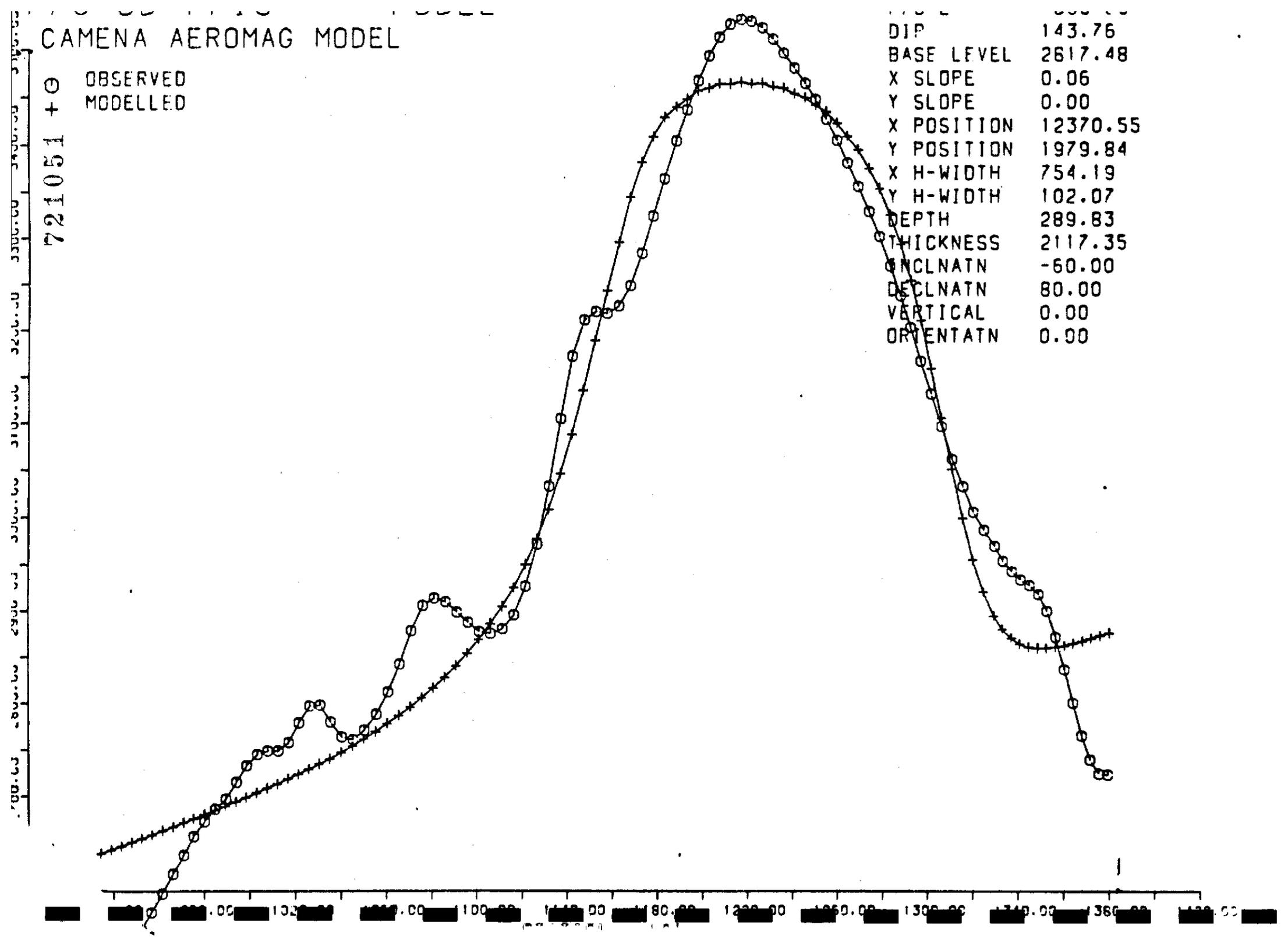
CC 360.00 1020.00 1060.00 1100.00 1140.00 1180.00 1220.00 1260.00 1300.00 1340.00 1360.00 1420.00
STATION

721050

CAMENA AEROMAG MODEL

721051 +0
OBSERVED
MODELLED

DIP	143.76
BASE LEVEL	2617.48
X SLOPE	0.06
Y SLOPE	0.00
X POSITION	12370.55
Y POSITION	1979.84
X H-WIDTH	754.19
Y H-WIDTH	102.07
DEPTH	289.83
THICKNESS	2117.35
INCLNATN	-60.00
DECLNATN	80.00
VERTICAL	0.00
ORIENTATN	0.00

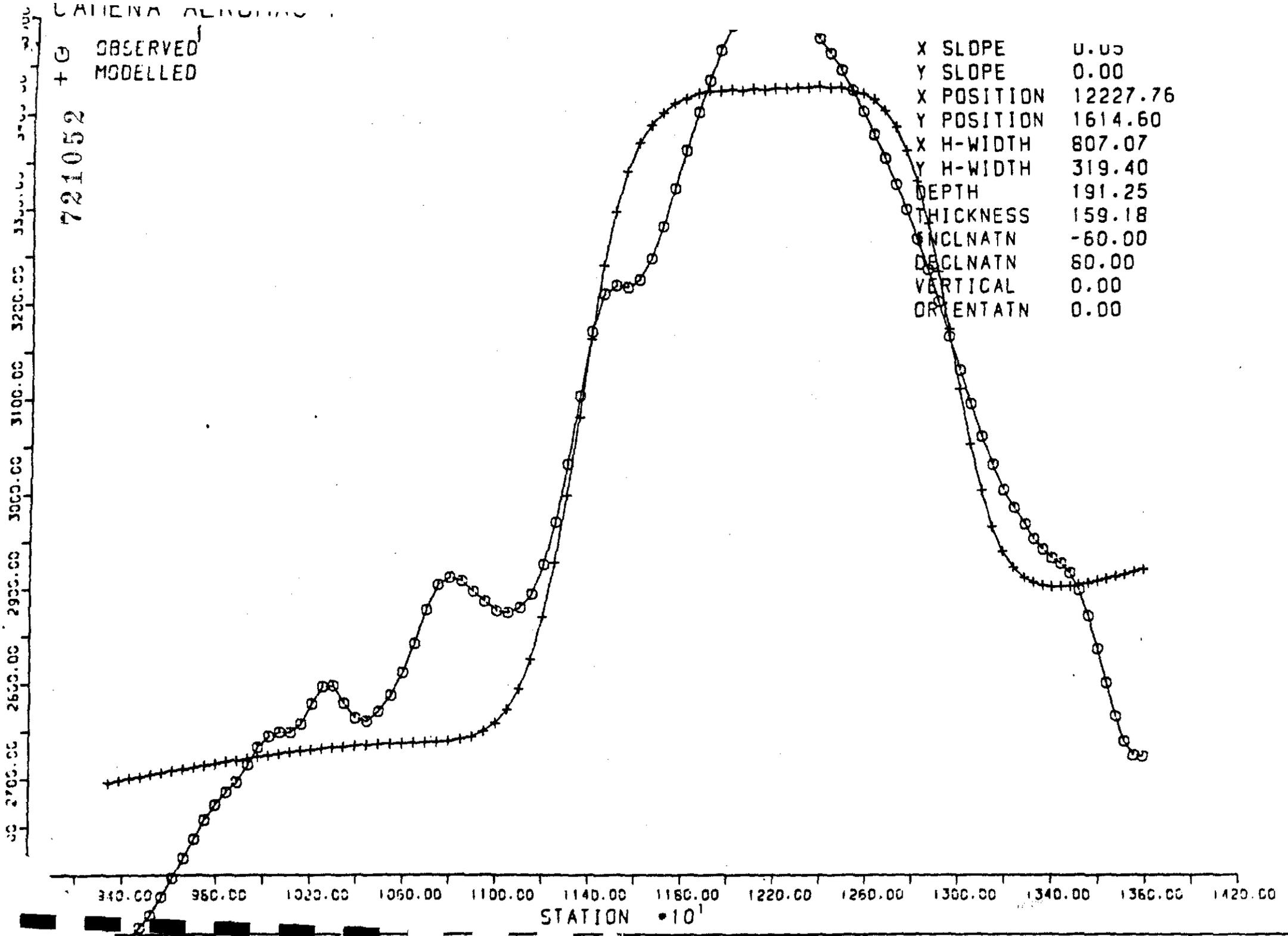


CALCENA AERONAUTICA

+ O OBSERVED
MODELLED

721052

X SLOPE	0.00
Y SLOPE	0.00
X POSITION	12227.76
Y POSITION	1614.60
X H-WIDTH	807.07
Y H-WIDTH	319.40
DEPTH	191.25
THICKNESS	159.18
INCLNATN	-60.00
DECLNATN	60.00
VERTICAL	0.00
ORIENTATN	0.00



APPENDIX 4

Cuprona Drill Hole Data

Percussion Hole Cu PD 1

From	To	Inter'l (m)	Core Rec'd	% Rec'd	Sample No.	Comp. NO.	Assays				Susceptibility		% Estimates		Core Angles		All.	T.S. P.S.	Description
											x10 ⁶	cgs. units							
0	2				5701		Not Assayed												Basal
2	4				5702						450								
4	6				5703						400								
6	8				5704						350								
8	10				5705						300								
10	12				5706						320								
12	14				5707						420								
14	16				5708						450								
16	18				5709						400								
18	20				5710						350								
20	22				5711						500								
22	24				5712						600								
24	26				5713						600								
26	28				5714						800								
28	30				5715						800								
30	32				5716						700								
32	34				5717						700								
34	36				5718						800								
36	38				5719						600								
38	40				5720						600								
40	42				5721						700								
42	44				5722						600								
44	46				5723						650								
46	48				5724						600								
48	50				5725						1500								
50	52				5726						2000								
52	54				5727						900								
54	56				5728						500								
56	58				5729						650								
58	60				5730						1500								
60	62				5731						800								
62	64				5732						900								
64	66				5733						950								
66	68				5734						800								
68	70				5735						700								
70	72				5736						800								
72	74				5737						1500								
74	76				5738						1500								
76	78				5739						2000								
78	80				5740						2000								
80	82				5741						3000								
82	84				5742						3000								
84	86				5743						3000								
86	88				5744						4000								
88	90				5745						5000								
90	92				5746						3000								
92	94				5747						2000								
94	96				5748						5000								
96	98				5749						3500								
98	100				5750						3000								

721054

From	To	Inte'r (m)	Core Rec'd	% Rec'd	Sample No	Comp No	Assays (ppm)								Susceptibility		% Estimates		Core Angles		All	T.S. P.S.	Description			
							Sn	W	Cu	Pb	Zn	Au	Ag	Mo	$\times 10^{-6}$	c.g.s	units									
100	102				5751																		Basalt			
102	104				5752																					
104	106				5753																					
106	108				5754																					
108	110				5755																					
110	112				5756																					
112	114				5757																					
114	116				5758																			Aluminum - Tertiary (?) deep lead deposits		
116	118				5759																					
118	120				5760	5866	<4	<10	48	4	100	<0.5	<1	<4	3000											
120	122				5761																					
122	124				5762																					
124	126				5763																				Basalt	
126	128				5764	5867	<4	<10	55	<4	105	<0.5	<1	<4	2000											
128	130				5765																					
130	132				5766																					
132	134				5767																				Aluminum - Tertiary (?) deep lead deposits	
134	136				5768	5868	6	10	46	<4	80	<0.5	<1	4	2000											
136	138				5769																					
138	140				5770																					
140	142				5771																					
142	144				5772	5869	6	<10	80	8	32	<0.5	<1	<4	200											
144	146				5773																					
146	148				5774																					
148	150				5775																				Slates and shales: fine grained, clayey, possibly Pre-Cambrian Burnie Formation	
150	152				5776																					
152	154				5777	5870	<4	15	105	<4	32	<0.5	<1	<4	60											
154	156				5778																					
156	158				5779																					
158	160				5780																					
160	162				5781																					
162	164				5782																					
164	166				5783	5871	6	10	170	4	42	<0.5	<1	<4	70											
166	168				5784																					
168	170				5785																					
170	172				5786																					
172	174				5787																					
174	176				5788	5872	<4	<10	355	8	75	<0.5	<1	<4	60											
176	178				5789																					
178	180				5790																					
180	182				5791																					
182	184				5792																					
184	186				5793	5873	12	<10	460	20	25	<0.5	<1	<4	35											
186	188				5794																					
188	190				5795																					
190	192				5796																					
192	194				5797																					
194	196				5798	5874	<4	<10	270	12	65	<0.5	<1	<4	70											
196	198				5799																					
198	200				5800																					

721055

SHEET 2

From	To	Inter'l (m)	Core Rec'd	% Rec'd	Sample No	Comp No	Assays (ppm)							Weighted Assays/Ro				
							Fe%	Mn	Ni	Hg	As	Sb	Bi					
100	102				5751													
102	104				5752													
104	106				5753													
106	108				5754													
108	110				5755													
110	112				5756													
112	114				5757													
114	116				5758													
116	118				5759													
118	120				5760	5866	6.8	740	230	<05	3	8	<4					
120	122				5761													
122	124				5762													
124	126				5763													
126	128				5764	5867	8.2	1200	250	<05	10	6	4					
128	130				5765													
130	132				5766													
132	134				5767													
134	136				5768	5868	8.5	1300	220	<05	7	14	<4					
136	138				5769													
138	140				5770													
140	142				5771													
142	144				5772	5869	10.0	1090	75	<05	34	42	4					
144	146				5773													
146	148				5774													
148	150				5775													
150	152				5776													
152	154				5777	5870	8.1	2000	65	<05	30	46	8					
154	156				5778													
156	158				5779													
158	160				5780													
160	162				5781													
162	164				5782													
164	166				5783	5871	8.9	1800	75	<05	34	32	<4					
166	168				5784													
168	170				5785													
170	172				5786													
172	174				5787													
174	176				5788	5872	11.0	1000	95	<05	46	46	10					
176	178				5789													
178	180				5790													
180	182				5791													
182	184				5792													
184	186				5793	5873	16.0	3200	120	10	85	15.5	42					
186	188				5794													
188	190				5795													
190	192				5796													
192	194				5797													
194	196				5798	5874	8.5	3500	75	05	55	65	16					
196	198				5799													
198	200				5800													

APPENDIX 5

NATONE

Minops Diamond Drilling Results from Holes NDDH 1, NDDH 2, & NDDH 3

Assay & Petrological Data

NATONE DIAMOND DRILL HOLE 1DESCRIPTIVE GEOLOGY

- 0' - 107.5' Limonitic/hematitic soil/rubble. Fragments of siliceous material - vuggy quartz and quartz veins present. Some pieces contain 1^o banding. Hematite mainly weathered to limonite. (Possibly gossanous?)
- 107.5' - 185' Calc - silicate rock - cream/brown colour - sugary texture, coarse grain-size, porous. Phases present epidote, calcite, pyroxene(?) amphibole (tremolite). Moderately weathered.
- 185' - 190' Hematite silicified rock - most of hematite gone to limonite - vugs present with quartz infill. (Recrystallized chert - LDB).
- 190' - 194' Limestone - salt and pepper colouring, some silty layers disseminated pyrrhotite (po) (less than 1%).
- 194' - 196' Calc - silicate rock - greissic texture, + veins of marcasite (Arsenopyrite?) - also more massive component - cream colour - extensive 2^o calcite veins (2-3 mm across) parallel to core axis.
- 196' - 231' Limestone - recrystallized - greissic texture and foliated. Bands of calc-silicate minerals and also disseminated pyrrhotite (15-20% max.). Bands of calc-silicate at 199'-204', 205.6', 207', 210' (27 cm wide), 211', 212' (70cm wide) 215'. After 216' 1st becomes more massive dark grey colour. Chlorite veins + some py/po veins. Diopside - Forsterite marble.
- 231' - 232' Silicified siltstone - disseminated po/py + chlorite common.
- 232' - 236' Limestone - recrystallized + diopside + amphiboles + disseminated and clumped po.
- 236' - 242' Calc - silicate rock - cream colour extensive 2^o calcite veins. Disseminated po upto 5-10% of rock. Also sulphides in veins mainly py associated with calcite. Green colours actinolite - diopside.
- 242' - 265' Silicified siltstone (cherty) fine laminations, veined with 2^o calcite and pyrite - 10-20% po in patches dominantly in bedding.
- 265' - 269' Calc - silicate rock (altered) - chlorite and clays present. Silty limestone layers. Banded rock 45^o to core axis. Some po and arsenopyrite.
- 269' - 273' Silicified siltstone, brecciated fine laminations, abundant calcite/pyrite veins associated with brecciation.
- 273' - 303' Silicified quartzite - some finer grained bands. Banding 40-45^o to core axis. Some disseminated po. less than 1% chlorite present in finer grained concretions and bands.

- 303' - 306' Silicified siltstone (chert) py and po veining, late stage event. No layering, calcite pyrite veins last event.
- 306' - 311' Banded (chert) silicified sediment (307' = 80°-90° to core axis. Disseminated po and py in coarser layers Brecciation with py/po infilling. Iron staining common. Bands of pink (garnet?) and blue/green minerals (tremolite on diopside).
- 311' - 315' Andalusite hornfels - py and po present in blobs.

END OF HOLE

Summary

N DDH 1 contains ironstones and associated silicified sediments plus metamorphosed limestones containing calc-silicate minerals and silicification.

OBJECT: NATONE, MINOPS

DIAMONDS, FULL LOG, SAMPLES, RECORDED

HOLE: DDH

Core Feet)	To	Inter'l (ft)	Core Rec'd Fr Log	% Rec	Sample No.	Compos No.	Assays							Weighted Assays/Ratios		% Estimates		Core Angles		T.S Alt P.S	Description
							Sn	W	Ni	Cu	Pb	Zn	Ag	Au							
0	70	70	6	4	99	21401	55	<10	80	150	6	100	<1	<0.05							Limnetic/Hematitic Soil (CW) + fragments of siliceous material & ironstone
70	84	14	2	6	79	21402	14	10	50	65	4	120	<1	<0.05							
84	88	4	1	6	75	21403	<4	35	60	145	14	150	<1	<0.05							
88	94	6	1	8	77	21404	20	25	110	310	50	350	<1	<0.05							
94	98	4	0	9	87	21405	<4	<10	22	46	4	70	1	<0.05							
98	102	4	2	6	82.5	21406	16	10	90	130	50	200	1	<0.05							
102	107.5	5.5	4	3	78.5	21407	8	15	30	80	12	90	1	<0.05							
107.5	120	12.5	3	7	45.0	21408	<4	15	30	30	8	100	1	<0.05							Calc silicate rock (W) cream/brown, coarse texture tremolite, epidote, calcite + pyroxene (?)
120	130	10	4	8	46.6	21409	<4	10	10	70	16	28	1	<0.05							
130	140	10	3	0	30.0	21410	<4	<10	8	30	12	22	<1	<0.05							
140	150	10	5	0	50.0	21411	8	<10	4	22	6	18	<1	<0.05							
150	160	10	1	11	23	21412	6	<10	6	14	4	24	<1	<0.05							
160	170	10	2	1	20.0	21413	6	<10	8	100	4	80	<1	<0.05							
170	180	10	3	0	30.0	21414	12	<10	16	20	4	40	<1	<0.05							
180	185	5	1	8	30.0	21415	14	<10	16	24	4	30	<1	<0.05							
185	190	5	1	11	38.4	21416	8	15	14	75	6	70	<1	<0.05							Hematitic silicified rock - vugs
190	194	4	4	0	100	21417	14	<10	8	14	6	22	<1	<0.05							Limestone - disseminated po/py
194	195	1	0	7	58.3	21418	8	<10	6	80	8	24	<1	<0.05							Calc silicate rock
195	196	1	1	0	100	21419	12	<10	14	80	<4	18	<1	<0.05							
196	205	9	9	0	100	21420	8	<10	20	55	14	28	<1	<0.05							Limestone + calc silicate bands (thin) layered. Disseminated po/py up to
205	210	5	4	9	35	21421	6	<10	6	16	<4	28	<1	<0.05							20-30% Diopside + olivine (?)
210	211	1	1	0	100	21422	6	<10	8	10	16	22	<1	<0.05							
211	212	1	1	0	100	21423	12	<10	26	30	50	120	<1	<0.05							
212	214	2	2	0	100	21424	16	<10	26	20	8	28	<1	<0.05							
214	216	2	2	0	100	21425	20	<10	18	8	<4	22	<1	<0.05							
216	225	9	9	0	100	21426	8	<10	16	12	8	38	<1	<0.05							
225	231	6	6	0	100	21427	20	10	16	4	4	20	<1	<0.05							
231	232	1	1	0	100	21428	80	10	100	20	16	60	1	<0.05							Silicified siltstone + disseminated po/py (<5%)
232	236	4	4	0	100	21429	8	<10	50	10	4	30	<1	<0.05							Limestone - some calc silicates + po
236	242	6	6	0	100	21430	10	<10	44	26	<4	22	<1	<0.05							Calc silicate rock - disseminated po (5-10%)
242	249	7	7	0	100	21431	20	<10	22	18	4	32	1	<0.05							Silicified siltstone - disseminated po (10-20%) v. fine layering
249	254	5	5	0	100	21432	20	10	36	35	10	70	<1	<0.05							
254	265	11	10	6	36	21433	18	<10	10	40	70	60	<1	<0.05							
265	269	4	3	2	80	21434	12	<10	16	85	10	70	<1	<0.05							Calc silicate rock (altered) some arsenopyrite
269	273	4	4	0	100	21435	8	10	18	12	<4	12	<1	<0.05							Silicified siltstone (chert) brecciated and silicified
273	283	10	10	0	100	21436	4	<10	12	8	<4	10	<1	<0.05							Silicified quartzite, conglomeratic clasts (now silica) some po
283	293	10	10	0	100	21437	8	10	8	8	<4	16	<1	<0.05							
293	303	10	10	0	100	21438	10	<10	16	6	<4	20	<1	<0.05							
303	306	3	3	0	100	21439	10	<10	36	32	8	24	<1	<0.05							Silicified siltstone (chert), banded chert, brecciated, po/py disseminated
306	311	5	5	0	100	21440	12	<10	32	70	18	80	<1	<0.05							
311	315	4	4	0	100	21441	4	15	36	65	<4	36	<1	<0.05							Andalusite hornfels - py/po present (<5%)

721060

From (feet)	To	Interval (ft)	Core Rec'd Fr. log	% Fr. log	Sample No.	Depth No.	Assay							Weight %	
							Hg	Mo	As	Sb	Fe%	Mn	Bi		
0	70	70	6	4	9.0	21401	<0.05	4	280	12	31.0	1300	<4		
70	84	14	2	6	7.5	21402	0.04	4	150	16	32.0	1100	<4		
84	88	4	1	6	37.5	21403	0.35	4	270	20	24.5	1700	<4		
88	94	6	1	8	27.7	21404	0.10	<4	1250	20	34.5	1907	<4		
94	98	4	0	9	10.7	21405	0.15	4	105	12	10.5	2600	<4		
98	102	4	2	6	22.5	21406	<0.05	<4	350	14	16.5	1507	<4		
102	107.5	5.5	4	3	18.5	21407	0.10	<4	175	10	6.80	2700	<4		
107.5	120	12.5	5	7	15.0	21408	<0.05	<4	175	8	6.90	2700	<4		
120	130	10	4	8	46.6	21409	<0.05	<4	65	6	2.10	1250	<4		
130	140	10	3	0	30.0	21410	0.05	<4	44	4	0.85	830	<4		
140	150	10	5	0	50.0	21411	<0.05	<4	46	6	0.73	500	<4		
150	160	10	1	11	22.2	21412	<0.05	<4	20	4	0.90	1150	<4		
160	170	10	2	1	20.0	21413	<0.05	<4	48	8	4.30	1680	<4		
170	180	10	3	0	30.0	21414	<0.05	<4	32	8	1.65	1350	<4		
180	185	5	1	6	30.0	21415	<0.05	<4	50	6	3.20	2800	<4		
185	190	5	1	11	22.0	21416	0.05	<4	105	10	6.90	3900	<4		
190	194	4	4	0	100	21417	<0.05	<4	10	4	0.93	1200	<4		
194	195	1	0	7	58.3	21418	<0.05	<4	2	4	1.20	1000	<4		
195	196	1	1	0	100	21419	<0.05	<4	16	6	2.40	460	<4		
196	205	9	9	0	100	21420	<0.05	<4	6	6	2.50	1550	<4		
205	210	5	4	9	95	21421	<0.05	<4	4	8	1.15	1400	<4		
210	211	1	1	0	100	21422	<0.05	<4	2	<4	0.68	1150	<4		
211	212	1	1	0	100	21423	<0.05	<4	8	8	2.70	1700	<4		
212	214	2	2	0	100	21424	<0.05	<4	5	12	1.75	1250	<4		
214	216	2	2	0	100	21425	<0.05	<4	14	4	2.10	1350	<4		
216	225	9	9	0	100	21426	<0.05	<4	12	<4	1.95	2000	<4		
225	231	6	6	0	100	21427	<0.05	<4	18	4	2.65	2700	<4		
231	232	1	1	0	100	21428	<0.05	<4	38	14	6.10	1450	<4		
232	236	4	4	0	100	21429	<0.05	<4	34	8	3.70	2550	<4		
236	242	6	6	0	100	21430	<0.05	<4	18	10	3.80	2700	<4		
242	249	7	7	0	100	21431	<0.05	<4	80	6	2.70	460	<4		
249	254	5	5	0	100	21432	0.30	<4	100	10	4.00	500	<4		
254	265	11	10	5	95	21433	0.10	4	50	16	1.38	450	<4		
265	269	4	3	2	80	21434	<0.05	<4	250	10	3.90	890	<4		
269	273	4	4	8	100	21435	0.05	4	32	10	0.68	125	<4		
273	283	10	10	0	100	21436	<0.05	4	36	10	0.56	80	<4		
283	293	10	10	0	100	21437	0.05	4	10	8	0.83	270	<4		
293	303	10	10	0	100	21438	<0.05	<4	14	12	0.74	250	<4		
303	306	3	3	0	100	21439	<0.05	<4	32	18	3.20	320	<4		
306	311	5	5	0	100	21440	<0.05	<4	60	18	3.90	250	<4		
311	315	4	4	0	100	21441	<0.05	<4	75	10	3.50	180	<4		

NATONE DIAMOND DRILL HOLE 2DESCRIPTIVE GEOLOGY

- 0' - 20' Ironstone - dominantly hematite with inclusions of qtz and feldspars, vuggy in places.
- 20' - 75' Siltstone - Claystone - weathered Tertiary sediments.
- 75' - 95' Weathered hematite-bearing sediment - rubble fragments of ironstone.
- 95' - 139' Weathered ironstones.
- 139' - 245' Ironstone.
- 245' - 265' Weathered limonitic/hematitic rubble.
- 265' - 305' Weathered actinolite-pyrrhotite rock. Unconsolidated kharki brown material cemented by the secondary recrystallization of FeSO_4 derived from broken down po and py.
- 305' - 328' Altered limestone - greisen like texture. Disseminated pyrrhotite. Calc-silicate minerals are tremolite (dolomite or garnet). Some Fe staining. Contact metamorphic marble.
- 328' - 344' Altered limestone - calc-silicate minerals tremolite talc, diopside (garnet and dolomite?) veins of CO_3 . Siliceous in places.
- 344' - 360.5' Altered & silicified limestone. "Conglomerate" layers rounded clasts of CO_3 or silicified sediments, po in brecciation and clast matrix (1-2%).
- 362' - 371' Diopside, rock - upto 20% po. (magnetic susceptibility = 600).
- 371' - 439' Silicified limestone - white/grey colour some "conglomerates" of CO_3 disseminated po (1-2%) few calc-silicate minerals.
- 437' - 478' Altered Limestone - partially silicified, few calc-silicate minerals, po rare. Some conglomerate.
- 478' - 600' CORE MISSING
- END OF HOLE

Summary

Ironstone and altered/silicified limestones dominate this hole.

True FEET)	L	Core		Sample No.	Layers No.	Assays						
		Inner FT	Core FT			Hg	Mo	As	Sb	Fe%	Mn	Bi
0	20	20	3 0	15	21465	<0.05	<4	12	250	410	60	<4
20	65	45	3 0	67	21466	<0.05	<4	14	24	570	80	<4
65	75	10	3 0	50	21467	<0.05	<4	18	22	500	290	<4
75	95	20	4 0	20	21468	<0.05	<4	50	200	430	710	<4
95	120	25	6 4	253	21469	<0.05	<4	145	120	310	3900	<4
120	147	27	7 3	268	21470	<0.05	<4	30	210	390	420	<4
147	177	30	20 0	666	21471	<0.05	<4	46	230	380	340	<4
177	195	18	13 10	727	21472	<0.05	<4	60	230	345	560	<4
195	231	36	5 0	133	21473	<0.05	<4	44	145	350	460	<4
231	245	14	1 0	711	21474	<0.05	<4	115	8	480	260	16
245	264	19	7 0	368	21475	<0.05	<4	70	22	440	175	65
264	265	1	0 2	666	21476	0.10	<4	22	26	195	650	20
265	294	29	10 5	869	21477	0.05	<4	8	4	900	440	4
294	305	11	8 6	773	21478	0.05	<4	<2	4	155	360	<4
305	318	13	13 0	100	21479	<0.05	<4	8	6	105	640	8
318	328.5	10.5	5 11	584	21480	0.10	<4	2	6	410	560	4
328.5	336	7.5	7 5	100	21481	<0.05	<4	4	6	0.90	390	4
336	344	8	7 0	875	21482	<0.05	<4	7	<4	0.70	350	<4
344	349	5	5 0	100	21483	<0.05	<4	2	10	1.20	440	<4
349	360.5	11.5	10 0	869	21484	<0.05	<4	4	14	1.00	360	<4
360.5	362	1.5	0 6	333	21485	0.15	<4	<2	<4	8.20	310	<4
362	371	9.0	9 0	100	21486	<0.05	<4	8	10	2.70	330	<4
371	382	11	11 0	100	21487	<0.05	<4	8	12	2.00	550	<4
382	393	11	11 0	100	21488	<0.05	<4	6	<4	0.85	250	<4
393	396	3	3 0	100	21489	<0.05	<4	14	12	1.95	320	<4
396	405	9	9 0	100	21490	<0.05	<4	3	4	0.90	230	<4
405	420	15	13 2	878	21491	<0.05	<4	3	6	0.65	350	<4
420	433	13	13 0	100	21492	<0.05	<4	5	8	2.20	390	<4
433	439	6	6 0	100	21493	<0.05	<4	4	4	0.85	680	4
439	445	6	6 0	100	21494	<0.05	<4	2	4	0.30	360	<4
445	455	10	10 0	100	21495	<0.05	<4	6	8	0.35	360	<4
455	465	10	10 0	100	21496	<0.05	<4	9	6	0.40	360	<4
465	478	13	13 0	100	21497	<0.05	<4	5	8	0.56	490	<4
478	600											
END OF HOLE												

NATONE DIAMOND DRILL HOLE 3DESCRIPTIVE GEOLOGY

- 0' - 50' Basalt rubble (weathered).
- 50' - 139' Basalt rubble and Tertiary alluvium - claystones and siltstones - highly weathered.
- 139' - 158' Weathered limonitic soil rubble. Some fragments of brecciated chert and limonite cement. Some vug filling limonite.
- 158' - 186' Silicified sediment (chert) + hematite. Brecciated chert and hematite + silicification and quartz vug fills. Some banding in fragments.
- 186' - 188' Ironstone - vugs common.
- 188' - 199' Brecciated chert + some ironstone quartz fills vugs.
- 199' - 325' Limonitic/hematitic silicified sediment (chert) no banding - limonitic cherts.
- 325' - 326' Andalusite hornfels.
- 326' - 360' CORE MISSING.
- End of Hole

Summary

Basalt cap with silicified iron-rich sediments below. The hole is terminated in andalusite hornfels.

From (Fmft)	To	Interf	Core Rec'd Pt	2 Rec Ins	Sample No.	Compos No.	Assays							Weighted
							Hg	Mo	As	Sb	Fe%	Mn	Bi	
0	90	50	3	9	133	21442	<0.05	<4	6	4	7.00	560	<4	
50	65.5	15.5	8	0	548	21443	<0.05	<4	10	4	10.5	1200	<4	
65.5	76	10.5	3	7	341	21444	<0.05	<4	4	4	11.0	640	<4	
76	86	10	6	8	341	21445	<0.05	10	145	125	16.5	340	12	
86	116	30	2	8	211	21446	<0.05	<4	140	200	21.0	460	<4	
116	126	10	3	0	38	21447	<0.05	4	85	230	16.5	410	<4	
126	135	13	10	3	388	21448	<0.05	<4	145	135	21.0	1050	<4	
135	145	6	4	0	666	21449	<0.05	<4	380	145	41.0	1200	12	
145	150	5	3	4	666	21450	<0.05	<4	48	24	5.50	3700	4	
150	158	8	3	4	416	21451	<0.05	<4	150	50	29.0	1300	<4	
158	168	10	8	9	815	21452	<0.05	<4	34	22	4.80	1250	<4	
168	175	7	6	2	138	21453	<0.05	<4	28	18	4.80	6400	<4	
175	186	11	5	3	173	21454	<0.05	<4	34	14	7.60	1300	<4	
186	186	2	0	4	165	21455	<0.05	<4	26	18	30.0	1500	4	
186	199	11	4	1	171	21456	<0.05	<4	28	12	27.0	1150	4	
199	210	11	7	1	614	21457	<0.05	<4	65	14	6.00	1850	<4	
210	223	13	6	6	50	21458	<0.05	<4	65	14	5.30	3000	4	
223	237	14	2	3	161	21459	<0.05	<4	75	20	7.50	2150	<4	
237	270	33	2	8	84	21460	<0.05	<4	80	10	5.80	2900	<4	
270	310	40	3	7	83	21461	<0.05	<4	45	18	6.20	4400	4	
310	315	5	4	1	86	21462	<0.05	<4	40	14	5.50	7000	<4	
315	325	10	6	11	682	21463	<0.05	<4	120	12	7.80	4150	<4	
325	326	1	0	6	50	21464	<0.05	<4	14	14	2.30	1850	4	
326	369													

721087

REPORT CMS 82/2/9Petrology of Samples 5917 - 5933

Nine samples were received for petrological examination; thin-sections were prepared of all samples, and three polished sections were also prepared as requested. The samples are briefly described in the accompanying table.

Summary

Most of the rocks are skarns of simple composition, formed from the pyrometasomatism of carbonate rocks; some still contain carbonate and one has been termed a marble; some retrograde metamorphism is evident, possibly contemporaneous with the introduction of sulphides, which comprise pyrrhotite and traces of chalcopyrite.

Two rocks are metasomatised clastic sediments and may have been tuffaceous, especially 5931, but this is fairly speculative because of the intensity of alteration. Sample 5933 is an intrusive basic igneous rock of presumed Palaeozoic age.

H.W. Fander, M. Sc.

Central Mineralogical Services

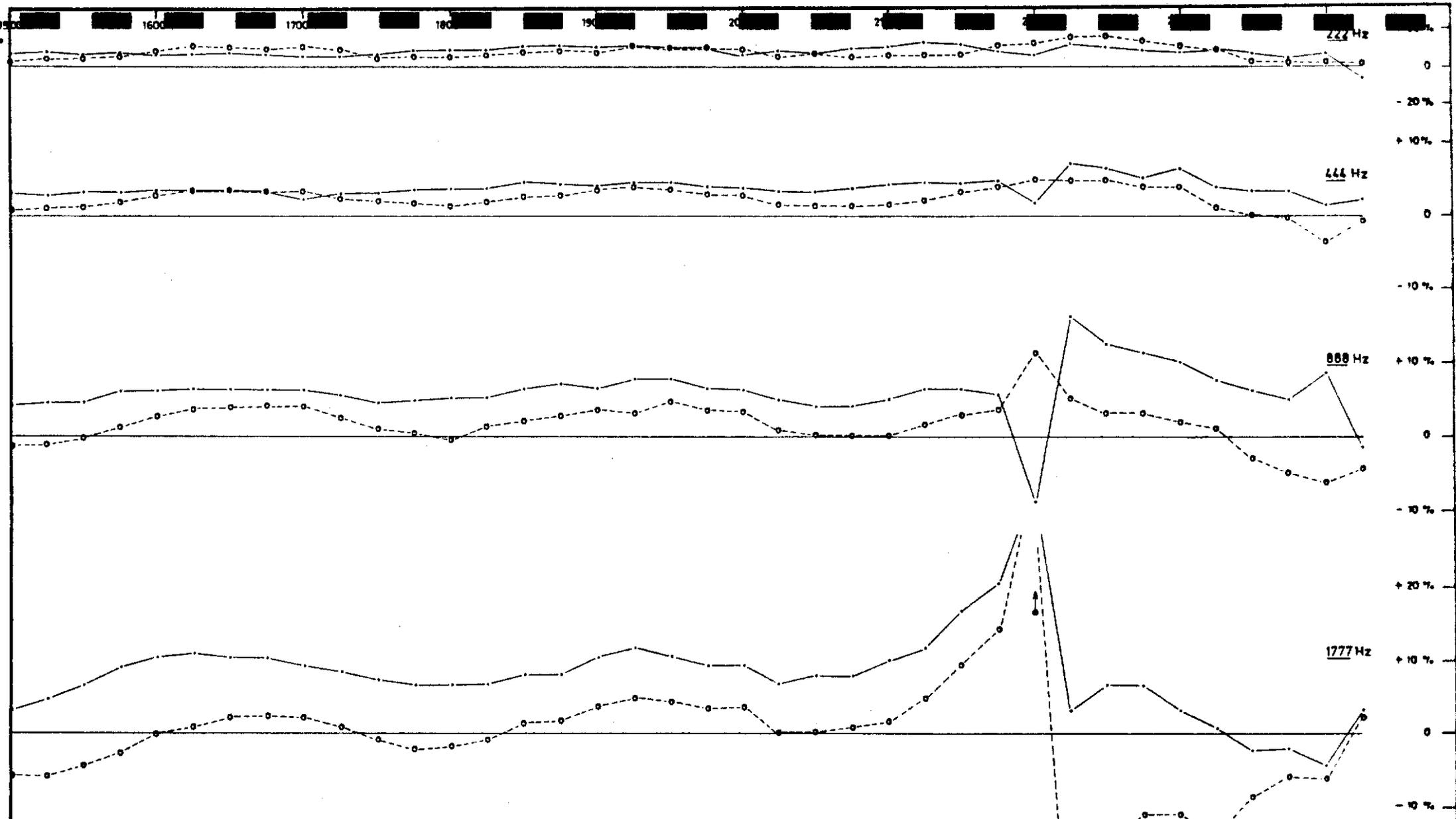
Comments

Sample No.	Rock Type - Composition	Fabric	Minor Minerals	Comments
5917 NDDH2 (T.S. 40898) 309 ft.	Skarn. Mostly fairly coarsely-crystalline diopside, with minor fibrous wollastonite partly altered to tremolite and calcite.	Random, coarse crystals; no relict textures. Typical skarn.	Fine and coarse pyrrhotite as irregular patches.	Featureless calc-silicate rock very probably of pyrometamorphic origin. UV check for scheelite negative.
5918 NDDH2 316 ft.	Tremolite Marble. Very coarsely-crystalline calcite; large random fibrous tremolite bundles, minor intergrown wollastonite.	All minerals coarse, though tremolite has fibrous habit; random.	A few irregular quartz patches (unreacted).	Contact-metamorphosed impure limestone; simple, featureless mineral assemblage.
5919 NDDH2 320 ft.	Diopside Skarn. Principally diopside, as interlocking subhedral crystals, with scattered sulphides (pyrrhotite altered to pyrite).	Random orientation, medium- to coarsely-crystalline.	Minor tremolite, replacive talc and chlorite. Carbonate.	Virtually monomineralic composition. Pyrrhotite is apparently younger, partly as veins; minor trace chalcopyrite.
5920 NDDH2 325 ft.	Altered Skarn. Large acicular diopside crystals partly replaced by fibrous tremolite, itself partly replaced by carbonate. Altered pyrrhotite.	Originally coarsely-crystalline, but alteration-products much finer.	Oxidised chlorite veinlets. Goethite impregnations.	Retrograde alteration well demonstrated here. Pyrrhotite pseudomorphed by fine pyrite.
5921 NDDH2 333 ft.	Skarn. Relict patches of granular diopside, large prismatic tremolite crystals, euhedral K-feldspar, interstitial coarse calcite.	Variable textures, fabric, medium- to coarse-grained. Relic textures.	Interstitial quartz. Traces of granular sphene. Chlorite.	K-feldspar is unusual in this context, appears to be part of the skarn assemblage.
5922 NDDH2 357 ft.	Diopside Skarn. Dominantly composed of granular interlocking diopside, with interstitial sulphide patches and quartz mosaics.	Medium-grained, random fabric, granular to subhedral textures.	Small scattered tremolite needles. Traces of chlorite.	Very similar to 5919; simple composition and fabric. Sulphides are dominant pyrrhotite, minor pyrite, trace chalcopyrite.
5931 NATONE SULLY SEDIMENT near 1320N	Metasomatized Sediment. Fine silicified tuff extensively pervaded by microgranular diopside, with diopside patches and veins.	Relict textures poorly-preserved, but suggest shards. Finely bedded and faulted.	Fibrous clay patches, veins. Granular sulphides throughout.	Severe alteration precludes accurate interpretation, but available evidence suggests tuffaceous sediment. Sulphides are fresh and altered pyrrhotite .
5932 NATONE S. of 1320N	Metasomatized Sediment. Now composed of fine and coarse scapolite as mosaics, with embedded microgranular diopside.	Sedimentary structures preserved; fine bedding, slumping, folding, microfaulting.	Fine pyrrhotite throughout. Prehnite-diopside veinlets.	Original rock was fine-grained sediment, possibly shale/siltstone, perhaps with carbonate, and tuffaceous lenses.
5933 NATONE (T.S. 40906) of 1320N	Uralitised Dolerite. Small random andesine laths; intersertal and subophitic patches of uraltic hornblende, small Ti-biotite aggregates.	Medium-grained, igneous fabric, typical of dolerites.	Skeletal, primary magnetite throughout.	Fabric suggests minor intrusive, and alteration indicates Palaeozoic rather than Tertiary rock.

APPENDIX 6

Geophysical Models Defining Drill Targets PDH NT1 & PDH NT2 at Natone

Plan D/MQ 04/117



COIL SPACING = 200M
 STATIONS EVERY 25M
 OPERATOR T₁ = Leigh
 OPERATOR R₁ = R. Dury
 IN PHASE ———
 OUT OF PHASE - - - - -

100 Metres

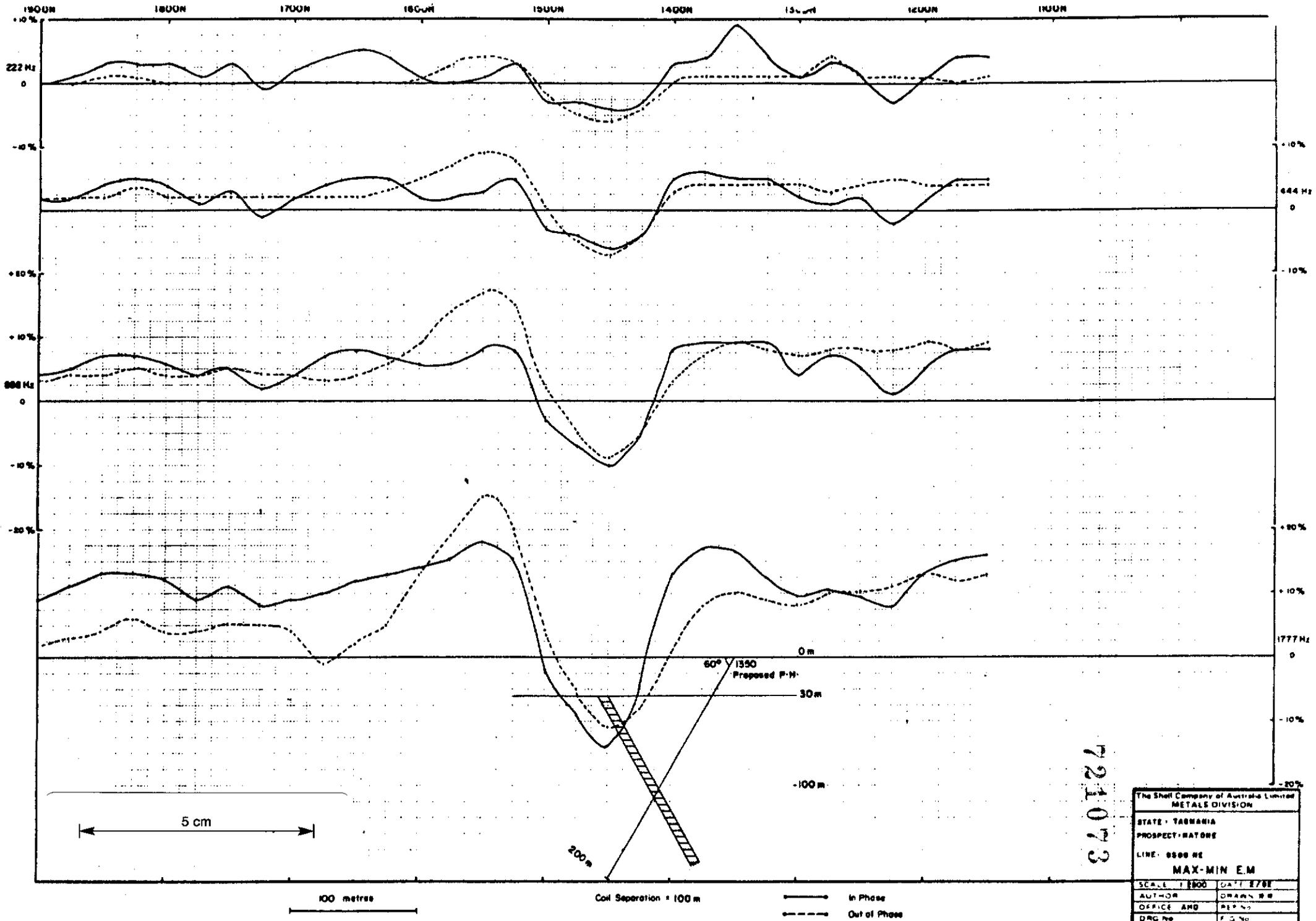
5 cm

721071

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE GRID MAX - MIN E.M. LINE 1250 E (NOT TERRAIN CORRECTED)	
SCALE 1: 2500	DATE 6-7-62
AUTHOR P. RUXTON	DRAWN H. L. H.
OFFICE DEVONPORT	REP No
ORG No D/M006/117	FIG No

Target Modelling PDH NT1
(8500 NE 1350 N)

Max-Min EM
Magnetic, IP & Gravity Modelling
Further Information on Plan D/MQ 04/065

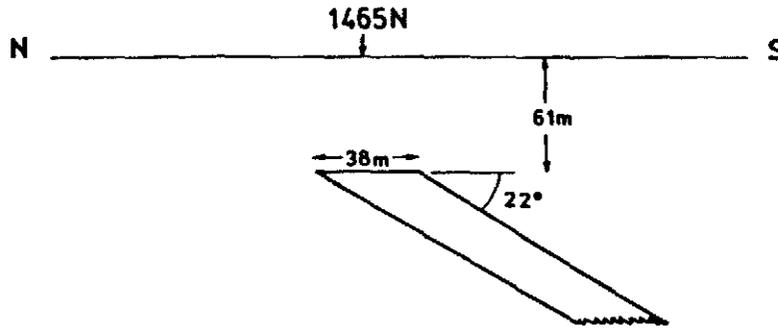


721073

The Shell Company of Australia Limited METALS DIVISION	
STATE - TASMANIA	
PROSPECT - MATONGE	
LINE - 6500 RE	
MAX-MIN E.M.	
SCALE 1:1000	GATE 878E
AUTHOR	DRAWN P.H.
OFFICE AND	REV No
DRG No	F.S. No

MAGMOD MODEL

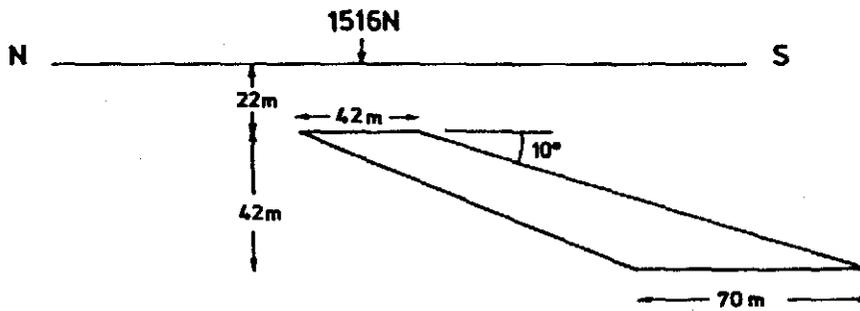
NATONE - 8500E



$K \sim 45,000 \times 10^{-4}$ cgs

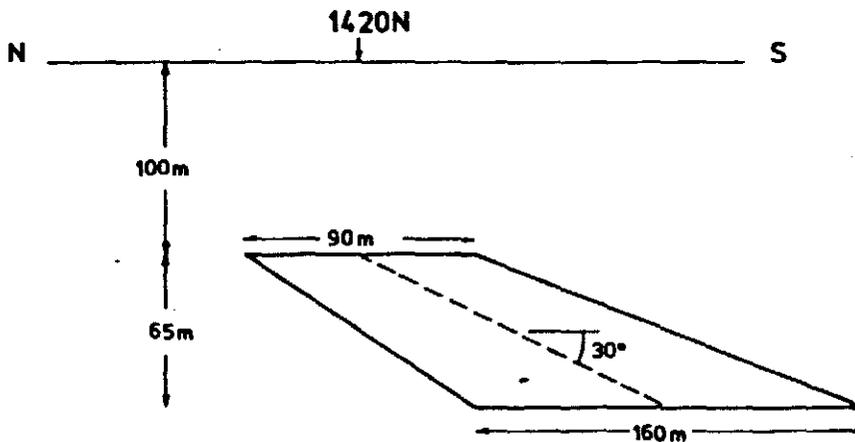
GRAMOD MODELS

SHALLOW SOURCE



DENSITY CONTRAST = 2.9

DEEP SOURCE



DENSITY CONTRAST = 1.5

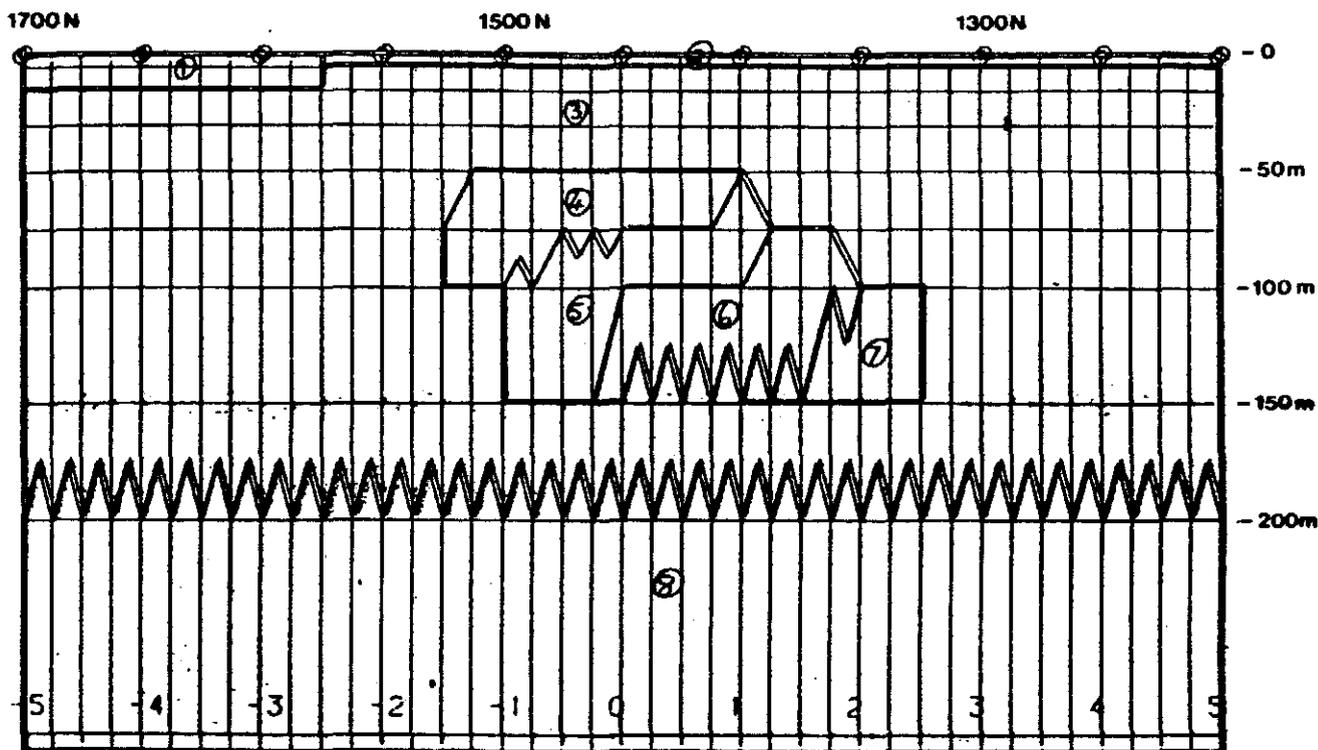
The Shell Company of Australia Limited
METALS DIVISION

NATONE PROSPECT
LINE 8500 E
MAGMOD AND
GRAMOD MODELS

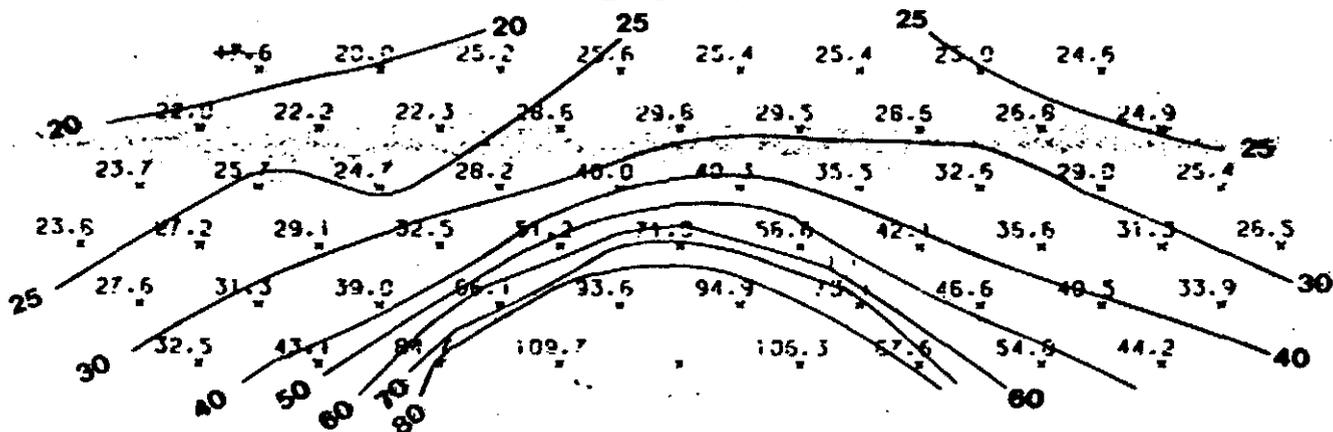
SCALE	DATE Nov 81
AUTHOR G Oates	DRAWN J.C.
OFFICE AMO	REP.No.
DRG.No M004/1004	FIG.No. 2

Fig 3.

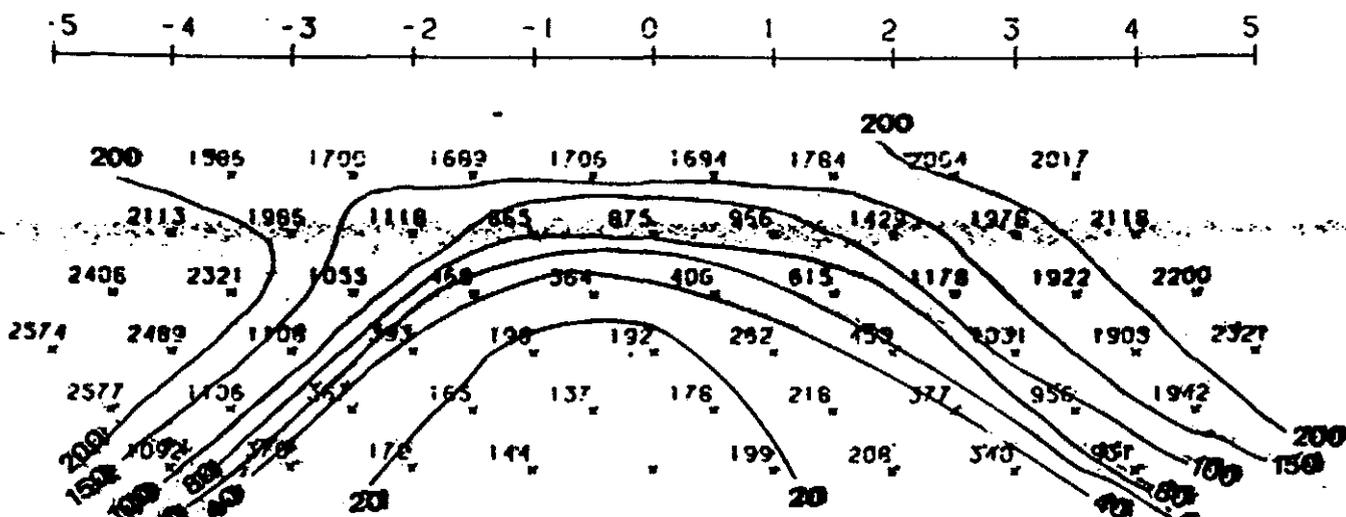
NATONE - 8500 E - IP2D MODEL
 (see fig.4 for key to resistivities and chargeabilities)

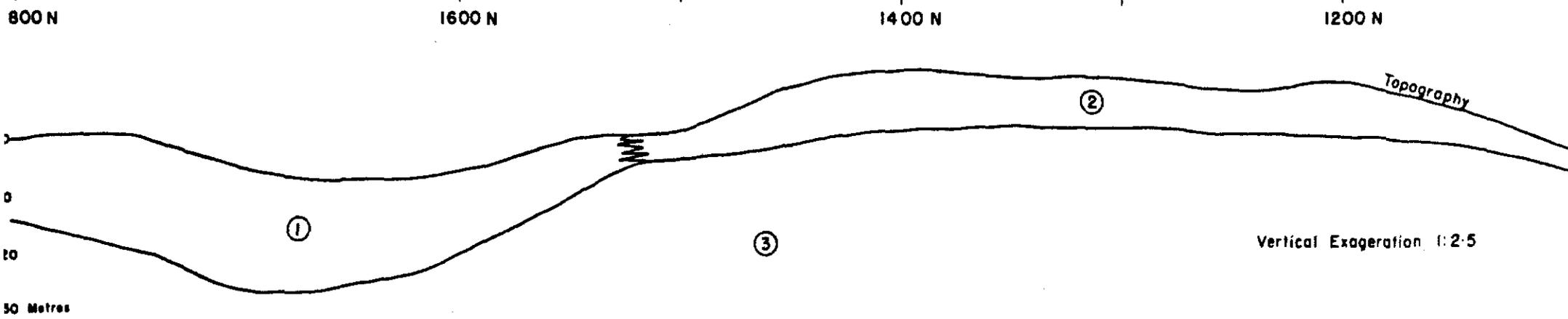


PFE - COMPUTED



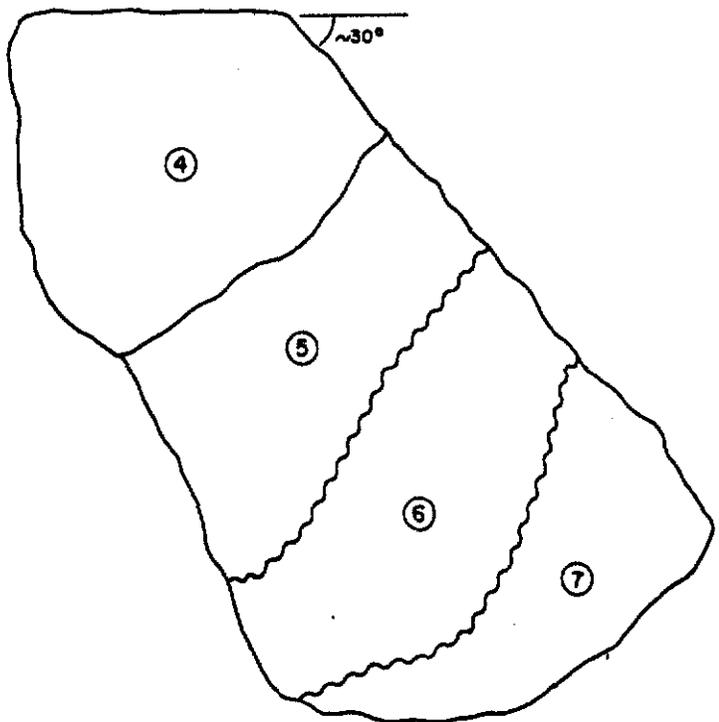
APPARENT RESISTIVITY - COMPUTED





PHYSICAL PROPERTIES

BODY	DENSITY	SUSCEPTIBILITY	RESISTIVITY	CHARGEABILITY
①	~ 2.5	—	~100 Ωm	~10
②	~ 2.5	—	~300 Ωm	~15
③	2.5-3.0	—	~200 Ωm	~25
④	4.0-4.5	45000 x 10 ⁻⁶ cgs	~0.1 Ωm	~400
⑤	4.0-4.5	45000 x 10 ⁻⁶ cgs	~ 2 Ωm	~300
⑥	4.0-4.5	45000 x 10 ⁻⁶ cgs	~ 20 Ωm	~150
⑦	4.0-4.5	45000 x 10 ⁻⁶ cgs	~ 50 Ωm	~150
⑧	2.5-3.0	—	~500 Ωm	~100



5 cm

721076

The Shell Company of Australia Limited
METALS DIVISION

**NATONE PROSPECT
 LINE 8500 E
 INTEGRATED
 INTERPRETATION**

SCALE 1:2500	DATE Nov 81
AUTHOR G Oakes	DRAWN A S.
OFFICE A.H.O.	REP.No

⑧

TARGET MODELLING PDH NT 2

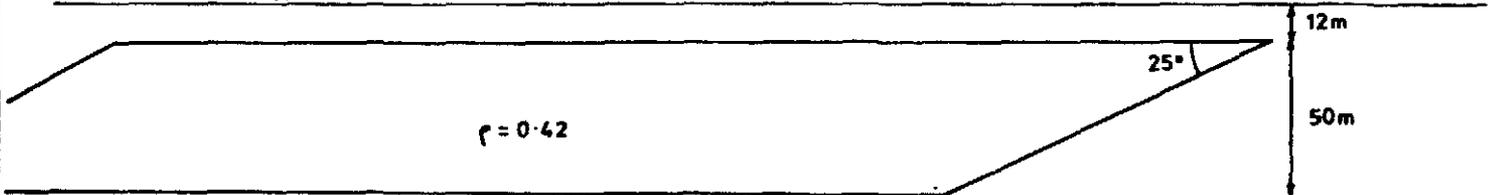
(1750 N 1250 E)

Max-Min EM, Gravity, Magnetic & IP Models
Further Information on Plan D/MQ 04/066

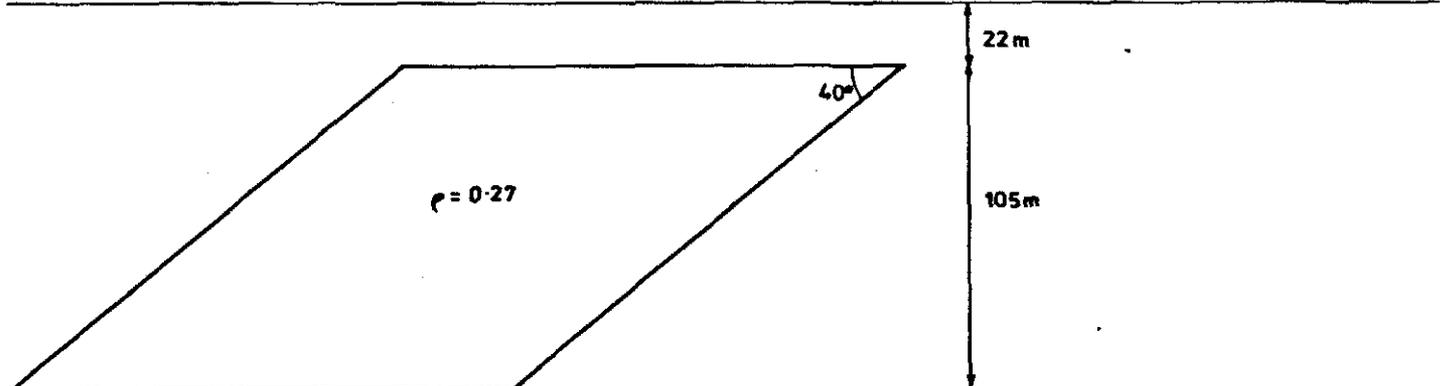
GRAVITY MODELS [by GRAMOD]



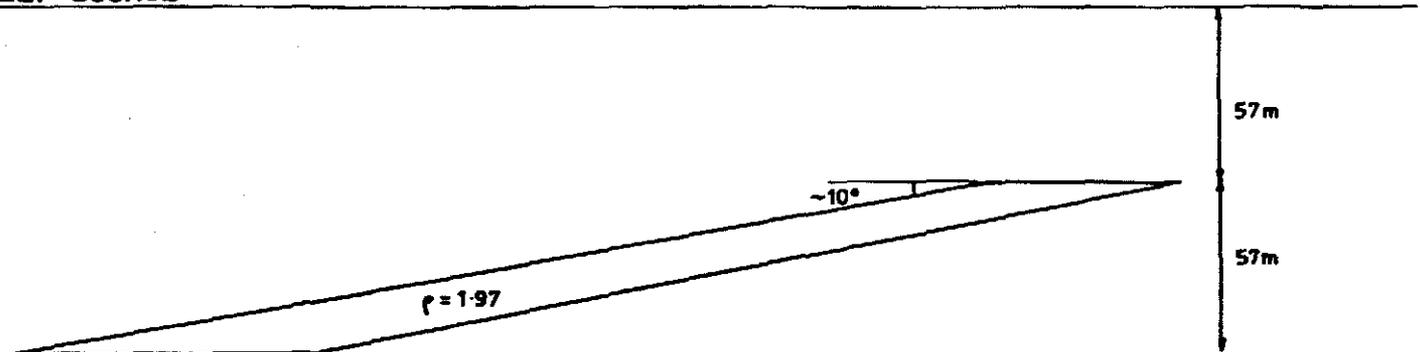
SHALLOW SOURCE A



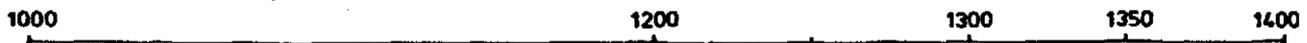
SHALLOW SOURCE B



DEEP SOURCE



MAGNETIC MODEL [by MAGMOD]



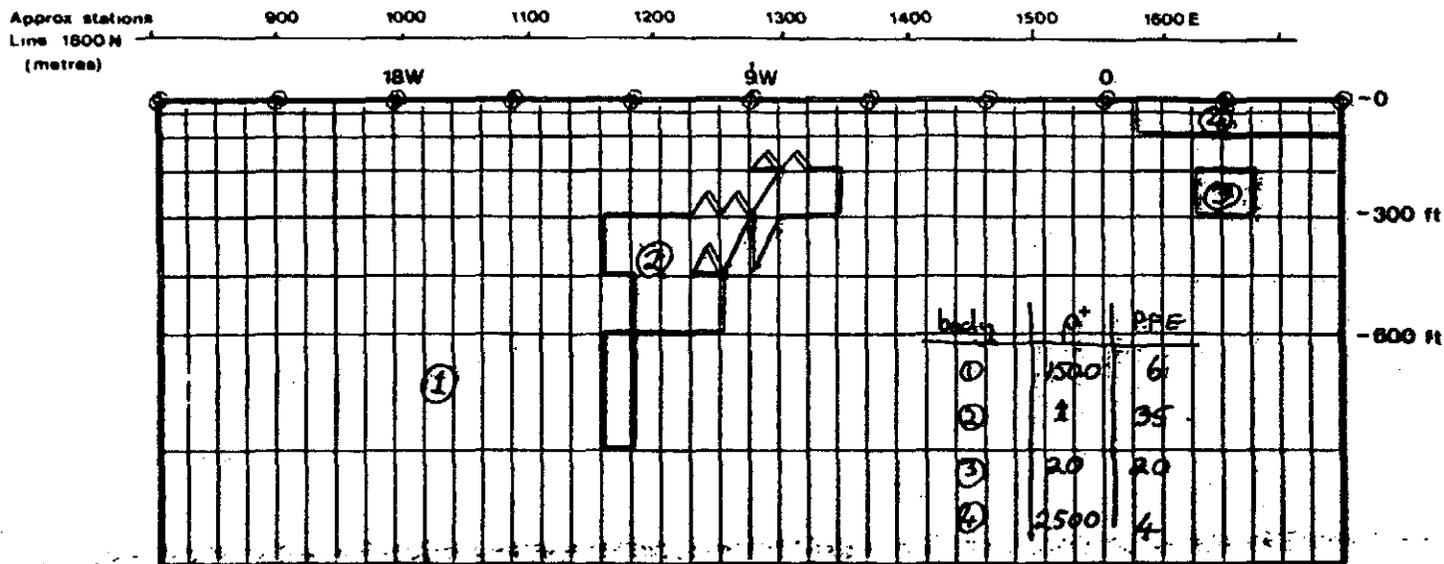
45m

K ~ 350,000 x 10⁻⁴ cgs

The Shell Company of Australia Limited METALS DIVISION	
NATONE PROSPECT LINE 1800 N MAGMOD AND GRAMOD MODELS	
SCALE	DATE Nov 81
AUTHOR G. G. G. G.	DRAWN J.C.
OFFICE AHO	REP.No.
DRG No M004/1003	FIG No. 8

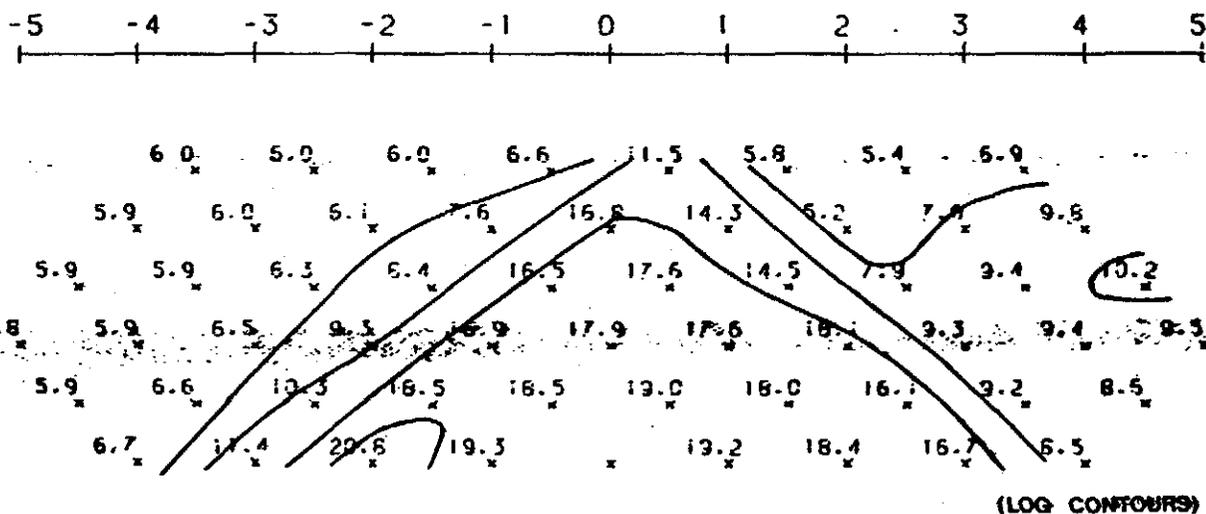
NATONE

Fig. 7(a) : IP2D Model Minops Line 20S
(300' electrode spacing)

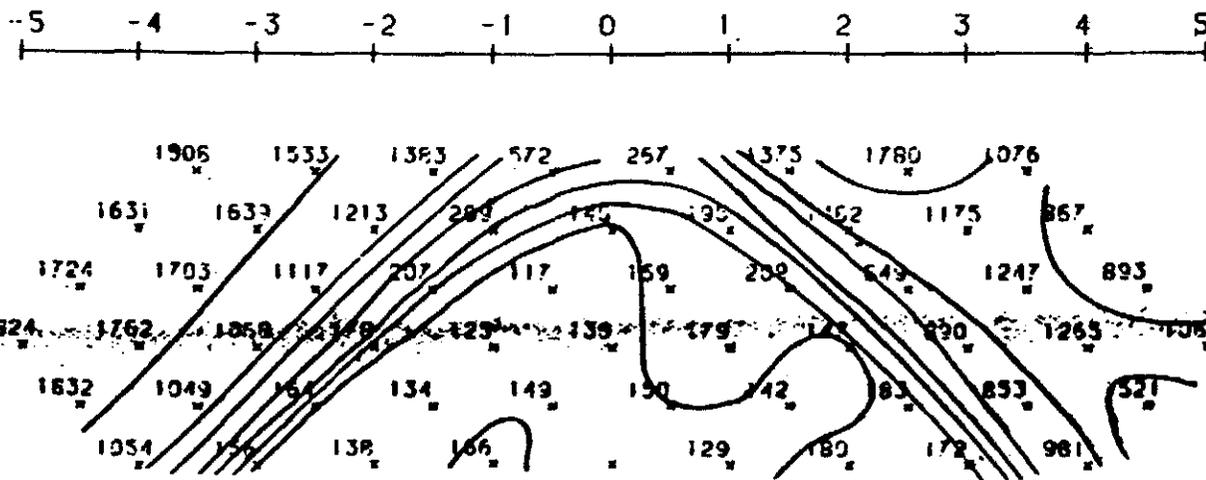


* divide resistivity by 20 to relate to the real world

PFE - COMPUTED



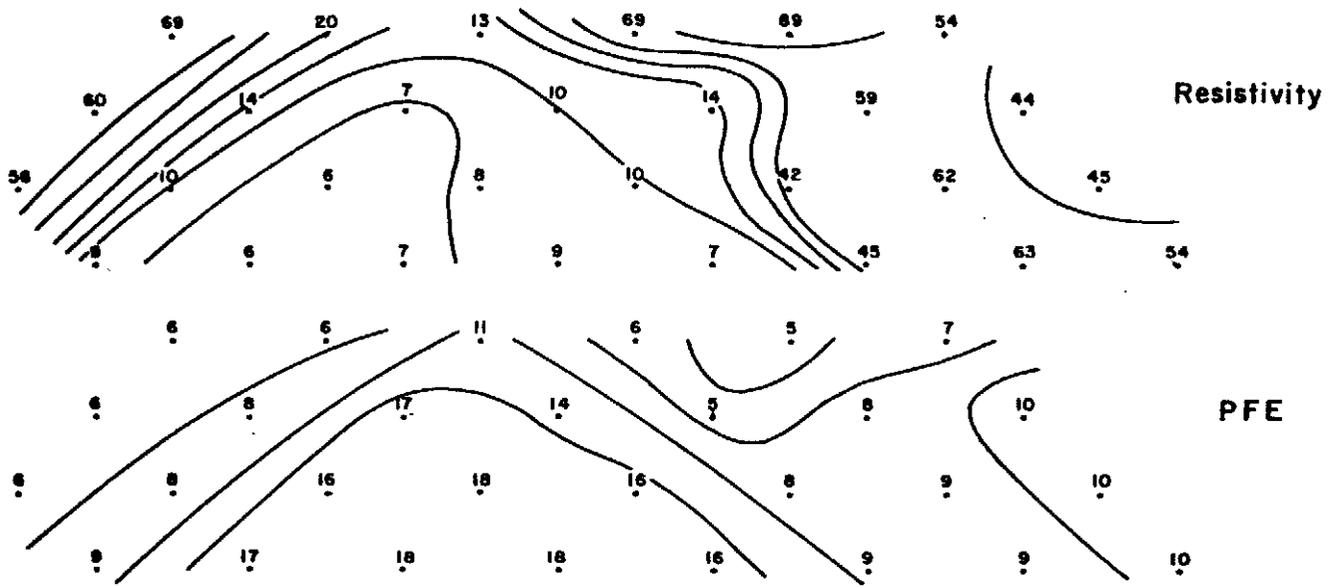
APPARENT RESISTIVITY - COMPUTED



721080

LINE 20 S
(300 ft. spacing)
LOG CONTOURS

MODELLED

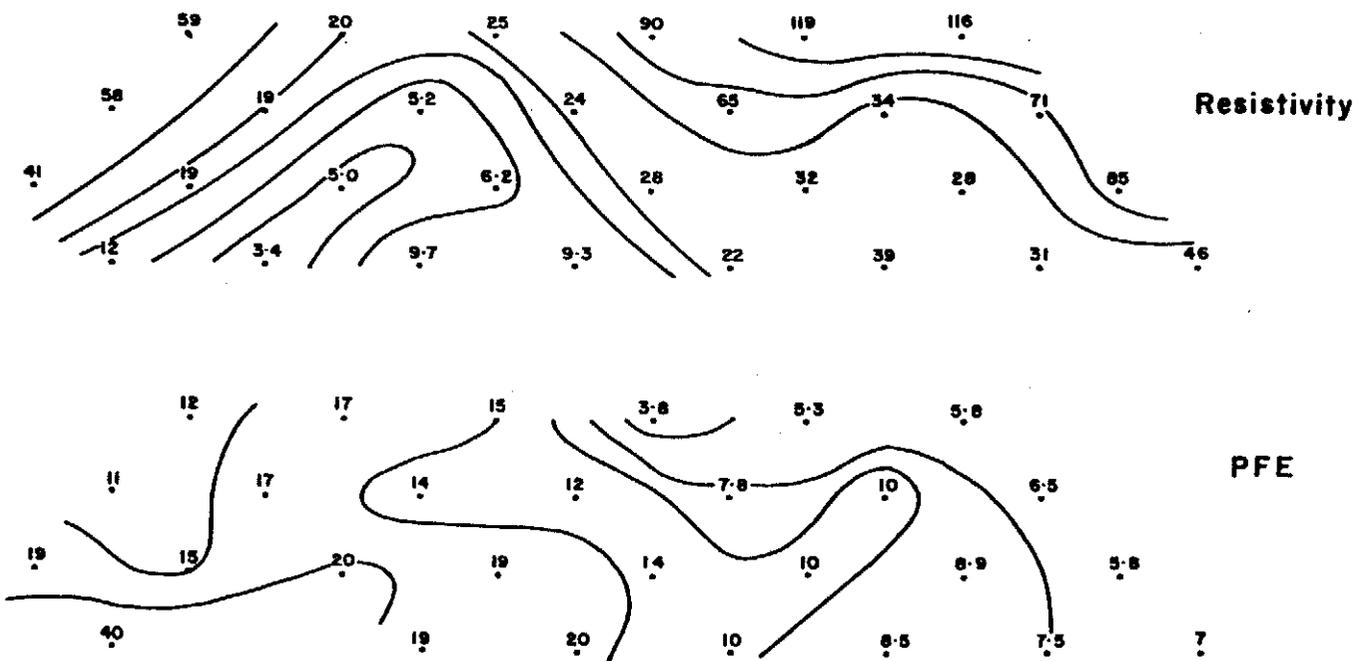


Approx 1200 E (on Line 1800 N)

12 W 9 W 6 W 3 W 0

MINOPS LINE 20 S

OBSERVED



5 cm

The Shell Company of Australia Limited METALS DIVISION	
NATONE PROSPECT LINE 20S COMPARISON OF MODELLED AND MINOPS IP RESULTS	
SCALE 1:13700	DATE Nov 81
AUTHOR S Ochoa	DRAWN AS
OFFICE AHO	REP.No.
DRG No M004/1008 FIG.No. 7(b)	

APPENDIX 7

VLF, EM Traverses on Lines 3000N, 2800N, 2600N, 2400N & 2100N, Natone

For lines 8500NE, 1800N & 2700N see Plans D/MQ 04/065, 066 & 107

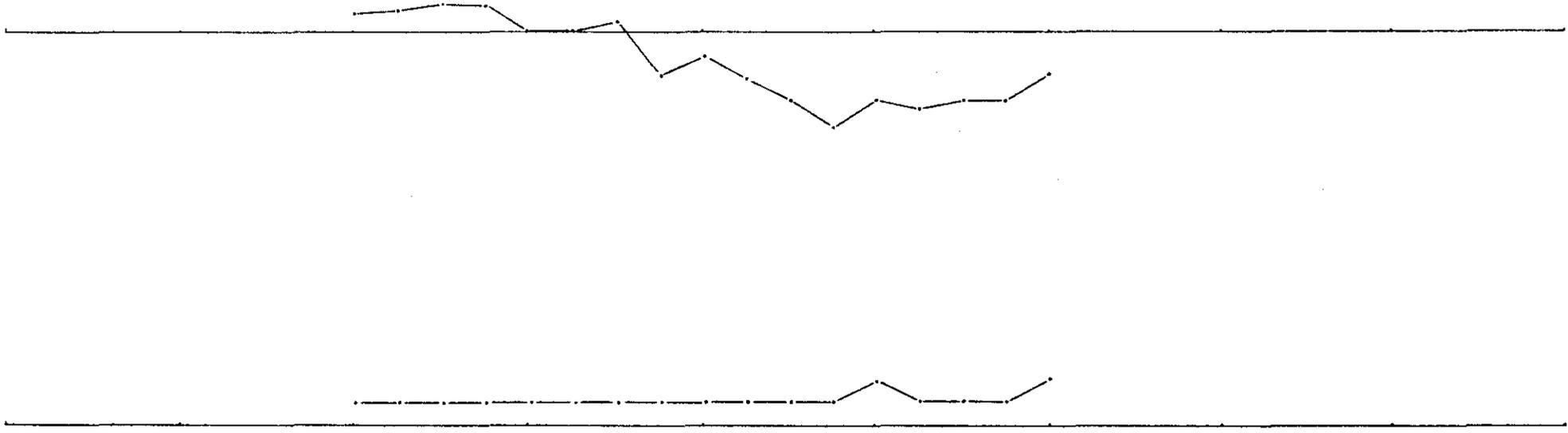
600 E 700 E 800 E 900 E 1000 E 1100 E 1200 E 1300 E 1400 E 1500 E

DIP°

+ 30
+ 20
+ 10
0
- 10
- 20
- 30

LEVEL %

+ 150
+ 100
+ 50



DIP CONVENTION +ve FOR A NORTHERN DIP
-ve FOR A SOUTHERN DIP

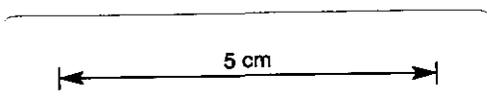
0 50 100 150 M

721082

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
NATONE V.L.F.
STATION NW. CAPE
LINE 3000 N

SCALE	1:2500	DATE	22-2-62
AUTHOR	F. NURTON	DRAWN	N. L. N.
OFFICE	DEVONPORT	REP No.	
DRG. No.	DV8006/112	FIG. No.	



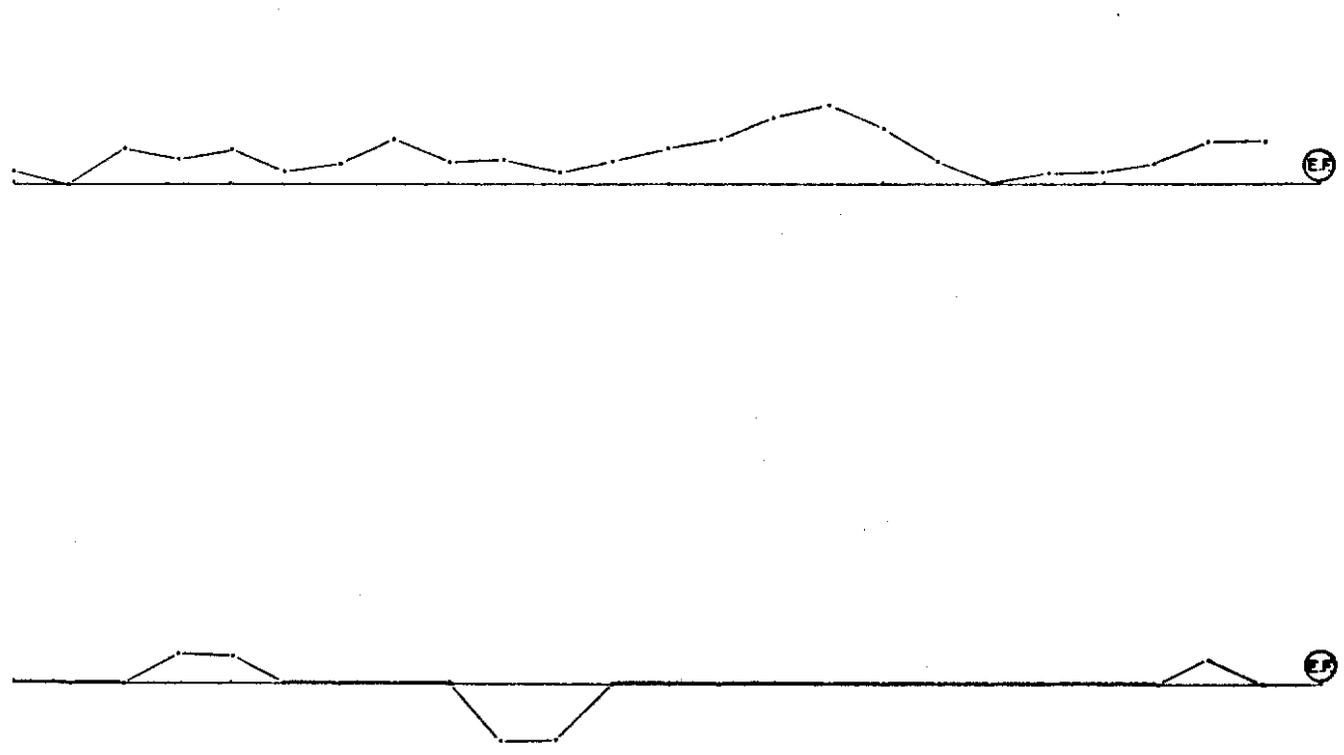
800 E 900 E 1000 E 1100 E 1200 E 1300 E 1400 E

DIP°

+30
+20
+10
0
-10
-20
-30

LEVEL %

+150
+100
+50



DIP CONVENTION +ve FOR A NORTHERN DIP
-ve FOR A SOUTHERN DIP

721083

0 50 100 150 M

The Shell Company of Australia Limited
METALS DIVISION

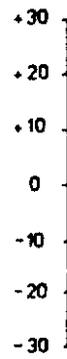
E.L. 8/77 RIANA
NATONE V.L.F.
STATION N.W. CAPE
LINE 2800N

5 cm

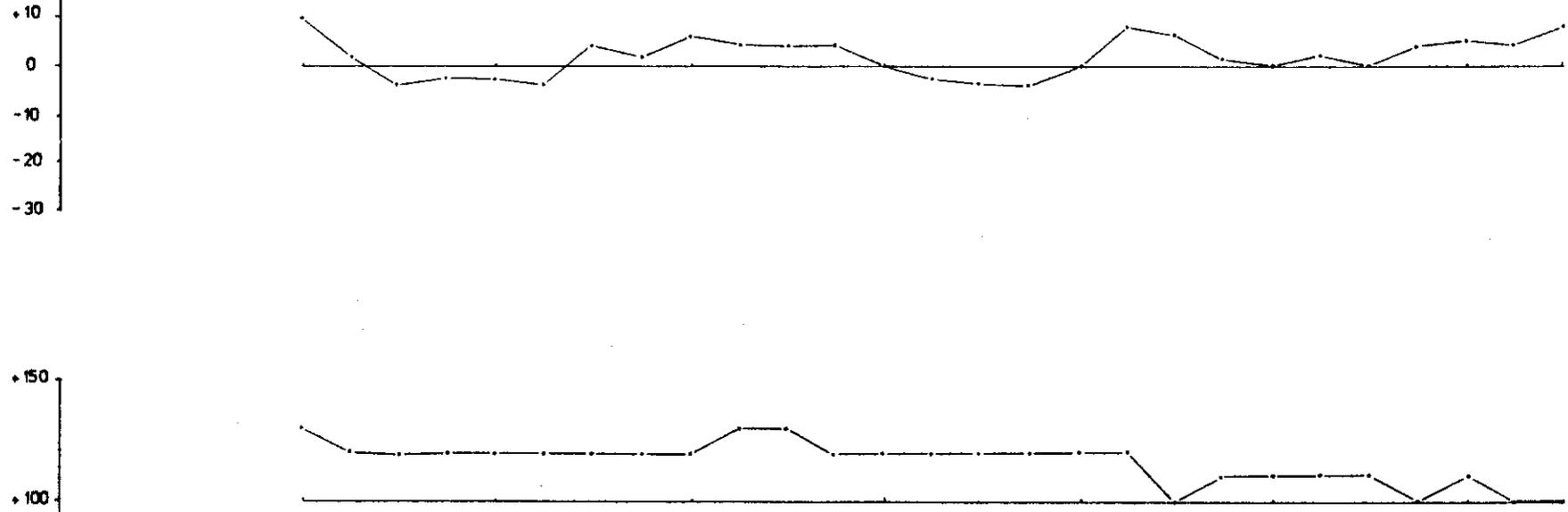
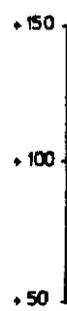
SCALE	1:2500	DATE	22-2-82
AUTHOR	P. RUSTON	DRAWN	H. L. M.
OFFICE	DEVONPORT	REP No.	
DRG No.	D/MQ06/18	FIG No.	

800 E 900 E 1000 E 1100 E 1200 E 1300 E 1400 E

DIP °



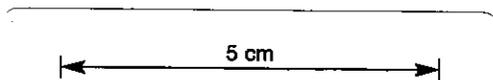
LEVEL %



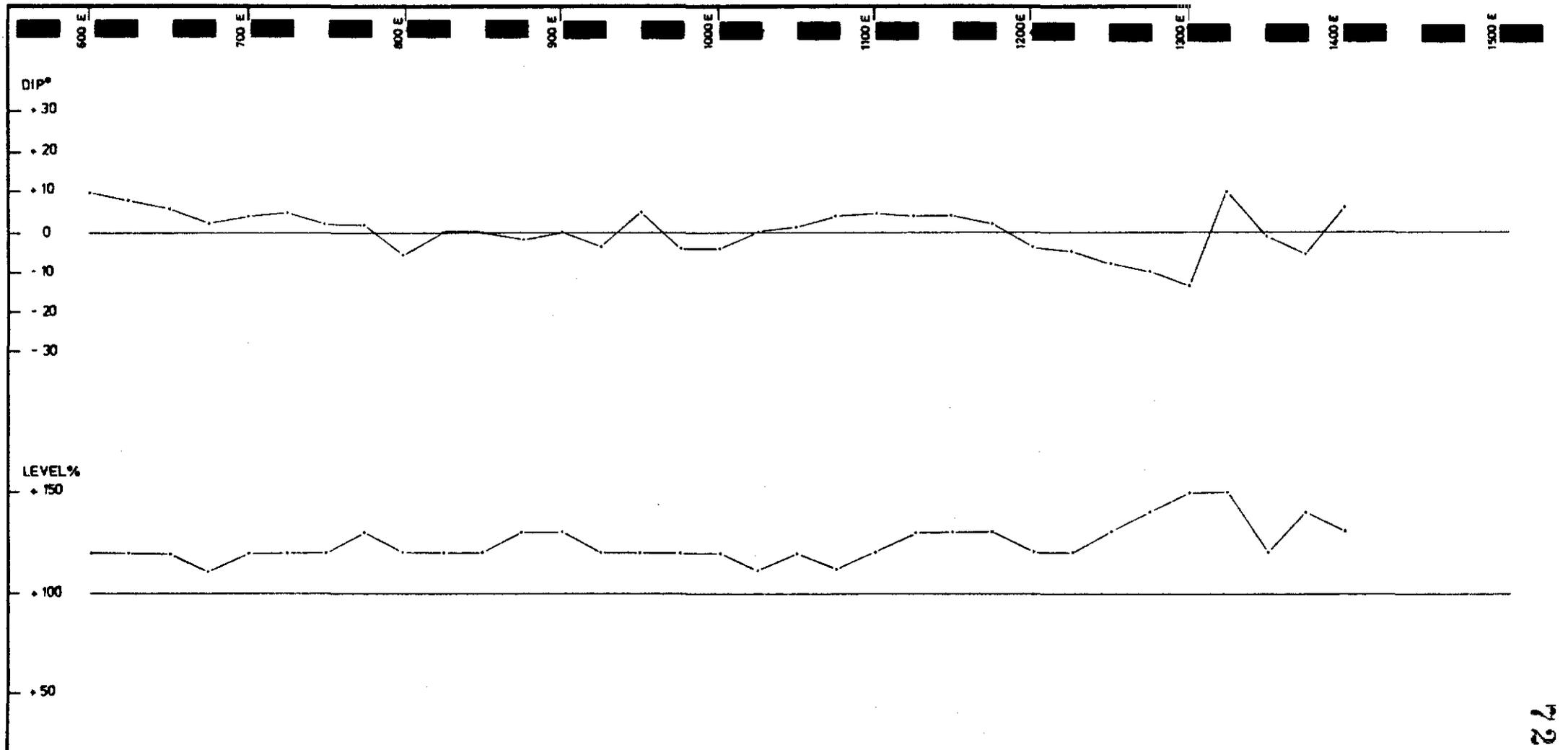
DIP CONVENTION +ve FOR NORTHERN DIP
-ve FOR SOUTHERN DIP

721084

0 50 100 150 M



The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE V.L.F. STATION N.W. CAPE LINE 2600 N	
SCALE 1:2500	DATE 22-2-82
AUTHOR P. BURTON	DRAWN M.L.H.
OFFICE DEVONPORT	REF No.
DRG No. D/M2004/774	FIG No.



DIP CONVENTION +ve FOR NORTHERN DIP
-ve FOR SOUTHERN DIP

0 50 100 150

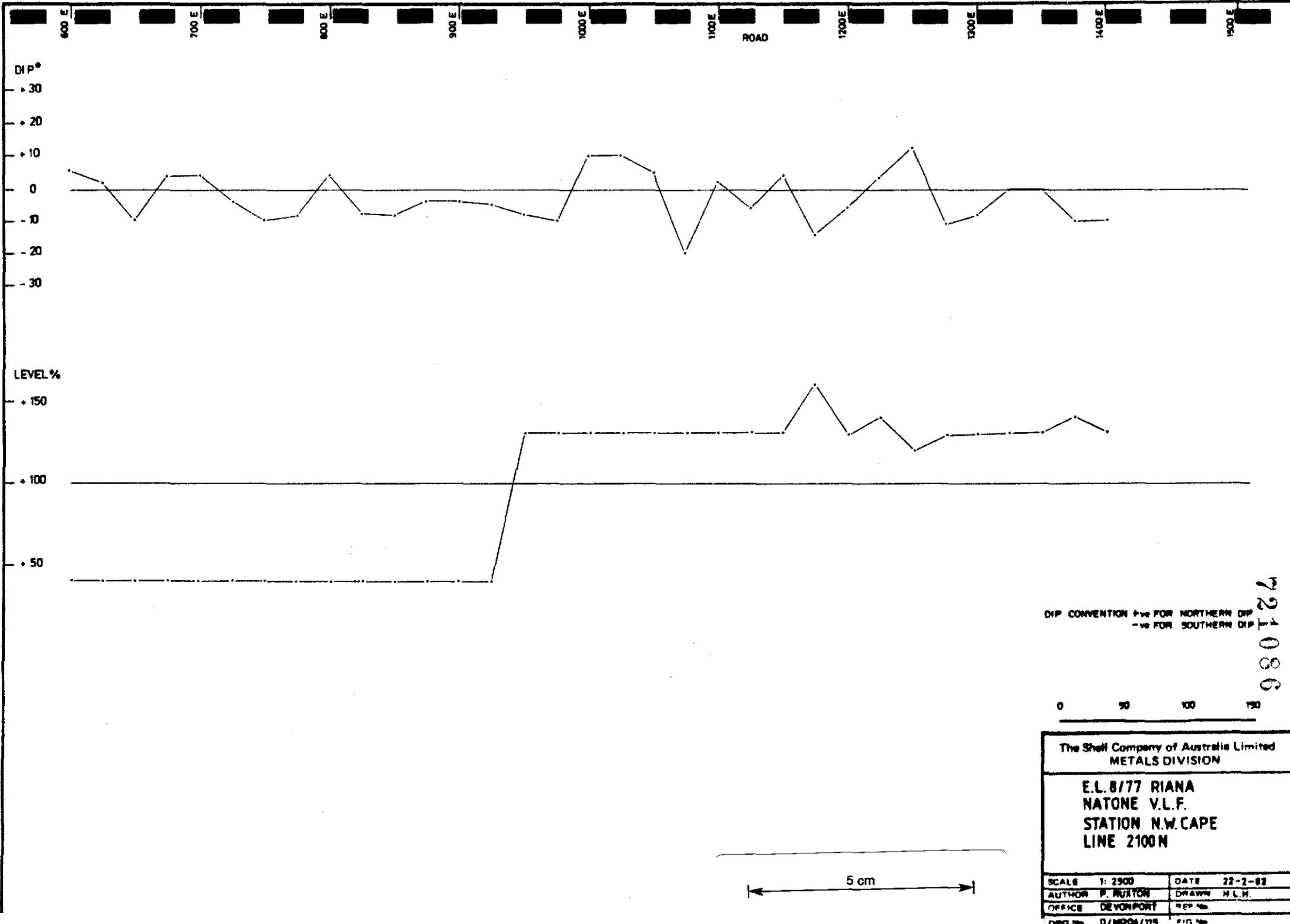
721085

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
NATONE V.L.F.
STATION N.W. CAPE
LINE 2400 N

5 cm

SCALE	1: 2500	DATE	22-2-67
AUTHOR	P. RUXTON	DRAWN	M.L.H.
OFFICE	DEVONPORT	REP No	
DRG. No	D/MQ04/718	FIG No	



DIP CONVENTION +ve FOR NORTHERN DIP
 -ve FOR SOUTHERN DIP

721086

0 50 100 150

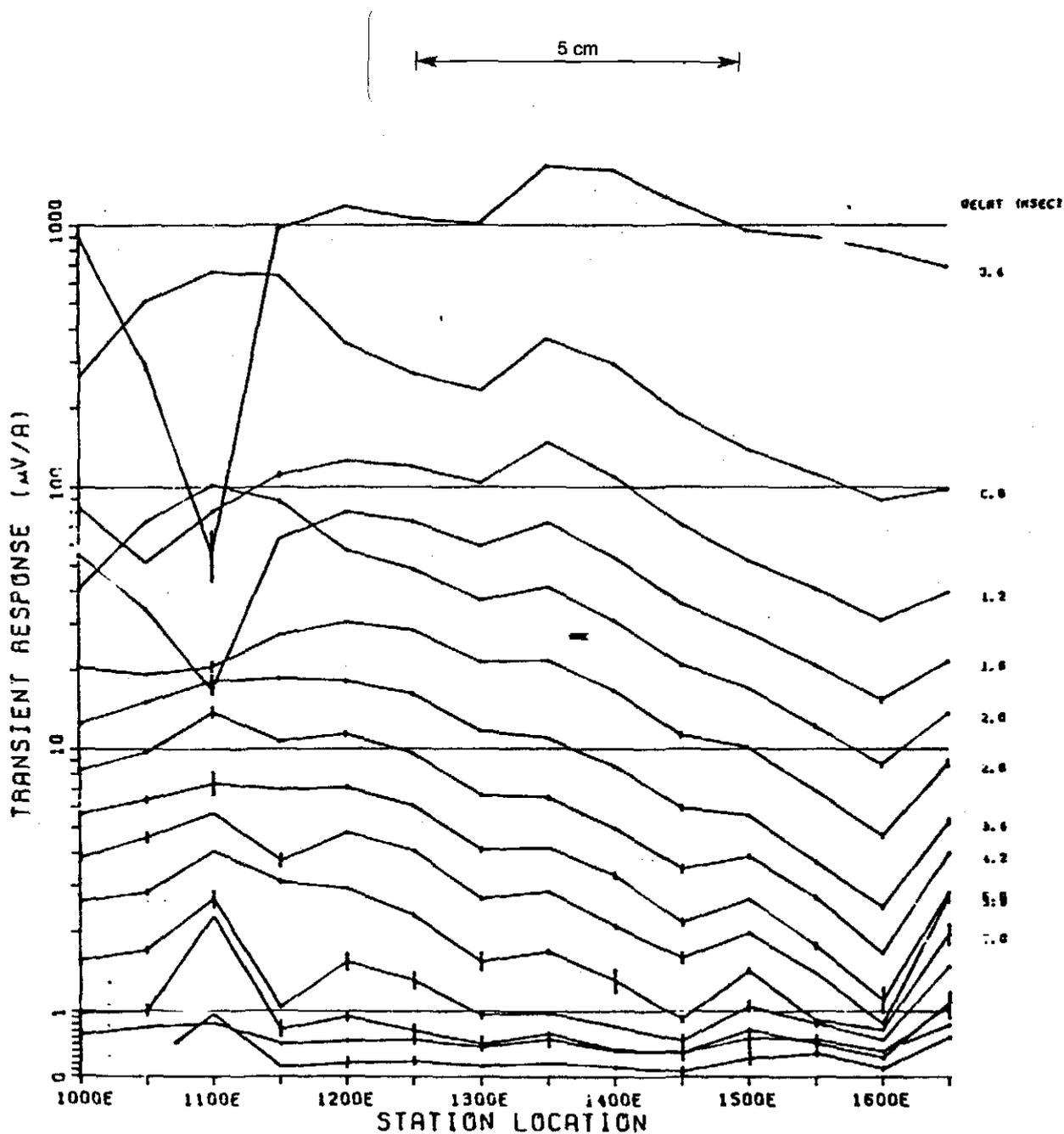
The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE V.L.F. STATION N.W. CAPE LINE 2100 M	
SCALE 1: 2500	DATE 22-2-82
AUTHOR P. NUTON	DRAWN H.L.H.
OFFICE DEVONPORT	REP No.
DRG. No. D/M004/115	FIG No.

5 cm

APPENDIX 8

Experimental Sirotem TEM Results
from lines 1800N, 8500NE & 2500N, 2600N, 2700N & 2800N
plus downhole logging of PDH NT1, Natone

Survey completed by Geox for the Shell Co. of Australia Ltd.

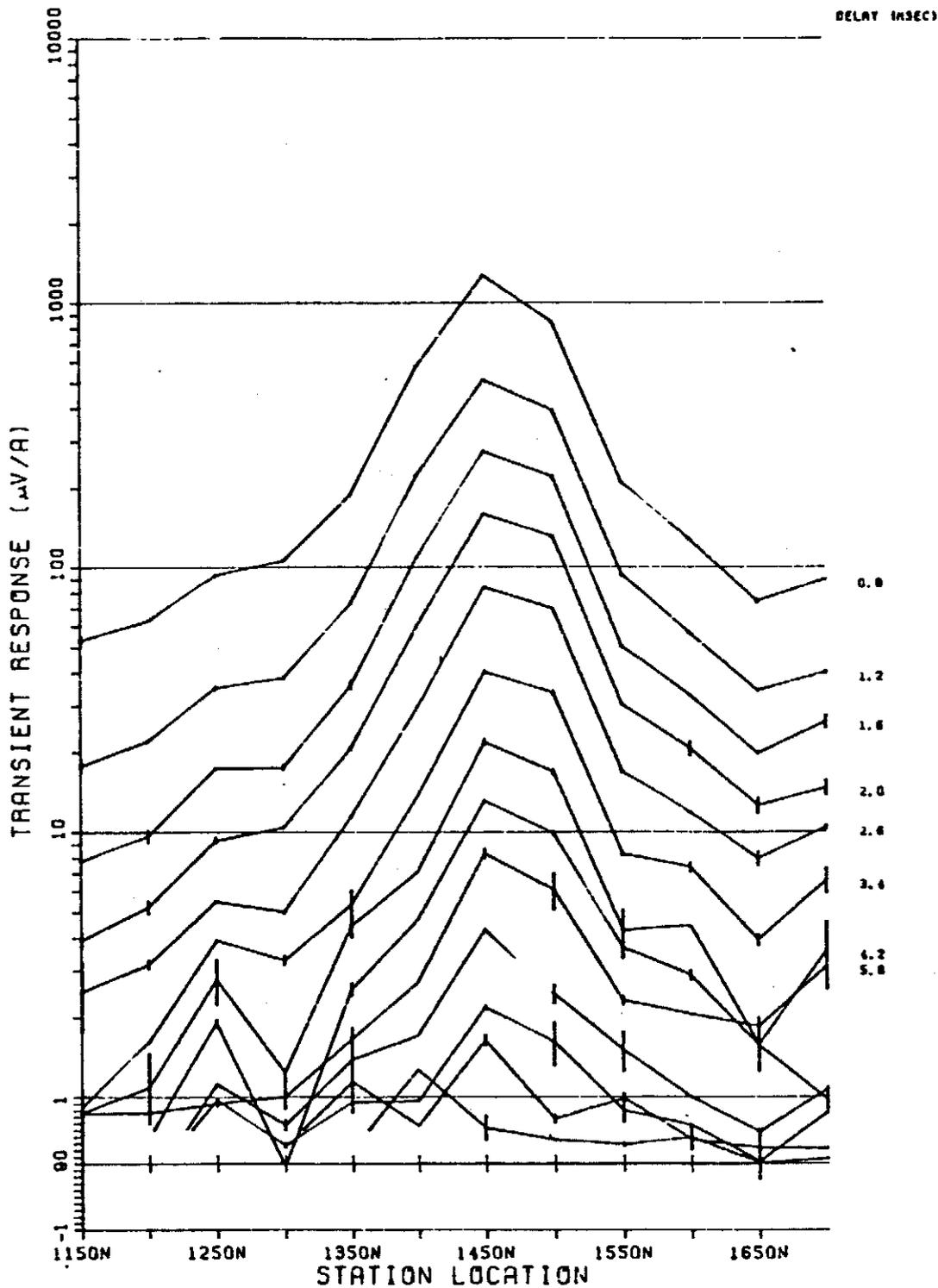
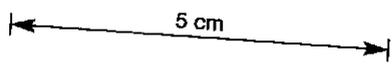


INSTRUMENT :SIATEM
 CONFIGURATION:100M SQUARE TRANSMITTER LOOP.
 IN LOOP RECIEVER
 READING INTERVAL 50M

SCALE: 1:5000
 DATE : 19/4/82
 MAP : BURNIE, TAS.

HELL MINERALS EXPLORATION (AUST.) PTY. LTD.
 TRANSIENT E.M. PROFILE

GEOEX

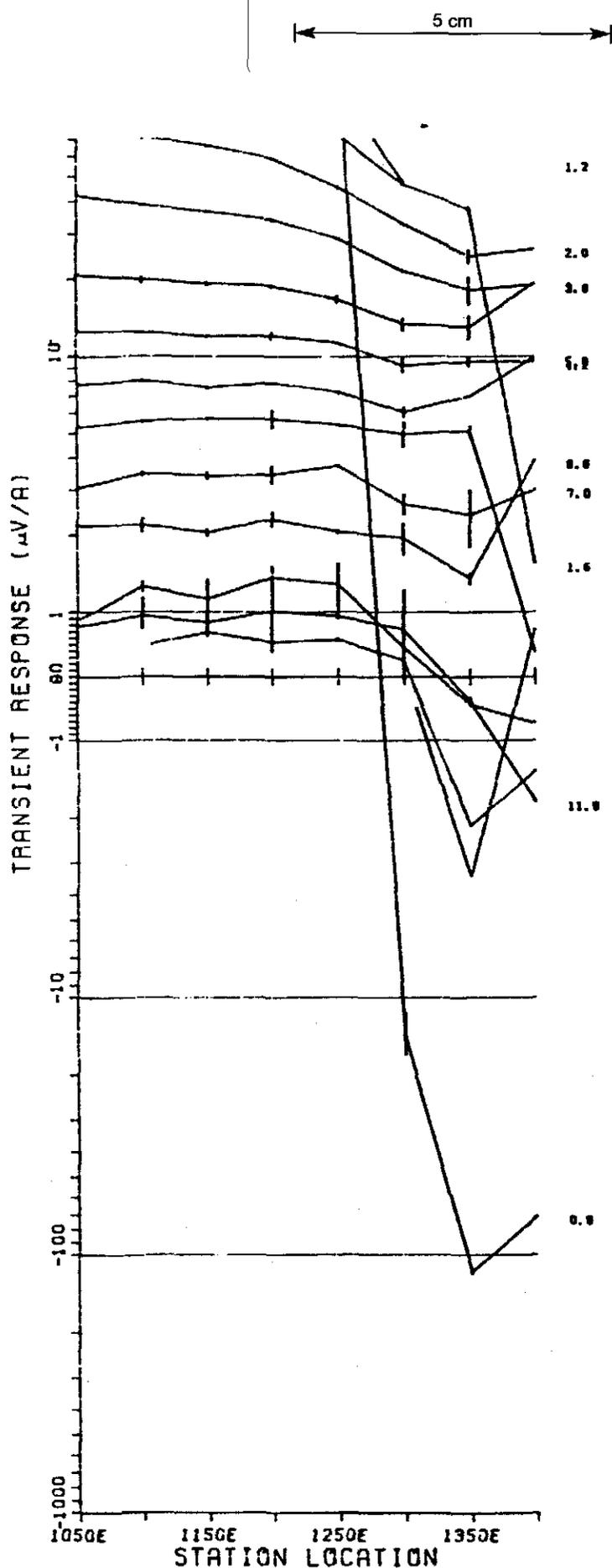


INSTRUMENT : SIROTEM
 CONFIGURATION : 100M SQUARE TRANSMITTER LOOP,
 IN LOOP RECEIVER
 READING INTERVAL 50M

SCALE : 1:5000
 DATE : 1/5/82
 MAP : BURNIE, TAS.

ELL MINERALS EXPLORATION (AUST.) PTY. LTD.
 TRANSIENT E.M. PROFILE



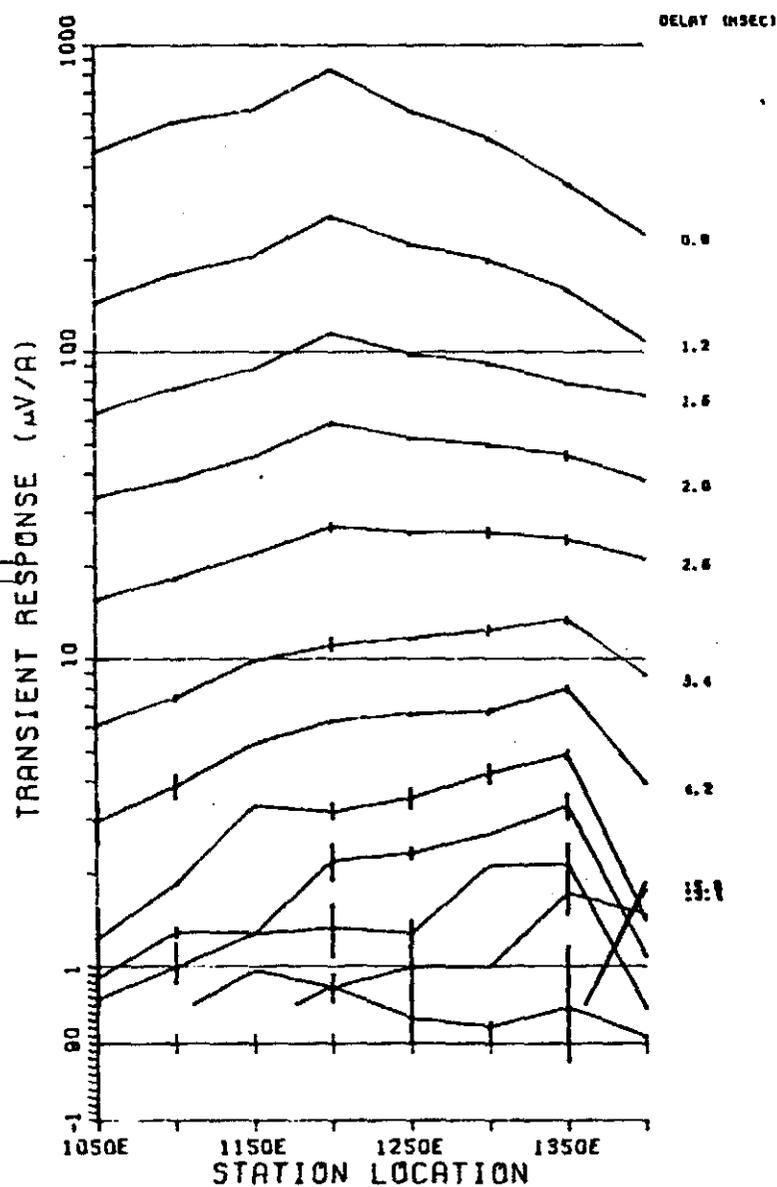
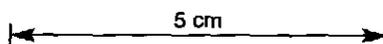


INSTRUMENT : SIADTEM
 CONFIGURATION : 100M SQUARE TRANSMITTER LOOP.
 TURAM MODE (AVR) SURVEY
 READING INTERVAL 50M

SCALE : 1:5000
 DATE : 2/5/82
 MAP : BURNIE, TAS.

MINERALS EXPLORATION (AUST.) PTY. LTD.
 TRANSIENT E M PROFILE

GEOEX

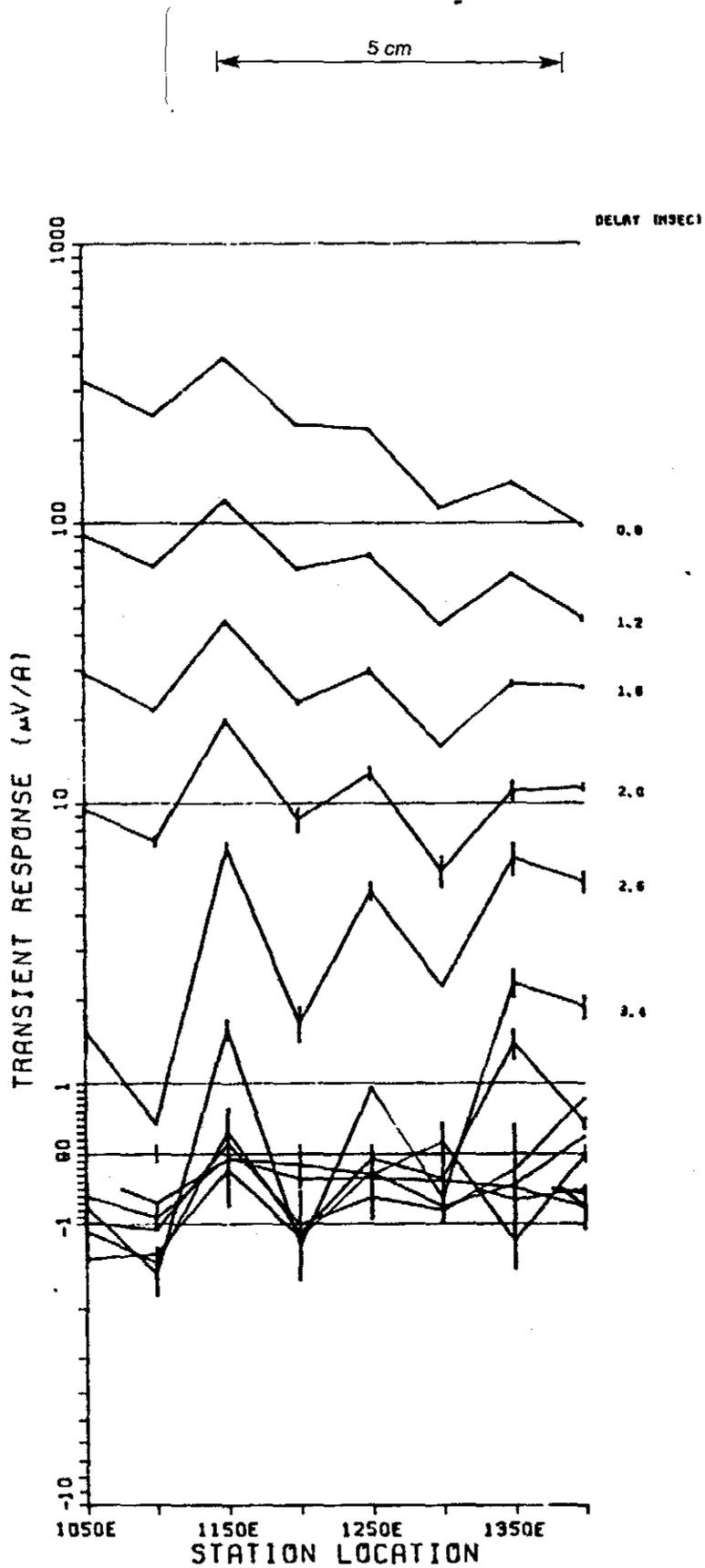


INSTRUMENT : SIROTEM
 CONFIGURATION : 100M SQUARE TRANSMITTER LOOP,
 TURAM MODE (AVA) SURVEY
 READING INTERVAL 50M

SCALE : 1:5000
 DATE : 2/5/82
 MAP : BURNIE, TAS.

ELL MINERALS EXPLORATION (AUST.) PTY. LTD.
 TRANSIENT E.M. PROFILE

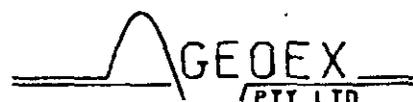




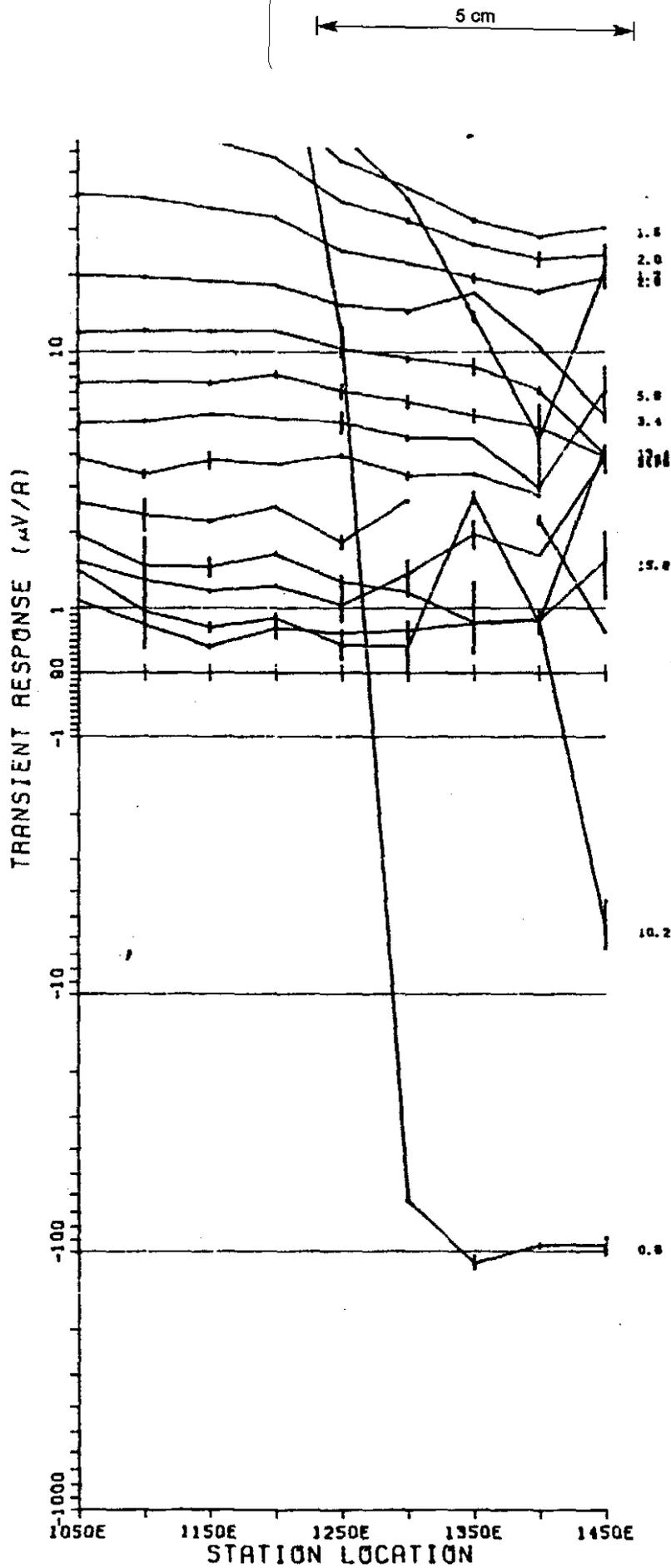
INSTRUMENT : SIROTEM
 CONFIGURATION: 100M SQUARE TRANSMITTER LOOP,
 TURAM MODE (AVR) SURVEY
 READING INTERVAL 50M

SCALE: 1:5000
 DATE: 2/5/82
 MAP: BURNIE, TAS.

HELL MINERALS EXPLORATION (AUST.) PTY. LTD.
 TRANSIENT E.M. PROFILE



721093



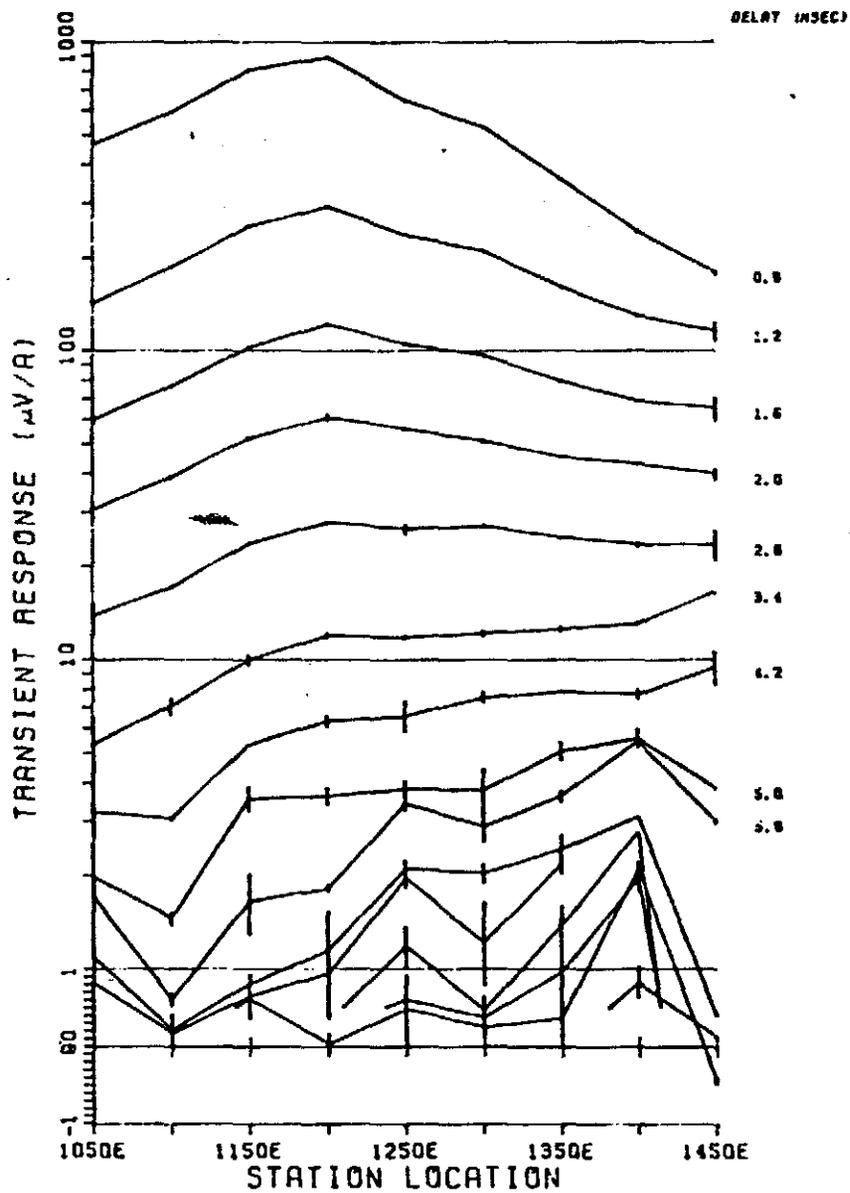
INSTRUMENT :SIRTEM
CONFIGURATION:100M SQUARE TRANSMITTER LOOP,
TURAN MODE (AVR) SURVEY
READING INTERVAL 50M

SCALE: 1:5000
DATE : 2/5/82
MAP : BURNIE, TAS.

MINERALS EXPLORATION (AUST.) PTY. LTD.
TRANSIENT E.M. PROFILE

GEOEX
PTY LTD

5 cm

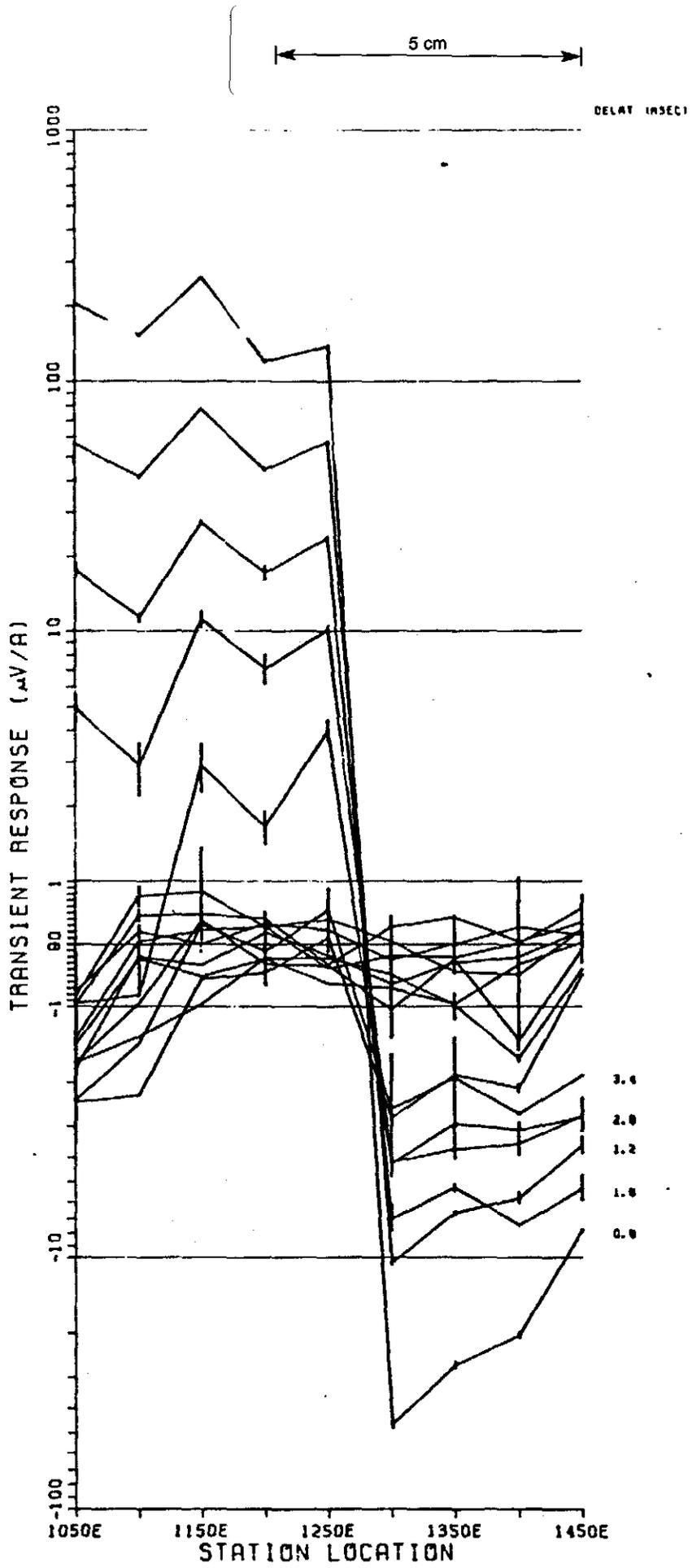


INSTRUMENT : SIROTEM
 CONFIGURATION : 100M SQUARE TRANSMITTER LOOP,
 TURAM MODE (AVR) SURVEY
 READING INTERVAL 50M

SCALE : 1:5000
 DATE : 2/5/82
 MAP : BURNIE, TAS.

MINERALS EXPLORATION (AUST.) PTY. LTD.
 TRANSIENT E.M. PROFILE





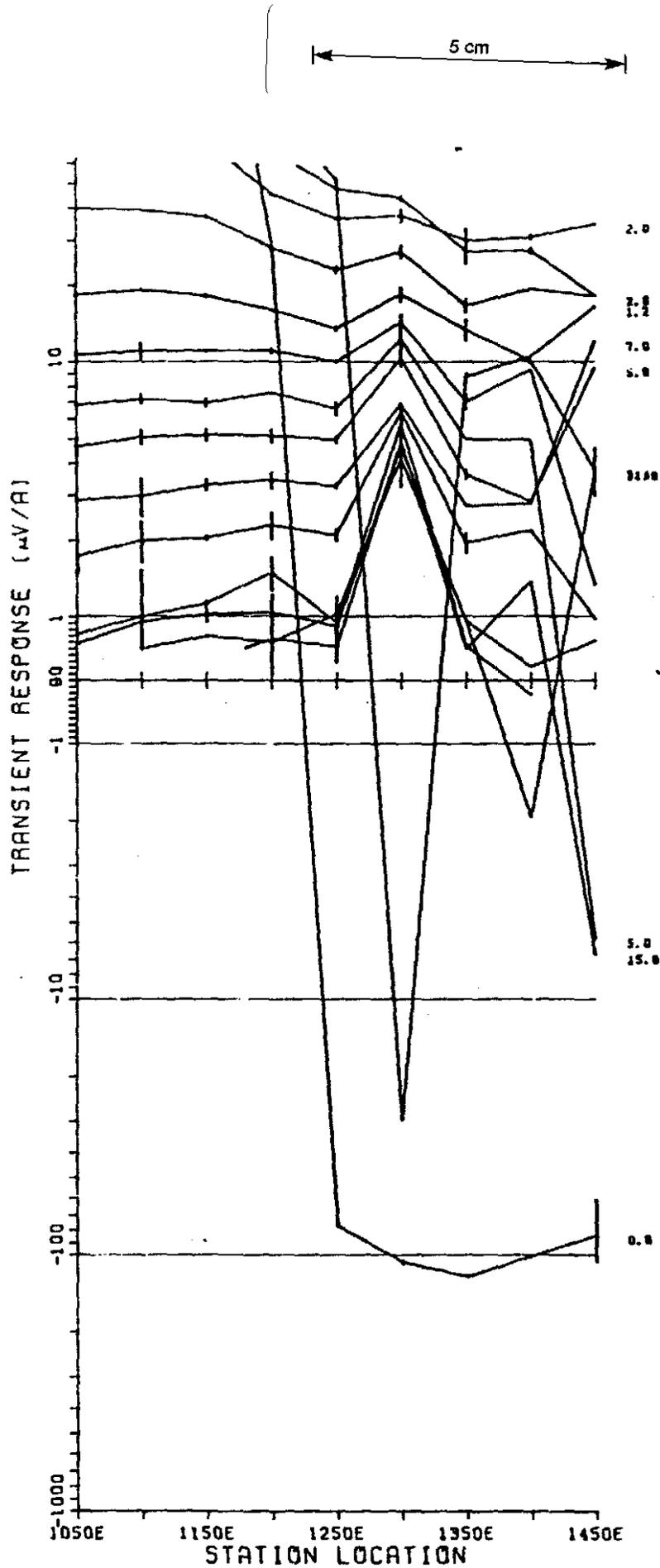
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 CONFIGURATION : 100M SQUARE TRANSMITTER LOOP.
 TURAM MODE (AVR) SURVEY
 READING INTERVAL 50M

SCALE : 1:5000
 DATE : 2/5/82
 MAP : BURNIE, TAS.

HILL MINERALS EXPLORATION (AUST.) PTY. LTD.
 TRANSIENT E.M. PROFILE



721096

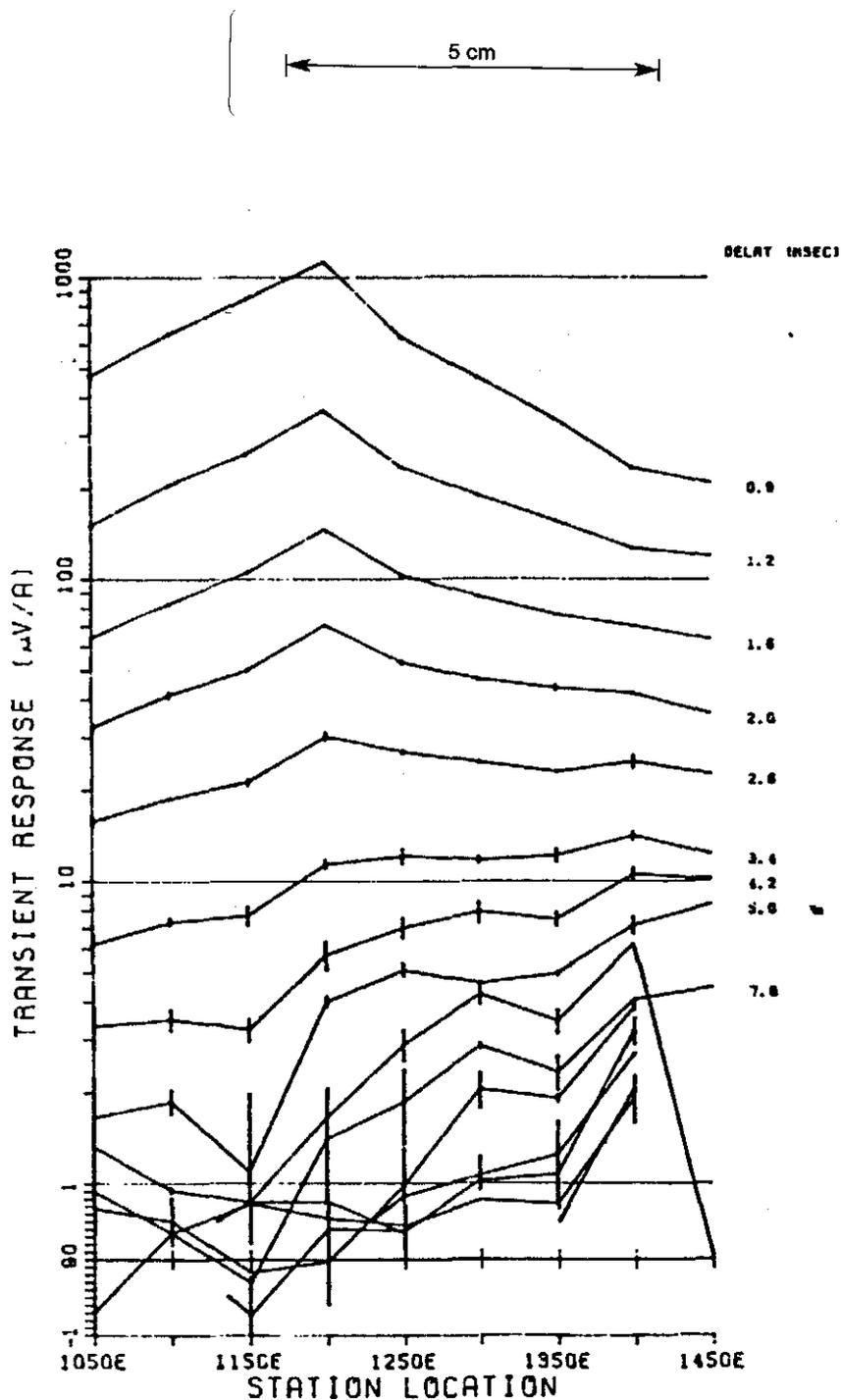


INSTRUMENT : SIADTEM
CONFIGURATION : 100M SQUARE TRANSMITTER LOOP.
TURAM MODE (AVR) SURVEY
READING INTERVAL 50M

SCALE : 1:5000
DATE : 2/5/82
MAP : BURNIE, TAS.

SHELL MINERALS EXPLORATION (AUST.) PTY. LTD.
TRANSIENT E.M. PROFILE

 **GEOEX**
PTY LTD



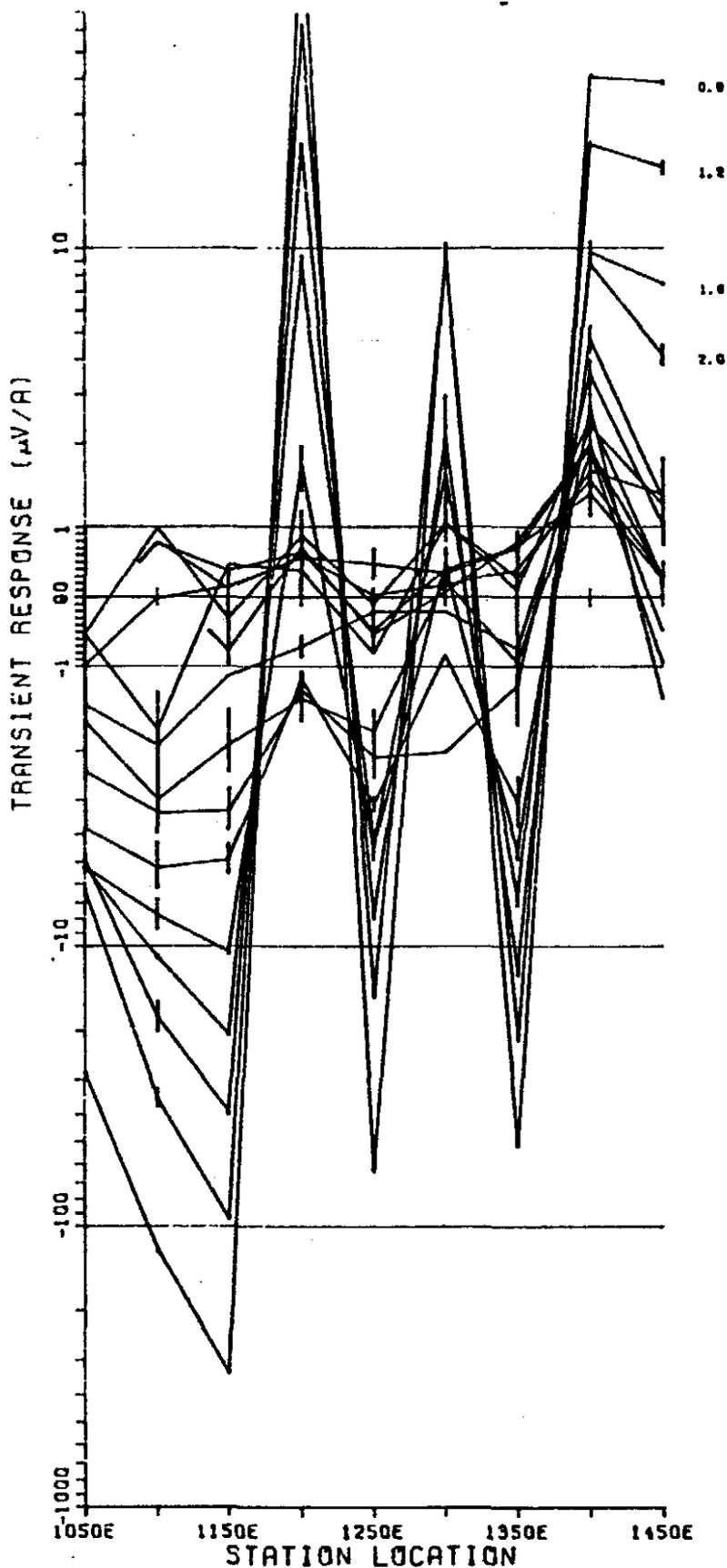
INSTRUMENT : SIROTEM
 CONFIGURATION : 100M SQUARE TRANSMITTER LOOP,
 TURAM MODE (RV/A) SURVEY
 READING INTERVAL 50M

SCALE : 1:5000
 DATE : 2/5/82
 MAP : BURNIE, TAS.

MINERALS EXPLORATION (AUST.) PTY. LTD.
 TRANSIENT E.M. PROFILE



721098

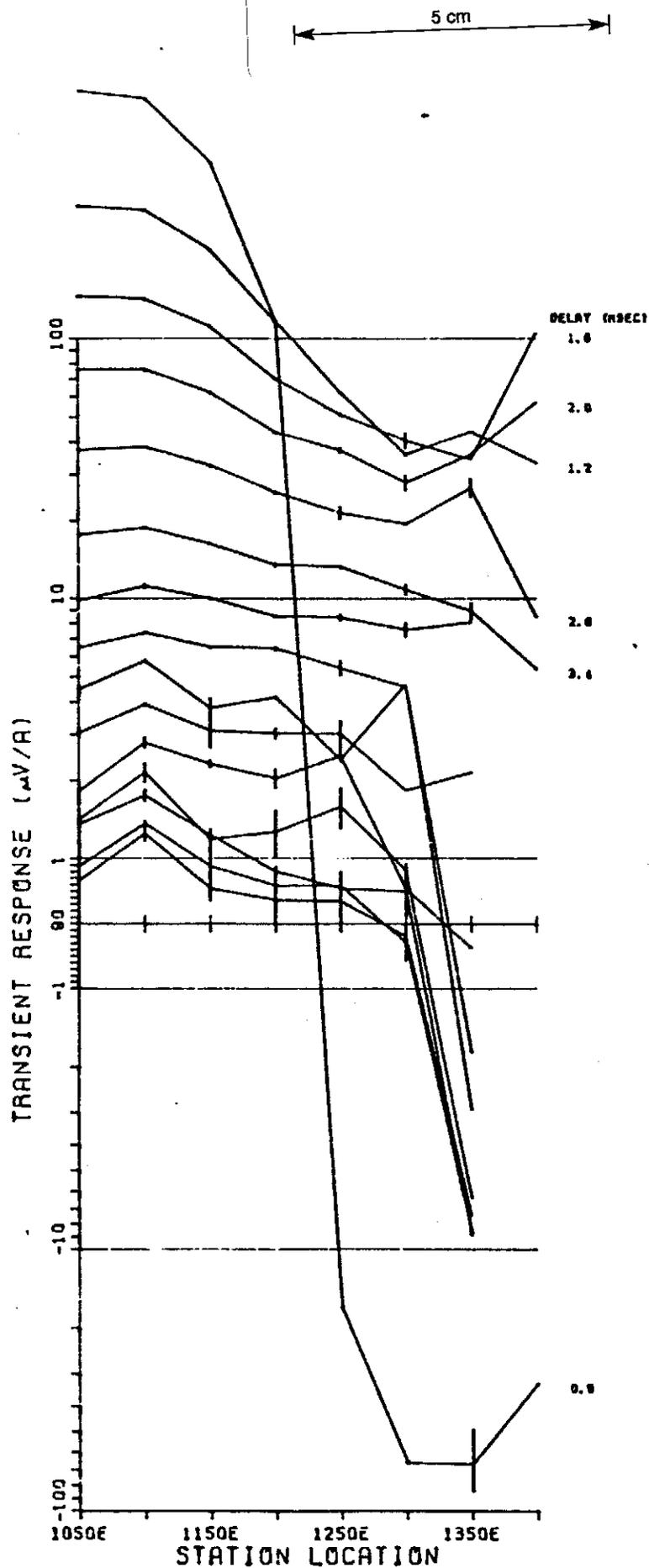


INSTRUMENT : SIADTEM
CONFIGURATION : 100M SQUARE TRANSMITTER LOOP,
TURAM MODE (AVA) SURVEY
READING INTERVAL 50M

SCALE : 1:5000
DATE : 2/5/82
MAP : BURNIE, TAS.

MINERALS EXPLORATION (AUST.) PTY. LTD.
TRANSIENT E.M. PROFILE

 GEOEX

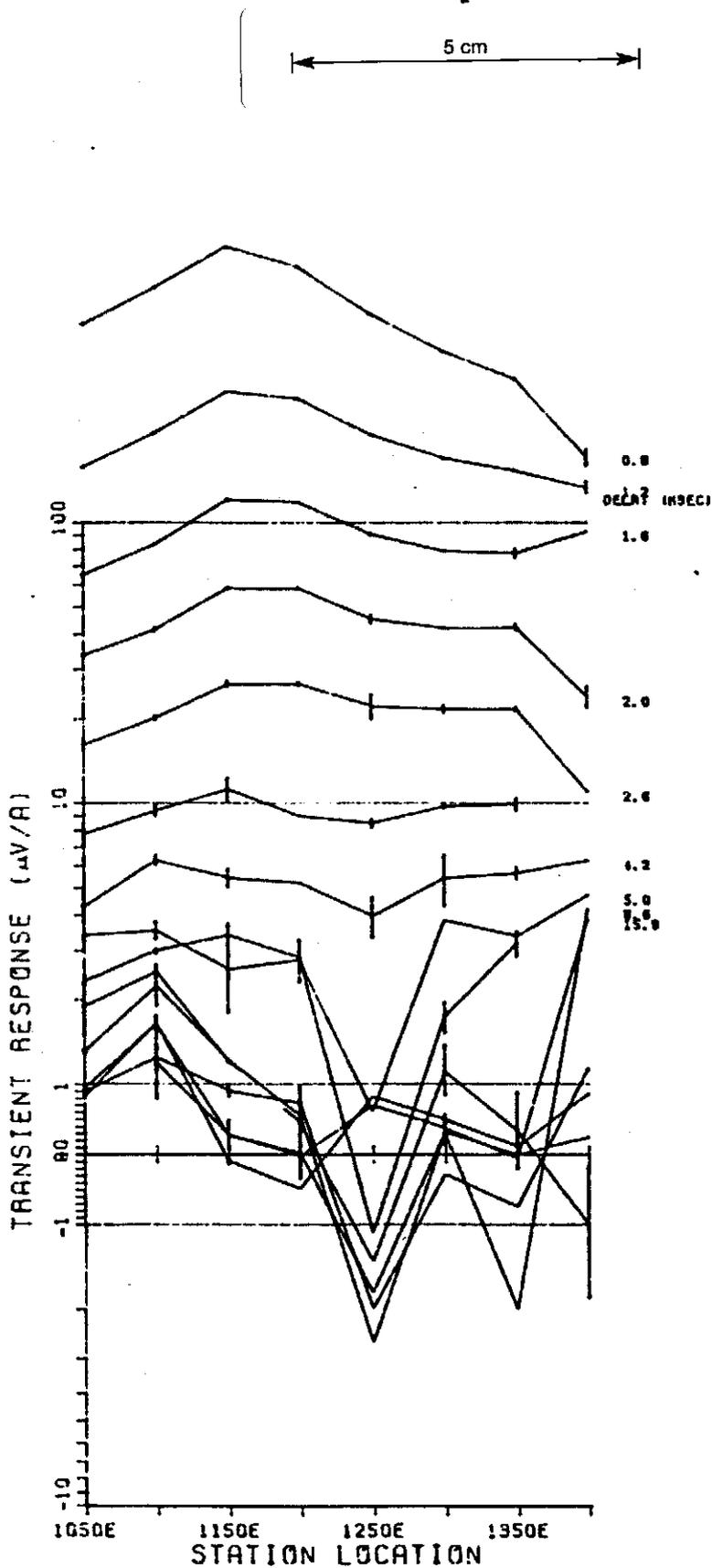


INSTRUMENT : SIADTEM
 CONFIGURATION : 100M SQUARE TRANSMITTER LOOP.
 TURAM MODE (AVR) SURVEY
 READING INTERVAL 50M

SCALE : 1:5000
 DATE : 3/5/82
 MAP : BURNIE, TAS.

MINERALS EXPLORATION (AUST.) PTY. LTD.
 TRANSIENT E.M. PROFILE

GEOEX

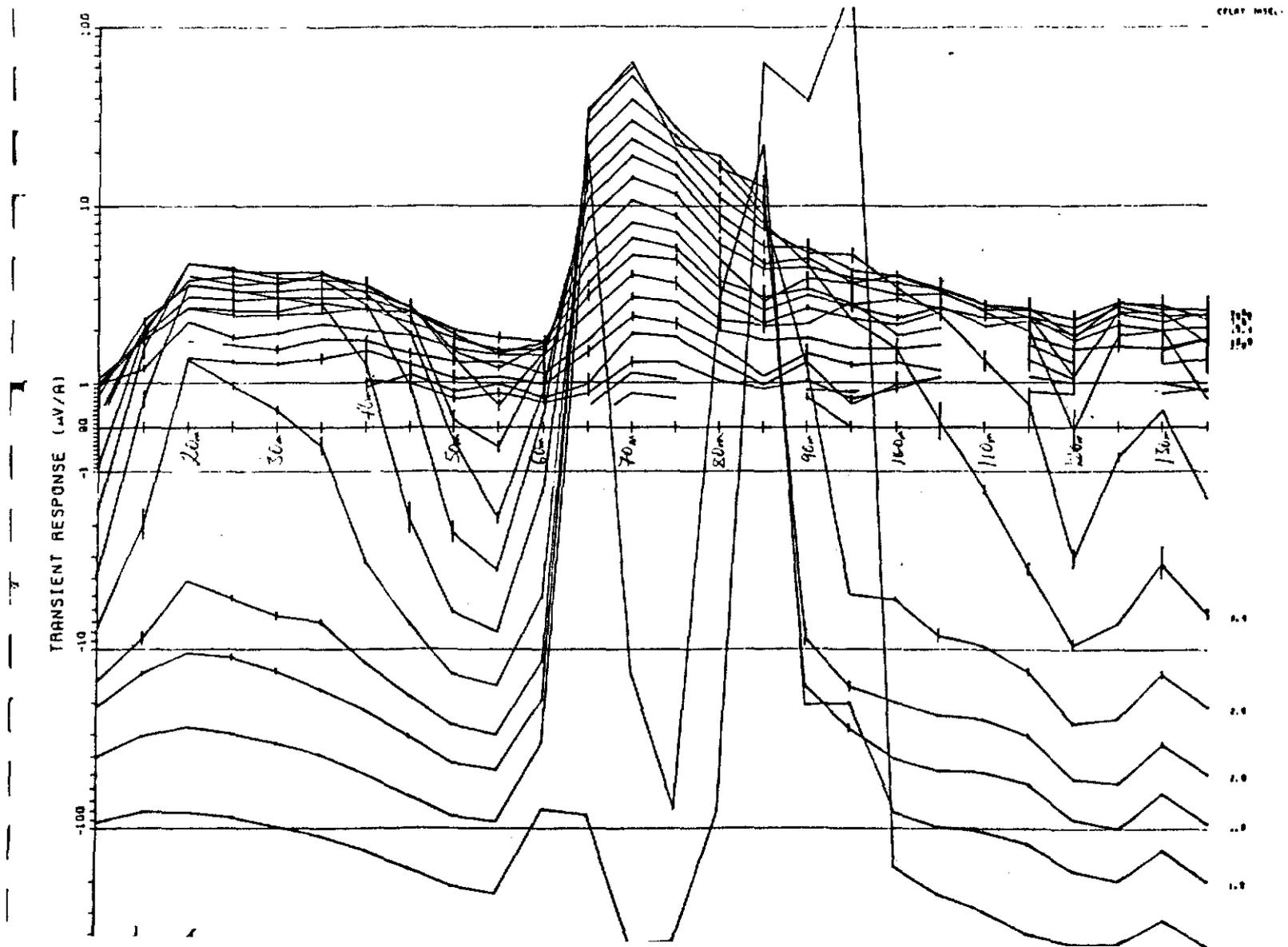


INSTRUMENT : SIAGTEM
 CONFIGURATION : 100M SQUARE TRANSMITTER LOOP,
 TURAM MODE (AVR) SURVEY
 READING INTERVAL 5CM

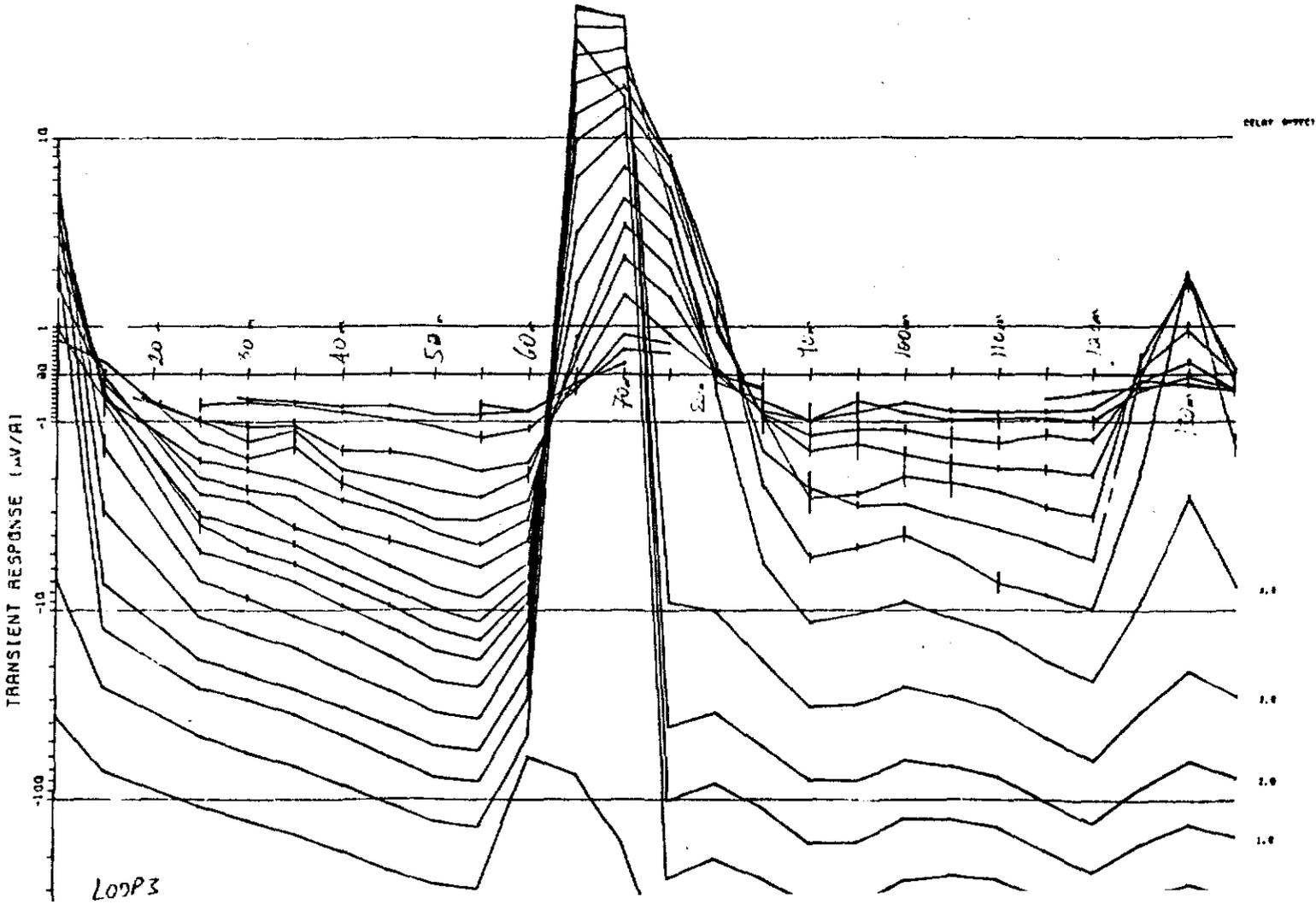
SCALE : 1:5000
 DATE : 3/5/82
 MAP : BURNIE, TAS.

MINERALS EXPLORATION (AUST.) PTY. LTD.

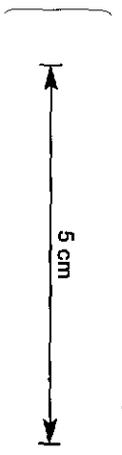
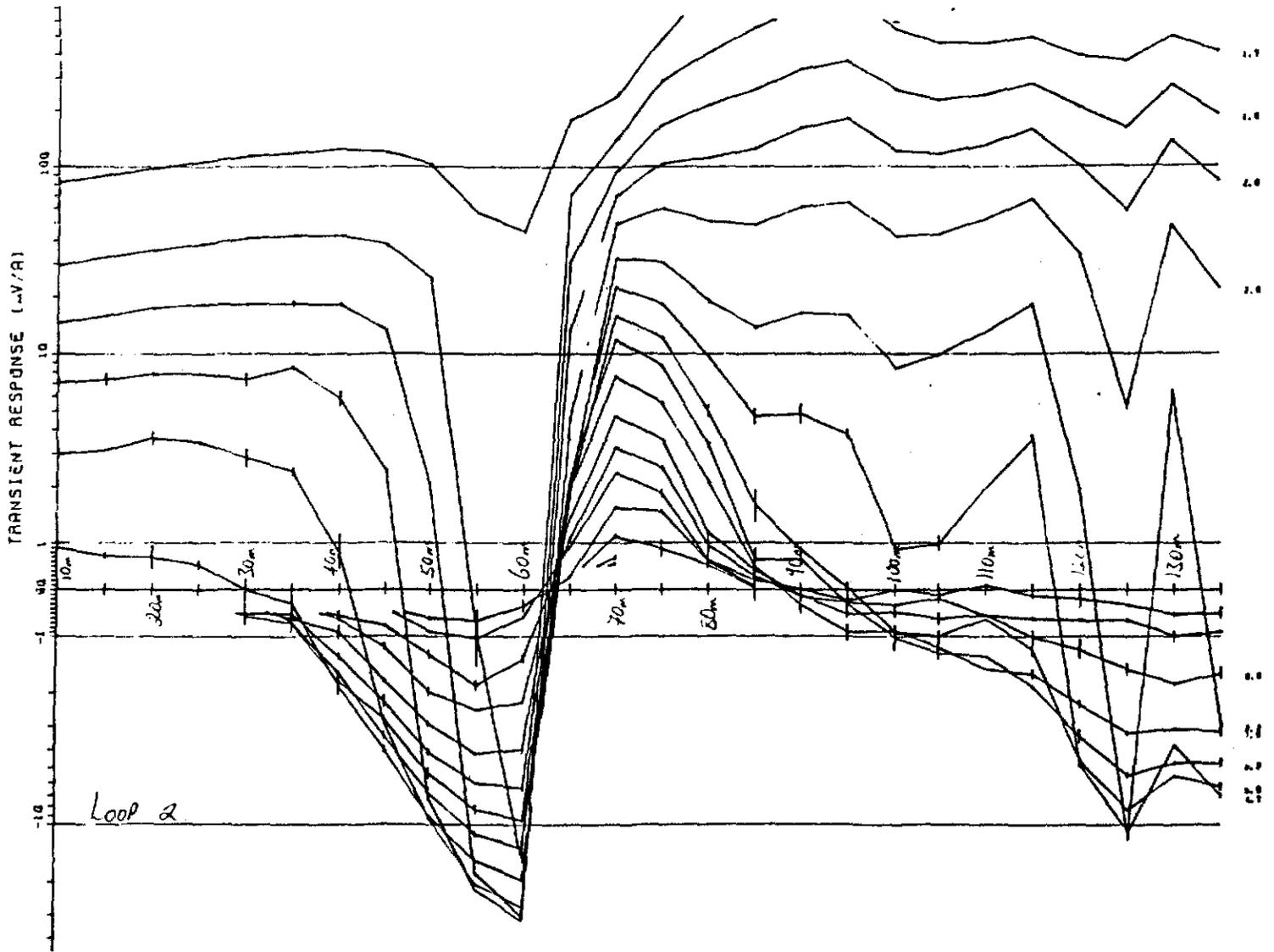
AGEEV



721102



721103



721104

TRANSIENT RESPONSE (μV/A)

-100

-10

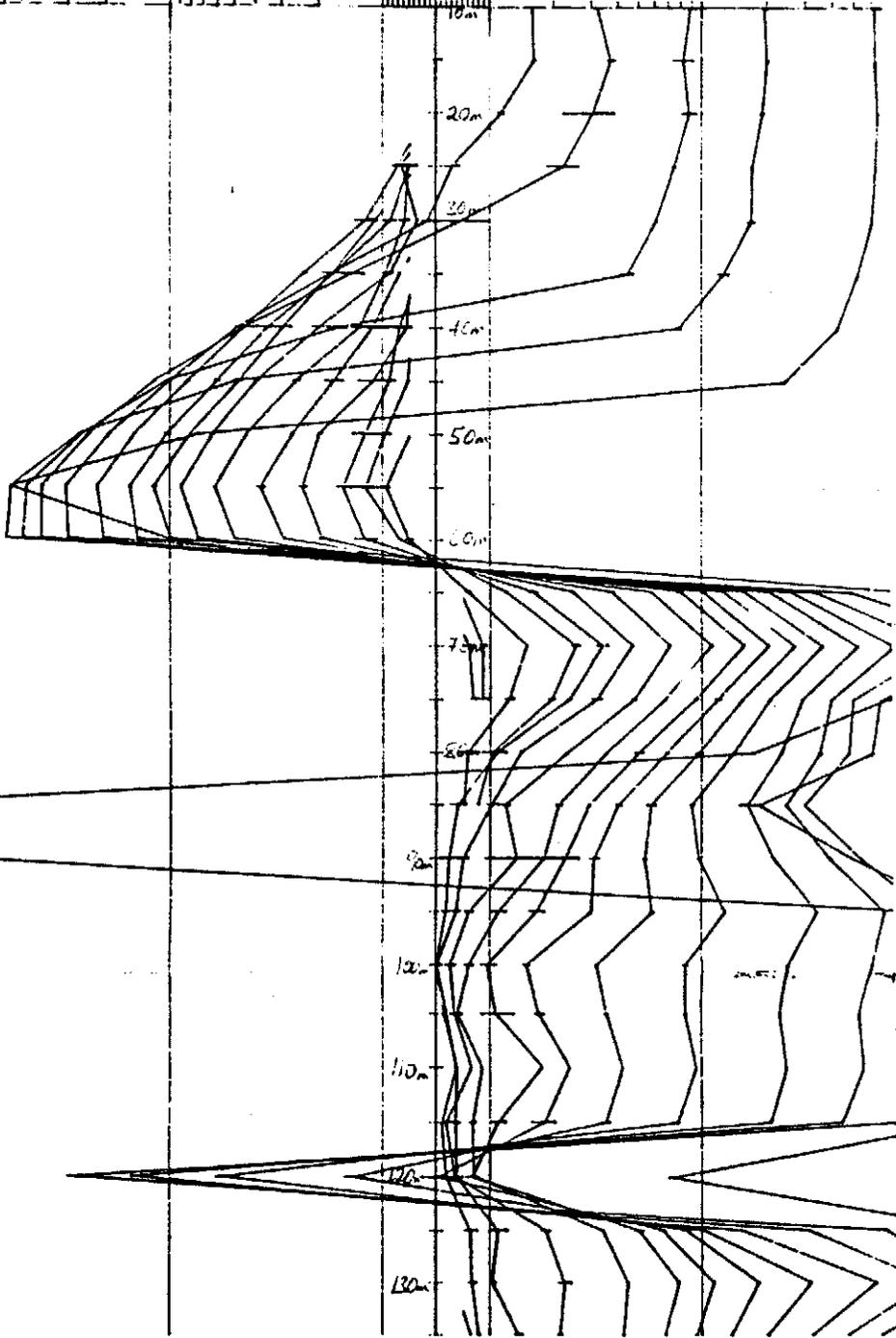
-1

00

1

10

Loop response



1 2 3 4 5 6 7 8

5 cm



APPENDIX 9

Drilling Results PDH NT1 & PDH NT2, Natone Grid
Including assay, petrological & magnetic susceptibility results

PERCUSSION CHIP & CORE SAMPLES SENT FOR PETROLOGICAL DESCRIPTIONDRILL HOLE NT 1

<u>Sample No.</u>	<u>From</u>	<u>To</u>	<u>Description</u>
5324	52	54	Dolomitic marble with 45% disseminated pyrrhotite.
5330	64	66	Dolomitic marble with ?fluorite.
5339	82	84	Marble with abundant calc silicate minerals.
5347	98	100	Marble with 60% disseminated pyrrhotite.
5355	114	116	Limestone with abundant ?calc silicate minerals.
5371	148	150	Limestone with 35% disseminated pyrrhotite.
5994	160.75m		<u>CORE</u> Limestone with unusual black mineral.
5995	167.63m		<u>CORE</u> Bedded limestone showing green and black alteration along certain bands.
5996	170.70m		<u>CORE</u> Limestone with calc silicates and black mineral.
5997	172.52m		<u>CORE</u> Marble with unidentified green mineral.

DRILL HOLE NT 2

5998	124.82m		<u>CORE</u> Spotted shale.
5999	129.88m		<u>CORE</u> Red hornfels with white spots
6000	131.93m		<u>CORE</u> A 10 cm thick band of calc silicate minerals.
21499	143m		Silicified fault zone.

REPORT CMS 82/5/33

Fourteen percussion-chip and drill core samples were received for petrological examination; thin-sections were prepared, and carbonate stain tests were applied to offcuts where necessary. A special technique was used to prepare thin-sections of the percussion chips so as to obtain good representation of each sample.

Summary

Several of the percussion-chip samples consist of a mixture of lithologies, and because the chips are small, the relationships between these lithologies are not known.

Clearly, the fresh basalts are Tertiary and are entirely unrelated to the other rocks; their presence is presumably accidental. The fact that they contain no metasomatic pyrrhotite shows that they are younger than the metasomatism, whose style is typical of the Devonian events elsewhere.

The marbles appear to be of metamorphic formation, containing forsterite; however, this interpretation must be treated with caution, since there is a metasomatic overprint whose effect could be misleading.

In several rocks, a serpentinite appears and has all the classical textural features associated with these rocks; elsewhere in Tasmania, recent work has shown the existence of "pseudo-serpentinites", i.e. rocks with the general characteristics of serpentinites, but not of orthodox igneous origin. Rather, these rocks have formed from the serpentinisation of Ca-Mg silicate assemblages (in contact aureoles) such as diopside, chondrodite-humite and others. On the other hand, igneous serpentinites may well be present in rocks such as 5994, though very difficult to envisage in 5995.

No cassiterite was identified, but clearly there is considerable potential for the occurrence of Sn, though perhaps in silicate or other forms rather than as cassiterite.

H.W. Fander, M. Sc.

Sample No.	Rock Type - Composition	Fabric	Major Minerals	Central Mineralogical Service Comments
5324 (T.S. 42297) NTI 52	Quartz-Carbonate Rocks. One chip is an ankeritic marble, two are quartz-pyrite veins replacing ankerite, with intergrown siderite.	Microcrystalline, with some preferred orientation, typical marble fabric.	Subparallel flakes of degraded phlogopite, traces of talc.	Probably from a fault zone in an ankeritic marble, which contains blebs of pyrrhotite.
5330 NTI 64-66	Miscellaneous Rocks. Dolomite marble with tremolite, diopside, forsterite (serpentinised); basalt (fresh); quartzite/quartz veins. Pyrrhotite occurs in most chips.	Marbles are finely crystalline; basalts have typical fabrics, textures.	Patches of calcite in some chips. Chalcopyrite associated with pyrrhotite.	Basalts are clearly Tertiary. Some skarn may be present and marbles are probably metasomatised. No sulphides in basalts.
5339 NTI 62-64	Mineralised Marble. Medium-crystalline dolomite, with scattered forsterite, partly serpentinised, and replacive pyrrhotite, pyrite, chalcopyrite.	Typical subhedral textures, with weak preferred orientation. Medium-grained.	A few calcite aggregates and tremolite needles. Quartz veins.	A more consistent sample, representing only one lithology. Green mineral is chlorite/serpentine.
5347 NTI 98-100	Forsterite Marble. Medium-crystalline dolomite with partly serpentinised forsterite and associated calcite; scattered magnetite and pyrrhotite.	Typical marble fabric, as above. Preferred orientation, metamorphic.	Chips of diopside skarn, and isolated basalt fragments.	Closely resembles 5339. Rock was presumably a marble (i.e. metamorphic) before (?Devonian) metasomatism.
5355 NTI 114-116	Miscellaneous Rocks. Diopside and diopside-tremolite skarns, dolomite marbles, talc rocks with diopside, serpentinite and basalt fragments.	Skarns are fine/medium-granular; marbles are medium-crystalline, as above.	Scattered pyrrhotite occurs in all rock types except basalt.	Similar to 5330, with the addition of abundant skarn fragments and partly metasomatised marbles.
5371 NTI 148-150	Miscellaneous Rocks. Fragments of dolomite marble, serpentinite, diopside skarns, coarsely-crystalline olivine, and fresh basalts.	As above. Serpentinite evidently from coarse ultramafic.	Chips of massive pyrrhotite. Also replacive pyrrhotite in all rocks except basalt.	Similar to 5355, with more obvious serpentinite and with fresh coarse olivine (could be from ultramafic).
5394 160-74 NTI	Carbonate Breccia. Irregular fragments of coarsely-crystalline calcite (with diopside) in a mass of extensively serpentinised peridotite or calc-silicate.	Breccia fabric, many small-scale replacement textures. Network textures.	Ultrafine magnetite in serpentine, also relict olivine grains. Relict dolomite patches.	Apparently this is a breccia contact between a calcitised dolomite marble and an igneous serpentinite. Black mineral is magnetite. See text.
5395 167-63 NTI	Banded Calc-Silicate Rock. Alternating bands of calcite, calcite/scapolite, scapolite, dark serpentinite, diopside, and calcite intergrown with green phlogopite.	Excellent banding, inherited from sediment, with large- and small-scale folding.	Thin streaks of apatite. Black component in serpentinite is carbonaceous. Pyrrhotite.	Probably a laminated chemical sediment (Mg-clay/carbonate). Serpentinite is metasomatic, i.e. serpentinised Mg-silicates.

2

Sample No.	Rock type - Composition	Fabric	Color Minerals	Central Mineralogical Services Comments
5996 NT1 172.52	<u>Brecciated Marble</u> . Small polygonal interlocking dolomite crystals; veins of serpentine with pyrrhotite; adjacent dolomite is calcitised.	Marble is medium-grained, featureless; serpentine veins have typical network textures.	Phlogopite shreds. Black carbonaceous pigment in serpentine, and relict diopside.	The serpentine veins represent a serpentinised Mg-Ca silicate mineral, probably diopside, i.e. metasomatic, not igneous.
5997 NT1 172.52	<u>Metasomatised Marble</u> . Relict patches of dolomite with calcitised margins; broad zones of finely-intergrown green phlogopite, talc, diopside, prehnite.	Medium-grained marble, extensively replaced. Veins are mineralogically zoned.	Pyrrhotite selvages and small grains in replacive zones.	Similar to 5996, though replacive zones differ from serpentine veins in 5996.
5998 NT2 124.82	<u>Metasediment</u> . Contact-metamorphosed sedimentary breccia/slumped sediment, in which shale bands are now spotted cordierite hornfels, silt/sand bands are sericite-biotite metaquartzites.	Slumping, auto-brecciation features well-preserved. Cordierite poikiloblasts.	Pyrrhotite veins and clusters, restricted to coarser rock.	Mild contact-metamorphism was succeeded by incipient, patchy metasomatism. Original rock was banded shale/siltstone/sandstone.
5999 NT2 129.88	<u>Cordierite Hornfels</u> . Small random cordierite poikiloblasts set in ultrafine quartz, sericite, biotite, clastic muscovite flakes; cut by quartz veins.	Fine relict laminations and bedding; originally well-bedded siltstone.	Quartz veins contain pyrrhotite, traces of siderite, epidote or pumpellyite.	Similar lithology and metamorphic grade to 5998, but much more uniform. Incipiently metasomatised.
6000 NT2 131.93	<u>Tremolite Rock</u> . Virtually monomineralic mass of radiating tremolite needles forming a matted intergrowth.	No relict features; haphazard coarse and fine crystals.	Isolated scattered pyrrhotite grains and small phlogopite flakes.	A metasomatic rock, presumably formed from a carbonate; could be vein-like in form.
21499 NT2 (T.S. 42310) 143.n	<u>Intraformational Breccia</u> . Pebbles, lenses and wedges of siltstone set in a contorted mass of indurated shale, mostly sericite and fine quartz.	Indurated, but not noticeably metamorphic; well-preserved structures.	Ultrafine ?tremolite needles in places. Chlorite "spots" and green clay veinlets.	Only incipiently metamorphosed. Lithologically comparable with 5998, possibly Crimson Creek Formation.

b

DRILL LOG SHEET

PROJECT : RIANA NATONE

Hole No : PDH NT 1

COLLAR CO-ORDINATES : 8500 NE / 1350 N

LOCATION CODE : MQ 04

COLLAR R.L. : 305m OD Angled hole 60°N

LOCATION : <u>NATONE</u> MAP/PHOTO REFERENCE : <u>54401530 N / 4008240 E</u>	DATE STARTED	<u>14-4-82</u>	HOLE SIZE		FROM	TO	TOTAL	CORE STORAGE	DEVONPORT				
	DATE FINISHED	<u>23-4-82</u>	NON CORE	<u>6"</u>	<u>0</u>	<u>18</u>	<u>18m</u>	NO OF TRAYS	<u>3 CORE TRAYS</u>				
	TOTAL DEPTH	<u>173.59m</u>		<u>5½"</u>	<u>18</u>	<u>160</u>	<u>142m</u>	SAMPLE STORAGE	DEVONPORT				
HOLE SURVEY DATA			LOGGED BY	<u>P.A.RUXTON</u>	CORE	<u>NQ</u>	<u>160</u>	<u>173.59m</u>	<u>13.59m</u>	ASSAY LAB.	COMLABS		
INSTRUMENT : <u>EASTMAN SURVEY / CAMERA SURVEY</u>			CONTRACTOR	<u>OVERLAND DRILLING</u>						ASSAY REPORTS			
DEPTH	INSTRUMENT		ACID ETCH		REMARKS	RIG	<u>WARMAN 750</u>						
	INCL.	AZ.	INCL.	AZ.									
COLLAR													
EASTMAN	<u>167.50m</u>	<u>STRIKE</u>	<u>E-W</u>	<u>29°N</u>		DRILL CREW	<u>J. WEAVER</u> <u>R. LANCASTER</u>	CASING	<u>6"</u>	<u>0</u>	<u>18 cemented</u>	<u>18m</u>	MIN. & PET. LAB.
	<u>170.57m</u>	<u>STRIKE</u>	<u>E-W</u>	<u>35°N</u>					<u>2"</u>	<u>0</u>	<u>36m</u>	<u>36m</u>	MIN. & PET. REPORTS
								CASING LEFT					

CAMERA	<u>169.19</u>	<u>67.5° Due</u>	<u>N</u>		Deflection of
	<u>172.19</u>	<u>67.5° Due</u>	<u>N</u>		<u>7.5°</u>

GRAPHIC / LETTER SYMBOL LOGGING KEY

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STRUCTURE / ALTERATION CODE

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

O OXIDATION

DRILLING SUMMARY : Drill hole located over Max-Min E.M., S.P., Gravity, I.P. Magnetic anomaly - no surface geochem - the anomalous zone is basalt covered.

Results 0.50m of basaltic material of Tertiary age. 50-108m dolomitic limestone with upto 60% sulphide. 108-173.59m altered limestone + sulphides (upto 45%) calcisilicate minerals. Limestone well bedded striking E-W and dipping 30-40° N.

921111

From	To	Inter'l (#)	Core Rec'd	# Hec	Sample No.	Inches No.	Assays				
							Ni	Fe%	Mn	Pb	Bi
130	132	2			5362	95	4.40	4100	110	8	
132	134	2			5363	130	6.50	4300	80	8	
134	136	2			5364	140	6.30	4000	80	8	
136	138	2			5365	125	5.00	3150	75	10	
138	140	2			5366	100	3.80	4050	85	<4	
140	142	2			5367	120	4.80	3650	80	<4	
142	144	2			5368	110	4.60	3000	75	86	
144	146	2			5369	105	4.40	3100	50	16	
146	148	2			5370	160	14.0	2500	44	14	
148	150	2			5371	160	18.0	2200	30	6	
150	152	2			5372	115	9.50	3450	42	<4	
152	154	2			5373	120	9.70	4500	34	14	
154	156	2			5374	110	4.80	4000	48	<4	
156	158	2			5375	165	7.30	3400	85	16	
158	160	2			5376	140	6.40	3200	160	10	

721114

A

From	To	Interval (m)	Core Rec'd	% Rec	Sample No.	Compos No.	Assays						Susc
							Ni	Fe2	Mn	Pb	Bi		
0	2	2			5301								
2	4	2			5302								
4	6	2			5303								
6	8	2			5304								
8	10	2			5305								
10	12	2			5306								
12	14	2			5307								
14	16	2			5308								
16	18	2			5309								
18	20	2			5310								
20	22	2			5311								
22	24	2			5312								
24	26	2			5313								
26	28	2			5314								
28	30	2			5315								
30	32	2			5316								
32	34	2			5317								
34	36	2			5318								
36	38	2			5319								
38	40	2			5320								
40	42	2			5321								
42	44	2			5322								
44	46	2			5323								
46	48	2			5324								
48	50	2			5325								
50	52	2			5326								
52	54	2			5327								
54	56	2			5328								
56	58	2			5329								
58	60	2			5330								
60	62	2			5331								
62	64	2			5332								
64	66	2			5333								
66	68	2			5334								
68	70	2			5335								
70	72	2			5336								
72	74	2			5337								
74	76	2			5338								
76	78	2			5339								
78	80	2			5340								
80	82	2			5341								
82	84	2			5342								
84	86	2			5343								
86	88	2			5344								
88	90	2			5345								
90	92	2			5346								
92	94	2			5347								
94	96	2			5348								
96	98	2			5349								
98	100	2			5350								
100	102	2			5351								
102	104	2			5352								
104	106	2			5353								
106	108	2			5354								
108	110	2			5355								
110	112	2			5356								
112	114	2			5357								
114	116	2			5358								
116	118	2			5359								
118	120	2			5360								
120	122	2			5361								
122	124	2											
124	126	2											
126	128	2											
128	130	2											

721115

B

DRILL LOG SHEET

PROJECT: RIANA
LOCATION CODE: MQ 04

Hole No: PDH NT 2

COLLAR CO-ORDINATES: 1750N 1250E

COLLAR R.L.: 295m O.D.
INCLINED 70° NE 1030'

LOCATION: <u>NATONE</u> MAP/PHOTO REFERENCE: <u>54 402 050N 4 008 750 E</u>	DATE STARTED	<u>26/4/82</u>	HOLE SIZE		FROM	TO	TOTAL	CORE STORAGE	DEVONPORT	
	DATE FINISHED	<u>7/5/82</u>	NON CORE	<u>6</u>	<u>0</u>	<u>33m</u>	<u>33m</u>	NO OF TRAYS	<u>24</u>	
	TOTAL DEPTH	<u>152.88</u>						SAMPLE STORAGE	DEVONPORT	
HOLE SURVEY DATA			LOGGED BY	<u>P.A. RUXTON</u>	CORE	<u>33</u>	<u>152.88</u>	<u>119.88</u>	ASSAY LAB.	COMLABS
INSTRUMENT: <u>EASTMAN SURVEY</u>			CONTRACTOR	<u>OVERLAND DRILLING</u>					ASSAY REPORTS	
DEPTH	INSTRUMENT		ACID ETCH		REMARKS	RIG				
	INCL.	AZ.	INCL.	AZ.						
COLLAR						<u>WARMAN 750</u>				
EASTMAN	<u>5383</u>	<u>① 010°</u>	<u>85°W</u>			<u>J. WEAVER</u>				
	<u>DR</u>	<u>② 350°</u>	<u>70°E</u>			<u>C. RICHARDSON</u>	CASING			MIN. & PET. LAB.
							CASING LEFT			MIN. & PET. REPORTS
CAMERA	<u>152.88m</u>	<u>bearing</u>	<u>027°</u>							

GRAPHIC / LETTER SYMBOL LOGGING KEY

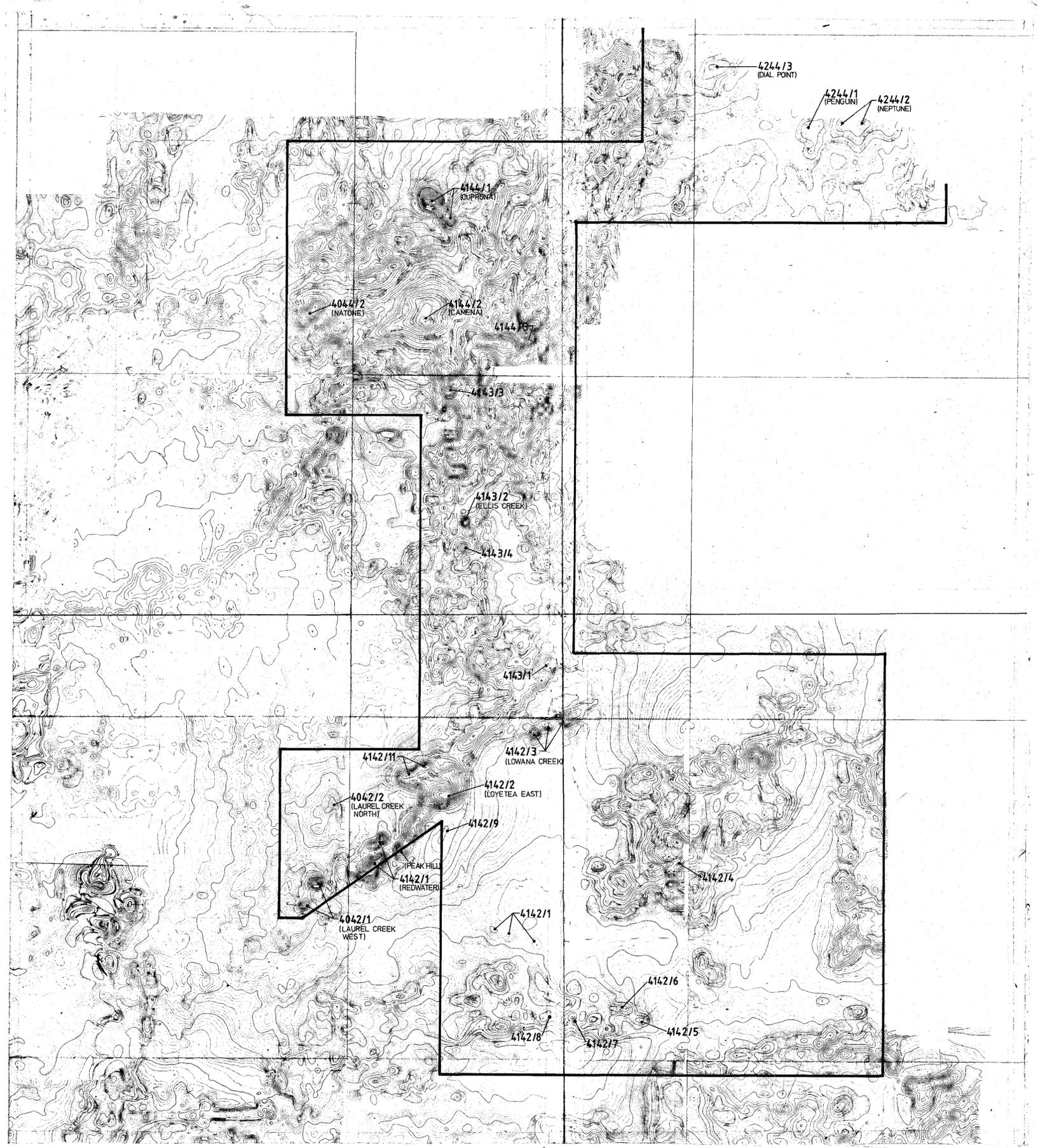
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	STRUCTURE / ALTERATION CODE B BEDDING J JOINTING C CLEAVAGE F FOLIATION sh SHEARING q QUARTZ VEINS O OXIDATION
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

DRILLING SUMMARY: Drill hole located over a Max-Min E.M., Gravity and I.P. anomaly - offset from a magnetic and S.P. anomaly.
Results: Capping of Basalt soil with the rest of the hole in Black shales/siltstones of the Burnie Formation. Many fractured and sheared zones + some pyrite and pyrrhotite. Bottom of the hole intersected red and spotted hornfels due to contact metamorphic effects of the Housetop Granite on Burnie Formation shales. Beds strike 010° 85°N or 350° 70°E - the former is more geologically reasonable.

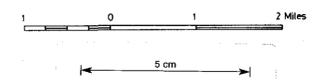
791116

Date	To	Interval (m)	Core Rec'd	% Rec'd	Sample No.	Assay No.	Analysis				Suscept.
							Ni	Fe%	Mn	Pb	
0	2	2			5401						
2	4	2			5402						
4	6	2			5403						
6	8	2			5404						
8	12	4			5405						
12	15	3			5406						
15	18	3			5407						
18	21	3			5408						
21	24	3			5409						
24	27	3			5410						
27	30	3			5411						
30	33	3			5412						
33	44.02										
44.02	53.83										
47.83	49.80	1.97	1.97	100	5413	24	2.45	400	10	ASSAYED	
53.83	54.64										
54.64	70.55										
70.55	70.65										
70.65	84.60										
72.26	73.63	1.37	1.37	100	5414	24	4.00	680	4	ASSAYED	
84.60	91.90										
91.90	92.47										
92.47	93.80										
93.80	95.83										
95.83	117.83	1.17	1.17	100	5415	20	3.05	580	4	ASSAYED	
95.83	97.00	0.74	0.74	100	5416	32	4.35	680	12	ASSAYED	
99.26	100.00	1.81	1.81	100	5417	24	3.60	530	22	ASSAYED	
104.70	106.51	1.35	1.35	100	5418	12	2.50	290	24	ASSAYED	
110.57	111.92										
117.83	126.43										
	124.82				PET. SAMPLE						
					5998						
126.43	128.90										
128.90	134.83										
	129.88				PET. SAMPLE						
	131.93				PET. SAMPLE						
					6000						
134.83	141.54										
138.00	139.36	1.36	1.36	100	5419	8	2.30	640	4	ASSAYED	
141.54	147.40										
	143m				PET. SAMPLE						
					21489						
145.68	147.40	1.72	1.72	100	5420	36	3.05	440	12	ASSAYED	
147.40	152.88										
152.88	END OF HOLE										

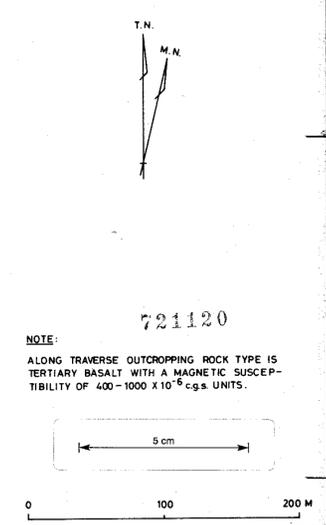
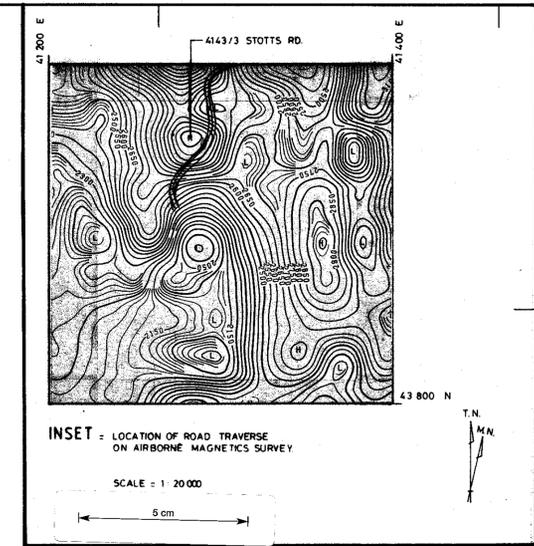
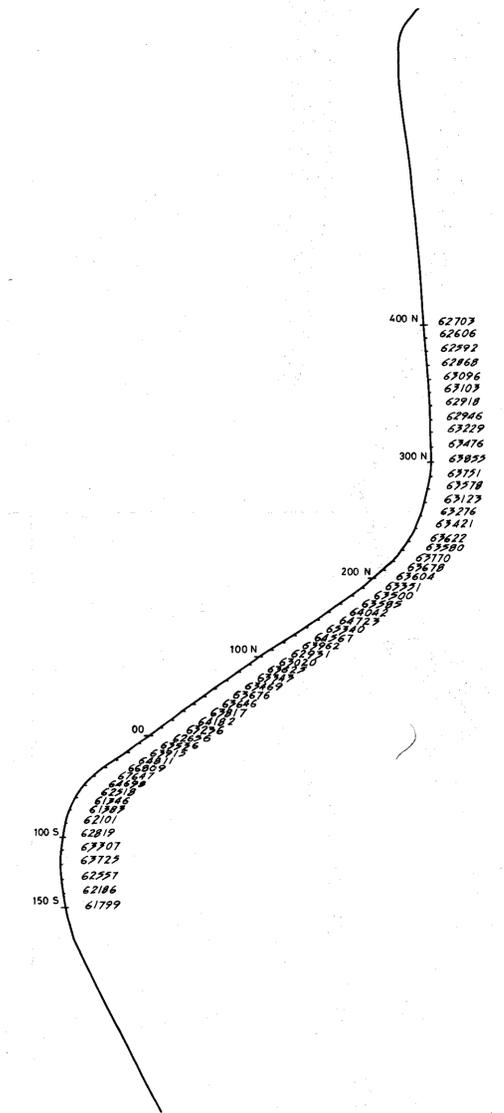
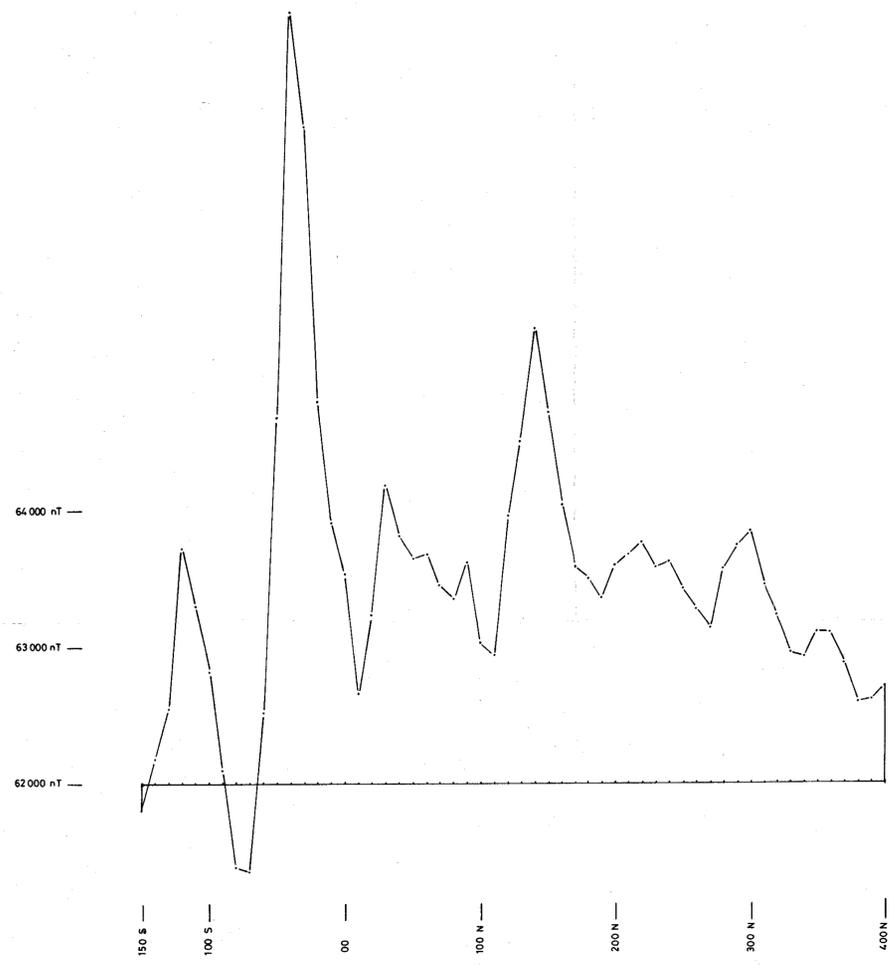
721118



721119



The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA GEOMETRICS AIRBORNE MAGNETICS SURVEY WITH ANOMALY NUMBERS	
Scale - 1:63 360	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/080
DATE 23-10-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT



721120

NOTE:
 ALONG TRAVERSE OUTCROPPING ROCK TYPE IS TERTIARY BASALT WITH A MAGNETIC SUSCEPTIBILITY OF $400-1000 \times 10^{-6}$ c.g.s. UNITS.

5 cm

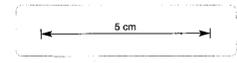
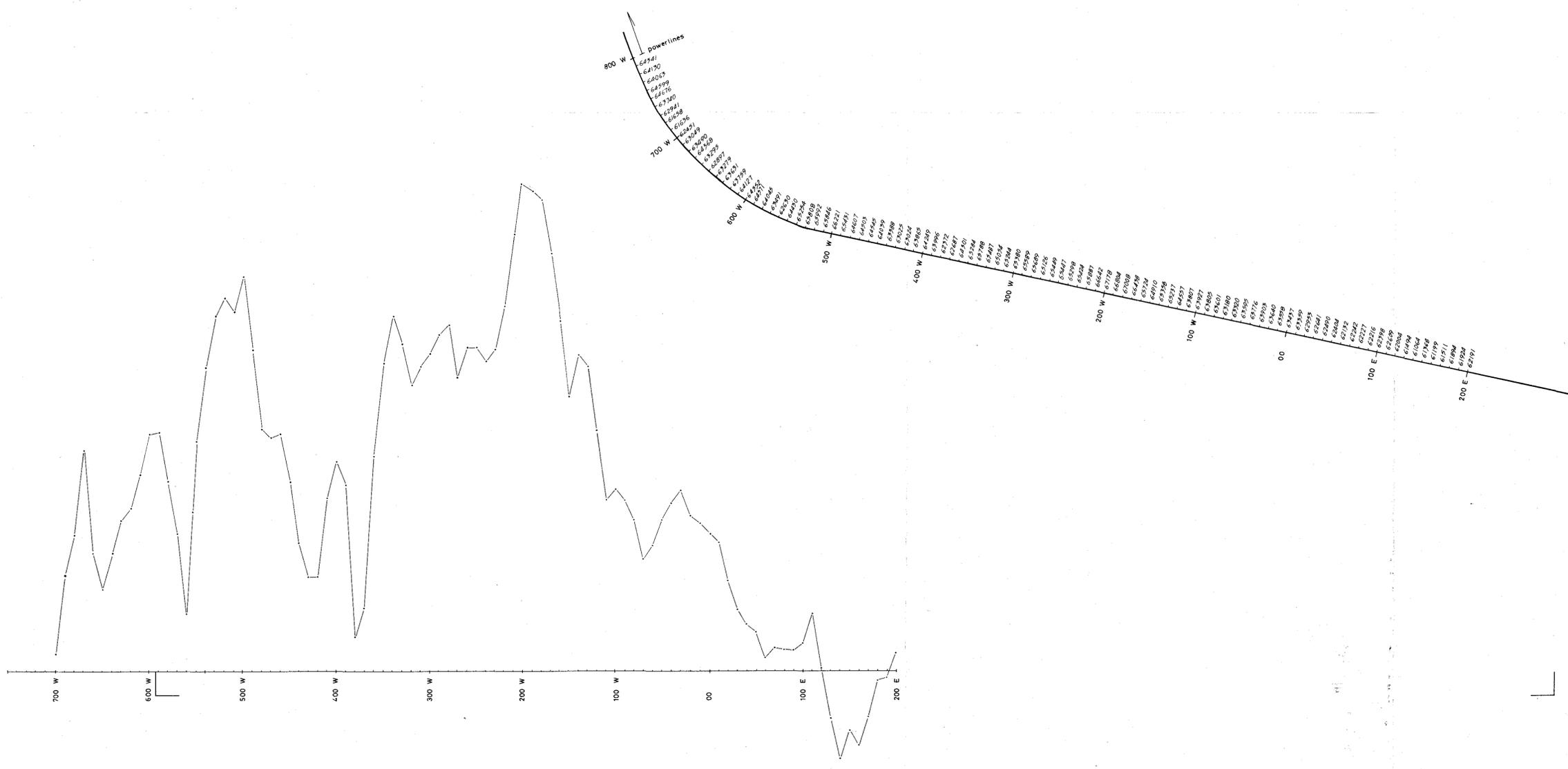
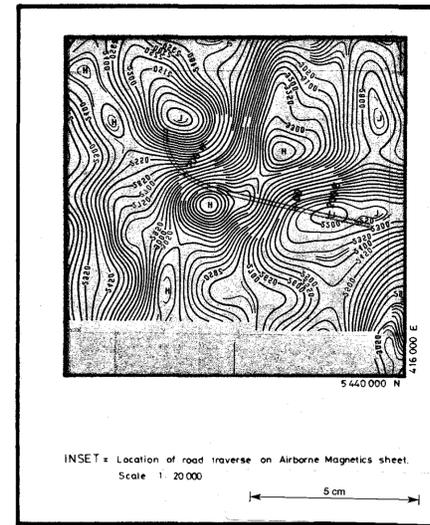
0 100 200 M

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
INITIAL GROUND RECONNAISSANCE
OF MAGNETIC ANOMALY 4143/3
STOTTS ROAD

Scale : 1:2500

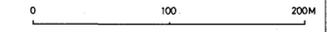
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MG04/077
DATE 1-10-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT.



N.B.
Outcropping rock type along traverse is Tertiary basalt,
with a magnetic susceptibility of $100-300 \times 10^{-6}$ c.g.s. units.



721121

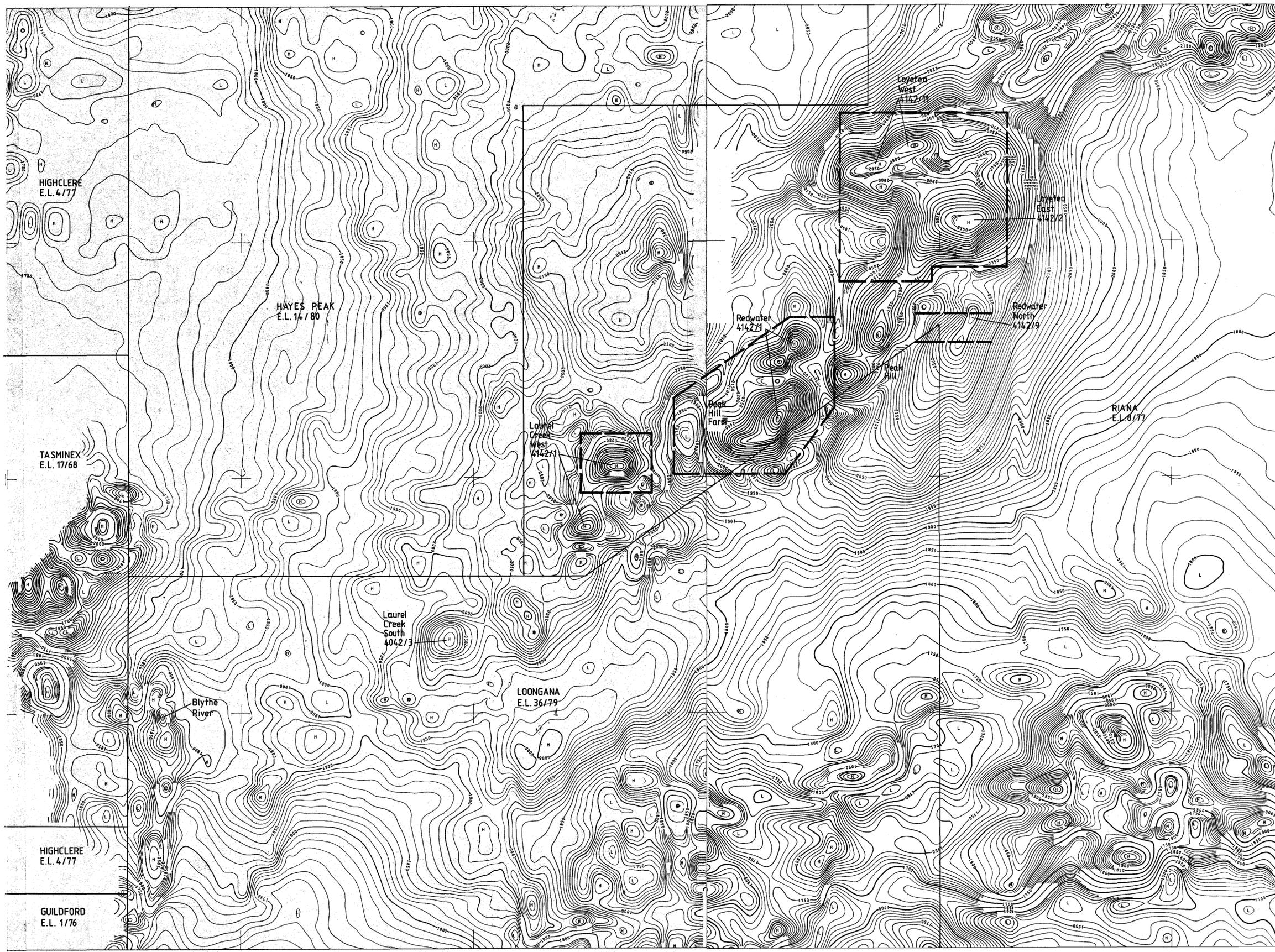


The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
Initial Reconnaissance of
Ground Magnetic Anomaly
4144/3 Midgley Falls.

Scale 1: 2500

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/M004/082
DATE 14-12-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT



——— E. L. BOUNDARIES
 - - - - - APPROX. POSITIONS OF GRIDDED AREAS (SHELL)
 5 cm



721122

50 0 50 100 M

The Shell Company of Australia Limited
METALS DIVISION

M.T. 24 TASMANIA REGIONAL
 Aeromagnetic map of the
 Southern margin of the
 Housetop Granite
 (From sheets 4142 & 4042)

SCALE 1:20000	DATE 24-6-82
AUTHOR P. RUXTON	DRAWN H.L.H.
OFFICE DEVONPORT	REP No.
ENCL No.	DRG No. D/MT24/024

N 0009

N 0008

N 0007

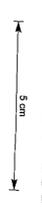
N 0006

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2100 E
2200 E
2300 E
2400 E
2500 E
2600 E
2700 E
2800 E
2900 E
3000 E
3100 E
3200 E

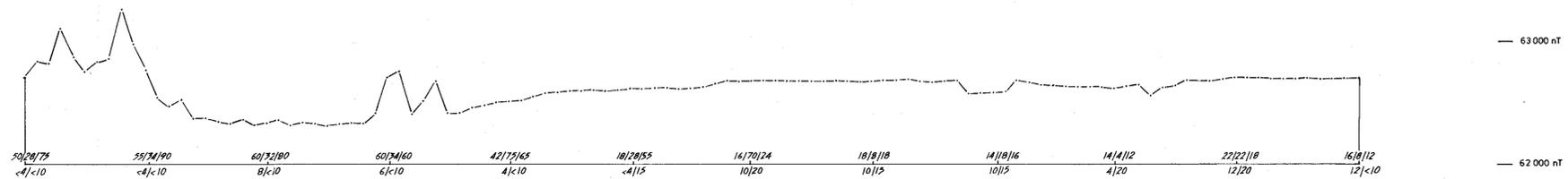
721123



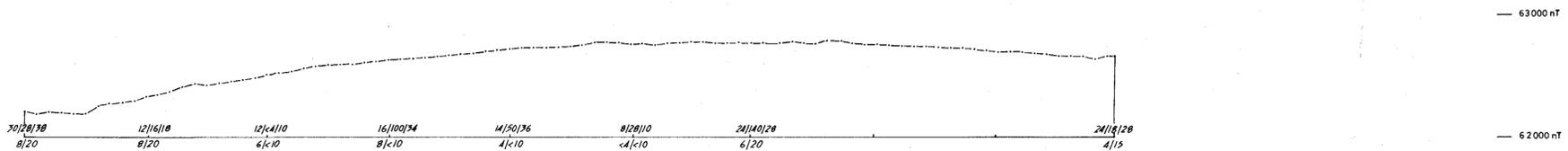
The Shell Company of Australia Limited
METALS DIVISION
E.L. 8/77 RIANA
ANOMALY 414279
REDWATER NORTH
GROUND MAGNETIC VALUES

Scale: 1:2500
FIG. No. REPORT No.
ENCL. No. DRG. No. D/14024/076
DATE 24-9-81 AUTHOR L.D. BARNWELL
DRAWN H.L.H. OFFICE BRONKHOFF

LINE 6700 N
Magnetics &
Soil Geochemistry



LINE 6400 N
Magnetics &
Soil Geochemistry



Cu/Pb/Zn
Sn/W

5 cm



0 100 200 M

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
ANOMALY 4142/9
REDWATER NORTH
GROUND MAGNETIC PROFILES

Scale 1cm = 250 nT VERTICAL
1:2500 HORIZONTAL

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/M004/072
DATE	10-9-81
	AUTHOR L. D. BANWELL.
DRAWN	H. L. H.
	OFFICE DEVONPORT.

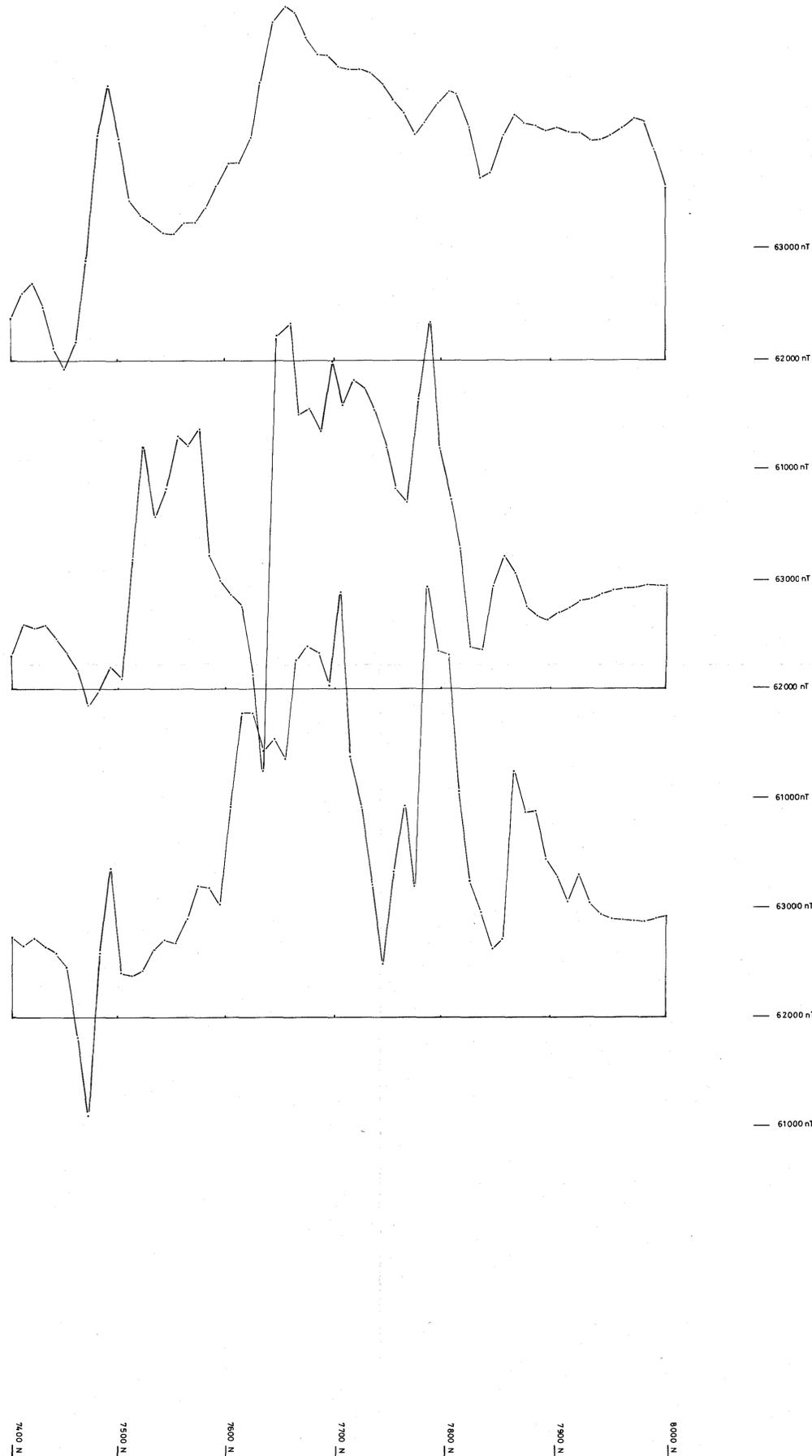
721124

1049

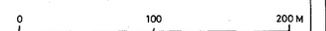
LINE 2900 E

LINE 3000 E

LINE 3100 E



721125



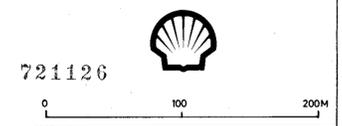
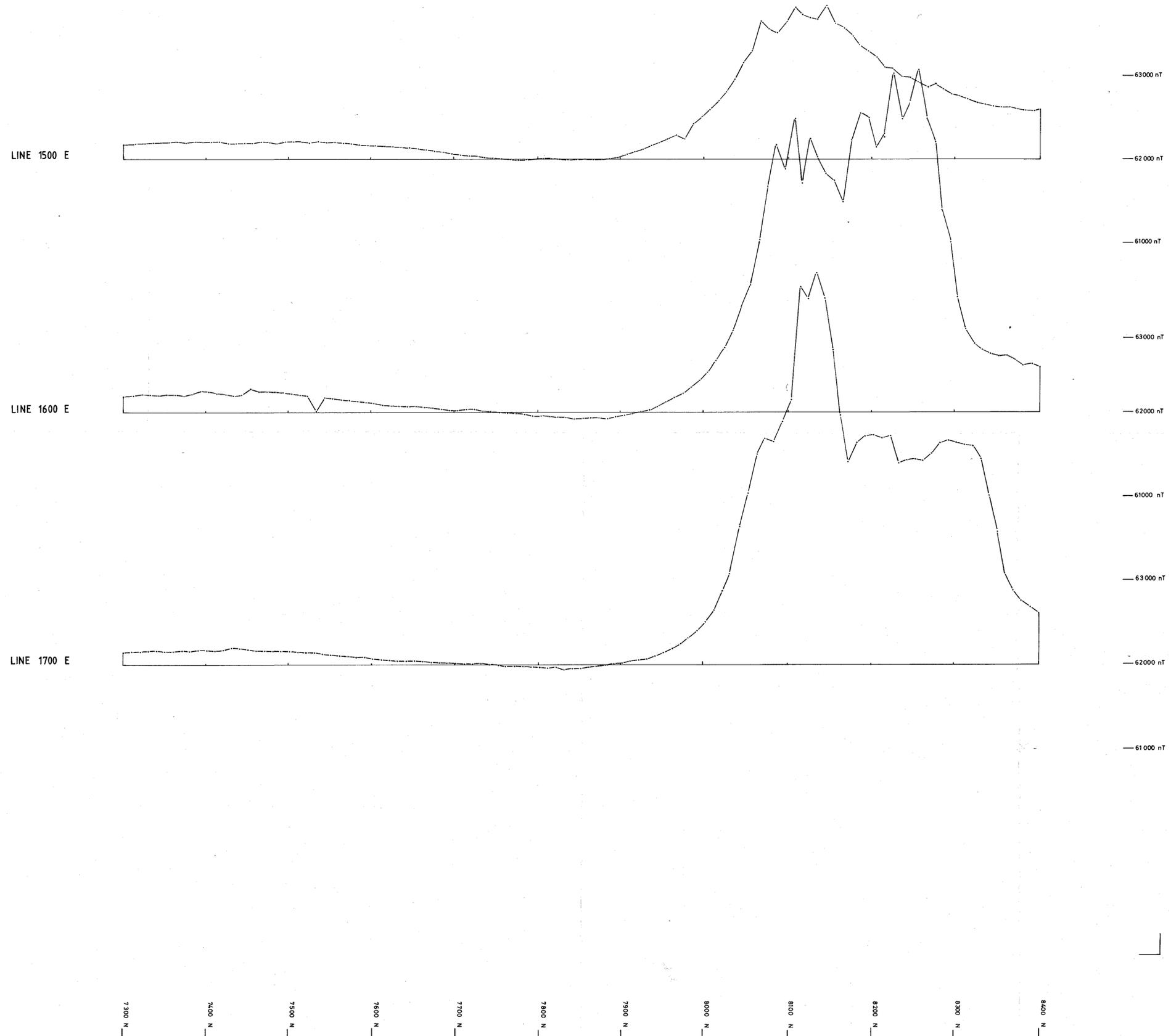
The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
LOYETEA EAST, ANOMALY 4142/2
STACKED MAGNETIC PROFILES
2900E, 3000E, & 3100E.

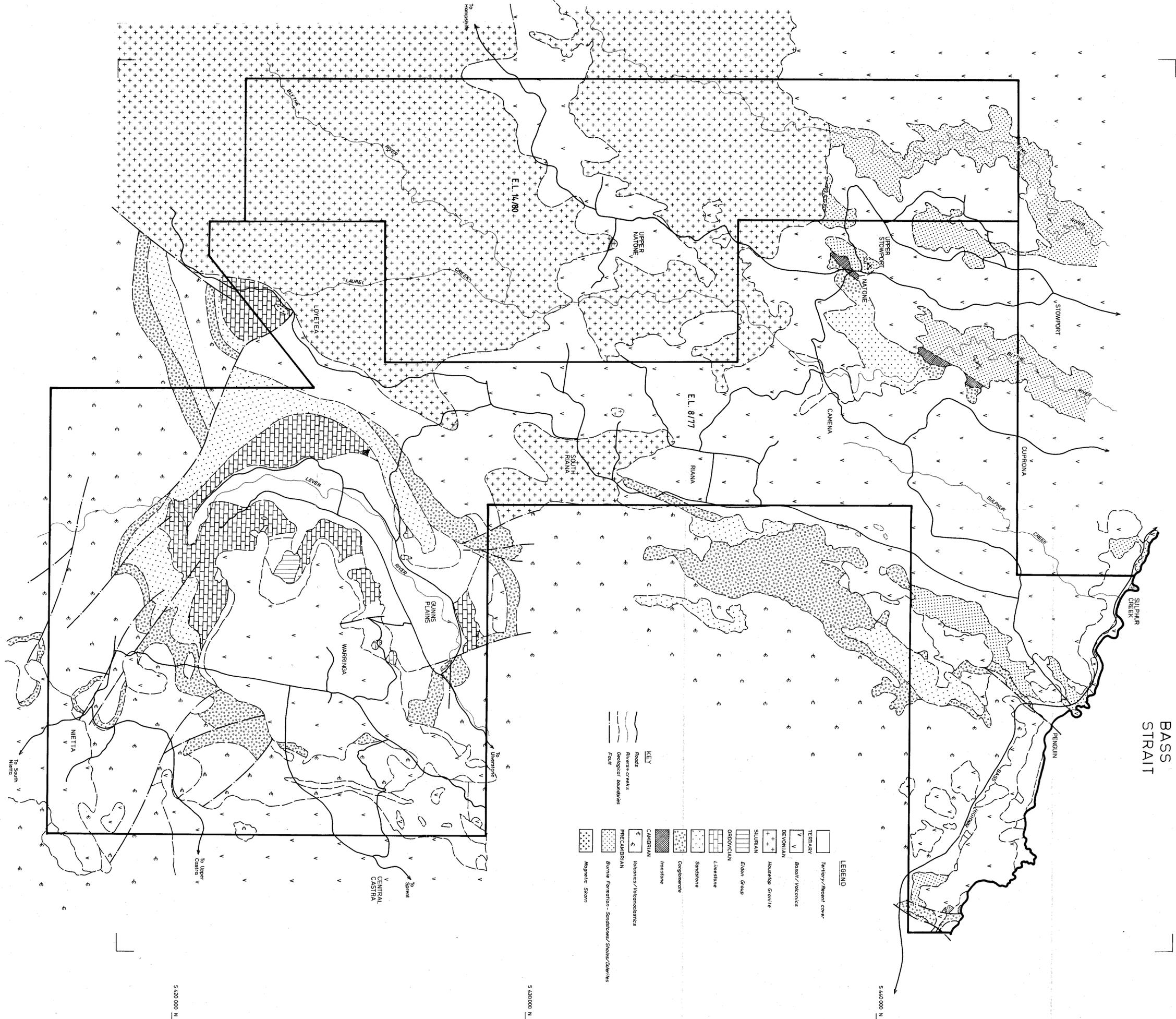
Scale 1cm = 250 nT VERTICAL
1: 2500 HORIZONTAL

FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/M004/070
DATE 9-9-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT

1049



The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA LOYETEA WEST ANOMALY 4142/11 STACKED MAGNETIC PROFILES 1500 E, 1600 E, & 1700 E.	
Scale 1cm = 250m VERTICAL 1:2500 HORIZONTAL	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/M004/071
DATE 9-9-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT.



KEY

- Roads
- Rivers/creeks
- Geological boundaries
- - - Fault

LEGEND

- Tertiary/Recent cover
- TERTIARY
- Basalt/volcanics
- DEVONIAN
- Housetop Granite
- SILURIAN
- Eden Group
- ORDOVICIAN
- Limestone
- Sandstone
- Conglomerate
- Ironstone
- Cambrian
- Precambrian
- Volcanic/volcanoclastics
- Burnie Formation - Sandstones/Slates/Quartzites
- Magnetic Skarn

The Shell Company of Australia Limited METALS DIVISION			
GEOLOGY OF :			
E.L. 8/77 RIANA			
E.L. 14/80 HAYES PEAK			
SCALE	1: 50 000	DATE	31-5-82
AUTHOR	P. RUXTON	DRAWN	H.L.R.
OFFICE	DEVONPORT	REP. No.	
ENCL. No.		DRG No.	D/MQ04/104

721127

5 cm



400 000 E

420 000 E

5 420 000 N

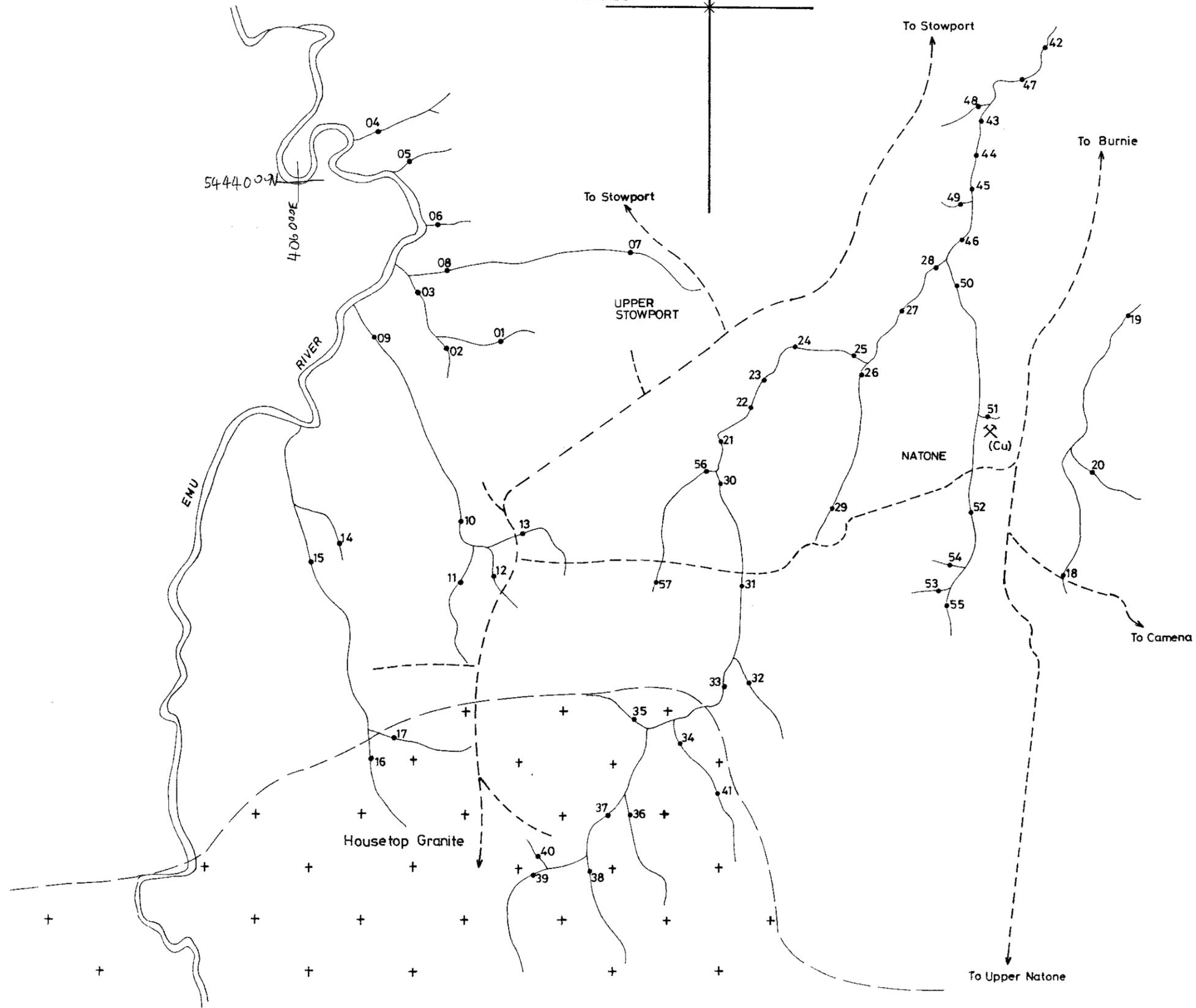
5 430 000 N

5 440 000 N

5 450 000 N

E.L. 14/80
HAYES PEAK

E.L. 8/77
RIANA



721128

KEY

- Sample positions
- Roads
- ~ Rivers & creeks
- - - Granite contact

5 cm

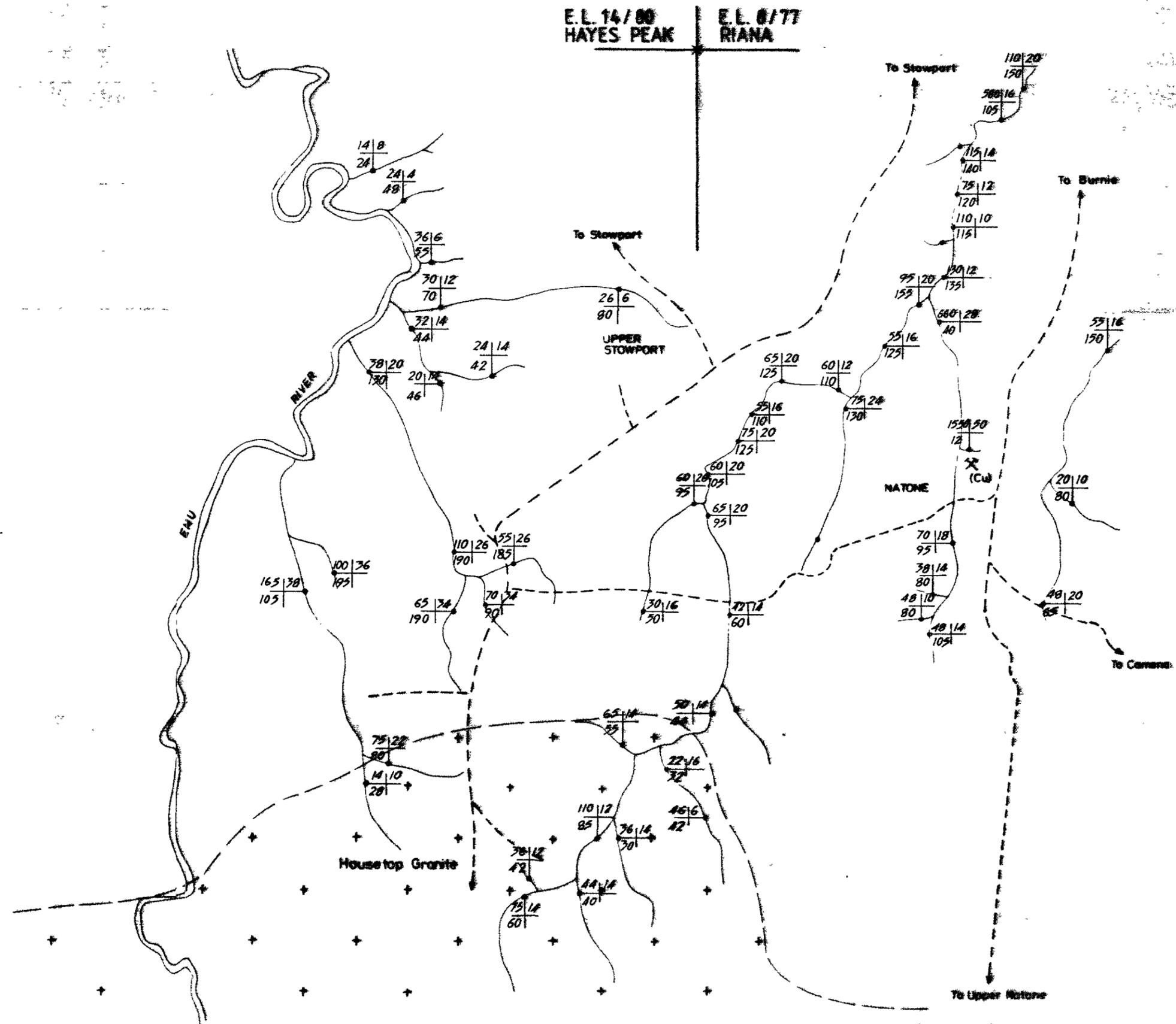
0 Km 1

The Shell Company of Australia Limited
METALS DIVISION

**RIANA/HAYES PEAK
NATONE/UPPER STOWPORT
STREAM SEDIMENT SAMPLING
SAMPLE LOCATION**

SCALE	1:20 000	DATE	16-2-82
AUTHOR	P. RUXTON	DRAWN	H.L.H.
OFFICE	DEVONPORT	REP. No.	
FIG. No.	D/MOQ/086		

STOWPORT 1:25,000



E.L. 14/80
HAYES PEAK

E.L. 8/77
RIANA

Cu	Pb
Zn	

NOTE: Analyses in ppm.

721130

KEY

- Sample positions
- Roads
- ~ Rivers & creeks
- - - Granite contact

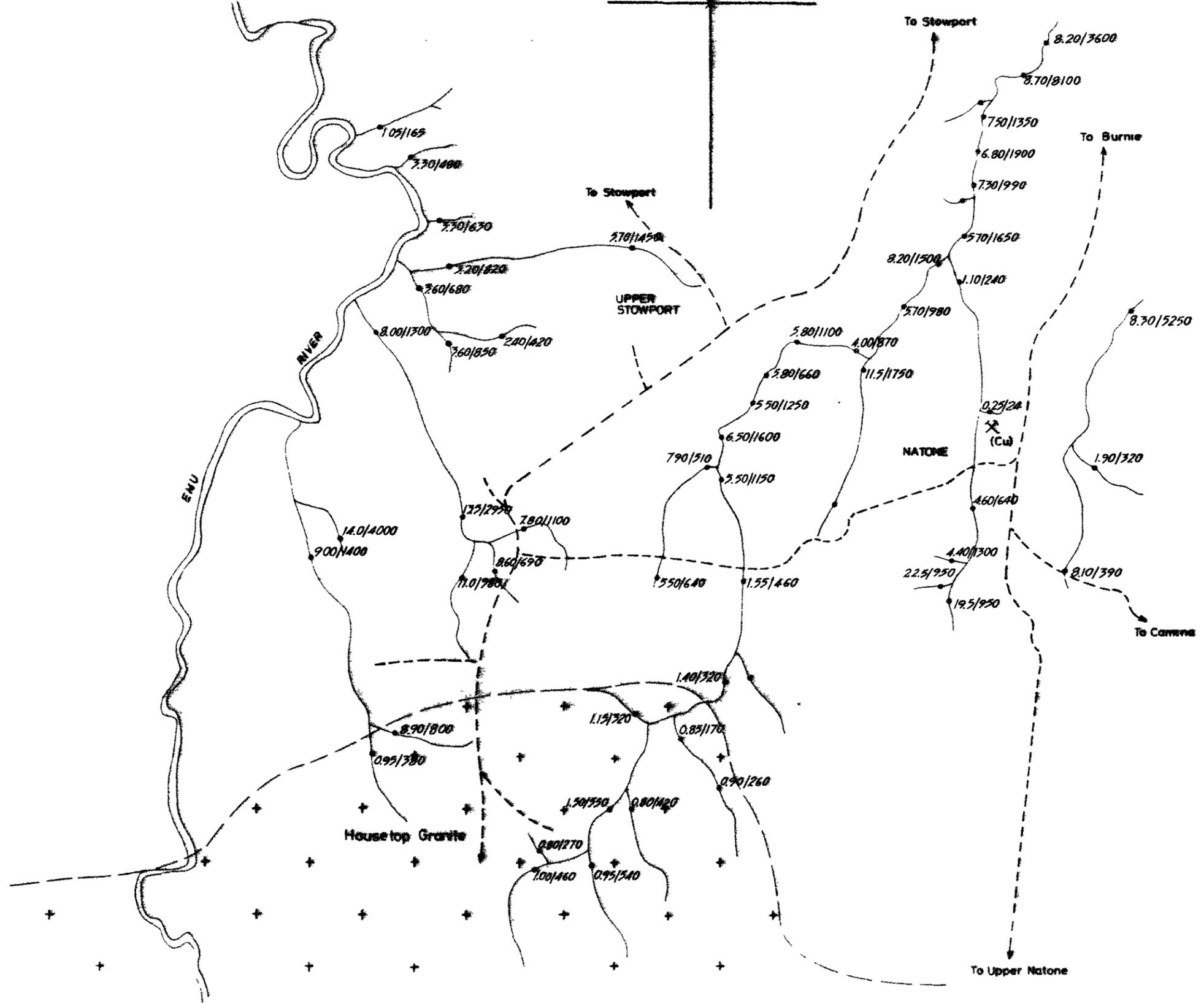
5 cm

0 Km 1

The Shell Company of Australia Limited METALS DIVISION	
RIANA/HAYES PEAK NATONE/UPPER STOWPORT STREAM SEDIMENT SAMPLING ASSAY RESULTS	
SCALE 1:20 000	DATE 10-2-82
AUTHOR W. RUXTON	DRAWN H. L. H.
OFFICE DEVONPORT	REP No.
DRG D/M/04/098	FIG No.

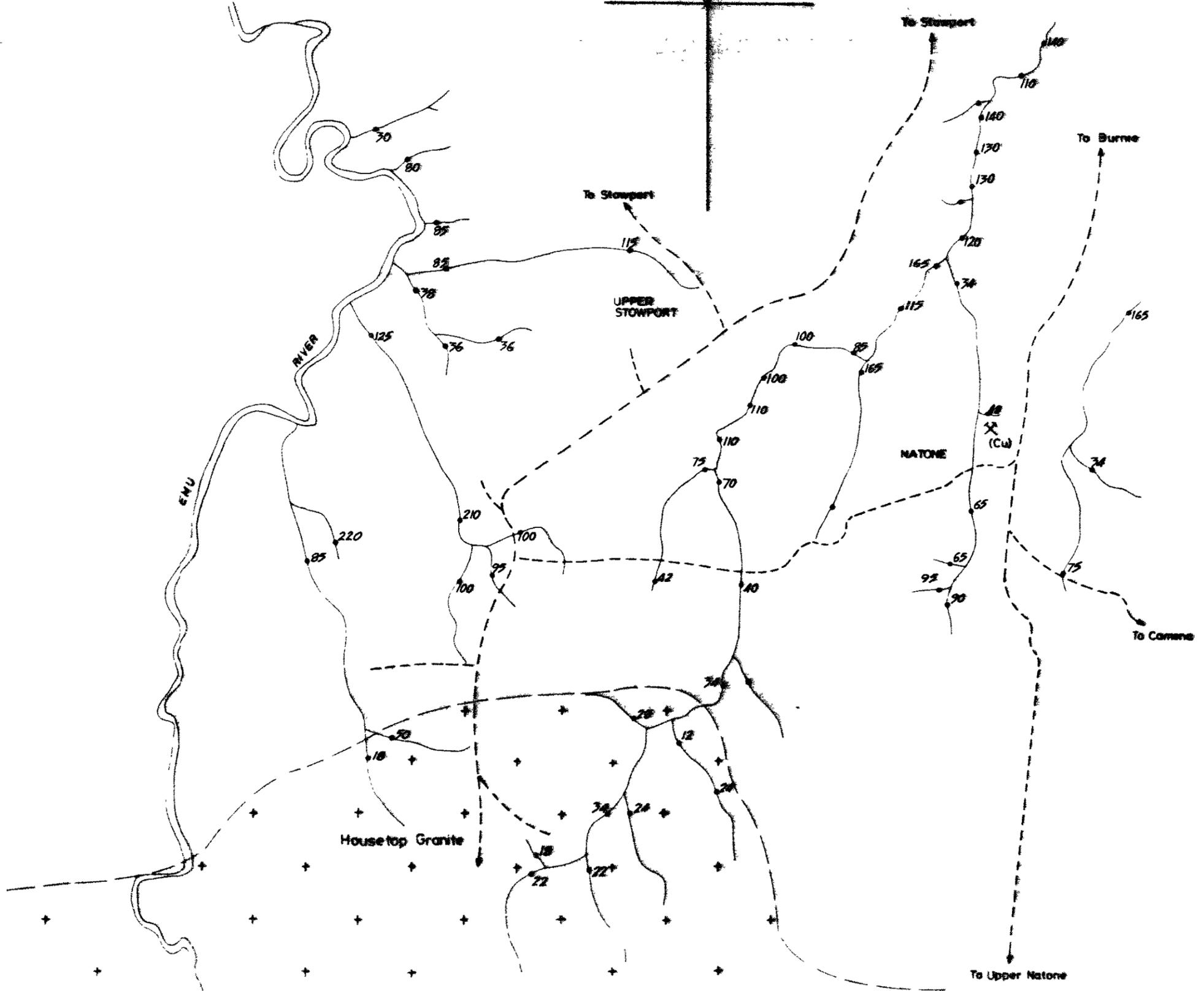
E.L. 14/88
HAYES PEAK

E.L. 8/77
RIANA



The Shell Company of Australia Limited METALS DIVISION			
RIANA/HAYES PEAK NATONE/UPPER STOWPORT STREAM SEDIMENT SAMPLING ASSAY RESULTS			
SCALE	1:20 000	DATE	16-2-82
AUTHOR	P. RUXTON	DRAWN	H.L.H.
OFFICE	DEVONPORT	REP No.	
DRG No.	D/M004/097	FIG No.	

EE 1478 HAYES PEAK
EL 6177 RIANA



Ni
Ni

NOTE: Analyses in ppm.

KEY

- Sample points
- - - Roads
- ~ Rivers & creeks
- - - Granite contact

721132



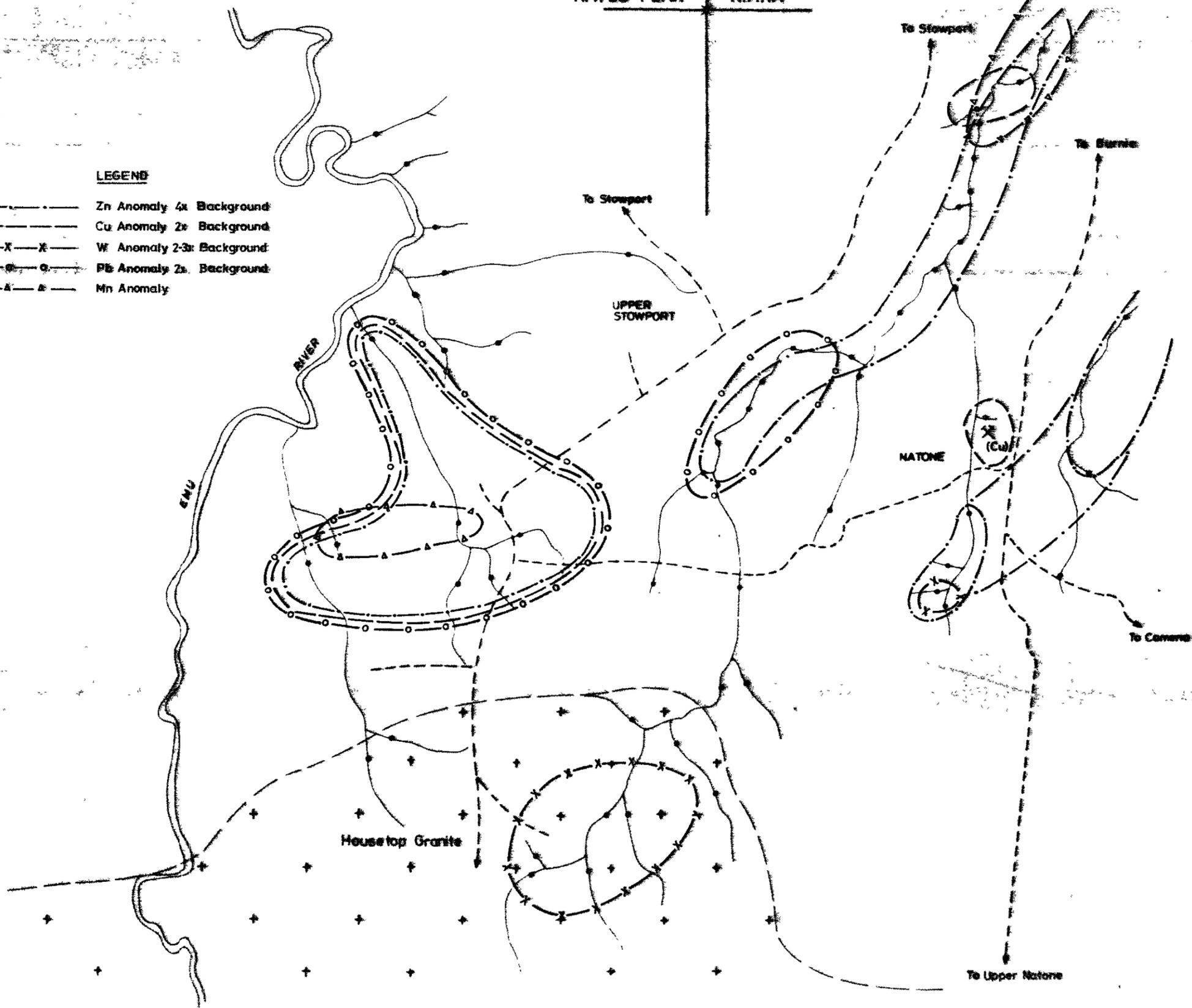
The Shell Company of Australia Limited METALS DIVISION	
RIANA/HAYES PEAK NATONE/UPPER STOWPORT STREAM SEDIMENT SAMPLING ASSAY RESULTS	
SCALE 1:20 000	DATE 16-2-82
AUTHOR P. RUXTON	DRAWN H.L.H.
OFFICE DEVONPORT	REP No.
DR. N. D/M904/099	FIG. N.

E.L. 14/89
HAYES PEAK

E.L. 8/77
RIANA

LEGEND

- Zn Anomaly 4x Background
- Cu Anomaly 2x Background
- X—X— W Anomaly 2-3x Background
- Pb Anomaly 2x Background
- ▲—▲— Mn Anomaly



721133

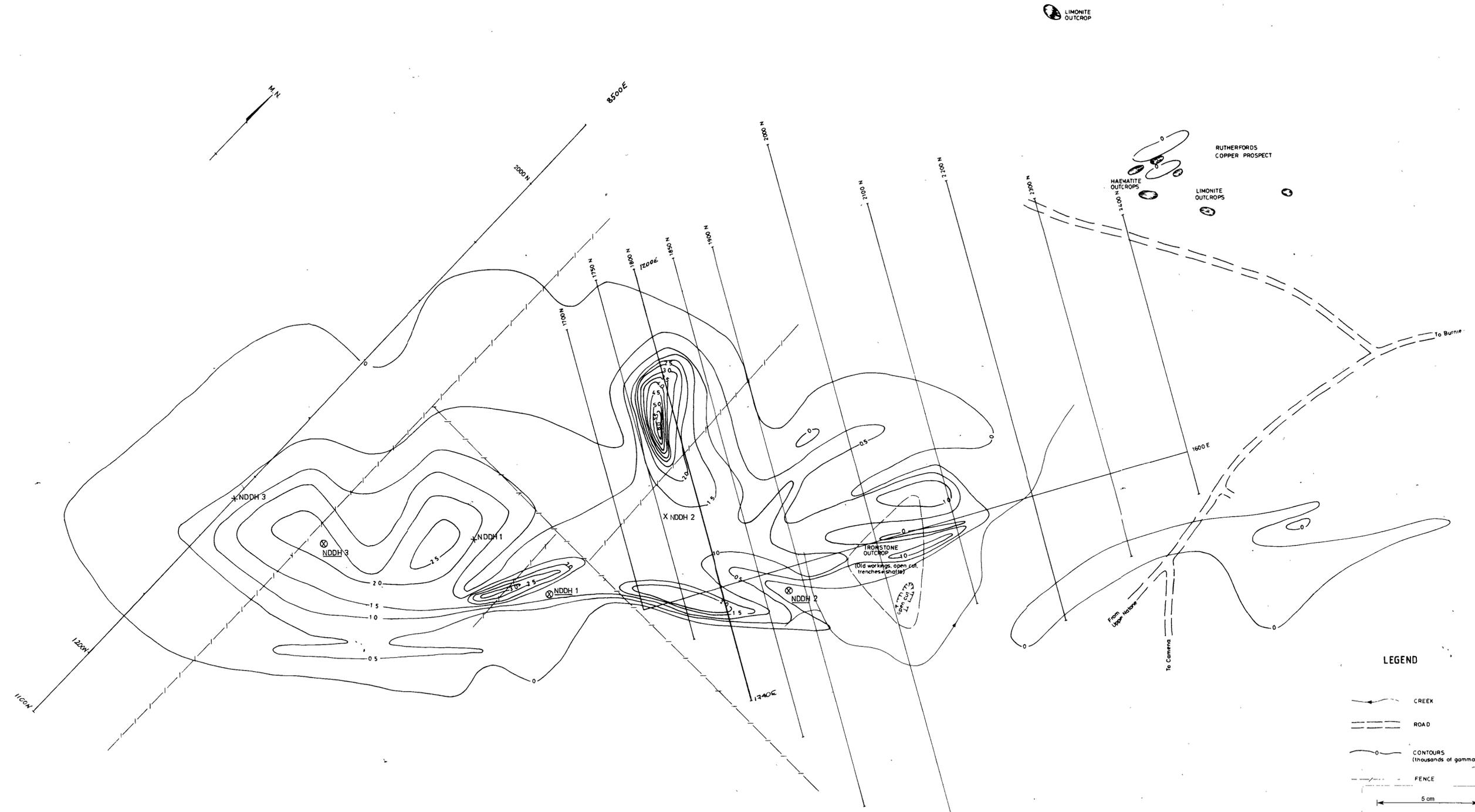
KEY

- Sample positions
- Roads
- ~ Rivers & tracks
- Granite contact

5 cm

1 km

The Shell Company of Australia Limited METALS DIVISION			
RIANA / HAYES PEAK NATONE / UPPER STOWPORT STREAM SEDIMENT SAMPLING SUMMARY OF ASSAY VALUES			
SCALE	1:20 000	DATE	16-2-82
AUTHOR	P. BUXTON	DRAWN	H. L. H.
OFFICE	DE VONPORT	REP No	
NO.	D/M904/100	REV	



LEGEND

-  CREEK
-  ROAD
-  CONTOURS (thousands of gammas)
-  FENCE



The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
NATONE ANOMALY 4044/1
Vertical field magnetic contours
from 1962 BMR survey plus
approx. position of Shell grid.

Scale 1:2500	
FIG No	REPORT No
ENCL No	DRG No D/MQ04/064
DATE 29-7-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT

GRID REFERENCES

Reported position of MINOPS drill holes.	X NDDH 1	408650 E / 5441700 N	From Comalco Riana report Dec 1979
	X NDDH 2	408880 E / 5441900 N	
	X NDDH 3	408450 E / 5441600 N	

⊗ NDDH 1 Corrected positions from local information, etc.



3000 N
2900 N
2800 N
2700 N
2600 N
2500 N
2400 N
2300 N
2200 N
2100 N
2000 N
1900 N
1800 N
1700 N

600 E 700 E 800 E 900 E 1000 E 1100 E 1200 E 1300 E 1400 E 1500 E 1600 E 1700 E 1800 E 1900 E 2000 E

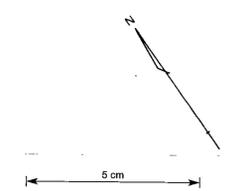
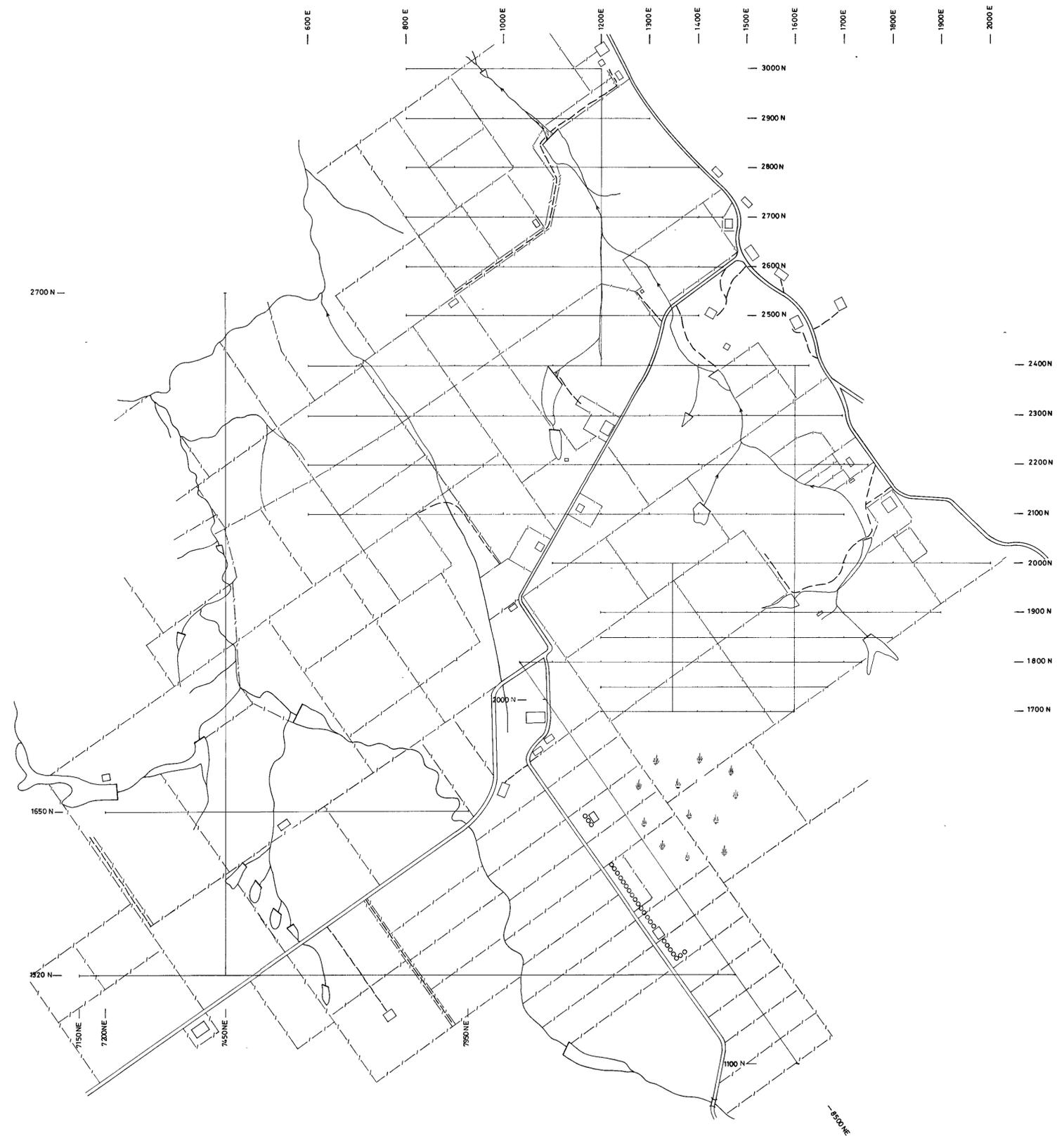
- LEGEND**
- Creek with dam
 - Road
 - Track
 - Houses and outbuildings
 - Fences

721135



0 100 200 M

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE PROSPECT CULTURE MAP & GRID	
Scale 1:2500	
FIG No	REPORT No
ENCL No	DRG No D/MQ04/083
DATE 10-2-82	AUTHOR P RUXTON
DRAWN H L H	OFFICE DEVONPORT



- LEGEND**
- Creek with dam
 - Road
 - Track
 - Houses & outbuildings
 - Fences
 - Trees
 - Swamp

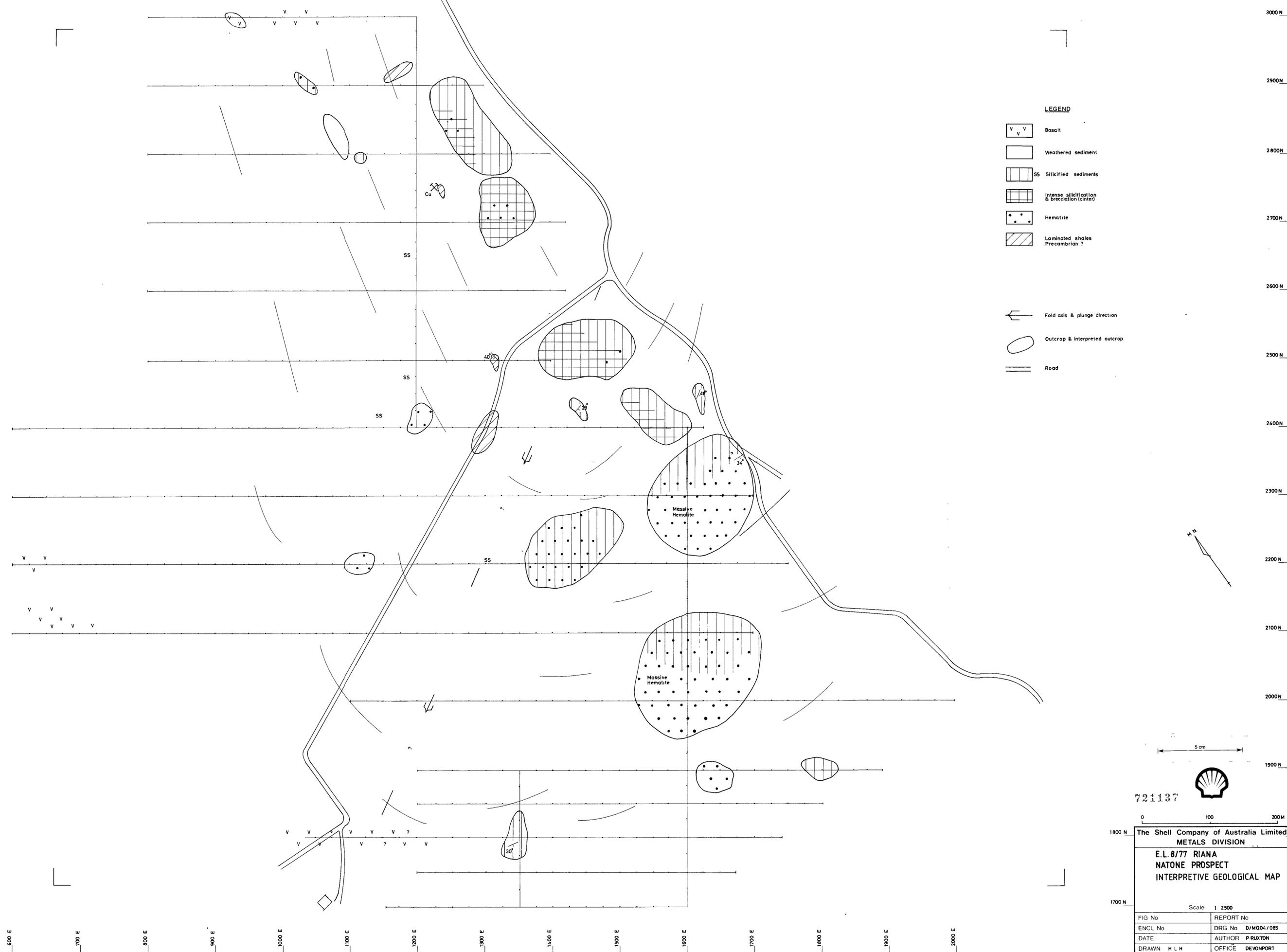


721136

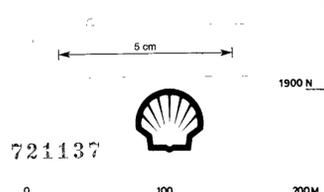
The Shell Company of Australia Limited
METALS DIVISION

**E.L. 8/77 RIANA
NATONE EXTENDED GRID
& CULTURE MAP**

Scale 1 5000	
FIG No	REPORT No
ENCL No	DRG No D/M004/087
DATE 17-2-82	AUTHOR P RUXTON
DRAWN H L H	OFFICE DEVONPORT

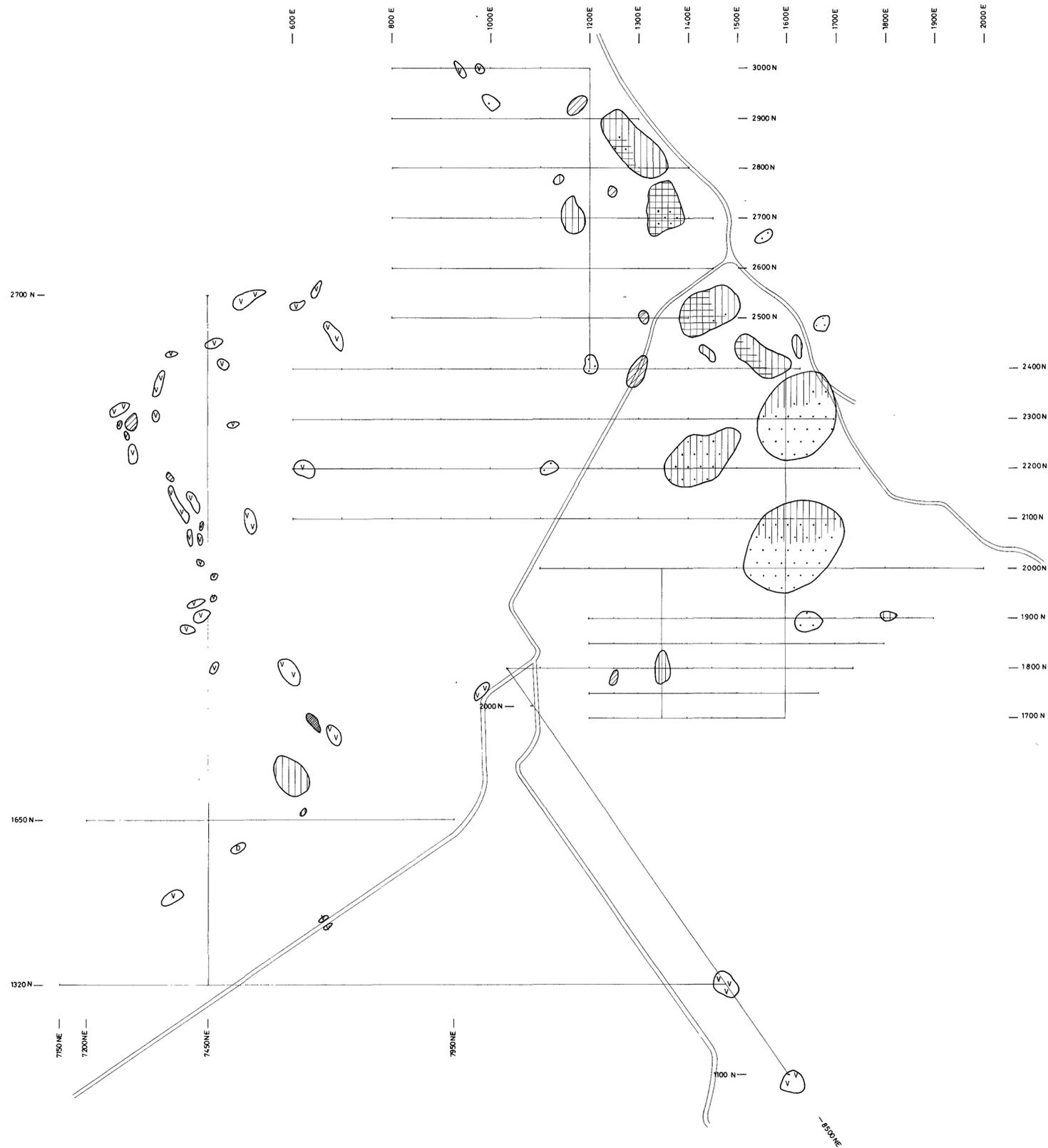


- LEGEND**
- Basalt
 - Weathered sediment
 - SS Silicified sediments
 - Intense silicification & brecciation (center)
 - Hematite
 - Laminated shales
Precambrian?
-
- Fold axis & plunge direction
 - Outcrop & interpreted outcrop
 - Road



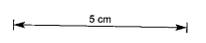
721137

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE PROSPECT INTERPRETIVE GEOLOGICAL MAP	
Scale 1:2500	
FIG No	REPORT No
ENCL No	DRG No D/MQ04/085
DATE	AUTHOR P RUXTON
DRAWN H L H	OFFICE DEVONPORT



-  Basalt
-  Weathered sediment
-  Silicified sediments
-  Intense silicification & brecciation (center)
-  Hematite
-  Laminated shales - Precambrian?
-  p6 Dolerite
-  Ironstone

721138

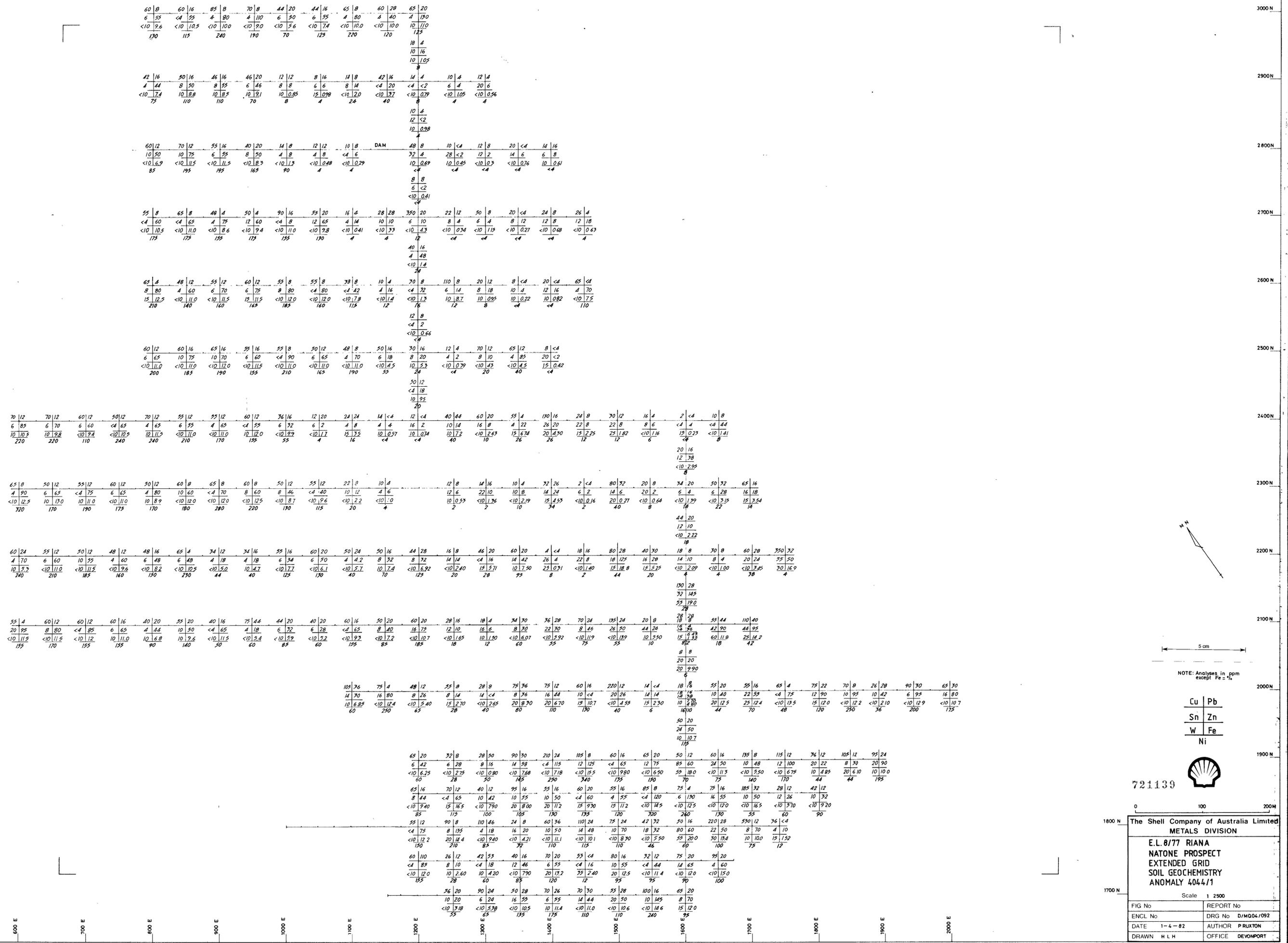


The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
NATONE EXTENDED GRID
INTERPRETIVE GEOLOGICAL MAP

Scale 1:5000

FIG No	REPORT No
ENCL No	DRG No D/M004/103
DATE 17-2-62	AUTHOR P. RUXTON
DRAWN H. L. H.	OFFICE DEVONPORT



NOTE: Analyses in ppm except Fe = %

5cm

0 100 200M

1800 N

The Shell Company of Australia Limited
METALS DIVISION

721139

1900 N

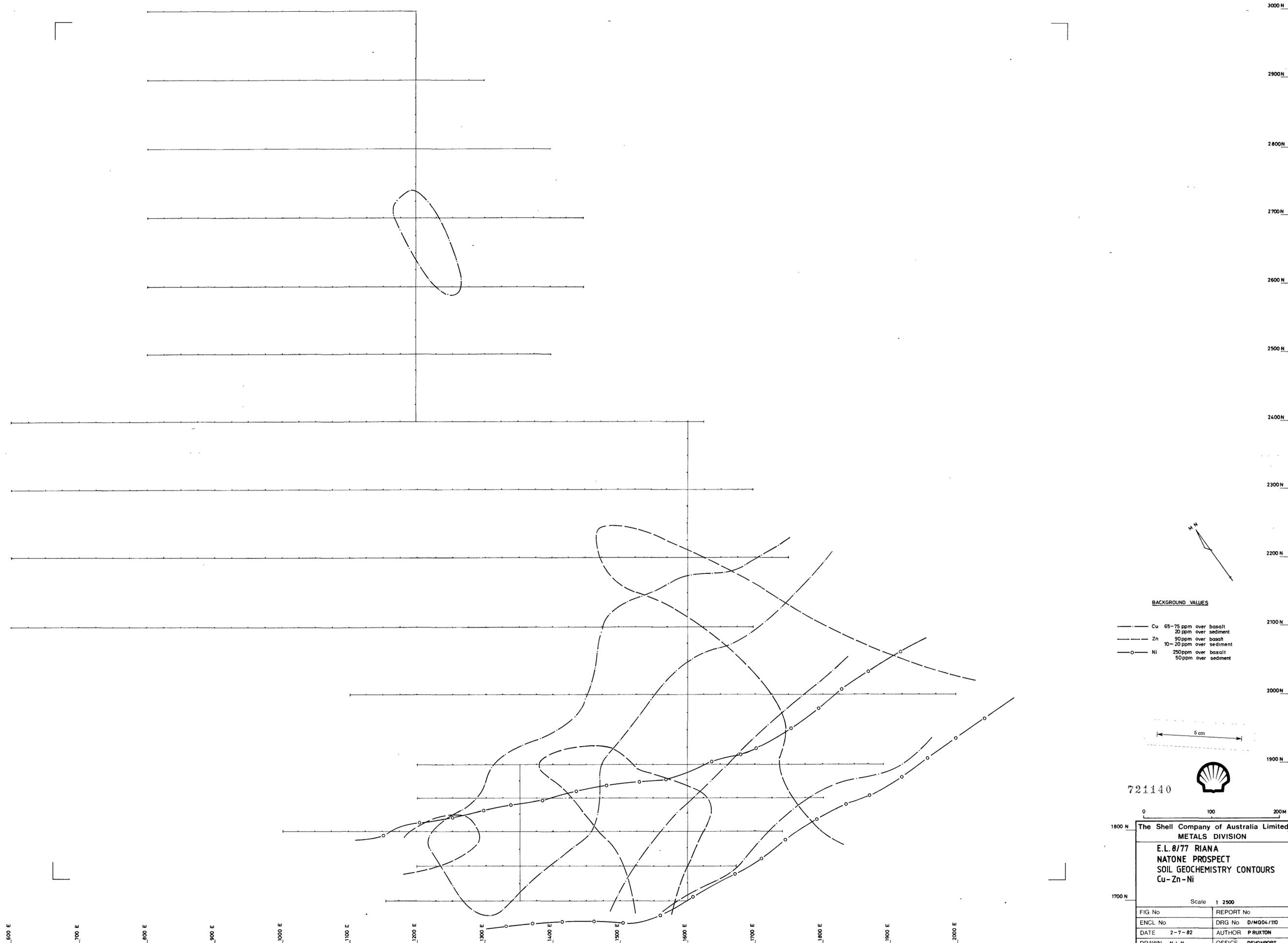
E.L. 8/77 RIANA
NATONE PROSPECT
EXTENDED GRID
SOIL GEOCHEMISTRY
ANOMALY 4044/11

1700 N

Scale 1:2500

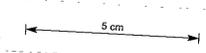
FIG No	REPORT No
ENCL No	DRG No D/M04/092
DATE 1-4-82	AUTHOR P RUXTON
DRAWN H L H	OFFICE DEVONPORT

1051



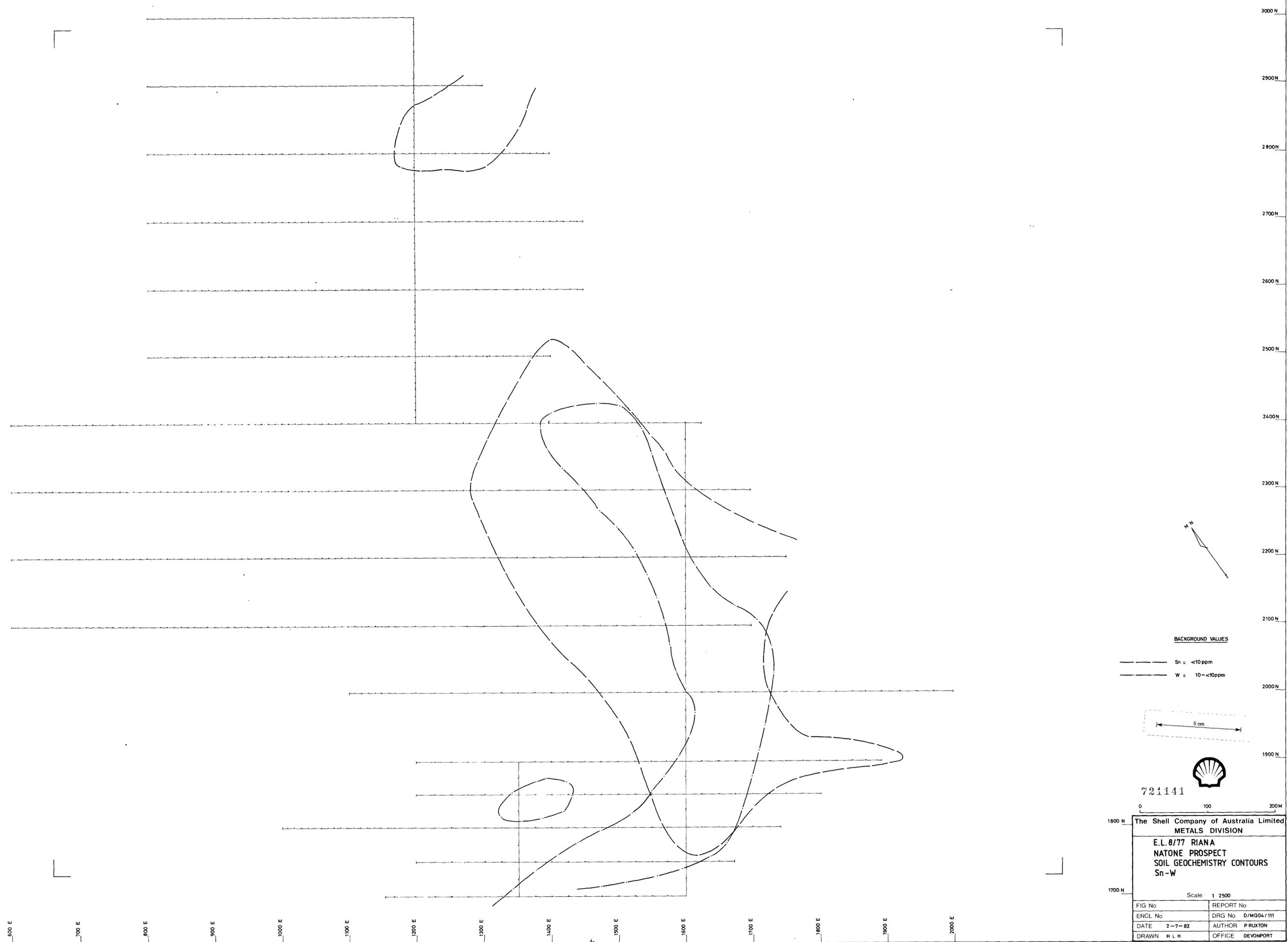
BACKGROUND VALUES

- Cu 65-75 ppm over basalt
20 ppm over sediment
- - - Zn 90 ppm over basalt
10-20 ppm over sediment
- Ni 250 ppm over basalt
50 ppm over sediment



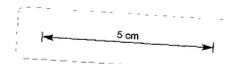
721140

0 100 200M	
The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE PROSPECT SOIL GEOCHEMISTRY CONTOURS Cu-Zn-Ni	
Scale 1 2500	
FIG No	REPORT No
ENCL No	DRG No D/M004/110
DATE 2-7-82	AUTHOR P RUKTON
DRAWN H L H	OFFICE DEVONPORT



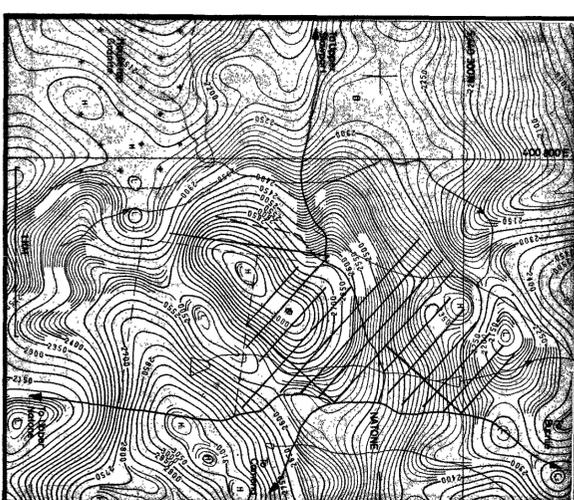
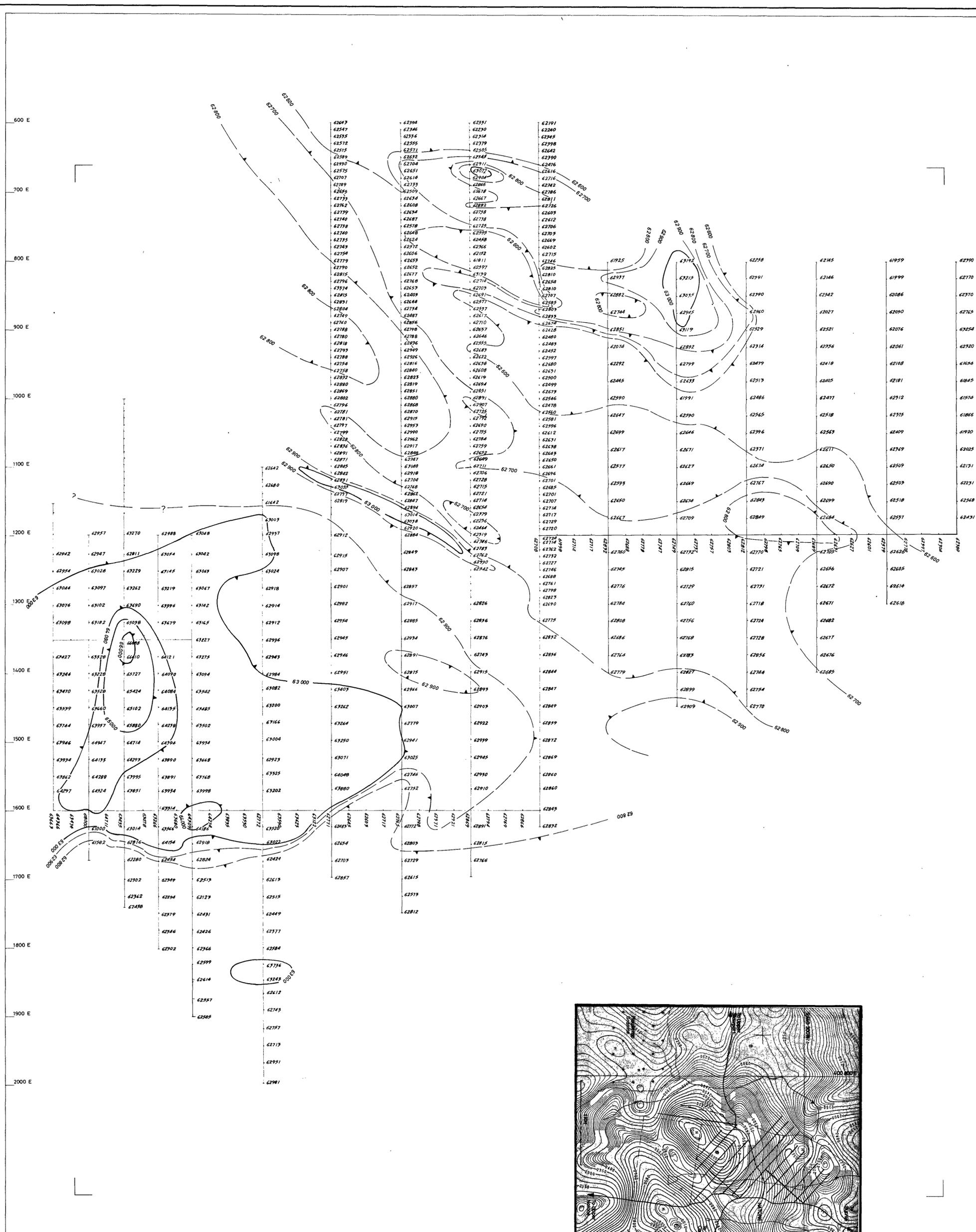
BACKGROUND VALUES

- Sn = <math>< 10 \text{ ppm}</math>
- - - W = 10 - <math>< 10 \text{ ppm}</math>



721141

0		100		200M	
The Shell Company of Australia Limited					
METALS DIVISION					
E.L. 8/77 RIANA					
NATONE PROSPECT					
SOIL GEOCHEMISTRY CONTOURS					
Sn - W					
Scale 1:2500					
FIG No	REPORT No				
ENCL No	DRG No D/M004/111				
DATE 2-7-82	AUTHOR P RUXTON				
DRAWN H L H	OFFICE DEVONPORT				



721142

0 100 200 300 400 500 600 700 800 900 1000

1700 N 1800 N 1900 N 2000 N 2100 N 2200 N 2300 N 2400 N 2500 N 2600 N 2700 N 2800 N 2900 N 3000 N

1700 E 1800 E 1900 E 2000 E 2100 E 2200 E 2300 E 2400 E 2500 E 2600 E 2700 E 2800 E 2900 E 3000 E

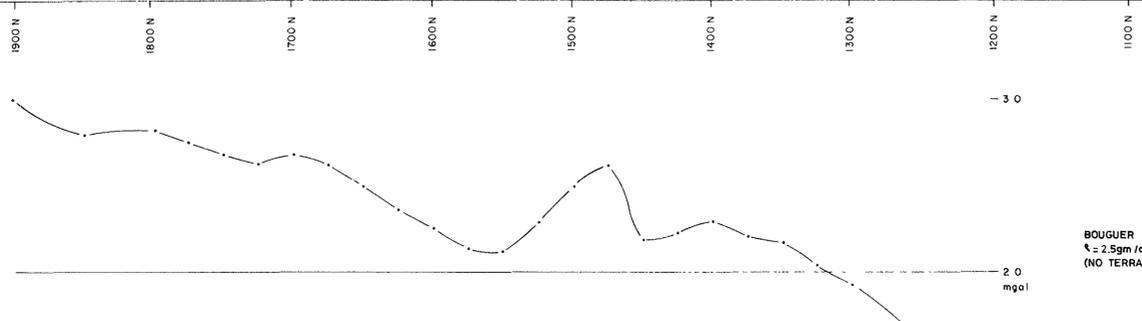
1000 FT
1000 FT

5 cm

Scale 1:2500

FIG. NO. REPORT NO.
ENCL. NO. DRG. NO. DIMOUL/DB
DATE AUTHOR PLATON
DRAWN H. L. H. OFFICE DEWOPORT

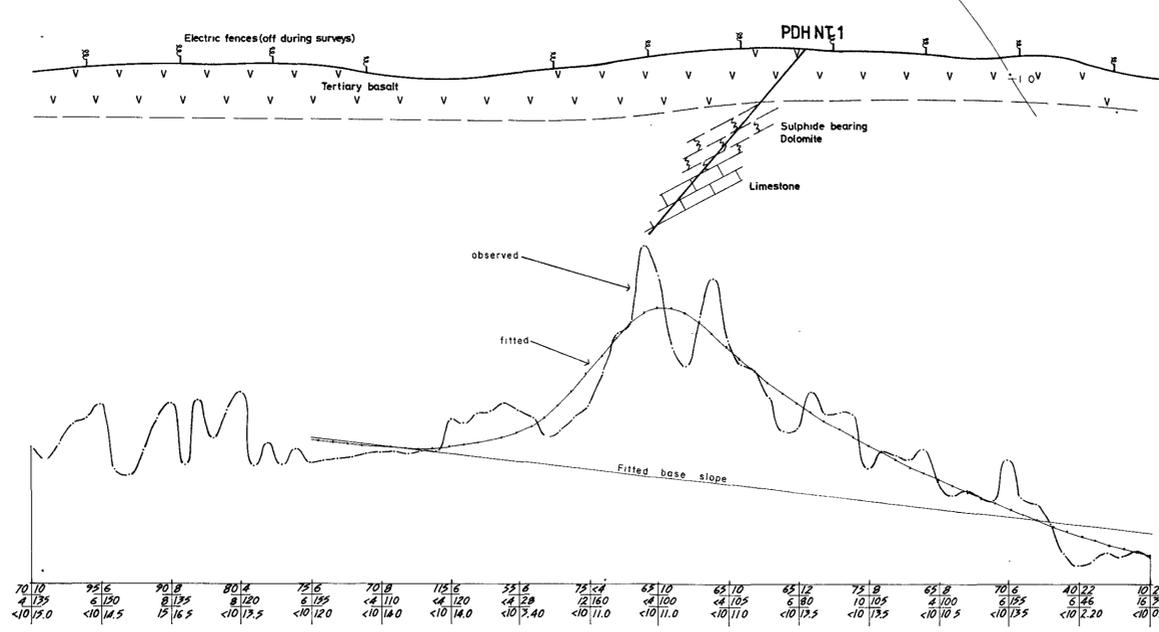
The Shell Company of Australia Limited
METALS DIVISION
E.L. 8/77 RIANA
NATONE PROSPECT
EXTENDED GRID
GROUND MAGNETICS &
CONTOURS



BOUGUER GRAVITY
 $\rho = 2.5 \text{ gm/cc}$
 (NO TERRAIN CORRECTIONS)

ELEVATION & INFERRED GEOLOGY

Fitted model (by MAGMOD, TABULAR 2)
 Top depth 61m
 Top width 38m
 Centre position 1465 N
 Dip 22° S



721144

The Shell Company of Australia Limited
 METALS DIVISION

E.L. 8777 RIANA
 NATONE ANOMALY 4044/1
 LINE 8500 N.E.
 GEOPHYSICAL SURVEYS

FIG No	REPORT No
ENCL No	DIRG No
DATE	AUTHOR
DRAWN	OFFICE

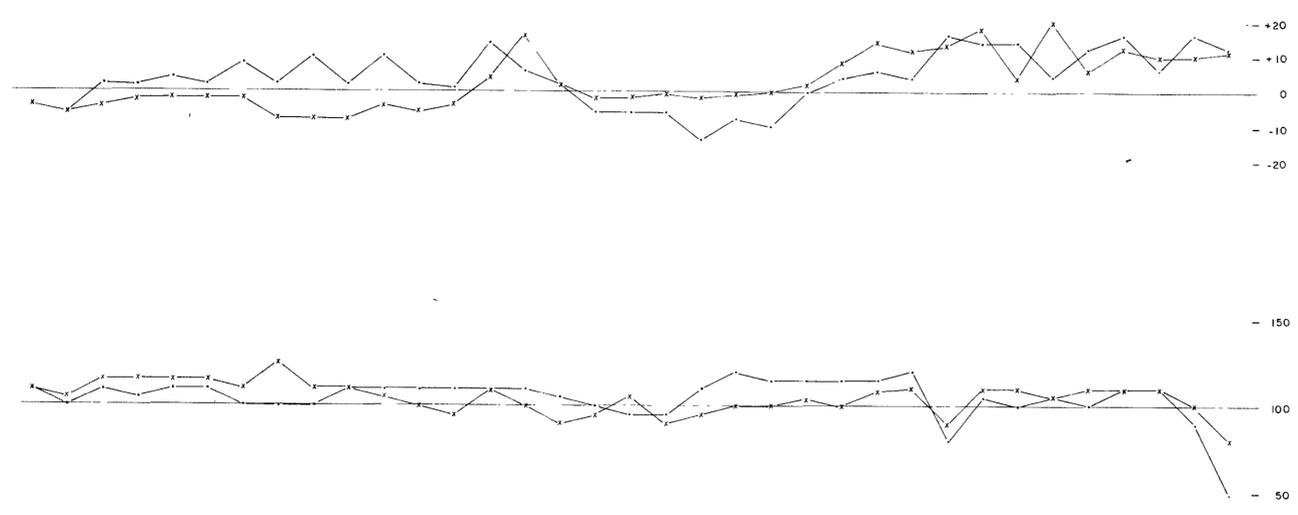
Scale 1:2500 HORIZONTAL

70.170	93.16	90.18	80.18	75.16	70.18	115.16	55.16	75.14	62.170	65.170	62.172	75.18	65.18	70.16	40.122	10.26
<10.135	<10.145	8.1125	8.120	6.125	<10.120	<10.120	<10.140	<10.140	<10.110	<10.105	<10.125	<10.135	<10.105	<10.135	<10.120	<10.066

LINE 8500 N.E.
 (BEARING ~ 0° MN)

NOTE
 SOIL GEOCHEMISTRY =
 Analyses in ppm.

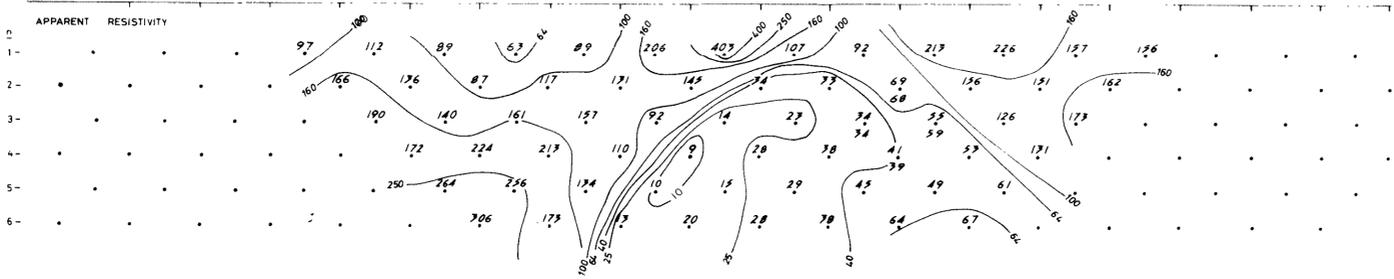
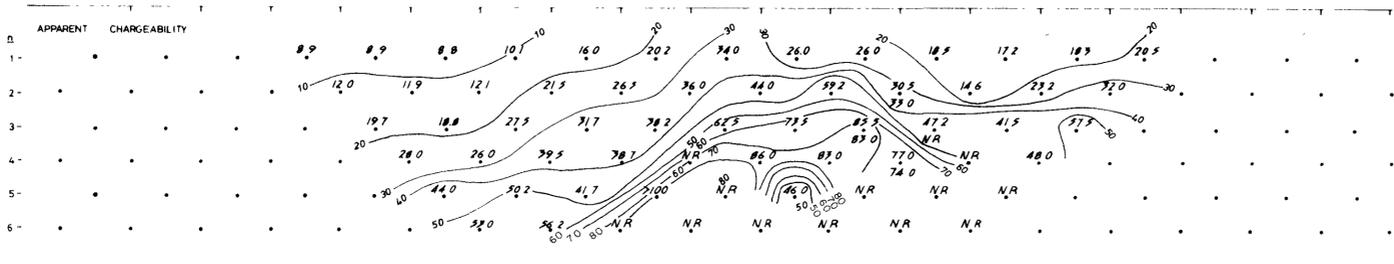
Cu	Pb
Zn	Fe%



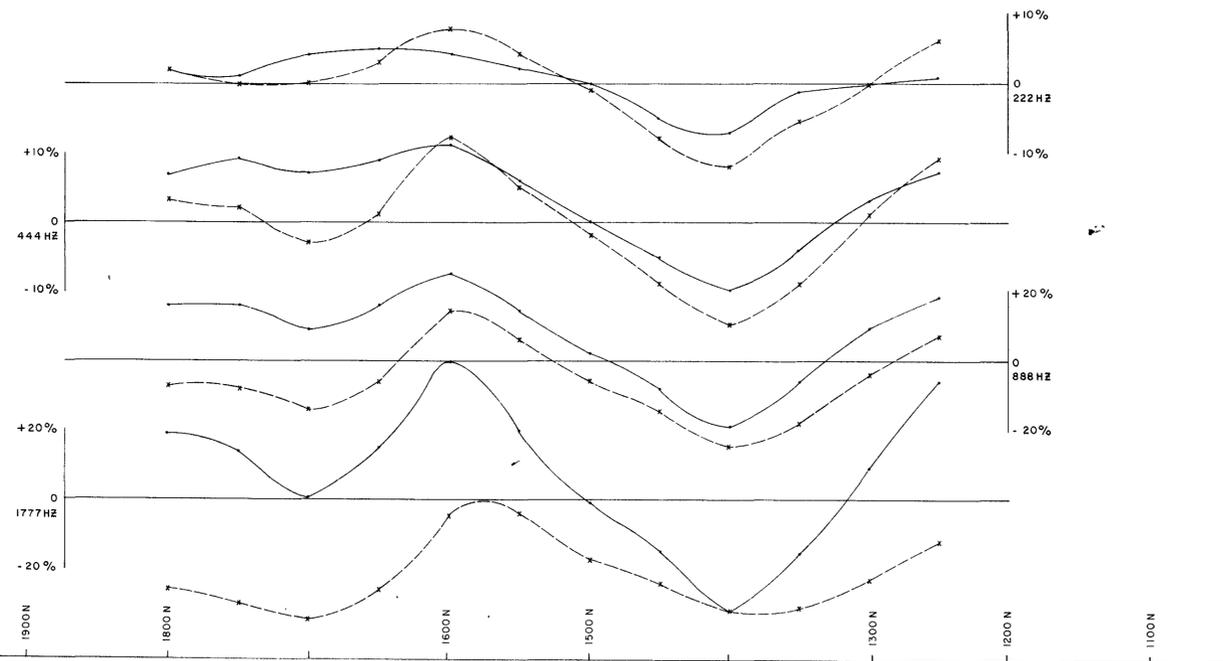
Dip °

Level (%)

VLF E.M. SURVEY
 X - Japan
 Dip convention +ve for easterly dip, -ve for westerly dip
 F - North West Cape
 Dip convention +ve for northerly dip, -ve for southerly dip

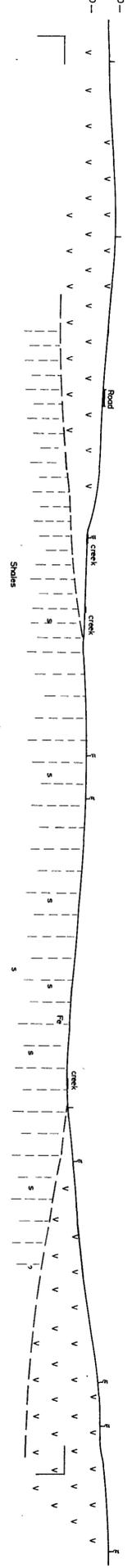


Contractor SCINTREX
 Date 3-8-81
 Timing 2-SEC
 Transmitter IBC-7/2.5kw
 Receiver IPR 8
 Array DIPOL E - DIPOLE
 Dipole length 50M

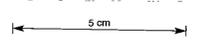


MAX - MIN - EM LINE 8500 NE
 — IP
 X — OP
 COIL SEP'N = 200m

TOPOGRAPHY - INFERRED GEOLOGY
 (Meters A.S.L.)
 300 -
 1 Fences
 Electric fences



- V Tertiary basalt
- V Precambrian shales & sandstones
- S Silicified sediment
- S Iron staining



721145

0 100 200M

The Shell Company of Australia Limited
 METALS DIVISION

E.L. 8/77 RIANA
 NATONE PROFILES
 LINE 1320N

SCALE	1 2500	DATE	8-6-82
AUTHOR	P RUXTON	DRAWN	H L H
OFFICE	DEVONPORT	REP No	
ENCL No		DRG No	DMG04/106

MAGNETICS



V.L.F.

150 1/2
 Transmitter = NW CGP
 Dip convention = true dip to W



Dip angle



S.P.
 (in volts)

- +200 -
- +100 -
- 0 -
- 100 -
- 200 -

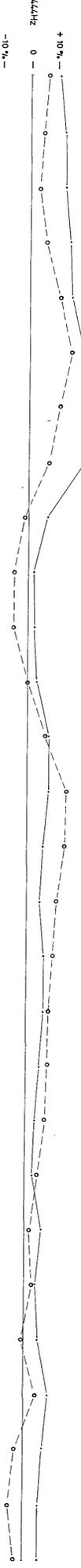


MAX-MIN

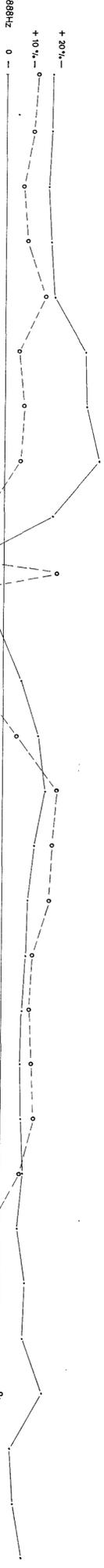
+20 1/2
 +20 1/2



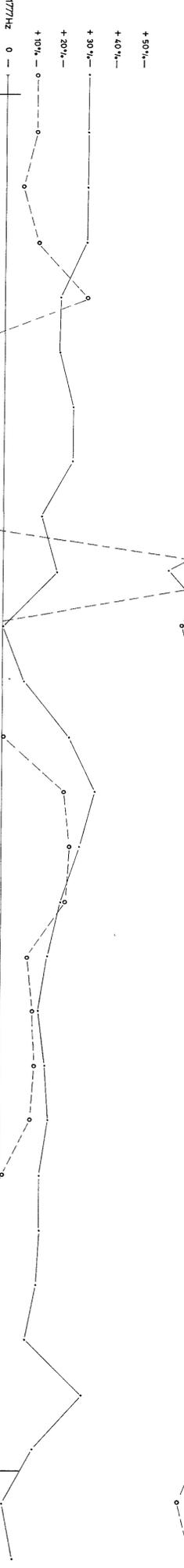
222Hz



444Hz



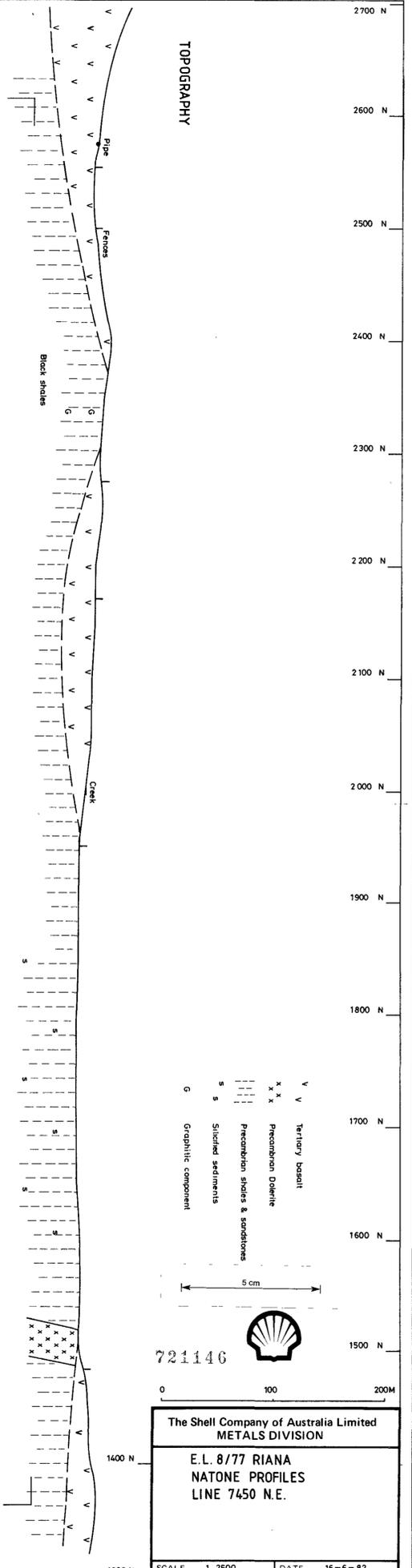
888Hz



1777Hz

- o Out of phase
- - - - - In phase
- o Coil separation - 200m

TOPOGRAPHY

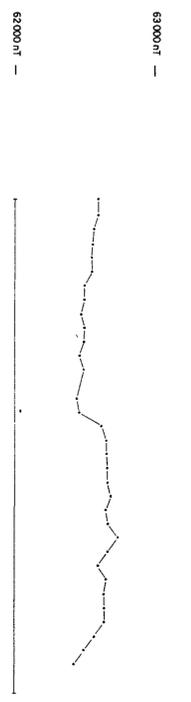


721146



The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE PROFILES LINE 7450 N.E.	
SCALE 1 2500	DATE 16-6-82
AUTHOR P RUXTON	DRAWN H L H
OFFICE DEVONPORT	REP No
ENCL No	DRG No D/MQ04/108

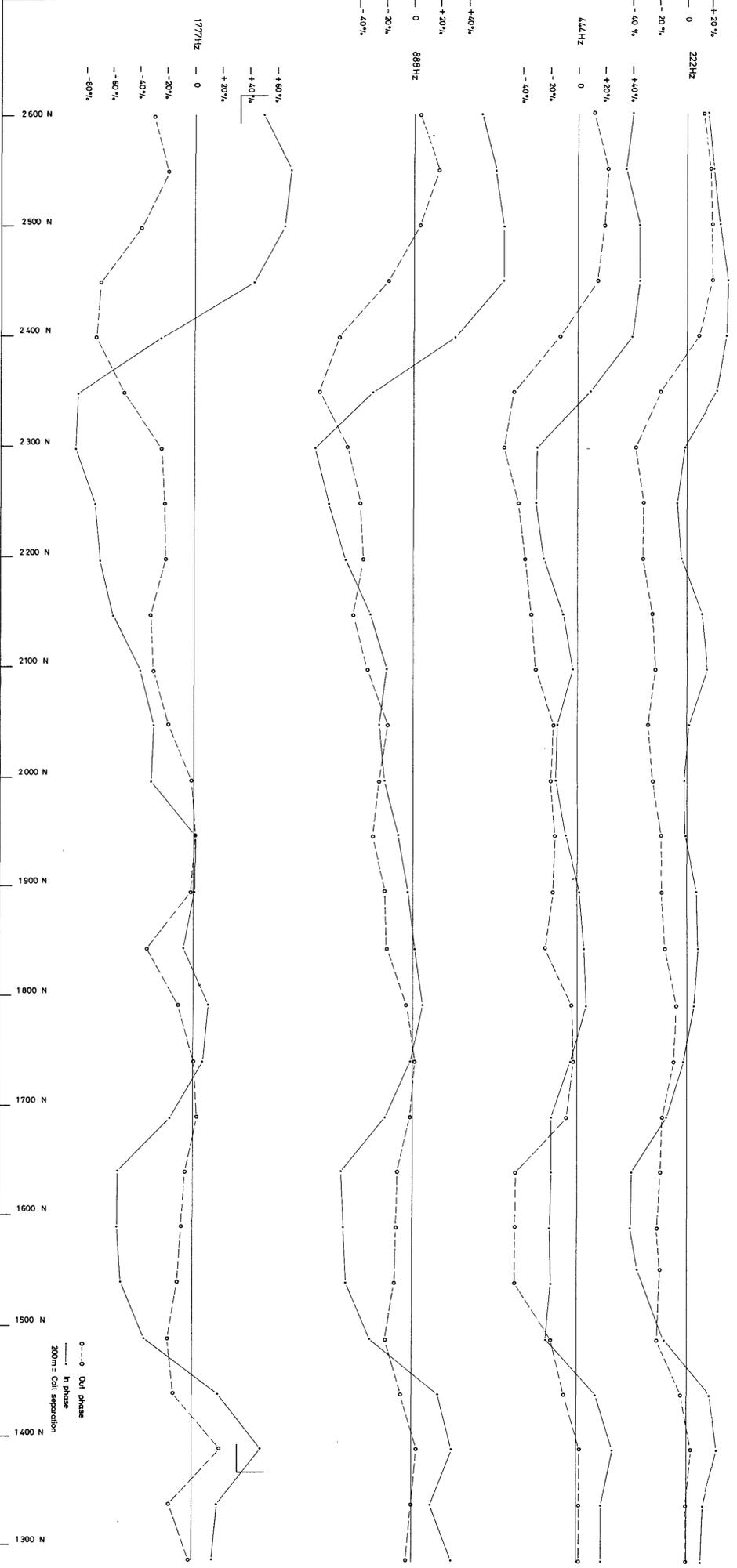
MAGNETICS



S.P.



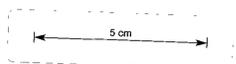
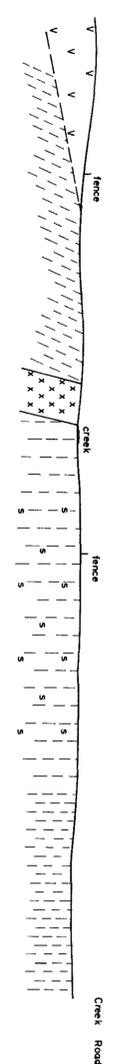
MAX-MIN



7250 E
7300 E
7400 E
7500 E
7600 E
7700 E
7800 E
7900 E
7950 E

NW

SE



721147

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
NATONE PROFILES
LINE 1650 N

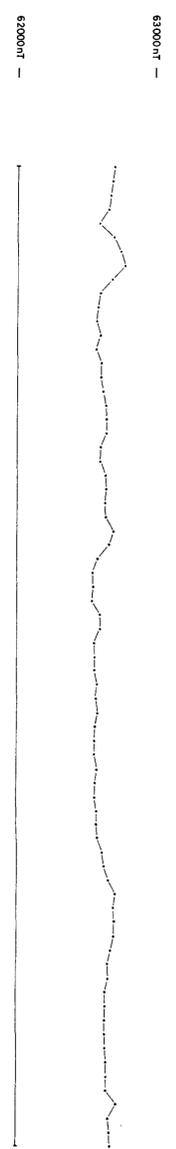
SCALE	1:2500	DATE	3-6-82
AUTHOR	P. RUXTON	DRAWN	H.L.H.
OFFICE	DEVONPORT	REP No	
ENCL No		DRG No	D/MG04/105

TOPOGRAPHY
(Meris A.S.L.)

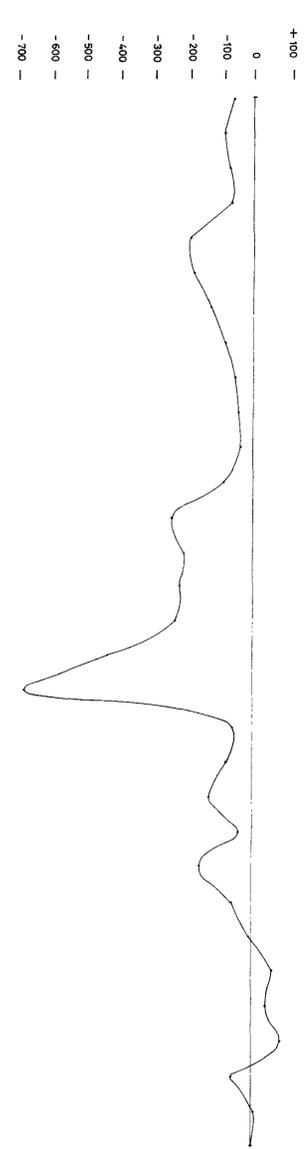
INFERRED GEOLOGY

- V Tertiary basalt
- X X Precambrian Diorite
- ||||| Precambrian Shales & Sandstones
- S S Silicified sediments

MAGNETICS



S.P.
(mV/m)



GRAVITY
(mgals)

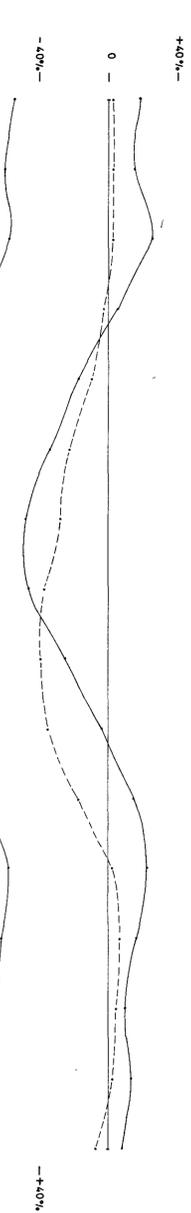
BOLAUER DENSITY = 2.79/cm³
(no terrain corrections)



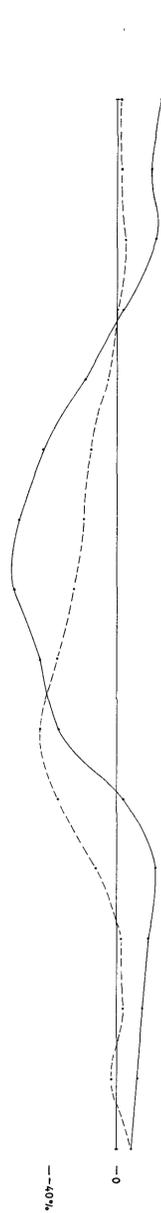
MAX-MIN

--- Out Phase
--- In Phase
200m = Coil separation

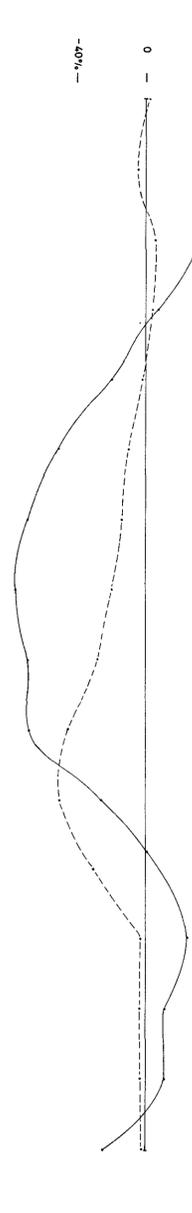
222 Hz



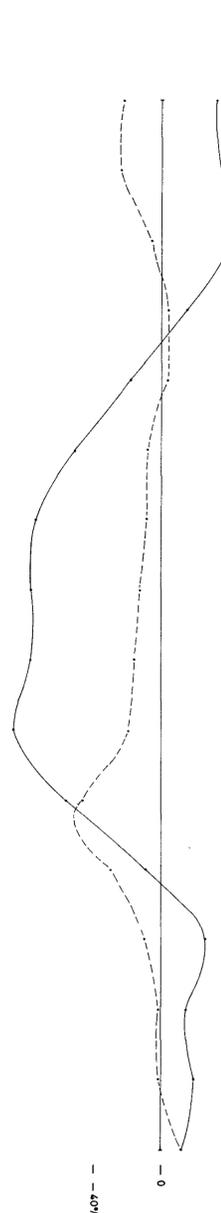
444 Hz



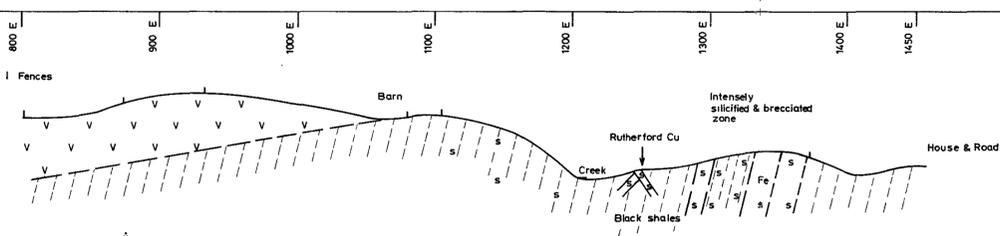
888 Hz



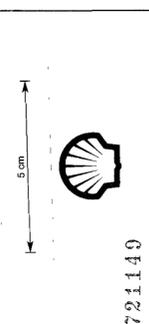
1777 Hz



TOPOGRAPHY & INFERRED GEOLOGY

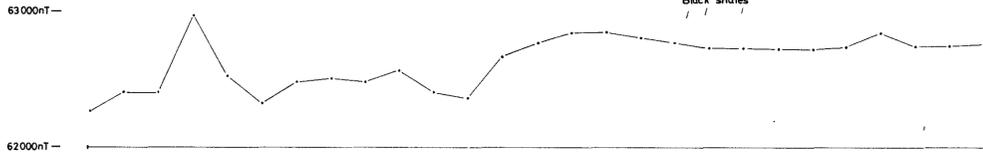


- V Tertiary basalt
- Precambrian shales & sandstones
- s Silicified sediments
- Fe Iron staining

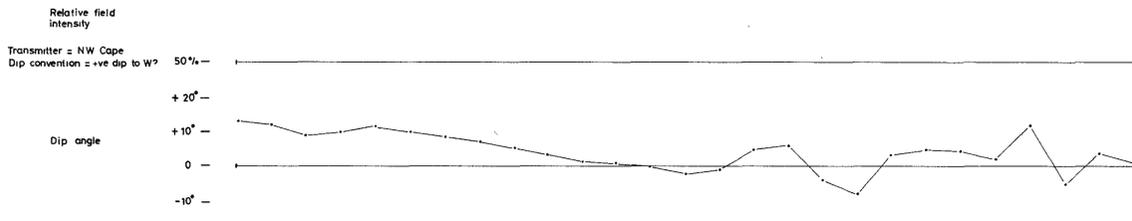


The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE PROFILES LINE 2700 N	
SCALE 1:2000	DATE 8-6-82
AUTHOR P. RIXTON	DRAWN H.L.H.
OFFICE DEVONPORT	REP. No.
ENCL. No.	DRG. No. D/M004/107

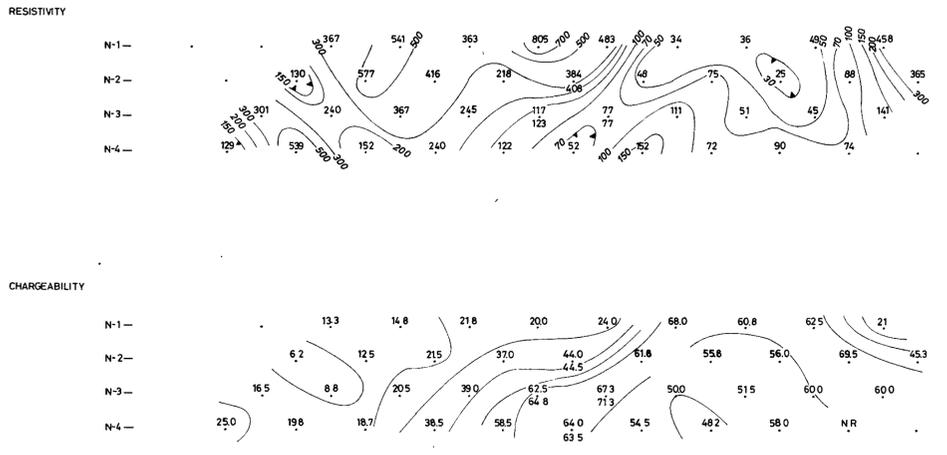
MAGNETICS



V.L.F.

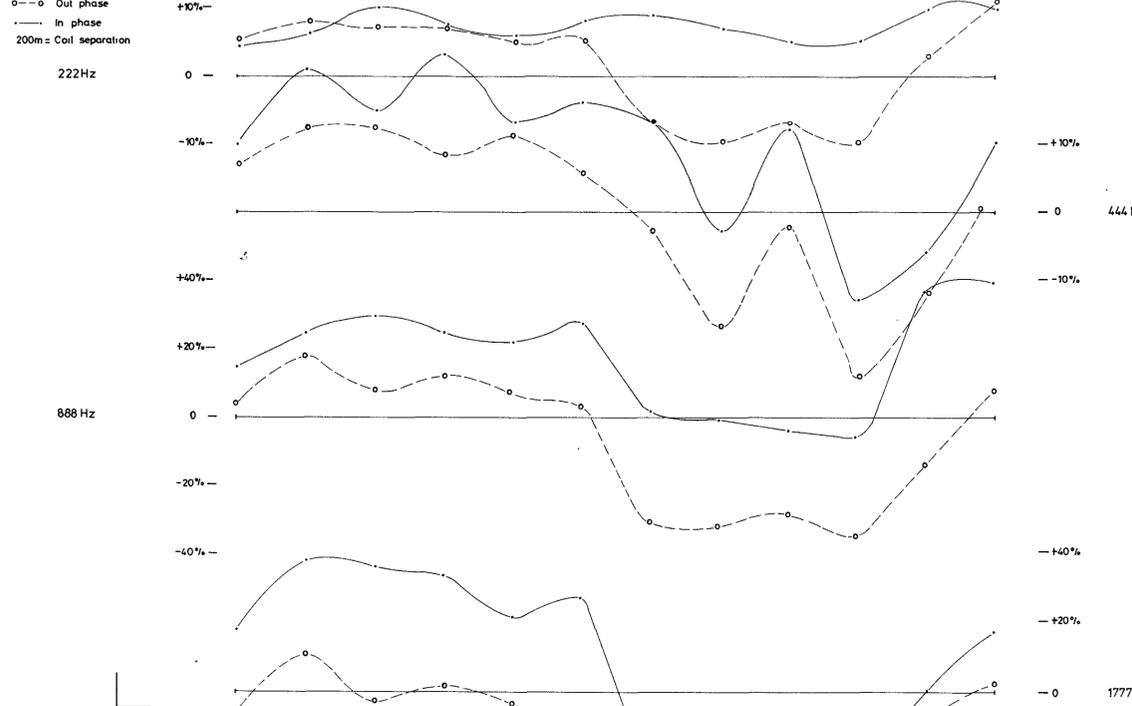


I.P.



Contractor SCINTREX
 Date 30-3-82
 Timing 2sec
 Transmitter IPTA
 Receiver IPR-8
 Integration time 650-1170 msec
 Array Dipole-Dipole
 Dipole length 50m

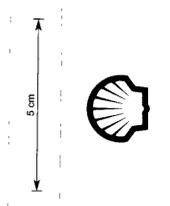
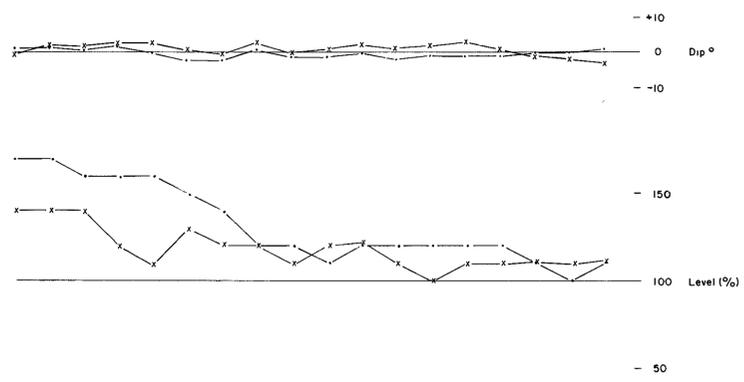
MAX-MIN



S.P.



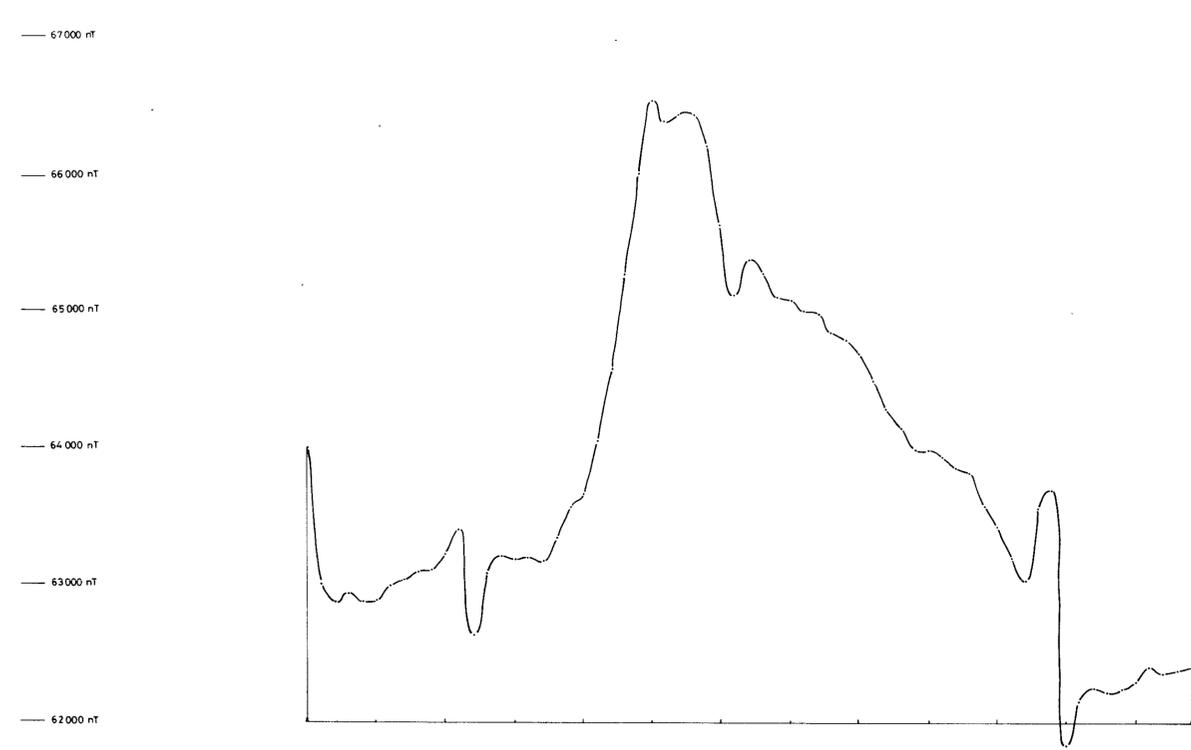
1100 E 1200 E 1300 E 1400 E 1500 E 1600 E 1700 E



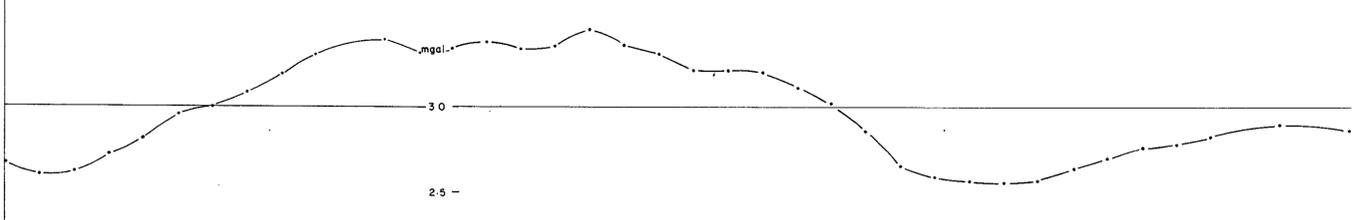
The Shell Company of Australia Limited
 METALS DIVISION
 E.L. 8/77 RIANA
 NATONE ANOMALY 4044/1
 LINE 1800 N
 GEOPHYSICAL SURVEYS

FIG No	1 2000
REPORT No	
ENCL No	DRG No D/M204/096
DATE	NOV '81
AUTHOR	L D B W H
DRAWN	H L H

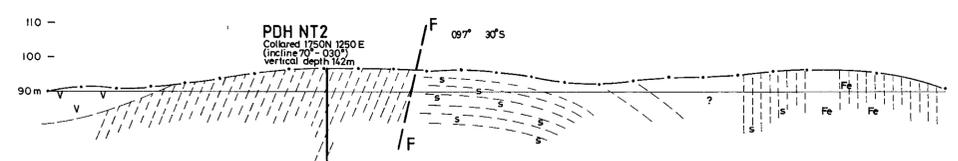
VLF E M SURVEY
 x—x Japan
 Dip convention: +ve for easterly dip, -ve for westerly dip
 — North West Cape
 Dip convention: +ve for northerly dip, -ve for southerly dip



LINE 1800 N

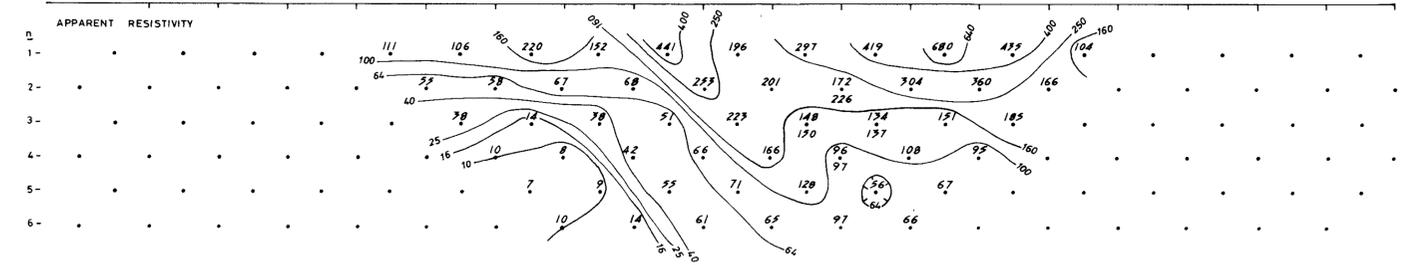
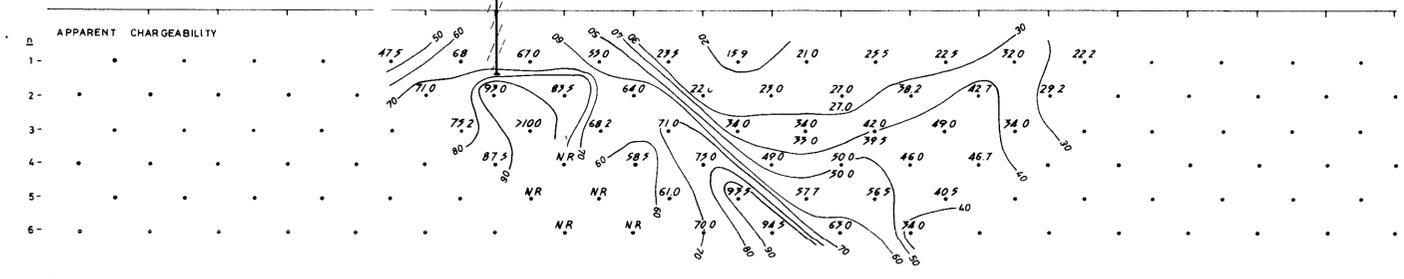


BOUGUER GRAVITY
 $\rho = 2.5 \text{ gm/cm}^3$
 (NO TERRAIN CORRECTIONS)

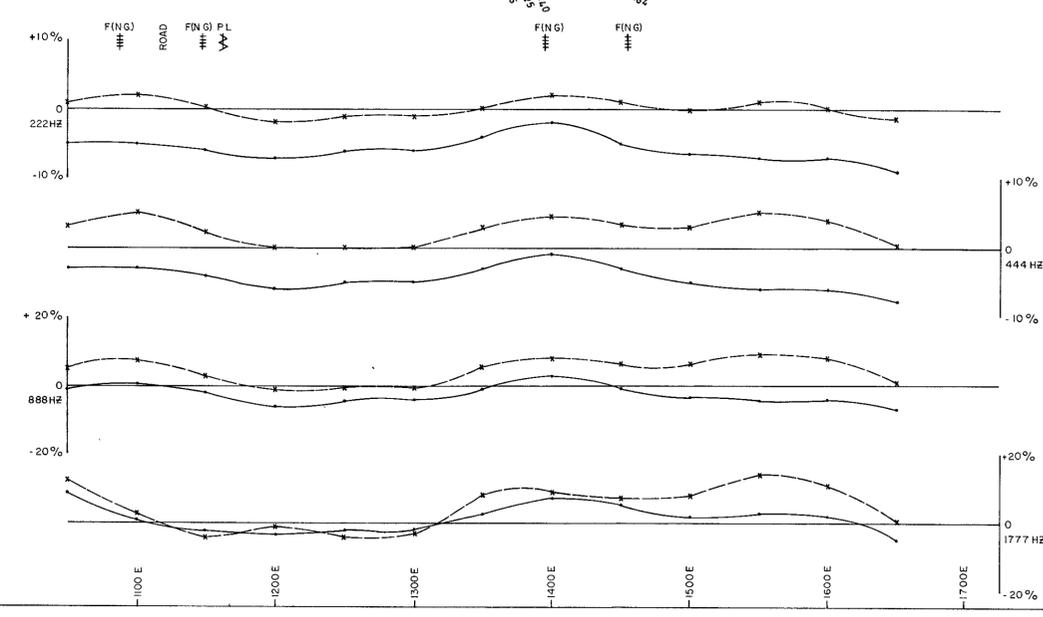


ELEVATION & INFERRED GEOLOGY

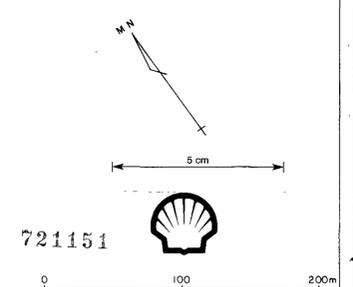
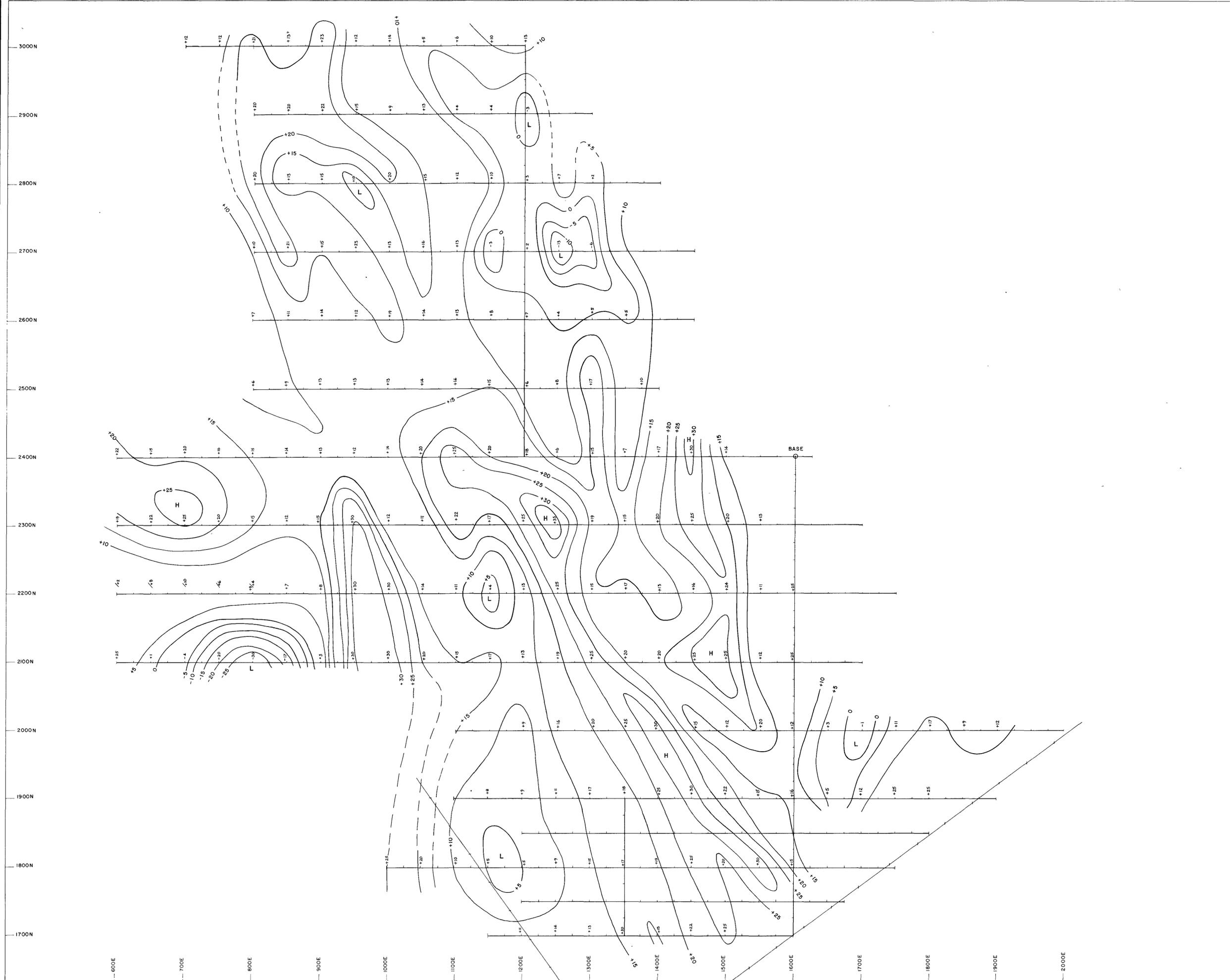
V Tertiary basalt
 s Precambrian shales & sandstones
 S Silicified sediments
 Fe Ironstones



Contractor: SCINTREX
 Date: 1-8-81
 Timing: 2-SEC
 Transmitter: IPTA/A
 Receiver: IPR 6
 Array: DIPOLE-DIPOLE
 Dipole length: 50M

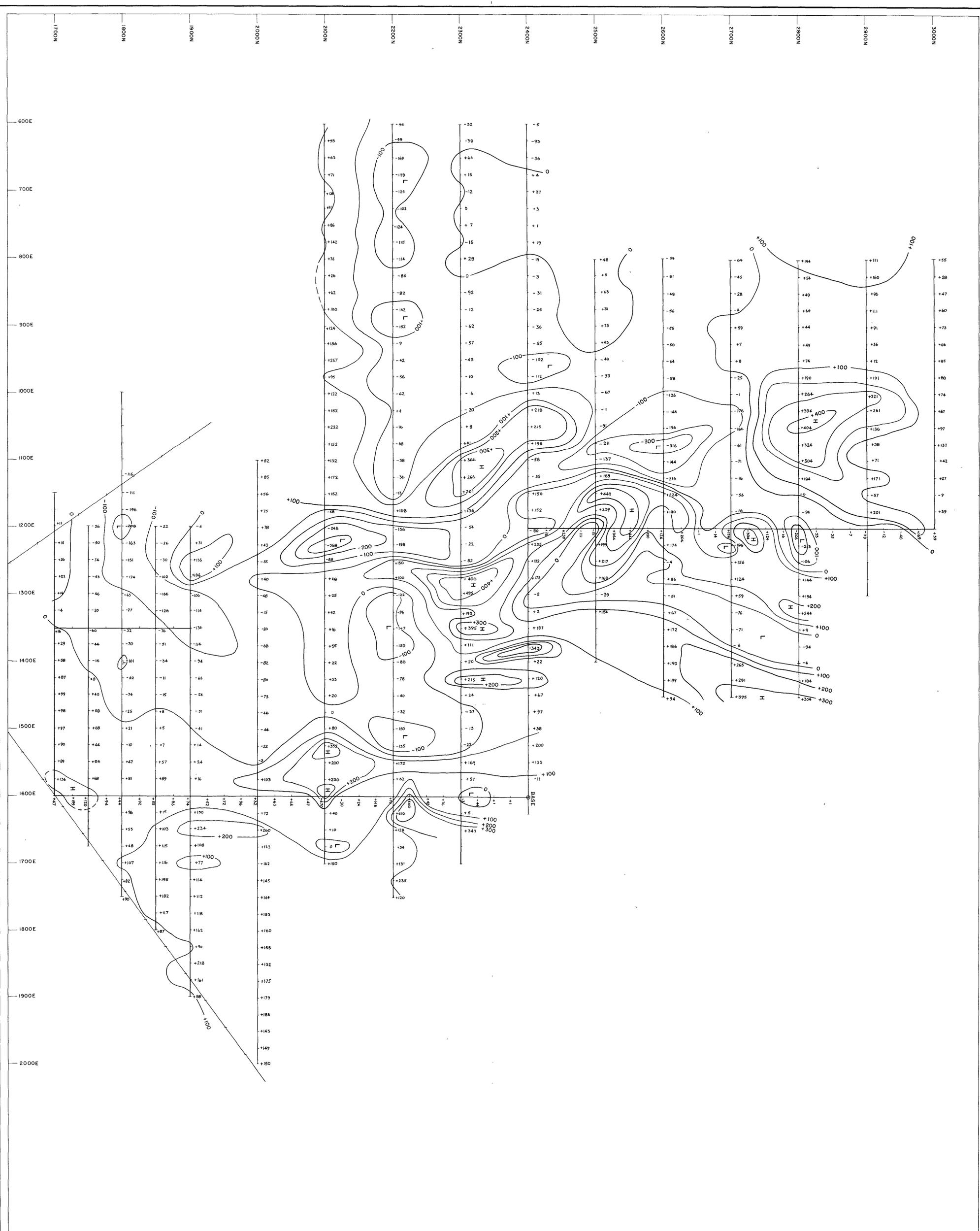


MAX - MIN - EM
 — IP
 - - - OP
 COIL SEP'N = 100m



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E L 8/77 RIANA NATONE PROSPECT (4044/1) MAX-MIN HEM. CONTOURS OF INPHASE @ 444 HZ C.I. = 5% (200 m Coil Separation)	
Scale 1:2500	
FIG No	REPORT No
ENCL No	DRG No MQ 04/1015
DATE FEBRUARY 1982	AUTHOR N HUNGERFORD
DRAWN AS	OFFICE AHO



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The Shell Company of Australia Limited
METALS DIVISION

EL-8/77 RIANA
NATONE PROSPECT (4044/1)
SELF POTENTIAL CONTOURS

FIG. No.	REPORT No.
ENCL. No.	DRG. No. M004/1016
DATE FEBRUARY 1982	AUTHOR N. HUNGERFORD
DRAWN A.S.	OFFICE AND

Scale 1:2500

