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THE SHELL COMPANY OF AUSTRALIA LIMITED

METALS DIVISION

E.L. 8/77 - RIANA

Progress Report on Exploration During the Period

2/7/82 to 1/9/83

MISCELLANEOUS

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Report No : 08.2061

Date : 2/9/83

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D/MQ 04/174	Riana/Hayes Peak Geology plus Grid Locations	1:50,000
D/MQ 04/080	Riana - Airborne Magnetics - Geometrics	1:63,360
D/MQ 04/137	INPUT Anomaly 4144/IR 1 - Initial Ground Check	1:2,500
D/MQ 04/151	Natone - Southern Grid Extension - Cultural Map	1:2,500
D/MQ 04/150	Natone - Southern Grid Extension - Geological Map	1:2,500

SUMMARY

This report outlines exploration by the Shell Company of Australia Limited, Metals Division in conjunction with the Commonwealth Aluminium Corporation Limited in E.L. 8/77, Riana - located 6 km south of Burnie, NW Tasmania during the period 1/7/82 to 1/9/83.

Ground followup of eight aeromagnetic anomalies continued with gridding, ground magnetics and surface EM and IP techniques where warranted.

Four INPUT anomalies within the licence were followed up with gridding and magnetics, max-min EM and IP where necessary.

The Midgley Falls aeromagnetic and Knob Park INPUT anomalies are of particular interest due to their proximity to a 10 mg gravity low and position over the centre of an Ordovician synclinorium which may contain Gordon Limestone beneath basalt cover.

One combined percussion/diamond drillhole was drilled on the Natone Prospect intersecting a high temperature pyrrhotite/magnetite - bearing skarn in the Oonah Formation dolomitic limestones. Sn, WO₃ and Au assays were low.

Recompilation of Comalco stream sediment data highlighted two anomalous areas - Loyetea Peak (Pb - Zn) and Redwater Granite (Sn - WO₃). Followup is in progress.

1.0 REGIONAL STUDIES

1.1 Regional Gravity Survey

A total of 1186 gravity measurements were taken over the Housetop Granite and surrounding rocks in late 1981/early 1982. The regional survey concentrated on the Northern and Western margins of the granite in an effort to locate granite cupolas (gravity lows) adjacent to limestone - dolomite stratigraphy to aid in the search for Renison/Bischoff-style replacement skarn bodies. Survey details and results are reported in Oakes (1983). Followup of the initial survey identified four gravity lows on the Riana Licence (Plan D/ MQ 04/164). Anomalies GL 8 and 9 were defined as 1 - 3 mgal anomalies with three possible sources: 1) topographic; 2) basalt cover; and 3) granite cusp. GL 10 has a 3 - 5 mgla source but modelling results suggest a shallow source. GL 11 is a 10 mgal anomaly which is considered to represent a granite cusp. The proximity of the Midgley Falls aeromagnetic anomaly (4144/3) and Knob Park INPUT anomaly (IR 1) to GL 11 is considered to upgrade these anomalies.

Modelling of the entire gravity survey data confirms work by Sheehan (1969) which suggested that the Housetop Granite has a laccolith shape with a gently east dipping western margin, steep northern contact and a complex steep to gently east dipping eastern margin (Oakes, 1983).

1.2 Stream Sediment Sampling

Stream sediment data collected by Comalco (Weste, 1979) was recompiled. The survey involved collection of -20#

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size fraction, magnetic fraction and panned concentrates. Results from the -20# fraction were used. Background metal values were found to be variable on different rock types and are summarized below.

	Cu	Pb	Zn	Sn	WO ₃
Basalt	30-70	10-30	100-200	10	15
Granite	0-30	20-50	50-120	20	20

(Results in ppm)

Four anomalous areas were outlined (Plan D/MQ 04/164):

- 1) Loyetee Peak (Pb/Zn) - Values of upto 190 ppm Pb and 600 ppm Zn with a good dispersion trail were recorded in an easterly flowing creek SE of Loyetee Peak. The stream flows across Ordovician sandstones and conglomerates but drains Cambrian volcanics and sediments on the Riana/Loongana Licence boundaries. Followup is in progress.
- 2) Redwater Granite (Sn/WO₃) - Values of upto 0.24% Sn and 90 ppm WO₃ were recorded in a broad anomalous zone coincident with the southern margin of the Housetop Granite north of the Redwater Skarn bodies.
- 3) Natone - Cuprona (Cu) - Assay values upto 1000 ppm Cu occur in streams draining the Rutherford Copper Prospect (Natone) and the Copper King Mine (Cuprona). At both prospects chalcopyrite occurs within quartz veins hosted by Burnie Formation shales and siltstones close to the Precambrian/Cambrian boundary. No followup is considered necessary.
- 4) Penguin (WO₃) - Spot highs of 35 ppm WO₃ occur north of Penguin centred over Cambrian volcanics. These values are low and probably originate from the Tasmanian Iron Mines workings and adjacent Dial Range volcanics.

008

Spasmodic Cu (110 ppm max.) and Zn (290 ppm max.) highs over basalt covered areas are considered to reflect minor scavenging by Fe and Mn oxides. Slightly elevated Pb values (40 ppm max.) are recorded over Gordon Limestone stratigraphy in the Gunns Plains region - no followup is required.

2.0 AEROMAGNETIC & INPUT ANOMALY FOLLOWUP

Upto date Aeromagnetic and Input anomaly lists are presented in Tables 1(A), 1(B) and 2 respectively, with locations plotted on Plan D/MQ 04/164, and grid orientations are indicated on Plan D/MQ 04/174.

2.1 Southern Margin of the Housetop Granite

2.1.1 Housetop Aeromagnetic Anomaly 4042/2
(Alias Laurel Creek North)

The Housetop aeromagnetic anomaly is located on Housetop granite north of Peak Hill Farm. One line of ground magnetics along a logging track recovered the anomaly at 400 E with an amplitude of about 3000g (Fig. 1). The source is obviously shallow and has been attributed to magnetite in granite.

Granite samples have a maximum magnetic susceptibility of 1000×10^{-5} SI units. The granite is unaltered, medium to coarse grained, pink and contains biotite and minor magnetite. Scheelite was panned in the creek draining this area. ||.

2.1.2 Castra Aeromagnetic Anomaly (4142/4)

The Castra aeromagnetic anomaly is broad and elongated with a maximum amplitude of 400g and

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has a coincident radiometric anomaly. Ground magnetic readings on the grid are very noisy (presumably due to basalt cover) and define a 400g anomaly (Fig. 2). Geological mapping indicates that the anomaly is basalt covered. Three distinct basalt flows can be recognized the lowermost with a magnetic susceptibility of 500, the middle flow 3000 and uppermost basalt 5100×10^{-5} SI units. An estimated thickness of 200 metres (+) of basalt cover overlies unaltered Gordon Limestone in this area.

2.2 Northern Margin of the Housetop Granite

2.2.1 Midgley Falls Aeromagnetic Anomaly 4144/3 (Coincident IR 11)

The Midgley Falls aeromagnetic anomaly is of particular interest since it sits adjacent to GL 11 and has a coincident Input anomaly IR 11. Modelling of reconnaissance ground magnetics in Banwell, (1981) downgrades the potential a replacement skarn body beneath a basalt cover at Midgley Falls. The magnetic signature is extremely high and would require a basalt magnetic susceptibility of $47,000 \times 10^{-6}$ cgs units or a remanance measurement equivalent to that of Cuprona (Konigsberg ratio of 40-50) to explain the anomaly by a basalt source (Appendix 1). Recent ground work has outlined a magnetic anomaly with two peaks which are broadly coincident with a basalt hill. Ground magnetic stacked profiles and contoured values are presented in Figures 3 and 4 respectively. The maximum amplitude of the eastern anomaly is greater than 4500g. On the ground the anomaly is entirely basalt covered. A line of IP is in progress.

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2.2.2 Stotts Road Aeromagnetic Anomaly 4143/3

A strong aeromagnetic anomaly with a maximum amplitude of 600g has been recovered on the ground at Stotts Road. The anomaly is broad and noisy (Figure 5). The grid is entirely basalt covered with magnetic susceptibilities upto 600×10^{-5} SI units. The magnetic peak is coincident with a basalt hill. Sub-basalt geology is likely to be Gordon Limestone or Husetop Granite.

2.2.3 Wattle Grove Aeromagnetic Anomaly 4143/2

The aeromagnetic anomaly of 450g has been recovered as a ground magnetic anomaly of about 2500g (Fig. 6). The source is highly magnetic and shallow. On the ground the anomaly is clearly related to a basalt ridge adjacent to a window of Husetop Granite. Magnetic susceptibilities reach 270 (basalt) and 20 (granite) $\times 10^{-5}$ SI units.

2.2.4 South Riana Aeromagnetic Anomaly 4143/4

The aeromagnetic anomaly is sharp with an amplitude of 350g (Fig. 7). The source is shallow and appears related to a basalt ridge on the ground.

The Stotts Road, Wattle Grove and South Riana anomalies lie on a roughly N-S trending magnetic lineament (magnetic high) which stretches from Camena in the north to the Loyetea East/Lowana Creek anomalies in the south (Plan D/MQ 04/080). The aeromagnetic highs on this trend are associated with positive basalt-covered relief features. It is suggested that the Camena anomaly represents a Tertiary basalt plug and the N-S lineament one of

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a number of magnetic basalt extrusions related to the Camena Plug. No further work is recommended on these anomalies.

2.2.5 Natone East Aeromagnetic Anomaly

The Natone East aeromagnetic anomaly is located 800m east of Natone itself. It has a magnitude of about 400 gammas centred on a basalt ridge. Sub-basalt geology is Moina sandstone or Roland Conglomerate of Ordovician age. The anomaly is of interest because of it's proximity to the Natone Skarn. Four lines of ground magnetics, one of VLF and one gravity line have been completed. The magnetic data has been modelled (Appendix 2). The anomaly has not been fully tested due to problems with the local farmer Mr. Shepherd. However the coincidence of the anomaly with a basalt ridge and the position of the anomaly over Ordovician sandstones tends to suggest a basalt source rather than extensions to the Natone Skarn body.

2.3 INPUT Anomalies

Four INPUT anomalies were intially selected by Geoterrex for followup in the Riana Licence (Fig. 8, Plan D/MQ 04/164). A further nine low order anomalies were outlined by Oakes (1983) from broad conductive zones centred over basalt cover (Plan D/MQ 04/164). Definition and detail of anomaly followup is outlined in Appendix 2.

2.3.1 Knob Park IR 1

A recce line of VLF and magnetics was completed over IR 1 (D/MQ 04/137). On the discovery of the proximity of IR 1 to the gravity low GL 11 a grid was pegged and ground magnetics completed (Fig. 9). A line of IP is planned. Results are currently being evaluated. IR 1 is centred over basalt cover above an Ordovician synclinorium which may contain Gordon Limestone in the central part of the fold. The anomaly may therefore represent a skarn body beneath basalt.

2.3.2 IR 2

IR 2 straddles the Riana/Hayes Peak Licence boundary forming a synclinal structure plunging to the SW. The identification of graphitic Burnie Formation black shales in the area strongly suggests a lithological source.

Natone (IR 3) see below.

2.3.3 IR 5

Followup of IR 5 confirmed a cultural source (Appendix 3A, D/MQ 04/164).

From anomalies IR 7 to 15 (Appendix 3B) IR 11 has been selected for testing because: 1) IR 11 is coincident with the Midgley Falls aeromagnetic anomaly, and 2) anomalies IR 7 to IR 15 are similar to type, probably related to conductive zone in the basalt.

013

2.3.4 Natone 4044/1, IR 3

The Natone grid was extended to the south to define the limits of the pyrrhotite/magnetite skarn body intersected in NT 1. A cultural (D/MQ 04/151) and a geological (D/MQ 04/150) map of the grid extension were prepared. Outcrop in the NT 1 area is essential basalt and reliance was placed on geophysical methods to outline the skarn boundaries beneath this basalt cover. Ground magnetics, max-min EM, gravity and selected lines of IP were used and are fully documented in Appendix 4. The skarn body has not been entirely defined due to access problems to Mr. Shepherd's property which is centred over the eastern, central portion of the body. This work indicates a southern extension of the skarn from NT 1 with a sharp contact against fine grained and porphyritic granite at approximately 1000 E (D/MQ 04/150). A review of the Natone Skarn deposit has been compiled in a separate report.

NT 1 drillhole was logged using sirotem (Ruxton, 1982), IP (Appendix 5) and a Mise a la Masse survey (Fig. 10) completed.

One line of soil geochemistry on 800 N from 1200 E to 400 E was completed to determine the potential for Sn/WO₃ mineralization in contact metamorphosed Burnie Formation basic volcanics and sediments close to the granite contact. These rocks contain arsenopyrite, pyrrhotite and pyrite. The line traverses the south-eastern part of Input anomaly IR 2. Maximum values include 50 ppm Sn, 15 ppm WO₃, 280 ppm Cu, 270 ppm Pb and 140 ppm Zn. Soil samples were taken at 25m intervals.

014

One percussion/diamond drillhole was sited (NT 3) south of NT 1 to intersect the Natone Skarn body close to the Housetop Granite (close to the highest temperature zone of the skarn?). NT 3 was collared at 1070 N and 1470 E inclined at 60° to grid west (300° M) to test a combined magnetic/conductive feature with a suggested easterly dip. The hole intersected 34m of Tertiary basalt and sediments before passing into a sequence of dolomitic limestones and interbedded andalusite/cordierite-bearing hornfels to a total depth of 269.5m. Bands of massive pyrrhotite and magnetite are recorded (Fig. 10). A detailed geological and geochemical log is shown in Appendix 6. Sn, WO₃ and Au values are low throughout the hole. Specific gravity measurements and full element scans were run on samples from NT 3 and NT 1 (Appendix 7). Limited down hole IP data was obtained (Appendix 4) - limited due to a cavein in the hole. Petrological reports are contained in Appendix 8.

3.0 CONCLUSIONS & RECOMMENDATIONS

Ground followup of the Midgely Falls, Castra, Wattle Grove, Stotts Road, Housetop, South Riana and Knob Park aeromagnetic and INPUT anomalies will complete the followup of geophysical surveys on Riana.

Ground checking and resampling of the Loyetea Peak (Pb-Zn) and Redwater Granite (Sn-WO₃) stream sediment anomalies will complete followup of the geochemical stream programme initiated by Comalco.

The Natone prospect is currently being reviewed with a view to further drilling. A separate report has been compiled summarizing the geology, geochemistry and geophysical response of the Natone Skarn. [TCA 93-2041]

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AIRBORNE ANOMALY LIST

'PROSPECT : RIANA

SURVEY : AEROMAG

016

Anomaly Number	Line and Fiducial	Name	Location (AMG)	Description	Follow-up to Date	Modelling and Interpretation	Geology	Future Work
4042/1	6.02869 5.03485	Laurel Creek W.	409000E 5425200N	Large, narrow anomaly	Mag, geochem, Drill		Granite-magnetite Skarn	None
4042/2	8.01578	Laurel Creek N. (House Top)	409500E 5427300N	- Small and Broad - Look formational			Magnetite-bearing Granite	Ground Check Geochem
4042/8			407000E 5424000N	N of Laurel Creek S.			Granite	Depends on 4042/2
4042/9			408100E 5423600N	E of Laurel Creek S.			Granite	Depends on 4042/3
4042/10			407500E 5429800N	W of Laurel Creek W.				None
4042/11			409000E 5424400N	Group of anomalies to S of Laurel Creek W.			Minor magnetite Skarn?	None
4042/12			407700E 5425800N	NW of Laurel Creek W.			Granite	Depends on 4042/2
4042/13			408300E 5425700N	NW of Laurel Creek W.			Granite	Depends on 4042/13
4042/14			409800E 5425500N	Large low to W of Peak Hill Farm	Mag.	Remanence?	Basalt?	None
4043/1	248.53365	Ellis Creek	409500E 5438200N	High amplitude 900n T		Possible basalt hill	Basalt over granite?	Ground Check None
4043/2	243.5119	Ellis Creek N.			Recce. line?	Possible basalt hill	Basalt over granite contact	Depends on 4043/IR5
4142/2	21.9253	Loyettea E	412800E 5427700N		Mag., Gravity		Basalt	Reassess Data, IP
4142/3		Lowana Ck.	415400E 5429600N		Ground Check		Basalt on 6m?	None
4142/4	46.2615		419600E 5425700N	Mag., high with elevated K			Basalt on 6g	Ground check Mag
4142/5	44.2717		418700E 5421200N	Broad mag (with good shape) + elevated K		E volcs.	Cambrian	None
4142/6	41.6452		418000E 5421500N	Broad, weak Mag, & elevated K		E volcs.	Cambrian	None
4142/7	36.6749		416600E 5421300N	Mag to K high - possibly topographic		E volcs.	Cambrian	None
4142/8	34.6868		416000E 5421300N	Mag., to K high - possibly topographic		volcs.	Cambrian	None
4142/9	22.9218	Redwater North	412800E 5426500N		Ground Check		Basalt??? over 6m	None
4142/10	27.7277	Gunn's Plain	414400E 5423700N			volcs.	Cambrian Volcanics?	None
4142/11	19.938	Loyettea W.		Mag and elevated radiometrics	Mag. Geochem	volcs.	Cambrian Volcanics? on Granite contact	None
4142/12	16.9617	Peak Hill		Moderate K' for source at 60m depth				None

TABLE 1A
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AIRBORNE ANOMALY LIST

PROSPECT : RIANA

SURVEY : AEROMAG

017

Anomaly Number	Line and Fiducial	Name	Location (AMG)	Description	Follow-up to Date	Modelling and Interpretation	Geology	Future Work
4142/13			410900E 5426800N	Northern extension of Redwater anomaly			Minor skarn?	None
4142/14			412000E 5426000N	E of Redwater			Basalt	None
4142/15			413600E 5429500N	NE of Loyet ea			Basalt over ϵ volcs?	None
4142/16			413100E 5429800N	NE of Loyet ea			Basalt/granite	None
4143/1	33.6907		415800E 5431700N	Strong, mag., but poorly Shaped		Basalt hill	Basalt on Ord. or Cambrian?	None
4143/2	258.57115	Wattle Grove	413400E 5435700N	Strong isolated mag.			Basalt over Granite	Ground Check, Mag
4143/3	243.51275	Stotts Rd.	412800E 5439500N	Strong mag	Ground Check		Basalt	Ground Check, Mag
4143/4	261.4908	S. Riana	413300E 5434900N			Basalt hill	Basalt	Ground check
4144/1	221.3069	Cuprona	412300E 5445200N	Strong mag., over large hill	Mag gravity drill	Basalt hill	Basalt and Ironstone	None
4144/2	236.4744	Camena	412100E 5441700N	V. large mag anomaly - inferred deep source	Ground Check	Possible Basalt Plug	Basalt	Extend ground line? <i>None</i>
4144/3	237.4793	Midgley Falls	415100E 5441000N	Related to topography? V. high K	Ground Check		Basalt	Remanence measurements Mag, IP.
4244/1	212.36765	Penguin	423500E 5447300N		Ground Check	Fe-rich seds	North margin of Penguin Ag-Pb, ϵ . Volc.	None
4244/2	212.36800	Neptune	424500E		Ground Check	C Volcs,	West margin of Penguin Ag-Pb, ϵ . Volc.	None
4244/3	205.38460	Dial Pt	420600E 5449100N	300 nT	Ground Check	Basalt hill	Basalt?	None
4044/3		East Natone		Mag, high // = to E of Natone mag. (Slightly broader)	- Ground check (mag, VLF) - IP/max-min U/s Due to powerline		Basalt over Om?	Access problems
4044/1	234.47845	Natone	408800E 5441750N	Also priority 1 INPUT 900m Taeromag	Mag., gravity, see separate report IP, SP, Max-Min, drill, SIROTEM		Massive sulphides & black shales & ironstones beneath basalt	
4044/2		Upper Stowport						

018

AIRBORNE ANOMALY LIST

PROSPECT . RIANA

SURVEY : INPUT

Anomaly Number	Line and Fiducial	Name	Location (AMG)	Description	Follow-up to Date	Modelling and Interpretation	Geology	Future Work
4144/IR1	1251.38141 - 1221?		415400E 5442900N	- 6 Channel response in conductive surficial zone - Priority 3	Ground Check		- Near gravity low	- Max-min/ mag - IP
4044/IR3	1101.58443 -1061.57055	Natone	408800E 5441800N	- Priority 1 INPUT and mag.	Max-min, mag., IP, gravity, SP, VLF, drilling (NT-1,2,3)		Massive Sulphides & Carbonaceous Shales	drilling?
4043/IR5	1042.35424		409800E 5439800N	- Priority 3 INPUT - probably cultural mag correl	Ground Check	Cultural? & Topo high?	Basalt on Granite?	None
4044/IR7				- Sth of Natone		Clay band?	Basalt over granite	None
4144/IR8						As for IR5	Basalt over Θ m?	None
4144/IR9						Basalt	Basalt over Θ m?	None
4144/IR10							Basalt over Θ g?	Depends on 4144/IR10
4144/IR11		Midgley Falls		See 4144/3			Basalt over Θ g?	Mag, IP
4144/IR12						Basalt	Basalt over Θ	None
4144/IR13						Basalt	Basalt over Θ m?	None
4144/IR14						Basalt	Basalt over Θ m?	None
4144/IR15						Basalt	Basalt over Θ m?	None

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TABLE 2

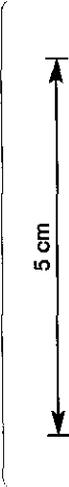
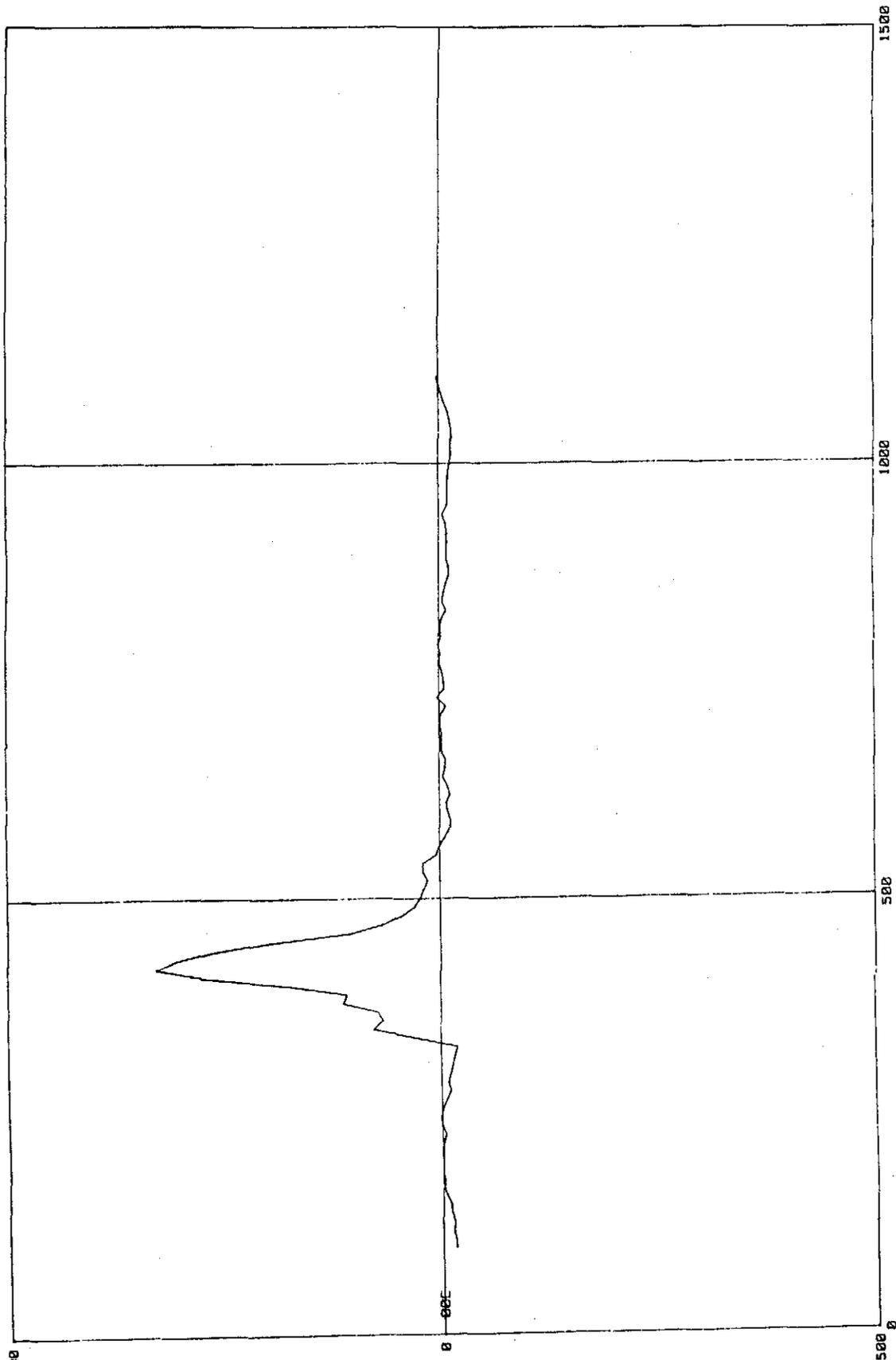


SHELL COMPANY OF AUSTRALIA
METALS DIVISION

RIANA E.L., TAS
HOusetop, 4042/27
TOTAL FIELD
MAGNETICS

DISTANCE SCALE : 50 M/CM
READING SCALE : 500 /CM
BASE READING : 62000

514020



019



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METALS DIVISION

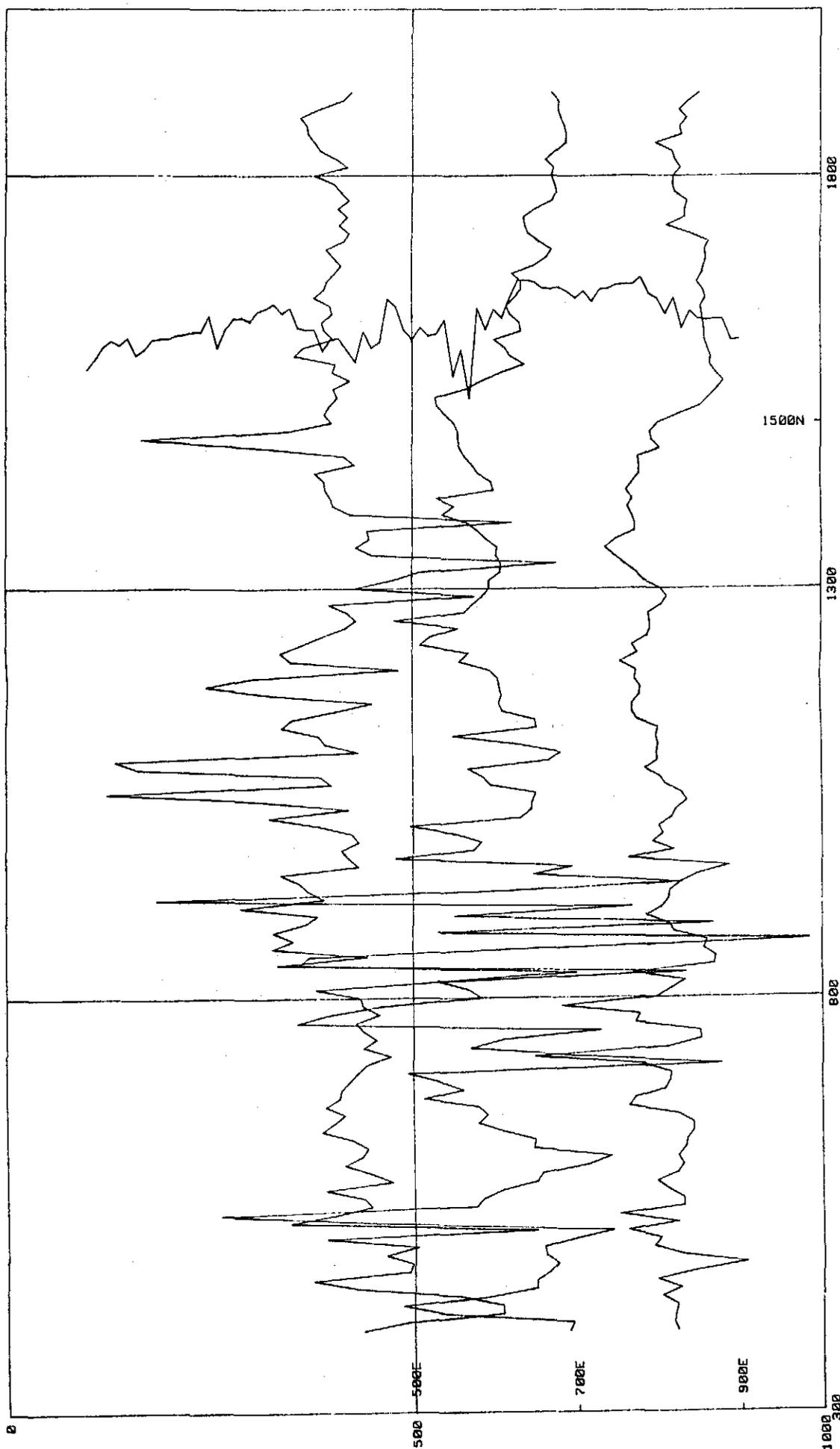
RIANA E.L., TAS
CASTRA 4142/4
TOTAL MAGNETICS

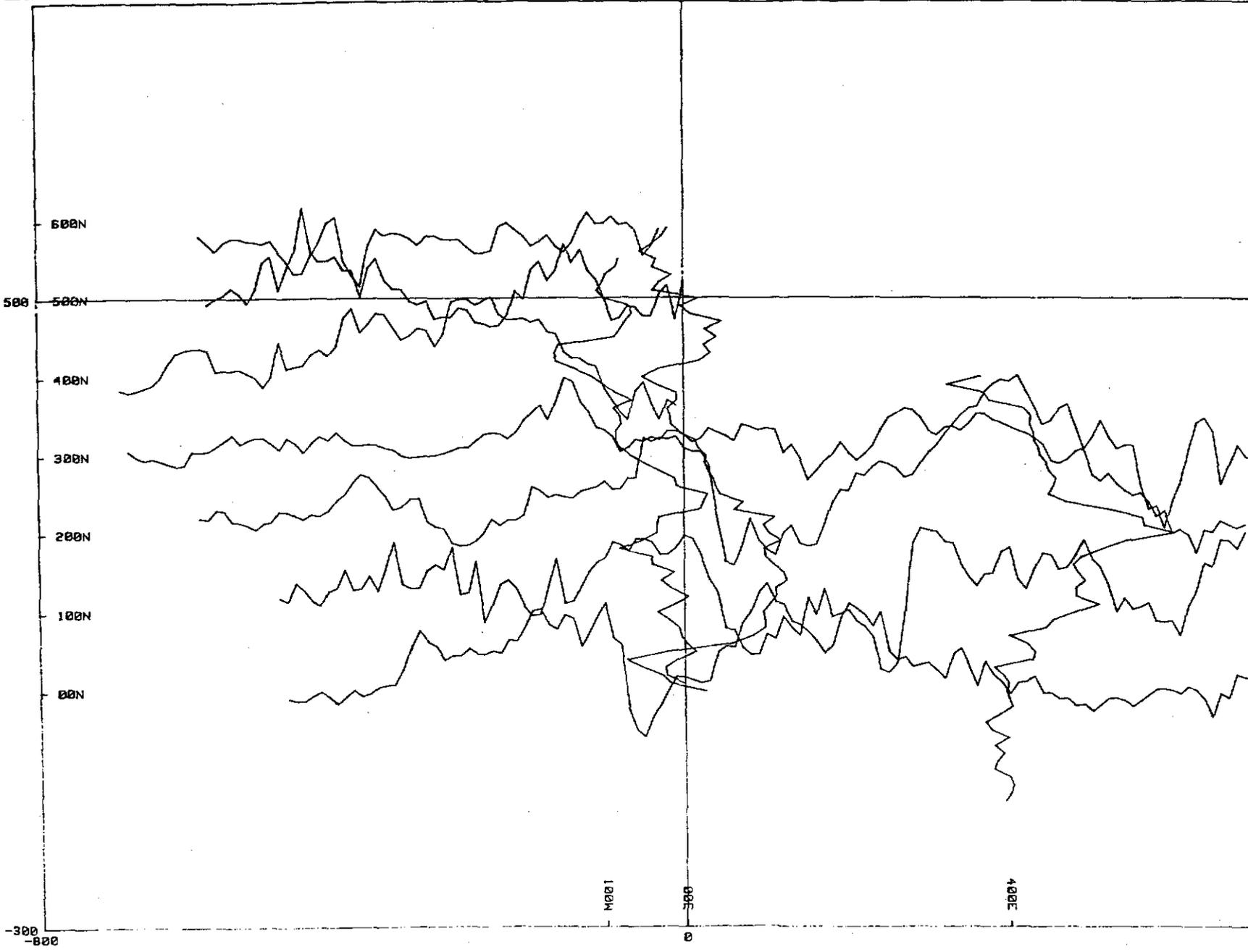
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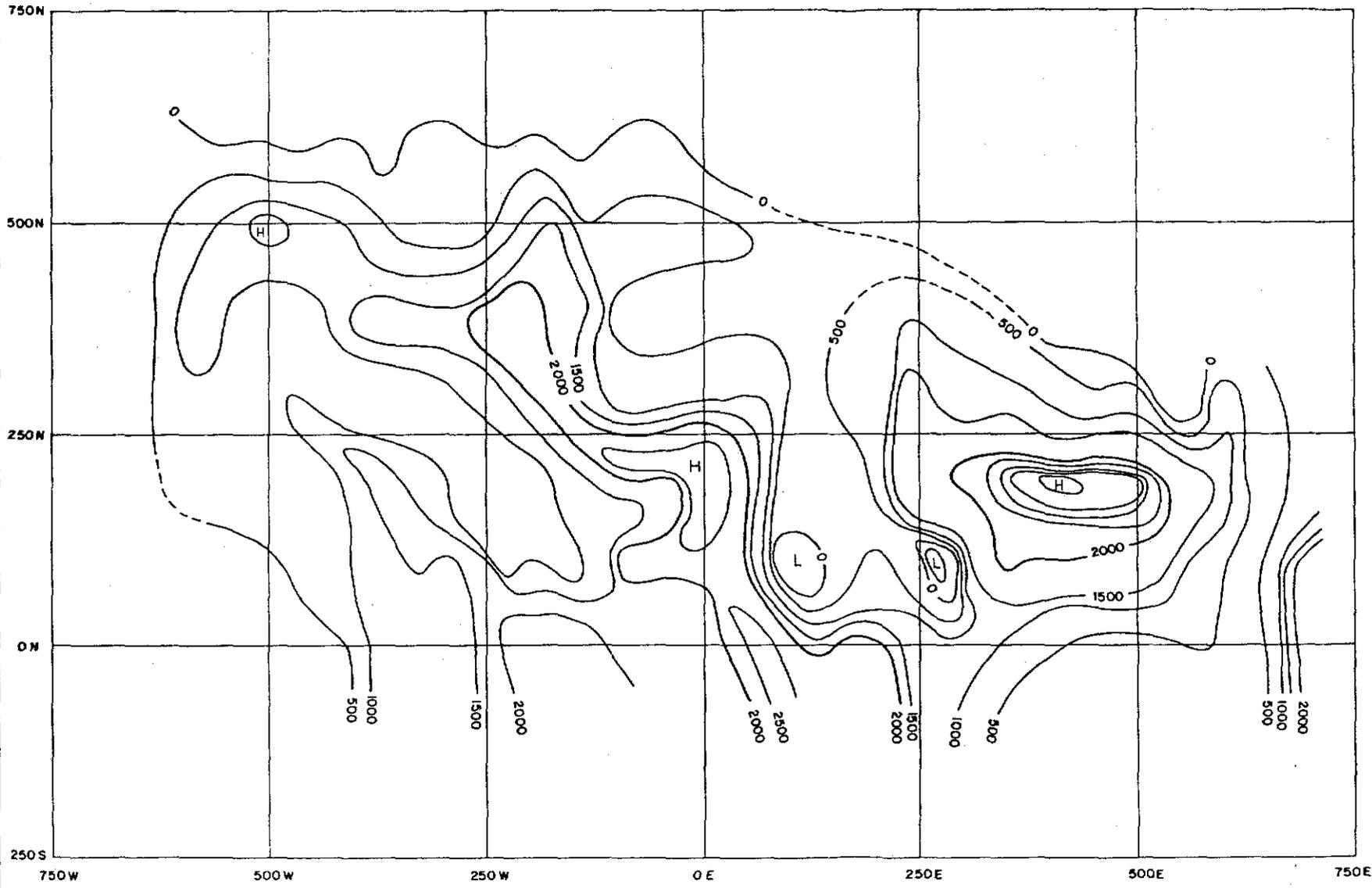
MIDGELY FIRLS 4114/3
TOTAL FIELD
MAGNETICS

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READING SCALE : 1000 /CM
BASE READING : 62500

FIG. 3

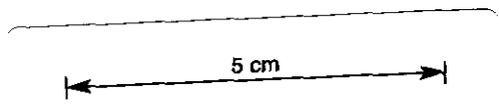
DRWS NO. 1032

022



BASE LEVEL : 62 000

C.I. 500 nT



514023

FIG. 4

The Shell Company of Australia Limited
METALS DIVISION

RIANA - E.L. 8/77
TASMANIA

MIDGLEY FALLS, 4144/3
TOTAL FIELD

MAGNETIC CONTOURS
(FILTERED)

SCALE	1 : 5000	DATE	JULY 1983
AUTHOR	M.H.	DRAWN	O.L.
OFFICE	A.H.O.	REP No	
DRG No	M004/1031	FIG No	



SHELL COMPANY OF AUSTRALIA
METALS DIVISION

RIANA E.L., TAS
STOTTS RD., 4143/3
TOTAL FIELD
MAGNETICS

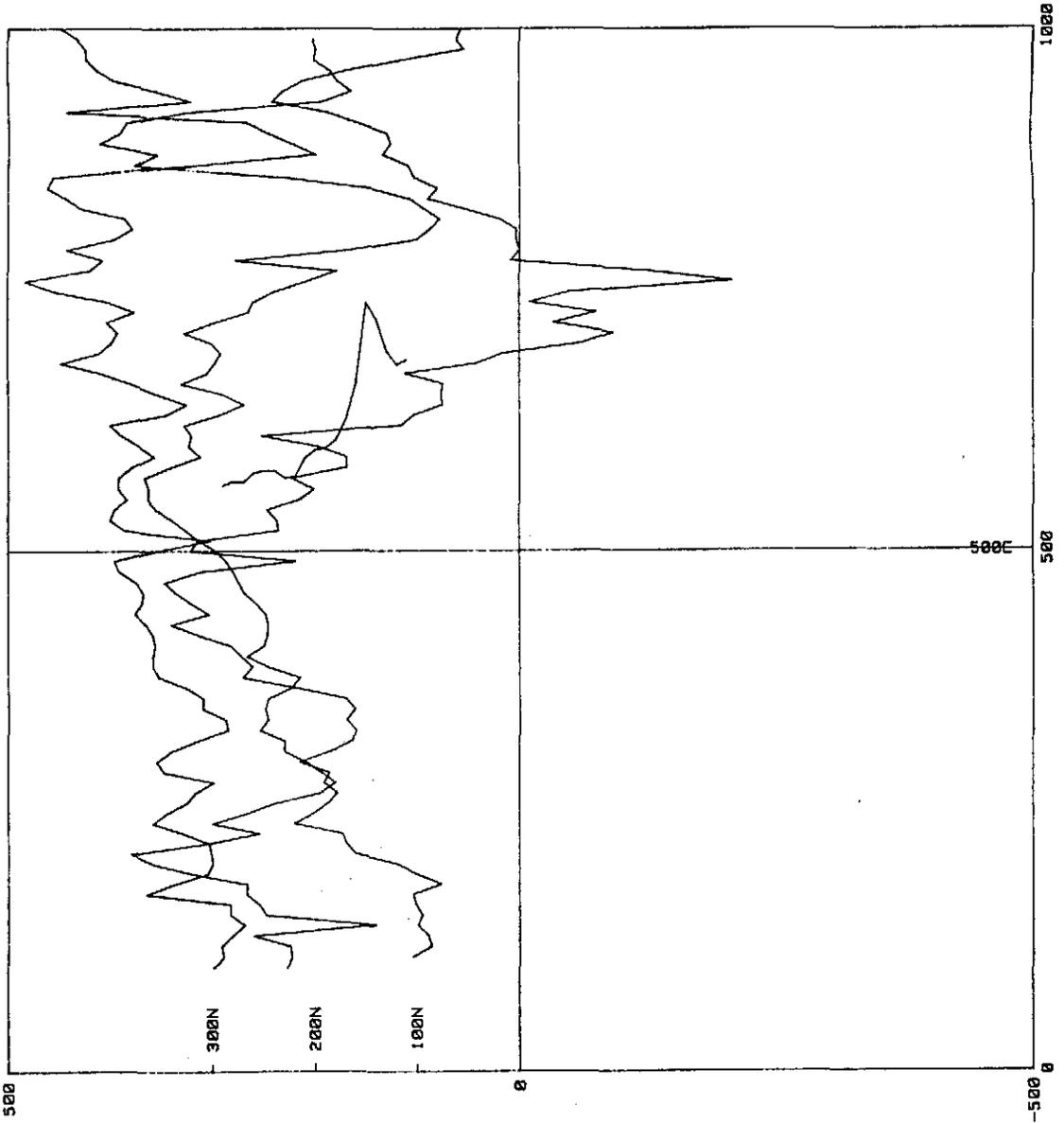
DISTANCE SCALE : 50 M/CM
READING SCALE : 500 /CM
BASE READING : 62000

FIG. 5



514024

5 cm



023



SHELL COMPANY OF AUSTRALIA
METALS DIVISION

WATTLE GROVE, 4143/2

TOTAL FIELD
MAGNETICS

DISTANCE SCALE : 50 M/CM

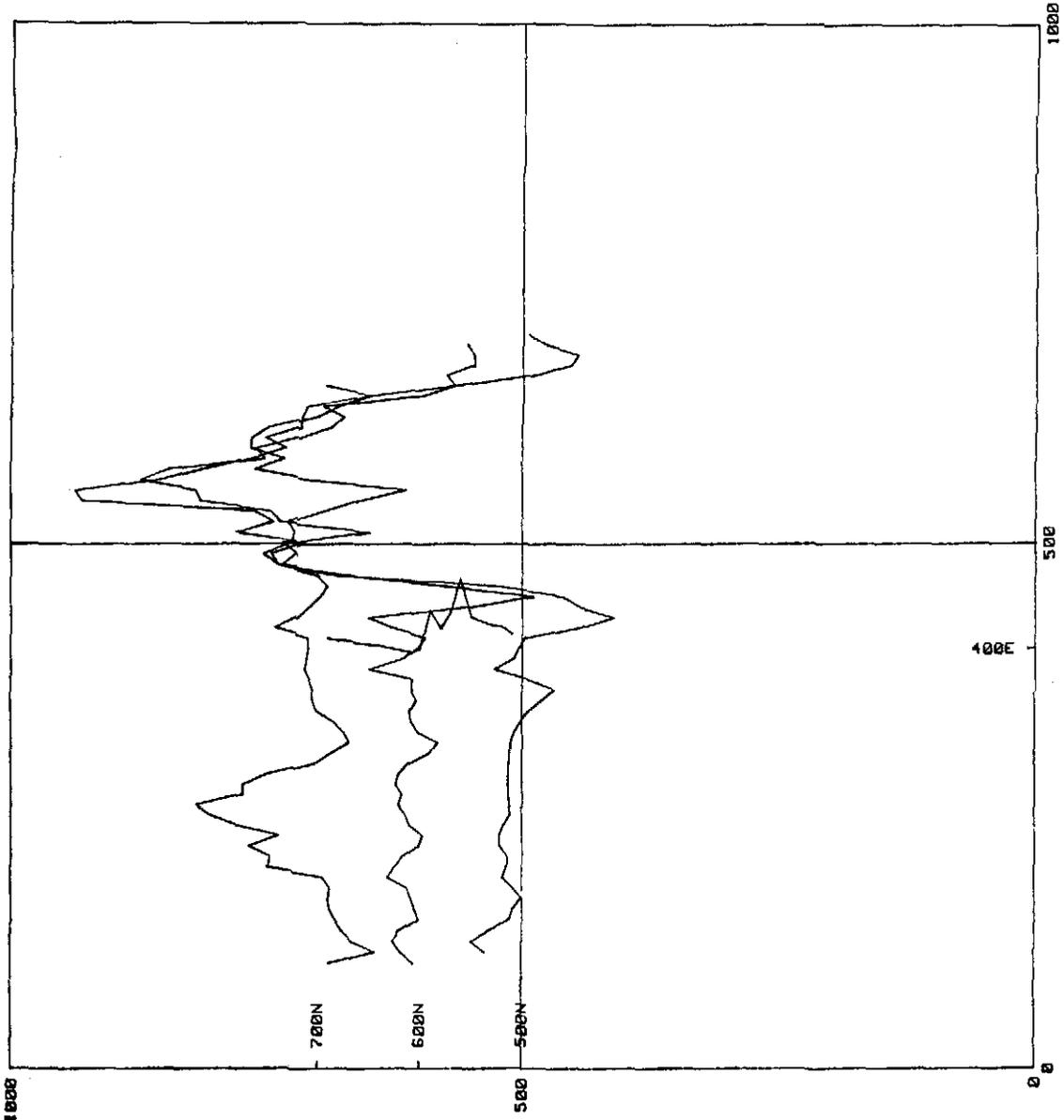
READING SCALE : 500 γ/CM

BASE READING : 63000



514025

5 cm



02A



SHELL COMPANY OF AUSTRALIA
METALS DIVISION

RIANA E.L., TAS
SOUTH RIANA, 4143/4
TOTAL FIELD
MAGNETICS

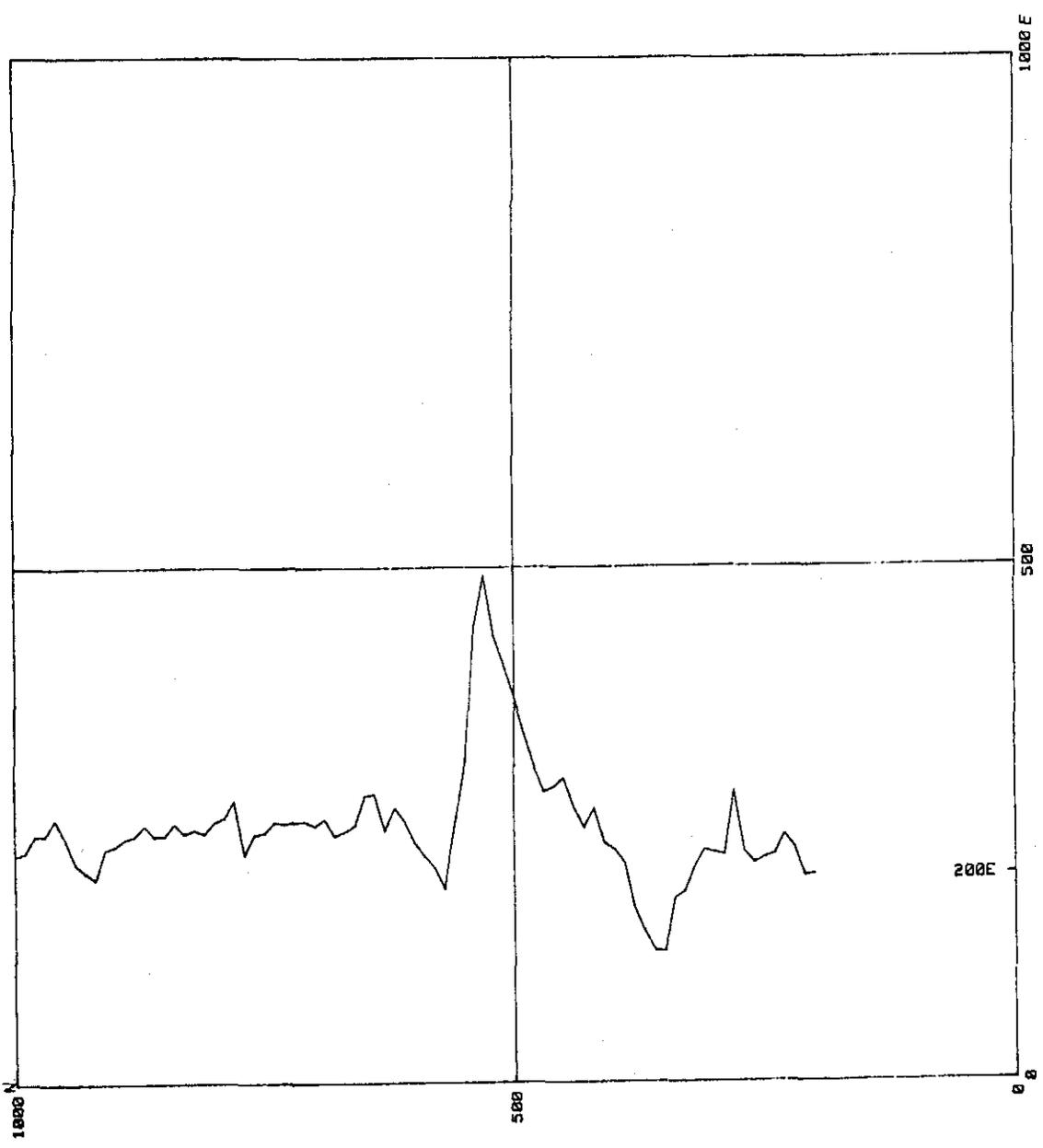
DISTANCE SCALE : 50 M/CM
READING SCALE : 500 /CM
BASE READING : 65000



514026

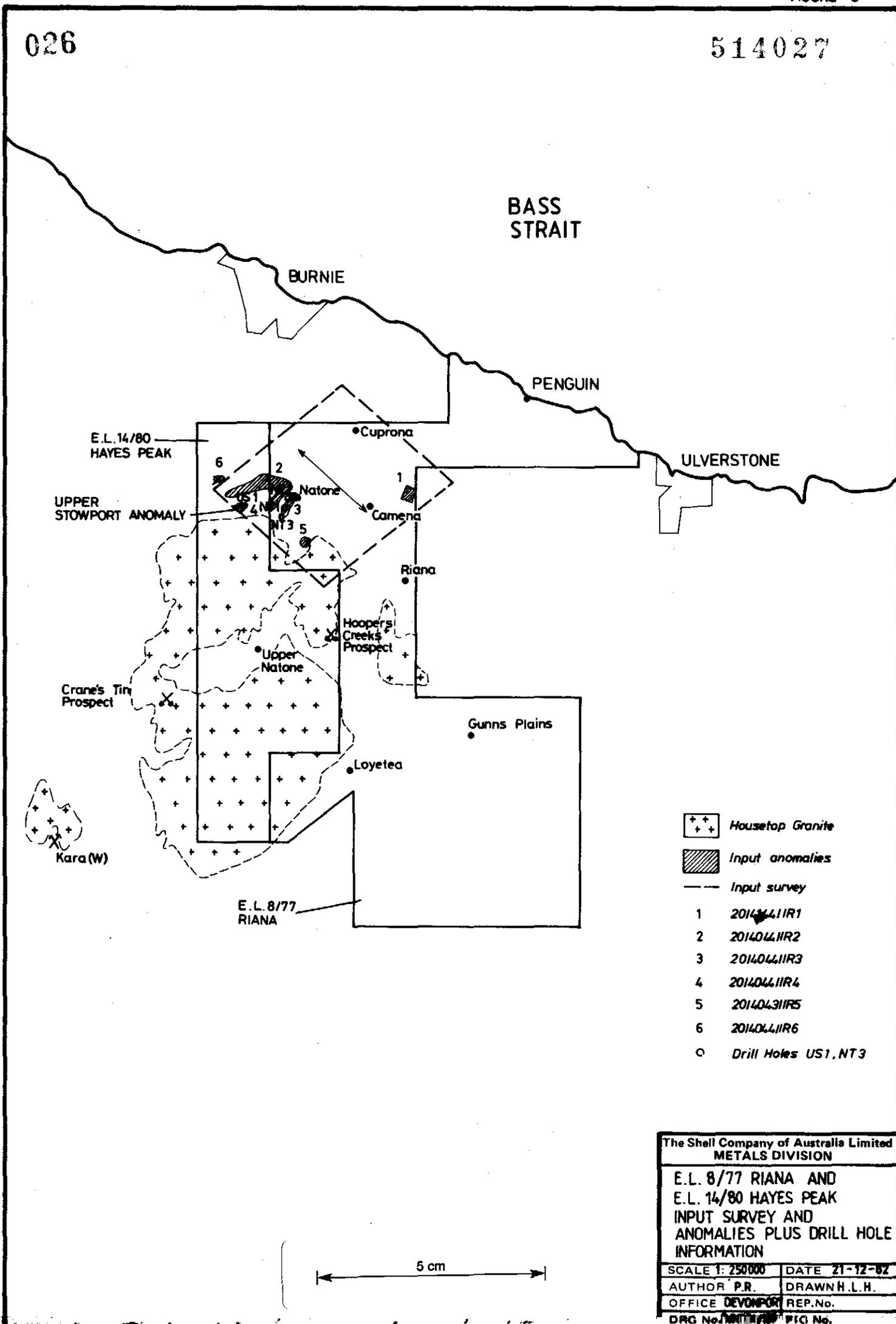
5 cm

025



026

514027



-  House Top Granite
-  Input anomalies
-  Input survey
- 1 20140411R1
- 2 20140411R2
- 3 20140411R3
- 4 20140411R4
- 5 20140431R5
- 6 20140411R6
- Drill Holes US1, NT3

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA AND E.L. 14/80 HAYES PEAK INPUT SURVEY AND ANOMALIES PLUS DRILL HOLE INFORMATION	
SCALE 1: 250000	DATE 21-12-82
AUTHOR P.R.	DRAWN H.L.H.
OFFICE DEVONPORT	REP.No.
DRG No. 514027	FIG No.

5 cm



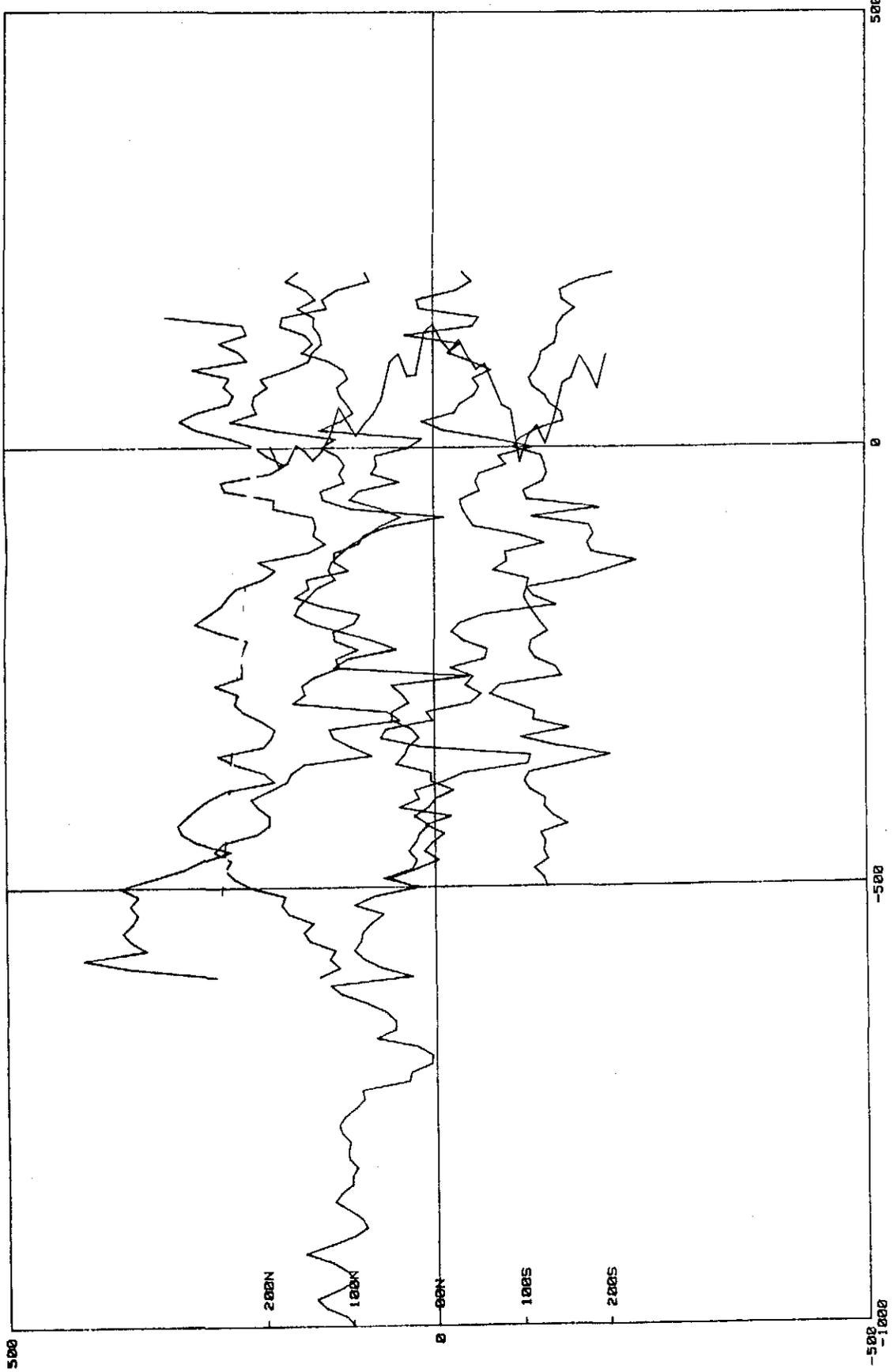
SHELL COMPANY OF AUSTRALIA
METALS DIVISION

RIANA E.L., TAS
KNOB PARK 4144/1.7
TOTAL FIELD
MAGNETICS

DISTANCE SCALE : 50 M/CM
READING SCALE : 500 /CM
BASE READING : 62000

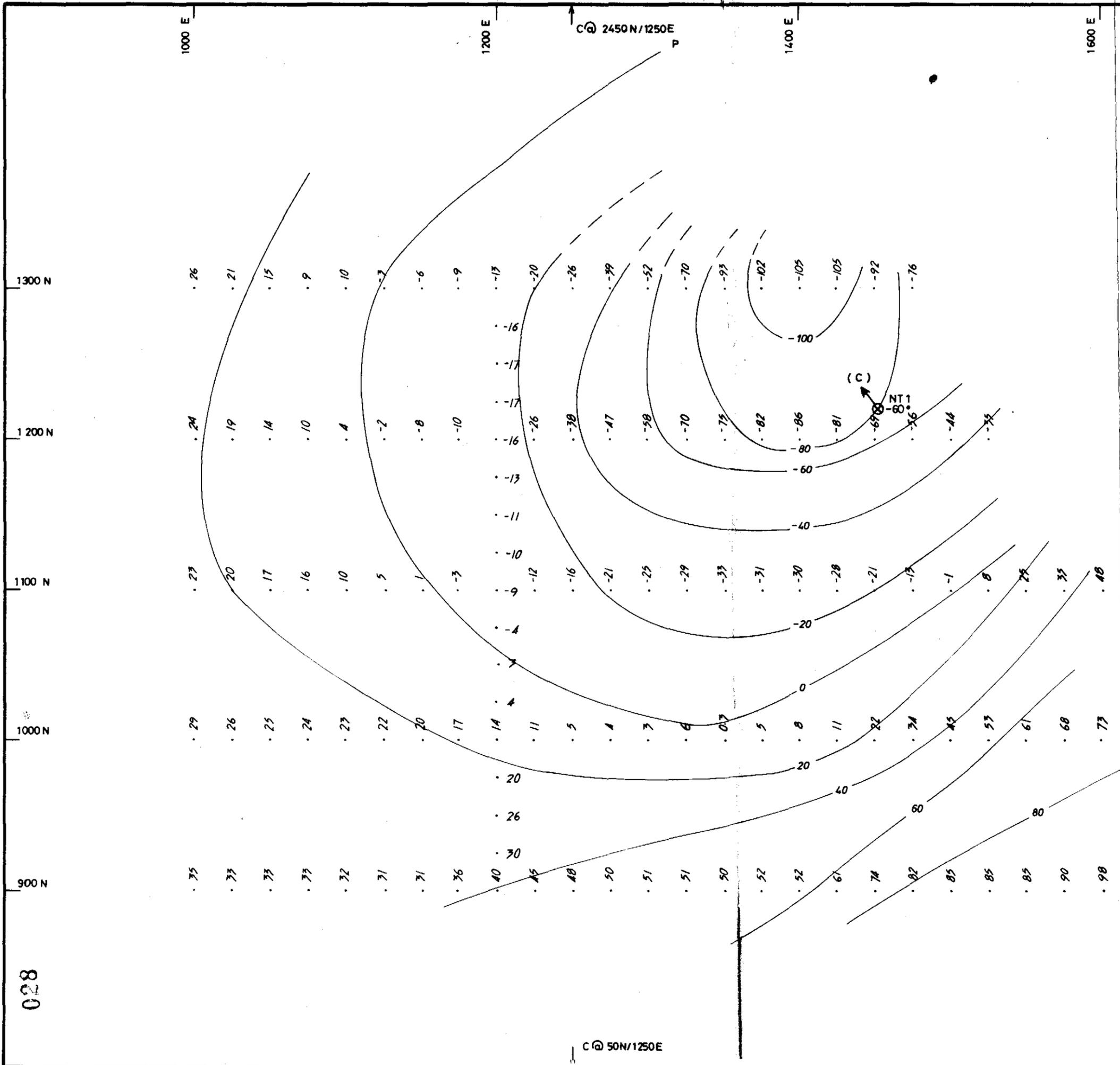


5 cm

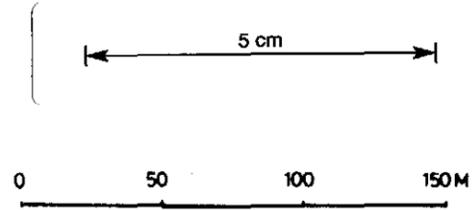


027

514028



028



The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE MISE A LA MASSE (current electrode in NT 1) m V.	
SCALE 1: 2500	DATE 20-9-82
AUTHOR G. OAKES	DRAWN H. L. S.
OFFICE DEVONPORT	REP.No.
DRG No D/MQ04/136	FIG No

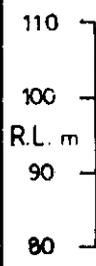
N.W. 029

1400 E

514029

1500 E

S.E.



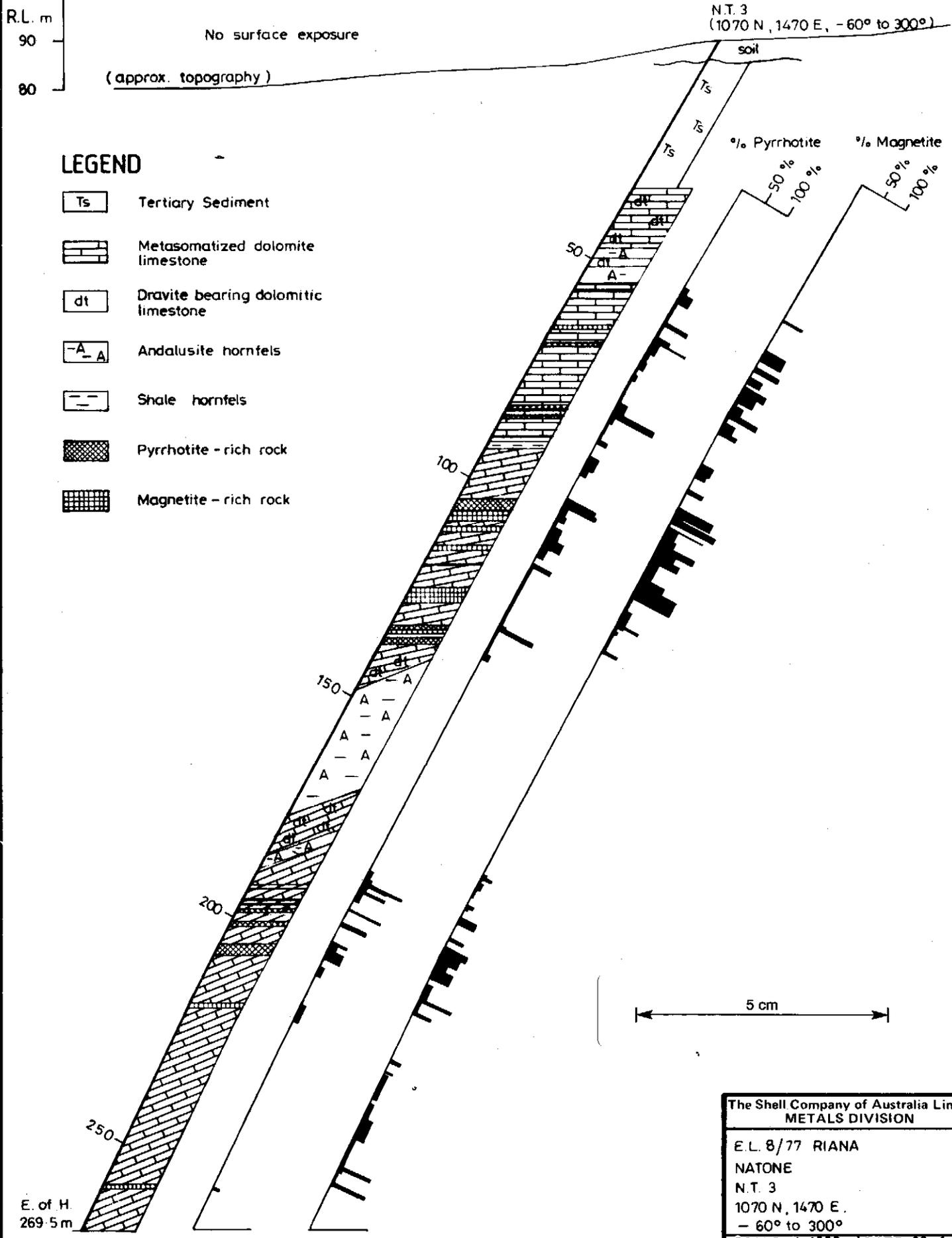
No surface exposure
(approx. topography)

N.T. 3
(1070 N, 1470 E, -60° to 300°)

soil

LEGEND

- Ts Tertiary Sediment
- ▨ Metasomatized dolomite limestone
- dt Dravite bearing dolomitic limestone
- A-A Andalusite hornfels
- - - Shale hornfels
- ▩ Pyrrhotite - rich rock
- ▧ Magnetite - rich rock



The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA	
NATONE	
N.T. 3	
1070 N, 1470 E.	
- 60° to 300°	
SCALE 1:1000	DATE 26-1-83
AUTHOR P.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG.No. D/M004/154	FIG.No.

APPENDIX 1

Midgley falls (4144/3)

Ground Magnetic Modelling

by

G. Oakes

031

Midgley Falls - Recce Mag Modelling

A couple of quick models for the recce mag at Midgley Falls are attached. As Kim's gravity work has confirmed the existence of the regional gravity low (GL 11) to the north-east of the Housetop Granite, this anomaly is in a quite interesting location. (A report on the gravity should follow shortly, as part of the summary of Housetop geophysics. The overall priority etc. for work at Midgley Falls is contained in the portion of the report which Dick already has).

Figure 1 shows a possible skarn model beneath basalt cover. The fit between modelled and observed curves is not particularly good, but this is explained by the basalt cover. The regional is also a little unrealistic. Figure 2 shows another skarn model. The fit is perhaps slightly better, given the basalt cover, and indicates a body dipping 30° W from beneath 113W on the recce traverse, at a depth 150m. The modelled susceptibility for both models is extremely high ($150,000 - 180,000 \times 10^{-6}$ cgs units), indicating a magnetite skarn source is possible. A slightly thicker or shallower body would require a lower susceptibility to give an equally good fit.

Figure 3 shows a basalt-type model. The shallowly dipping (10° W) body at shallow depth (11m) would fit basalt, and the anomaly lies on the top of a basalt hill. The fit between observed and modelled curves is reasonable, but requires a susceptibility of $47,000 \times 10^{-6}$ cgs units, which is extremely high for basalt. A konigsberg ratio of at least 40-50 is required for remanence to explain this (cf mean ratio of 10-20 for all Tasmanian basalt samples so far). This is the sort of remanence seen at Cuprona, so the anomaly is possibly caused by the same basalt flow as at Cuprona, forming a hill at Midgley Falls also.

I suggest that a few samples for remanence measurements be obtained from over the anomaly. Also, although this modelling has downgraded the priority of the anomaly, magnetics alone cannot discount a skarn source, so the gridding and max-min (and IP?) recommended in my report should still be carried out, especially if an extremely high remanent magnetization is not measured in the basalt.

MIDGLEY FALLS - RECCE MAG - MODEL 1

DIP 86.04
 BASE LEVEL 63129.53
 X SLOPE -3.96
 Y SLOPE 0.00
 X POSITION -200.60
 Y POSITION 0.00
 X H-WIDTH 9.76
 Y H-WIDTH 495.20
 DEPTH 90.60
 THICKNESS 1990.96
 INCLNATN -70.00
 DECLNATN 90.00
 VERTICAL 0.00
 ORIENTATN 0.00

032

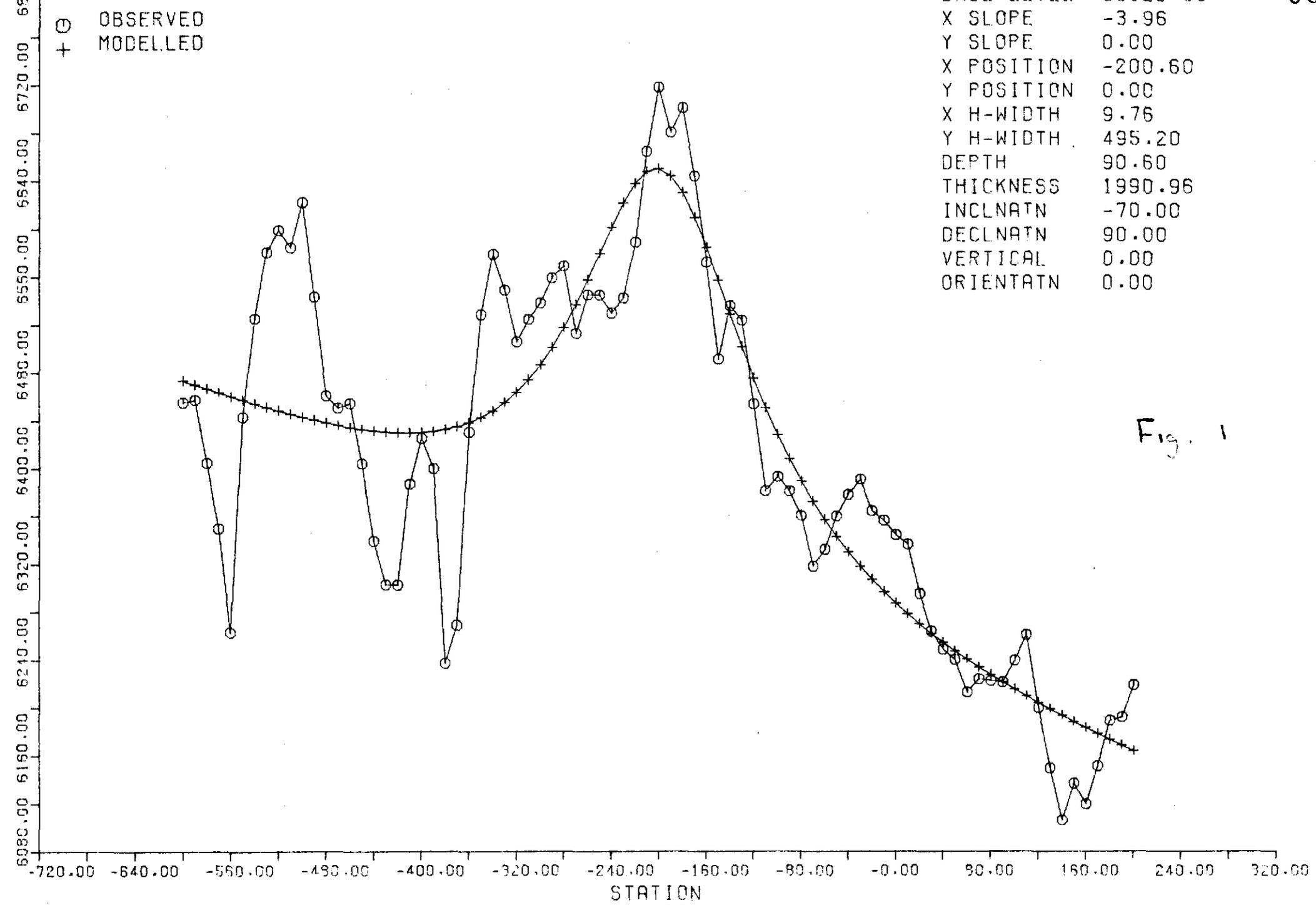


Fig. 1

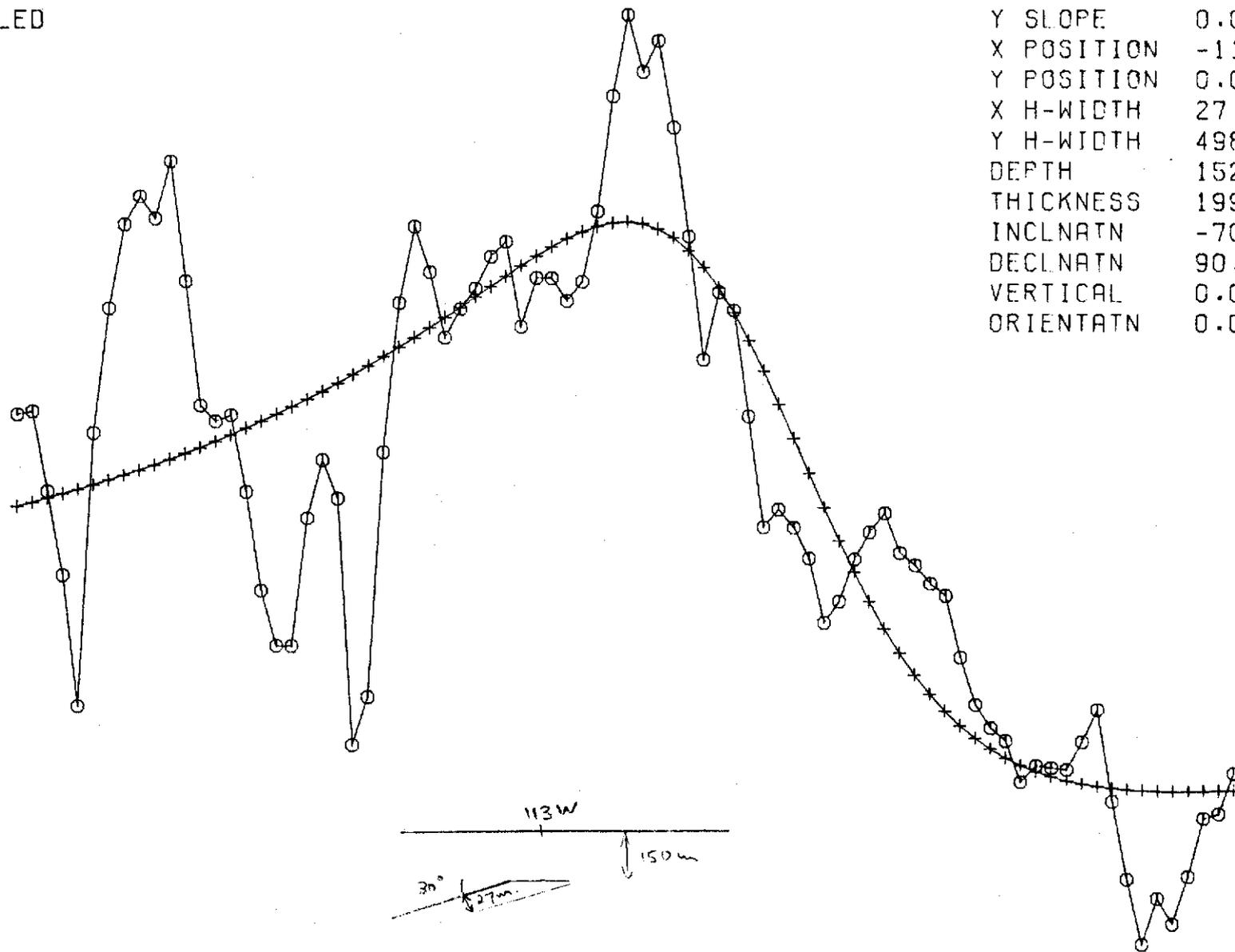
514032

MIDGLEY FALLS - RECCE MAG - MODEL 1

MAGNET 1 1718.48
 DIP 149.17
 BASE LEVEL 62518.78
 X SLOPE 0.00
 Y SLOPE 0.00
 X POSITION -113.80
 Y POSITION 0.00
 X H-WIDTH 27.19
 Y H-WIDTH 498.26
 DEPTH 152.41
 THICKNESS 1995.50
 INCLNATN -70.00
 DECLNATN 90.00
 VERTICAL 0.00
 ORIENTATN 0.00

033

⊖ OBSERVED
 + MODELLED



Fs. 2

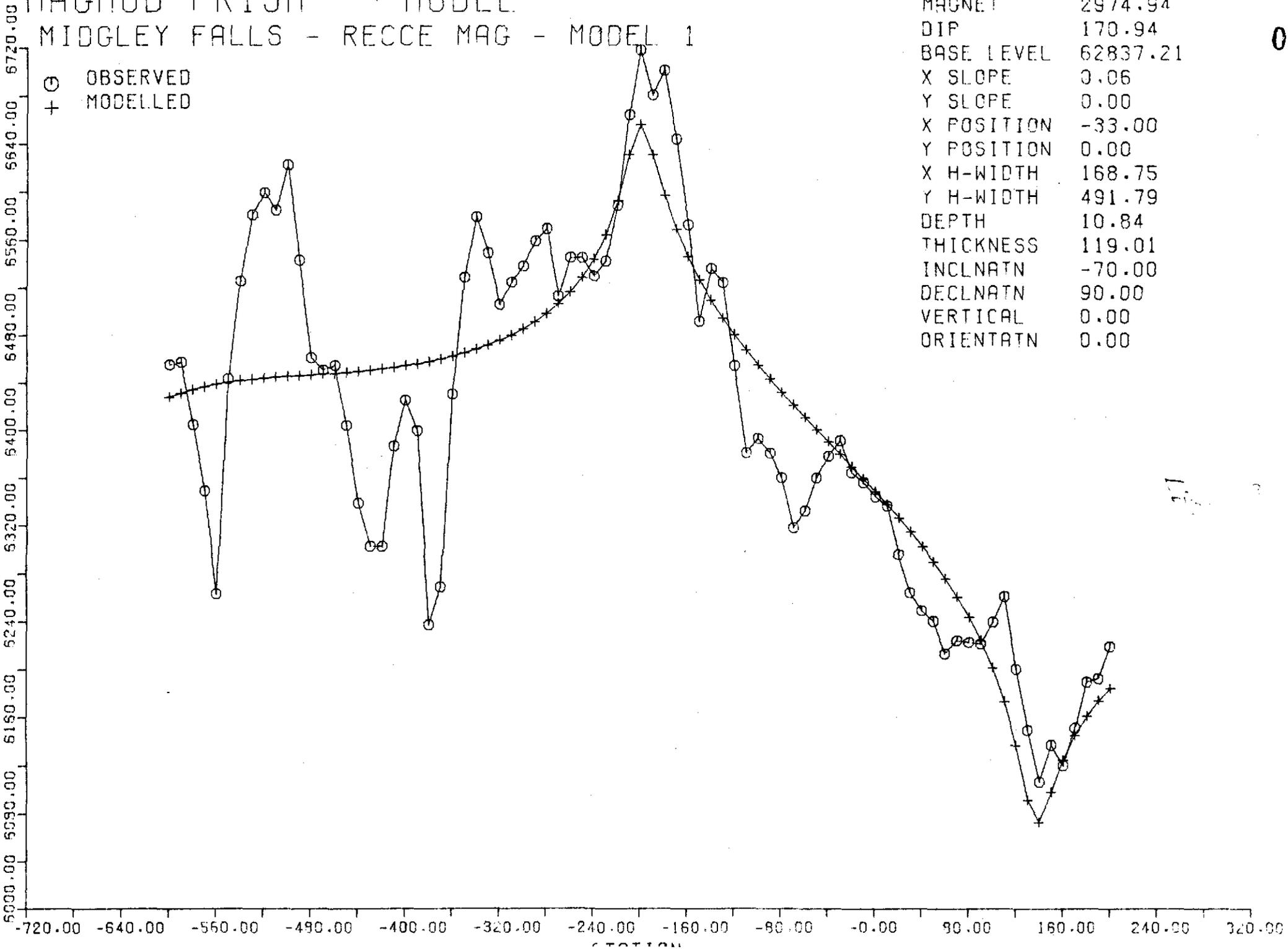
514033

MAGMOD PRISM MODEL
MIDGLEY FALLS - RECCE MAG - MODEL 1

MAGNET 2974.94
DIP 170.94
BASE LEVEL 62837.21
X SLOPE 0.06
Y SLOPE 0.00
X POSITION -33.00
Y POSITION 0.00
X H-WIDTH 168.75
Y H-WIDTH 491.79
DEPTH 10.84
THICKNESS 119.01
INCLNATN -70.00
DECLNATN 90.00
VERTICAL 0.00
ORIENTATN 0.00

034

○ OBSERVED
+ MODELLED



514034

APPENDIX 2

Natone East Aeromagnetic Anomaly

Summary of Ground Follow-up

by

G. Oakes

FIGURES

FIGURE 1	:	Magmod modelling - Natone East	SW recce
FIGURE 2	:	Magmod modelling - Natone East	SW recce
FIGURE 3	:	Magmod modelling - Natone East	SW recce
FIGURE 4	:	Magmod modelling - Natone East	NE recce
FIGURE 5	:	Magmod modelling - Natone East	NE recce
FIGURE 6	:	Magmod modelling - Natone East	NE recce
FIGURE 7	:	Magmod modelling	NE recce
FIGURE 8	:	Plan of Natone East Anomaly	

PLANS

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
D/MQ 04/138	Natone East - W & E lines - Initial check	1:2,500
D/MQ 04/152	Natone East - Road Traverse - Gravity	1:2,500

Natone East - Magnetism & Gravity Results

1.0 Magnetism

Four recce lines of ground magnetism have been done over the Natone East aeromagnetic anomaly. The results from 2 traverses (along roads) are discussed in my memo of 14/10/82 (Refer attached + Plans D/MQ 04/138, 152). Modelling results for the two lines on Mr. Shepherd's property are described here. (Location map attached).

1.1 South-west Recce Line

Figure 1 to 3 show possible models for the results from the south-west recce line (which gave the best anomaly observed in the area).

Figure 1 has a good fit to the observed magnetism and the modelled body is quite interesting - the dip of $50^{\circ}N$ is probably too steep to represent a basalt source, although the modelled susceptibility would be reasonable for remanently magnetized basalt. The depth (70m) could well fit a sulphide source beneath the basalt.

Figure 2 shows a shallowly dipping body which would also fit the data well. This body could easily be basalt - the modelled depth suggests a second, more magnetic basalt flow at depth as the cause, rather than the basalt observed at the surface. (Of course, a flat-lying sulphide body is also possible).

Figure 3 shows a body intermediate between 1 and 2, which would also fit the data.

Using magnetism alone it is not possible to discriminate between the 2 models (i.e. sulphides at depth, as represented by figure 1, or basalt, as given in figure 2). The known basalt cover, association with a topographic ridge and noisy patchy nature of the anomaly makes basalt seem to be the more likely cause, but the proximity and parallelism to the Natone sulphides and inferred carbonate stratigraphy and granite beneath the basalt mean that sulphides cannot be ruled out.

The best way to discriminate between the 2 possible sources would be a line of IP along this recce line. As problems with Mr. Shepherd preclude this option, a drillhole is the only certain way to resolve the problem.

1.2 North-East Recce Line

The results on this line were very noisy making a basalt source more likely. The strong hash makes modelling difficult, and none of the models tried give a particularly good fit. Nonetheless, figures 4-7 give a feel for the type of bodies which may cause the anomaly.

Figures 4-6 give possible basalt configurations to fit the anomaly. The body generally has a shallow dip (to the south) and relatively low susceptibility. Depths of 10 to 60m are given - the shallowest body probably gives the best fit (fig. 4) but all models are reasonable, given the strong near-surface hash.

Fig. 7 shows a possible steeply-dipping source model. The fit is probably as good as that for the basalt models. The depth is fairly large (200m) but it is clear that a shallower body of similar configuration could give an equally good fit, hence a sulphide source for the anomaly cannot be ruled out on the basis of this data either.

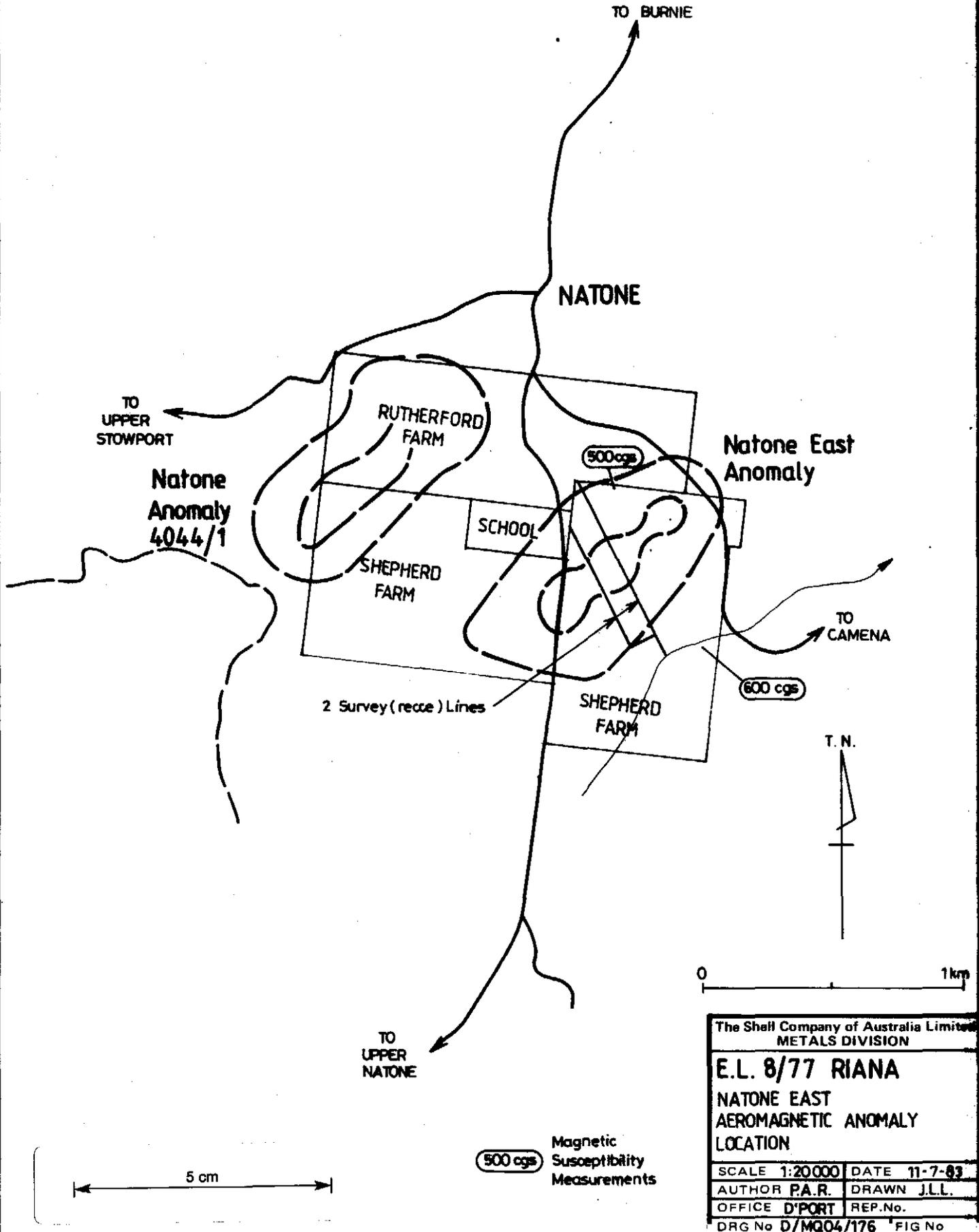
2.0 Gravity - Western Road Traverse

As expected the gravity merely shows a very strong regional gradient reflecting the proximity to the granite contact (as shown in the regional gravity). The centre of the line probably corresponds to the steep northern contact of the Housetop Granite. It is hard to see any anomaly superimposed on the regional, so the gravity also has been inconclusive.

(This line may be worth tying into the regional gravity at some stage - to assist in modelling the attitude of the margin of the granite).

3.0 Proposed Drillhole

A hole to test the source of this anomaly is given in my memo of 9/11/82. As noted above, magnetics and gravity alone are unable to discriminate between a basalt and a sulphide source. A line of IP would do this, but cannot be done due to Mr. Shepherd. A basalt source seems more likely, but sulphides cannot be ruled out in this location.



The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA	
NATONE EAST AEROMAGNETIC ANOMALY LOCATION	
SCALE 1:20000	DATE 11-7-83
AUTHOR P.A.R.	DRAWN J.L.L.
OFFICE D'PORT	REP.No.
DRG No D/MQ04/176	FIG No

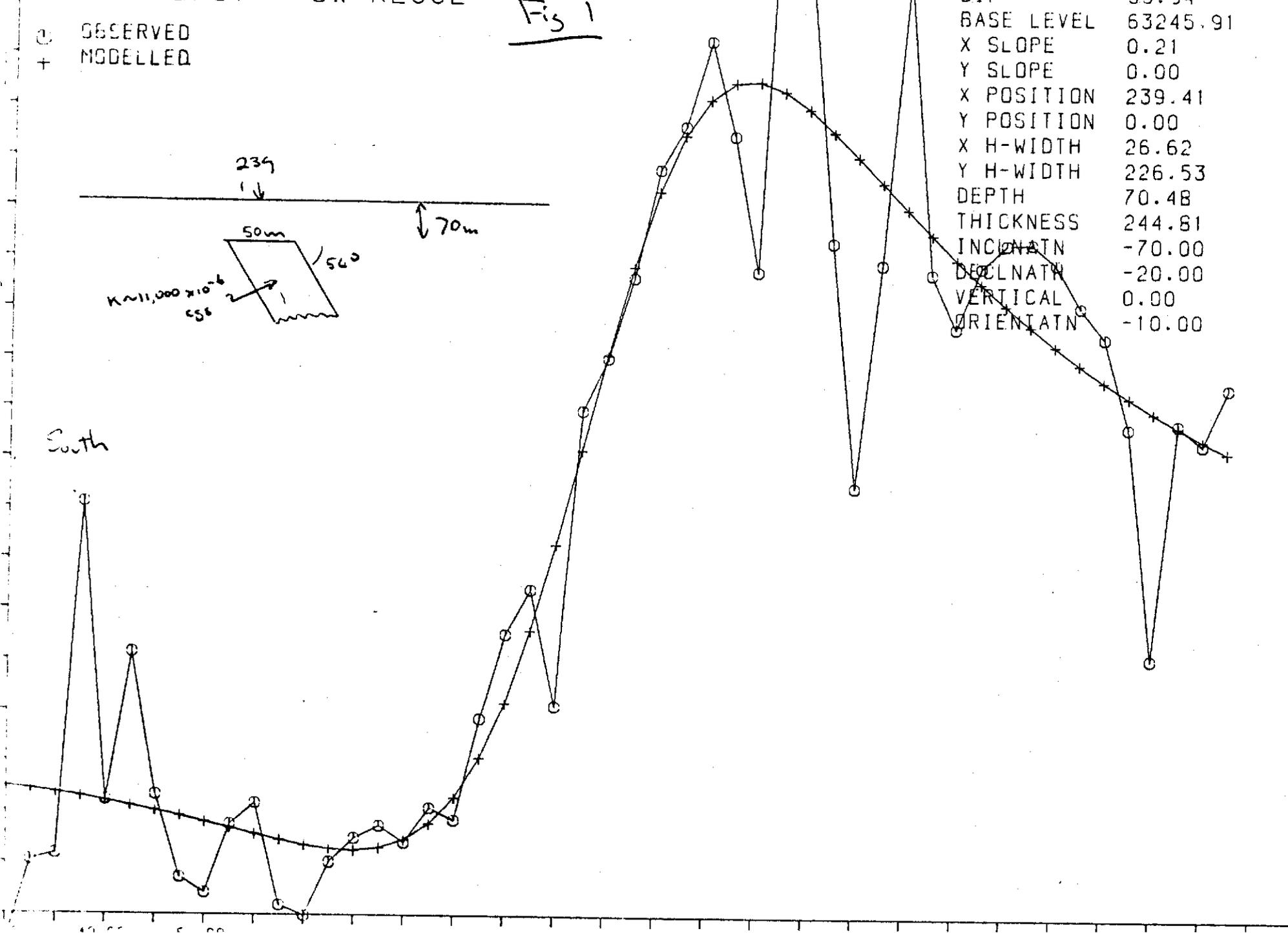
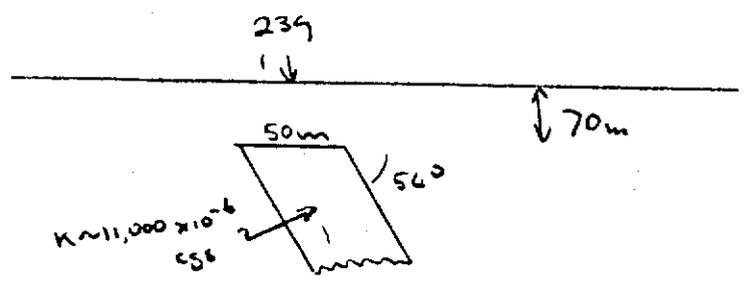
MAGMOD PRISM MODEL
 STATION EAST - SW RECCE

040

Fig 1

○ OBSERVED
 + MODELLED

MAGNET	668.96
DIP	53.54
BASE LEVEL	63245.91
X SLOPE	0.21
Y SLOPE	0.00
X POSITION	239.41
Y POSITION	0.00
X H-WIDTH	26.62
Y H-WIDTH	226.53
DEPTH	70.48
THICKNESS	244.81
INCINATN	-70.00
DECLNATH	-20.00
VERTICAL	0.00
ORIENTATN	-10.00

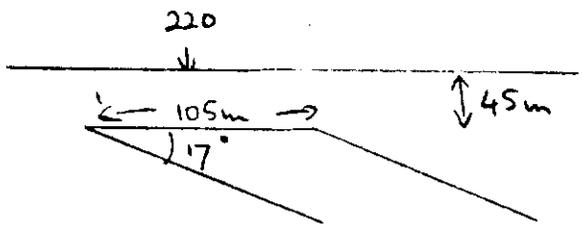


514040

MAGMOD PRISM MODEL
 NATONE EAST - SW RECCE

○ OBSERVED
 + MODELLED

Fig. 2

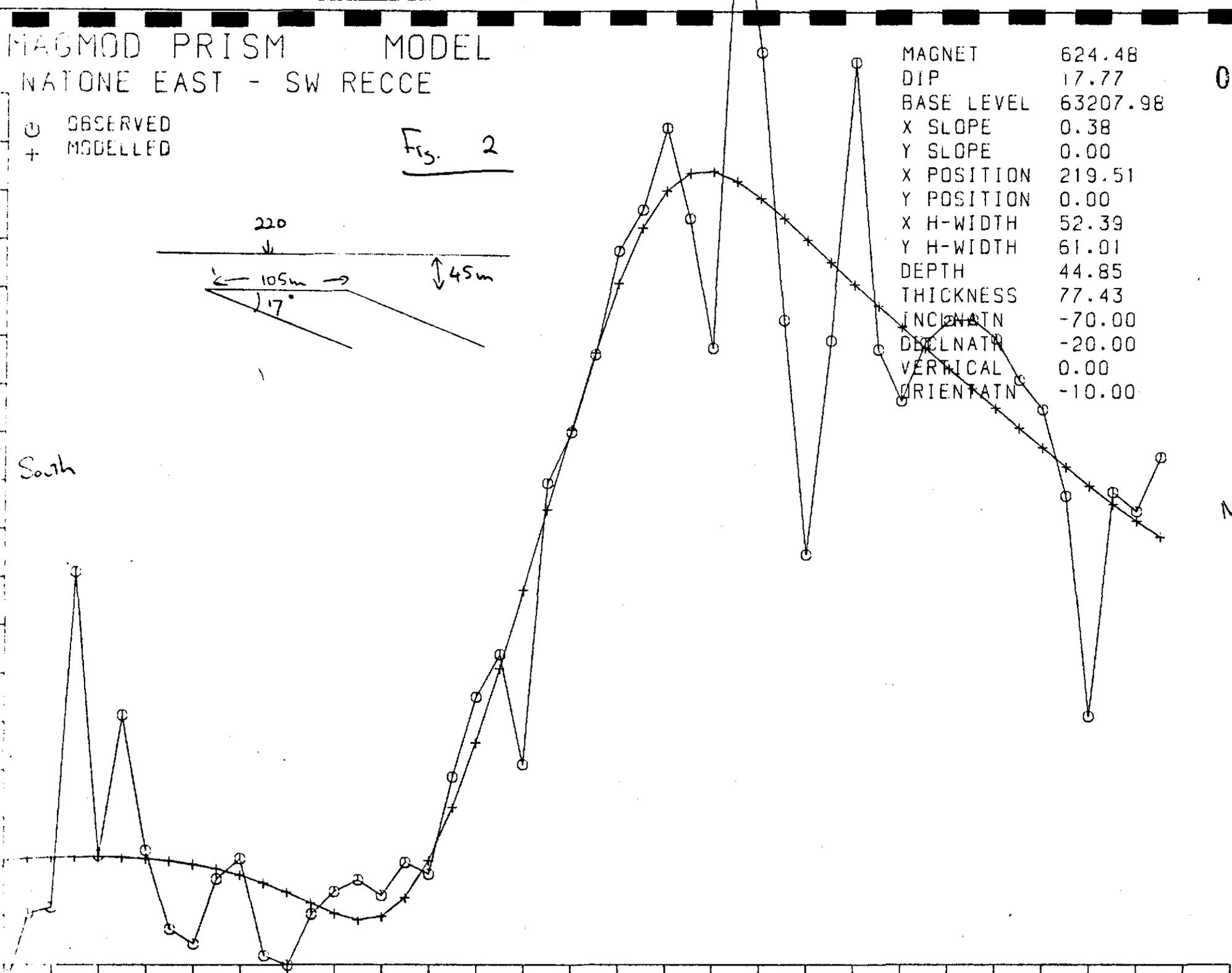


MAGNET	624.48
DIP	17.77
BASE LEVEL	63207.98
X SLOPE	0.38
Y SLOPE	0.00
X POSITION	219.51
Y POSITION	0.00
X H-WIDTH	52.39
Y H-WIDTH	61.01
DEPTH	44.85
THICKNESS	77.43
INCLINATN	-70.00
DECLNATH	-20.00
VERTICAL	0.00
ORIENTATN	-10.00

040

South

North



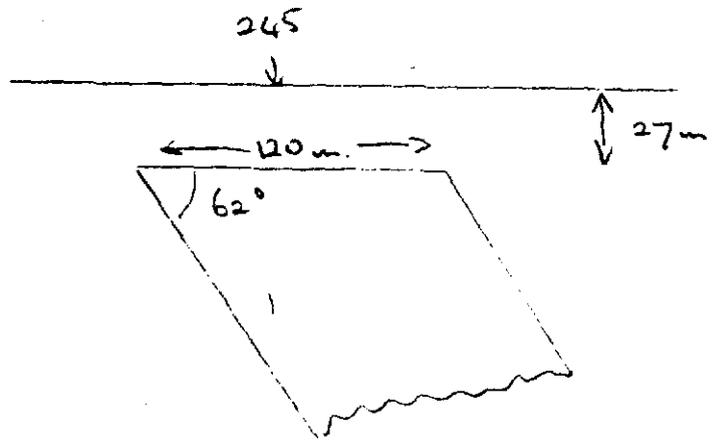
514041

MAGMOD PRISM MODEL

NATONE EAST - SW RECCE

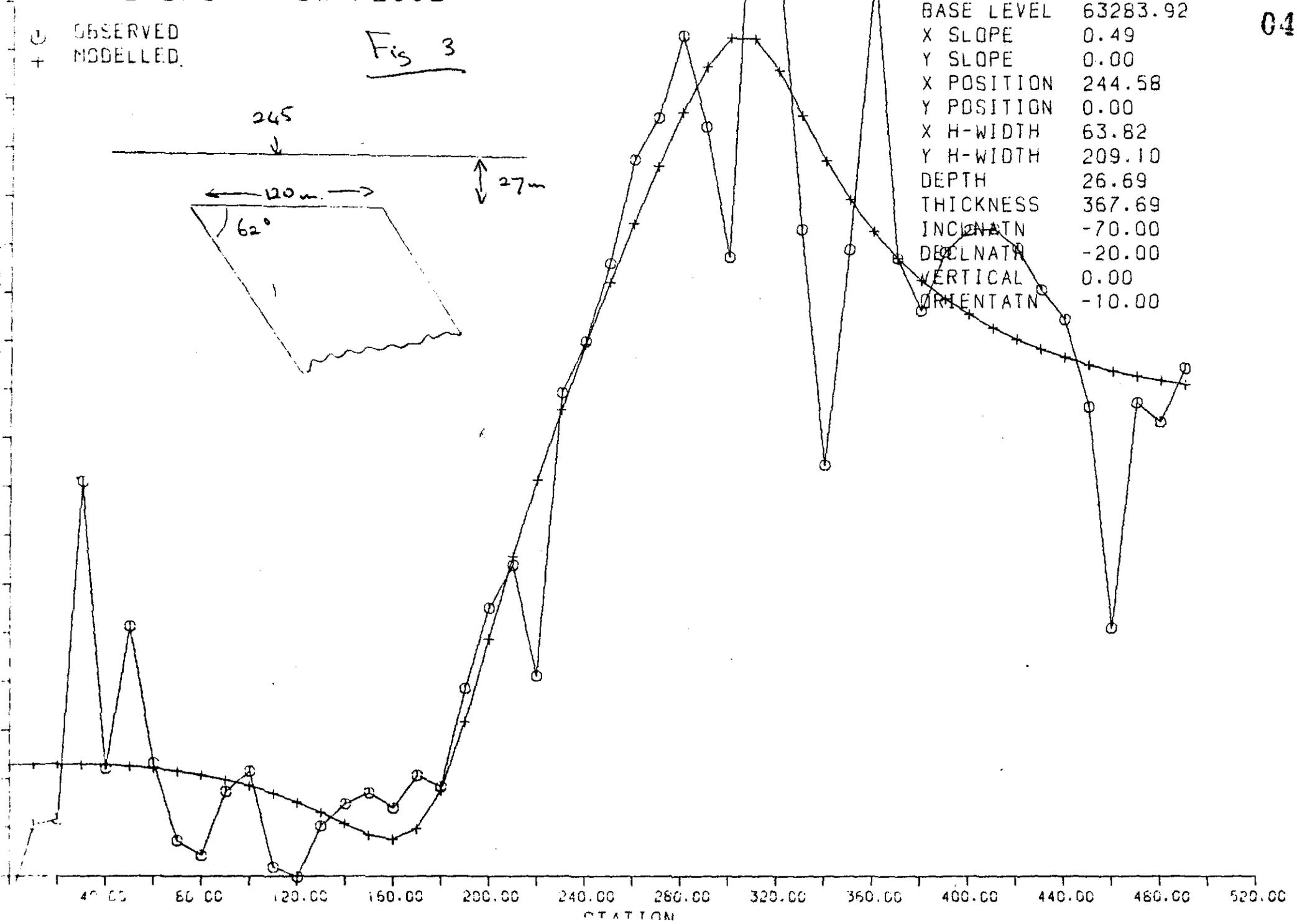
○ OBSERVED
+ MODELLED

Fig 3



MAGN	145.05
DIP	62.09
BASE LEVEL	63283.92
X SLOPE	0.49
Y SLOPE	0.00
X POSITION	244.58
Y POSITION	0.00
X H-WIDTH	63.82
Y H-WIDTH	209.10
DEPTH	26.69
THICKNESS	367.69
INCINATN	-70.00
DECLNATH	-20.00
VERTICAL	0.00
ORIENTATN	-10.00

042

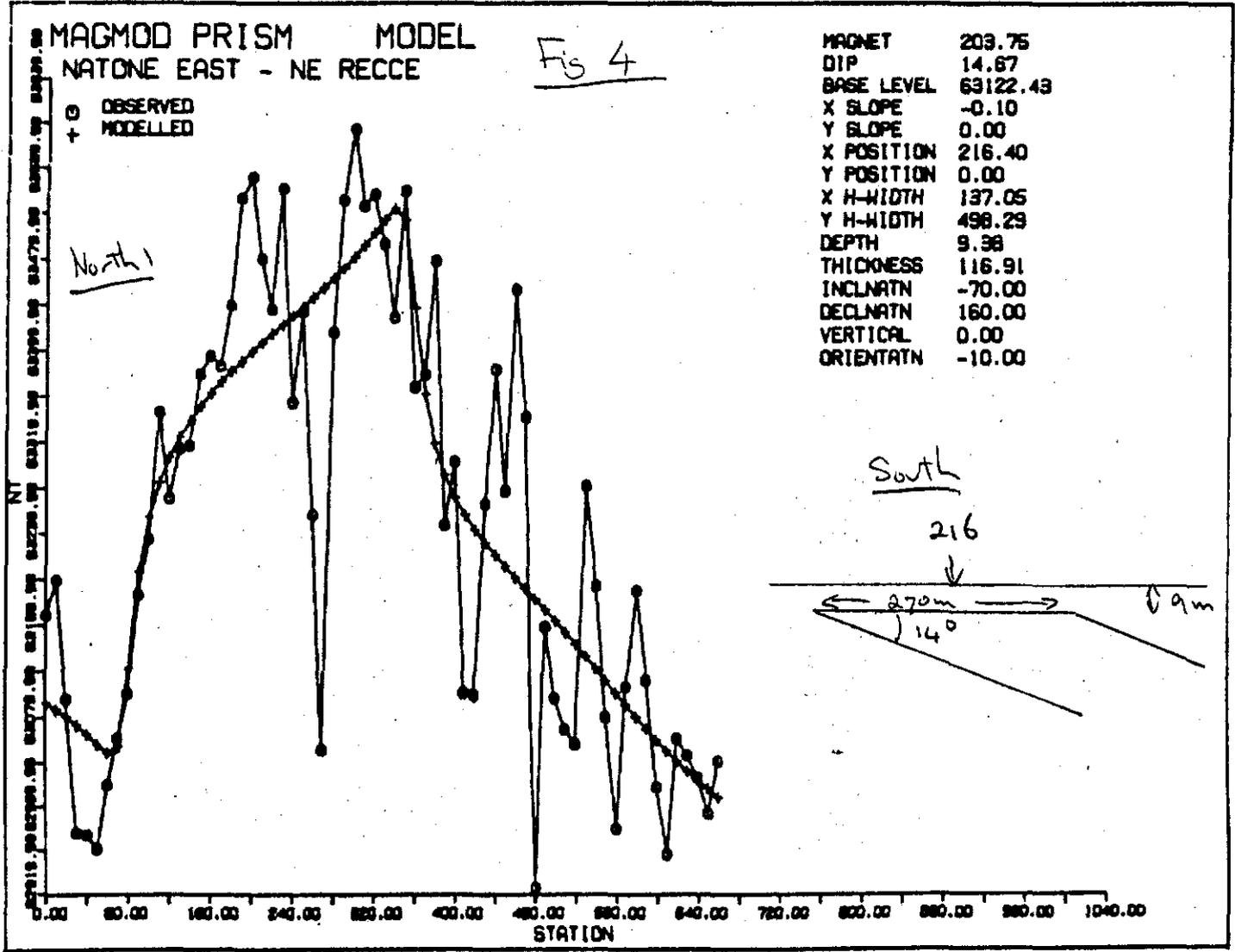


514042

(4)

043

*** STOP
OK, C 3
OK, C MEMOD4
OK, DO -TTY T80000
OK.



20

514043

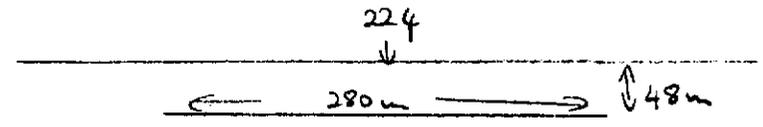
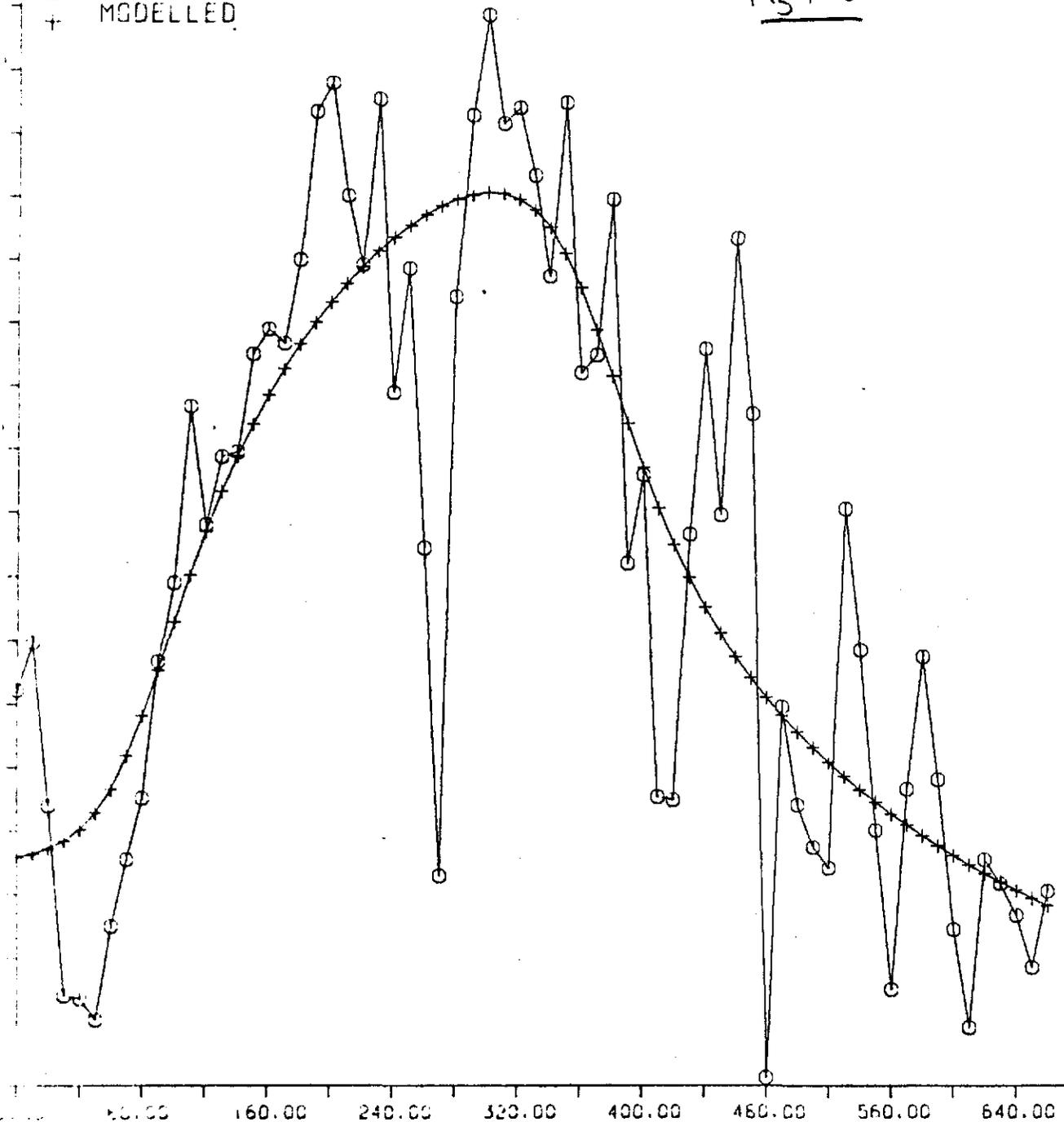
MAGMOD PRISM MODEL
 NATONE EAST - NE RECCE

MAGNET	216.44
DIP	21.04
BASE LEVEL	63041.60
X SLOPE	-0.08
Y SLOPE	0.00
X POSITION	223.80
Y POSITION	0.00
X H-WIDTH	141.67
Y H-WIDTH	63.93
DEPTH	47.76
THICKNESS	195.15
INCLNATN	-70.00
DECLNATN	160.00
VERTICAL	0.00
ORIENTATN	-10.00

044

○ OBSERVED
 + MODELLED

Fig. 5



514044

MAGMOD PRISM MODEL

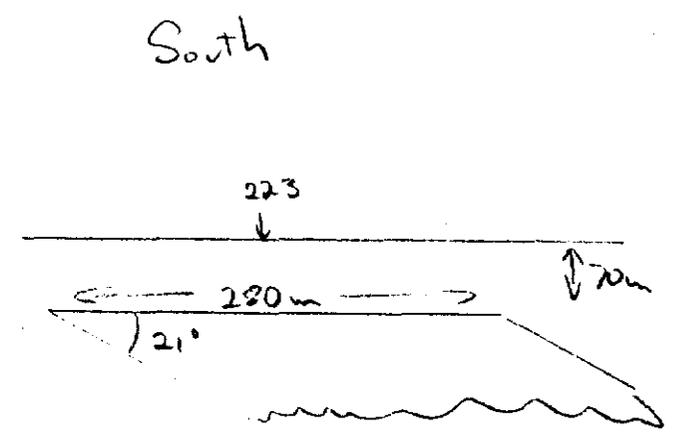
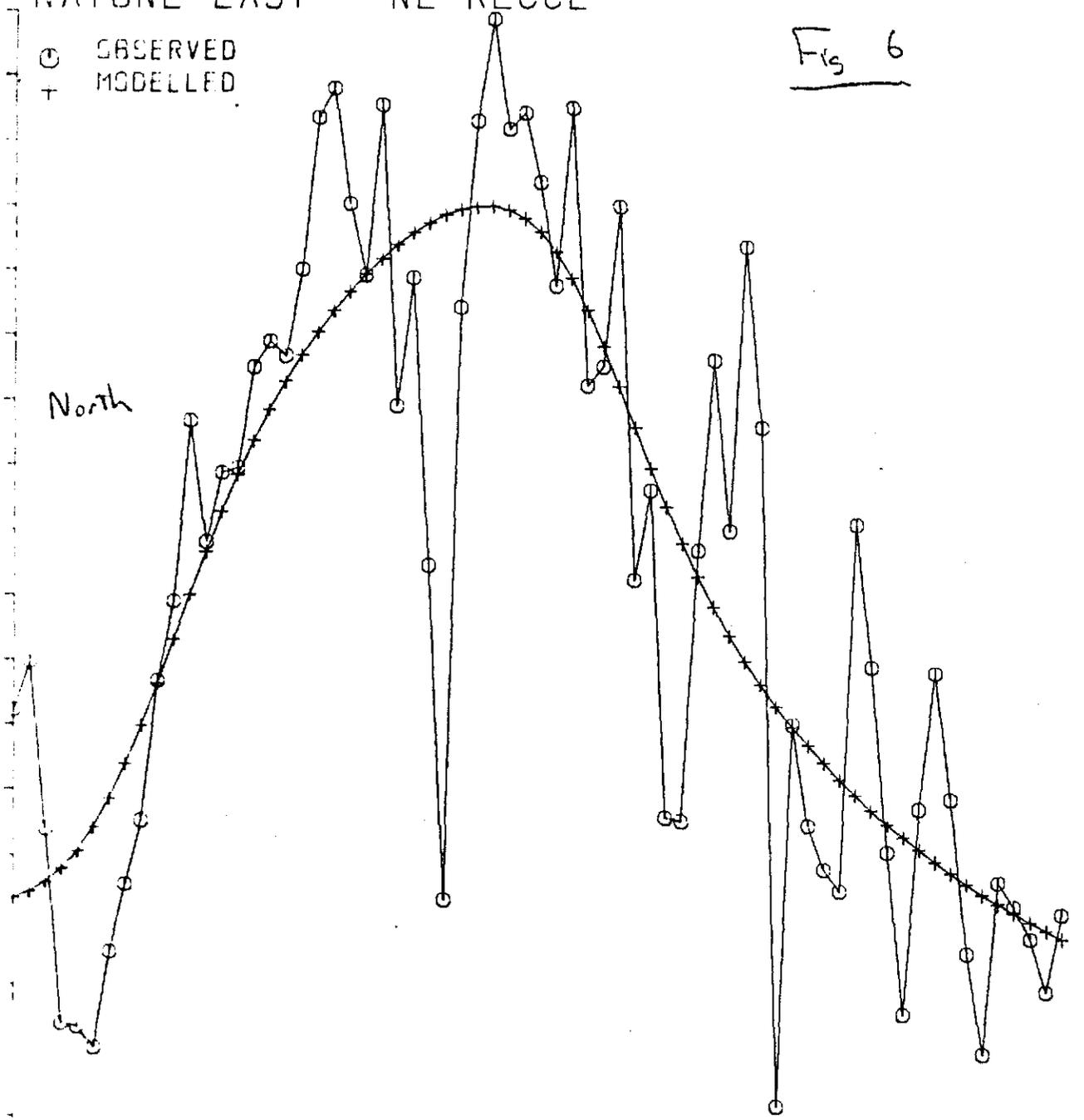
NATONE EAST - NE RECCE

○ OBSERVED
+ MODELLED

Fig 6

MAGNET	318.62
DIP	21.34
BASE LEVEL	62996.42
X SLOPE	-0.17
Y SLOPE	0.00
X POSITION	222.60
Y POSITION	0.00
X H-WIDTH	142.33
Y H-WIDTH	67.76
DEPTH	69.70
THICKNESS	1829.59
INCLNATN	-70.00
DECLNATN	160.00
VERTICAL	0.00
ORIENTATN	0.00

045



00 50.00 160.00 240.00 320.00 400.00 460.00 560.00 640.00 720.00 800.00 860.00 960.00 1040.00

514045

MAGMOD PRISM MODEL

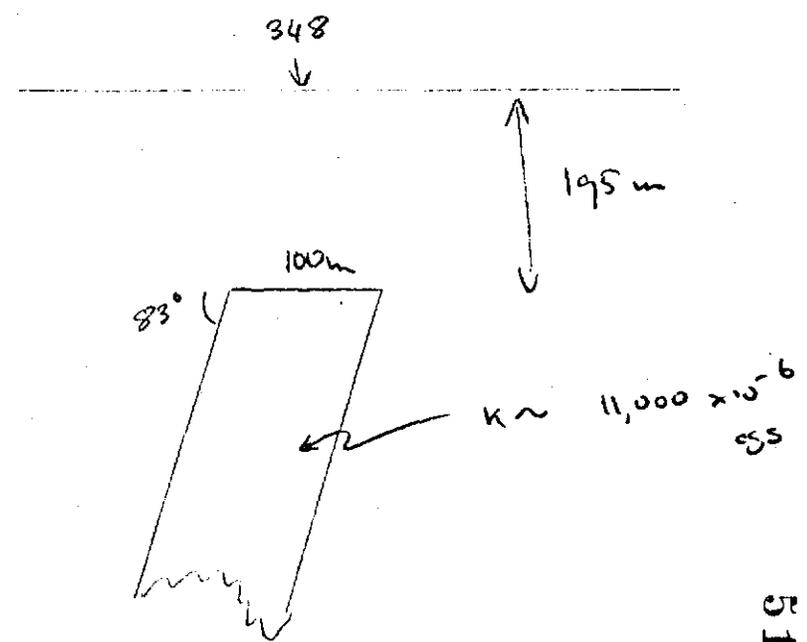
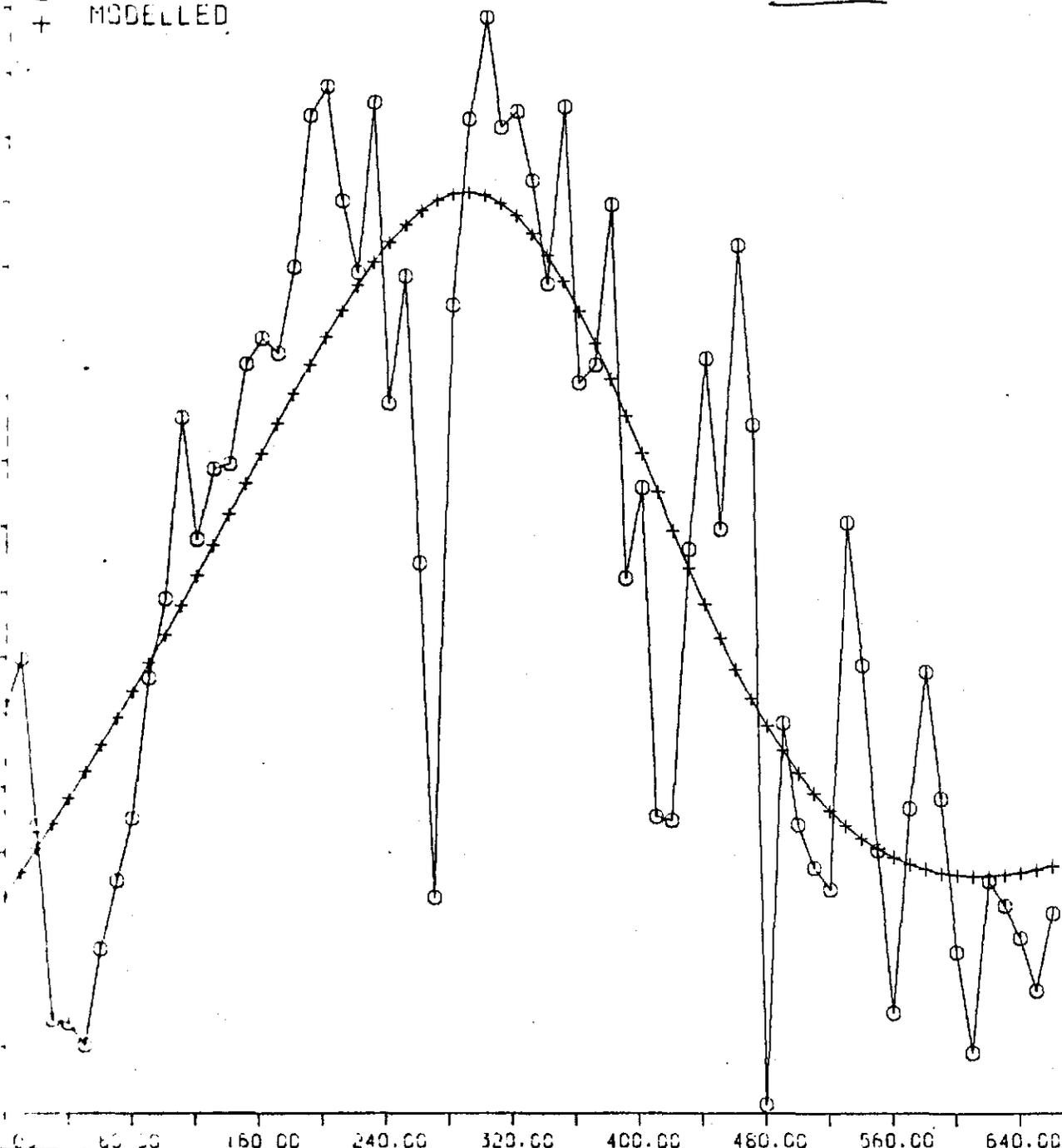
NATONE EAST - NE RECCE

○ OBSERVED
+ MODELLED

Fig 7

MAGNET 693.74
 DIP 96.86
 BASE LEVEL 62961.06
 X SLOPE 0.51
 Y SLOPE 0.00
 X POSITION 348.07
 Y POSITION 0.00
 X H-WIDTH 50.23
 Y H-WIDTH 497.61
 DEPTH 194.96
 THICKNESS 1968.69
 INCLNATN -70.00
 DECLNATN 160.00
 VERTICAL 0.00
 ORIENTATN 0.00

046



514046

Memorandum

514047 047

Date 14th October, 1982.

From G. Oakes (BXN)

To P. Ruxton (BXH)

Re: RIANA INPUT ANOMALIES & NATONE EAST
AEROMAGNETIC ANOMALY.

Natone East (Profiles currently being drawn up for all anomalies).

2 lines of magnetics and one of VLF have been done along roads over the Natone East aeromagnetic anomaly (approx. 800m SE of Natone anomaly). The anomaly lies almost entirely on ground owned by Mr. Shepherd.

VLF on the western traverse detected 2 conductors at 200 - 300S and another conductor at 900S. Magnetics gave a broad anomaly which, although it has not been modelled yet, suggests a broad, flat-lying body between 200S and 800S. A possible explanation for these anomalies would be a conductive zone at the base of a magnetic basalt flow. However, a magnetic, conductive feature parallel to the Natone body and only 800 metres away cannot be ignored (as a flat-lying sulphide body, such as Renison, would give a similar anomaly). Hence we have a bit of a problem.

We can't get a more quantitative handle on the body by electrical methods along the road, due to powerline noise (have already tried IP and max-min, with no interpretable results). When the gravity meter returns from Perth, I will try a line of gravity, but interpretation will be difficult due to the strong regional gradient in the area. As I see it, we only have 2 options:-

- a) get on to Shepherd's land, and do max-min, magnetics and gravity;
- b) drill on spec., from the road (if we get any encouragement from the gravity, this may be worthwhile anyhow).

APPENDIX 3

INPUT Anomaly Summaries

(location Plan D/MQ 04/164)

by

G. Oakes

APPENDIX 2 - Part 1INPUT Anomalies

A recce line of magnetics and VLF has been done over each of IR 1, IR 5 and IR 6. (IR 2, 3, 4 are in Natone - Stowport area and are covered by grids already). IR 5 and 6 can be forgotten for the time being. It would be worthwhile putting a small grid over IR 1 at some stage, although this has fairly low priority compared to work at Natone and Stowport. In detail:-

IR 1

Geoterrex recommended follow-up with a "deep penetration, discriminatory system", but only graded the anomaly priority 3, as it could be due to either a bedrock conductor or to a change in overburden parameters. The overburden is basalt. The anomaly is further downgraded by the fact that it follows a topographic ridge. On the plus side, it is located to the side of a regional gravity low (possible granite cusp), which adds a bit of interest.

A strong VLF anomaly was detected (although the VLF was very noisy, possibly due to powerlines), which would fit in with a surficial source. Hence I have given the anomaly low priority. More detailed work should still be done at some stage however, to check for a bedrock conductor beneath conductive overburden. I suggest a small grid be put in: 3 x 1km lines, 200m apart and bearing 090° (magnetic) and centred on 300W of the groundcheck traverse. (I have not yet contacted any farmers in the area). The grid should be covered with max-min (200m coil spacing, 50m station spacing) and magnetics (10m station spacing - ground mag. detected a 1500nT anomaly coincident with the VLF anomaly). IP should be done over the best max-min anomaly.

IR 5

The anomaly is almost certainly cultural:- there are several well-earthed fences in the vicinity (within 50m) of its plotted location. No further work is recommended.

IR 6

The anomaly coincides with a basalt ridge and was picked as being possibly topographic in origin on lines 102.1 and 104.1. Two well-earthed fences run along the top of the ridge from 0-450N of the ground traverse, and then veer to either side of the ridge. These fences appear to be too far to the east to have caused the anomaly although they may have contributed to the anomaly on line 103.1. (Exact location could not be recovered by Geoterrex).

The VLF traverse detected 2 strong conductors, implying 2 shallow conductors. Conductor 1 (see plot) is a strong crossover in North-West Cape (Japan was too noisy to read at that stage - possibly due to interference from grounded fences), with a topographic association. Hence it probably represents a basalt flow interface.

050

Conductors 2 and 3 are two crossovers (in both frequencies) at the contact between basalt and Precambrian and in roughly the right place to be the cause of the INPUT (given the uncertainty of the INPUT location). The two conductors here probably represent effects due to this and patchy basalt cover at the edge of the ridge.

Hence the most likely cause for the INPUT anomaly is a conductive zone at the base of the basalt/top of the Precambrian (probably a paleoweathering horizon), possibly with a contribution from topography, culture and conductive zones within the basalt. No further work is recommended.

APPENDIX 2 : Part 2Re-evaluation of Input Data Feb. 1983 - Riana Block

The Riana Block INPUT data was re-examined in Feb. 1983, to check for low-order anomalies in interesting geological locations, which may not have been picked by Geoterrex. Data from the Highclere and Loongana blocks was not considered as the greater basalt thickness over the prospective stratigraphy in these areas makes the INPUT's value dubious. Even in Riana, the large number of noisy powerlines and the basalt cover, makes interpretation of the INPUT very difficult.

Nine further anomalies were picked in Riana E.L. (designated IR 7 and IR 15). their locations are shown on Figs. 6-9. From the INPUT data alone, none of the anomalies can be distinguished from a strong basalt response. Nonetheless, they should all be ground checked at least, to check for topographic/cultural associations etc., before being discarded. This follow-up would have moderate priority. Any anomaly not explained by a ground check should be covered with max-min and IP.

4044/IR 7

A low-order anomaly to the southeast of Natone. The INPUT has been severely corrupted by a Hz (powerline) response, so the exact location and significance of the anomaly is not clear. I suspect that the anomaly represents the max-min conductors seen in the southeastern corner of the Natone grid (max-min conductor (b) in section 2 of the Natone report; Appendix A). These conductors would be tested by hole NT 4 proposed in the report, if they are considered significant.

4144/IR 8

A reasonable anomaly, with broad, low amplitude mag. association. The anomaly may have been affected by a Hz response. Its location on the side of hill suggests that it has been caused by a clay band at a basalt flow interface or at the base of the basalt. A ground check is suggested to test this hypothesis.

(A line of VLF yielding a strong anomaly over a topographic inflection would confirm the hypothesis).

4144/IR 9

The anomaly follows a property boundary and road, so a cultural source is possible. A ground check should be made to test this.

4143/IR 10

A fairly long anomaly (1500m strike length) with some mag. association. A ground check should be made to test a basalt-related source.

4144/IR 11

The anomaly follows the top of a hill so it could well be topographic or related to the basalt. A ground check is required to test this.

4144/IR 12

The anomaly contours around the side of a hill, so a check for a basalt-related source is required. Alternatively a cultural source is also possible, as the anomaly plots on a road and near a fence.

4144/IR 13

A strong 6-channel response, but apparently with a fairly long strike length (correlation between the northern and southern half of the anomaly is difficult due to a strong Hz response). The anomaly appears to follow the edge of a basalt sheet (edge of a zone of 60channel INPUT responses) so it could well have a basalt-related source. A ground check is required, to test this. The anomaly does not have any consistent topographic correlation (northern 2 lines plot at the top of a ridge, while the southern lines are at the side of a hill).

4144/IR 14

Ground check required.

4144/IR 15

A good 6-channel response at the edge of the surveyed area. The anomaly plots on a road, so a ground check for a cultural source is required.

APPENDIX 4

Natone, Southern Grid Extension

Geophysical Results

by

G. Oakes

LIST OF FIGURES

- FIGURE 1 : Resistivity/Chargeability Log of NT 3 - Electrode spacing 10m
- FIGURE 2 : Resistivity/Chargeability Log of NT 3 - Electrode spacing 2-5m
- FIGURE 3 : Magmod Modelling Data - 1100N Line
- FIGURE 4 : Magmod Modelling Data - 1050N
- FIGURE 5 : Magmod Modelling Data - 1150N
- FIGURE 6 : Magmod Modelling Data - 700N
- FIGURE 7 : Magmod Modelling Data - 750N
- FIGURE 8 : Magmod Modelling Data - 750N
- FIGURE 9 : Magmod Modelling Data - 750N
- FIGURE 10 : Magmod Modelling Data - 750N
- FIGURE 11 : Magmod Modelling Data - 1200E
- FIGURE 12 : Magmod Modelling Data - 1200E
- FIGURE 13 : Magmod Modelling Data - 1200E
- FIGURE 14 : Magmod Modelling Data - 1200E

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LIST OF PLANS

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
D/MQ 04/128	Natone - Line 1800N	1:2,500
D/MQ 04/131	Natone - Line 1700N	1:2,500
D/MQ 04/127	Natone - Lines 1600N and 1400N	1:2,500
D/MQ 04/132	Natone - Line 1500N	1:2,500
D/MQ 04/133	Natone - Line 1300N	1:2,500
D/MQ 04/126	Natone - Line 1200N	1:2,500
D/MQ 04/148	Natone - Line 1150N	1:2,500
D/MQ 04/134	Natone - Line 1100N	1:2,500
D/MQ 04/145	Natone - Line 1050N	1:2,500
D/MQ 04/124A	Natone - Line 1000N	1:2,500
D/MQ 04/144	Natone - Line 950N	1:2,500
D/MQ 04/135	Natone - Line 900N	1:2,500
D/MQ 04/147	Natone - Line 850N	1:2,500
D/MQ 04/123A	Natone - Line 800N	1:2,500
D/MQ 04/123B	Natone - Line 800N cont.	1:2,500
D/MQ 04/142	Natone - Line 750N	1:2,500
D/MQ 04/130	Natone - Line 700N	1:2,500
D/MQ 04/141	Natone - Line 650N	1:2,500
D/MQ 04/140	Natone - Line 600N	1:2,500
D/MQ 04/129A	Natone - Line 1200E	1:2,500
D/MQ 04/129B	Natone - Line 1200E cont.	1:2,500
D/MQ 04/146	Natone - Line 1000E	1:2,500
D/MQ 04/143B	Natone - Southern Extension - Max-min Interpretation	1:2,500
D/MQ 04/160	Natone - Southern Extension - Ground Magnetics	1:2,500
D/MQ 04/161	Natone - Southern Extension - Ground Magnetic Stacked Profiles	1:2,500
D/MQ 04/153	Natone - Southern Extension - Gravity & Magnetic Trends	1:2,500
D/MQ 04/122	Natone - Southern Extension - Bouger Gravity (No Terrain Corr.)	1:2,500
D/MQ 04/162	Natone - Southern Extension - Gravity	1:2,500
D/MQ 04/163	Natone - Southern Extension - Gravity 2nd vert. deriv.	1:2,500

Natone, Southern Extension - Geophysical Results1. Introduction

This note summarizes the results of max-min, magnetics, gravity and IP surveys between 1800N and 600N of the Natone grid (Plans D/MQ04/ attached).

Max-min was done with a 200 metre coil separation and 25 m station spacing between 600N and 1200N, with a 50 metre line spacing. From 1200N to 1800N, a 100 m line spacing was surveyed, with a 50 metre station spacing. Two baselines (1000E and 1200E) were also surveyed at a 25 m station spacing.

Magnetics (10 m station spacing) and gravity (25 m station spacing) were done on all lines, except 1300N, and 1700N, on which no gravity was done.

Dipole-dipole IP/resistivity (100 metre dipoles, n=1 to 6) was done on lines 1000N, 1100N and 1200E.

2. Results2.1 Max-min

Table 1 lists the conductors detected by the max-min surveys. This table is summarized in drawing D/MQ04/143B. Interpretation of max-min in the area is complicated by several factors -

- (i) many lines over the main sulphide zone do not extend far enough to the east (due to Mr. Shepherd's property) to enable confident interpretations, particularly of dip - although I am reasonably happy that the dip is generally to the east.
- (ii) the main sulphide zone is probably fairly broad and of complex shape, hence most scale modelling results (for thin sheets, in general) are not really applicable.
- (iii) interference from other conductors in the area (particularly black shales, but possibly also clay bands within or at the base of the basalt).

Despite these problems, the following conductors can be seen:-

- (a) an excellent conductor (conductivity - thickness up to 25, and increasing at low frequencies) at roughly 1400E, between 1300N and 1000N. The interpreted depth is generally of the order of 30-50 metres. The dip is probably to the east, but lack of max-min cover to the east makes interpretation difficult. The conductor clearly represents the main sulphide zone.
- (b) a series of flat-lying conductors between 1600E and 1800E on lines 600N to 950N. Whether these conductors represent a single, folded body or 2 bodies is unknown - interference from a grounded fence at 900N and 950N has certainly contributed to the anomalies

in the north. The interpreted conductivity-thickness is excellent (up to 10-15, and increasing at low frequency), and the body appears to be quite deep (greater than 50 metres). Possible causes are sulphides or clay bands at the base of the basalt.

- (c) a reasonable conductor at roughly 1200E between 1200N and 1800N. This conductor appears to be generally quite shallow (possibly of surficial origin) and dip to the west. The probable cause is black shales(?).
- (d) a westerly-dipping, black shale conductor on the western edge of the grid.
- (e) a U-shaped conductor between 900E and 1400E, to the south of 950N. The interpreted conductivity-thickness is generally reasonable (5-7), with the dips suggesting the nose of an anticline. This conductor may represent black shales (especially on the western arm - the eastern arm may be related to the edge of the granite(?)).

2.2 Magnetics

Drawings D/MQ04/160 & 161 show contours and stacked profiles of the ground magnetics interpreted trends are summarized in drawing D/MQ04/153

The main magnetic anomalies within the grid are:-

- (i) 1800N, 1350E - a 3000 nT, single line anomaly. This anomaly has been modelled earlier (see memo of 17/11/81). (Ruxton, 1982). It's cause is not clear at this stage.
- (ii) 1200N to 1700N - a large, broad anomaly at the eastern ends of these lines. This anomaly was tested by drillhole NT1, and found to be caused by pyrrhotite skarn (and associated magnetite). Some modelling results are given in my memo of 17/11/81.
- (iii) 1050N to 1150N at 1400E - a large (~1000 nT) narrow anomaly, coincident with a good conductor and positive gravity trend. A possible model for this anomaly is given in figures 1 to 3 :- a 30 metre thick body at a depth of 50 metres and dipping steeply east fits the data reasonably well. Drilling results (NT3) suggest a broader, shallower body, of similar attitude and susceptibility, would be closer to the actual situation. The modelled susceptibility would fit pyrrhotite or disseminated magnetite. A residual anomaly to the west of the main anomaly suggests a second body to the west - this could well be the second massive pyrrhotite zone intersected by NT3.

This anomaly almost certainly represents the southern extension of the body tested by NT1, but the change in the character of the magnetics possibly reflects a change in the style of mineralization, e.g. a thin zone of greater magnetite content closer to the granite. The band of massive magnetite intersected by drilling has possibly controlled most of the character of the

magnetic anomaly, with pyrrhotite controlling the max-min and tending to broaden the magnetic anomaly. Clearly, to adequately model the complex bodies at Natone, the approach used by MAGMOD is an over-simplification.

- (iv) 850N to 950N - there is a series of anomalies at the eastern ends of these lines, but the lines do not extend far enough to the east to allow detailed modelling and interpretation. The most likely dip is shallow to the south-west (from max-min interpretation; but would also fit the magnetics). The anomalies are fairly noisy, and could well be due to basalt hash. The area also has a possible gravity anomaly (which again does not rule out a basalt source), and would be worth considering for a drillhole (NT4 of my memo of 9/11/82), if Natone retains some interest after drilling NT3.
- (v) 650N - 750N, 1700E - 1800E - a series of low-order, noisy magnetic anomalies associated with a reasonable max-min conductor and a possible gravity ridge.

Figure 4 shows a possible model for the anomaly on line 700N:- a thin sheet dipping shallowly east from a depth of 14 metres gives a reasonable fit to the observed data (probably as good a fit as could be expected for such noisy data). The modelled geometry and susceptibility would certainly fit a basalt flow, in which case the max-min would be explained by a clay band at the base of the flow.

Figures 5 to 8 give models for line 750N. The best fit is for fig. 6, which shows a flat-lying body at a depth of 40 metres. The modelled susceptibility is too high for basalt, so a sulphide or magnetite skarn source cannot be ruled out. Alternately, a shallower, thicker body of lower susceptibility would probably give an equally good fit, and would suggest a basalt source. Fig. 8 models a body similar to that shown in figure 4.

All in all, these anomalies look to have a similar source to anomaly (iv) above. However, anomaly (iv) has a better gravity association and the max-min suggests a deeper source and is therefore more likely to be beneath the basalt?, hence it has a higher priority for drilling at this stage. If anomaly (iv) proves to have a sulphide source, then anomaly (v) is worth drilling also.

- (iv) 600-1000N, 1400-1600E - a series of small (200-300 nT) and noisy anomalies extending south from the main sulphide anomalies (which are of much larger amplitude) and over the top of the granite. The large, sudden change in amplitude suggests that they are of dubious significance - even if they do represent sulphides, they probably have limited depth extent. However, if interesting grades arise out of NT3, this zone would be worth testing with a shallow hole.

2.3 Gravity

show

Drawings D/MQ04/122, 162, gravity contours for the grid. Drawing D/MQ04/163 shows the second vertical derivatives of the gravity, to aid in anomaly picking (as the strong regional gradient close to the Housetop Granite margin makes anomaly recognition difficult). Interpreted trends are shown in drawing D/MQ04/153. The gravity has not been terrain corrected, but corrections were calculated for 14 scattered stations on the grid, and the maximum difference was 0.14 mgal, thus it was not considered to do complete terrain corrections, at this stage.

The main gravity anomalies are:-

- (i) centred on 1200E, 1025N - an east-west trending gravity ridge of roughly 1.2 mgals, clearly visible through the regional gradient. The ridge swings North-west and south-west at its western and eastern ends.

Figures 9 to 12 show models for this anomaly. It basically appears to be due to a flat-lying to shallowly dipping (south) body at a depth of 50 to 100 metres. The body appears to be thick (~40 metres) and very dense (contrasts ~1.5 g/cm).

The anomaly parallels the granite margin and probably represents some metamorphic/metasomatic effect related to the granite. The large modelled density contrasts (and lack of mag. or max-min association) suggest that this zone represents a different style of mineralization to that seen in the main sulphide body. NT3, designed to test the sulphide body, may have intersected the edge of the source of this gravity ridge, but it would not test the main anomaly. Note that wolframite is very dense, and may be the cause of this anomaly.

- (ii) 1400E, 1200N - gravity high over main sulphide zone. (NB the gravity trend does not appear to parallel the mag./max-min trends precisely, but this may be due to the strong regional making gravity trends hard to see with any precision).
- (iii) 1800E, 1000N - gravity ridges (?) on end of lines 850N-1050N, possibly related to the magnetic anomalies on these lines (and hence to the basalt cover?). The gravity coverage does not extend far enough east to give a detailed interpretation.
- (iv) 750N, 1400-1800E - gravity ridge, again possibly related to magnetic trends (and hence basalt?) in the area.

2.4 IP/Resistivity

Lines 1000N, 1100N and 1200E were surveyed with IP and resistivity (dipole-dipole, $a=100$ metres, $n=1$ to 6), to aid the max-min interpretation near the southern end of the main sulphide zone. This work clarified 3 points:-

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- (i) it confirmed that the southern end of the main zone is in the vicinity of 1000N.
- (ii) it gave a chargeability, but not resistivity, anomaly over gravity anomaly (i). This would be consistent with a wolframite source.

3. Integrated Interpretation

The geophysics at Natone has delineated the following bodies:-

(a) Main sulphide zone (a fairly broad, complex body detected by magnetics, max-min, gravity and IP). This can be subdivided into 2 zones:-

(i) North of 1200N = pyrrhotite skarn with disseminated magnetite, intersected by NT1

(max-min anomaly (a)
magnetic anomaly (ii)
gravity anomaly (ii)
IP from line 8500E and Minops)

(ii) South of 1200N = pyrrhotite skarn with bands of massive magnetite, intersected by NT3

(max-min anomaly (a)
magnetic anomaly (iii)
gravity anomaly (ii)
IP on line 1100N)

(b) Northern magnetic body - a magnetic body on line 1800N (magnetic anomaly (i)), of unknown cause.

(c) Secondary sulphide zones (?) - three zones of possible interest in the south-eastern portion of grid:-

(i) magnetic anomaly (iv), max-min anomaly (b) and gravity anomaly (iii). (To be tested by DH NT4?).

(ii) magnetic anomaly (v), max-min anomaly (b) and gravity anomaly (iv).

(iii) magnetic anomaly (vi).

These three zones could equally well be explained by basalt flows, and hence are only low priority targets for drilling, depending largely on favourable results from higher priority drill targets.

(d) Wolframite zone (?) - a gravity ridge (gravity anomaly (i) and chargeability anomaly parallel to the granite contact, and a high priority for drilling. (To be tested by DH NT5?).

(e) Black shales - (i) max-min anomaly (c) - NT2
(ii) max-min anomaly (d)
(iii) max-min anomaly (e)?

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(f) Granite - area of low gravity and low magnetic relief, with high resistivity and low chargeability, in the southern part of the grid.

4. Proposed Drillholes

NT 3 - location : 1470E, 1070N
inclination : 60° to grid west

Tests a magnetic, conductive target on the southern extension of the sulphide body intersected by NT1. Target depth ~90 metres down the hole.

As a secondary aim, the hole may test the edge of an east-west trending gravity ridge (gravity anomaly (i)), with a target depth ~60-90 metres.

NT4 - location : 1800E, 900N
inclination : vertical

Tests gravity, magnetic and max-min anomalies at the ends of lines 850-950N. These anomalies may represent a second sulphide zone beneath the basalt, or they may be due to basalt alone.

This hole has been deferred/cancelled, and depends on the results of NT3.

NT5 - location : 1200E, 1025N
inclination : vertical

Tests a gravity and chargeability anomaly at a target depth of 50-100 metres. These anomalies may be due to wolframite mineralization next to the granite contact, and trending east-west (perpendicular to the main sulphide trend). This zone was not adequately tested by NT3, which did however intersect a thin wolframite (?) zone at roughly the right depth.

Lower Priority Targets -

(a) magnetic anomaly (vi) - possible southern extension of the main sulphide zone? Depends on results of NT3.

(b) magnetic anomaly (v) - possible sulphide zone in the south-west of the grid. Depends on results of NT4 and NT3.

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TABLE 1

CONDUCTOR LIST

<u>LOCATION</u>	<u>DIP</u>	<u>DEPTH</u>	<u>CONDUCTIVITY - THICKNESS</u>	<u>COMMENTS</u>
1800N, 1250E			10+ (incr. at low freq.)	- broad, good conductor - coverage not complete - source in black shale
1700N, 1200E	60°W(?)	60m(?)	8(??)	- coverage not complete
1400N, 1150E				- shallow body, dipping west? (line is very short)
1300N, 1150E	30°W	20-40m	1-2	- surficial conductor?
1200N, 1400E				- sulphides - broad, good conductor on end of line
1150N, 1375E				- broad conductor on end of line
1100N, 1375E	30°E	30-50m	3 (incr. at low freq.)	
1050N, 1375E	60°W(?)	50m+	25 (incr. at low freq.)	- looks like complex body or line not perpendicular to strike - dip is from low freq. (high freq. suggests dip to E) lack of coverage to E makes dip interpretation a bit dubious anyhow (also inter- ference from west).
100N, 1400E	60°E(?)	30-50m	3 (incr. at low freq.)	- dip from low freq. (222-888 H ₂) - looks like a complex body or 2 conductors or west edge of broad conductor (lacks cover to E)
950N, 1700E	30°-60°W (?)	60m(?)	10(?) (incr. at low freq.)	- fence anomaly, esp. at high frequency - could be another conductor also (from low freq. - this is interp. given here)
900N, 950E				- dipping W? (not well covered and interference)

TABLE 1

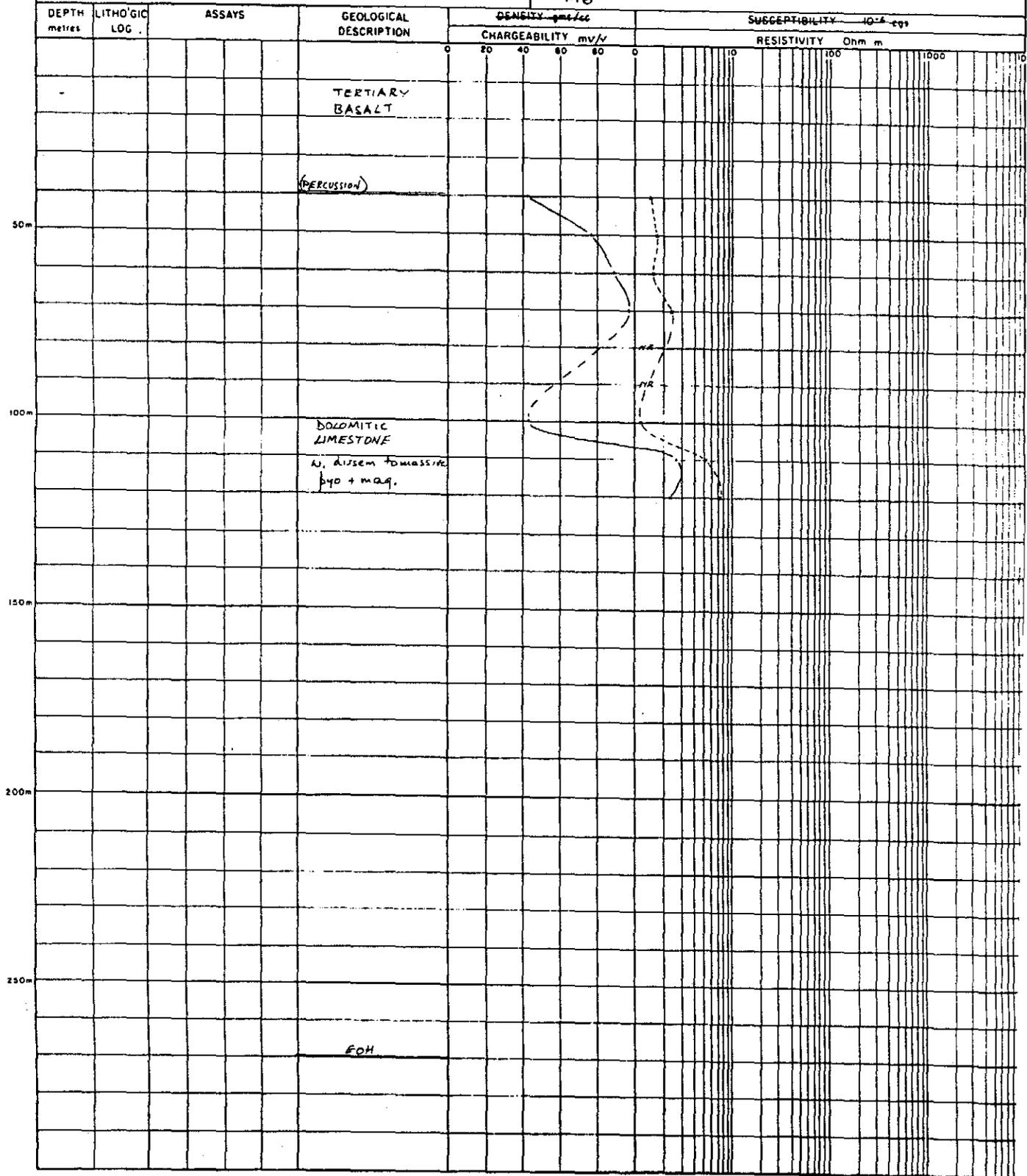
CONDUCTOR LIST

<u>LOCATION</u>	<u>DIP</u>	<u>DEPTH</u>	<u>CONDUCTIVITY - THICKNESS</u>	<u>COMMENTS</u>
900N, 1350E				- interference too great to give reasonable interpretation.
900N, 1650E				- fence anomaly
800, 950E	?	>50m(??)	5(??)	- lack of cover = no dip interpretation
800N, 1250E		20m(?)	5(?)	- dip east
800N, 1775E	<30°W	80m	10-15 (incr. at low freq.)	- interference from W, lack of cover to E - probably quite broad
750N, 1700E	30°W(?)	60M(?)	10-15 (incr. at low freq.)	- broad, good conductor (possible drill target) - lack of cover to E and interference from W = hard to see zero level for interp and dip is dubious (but probably OK)
700N, 1125E	30-60°W	40m	7 (incr. at low freq.)	- broad conductor
700N, 1600-1800E				- either a poor, shallow conductor or a broad flat-lying conductor or affected by magnetite/pyrrhotite
650N, 1650-1700E	<30°E	50m(?)	4+ (incr. at low freq.)	- broad conductor
600N, 1650-1700E	<30°E	50m(?)	2-4+ (incr. at low freq.)	- broad conductor

DIAMOND DRILL HOLE N° NT 3

PROJECT : NATONE	STATE : TAS	IP / RESISTIVITY LOGGING -
ANOMALY N° : 4044/1	GRID COORDS : 1070N/1475E	CONTRACTOR : SCINTREX (TAS-103)
INCLINATION : -60°	AZIMUTH :	DATE LOGGED : 17 JAN 83
DATE DRILLED : DEC 82	TOTAL DEPTH : 269.5m	ARRAY : 3 ARRAY
CASING :		ELECTRODE SPACINGS : 10m
GROUND GEOPHYSICAL ANOMALIES : MAGNETIC, IV, MAX-MIN		SUSCEPTIBILITY LOGGING
		BY :
		DATE LOGGED :

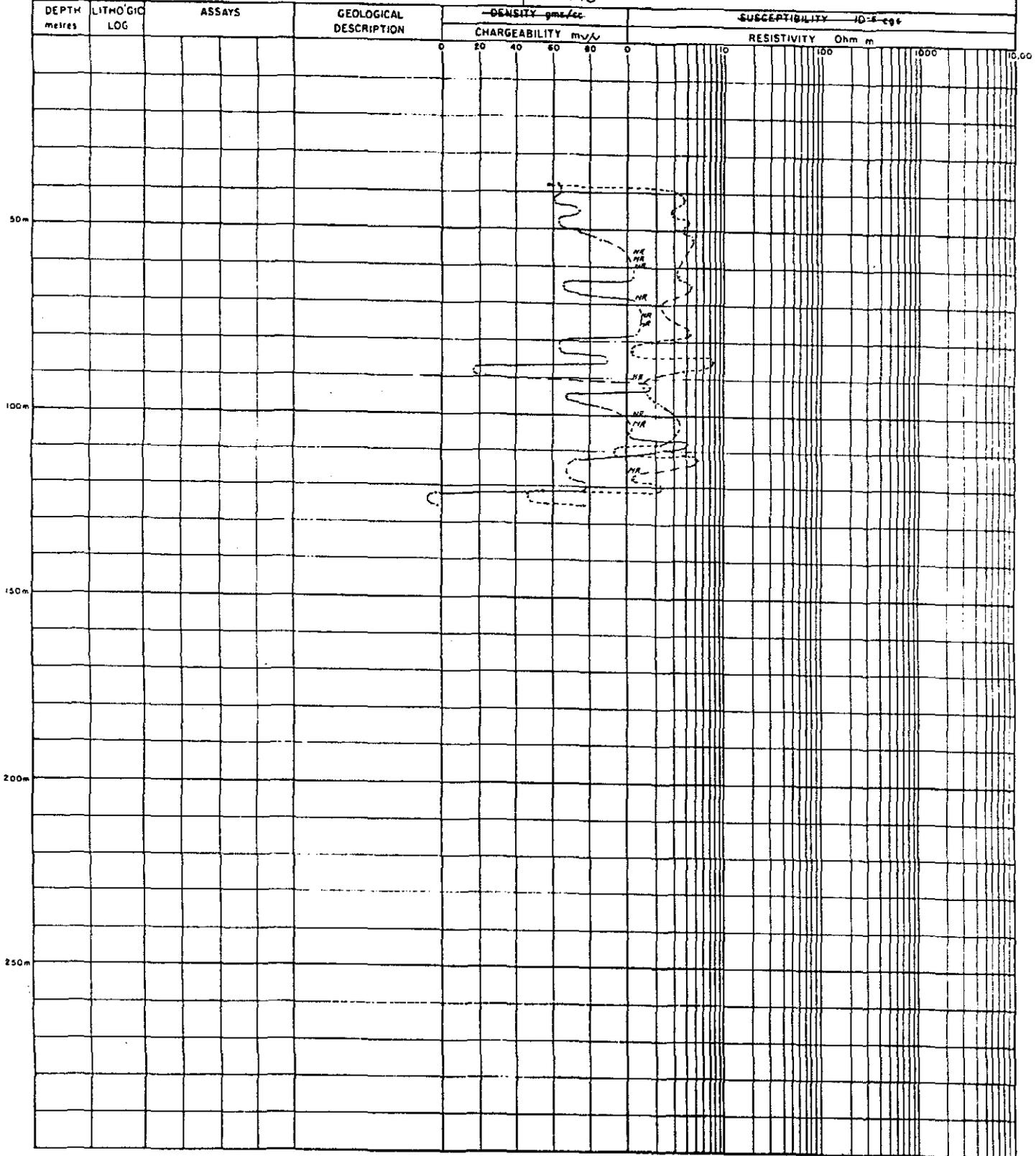
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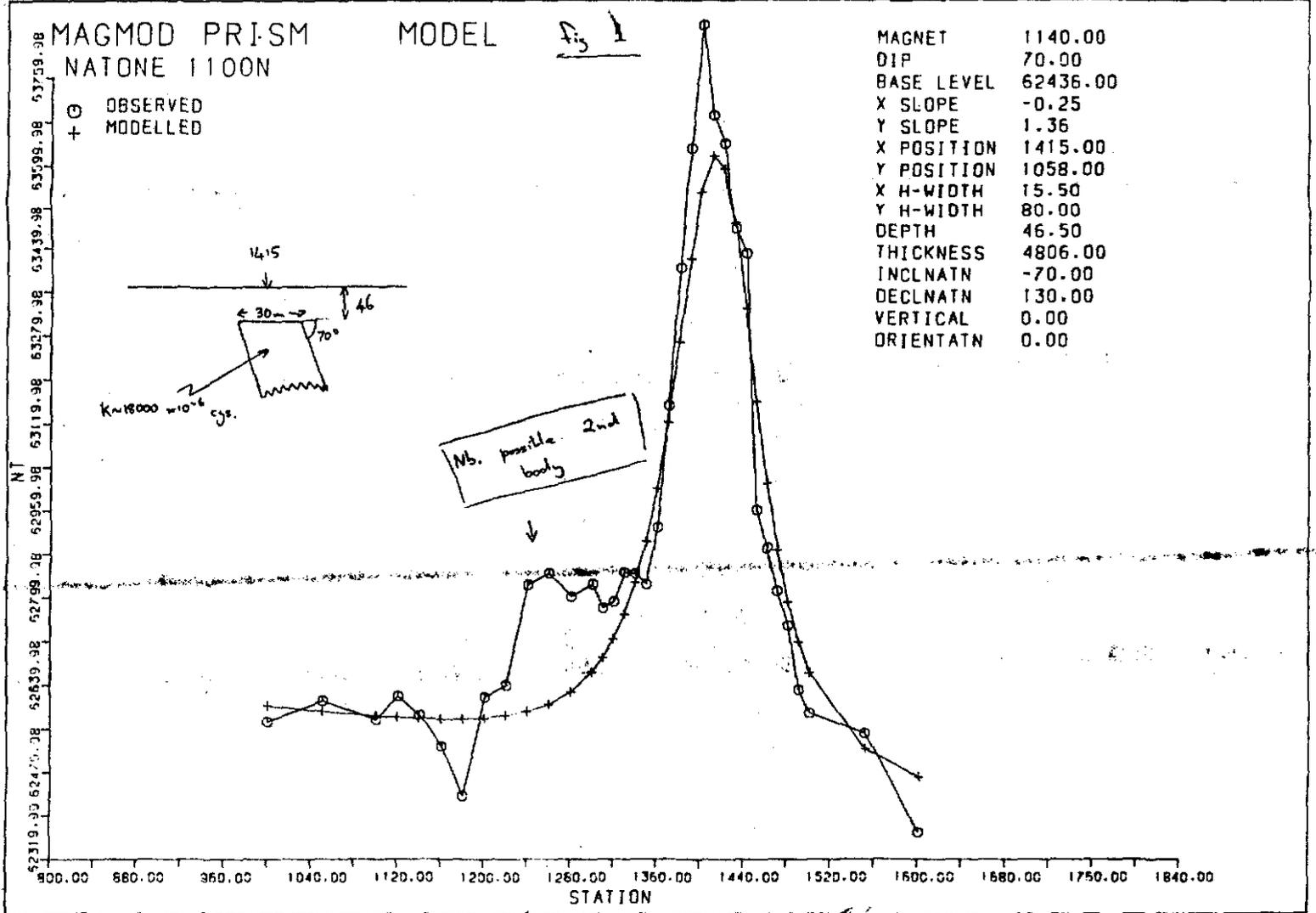


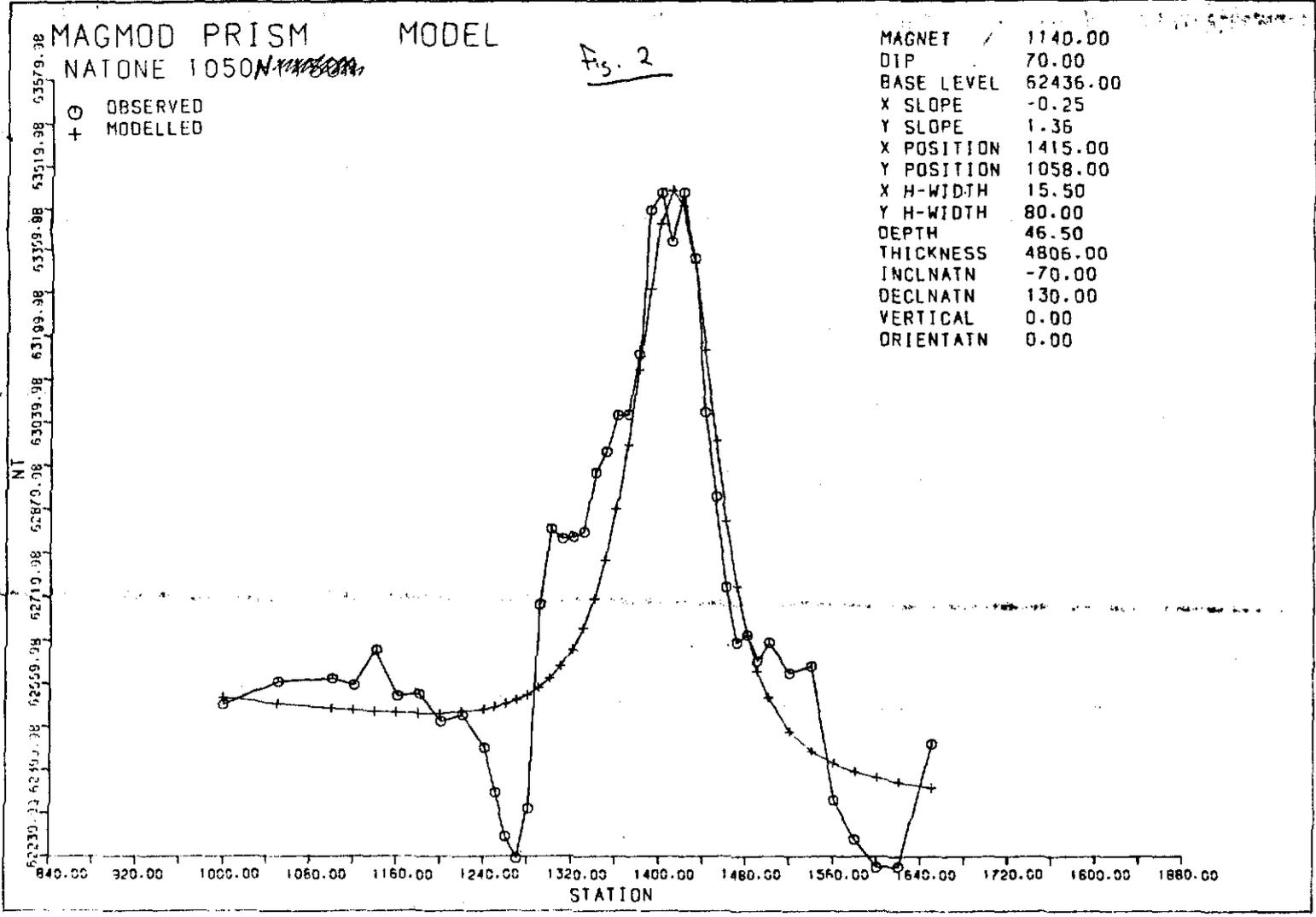
DIAMOND DRILL HOLE N° 1 NT 3

PROJECT : NATONE	STATE : TAS	IP / RESISTIVITY LOGGING —
ANOMALY N° :	GRID COORDS :	CONTRACTOR : SCINTREX(TAS-103)
INCLINATION :	AZIMUTH :	DATE LOGGED : 12 JAN 63
DATE DRILLED :	TOTAL DEPTH :	ARRAY : D.N ARRAY
CASING :		ELECTRODE SPACINGS : 2.5m
GROUND GEOPHYSICAL ANOMALIES :		SUSCEPTIBILITY LOGGING
		BY :
		DATE LOGGED :

M6

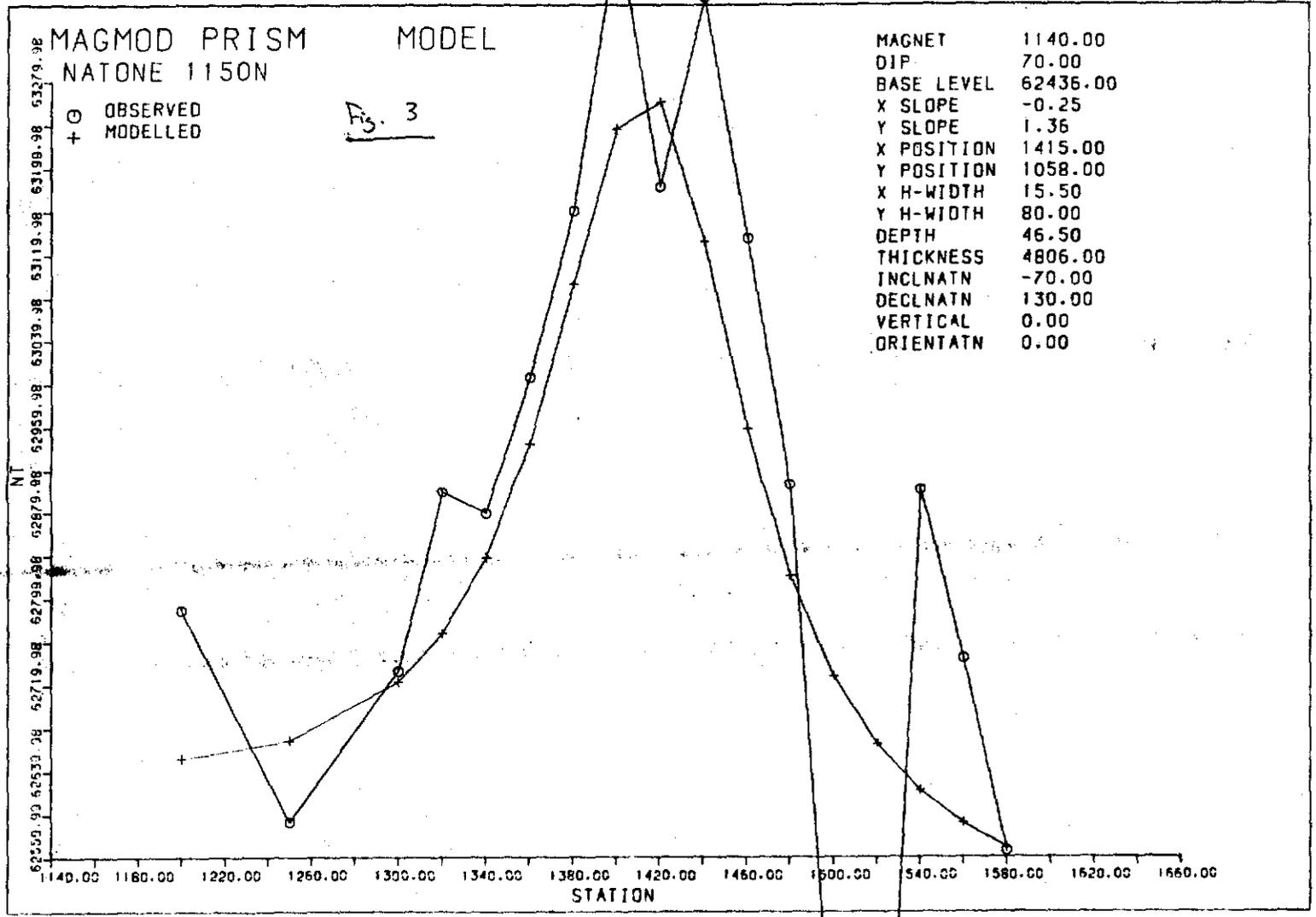


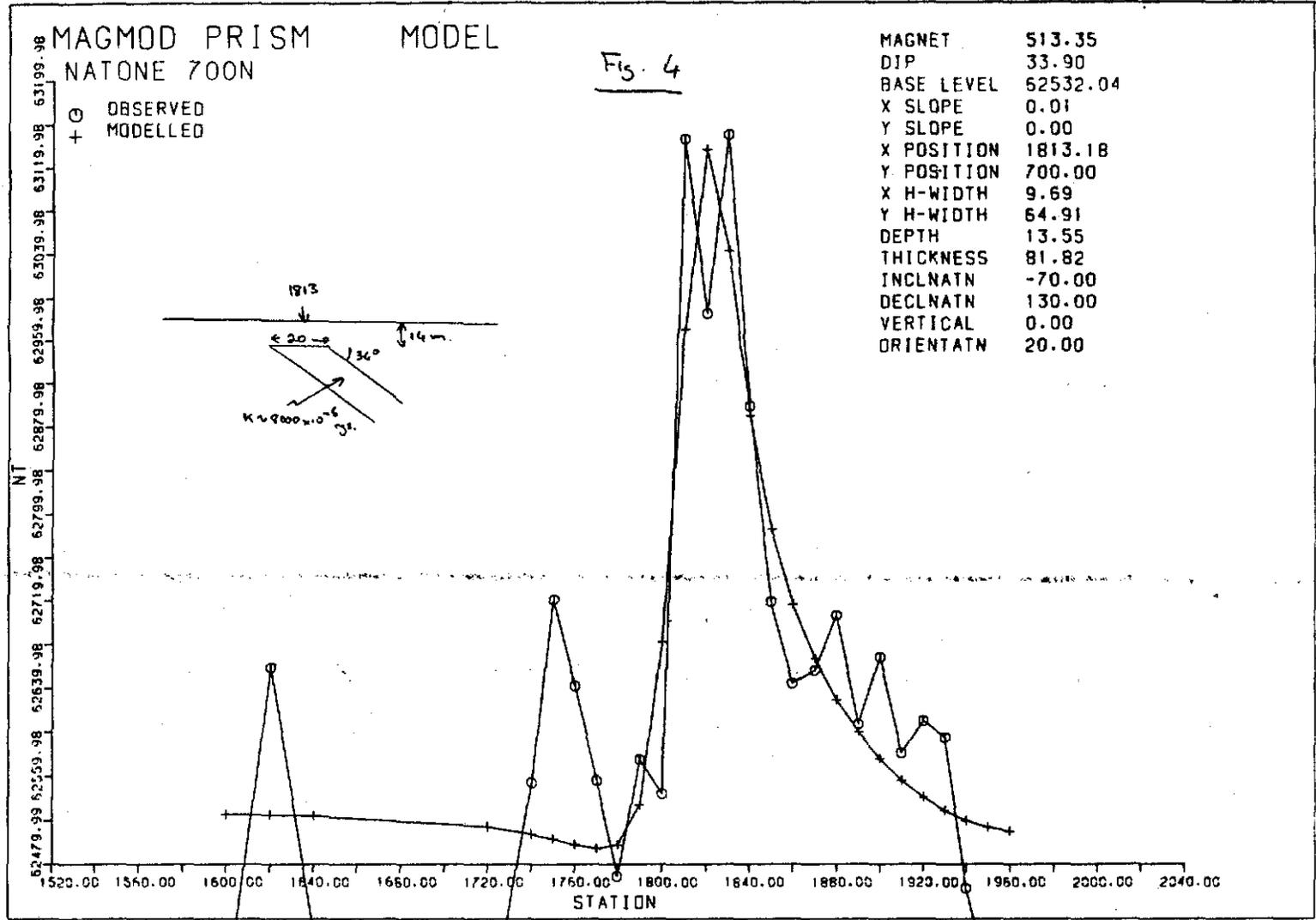


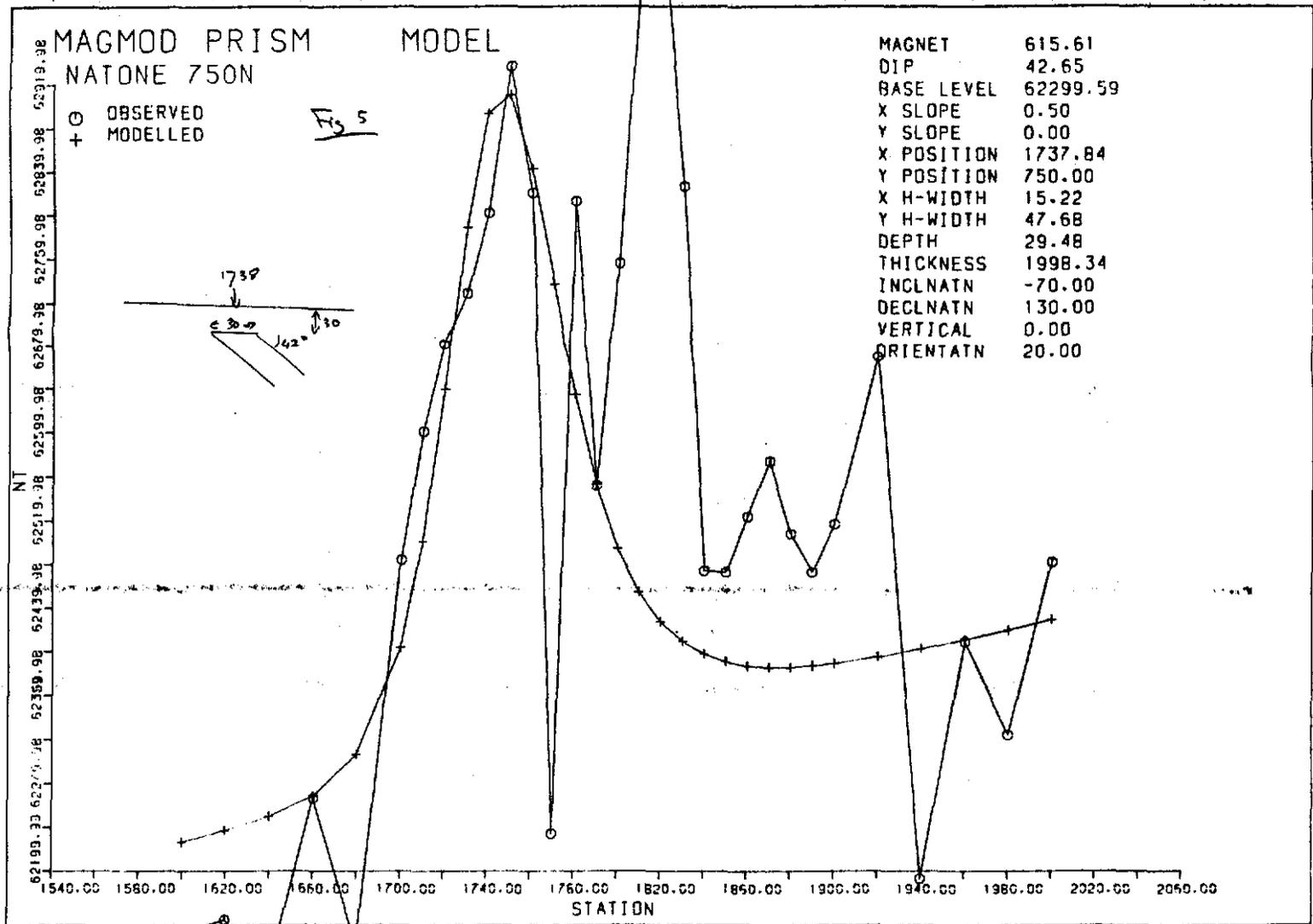


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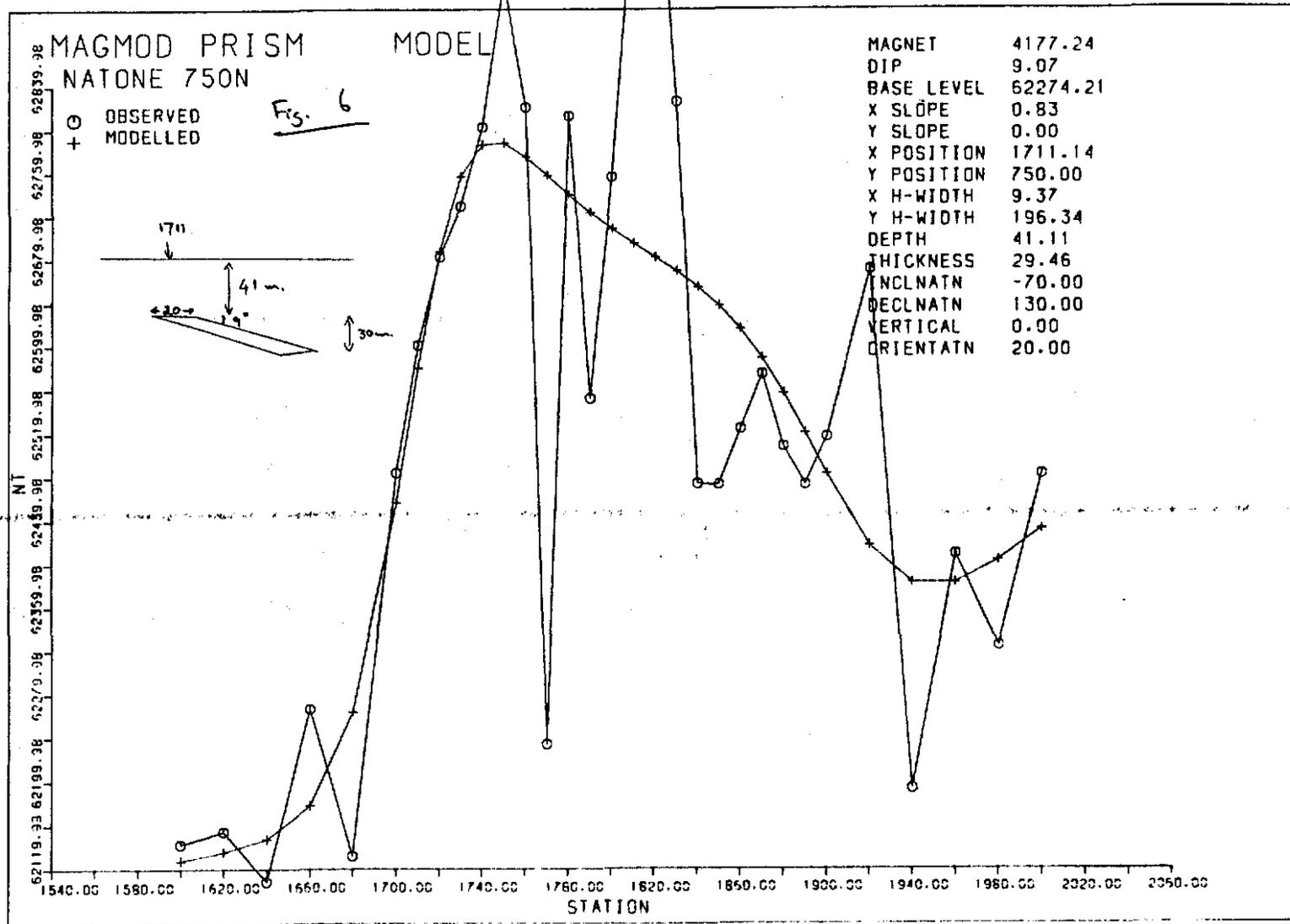
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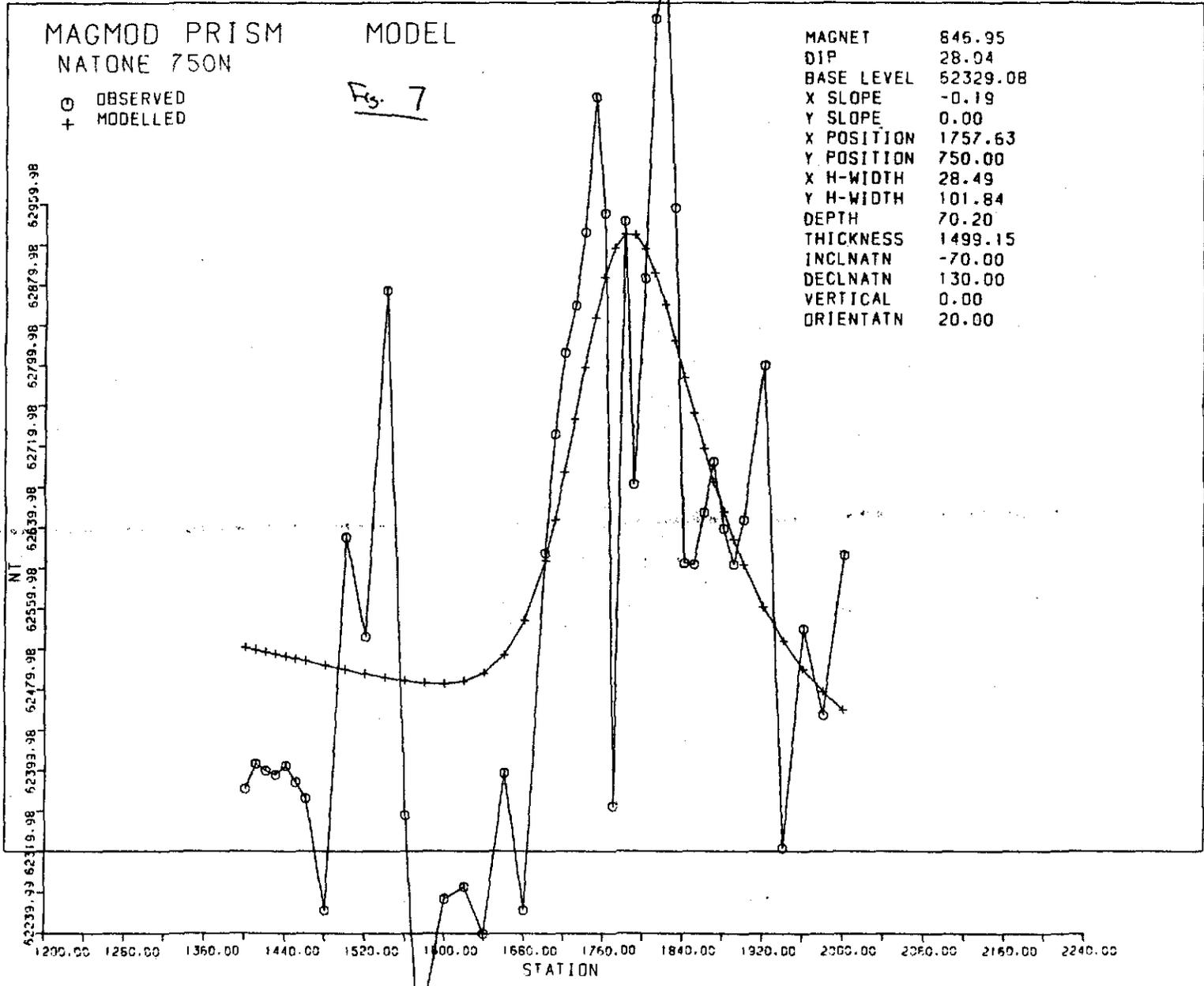


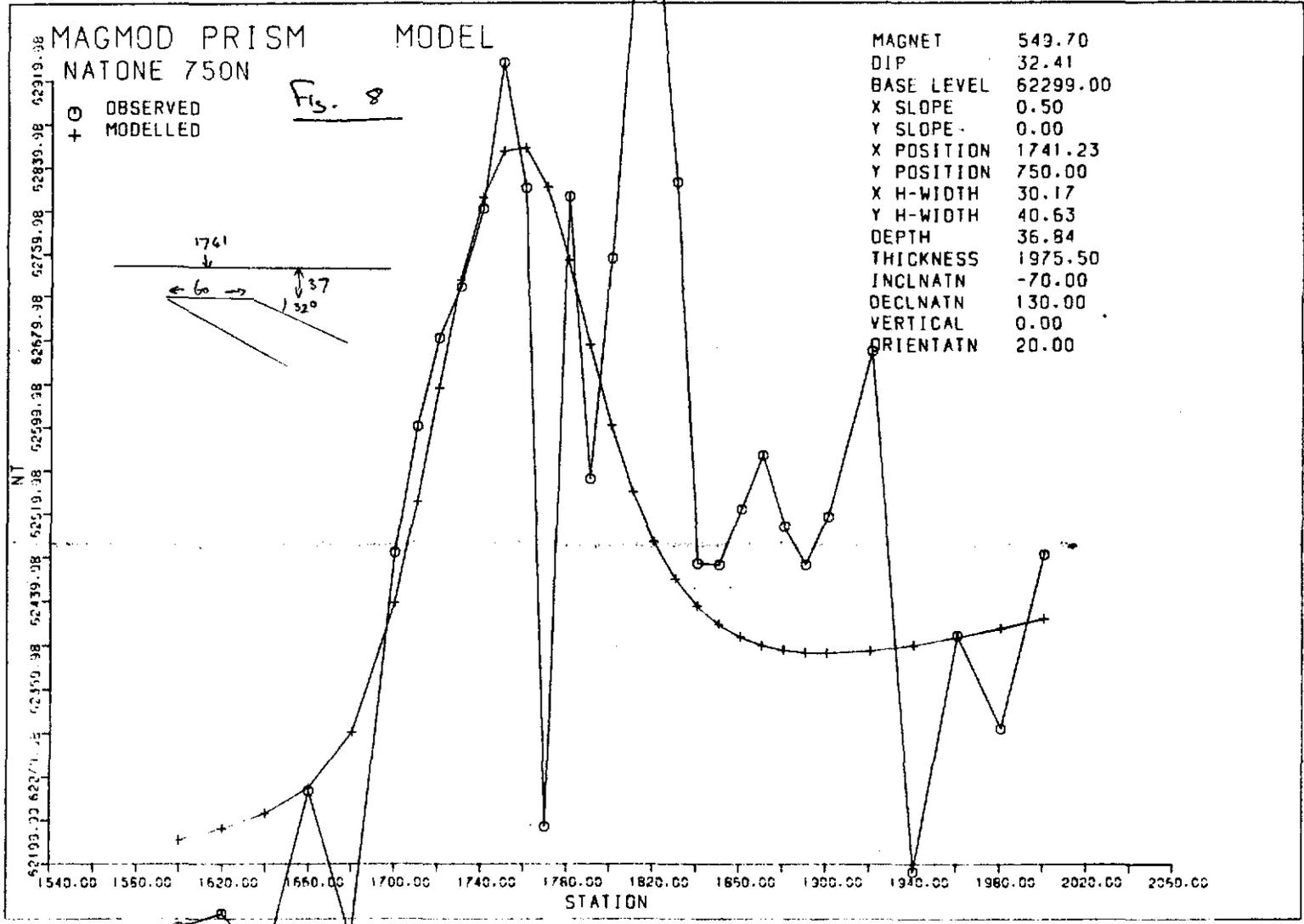


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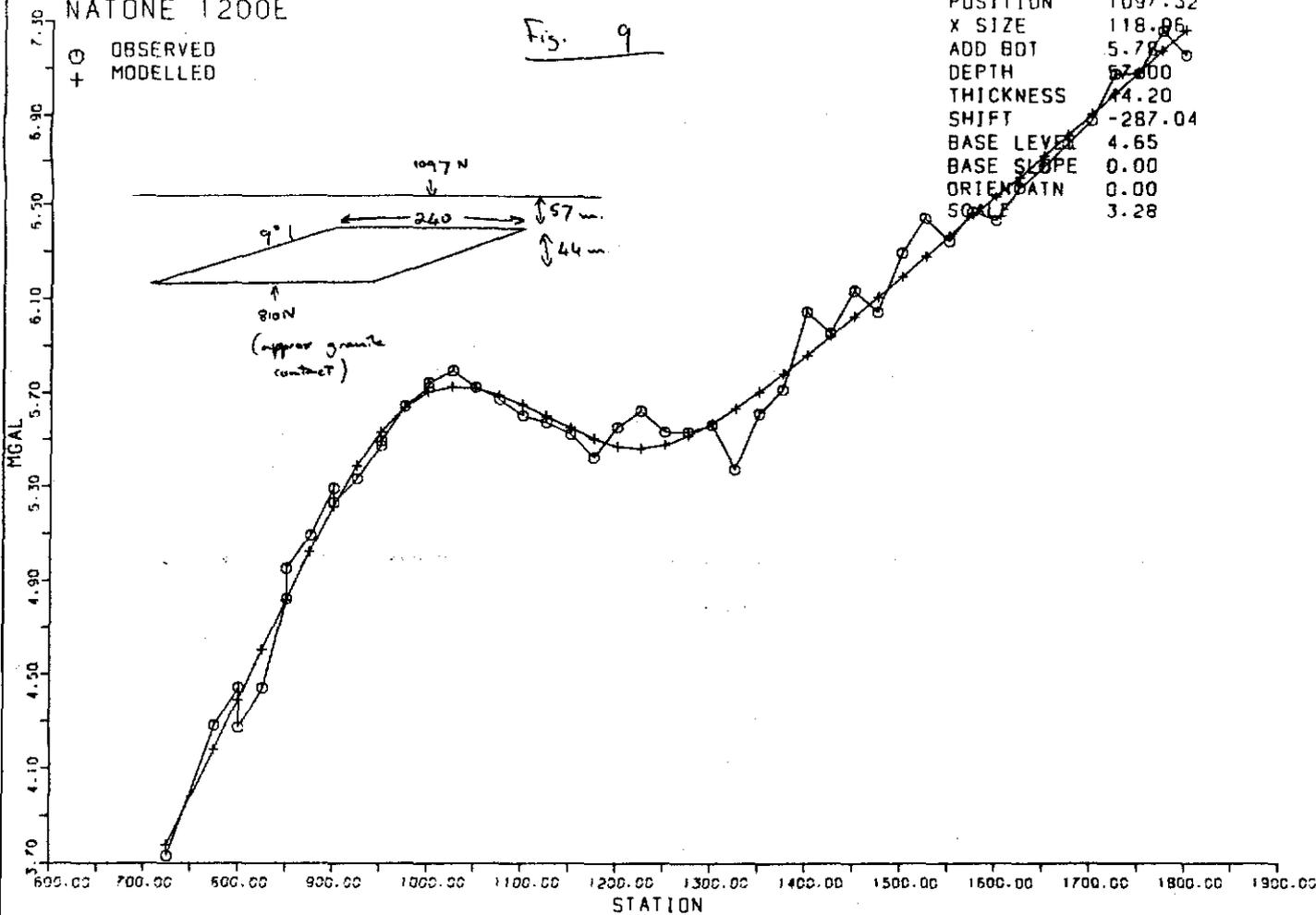
GRAMOD WEDGE MODEL

NATONE 1200E

Fig. 9

DENSITY	1.45
POSITION	1097.32
X SIZE	118.86
ADD BOT	5.78
DEPTH	57.00
THICKNESS	44.20
SHIFT	-287.04
BASE LEVEL	4.65
BASE SLOPE	0.00
ORIENTATN	0.00
SCALE	3.28

○ OBSERVED
+ MODELLED



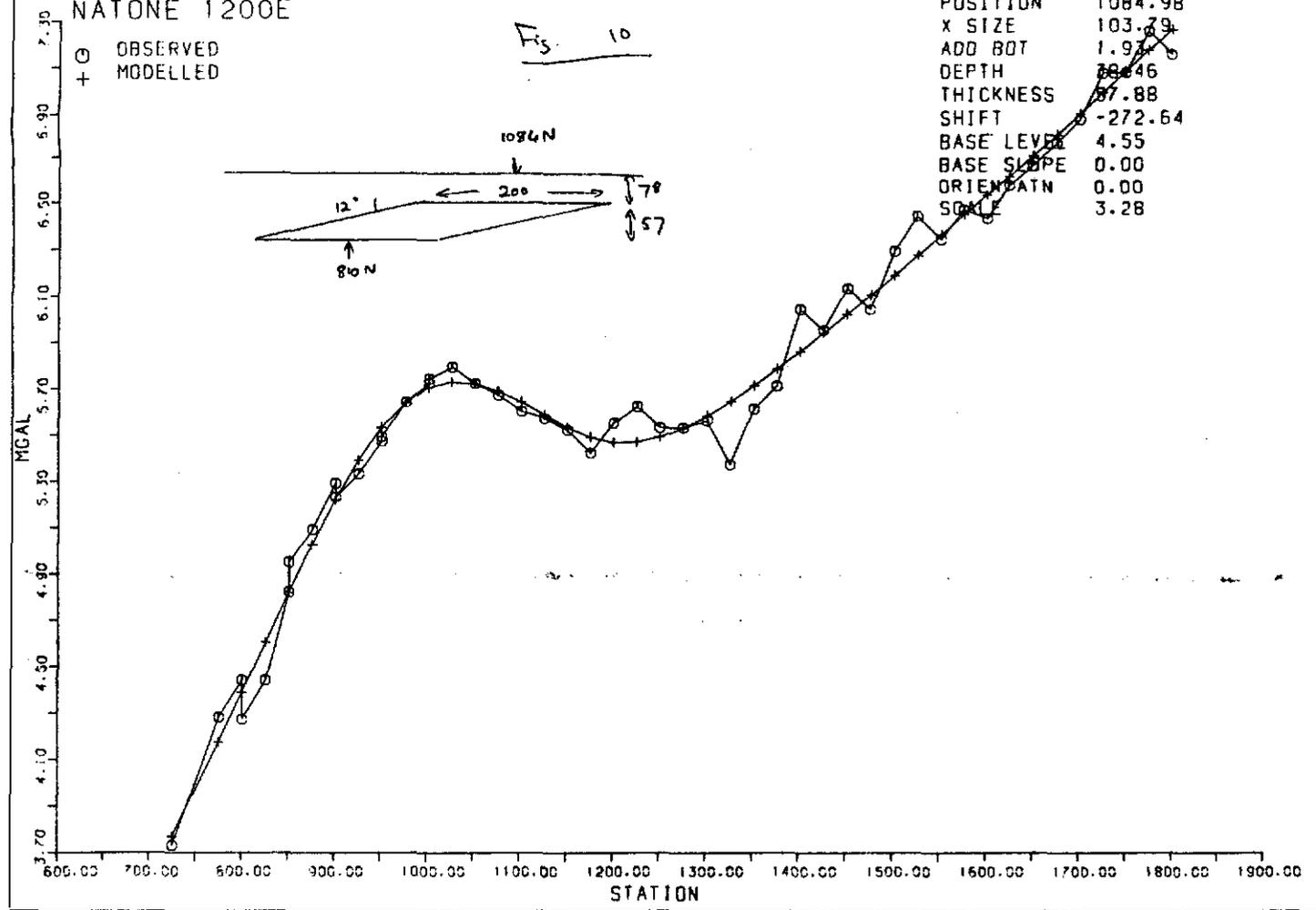
5 cm

GRAMOD WEDGE MODEL NATONE 1200E

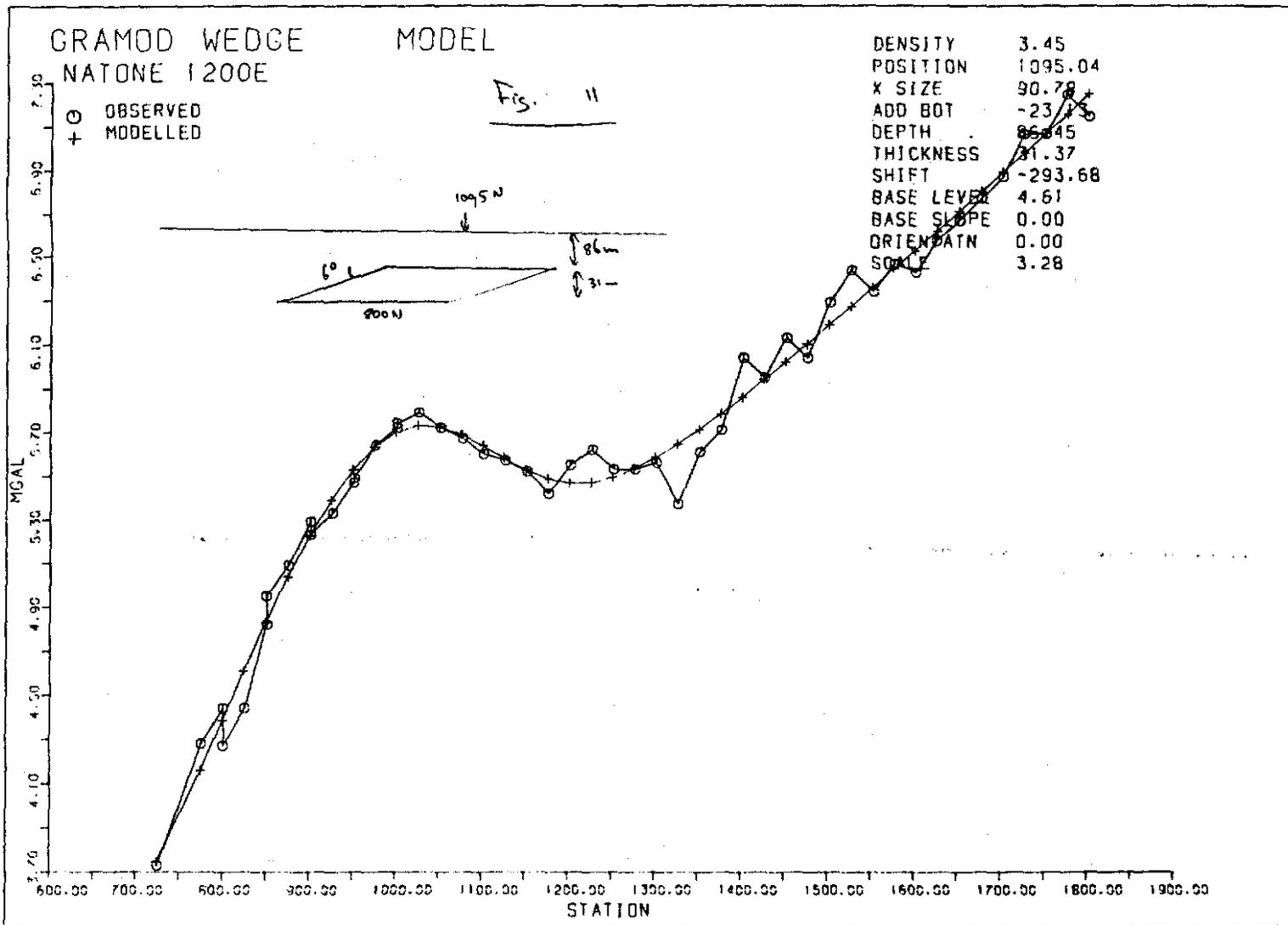
Fig. 10

DENSITY	1.49
POSITION	1084.98
X SIZE	103.79
ADD BOT	1.97
DEPTH	88.46
THICKNESS	87.88
SHIFT	-272.64
BASE LEVEL	4.55
BASE SLOPE	0.00
ORIENTATN	0.00
SCALE	3.28

○ OBSERVED
+ MODELLED

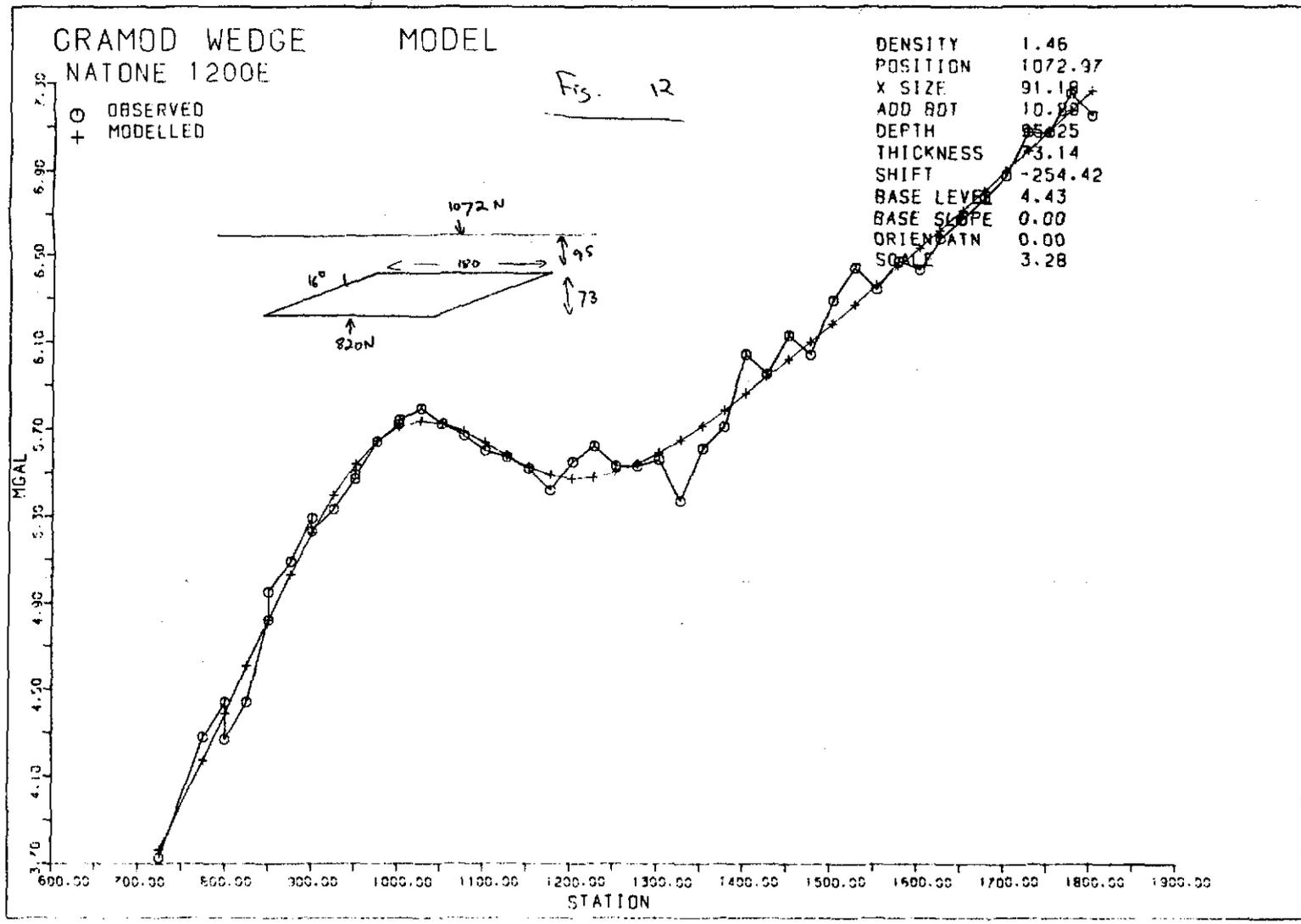


5 cm



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5 cm

APPENDIX 5

Natone - Downhole IP Logs of NT 1

by

P. Burnheim

2.3 Natone (NT-1)

The first attempt to log PDH NT-1 (21/4/82) was made whilst the drill rig was still on site, and steel casing in place downhole. Under these conditions, surveying of the hole was found to be impossible.

It was decided to use P.V.C. casing to facilitate access downhole, through a zone of unconsolidated, crumbly basalt at approximately 40 metres. The P.V.C. casing was cut with slots to allow electrical contact with the walls of the drillhole. Whilst installing this casing however, 42 metres of casing was lost downhole, and its exact position is unknown. Taking into consideration the condition of the drillhole, and the momentum of the casing as it was falling, it probably came to rest at the end of the drillhole. With this information in mind and knowing that the upper 18 metres of casing was unslotted, the data taken between 116 metres and 134 metres downhole may be unreliable. The current electrode (C_2) was laid at 200 metres to the south-west of the drillhole. The drillhole was then surveyed using the three standard electrode separations.

NT-1 proved to be a very difficult hole to survey, as the signals received by the IPR-7 were far outside the detectional capabilities and resolution levels of that instrument. The observed performance of the instrument does, however, permit me to make a qualitative estimate of ground conditions in this drillhole. The zone observed between (approximately) 106 metres and 45 metres downhole (this being coincident with large amounts of sulphides observed by project geologist, P. Ruxton), is characterised by extremely low resistivities (in the order of 10^{-1} ohm/metres in the three metre electrode separation to as low as 10^{-3} ohm/metres in the other electrode separations), and where it was possible to take data, very large charge-abilities. Water was observed at approximately 26 metres.

The processed data from drillhole NT-1 is presented in Figure 1.3.

082

5 cm

VALUES MARKED WITH ARROWS ARE ALL IN EXCESS OF 10⁴ OHM METRES (SEE RAW DATA FOR PRECISE VALUES)

SURVEY SPECIFICATIONS

PROJECT : RIANA
 STATE : TAS
 AREA : NATONE
 DRILL HOLE : NT-1 (PERCUSSION)
 SURVEYED : P. BURNHEIM/A. OUA
 DATE : 24-4-82
 TX : 1PC-7/25W
 Rx : 1PR-7
 C₂ : 200m SOUTH WEST
 SCALES;
 HORIZONTAL : 1:500
 VERTICAL : RESISTIVITY - 25mm LOG LIN
 : CHARGEABILITY - 25mf
 DATA PROCESSED BY : P. BURNHEIM
 PLOTTED BY :
 OFFICE : ORANGE

LEGEND

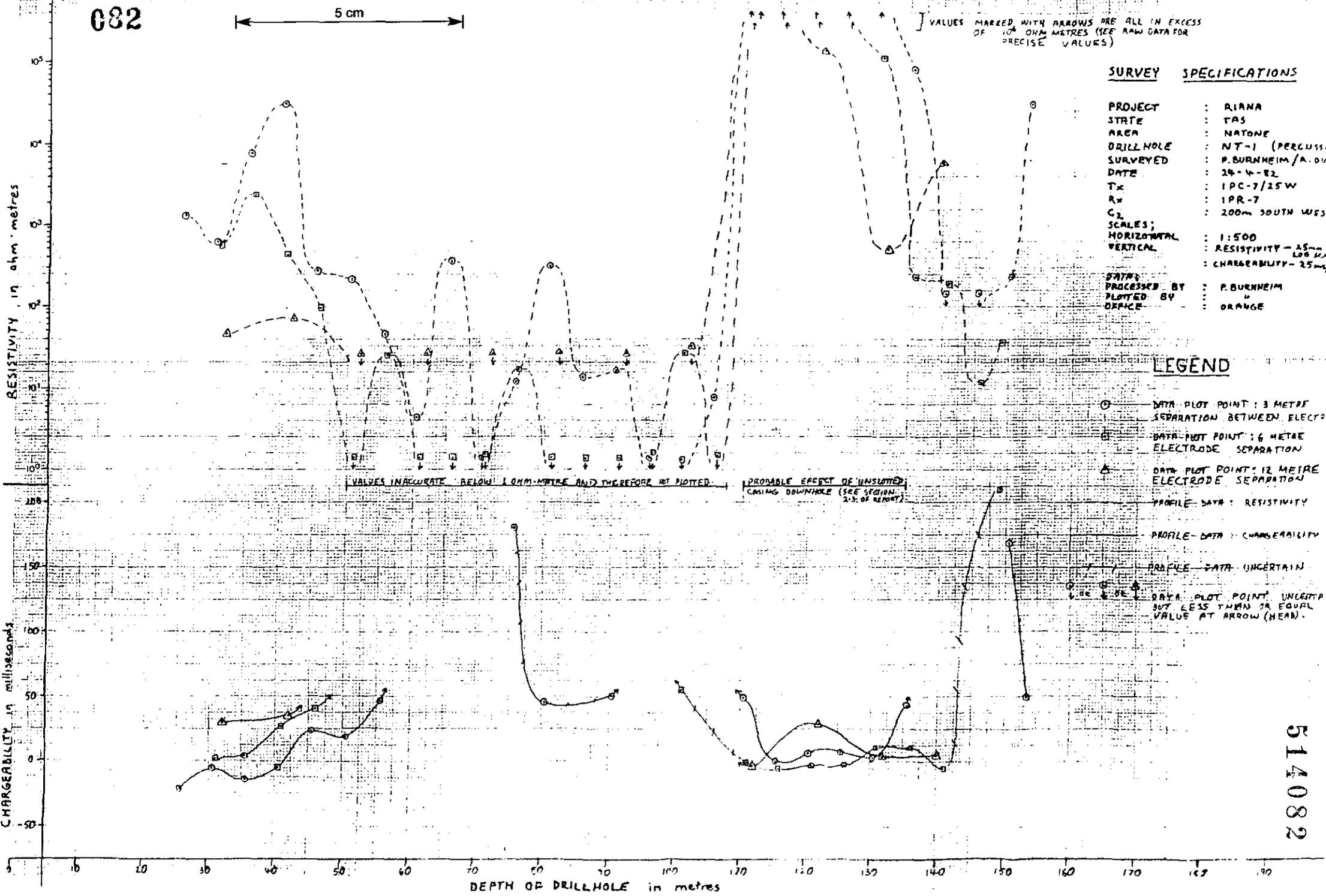
- DATA PLOT POINT: 3 METRE SEPARATION BETWEEN ELECTRODES
- DATA PLOT POINT: 6 METRE ELECTRODE SEPARATION
- △ DATA PLOT POINT: 12 METRE ELECTRODE SEPARATION
- PROFILE DATA: RESISTIVITY
- PROFILE DATA: CHARGEABILITY
- PROFILE DATA: UNCERTAIN
- ↓ DATA PLOT POINT UNCERTAINTY BUT LESS THAN 25% EQUAL VALUE AT ARROW (HEAD)

RESISTIVITY in ohm metres

CHARGEABILITY in milliseconds

VALUES INACCURATE BELOW 100m-METRE AND THEREFORE NOT PLOTTED

PROBABLE EFFECT OF UNSLOTTED CASING DOWNHOLE (SEE SECTION 2.5 OF REPORT)



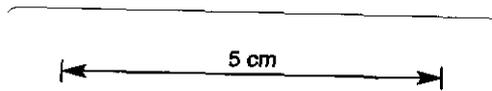
514082

083

APPENDIX 6

Natone NT 3 Drill Log

085



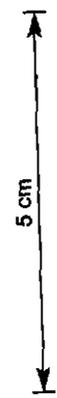
From	To	Inter'l (m)	Core Rec'd	% Rec'd	Sample NO	Grapt Log	Assays						Magnetic Susceplib				
							Ag	As	Sb	Ni	Co						
0	2	2			9145											300	
						Soil											
2	4	2			9146												350
						Soil											
4	6	2			9147												50
						S											
						S											
6	8	2			9148												15
						S											
						S											
8	10	2			9149												15
						S											
						S											
10	12	2			9150												15
						S											
						S											
12	14	2			9151												10
						S											
						S											
14	16	2			9152												5
						S											
						S											
16	18	2			9153												5
						S											
						S											
18	20	2			9154												10
						S											
						S											
20	22	2			9155												15
						S											
						S											
22	24	2			9156												5
						S											
						S											
24	26	2			9157												5
						S											

514085

086

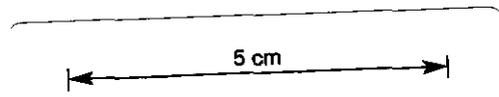
514080

From	To	Inter'l (m)	Core Rec'd	% Rec'd	Sample No	Graphic Log	Assays								Magnetic Susceptibility		% Estimates				Core Angles			T.S. P.S.	Description	
							Sn	W	Mo	Bi	Cu	Pb	Sn	Au			Po	Py	Sd	Mt	B	V	F			
0	2	2			9145	Soil									300											SOIL - deep red/brown, mottled clay - weathered basalt soil - haematite staining as pseudomorphs after ferromagnesian minerals
2	4	2			9146	Soil									350											SOIL - brown/khaki silt/mud grainsize unconsolidated soil - relic amygdalae.
4	6	2			9147	S									50											TERTIARY SEDIMENTS - white silt/sandstone plus free quartz - f.g. granitic origin plus white/brown soap stone/zeolitic clays
6	8	2			9148	S									15											TERTIARY SEDIMENT - White/brown soap/claystone with brown sediment, v. soft drilling.
8	10	2			9149	S									15											TERTIARY SEDIMENT - White/brown soap/claystone with qtz fragments plus black haematite specks - (altered basalt)
10	12	2			9150	S									15											TERTIARY SEDIMENT - Brown sludge - white/brown clay/soap stone plus altered basalt hole as black/red stained clays
12	14	2			9151	S									10											TERTIARY SEDIMENT - Brown haematite-rich claystone - qtz chips
14	16	2			9152	S									5											TERTIARY SEDIMENT - White/brown claystone chips, v. soft, chips 2-3cm across (large) Quartz chips more common.
16	18	2			9153	S									5											TERTIARY SEDIMENT - White/brown claystone 30% fine quartz sand - granite derived.
18	20	2			9154	S									10											TERTIARY SEDIMENT - White/brown clay/soapstone with haematitic and limonitic alteration plus quartz sand
20	22	2			9155	S									15											TERTIARY SEDIMENT - Claystone + Am/Lim staining - 2% fine quartz - often in aggregates
22	24	2			9156	S									5											TERTIARY SEDIMENT - Claystone, 30% quartz sand, kaolinized granite clasts (1)
24	26	2			9157	S									5											TERTIARY SEDIMENT - Claystone - large chips + 50-60% quartz sand



HOLE No :

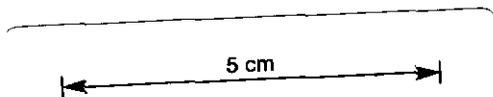
087



514087

From	To	Inter'l (m)	Core Rec'd	% Sect	Sample No	Graphic Log	Assays					Magnetic Susceptib			
							Ag	As	Sb	Ni	Co				
						S									
26	28	2			9158	S									5
						S									
28	30	2			9159	S									5
						S									
30	32	2			9160	S									10
						S									
32	34	2			9161	S									10
						S									
34.0	34.3	0.3	0.2	66	29162		<1	34	8	110	30				
34.3	35.8					gt									60
35.8	37.8				29163		1	42	4	80	38				200
						gt									150
37.8	39.2				29164		1	34	4	125	22				250
						gt									150
39.2	40.6				29165	gt	<1	32	10	150	22				45
40.6	41.8				29166		1	26	6	160	26				70
						gt									
41.8	43.8				29167		1	38	10	120	22				20
						gt									20
43.8	45.4				29168		1	50	6	140	22				65
						gt									150
45.4	47.3				29169	gt	1	70	10	100	24				85
						gt									300
47.3	48.6				29170		1	70	8	105	24				200
						- A									
						A -									
48.6	49.9				29171		1	42	8	130	22				150
						gt									
49.9	51.4				29172		1	30	10	105	24				150 (49.8)

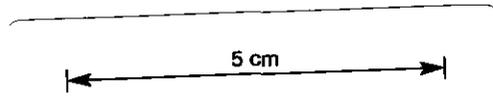
091



From	To	Inte'l (m)	Core Rec'd	% Sect	Sample NO	Grapt Log	Assays						Magnetic Susceptibilit					
							Ag	As	Sb	Ni	Co	Au						
						H												
						H												200
76.2	77.0				29194	M	<1	<2	8	12	18							
77.0	78.5				29195	M	<1	28	10	20	14							7500
						H												
78.5	79.8				29196	H	1	24	6	22	26							900
						M												0.5
79.8	80.5				29197	M	<1	7	<4	10	18							5500
						H												
80.5	81.7				29198	H	<1	9	<4	6	12							2000
						H												
81.7	83.5				29199	M	<1	55	6	16	20							650
						M												2000
83.5	84.0				29200		2	26	10	70	50	<0.05						
84.0	85.9				29201	H (M)	<1	185	10	20	24							4500
																		7500
						H (M)												
85.9	86.4				29202		<1	30	6	28	26	<0.05						4000
86.4	87.2				29203		1	380	6	32	28							
						M												850
87.2	89.1				29204	M	<1	135	8	12	20							950
						H (M)												
						H												900
89.1	90.1				29205	H	1	980	<4	48	30							2000
						(M)												
90.1	90.7				29206	H	1	980	<4	48	30							
90.7	91.2				29207		1	980	<4	48	30							1000 (90.9)
91.2	92.0				29208		1	930	8	80	50							
92.0	93.6				29209	H	1	200	65	120	34	<0.05						1500
						--												
						--												500
						--												
93.6	96.0				29210	H	<1	220	14	70	22	<0.05						2500
						H												95
						H												250
96.0	97.6				29211	H	<1	520	<4	40	22							200
						(M)												
						H												
97.6	99.1				29212	M	<1	270	<4	24	30							1500
						M												1500
99.1	101.1				29213	M	<1	140	4	18	24							60

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095



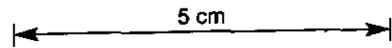
From	To	Inter'l (m)	Core Rec'd	% Fecht	Sample No	Grap's Log	Assays						Magnetic Susceptib		
							Ag	As	Sb	Ni	Co	Au			
125.1	128.0				29234	[Grid]	1	70	22	44	30	<0.05		0.5	(126.0)
						H								0.5	
						[Grid]								600	
128.0	128.9				29235	(M)	<1	65	8	42	28				
128.9	130.9				29236	H	<1	4	8	18	16			2000	
						H								2000	
						(M)								2000	
130.9	133.6				29237	H	<1	10	8	12	18			2000	
														2000	
														1000	
133.6	133.9				29238	[Grid]	1	6	10	26	20			0.5	
133.9	134.7				29239	[Grid]	3	100	12	60	55	<0.05		3000	(134.7)
						H									
134.7	135.3				29240	[Grid]	3	100	12	60	55	<0.05			
135.3	136.3				29241	[Grid]	3	100	12	60	55	<0.05		20000	
136.3	138.0				29242	[Grid]	1	40	10	12	20				
						G/W								2000	
						G/W								600	
138.0	140.2				29243	G/W	1	14	4	10	20			2500	
						G/W								300	
140.2	141.3				29244	G/W	1	290	8	14	18			400	
141.3	141.7				29245	[Grid]	1	290	8	14	18				
141.7	142.4				29246	[Grid]	1	250	8	70	22			60	
142.4	143.3				29247	[Grid]	1	40	10	70	14				
						gt								90	
143.3	146.5				29248	gt	1	28	12	100	14			70	
						gt								100	
						-A								150	
						gt								200	
146.5	148.7				29249	gt	1	28	12	100	14			250	
						-A								200	
						-A								250	
148.7	150.7				29250	D	1	22	6	95	16			200	
						A									
						-A								200	

514095

096

514096

From	To	Inter'l (m)	Core Rec'd	% Rec't	Sample No	Grp't Log	Assays								Magnetic Susceptibility				% Estimates				Core Angles			All.	T.S. P.S.	Description
							Sn	W	Mo	Bi	Cu	Pb	Zn	Au	S.G.	Po	Py	Sd	Mt	B	V	F						
125.1	128.0				29234	H	18	20	A	6	250	30	80	0.5				5%									125.1-128.0 Mt rich rock - minor altered dol. Ist. 85% Mt + Cc & Po minor Py veining + more extensive amph. veining.	
						H								0.5														
						H								600	Sg	127.8 m 3.8												
128.0	128.9				29235	H	4	<10	B	A	100	8	36					5%								128.0-141.7 Yellow/green host dol. limestone with irregular patches and intersections of Mt/Po/Cc alteration. Host dol. Ist. less 30% of section.		
128.9	130.9				29236	H	14	<10	<A	A	14	12	26	2000				5%								128.0-128.9 Yellow/green dol. Ist. with diss. Po - especially in top 30cm + Calc-silicate minerals.		
						H								2000												128.0 - CHANGED TO BQ core		
130.9	133.6				29237	H	10	<10	<A	A	30	22	30	2000				5%								128.9 - 133.6 Dom. Mt/Cc white/black rock replacing yellow/green dolomite. Minor Po, minor amph./Cc veining.		
														2000	Sg	131.4 m 3.2												
														1000														
133.6	133.9				29238	H	22	<10	<A	B	110	24	50	0.5				15%								133.6-133.9 Mt-rich replacement zone + Po		
133.9	134.7				29239	H	6	10	A	<A	550	20	42	3000				75%								133.9-134.7 Po-rich zone with Mt + Po + white Cc		
						H																						
134.7	135.3				29240	H	6	10	A	<A	550	20	42					10%								135.3-136.3 Po rich zone + Mt + Cc (white)		
135.3	136.3				29241	H	5	10	A	<A	550	20	42	20000	Sg	135.8 m		75%									136.3-140.2 Gray/white limestone recrystallized - minor Mt/Cc/Po irregular replacement	
136.3	138.0				29242	H	<A	<10	<A	<A	8	30	34	2000				<2%										
						G/W								2000														
						G/W								600														
138.0	140.2				29243	G/W	4	<10	<A	B	10	18	10	2500				<2%										
						G/W								300														
140.2	141.3				29244	G/W	10	<10	<A	12	40	16	24	Sg	140.6 m 2.8	10%											140.2-141.3 Dom. Mt/Cc/Po replacement	
						G/W								400														
141.3	141.7				29245	H	10	<10	<A	12	40	16	24					Tr								141.3-141.7 White/green fg. dolomite - minor Cc veins		
141.7	142.4				29246	H	10	10	B	4	150	10	14	60				7%								141.7-142.4 Black shale with andalusite crystals, not bedded. Po patches		
142.4	143.3				29247	H	<A	<10	10	<A	32	10	18					2%								142.4-143.3 Dolomitic black shale - Garnet (red fg.) + calc-silicate minerals + Py veins often bedded		
143.3	146.5				29248	gt	<A	<10	12	A	26	20	18	90				Tr								143.3-146.5 Banded (bedded) dolomite and black shale siltstone units. Dolomite layers contain some red garnet + Cc - Black shales occasionally contain andalusite		
						gt								70														
						gt								100														
						A								150														
146.5	148.7				29249	gt	<A	<10	12	A	26	20	18	200				Tr								146.5-148.7 As in 143.3-146.5 but more black and bearing shales		
						A								250														
						A								200				2%										
148.7	150.7				29250	D	4	10	10	A	42	18	14	200												148.7-176.5 Bedded black andalusite bearing shales and siltstones. Andalusite forms more prolifically in finer black shales. Po veins + fracture fills present - assoc. with white calcite		
						A								200														

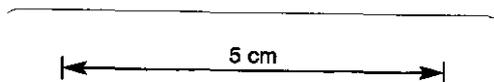


HOLE No. :

037

PROJECT : NATONE

SCALE : 1:100



From	To	Interval (m)	Core Rec'd	% Rec'd	Sample No	Graphic Log	Assays					Magnetic Susceptibility					
							Ag	As	Sb	Ni	Co						
150.7	152.7				29251	D											
						- A	1	40	6	105	16			150			
						A -								200			
						- A											
152.7	155.4				29252		2	32	10	90	16			350			(152.5)
						A -								700			
						- A								200			
						A -											
						- A											
155.4	158.5				29253		2	32	10	90	16						
						A -								200			
						- A											
						A -								150			
						- A											
						A -								200			
158.5	161.5				29254		2	32	10	90	16						
						A -								200			
						- A											
						A -								250			
						- A								300			
161.5	163.5				29255		1	24	<4	90	14						
						A -								200			
						- A											
						A -								400			
163.5	166.5				29256		1	48	12	130	16						
						A -								200			
						- A											
						A -								300			
						- A											
						A -								200			
166.5	169.6				29257		1	48	12	80	16						
						A -								350			
						- A											
						A -								300			
						- A											
						A -								95			
						- A											
169.6	171.0				29258		2	36	8	70	14			300			
						⊙											
						A -								250			
171.0	173.4				29259		1	38	6	70	14						
						⊙ A								250			
						A -											
						A ⊙								100			
173.4	176.5				29260		1	38	6	70	14						
						- A								200			
						A ⊙											
						- A								200			

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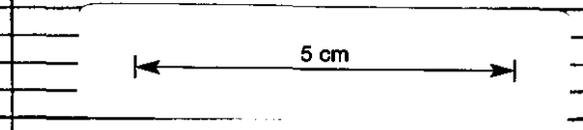
038

PROJECT: NATONE

SCALE: 1:100

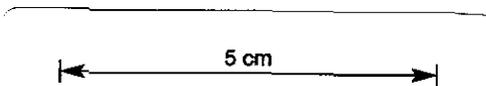
HOLE NO: NT 3

From	To	Interval (m)	Core Rec'd	% Rec'd	Sample NO	Graphic Log	Assays								Magnetic Susceptibility				% Estimates				Core Angles			All.	T.S. P.S.	Description
							Sn	N	Mo	Bi	Cu	Pb	Zn	Au	S.G.	Po	Py	Sd	Mt	B	V	F						
150.7	152.7				29251	D - A A - - A	8	<10	18	<4	40	14	12	150			2%			Tr								Bedding 0.5-5cm thickness. Bedding maybe disturbed. Rare amphibole + pyrite fracture fills. Core more broken than above. Minor dissem. Po in shales/siltstones.
152.7	155.4				29252	- A - A A - - A	<4	<10	10	<4	38	14	12	350	(152.5)	PEY	2%			Tr	40°	70°						
155.4	158.5				29253	- A - A A - - A A -	<4	<10	10	<4	38	14	12	200			2%			Tr	30°							
158.5	161.5				29254	- A - A - A - A A -	<4	<10	10	<4	38	14	12	200	Sq	158.6	m 2.9	2%			Tr	55°						
161.5	163.5				29255	- A - A - A A -	6	<10	14	<4	30	14	12	250				2%			Tr		45°					163.5-176.5 Core very broken - drilling extremely slow.
163.5	166.5				29256	- A - A - A A -	6	<10	24	<4	36	14	12	200				2%			Tr							
166.5	169.6				29257	- A - A - A A - - A	6	<10	24	<4	36	14	12	350				<2%			Tr							
169.6	171.0				29258	- A ⊙ A - A - A - A - A -	<4	<10	8	<4	36	14	10	300				5%			Tr	25°						169.6-173.4 Shales dolomitic - Po content increased - Po replacement along bedding.
171.0	173.4				29259	- A ⊙ A A - A - A -	4	<10	10	4	80	10	8	250														
173.4	176.5				29260	- A A - A -	4	<10	10	4	80	10	8	200								35°						173.4-176.5 Shales partly dolomitic highly fractured & disturbed - bedding rare - sheared minor amphibolitic - some dolomitic fracture fills + Py veins.



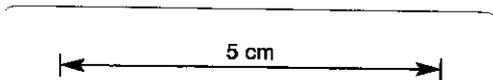
514098

HOLE NO :



From	To	Inter'l (m)	Core Rec'd	% Rec'd	Sample No	Grapt Log	Assays						Magnetic Suscept			
							Ag	As	Sb	Ni	Co	Au				
						A ⊕										
						- A										250
176.5	177.8				29261	A ⊕	1	9	12	32	16					
						H										90
						H ⊕										
177.8	179.7				29262	H ⊕	1	230	14	36	16					40
						qt ⊕										35
						⊕ qt										
179.7	181.8				29263	H	1	380	22	110	16	<0.05				200
						H										250
						H										
181.8	182.3				29264	A -	1	510	18	220	14	<0.05				200
182.3	182.7				29265	D A	1	7000	65	140	24	<0.05				
182.7	183.0				29266	A -	1	2100	24	90	18	<0.05				250
183.0	184.5				29267	qt ⊕	1	2100	24	90	18					
184.5	186.2				29268	⊕ qt	1	1000	10	170	14					200 (183)
						⊕										200
						A -										
						- A										200
186.2	187.6				29269	A -	3	600	8	80	14					250
						- A										
187.6	189.0				29270	A -	2	930	14	180	32					200
						- A										
						A -										250
189.0	190.7				29271	H ⊕	1	110	<4	80	32					250
						H										
190.7	191.0				29272	⊗	2	7300	10	130	500	<0.05				900
191.0	191.5				29273	H	2	28	8	50	60					
191.5	191.9				29274	⊗	2	28	8	50	60					2000
191.9	192.9				29275	H	1	50	8	50	30					(191)
192.9	193.5				29276	⊗	1	36	12	40	50					600
193.5	194.7				29277	⊗	1	36	12	40	50					1500
						⊕ H										
194.7	196.2				29278	H ⊕	1	14	<4	48	70					500
						⊕ H										
						⊕ H										90
196.2	197.2				29279	H	1	9	<4	26	26					300
197.2	198.6				29280	H	1	10	10	12	18					400
						⊕										
198.6	198.9				29281	⊗	3	70	<4	70	135					700
198.9	200.9				29282	H	2	30	8	38	60					4000

101



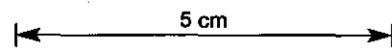
From	To	Inter'l (m)	Core Rec'd	% Rec'd	Sample No	Grapt Log	Assays						Magnetic Susceptibil				
							Ag	As	Sb	Ni	Co						
						H ⊕											
200.3	201.5				29283	⊗	2	30	8	38	50						1000
201.5	204.3				29284	⊕ H	1	14	4	24	30						8000
						H											5000
						⊕ H											450
						H											450
204.3	204.7				29285	⊗	2	60	10	38	55	<0.05					3000
204.7	206.0				29286	⊕ H	2	2050	12	42	50	0.10					1000
						H											3000
206.0	207.0				29287	⊗	2	2050	12	42	50	0.10					1500
207.0	208.1				29288	⊗	2	3950	16	44	95	<0.05					800
208.1	210.2				29289	M	1	16	<4	16	12						500 (208.9) f
						M											500
						M											90
210.2	212.1				29290	M	1	12	<4	12	12						90
						M											900
						M											150
212.1	214.3				29291	⊕ H	1	8	4	12	12						300
						⊕ H											600
						⊕ H	1	16	4	24	20						300
214.3	216.3				29292	⊕ H	1	16	4	24	20						300
						⊕ H											300
216.3	219.1				29293	⊕ H	2	30	90	10	14	<0.05					2500
						G/W											300
						G/W											400
219.1	219.7				29294	⊕ H	1	70	8	18	20						200
219.7	222.1				29295	⊕ H	1	70	8	18	20						15
						G/W											50
						G/W											50
222.1	222.8				29296	M	1	6	6	20	20						100
222.8	225.0				29297	G/W	1	18	4	14	14						300
						G/W											100

514101

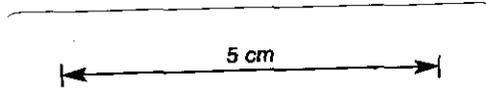
102

514102

From	To	Inter'l (m)	Core Rec'd	%	Sample No	Graph Log	Assays							Magnetic Susceptibility				% Estimates				Core Angles			All.	T.S. P.S.	Description		
							Sn	W	Mo	Bi	Cu	Pb	Zn	As			S.G.	Po	Py	Sd	Mt	B	V	F					
200.9	201.5				29283	H ⊕	4	20	10	6	600	26	37	1000			55%		35%									200.9-201.5 Po-Mt-rich zone minor Cc/amphibole	
201.5	204.3				29284	⊕ H	6	<10	4	<4	400	18	20	8000	Sg	201.6 m 3.8	5%		5%									201.5-204.3 Yellow/green metasomatized dol 1st with Po/Mt alteration. Minor amph/Cc veining	
						H								5000															
						H								450															
204.3	204.7				29285	⊕ H	10	<10	10	32	570	22	40				30%		30%									204.3-204.7 Mt/Po-rich zone replacing yellow/green dol 1st	
204.7	206.0				29286	⊕ H	<4	<10	10	210	620	20	30	3000			10%		2%		30°	30°						204.7-206.0 Yellow/green dol 1st with patchy Po + common amphibole veining and alteration. Core broken.	
						H								1000															
206.0	207.0				29287	⊕ H	<4	<10	10	210	620	20	30	3000			30%		40%									206.0-207.0 Mt/Po-rich zone with minor relic yellow-green dol 1st - Amphibole alteration and veining.	
207.0	208.1				29288	⊕ H	<4	<10	14	14	660	26	38	1500	Sg	207.1m 3.6	35%		50%										
						⊕ H								1500															
208.1	210.2				29289	M	6	<10	4	<4	22	20	36	800			2%		40%		15°							208.1-210.2 Finely banded white Cc + f.g. magnetite banding 1cm to 0.1cm. Banding appears uniform but on a fine scale, often irregular - May be disturbed by later Cc/Po/amph. Banding thought to be of metasomatic origin.	
						M								500							20°								
210.2	212.1				29290	M	<4	<10	<4	12	22	20	34	90							10°							210.2-212.1 Banding dislocated by Mt filled fractures	
						M								900							30°								
212.1	214.3				29291	M	<4	10	<4	<4	8	20	22	150			8%		40%									212.1-214.3 Metasomatically altered dolomitic 1st. Often well banded as 208.1-212.1 more amphibole veining & replacement - banding more irregular.	
						⊕ H								300														214.3-216.3 Some euhedral Mt/Cc + Po // appears Po less common in banded Mt/Cc areas.	
214.3	216.3				29292	⊕ H	<4	<10	<4	6	100	18	28	600							30°								
						⊕ H								300	Sg	215.8 m 2.7													
216.3	219.1				29293	G/W	10	<10	<4	4	34	24	22	2500			<2%		10%		45°							216.3-219.1 Grey/white equigranular dolomitic 1st (coarser grained than Y/G dol 1st) dissem. Mt/Po often assoc with slightly coarser grained crystalline calcite. Zones of Mt-rich rock uncommon. Faint banding common. Fluorescent fluorite present.	
						G/W								300															
						G/W								400															
219.1	219.7				29294	⊕ H	16	<10	<4	10	60	26	26				10%		65%									219.1-219.7 Mt-rich minor Po + white Cc	
219.7	222.1				29295	G/W	16	<10	<4	10	60	26	26	200															
						G/W								15							35°								
						G/W								50															
222.1	222.8				29296	M	<4	<10	<4	4	48	24	48				10%		30%									222.1-222.8 Zone of Mt/Cc - euhedral Mt + Po in white Cc matrix	
222.8	225.0				29297	G/W	4	<10	<4	<4	28	24	16	100														Amphibole veining	
						G/W								300															
						G/W								100															



HOLE NO :



From	To	Inter'l (m)	Core Rec'd	% Feact	Sample NO	Grav'c Log	Assays						Magnetic Susceptibility		
							Ag	As	Sb	Ni	Co				
225.0	227.1				29298	G/W	2	75	16	20	18			4000	
						G/W								300	
227.1	228.0				29299	G/W	2	90	16	14	16			150	
228.0	230.5				29300	G/W	1	620	6	12	14			70	
						G/W								90	
230.5	232.3				29301	G/W	1	620	6	12	14			100	
						G/W								5	
232.3	233.2				29302	G/W	1	2650	<4	16	16			10	
233.2	234.5				29303	G/W	1	80	<4	10	12			600	
234.5	235.7				29304	H	1	16	<4	10	12			800	
						(M)									
235.7	237.7				29305	(M)	1	18	4	8	8			30	
						H								5	
						(M)									
237.7	240.1				29306	H	1	18	4	6	10			100	
						(G/W)								70	
						H								10	
240.1	242.3				29307	G/W	1	14	<4	14	12			90	
						G/W								50	
242.3	245.8				29308	H	1	10	4	14	12			50	
						H								100	
						(M)									
						H								300	
						(M)									
245.8	247.8				29309	H	1	10	4	14	12			60	
						(M)								300	
247.8	249.5				29310	M	1	10	4	14	12			300	
						M								300	
						M								300	
249.5	251.9				29311	G/W	1	<2	<4	8	12			400	(249.0)

APPENDIX 7

Natone

Full Element Scans & Specific Gravity Measurements on NT 1 & NT 3
(Comlabs S.A.)



ANALYTICAL REPORT

JOB COM830666

O/N : 4172/MQ04/PAR/84

Results in ppm

	SAMPLE	S.G.
NT3 S.G. (1)	51.6m	2.7
NT3 S.G. (2)	56.2m	3.0
NT3 S.G. (3)	63.0m	3.2
NT3 S.G. (4)	74.4m	2.8
NT3 S.G. (5)	83.8m	4.3
NT3 S.G. (6)	106.5m	3.9
NT3 S.G. (7)	110.0m	4.2
NT3 S.G. (8)	127.8m	3.8
NT3 S.G. (9)	131.4m	3.2
NT3 S.G. (10)	135.8m	4.4
NT3 S.G. (11)	140.6m	2.8
NT3 S.G. (12)	158.6m	2.9
NT3 S.G. (13)	183.7m	2.6
NT3 S.G. (14)	193.3m	3.8
NT3 S.G. (15)	201.6m	3.8
NT3 S.G. (16)	207.1m	3.6
NT3 S.G. (17)	215.8m	2.7
NT3 S.G. (18)	226.0m	2.8
NT3 S.G. (19)	250.2m	2.9

Method of Analysis : S.G. : GRAV


ANALYTICAL REPORT

JOB COM830666

O/N : 4172/MQ04/PAR/84

Results in ppm

SAMPLE	Nd	Ce	La	Ba	Ca	Te	Sb
NT1 5330	20	<20	<20	65	<20	<10	210
NT1 5335	<20	<20	<20	35	<20	<10	105
NT1 5346	<20	<20	<20	30	<20	<10	95
NT1 5355	<20	<20	<20	25	20	<10	46
NT1 5361	<20	<20	<20	80	<20	<10	145
NT1 5367	<20	<20	<20	20	<20	<10	60
NT3 29167	50	70	40	410	40	<10	14
NT3 29200	<20	<20	<20	<10	<20	<10	4
NT3 29210	<20	50	30	60	<20	<10	16
NT3 29218	<20	<20	<20	<10	<20	<10	20
NT3 29222	<20	<20	<20	<10	<20	<10	12
NT3 29234	<20	<20	<20	<10	<20	<10	22
NT3 29243	<20	<20	<20	<10	<20	<10	<4
NT3 29248/49	60	80	40	310	30	<10	10
NT3 29273/74	<20	<20	<20	100	<20	<10	<4
NT3 29288	20	<20	<20	35	20	<10	<4
NT3 29292	30	30	<20	130	<20	<10	6
NT3 29293	20	30	<20	10	<20	<10	90

Method of Analysis : Nd Ce La Ba Cs Te Sb : XRF1



ANALYTICAL REPORT

JOB COM830666

O/N : 4172/MQ04/PAR/84

Results in ppm

SAMPLE	In	Sn	As	Nb	Zr	Sr
NT1 5330	<4	50	120	4	12	185
NT1 5335	4	14	100	4	12	190
NT1 5346	6	8	440	6	14	85
NT1 5355	<4	<4	220	5	8	145
NT1 5361	<4	18	195	4	6	185
NT1 5367	4	28	135	4	4	160
NT3 29167	<4	<4	38	12	165	60
NT3 29200	4	4	28	5	<4	20
NT3 29210	<4	4	240	2	10	34
NT3 29218	4	<4	115	3	<4	9
NT3 29222	10	24	<2	3	<4	10
NT3 29234	8	24	70	4	<4	14
NT3 29243	<4	4	16	3	<4	170
NT3 29248/49	<4	<4	38	14	190	46
NT3 29273/74	6	<4	28	6	8	10
NT3 29288	4	6	4200	3	10	<2
NT3 29292	<4	<4	12	5	14	110
NT3 29293	<4	8	22	12	28	220

Method of Analysis : In Sn As Nb Zr Sr : XRF1



ANALYTICAL REPORT

JOB COM830666

O/N : 4172/MQ04/PAR/84

Results in ppm

SAMPLE	Th	Y	Rb	Tl	Ge	U	Ga
NT1 5330	<4	3	<2	<10	<4	<4	<4
NT1 5335	<4	2	<2	<10	<4	<4	4
NT1 5346	<4	2	3	<10	<4	<4	<4
NT1 5355	<4	<2	<2	<10	<4	<4	<4
NT1 5361	6	<2	<2	<10	<4	<4	<4
NT1 5367	8	<2	<2	<10	<4	<4	<4
NT3 29167	16	28	210	10	<4	<4	20
NT3 29200	<4	4	5	<10	<4	<4	<4
NT3 29210	<4	3	2	<10	<4	<4	<4
NT3 29218	10	3	<2	10	<4	<4	<4
NT3 29222	<4	<2	5	<10	6	<4	<4
NT3 29234	<4	2	12	<10	<4	<4	<4
NT3 29243	<4	<2	<2	<10	<4	<4	<4
NT3 29248/49	16	28	195	<10	<4	<4	22
NT3 29273/74	16	5	24	<10	<4	8	<4
NT3 29288	<4	<2	14	<10	8	<4	<4
NT3 29292	<4	5	24	<10	<4	<4	<4
NT3 29293	<4	3	<2	<10	<4	<4	<4

Method of Analysis : Th Y Rb Tl Ge U Ga : XRF1



ANALYTICAL REPORT

JOB COM830666

O/N : 4172/MQ04/PAR/84

Results in ppm

SAMPLE	Hf	W	Ta	Se
NT1 5330	<10	<10	<10	<4
NT1 5335	<10	<10	<10	<4
NT1 5346	<10	<10	<10	4
NT1 5355	<10	<10	<10	<4
NT1 5361	<10	<10	<10	<4
NT1 5367	<10	<10	10	<4
NT3 29167	10	<10	<10	<4
NT3 29200	<10	20	15	<4
NT3 29210	<10	10	<10	<4
NT3 29218	<10	15	10	4
NT3 29222	<10	<10	<10	4
NT3 29234	15	<10	<10	<4
NT3 29243	<10	<10	<10	<4
NT3 29248/49	<10	<10	<10	<4
NT3 29273/74	<10	<10	<10	<4
NT3 29288	<10	10	<10	4
NT3 29292	<10	<10	<10	<4
NT3 29293	<10	10	<10	<4

Method of Analysis : Hf W Ta Se : XRF1



ANALYTICAL REPORT

JOB COM830666

O/N : 6172/MQA/PAR/84

Results in ppm

SAMPLE	Cu	Pb	Zn	Ni	Co	Cd
NT1 5330	80	220	75	170	60	<1
NT1 5335	60	110	70	140	60	<1
NT1 5346	130	95	60	240	70	<1
NT1 5355	80	50	36	120	42	<1
NT1 5361	110	150	32	115	50	<1
NT1 5367	150	60	30	90	44	<1
NT3 29167	30	14	22	120	18	<1
NT3 29200	30	36	80	60	38	<1
NT3 29210	260	22	24	70	20	<1
NT3 29218	550	6	26	90	80	<1
NT3 29222	22	26	70	24	26	<1
NT3 29234	280	24	70	20	18	<1
NT3 29243	14	10	12	12	12	<1
NT3 29248/49	28	12	20	105	12	<1
NT3 29273/74	600	8	28	50	50	<1
NT3 29288	670	8	32	34	80	<1
NT3 29292	110	6	28	20	18	<1
NT3 29293	34	12	22	4	<4	<1

Method of Analysis : Cu Pb Zn Ni Co Cd : AAS1



ANALYTICAL REPORT

JOB COM830666

O/N : 4172/MQ04/PAR/84

Results in ppm

SAMPLE	Bi	%Fe	Mn	Cr	Ag	Mo	V
NT1 5330	<4	12.0	7100	8	3	8	40
NT1 5335	<4	6.90	5700	10	2	10	50
NT1 5346	<4	13.0	2100	22	2	8	30
NT1 5355	<4	5.30	3300	8	1	10	20
NT1 5361	<4	6.80	4000	6	2	10	30
NT1 5367	<4	4.80	3300	6	2	8	30
NT3 29167	<4	3.40	1050	36	1	14	40
NT3 29200	26	25.0	2200	8	2	4	<10
NT3 29210	24	7.00	1400	14	1	<4	10
NT3 29218	10	25.0	3600	12	1	<4	<10
NT3 29222	<4	39.0	1.30%	14	2	<4	20
NT3 29234	<4	34.0	2.25%	8	2	4	20
NT3 29243	<4	1.60	2500	<4	1	8	30
NT3 29248/49	<4	3.10	1100	16	1	14	40
NT3 29273/74	<4	18.0	420	8	1	10	20
NT3 29288	<4	21.0	1500	6	2	12	20
NT3 29292	<4	3.90	1800	<4	<1	6	30
NT3 29293	<4	1.70	2100	<4	2	8	40

Method of Analysis : Bi : AAS1
 Fe Mn Cr : AAS2/2A
 Ag Mo V : AAS3

APPENDIX 8

Petrological Report NT 3 Drillhole - Natone

PETROLOGICAL SAMPLES NATONE - DDH N7 3

1. 49.8m - Partially silicified dolomitic limestone.
Garnet bearing vein with calcite/pyrite + calc-silicate minerals - fluorite - in dolomitic host.
Describe vein mineralogy + host rock description.
2. 56.1m - Metasomatic Minerals - in Po/Mt/Cc/Mica zone.
Euhedral crystalline zone - green mica - calcite + euhedral green mineral (amphibole) + Py/Po.
3. 90.9m - Po rich zone.
Po-rich zone (margin). Po/Mt/Cc + calc-silicate minerals - comment on the texture + identify minerals. (Po essentially euhedral - magnetite with inclusions of calcite(?)).
4. 121.9m - Metasomatic banding.
Metasomatically banded rock in host of yellow/green dolomitic limestone - Mineral zonation. Magnetite at margins + calcite + euhedral magnetite minerals - calc-silicate minerals in the centre.
5. 126.0m - Magnetite skarn.
Magnetite rich rock - fine grained equigranular Mt + Cc (+fluorite(?)) + disseminated Po.
6. 134.7m - Pyrrhotite skarn.
Po - Mt + original dolomitic limestone (yellow/green)
Marginal for textures.
7. 152.5m - Andalusite-bearing hornfels.
Bedded hornfels - bedding? andalusite?
8. 183.7m - Garnet-bearing dolomitic limestone.
Pink garnets? + pyrrhotite + calcite. Nature of red colouration.
9. 191.8m - Metasomatized dolomitic limestone (yellow/green).
Dolomite + calcite + pyrrhotite + fluorite? blue/turquoise + magnetic + calc-silicate minerals.
10. 207.9m - Magnetite - Pyrrhotite skarn.
Banded Po + magnetite in a dolomite/limestone host.
11. 208.9m - Finely banded (bedded?) metasomatized limestone.
Magnetite/calcite layering - green calc-silicate minerals + fluorite? trace Po. Origin of banding?
12. 225.8m - Grey/white dolomitic recrystallized limestone.
Crystalline calcite/dolomite(?)/fluorite + magnetite.
13. 249.0m - Magnetite/Cc metasomatic rock.
Magnetite/Cc irregular banding + pink/purple mineral - fluorite + pyrrhotite.

Please take the necessary measures to distinguish between calcite and dolomite.

Thank you.

Mt = Magnetite, Po = Pyrrhotite,
Cc = Calcite, Dol = Dolomite, Py = Pyrite

P.A. Ruxton

REPORT CMS 83/4/5Petrology of DDH NT3 Intersections

Thirteen drill core intersections were received for petrological description; thin-sections were prepared, and stain tests for carbonate and K-feldspar were carried out where appropriate, using the offcuts. Polished sections were also prepared, of all except two samples.

Summary

The rocks can all broadly be classified as metasediments; they comprised a series of argillic, quartzose and dolomitic/calclitic rocks which were contact-metamorphosed and metasomatised. There is little doubt that a late metasomatic phase operated which, in general terms, had a retrograde effect on the rocks. This phase is seen in the serpentinisation of the Ca-Mg silicates, and in the introduction of sulphides (principally pyrrhotite).

The contact-metamorphic event is not always recognisable, having been overprinted or obscured by subsequent metasomatism; also, it is not always possible to make a clear distinction between the two events, especially in reactive rocks whose precise original composition is not known.

Some of the minerals present in the calc-silicate rocks and skarns are unusual, but not unknown in some of the West Coast granite contact situations; they include members of the chondrodite-humite-clinohumite group of Mg-Fe silicates (with F, OH) which are prone to serpentinisation and are not always precisely identifiable under those conditions. The diopside seems to be an unusual variety too, and required confirmatory XRD. The mineral assemblages reflect the original compositions of the sediments, suggesting magnesite/ankerite-dolomite rocks.

Serpentinisation of such rocks produces "pseudoserpentinites" which can closely resemble true, igneous serpentinites and require critical examination; verification by assay checks for Cr are sometimes necessary.

Mg-silicate skarns similar to these may carry appreciable amounts of Sn in silicate form; on serpentinisation this Sn is released as a type of "hydrocassiterite" which is often difficult or impossible to detect optically. Again, assay verification is needed.

The dominant sulphide present is pyrrhotite, and its textural relationships suggest late-stage introduction. Other sulphides, generally in trace amounts, include chalcopyrite, galena, sphalerite, arsenopyrite and loellingite.

H.W. Fander, M. Sc.

Brief Descriptions of Sulphides in NT3

All except two intersections (121.9 m, 208.9 m) contained significant amounts of sulphides, and were thus examined in polished section, mainly to check for the occurrence of such minerals as stannite and the tetrahedrite group.

- 49.8 m The major sulphide is pyrrhotite, as lobate masses, with subordinate pyrite; traces of fine chalcopyrite and galena occur in association with pyrrhotite.
- 56.1 m Coarse masses of fresh pyrrhotite, with inclusions and rims of chalcopyrite and traces of sphalerite.
- 90.9 m Small and large, irregular pyrrhotite patches; some have rims of spongy magnetite with intergrown fine chalcopyrite.
- 126.0 m Pyrrhotite is virtually the only sulphide, as small rounded granular crystals; isolated arsenopyrite crystals occur.
- 134.7 m Masses of granular fresh pyrrhotite, with inclusions of small magnetite crystals. Isolated arsenopyrite crystals.
- 152.5 m Ragged pyrrhotite and occasional chalcopyrite grains, with a few coarser pyrrhotite masses.
- 183.7 m Scattered small grains, and vein-like bodies, of pyrrhotite and loellingite (arsenopyrite may also be present), with a trace of fine chalcopyrite.
- 191.8 m Pyrrhotite masses with small inclusions and very thin fracture-fillings of chalcopyrite.
- 207.9 m Apart from isolated fine pyrite, the only sulphide present is fresh pyrrhotite.
- 225.8 m Fresh granular pyrrhotite is the only sulphide.
- 249.0 m Pyrrhotite occurs as small blebs throughout the rock; most is fresh, but some is partly replaced by pyrite. Traces of magnetite are present.

H.W. Fander, M. Sc.

	Rock Type	Composition	Fabric	Minor Minerals	Comments
DH T 3 9.8 (T.S. 5653)	Metasomatised Metaquartzite.	Mainly very finely intergrown microgranular quartz, pale phlogopite, K-feldspar, cordierite; coarser quartz-phlogopite-sulphide zones.	Cordierite as typical poikiloblasts. Average grainsize = 10-20 μ .	Coarser zones contain anthophyllite patches, altered cordierite. Dravite poikiloblasts.	Rock probably an argillaceous siltstone, subjected to contact-metamorphism and Mg-metasomatism. Sulphides described separately.
56.1	Serpentinised Mg-Skarn.	Masses of serpentine pseudomorphs after Ca-Mg silicates (chondrodite group, diopside, tremolite); calcite, ankerite, sulphide, talc masses.	Originally very coarsely-crystalline; relict silicate grains in optical continuity.	Relict tremolite, diopside and chondrodite/clinochumite. Brown chlorite veins in sulphide.	Original rock was a Ca-Mg silicate skarn (ex carbonate rock), extensively altered to 'pseudo-serpentinite'. Possible silicate Sn.
90.9	Serpentinised Mg-Skarn.	Coarsely- to finely-granular masses of clinohumite, partly serpentinised; coarse antigorite and talc flakes, sulphide porphyroblasts.	Variable coarse to fine fabric; typical serpentine network textures.	Scattered pale green spinel crystals. Very minor fine secondary magnetite.	Related to 56.1 m; primary Mg-silicates more extensively preserved. Note spinel and variable grainsizes.
121.9	Chondrodite Skarn.	Granular interlocking fresh chondrodite masses; interstitial and coarser patches and bands of calcite; incipient serpentinisation.	Variable granular fabric. Compositional banding from primary rock?	Serpentine-magnetite zones flanking calcite bands.	Almost fresh equivalent of 90.9 m; original rock probably mainly magnesite or dolomite, perhaps banded.
126.0	Serpentinised Magnetite Skarn.	Abundant finely granular magnetite and sulphides, intergrown with dolomite, and serpentine pseudomorphs.	Fairly uniform granular textures and mineral distribution. No relict features.	Scattered small stubby apatite crystals.	Fresh rock was intergrowth of Mg-silicate, magnetite and sulphides thoroughly serpentinised.
134.7	Pyrrhotite-Humite Rock.	Mainly massive pyrrhotite, with embedded granular humite, partly serpentinised, and carbonate (?dolomite).	Granular, uniform fabric; medium-grained, featureless.	Thin films of ?graphitic material penetrate silicates and carbonate.	Textures suggest that sulphides were younger than other minerals and postdated serpentinisation.
152.5	Graphitic Andalusite-Cordierite Hornfels.	Numerous random small cordierite poikiloblasts, scattered andalusite (chiastolite) crystals, in fine quartz-graphite matrix.	Fine-grained hornfelsic fabric; random orientation, uniform.	Sulphide streaks and patches. Small dravite phlogopite, muscovite crystals.	Original rock was a strongly carbonaceous argillite, subjected to medium-grade contact-metamorphism.
83.7 A-417	Banded Hornfels.	Alternating bands and lenses of mosaic quartz and of cordierite studded with fine dravite and intergrown with K-feldspar.	Fine-grained with coarser patches; crude banding is inherited.	Scattered phlogopite shreds; granular sphene; sulphides. Apatite.	Dravite is exceptionally strongly coloured (orange-brown). Original rock was a banded argillaceous sediment.

No.	Rock type	Composition	Fabric	Color	Comments
DDH NT 3 191.8	<u>Calc-Silicate Rock</u> . Massive interlocking fine to coarse, brownish diopside; patches of ?chondrodite, lenses/bands of talc/chlorite intergrowths.	Originally banded, but folded and fractured. Variable grainsizes.	Massive sulphides in places. Crosscutting carbonate veins.	Diopside is unusual, possibly titaniferous; identity confirmed by XRD. Sulphides are younger.	
207.9	<u>Banded Skarn</u> . Bands of finely granular, partly serpentinised ?chondrodite-humite, impregnated with sulphides, and bands of diopside, partly serpentinised.	Generally fairly fine-grained, with coarser bands.	Patches of stubby talc flakes.	Perhaps a banded calc-silicate rock as distinct from a skarn, i.e. contact-metamorphic rather than pyrometamorphic.	
208.9	<u>Banded Calc-Silicate Rock</u> . Bands of calcite studded with ?chondrodite-humite (partly serpentinised), alternating with magnetite bands and talc/calcite bands.	Fine banding reflects original sedimentary structures. Mostly fine-grained.	Scattered pyrrhotite grains. Black ?carbonaceous material in serpentine minerals.	Not known whether calcite is recrystallized primary or introduced material. Rock was probably impure carbonaceous laminated carbonate.	
225.8	<u>Forsterite Marble</u> . Mainly granular interlocking dolomite, with calcite grains and bands, and scattered, partly serpentinised forsterite. Dispersed sulphides.	Medium-granular fabric with compositional banding, weak preferred orientation.	Serpentine minerals are semi-opaque, pigmented with ?carbon.	Related to 208.9 m, with much greater proportion of carbonates. Fine forsterite not readily distinguished from chondrodite-humite.	
249.0 (T.S. 45665)	<u>Diopside-Forsterite Marble</u> . Broad bands of calcite with finely granular, partly serpentinised forsterite and thinner bands of coarse diopside, also partly serpentinised.	Well-banded; medium-to coarse-grained, variable in bands.	Dispersed sulphides. Black ?carbonaceous matter in serpentine. Pale green spinel.	Very similar to 225.8 m; both rocks can be termed banded calc-silicates. Contact-metamorphic.	

LIST OF PLANS

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
D/MQ 04/128	Natone - Line 1800N	1:2,500
D/MQ 04/131	Natone - Line 1700N	1:2,500
D/MQ 04/127	Natone - Lines 1600N and 1400N	1:2,500
D/MQ 04/132	Natone - Line 1500N	1:2,500
D/MQ 04/133	Natone - Line 1300N	1:2,500
D/MQ 04/126	Natone - Line 1200N	1:2,500
D/MQ 04/148	Natone - Line 1150N	1:2,500
D/MQ 04/134	Natone - Line 1100N	1:2,500
D/MQ 04/145	Natone - Line 1050N	1:2,500
D/MQ 04/124A	Natone - Line 1000N	1:2,500
D/MQ 04/144	Natone - Line 950N	1:2,500
D/MQ 04/135	Natone - Line 900N	1:2,500
D/MQ 04/147	Natone - Line 850N	1:2,500
D/MQ 04/123A	Natone - Line 800N	1:2,500
D/MQ 04/123B	Natone - Line 800N cont.	1:2,500
D/MQ 04/142	Natone - Line 750N	1:2,500
D/MQ 04/130	Natone - Line 700N	1:2,500
D/MQ 04/141	Natone - Line 650N	1:2,500
D/MQ 04/140	Natone - Line 600N	1:2,500
D/MQ 04/129A	Natone - Line 1200E	1:2,500
D/MQ 04/129B	Natone - Line 1200E cont.	1:2,500
D/MQ 04/146	Natone - Line 1000E	1:2,500
D/MQ 04/143B	Natone - Southern Extension - Max-min Interpretation	1:2,500
D/MQ 04/160	Natone - Southern Extension - Ground Magnetics	1:2,500
D/MQ 04/161	Natone - Southern Extension - Ground Magnetic Stacked Profiles	1:2,500
D/MQ 04/153	Natone - Southern Extension - Gravity & Magnetic Trends	1:2,500
D/MQ 04/122	Natone - Southern Extension - Bouger Gravity (No Terrain Corr.)	1:2,500
D/MQ 04/162	Natone - Southern Extension - Gravity	1:2,500
D/MQ 04/163	Natone - Southern Extension - Gravity 2nd vert. deriv.	1:2,500

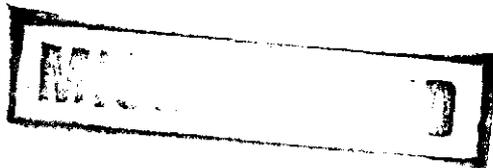
LIST OF PLANS

<u>Plan No.</u>	<u>Title</u>	<u>Scale</u>
D/MQ 04/164	Riana/Hayes Peak Geology plus Anomaly Map	1:50,000
D/MQ 04/174	Riana/Hayes Peak Geology plus Grid Locations	1:50,000
D/MQ 04/080	Riana - Airborne Magnetics - Geometrics	1:63,360
D/MQ 04/139	INPUT Anomaly 4144/IR 1 - Initial Ground Check	1:2,500
D/MQ 04/151	Natone - Southern Grid Extension - Cultural Map	1:2,500
D/MQ 04/150	Natone - Southern Grid Extension - Geological Map	1:2,500

D/MQ 04/139: Natone, Initial Ground Check

D/MQ 04/152 Natone - Road
 JA Traverse Bouguer
 Gravity Elevation

2	1	3
U of M	C.G.	E.O.
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
Received - 6 OCT 1983		E & IL
DEPT. REF. No. 9162/83		



83-2040



123

The Shell Company of Australia Limited
METALS DIVISION

GEOLOGY OF:
E.L. 8/77 RIANA
E.L. 14/80 HAYES PEAK
ANOMALY MAP

SCALE	1:50,000	DATE	11-7-83
AUTHOR	P. BRIDSON	DRAWN	H.C.H.
OFFICE	DEVONPORT	REF. No.	
ENCL. No.		DRG. No.	D170004/164

514123

8 cm

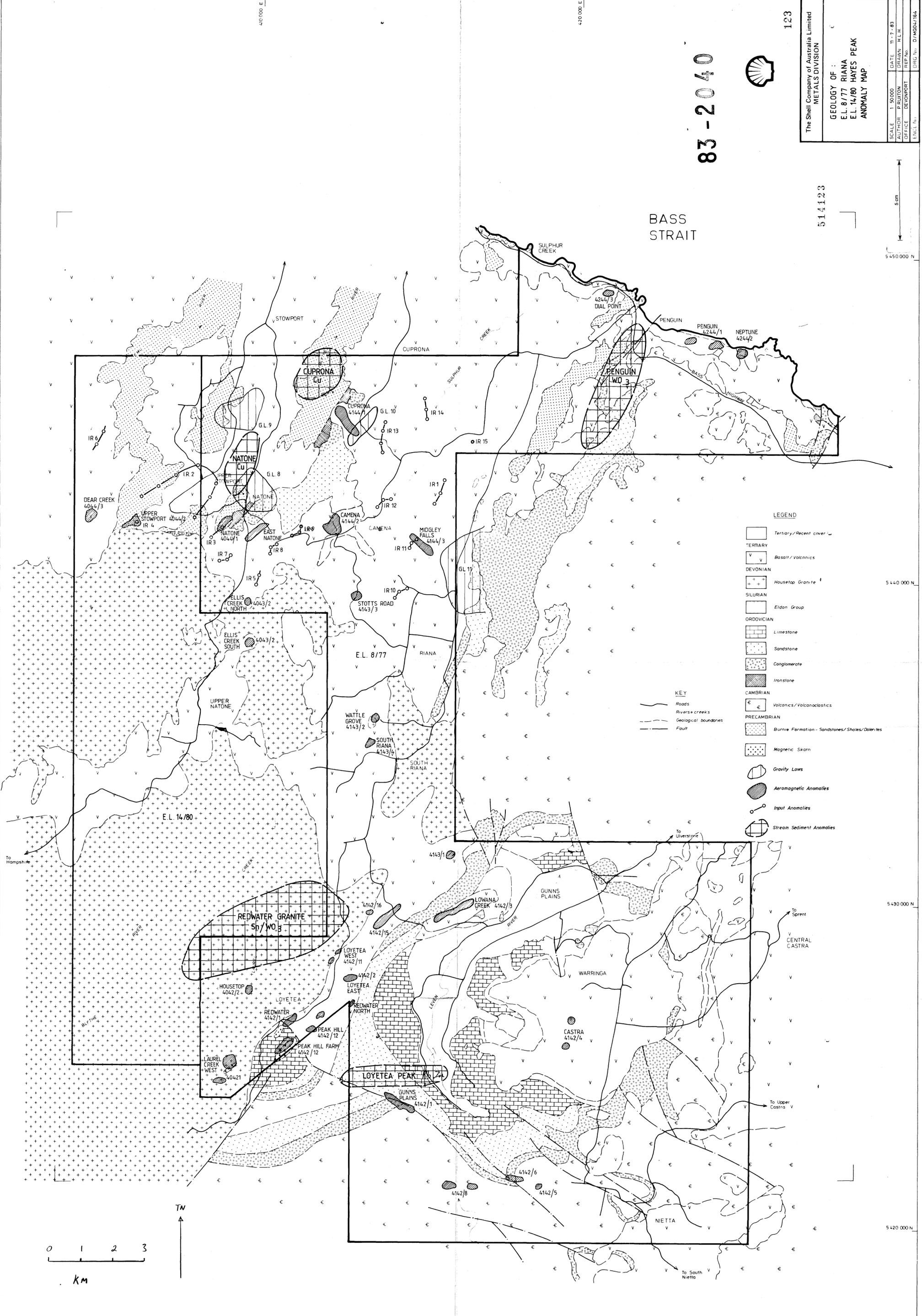
5 450 000 N

5 440 000 N

5 430 000 N

5 420 000 N

BASS STRAIT



LEGEND

- Tertiary/Recent cover
- TERTIARY**
- Basalt / Volcanics
- DEVONIAN**
- Housetop Granite
- SILURIAN**
- Eldon Group
- ORDOVICIAN**
- Limestone
- Sandstone
- Conglomerate
- Ironstone
- CAMBRIAN**
- Volcanics / Volcanoclastics
- PRECAMBRIAN**
- Burnie Formation - Sandstones / Shales / Dolerites
- Magnetic Skarn
- Gravity Lows
- Aeromagnetic Anomalies
- Input Anomalies
- Stream Sediment Anomalies

KEY

- Roads
- Rivers/creeks
- Geological boundaries
- Fault

0 1 2 3
km



40 000 E

420 000 E

124

83-2040



The Shell Company of Australia Limited METALS DIVISION	
GEOLOGY OF: E.L. 8/77 RIANA E.L. 14/80 HAYES PEAK GRID LOCATION MAP	
SCALE	1:50 000
DATE	30-8-83
AUTHOR	PRJATON
OFFICE	DEVONPORT
REP. No.	
DWG. No.	9/M004/174

514124

5 cm

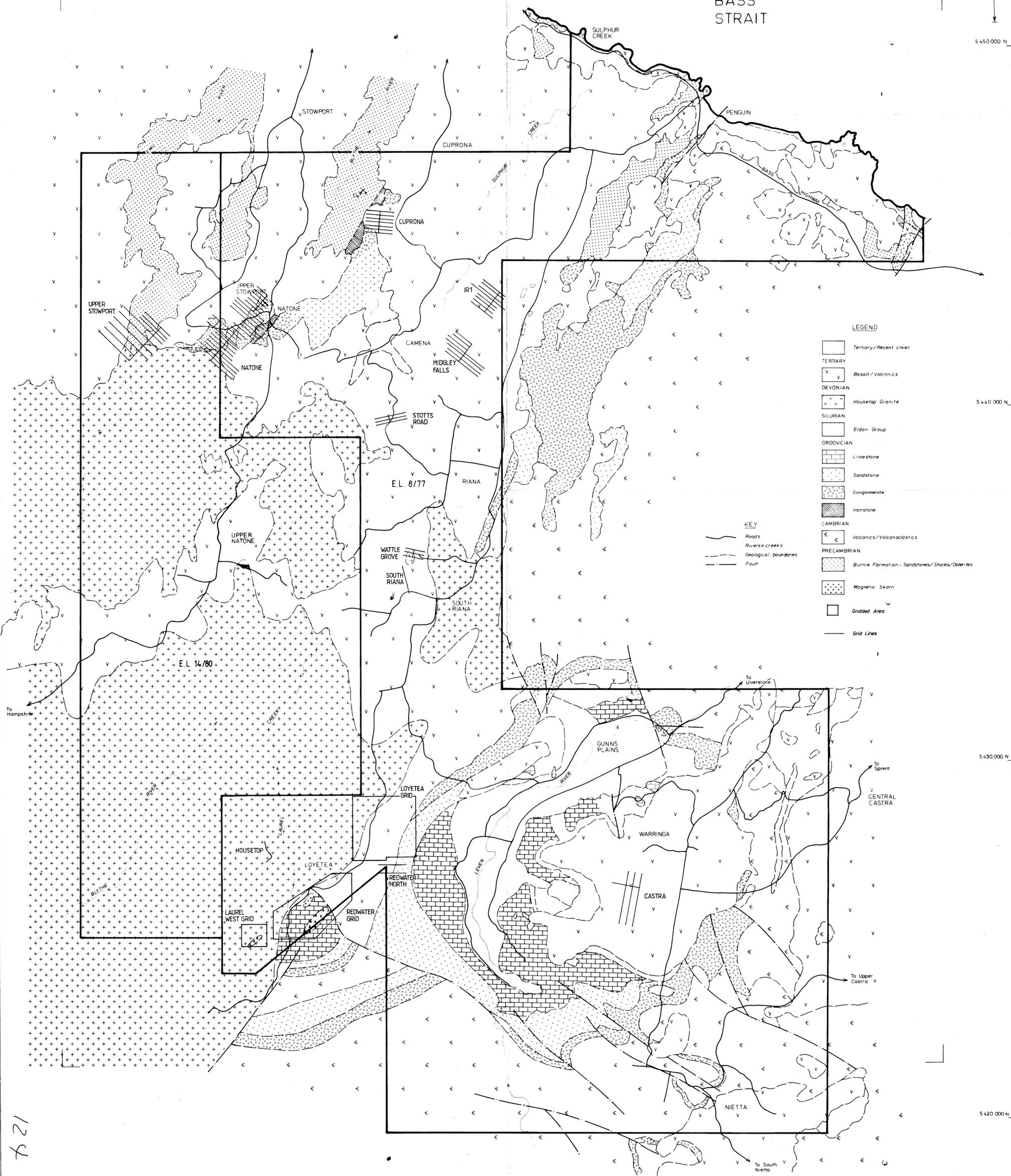
5 450 000 N

5 440 000 N

5 430 000 N

5 420 000 N

BASS STRAIT



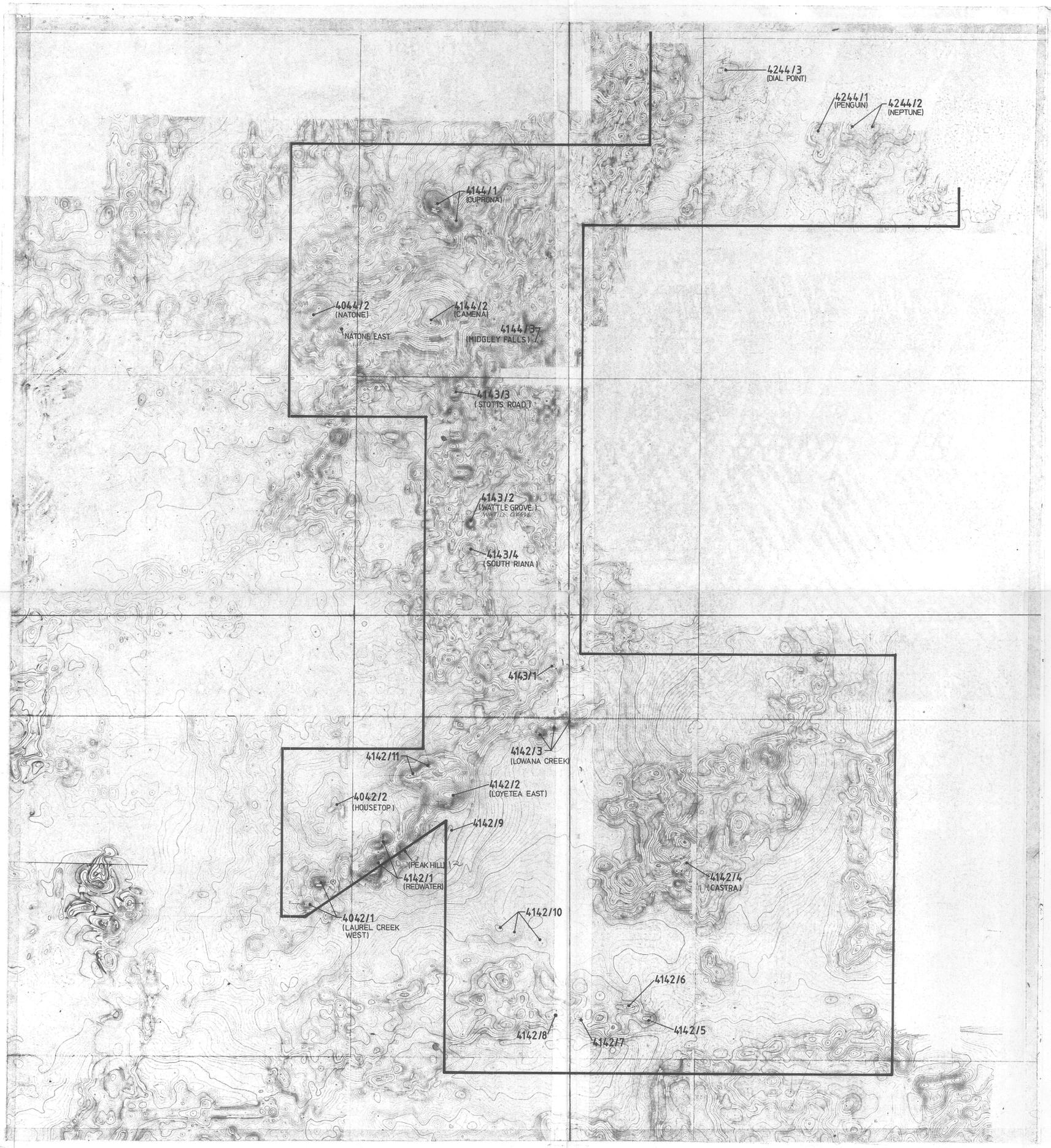
LEGEND

- Tertiary/Recent cover
- Basalt/Volcanics
- DEVONIAN
- House Top Granite
- SILURIAN
- Eldon Group
- ORDOVICIAN
- Limestone
- Sandstone
- Conglomerate
- Ironstone
- CAMBRIAN
- Volcanics/Volcanoclastics
- PRECAMBRIAN
- Burnie Formation - Sandstones/Shales/Dolerites
- Magnetic Skarn
- Gridded Area
- Grid Lines

KEY

- Roads
- Rivers/creeks
- Geological boundaries
- Fault

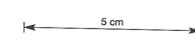
721



83 2040

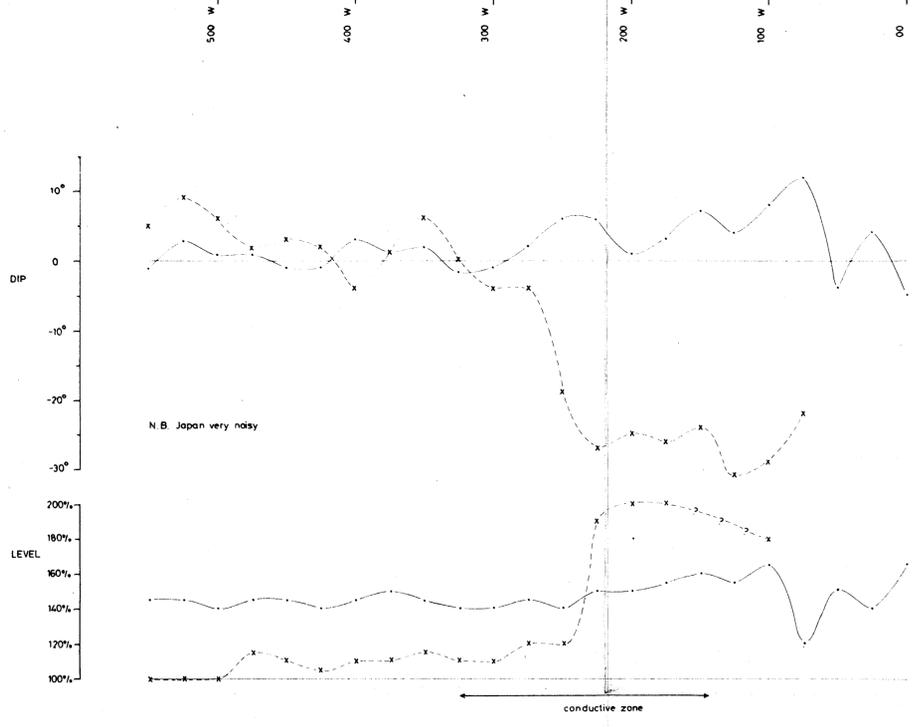
125

514125

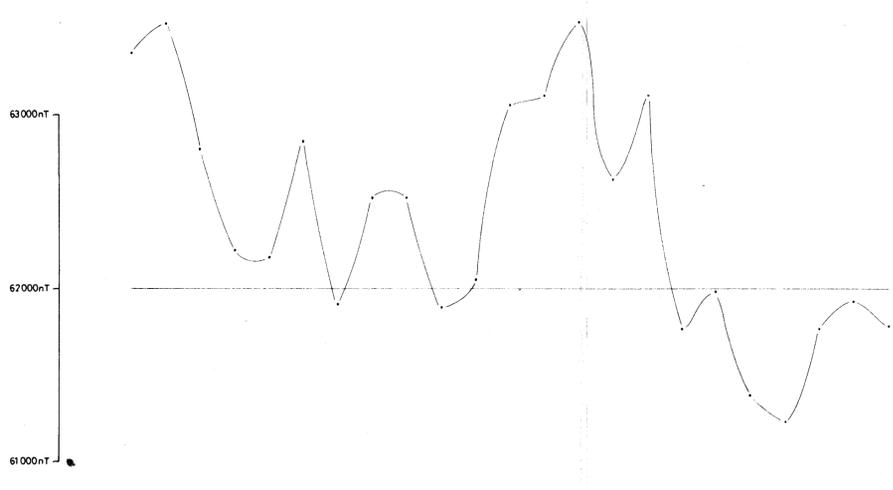


The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA GEOMETRICS AIRBORNE MAGNETICS SURVEY WITH ANOMALY NUMBERS	
Scale : 1:63360	
FIG. No.	REPORT No.
ENCL. No.	DRG. No. D/MQ04/080
DATE 23-10-81	AUTHOR L.D. BANWELL
DRAWN H.L.H.	OFFICE DEVONPORT

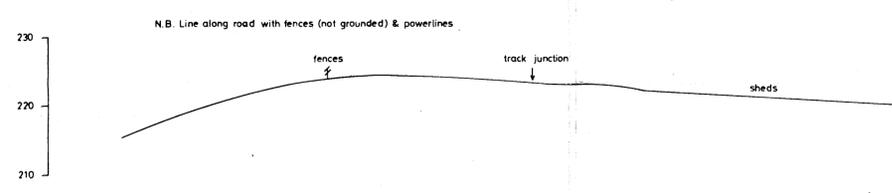
V.L.F.-EM
 - - - - - N.W. Cape (ave dip to N)
 x - - - - - Japan (ave dip to E)



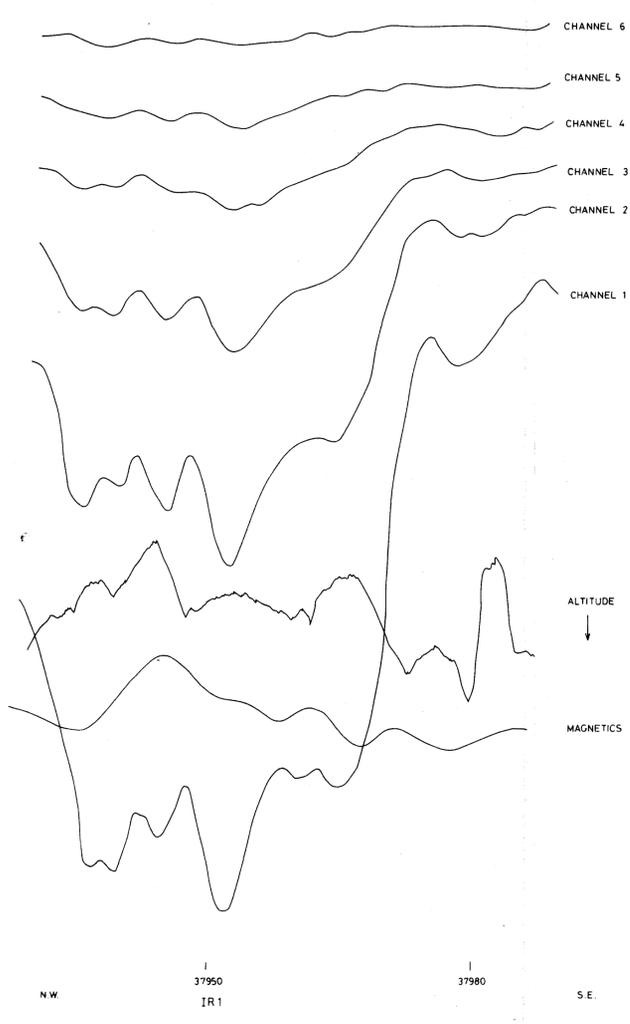
MAGNETICS



APPROX. TOPOGRAPHY & CULTURE (Metres A.S.L.)



INPUT LINE 1241



83-2040



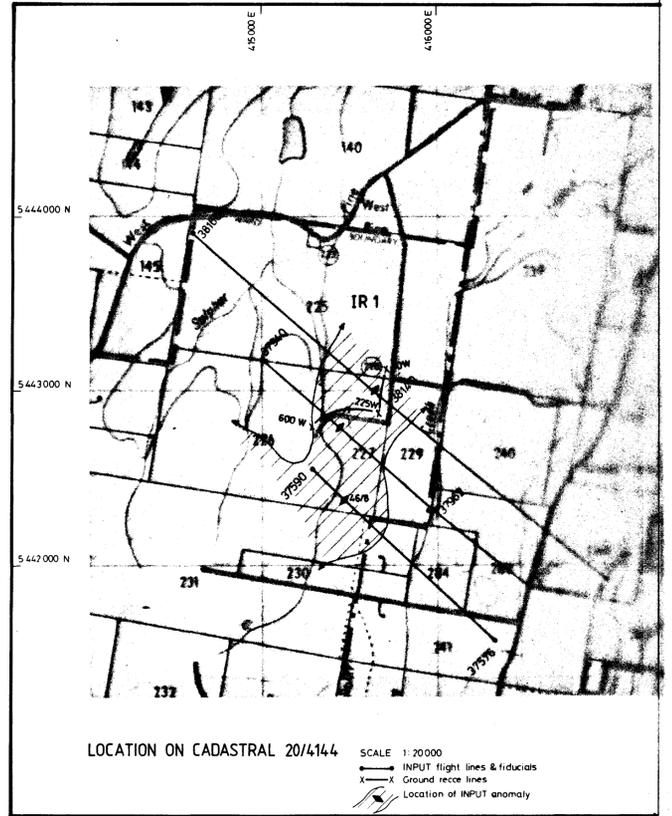
7010

The Shell Company of Australia Limited
 METALS DIVISION

E.L. 8/77 RIANA
 INPUT ANOMALY 4144/IR1
 INITIAL GROUND CHECK

SCALE	1:2500	DATE	15-10-87
AUTHOR	G. OAKES	DRAWN	H.L.S.
OFFICE	DEVONPORT	REP. No.	
ENCL. No.		DRG. No.	D/M004/139

514126



LOCATION ON CADASTRAL 20/4144

SCALE 1:20000
 - - - - - INPUT flight lines & fiducials
 x - - - - - Ground receive lines
 X - - - - - Location of INPUT anomaly



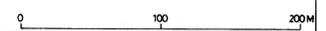
LEGEND

-  Fence Boundary
-  Building / Shed / Hut
-  Road / Track
-  Stream
-  Dam
-  Swamp Area
-  Steep Bank
-  Trees
-  Water Trough

83-2040



7011

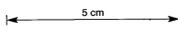


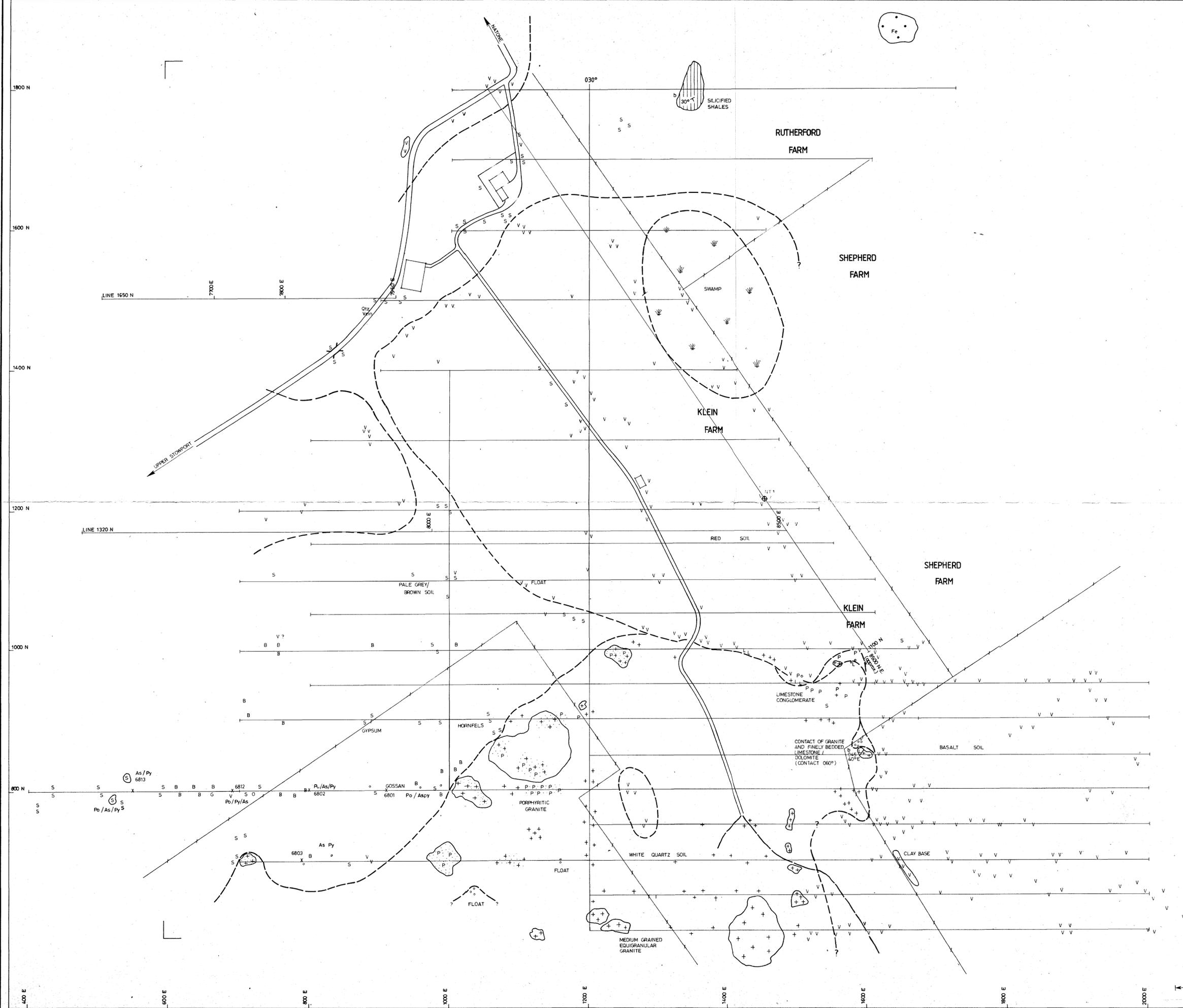
The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77 RIANA
NATONE
SOUTHERN GRID EXTENSION
CULTURAL MAP

SCALE 1:2500	DATE 22-11-82
AUTHOR P.RUXTON	DRAWN J.L.L.
OFFICE DEVONPORT	REP. No.
ENCL. No.	DRG No. D/M004/151

514127





- LEGEND**
- Inferred Geological Boundary
 - Outcrop
 - Farm Boundary
 - b or 30° Bedding
- TERTIARY**
- V Basalt
- CAMBRIAN**
- |||| Silicified Sediments
 - * Fe * Ironstone
 - L L Diatomite Limestone - Conglomerate (± Po)
 - ° ° Silicified Conglomerate
- PRECAMBRIAN**
- B/S/D B = Basalt
 - G D = Dolerite
 - S Gabbro
 - S Sandstone
- HOUSETOP GRANITE LATE DEVONIAN**
- Fine Grained Porphyritic
 - Porphyritic
 - Fine Grained Equigranular
 - Equigranular
- Po Pyrrhotite
 As or Arsenopyrite
 Py Pyrite
 6814 Rock Chip Sample

NW
NE

83-2040



7012

0 100 200M

514128

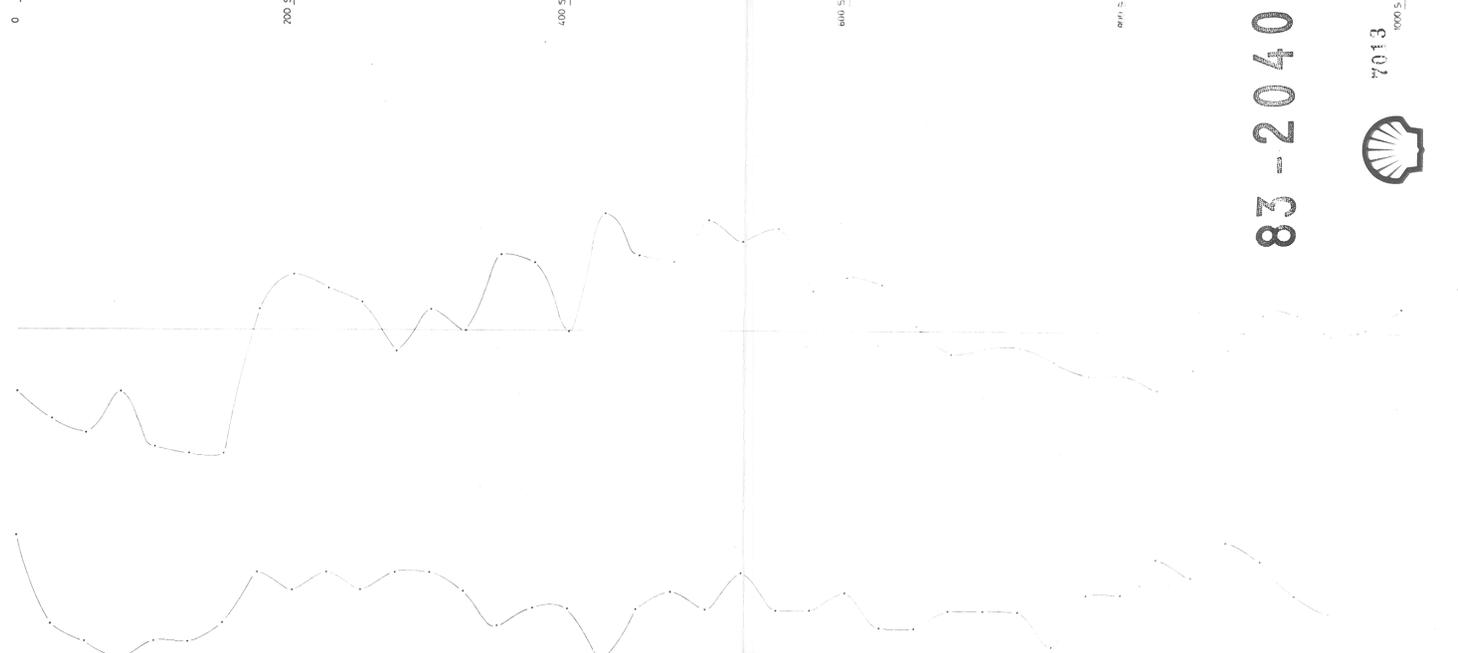
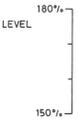
5 cm

The Shell Company of Australia Limited METALS DIVISION	
E. L. 8/77 RIANA NATONE SOUTHERN GRID EXTENSION GEOLOGICAL MAP	
SCALE 1:2500	DATE 18-11-82
AUTHOR P. RUXTON	DRAWN J.L.L.
OFFICE DEVONPORT	REP. No.
ENCL. No.	DRG. No. DJM204/150

WESTERN LINE

V.L.F.-EM

N.B.
No Japan readings due to powerline noise.
No max-min or IP due to powerline noise.



83-2040



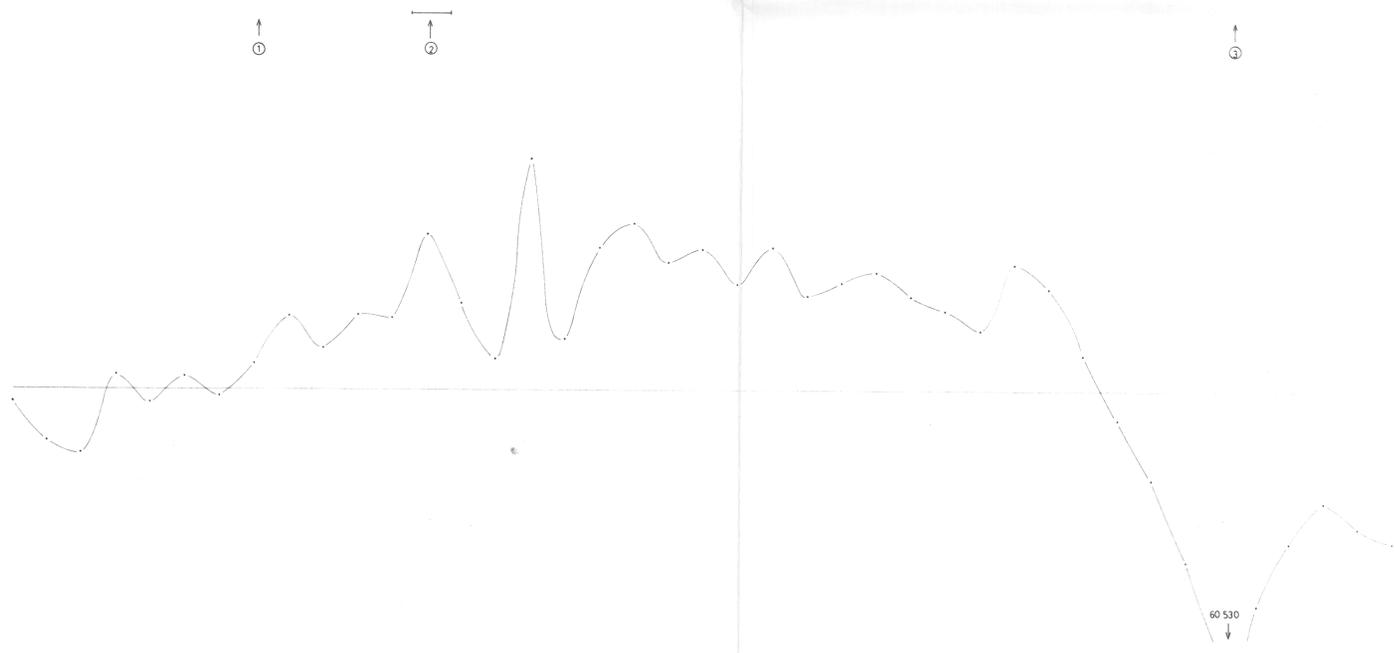
7013

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE - WESTERN LINE & EASTERN LINE AEROMAGNETIC ANOMALIES INITIAL GROUND CHECK	
SCALE 1:2500	DATE 14-10-87
AUTHOR G. OAKES	DRAWN H.L.S.
OFFICE DEVONPORT	REP. No.
ENCL. No.	DRG. No. D/M004/138

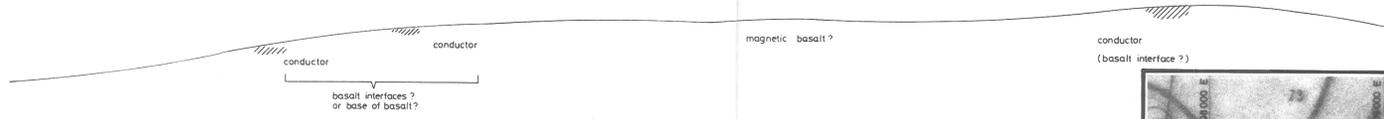
514129



MAGNETICS

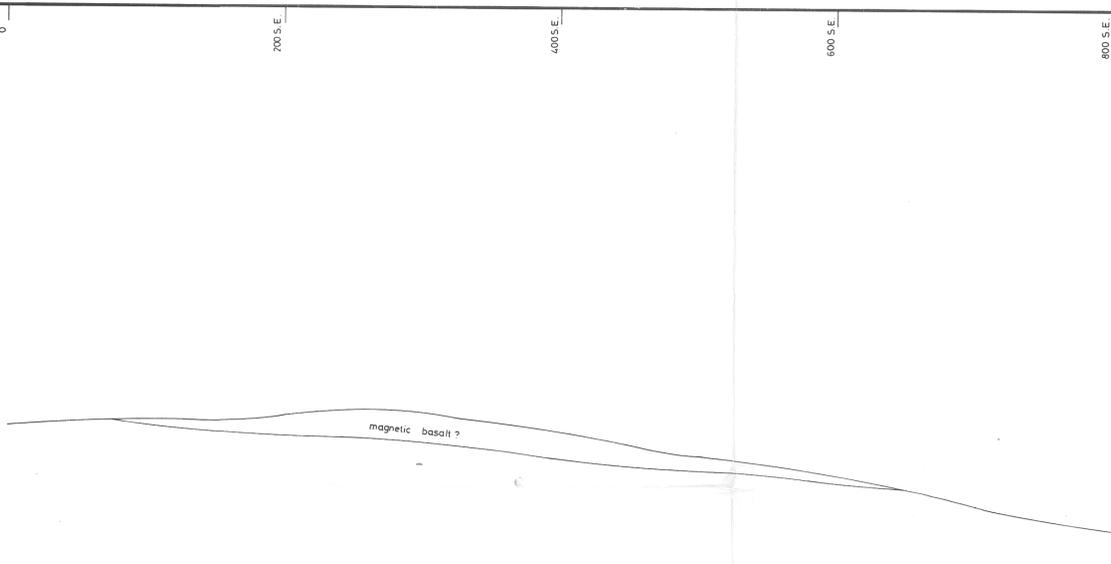


APPROX. TOPOGRAPHY & CULTURE (Metres A.S.L.)

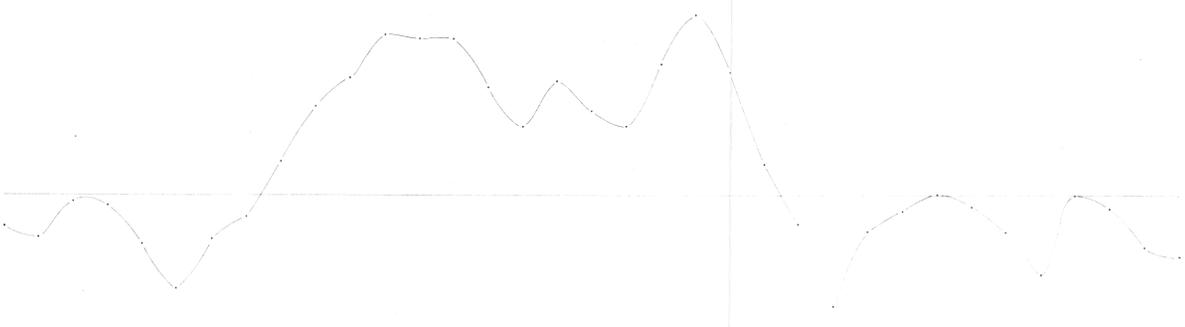


EASTERN LINE

APPROX. TOPOGRAPHY & CULTURE (Metres A.S.L.)



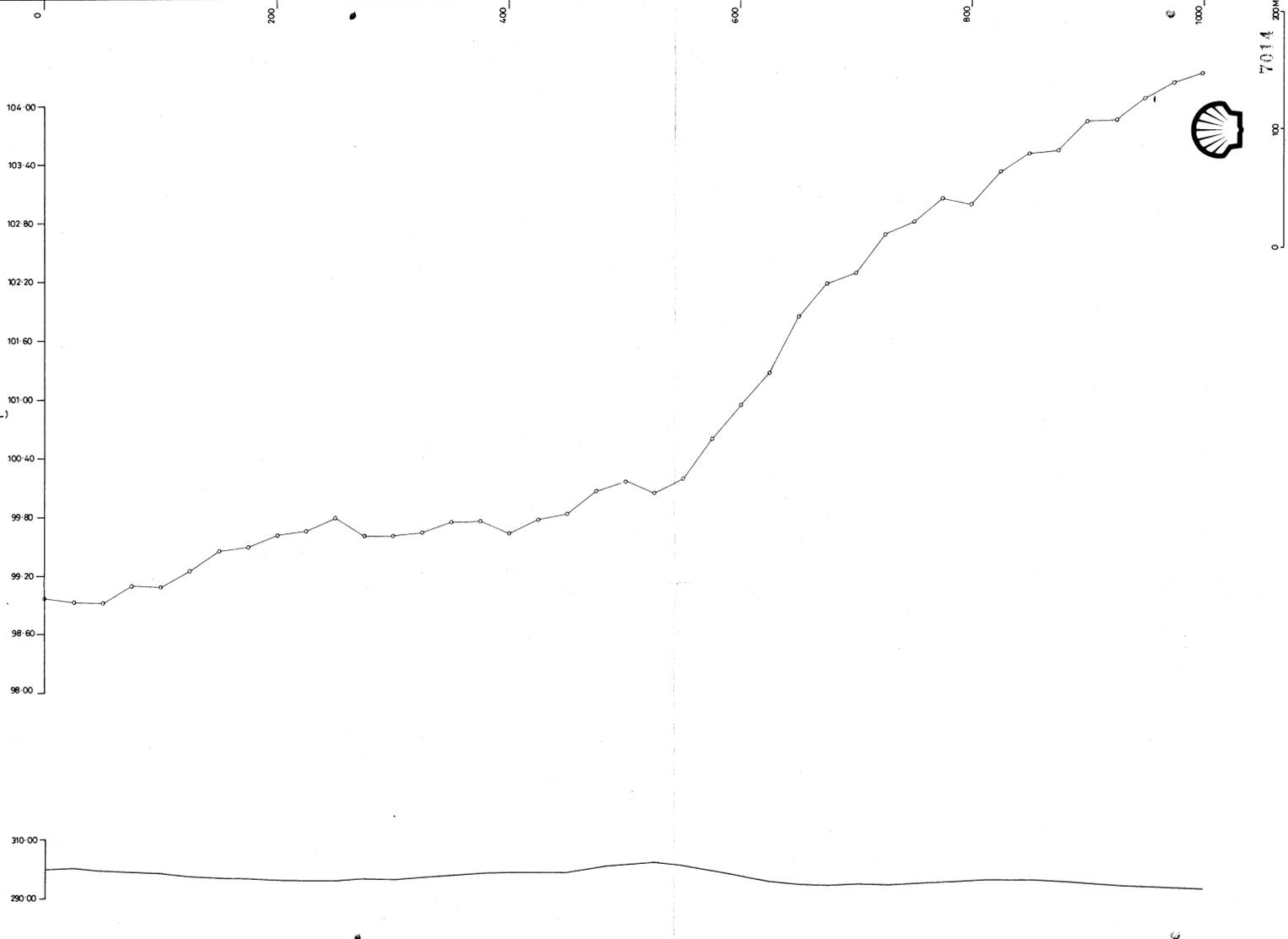
MAGNETICS



LOCATION ON CADASTRALS 20/4044 & 4144 SCALE 1:20000

7013

BOUGUER GRAVITY
DENSITY = 2.70
READING SCALE = MAGL
(1km = 0.30 MAGL.)



ELEVATION
METRES

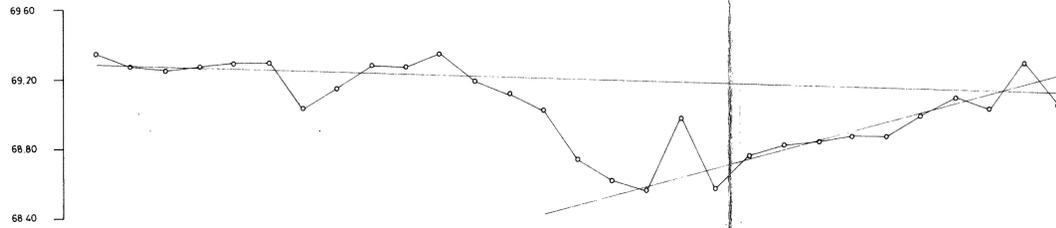
The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77	RIANA
NATONE - ROAD TRAVERSE	
BOUGUER GRAVITY	
ELEVATION	
SCALE 1:2500	DATE 21-12-82
AUTHOR G.OMES	DRAWN J.L.L.
OFFICE BRONPORT	REF. No.
ENCL. No.	DRG No. D/H004/152

514130

83-2040

5 cm

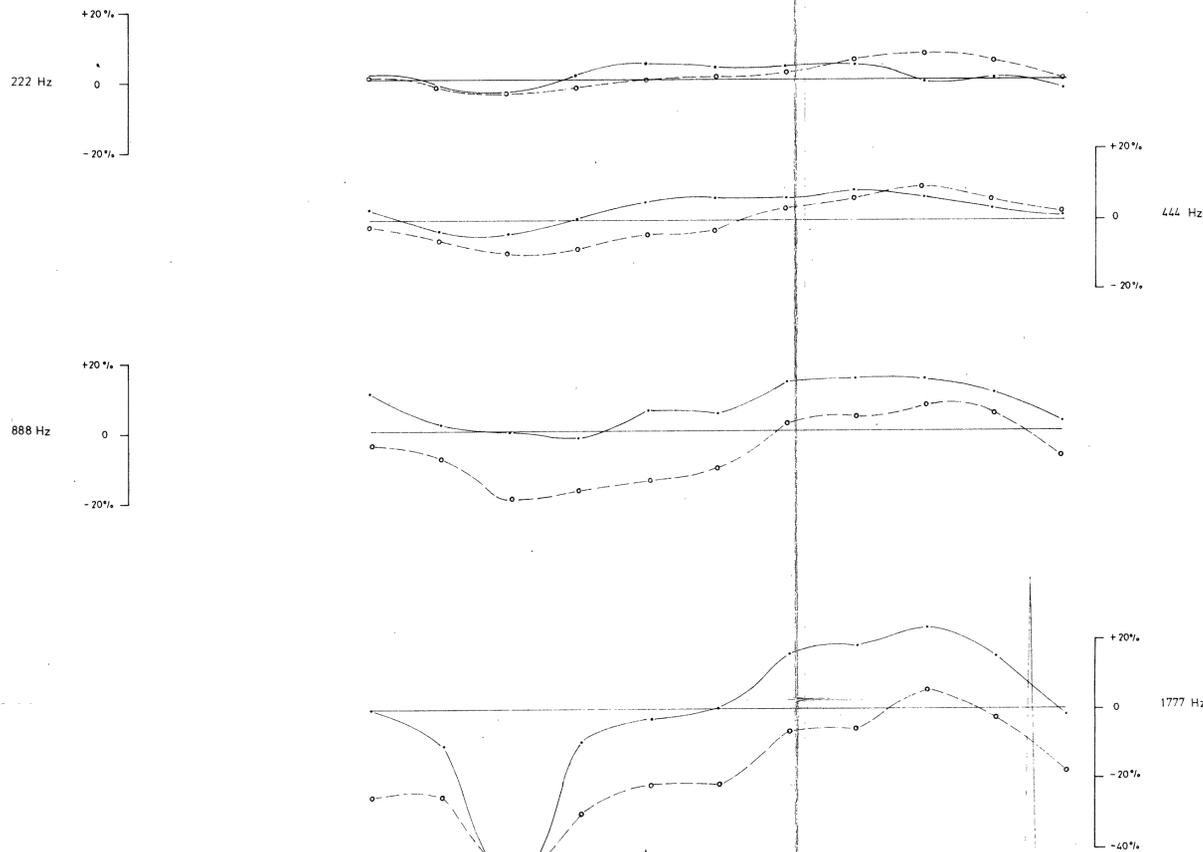
BOUGUER GRAVITY
 DENSITY = 2.70
 READING SCALE = MGAL
 NOT TERRAIN CORRECTED



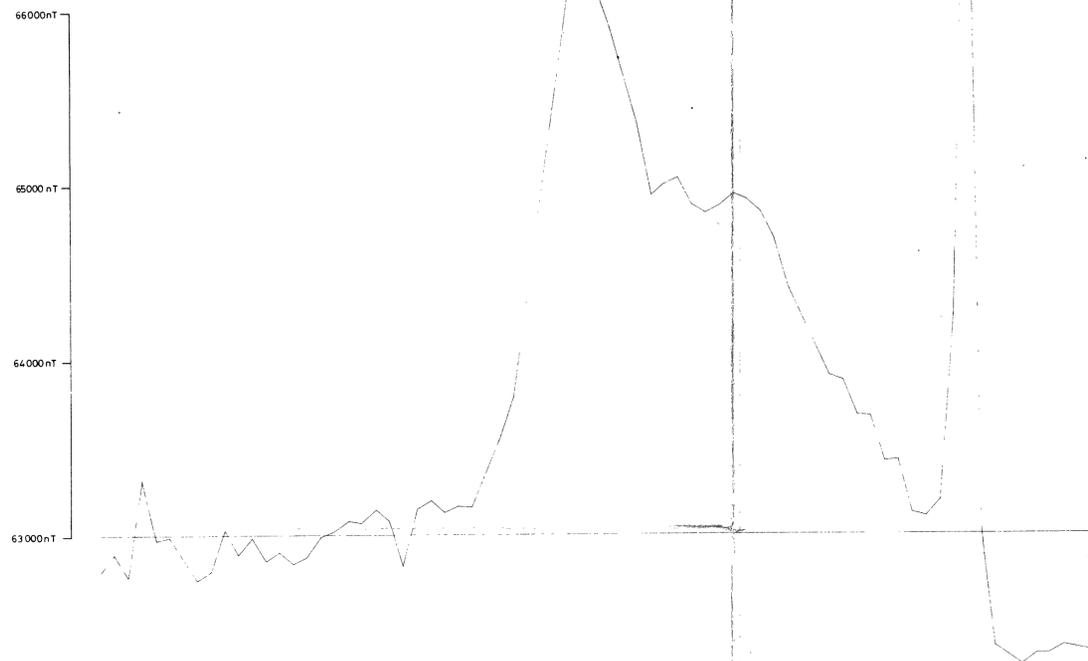
ELEVATION
 METRES



MAX-MIN
 COIL SEPARATION = 200
 IN PHASE (solid line with dots)
 OUT PHASE (dashed line with circles)



GROUND MAGNETICS
 READING SCALE = 200nT/cm



83-2040



7015

0 100 200M

The Shell Company of Australia Limited
 METALS DIVISION

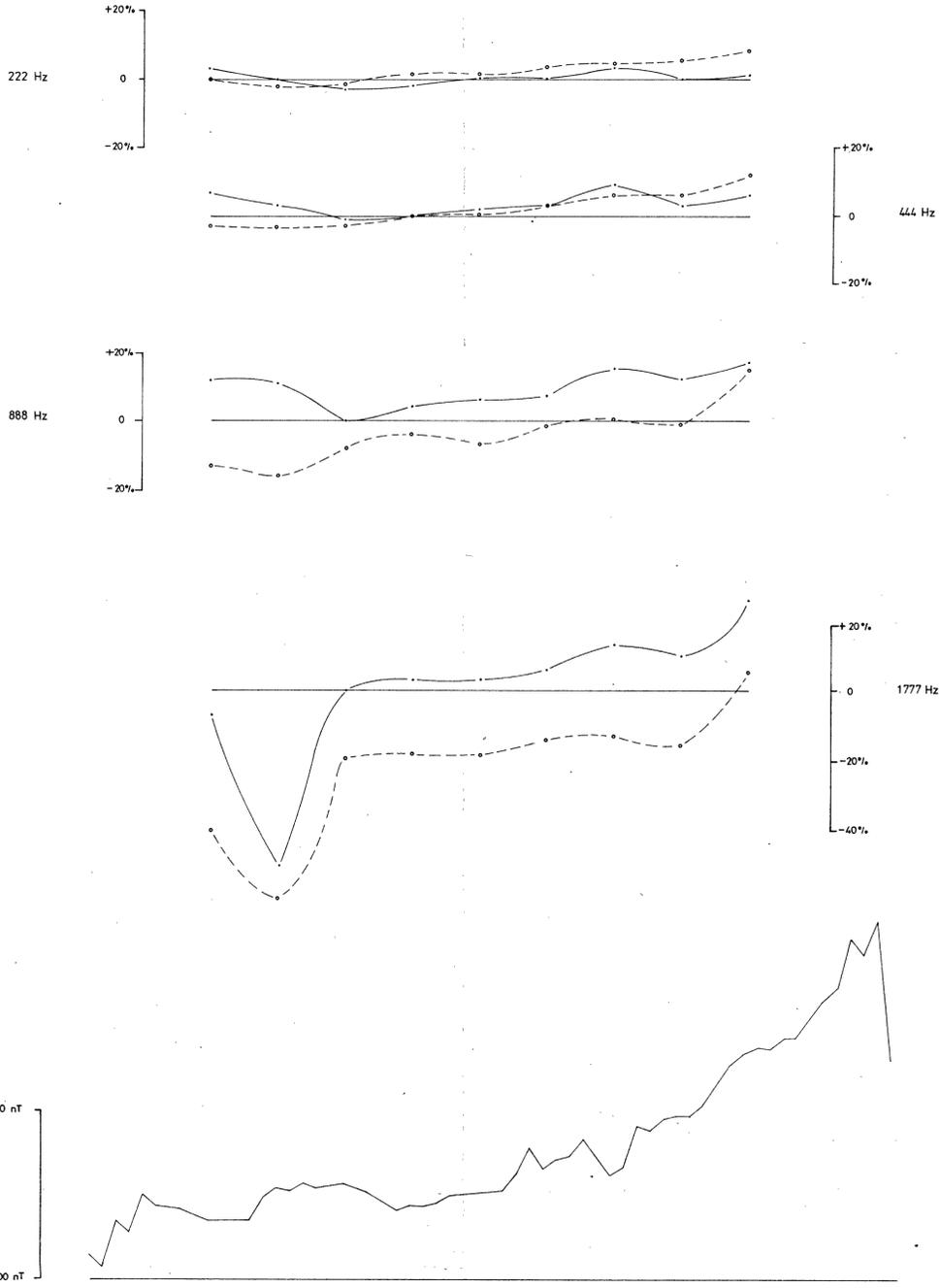
EL 8/77 RIANA
 NATONE
 LINE 1800N
 — BOUGUER GRAVITY
 — ELEVATION
 — MAX-MIN
 — GROUND MAGNETICS

SCALE	1:2500	DATE	10-9-82
AUTHOR	G. GAMES	DRAWN	H. L. S.
OFFICE	DEWOPORT	REP. NO.	
ENGINEER		DRG. NO.	D14004/128

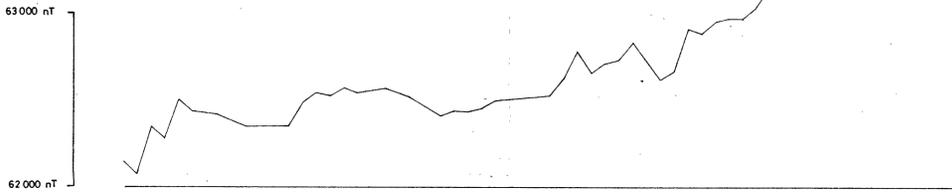
514131

5 cm

MAX-MIN
 COIL SEPARATION = 200M
 IN PHASE ———
 OUT PHASE - - - - -



GROUND MAGNETICS
 READING SCALE = 200 nT/cm



83-2040



7016

The Shell Company of Australia Limited METALS DIVISION		DATE	17-9-82
E.L. 8177 RIANA		DRAWN	H.L.S.
NATONE		REP. No.	
LINE 1700 N		DRG. No.	D/M804/131
— MAX-MIN			
— GROUND MAGNETICS			

514132

5 cm

1000 E 1100 E 1200 E 1300 E 1400 E 1500 E 900 E 1000 E 1100 E 1200 E 1300 E 1400 E 1500 E

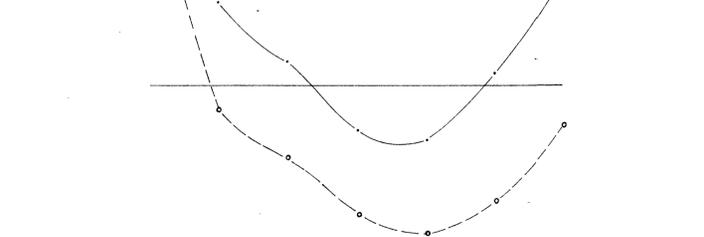
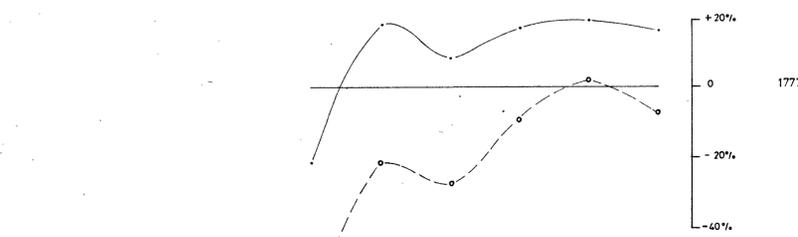
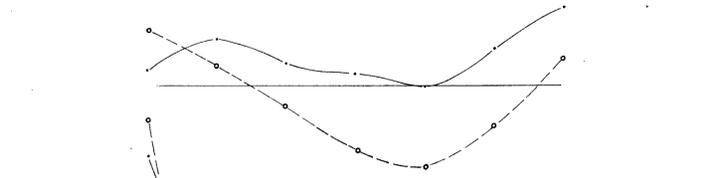
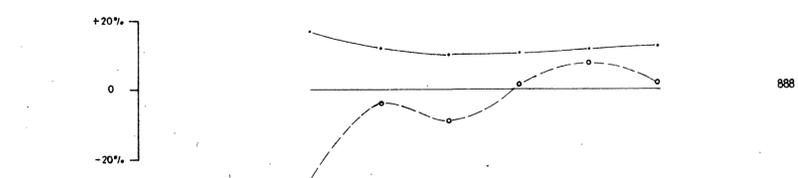
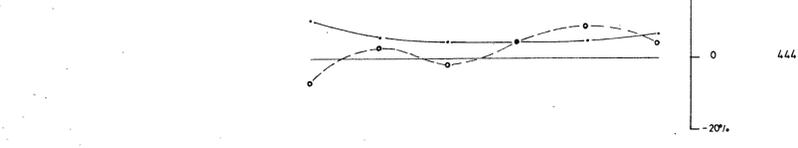
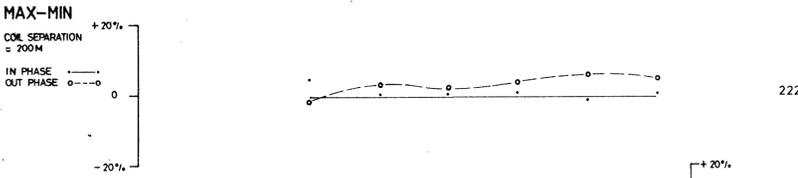
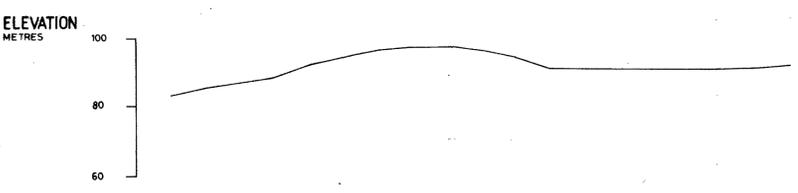
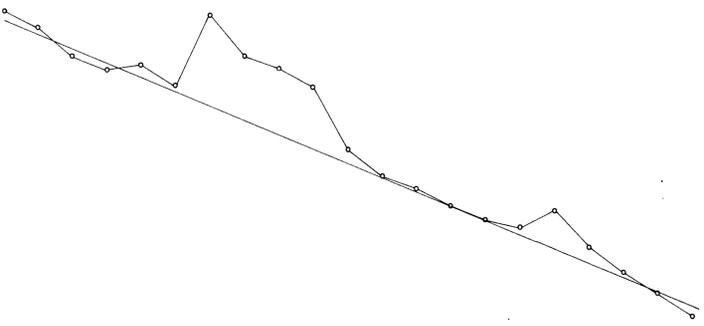
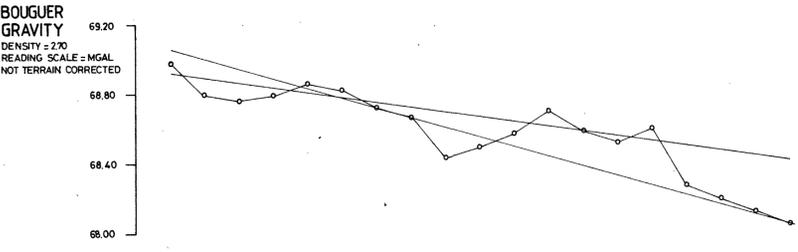
LINE 1600 N

LINE 1400 N

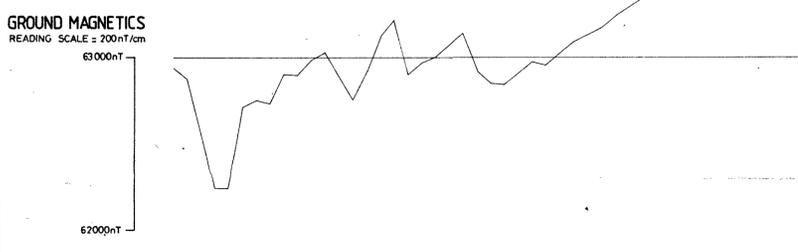


7017

The Shell Company of Australia Limited	
METALS DIVISION	
E.L. 8/77 RIANA	
LINES 1600 N & 1400 N	
- BOUGUER GRAVITY	
- ELEVATION	
- MAX-MIN	
- GROUND MAGNETICS	
SCALE 1:7500	DATE 10-9-87
AUTHOR C. SMES	DRAWN P.L.S.
OFFICE DEWOPORT	PREP No.
ENCL No.	DRG No. D/M004/127



powerline A fence f electric fence

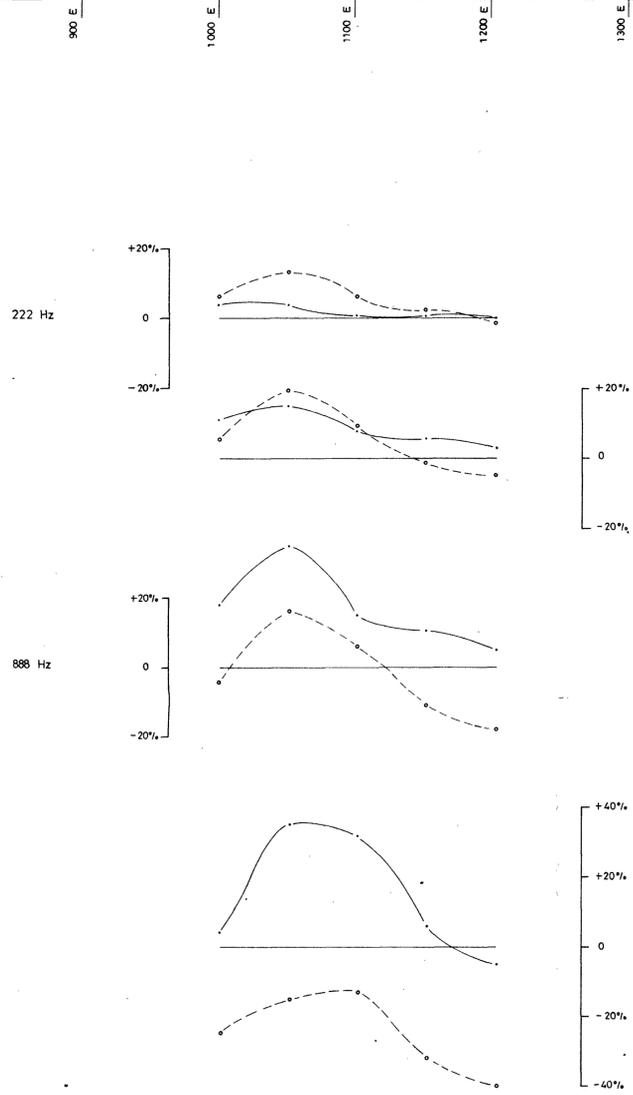


514133

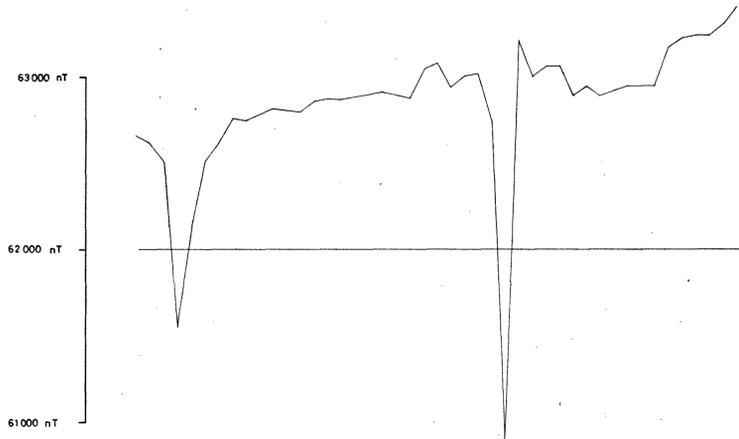


83-2040

MAX-MIN
 COIL SEPARATION = 200M
 IN PHASE ———
 OUT PHASE - - - -



GROUND MAGNETICS
 READING SCALE = 200 nT/cm



7018

0 100 200M

The Shell Company of Australia Limited
 METALS DIVISION

E.L. 8/77 RIANA
 NATONE
 LINE 1500 N
 — MAX-MIN
 — GROUND MAGNETICS

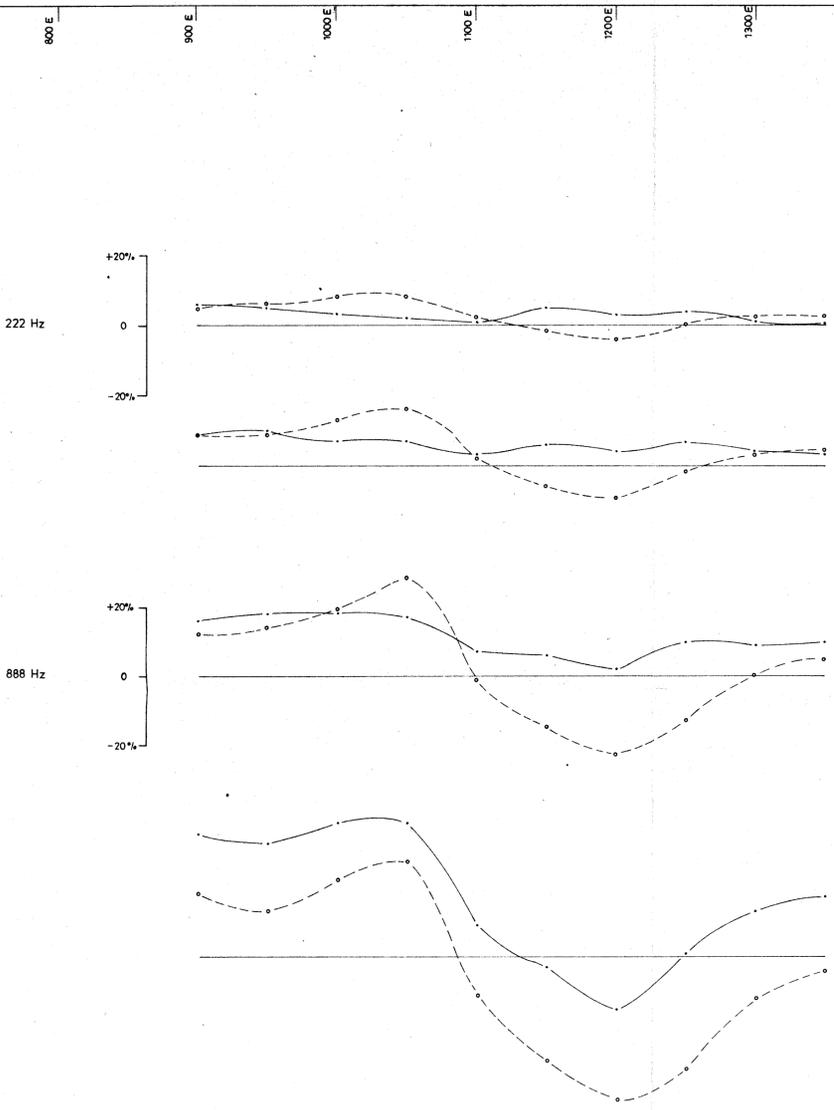
SCALE	1:2500	DATE	17-9-82
AUTHOR	G. OAMES	DRAWN	H.L.S.
OFFICE	DEVONPORT	REP. No.	
ENCL. No.		DRG. No.	D/MG04/132

514134

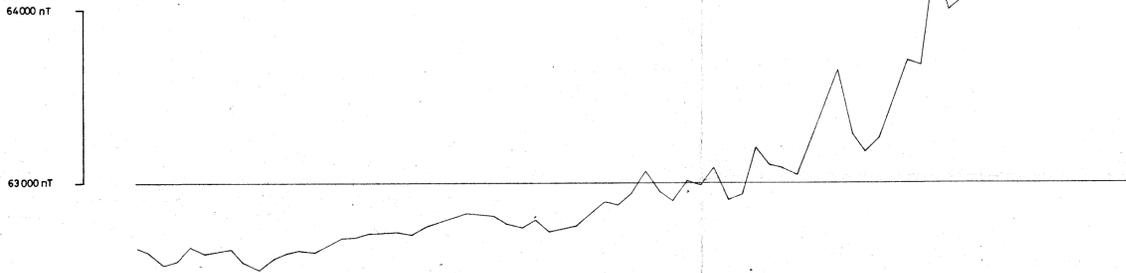
5 cm

83-2040

MAX - MIN
 COIL SEPARATION = 200M
 IN PHASE ———
 OUT PHASE - - - -



GROUND MAGNETICS
 READING SCALE = 200nT/cm



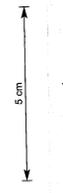
7019

The Shell Company of Australia Limited
 METALS DIVISION

E.L. 8/77 RIANA
 NATONE
 LINE 1300 N
 - MAX-MIN
 - GROUND MAGNETICS

SCALE	1:2500	DATE	17-9-82
AUTHOR	G. JAMES	DRAWN	P.L.S.
OFFICE	DEWOPORT	PREP. NO.	
ENCL. No.		DRG. No.	D140047/88

514135



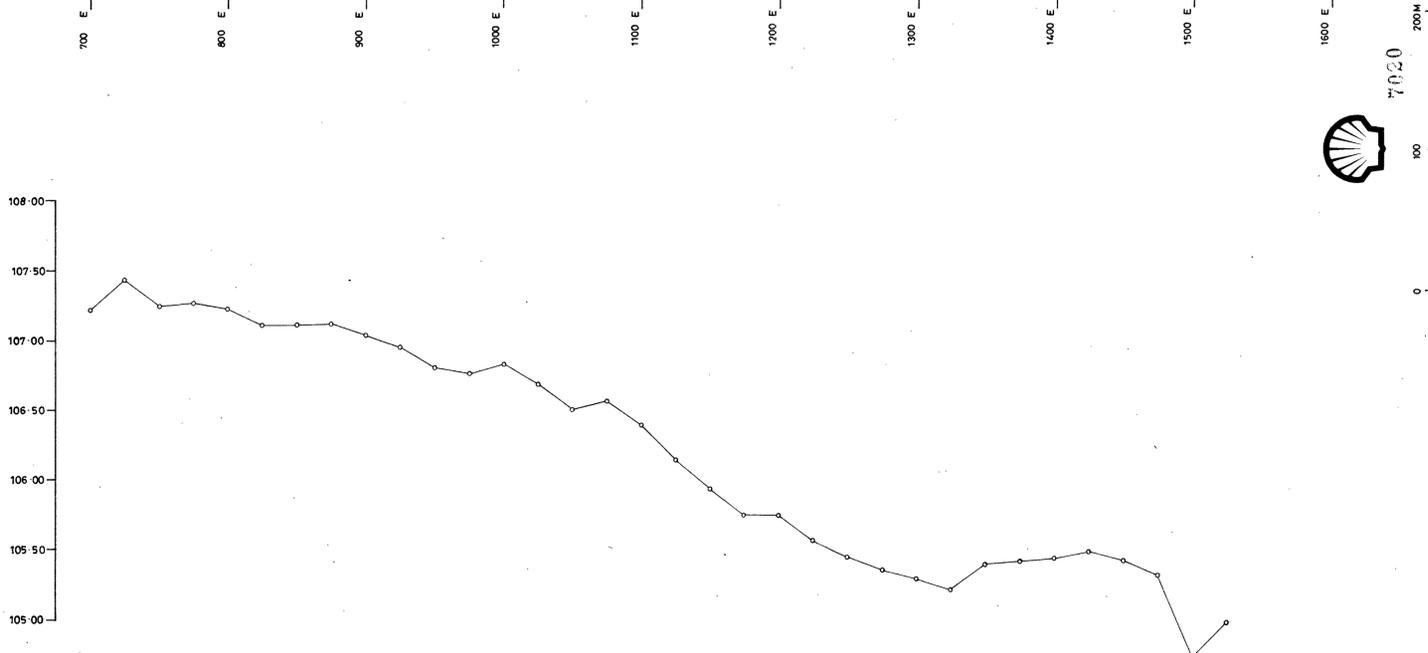
83-2040



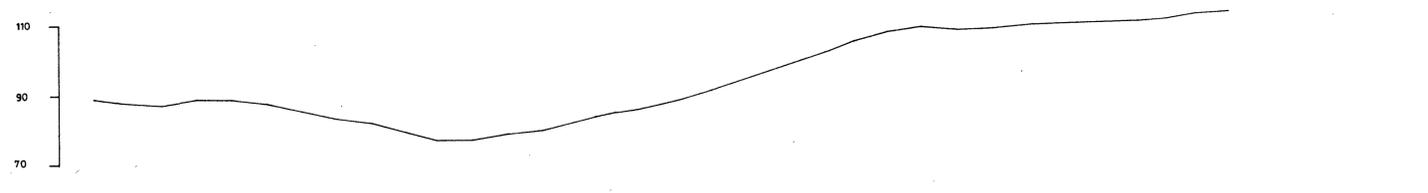
7020

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8777 RIANA	
NATONE	
LINE 1200 N	
— BOUGUER GRAVITY	
— ELEVATION	
— MAX-MIN	
— GROUND MAGNETICS	
SCALE	DATE
AUTHOR	G. OAKES
OFFICE	DEVONPORT
ENCL. No.	
DRAWN	H.L.S.
REP. No.	
DRG. No.	DM/004478

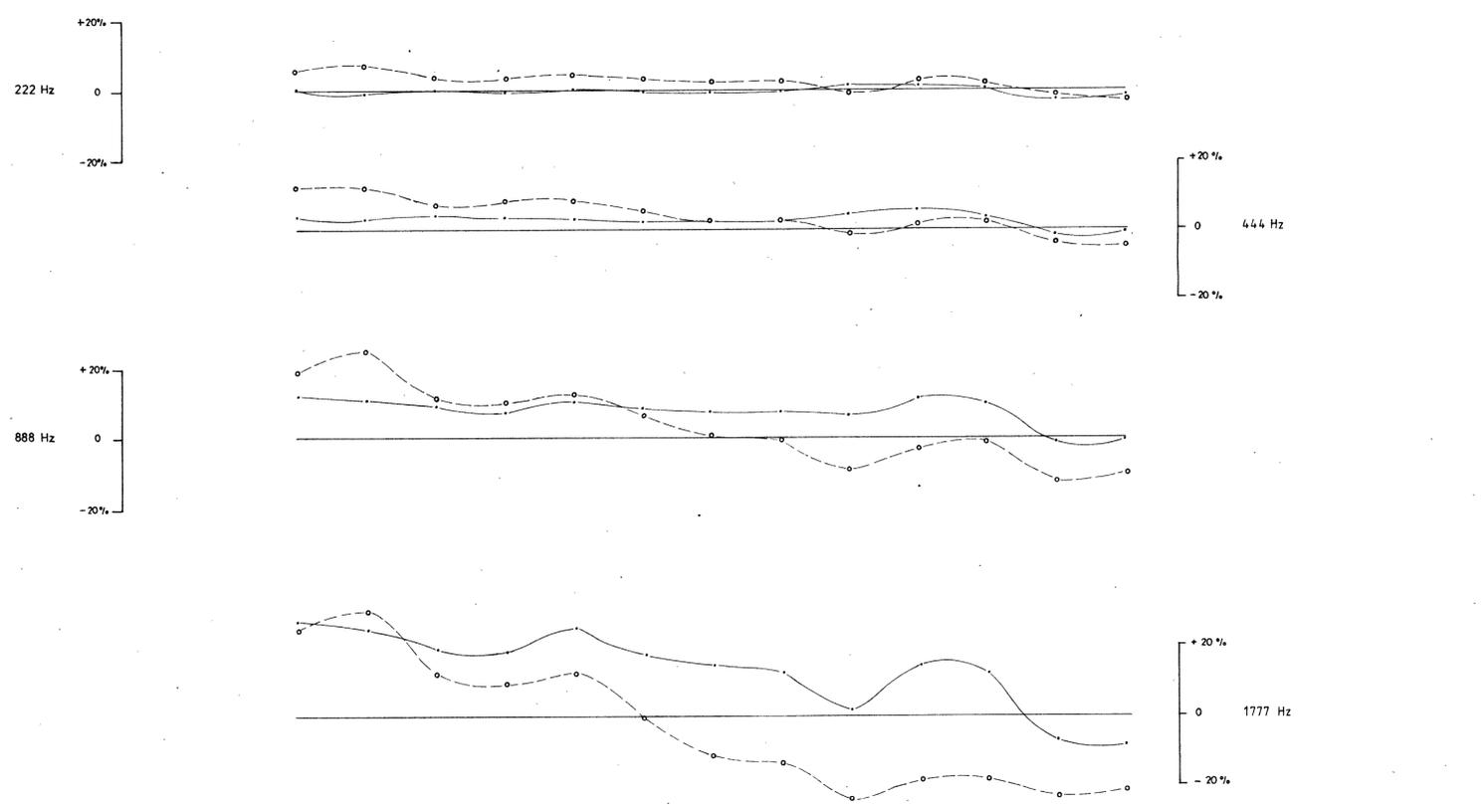
BOUGUER GRAVITY
 DENSITY = 2.70
 READING SCALE = MGAL
 NOT TERRAIN CORRECTED



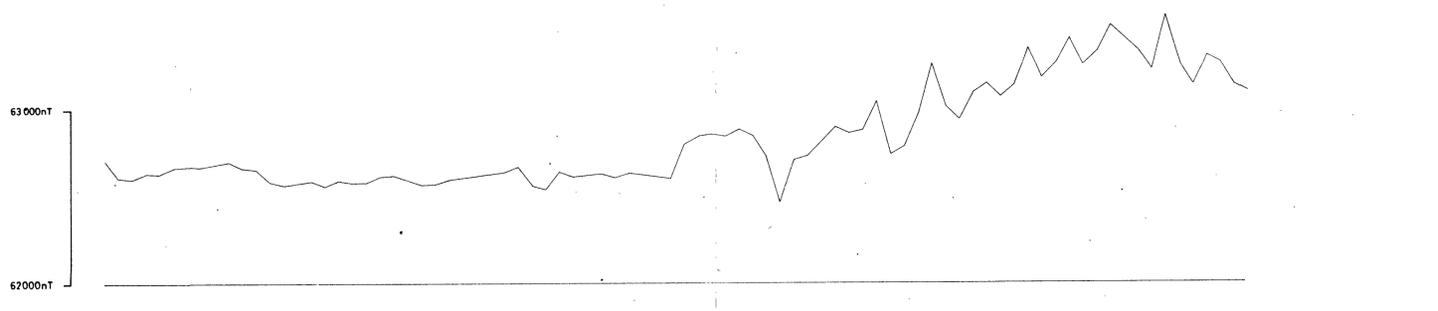
ELEVATION
 METRES



MAX-MIN
 COIL SEPARATION = 200M
 IN PHASE ———
 OUT PHASE - - - - -



GROUND MAGNETICS
 READING SCALE = 200nT/cm



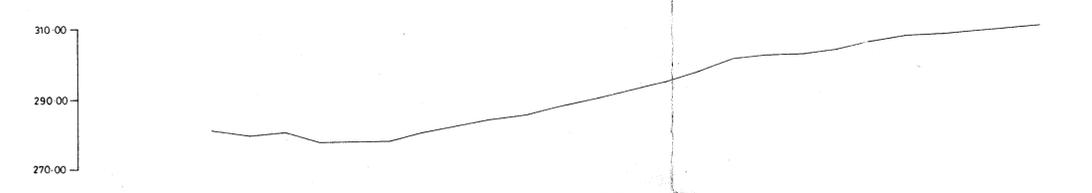
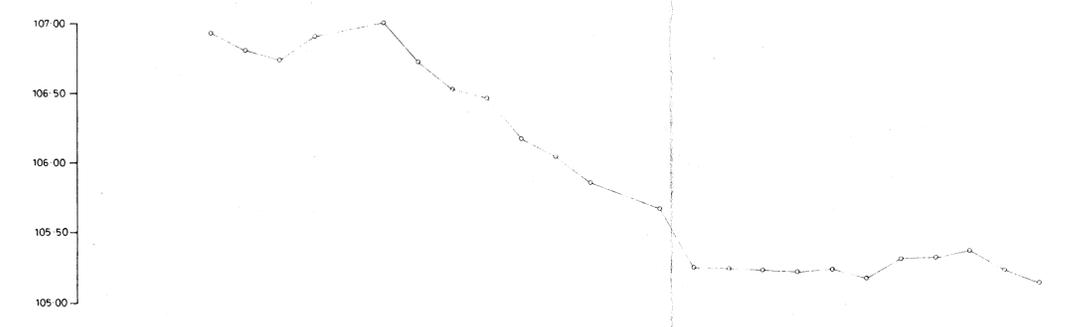
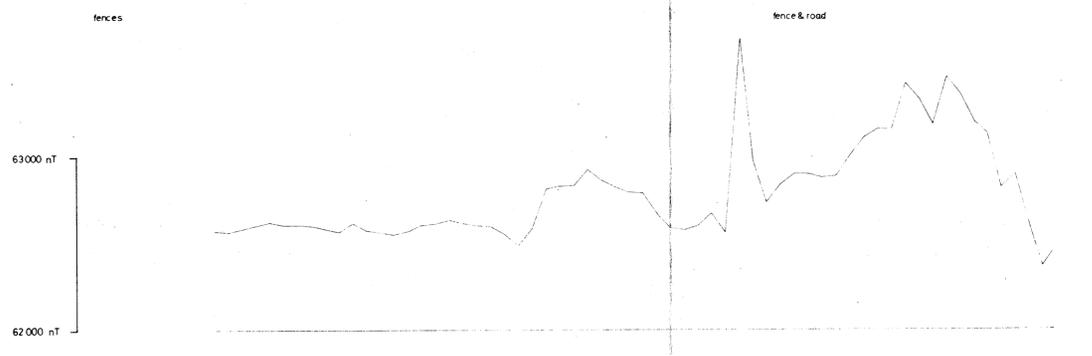
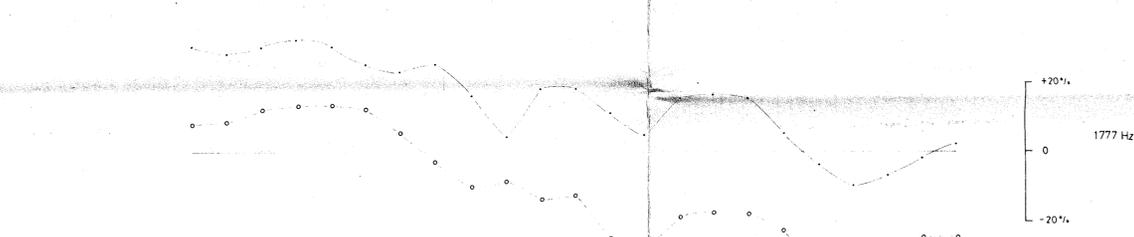
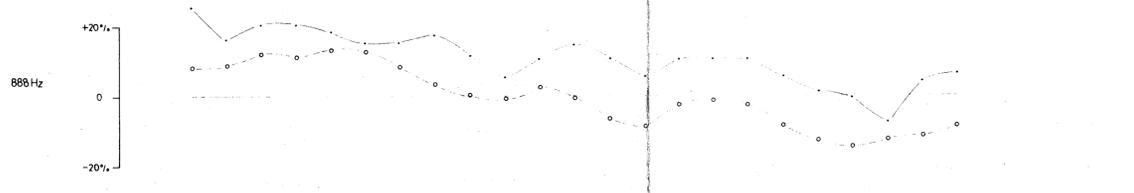
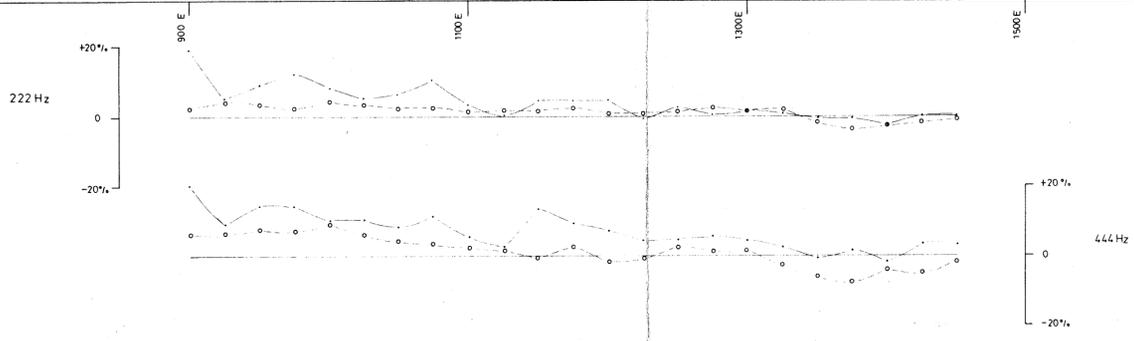
514136

5 cm

83-2040

MAX-MIN

COIL SEPARATION = 200 M
IN PHASE 
OUT PHASE 



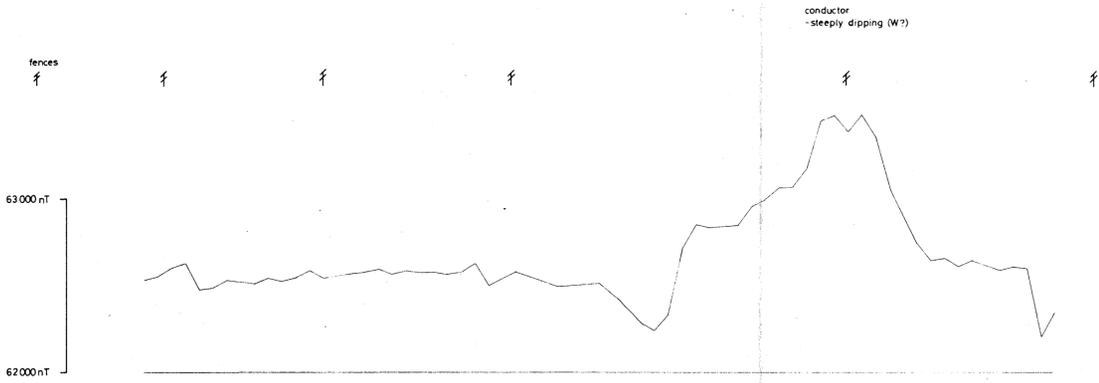
7021

The Shell Company of Australia Limited	
METALS DIVISION	
E.L. 8/77 RIANA	
NATONE - LINE 1150 N	
- MAX-MIN	
- GROUND MAGNETICS	
- BOUGUER GRAVITY	
- ELEVATION	
SCALE 1:7500	DATE 9-11-87
AUTHOR G.ONES	DRAWN H.L.S.
OFFICE DEWOPORT	REP'NO.
ENCL. No.	DRG. No. D/M004/148

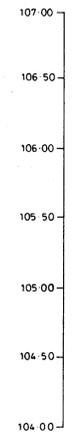
514137
6 cm

83-2040

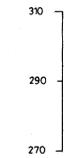
MAX-MIN
 COIL SEPARATION=200M
 IN PHASE ———
 OUT PHASE ○-○-○



GROUND MAGNETICS
 READING SCALE = 200 nT/cm



BOUGUER GRAVITY
 DENSITY = 2.70
 READING SCALE = MAGL



ELEVATION
 METRES

900E 1100E 1300E 1500E

7023

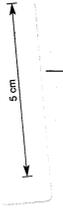


The Shell Company of Australia Limited
 METALS DIVISION

E.L. 8/77 RIANA
 NATONE - LINE 1050 N
 - MAX-MIN
 - GROUND MAGNETICS
 - BOUGUER GRAVITY
 - ELEVATION

SCALE	1: 2500	DATE	8-11-82
AUTHOR	G. OAKES	DRAWN	H.L.S.
OFFICE	BEVERPORT	REP. No.	
ENCL. No.		DRG. No.	D/M002/145

514139



83-2040

700 E 800 E 900 E 1000 E 1100 E 1200 E 1300 E 1400 E 1500 E 1600 E 1650 E

7024



The Shell Company of Australia Limited	
METALS DIVISION	
E.L. 8/77 RIANA	
NATONE	
LINE 1000 N	
- BOUGUER GRAVITY	
- ELEVATION	
- MAX-MIN	
- GROUND MAGNETICS	
SCALE 1:2500	DATE 8-9-82
AUTHOR G. DAKES	DRAWN H.L.S.
OFFICE DEVOIRPT	REP. No.
ENCL. No.	DRG. No. D/MS04/77. A

BOUGUER GRAVITY
DENSITY = 2.70
READING SCALE = MGAL (1 cm = 0.30 MAGL.)
NOT TERRAIN CORRECTED

108.00
107.00
106.80
106.20
105.60
105.00
104.40
103.80
103.20
102.60
102.00

110
90
70

ELEVATION
METRES

MAX-MIN
COIL SEPARATION = 200M
IN PHASE
OUT PHASE

+20%
0
-20%
222 Hz

+40%
+20%
0
-20%
888 Hz

+20%
0
-20%
444 Hz

+40%
+20%
0
-20%
1777 Hz

GROUND MAGNETICS
READING SCALE = 200 nT/cm

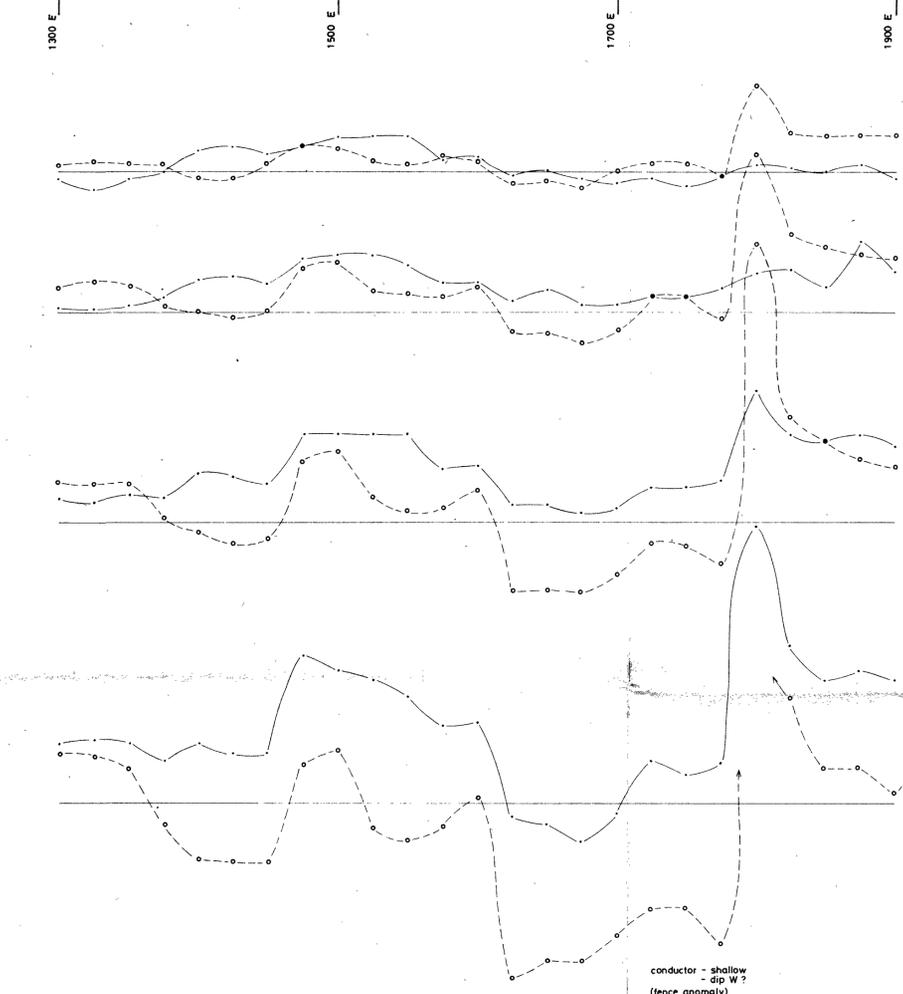
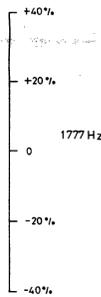
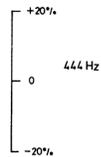
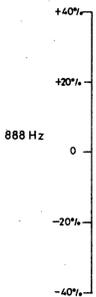
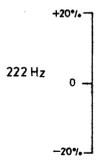
63000 nT
62000 nT

514140



83-2040

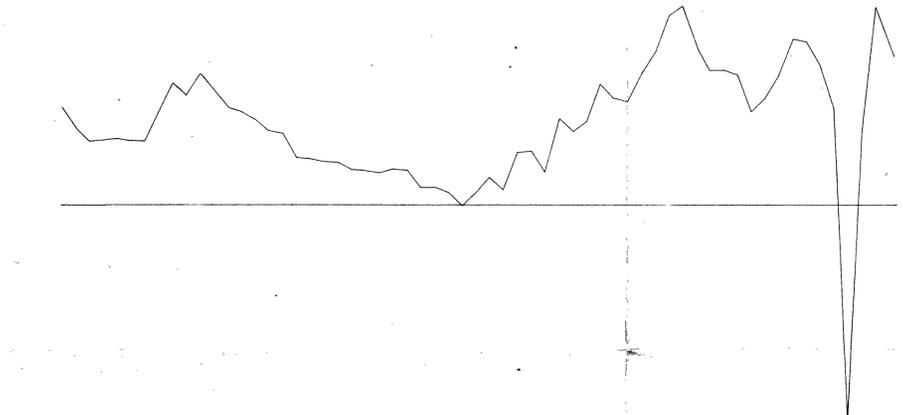
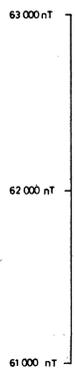
MAX-MIN
 COIL SEPARATION = 200M
 IN PHASE ———
 OUT PHASE - - -



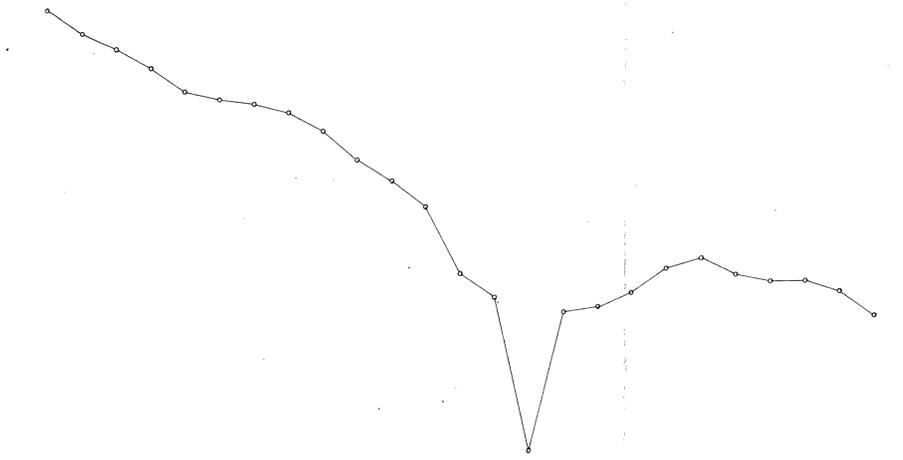
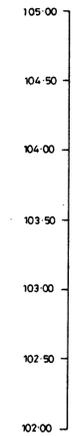
conductor - shallow
 dip W?
 (fence anomaly)

fences / fence & road / conductor - shallow dip W? (fence anomaly)

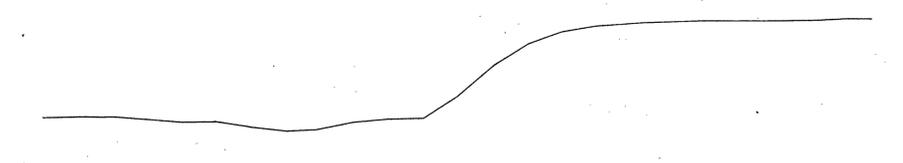
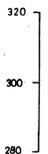
GROUND MAGNETICS
 READING SCALE = 200 nT/cm



BOUGUER GRAVITY
 DENSITY 2.70
 READING SCALE = MAGL



ELEVATION
 METRES



7025

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA	
NATONE	
LINE 950 N	
- MAX-MIN	
- GROUND MAGNETICS	
- BOUGUER GRAVITY	
- ELEVATION	
SCALE 1: 2500	DATE 5-11-82
AUTHOR G. OAKES	DRAWN H.L.S.
OFFICE DEVONPORT	REP. No.
ENCL. No.	DRG. No. D/M004/144

514141



83-2040

700 E 900 E 1100 E 1300 E 1500 E 1700 E

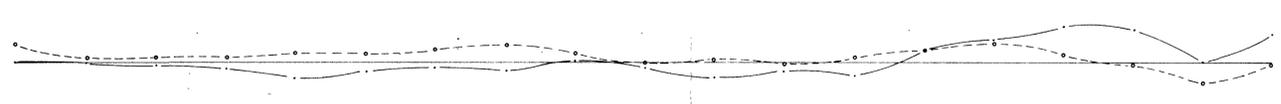
7026



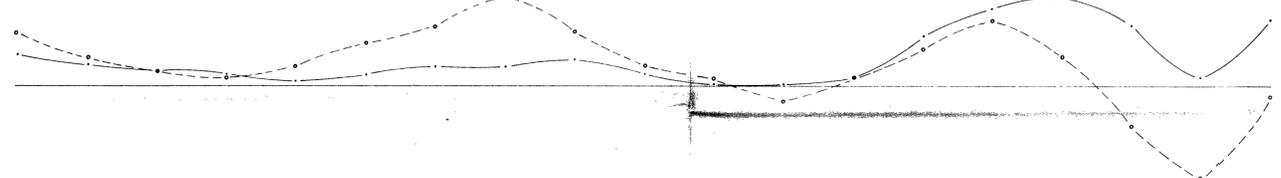
The Shell Company of Australia Limited METALS DIVISION			
E. L. 8177 RIANA			
NATONE			
LINE 900 N			
- MAX-MIN			
- GROUND MAGNETICS			
- BOUGUER GRAVITY			
- ELEVATION			
SCALE	1:2500	DATE	20-9-82
AUTHOR	G. OAKES	DRAWN	H.L.S.
OFFICE	DEVONPORT	REP. No.	
ENCL. No.		DRG. No.	81/0004/135

MAX-MIN
COIL SEPARATION = 200M

222 Hz
+20%
0
-20%

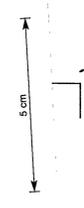


888 Hz
+20%
0
-20%



200 M
+20%
0
-20%

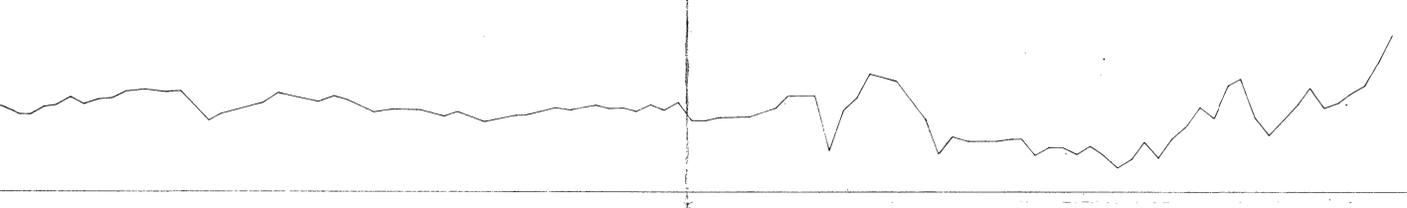
514142



83-2040

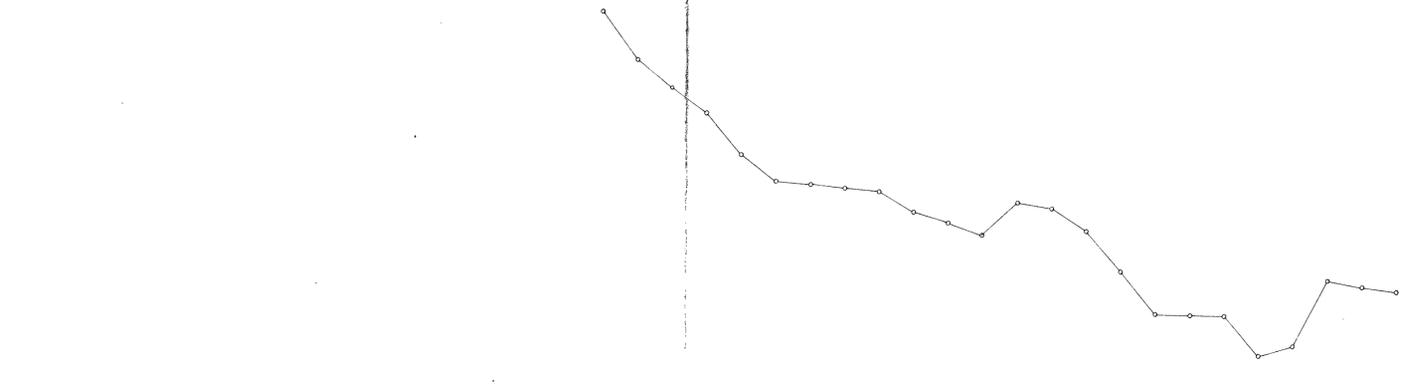
GROUND MAGNETICS
READING SCALE = 200nT/cm

63 000 nT
62 000 nT



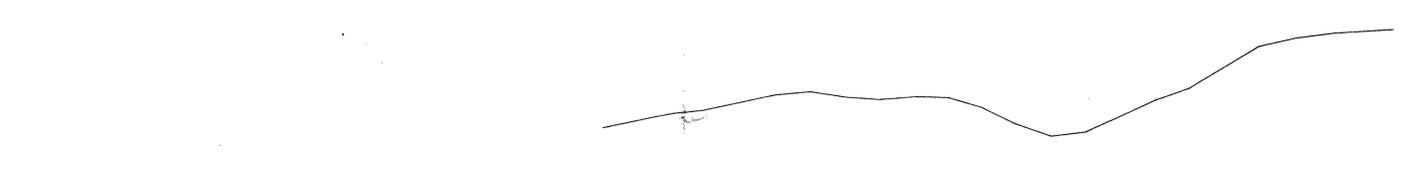
BOUGUER GRAVITY
DENSITY = 2.70
READING SCALE = MAGL

105.00
104.50
104.00
103.50
103.00
102.50



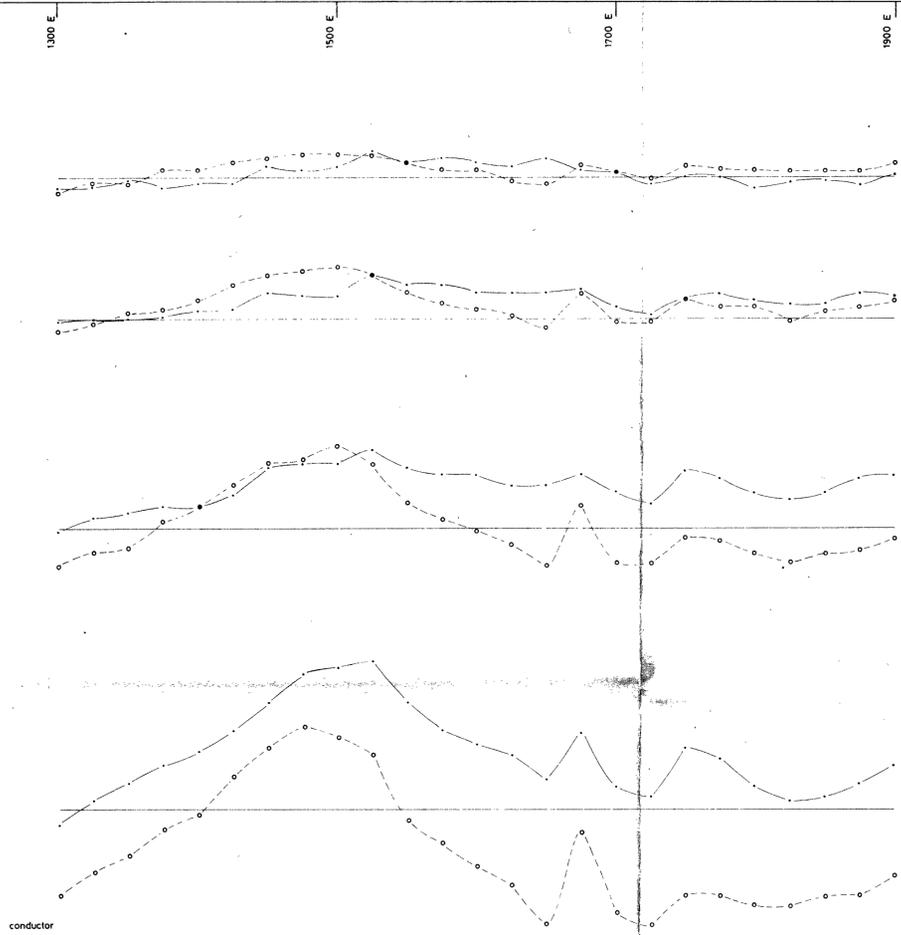
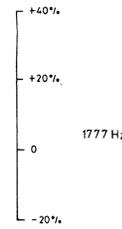
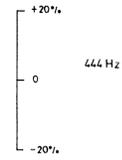
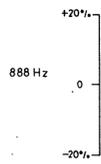
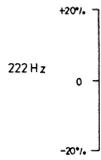
ELEVATION
METRES

320
300
280



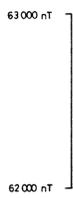
MAX-MIN

COIL SEPARATION = 200M
IN PHASE ———
OUT PHASE ○—○—○



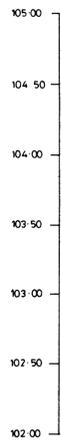
GROUND MAGNETICS

READING SCALE = 200 nT/cm



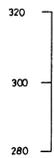
BOUGUER GRAVITY

DENSITY = 2.70
READING SCALE = MAGL



ELEVATION

METRES



7027

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8177 RIANA
NATONE - LINE 850N
- MAX-MIN
- GROUND MAGNETICS

SCALE	1: 2400	DATE	8-11-82
AUTHOR	C. GAMES	DRAWN	W.L.S.
OFFICE	DEVOHPORT	REP. NO.	
ENCLOSURE		DRG. NO.	D/4002/147

514143

5 cm

83-2040

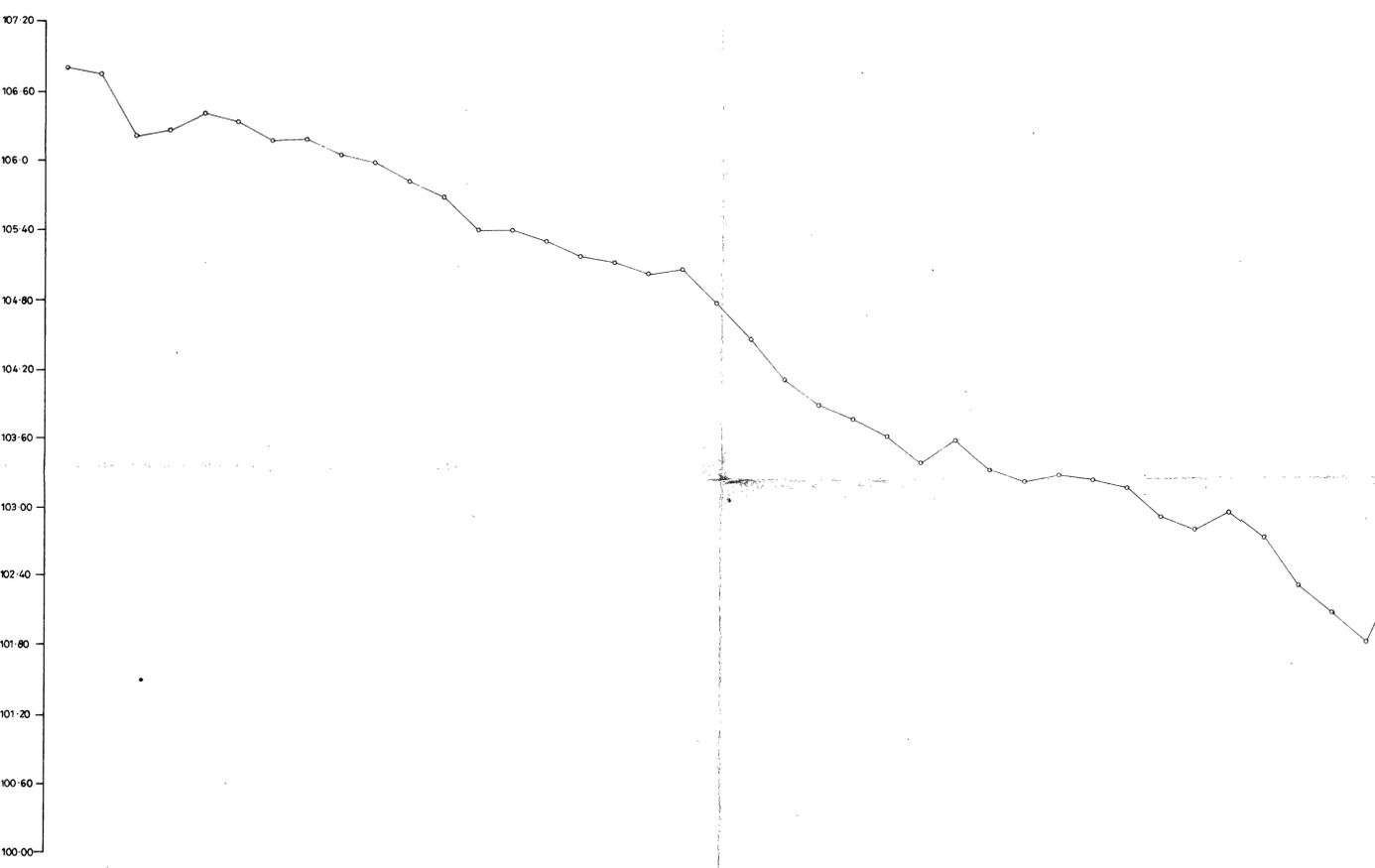
700 E 800 E 900 E 1000 E 1100 E 1200 E 1300 E 1400 E 1500 E 1600 E 1650 E 200M



7038

The Shell Company of Australia Limited	
METALS DIVISION	
E.L. 8/77 RIANA	
NATONE	
LINE 800N	
— BOUGUER GRAVITY	
— ELEVATION	
— MAX—MIN	
— GROUND MAGNETICS	
SCALE	1:2500
DATE	8-9-82
AUTHOR	G. OAKES
DRAWN	H.L.S.
OFFICE	DEVONPORT
REP. NO.	
ENCL. No.	
DRG. No.	D4M802/72A

BOUGUER GRAVITY
 DENSITY = 270
 READING SCALE = MGAL (1 cm = 0.30 MGAL)
 NOT TERRAIN CORRECTED

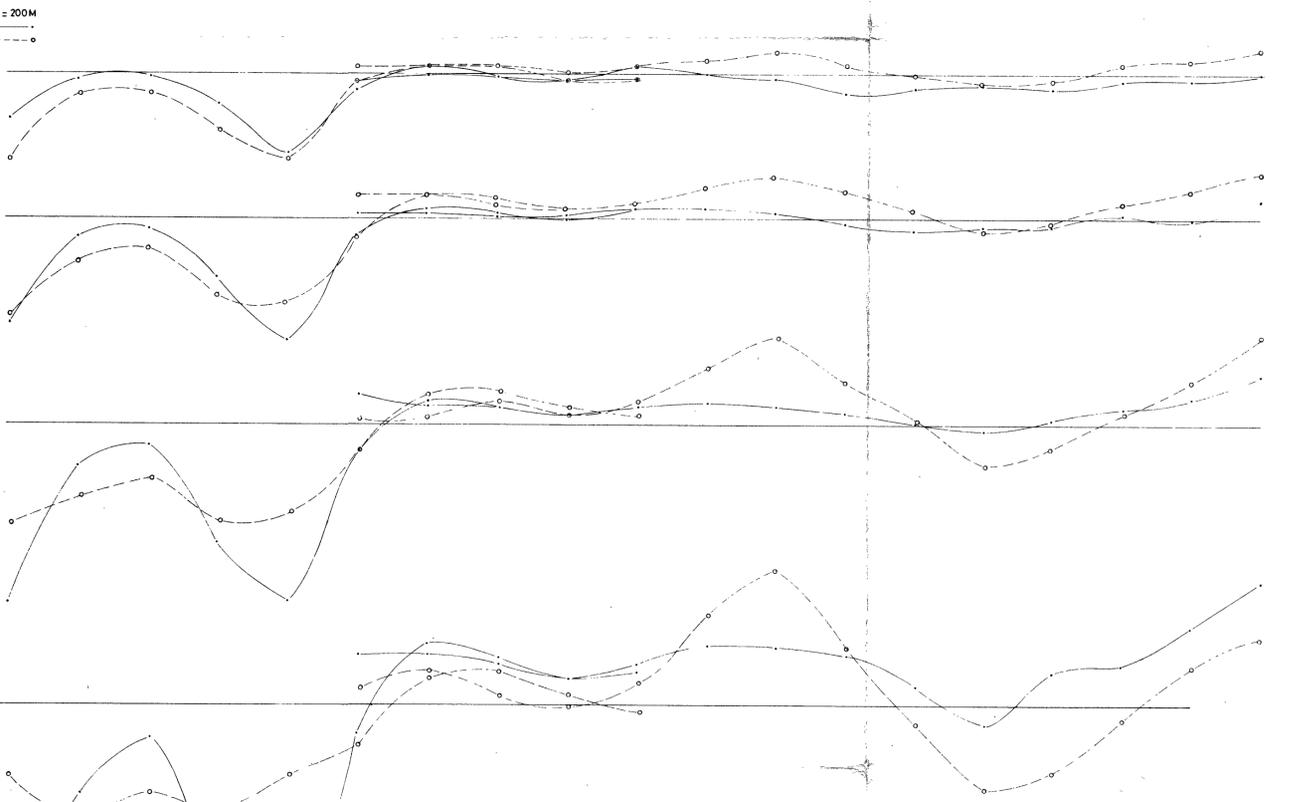


ELEVATION
 METRES



MAX-MIN

COIL SEPARATION = 200M
 IN PHASE ———
 OUT PHASE - - - - -



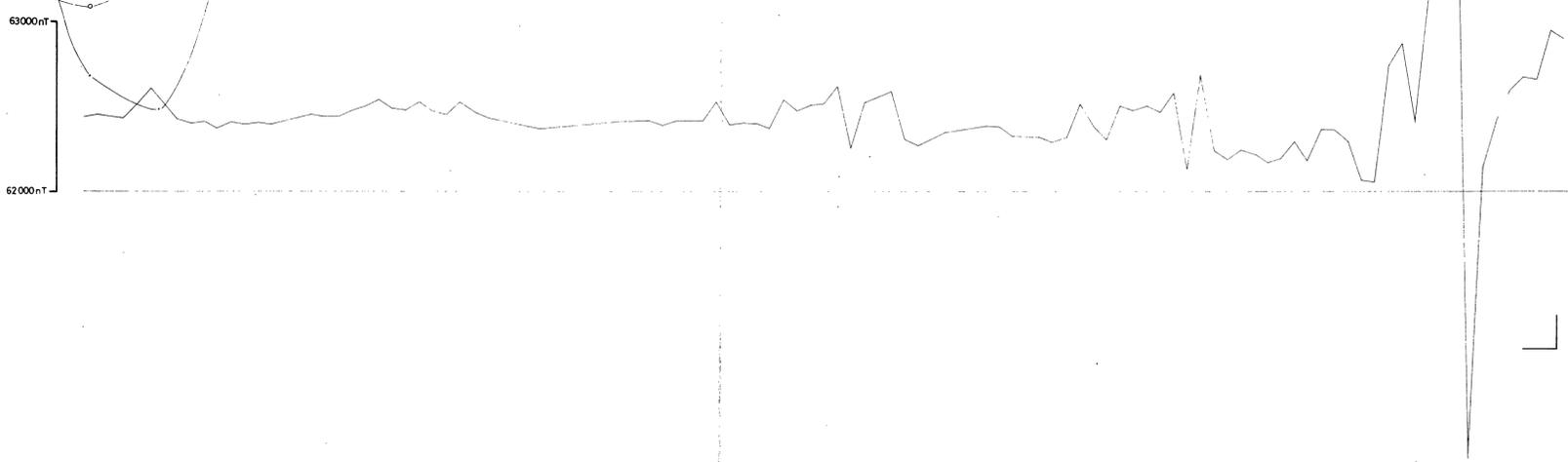
+20%
0
-20%
222 Hz

+20%
0
-20%
444 Hz

+40%
+20%
0
-20%
-40%
888 Hz

+40%
+20%
0
-20%
-40%
1777 Hz

GROUND MAGNETICS
 READING SCALE = 200 nT/cm

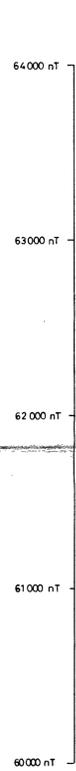
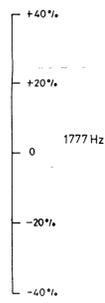
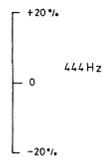
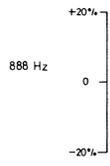
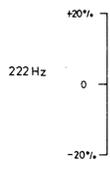


514144

5 cm

83-2040

MAX-MIN
 COIL SEPARATION = 200
 IN PHASE ———
 OUT PHASE ○—○



GROUND MAGNETICS
 READING SCALE = 200 nT/cm

fences

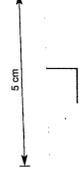
f f f f



7029

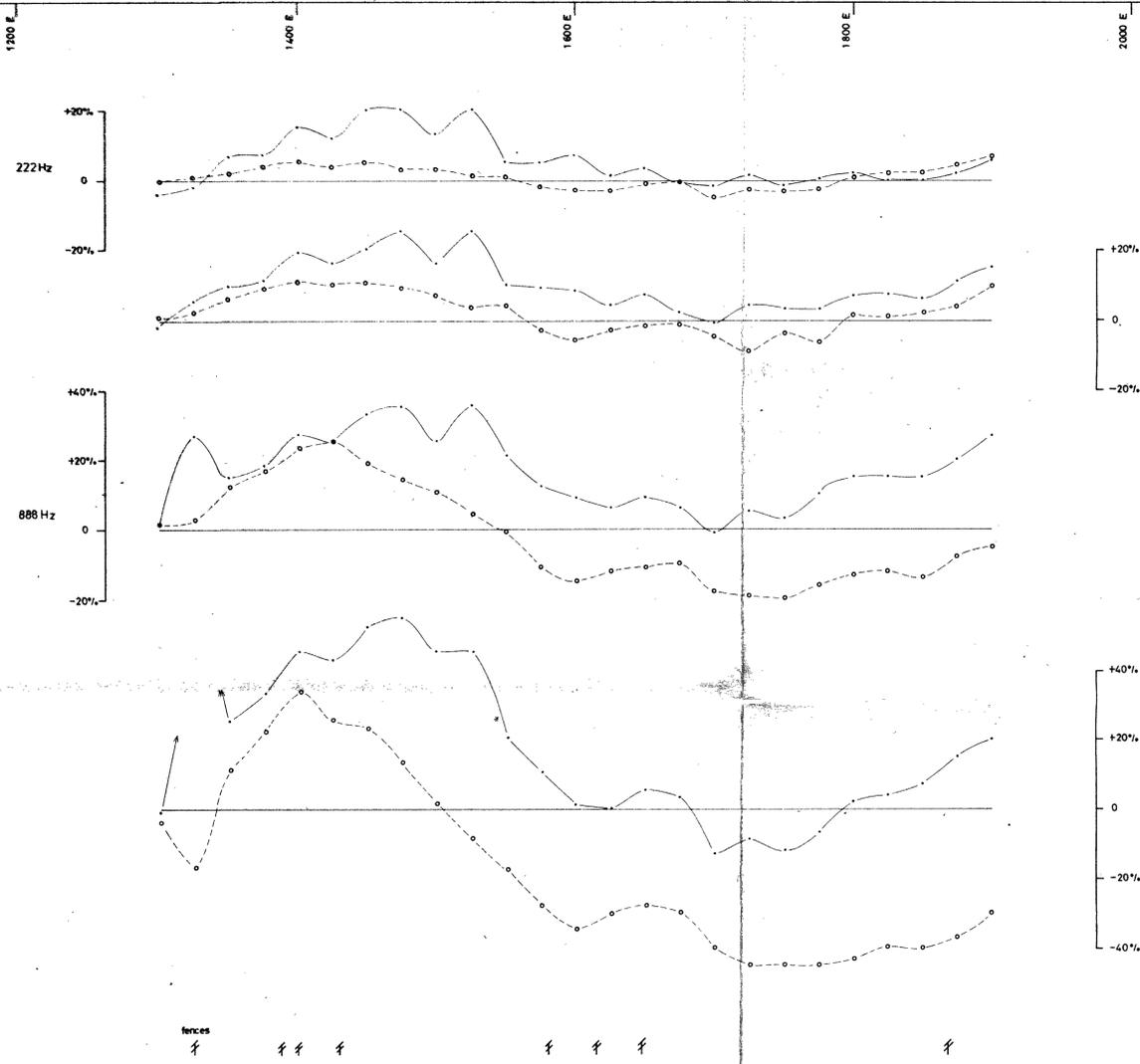
The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE - LINE 800 N - MAX-MIN - GROUND MAGNETICS	
SCALE 1:2500	DATE 9-11-82
AUTHOR C. JAMES	DRAWN R.L.S.
OFFICE DEWONPORT	REP. No.
ENCL. No.	DRG. No. D7/M004/123 B

514145

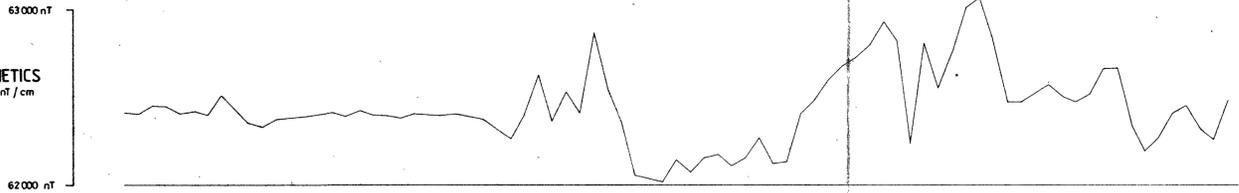


83-2040

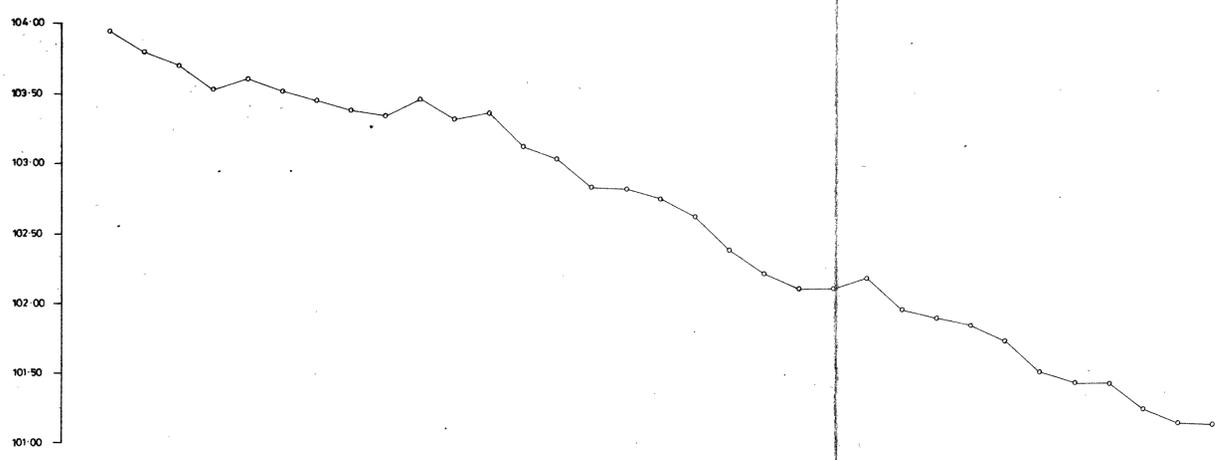
MAX-MIN
 COIL SEPARATION = 200M
 IN PHASE ———
 OUT PHASE - - - - -



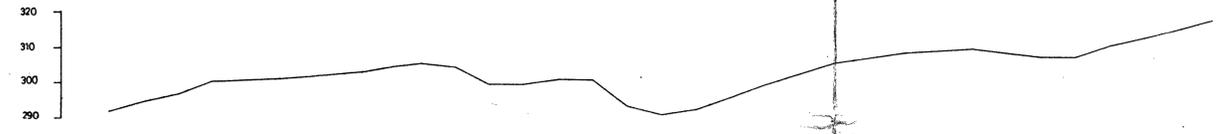
GROUND MAGNETICS
 READING SCALE = 200 nT / cm



BOUGUER GRAVITY
 DENSITY = 2.70
 READING SCALE = MAGL

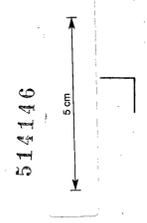


ELEVATION
 METRES

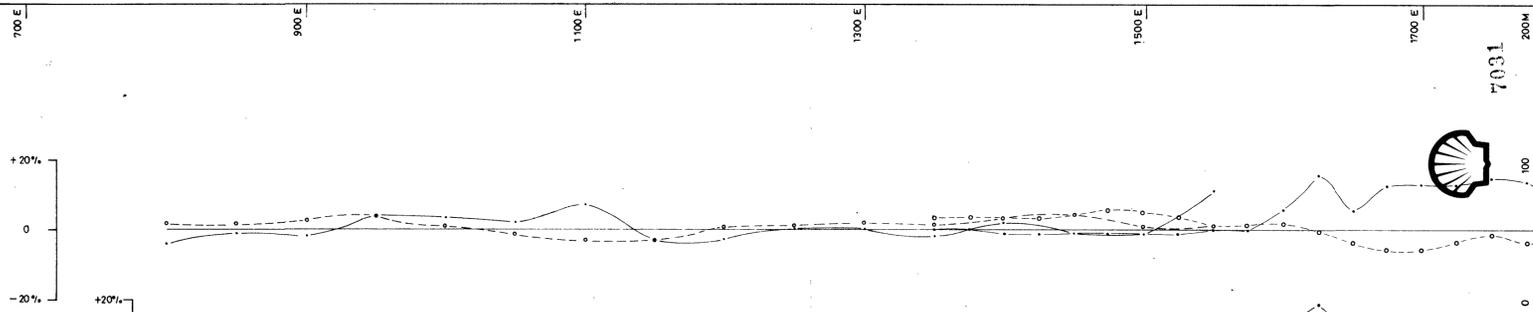


7030
 200M
 0 100 200

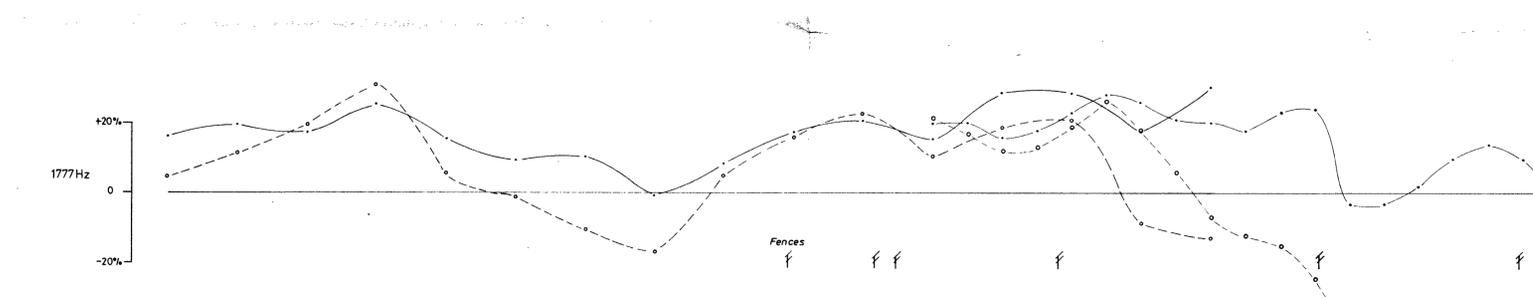
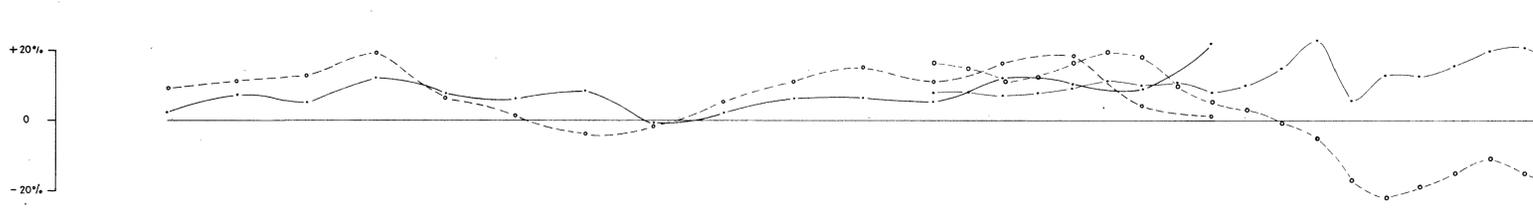
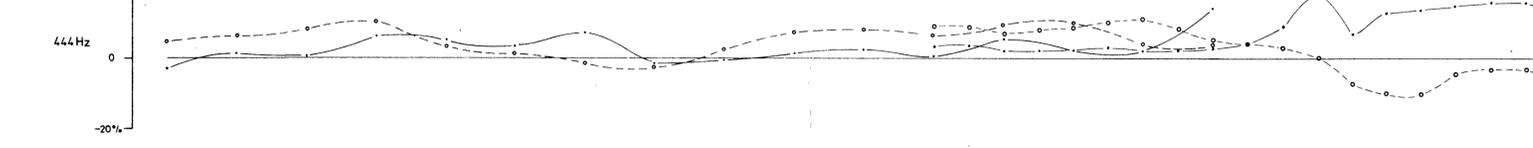
The Shell Company of Australia Limited	
METALS DIVISION	
E.L. 8/77 RIANA	
NATONE — LINE 750N	
— MAX-MIN	
— GROUND MAGNETICS	
— BOUGUER GRAVITY	
— ELEVATION	
SCALE	1:2500
DATE	28-10-82
AUTHOR	G. DAKES
DRAWN	H.L.S.
OFFICE	DEVONPORT
REP. NO.	
ENCL. NO.	
DRG. NO.	D/4036/442



83-2040

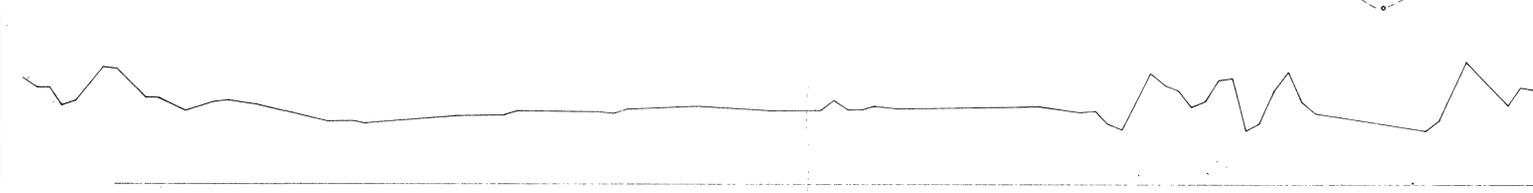


MAX - MIN
COIL SEPARATION = 200M
IN PHASE
OUT PHASE



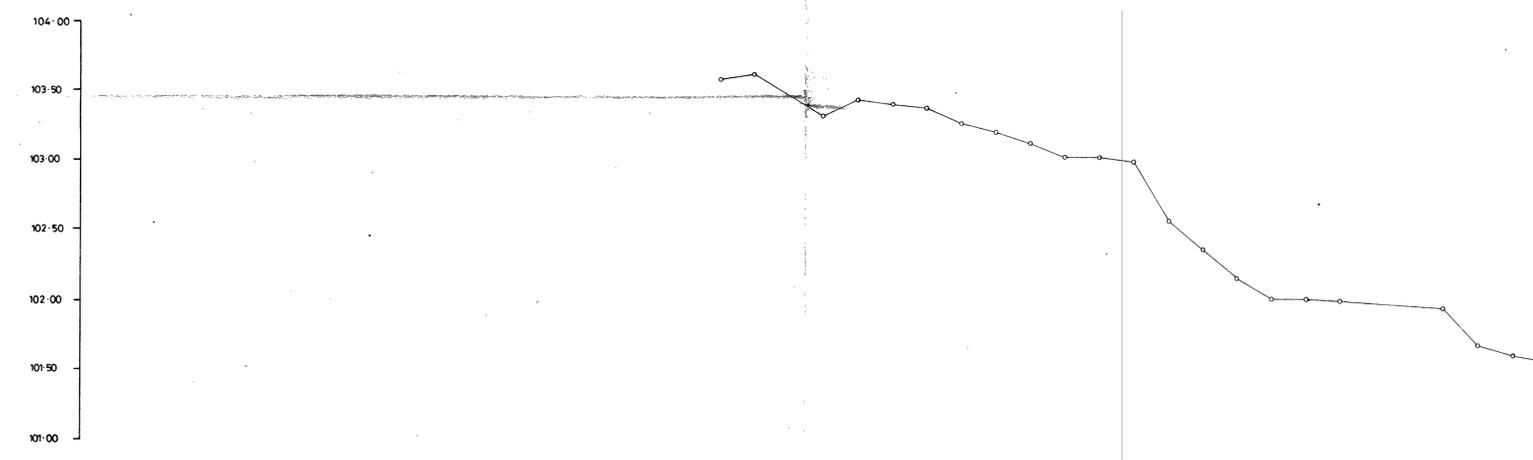
Fences
f f f f f f f

GROUND MAGNETICS
READING SCALE = 200 nT/cm



6 cm

BOUGUER GRAVITY
DENSITY = 2.70
READING SCALE = MAGL



ELEVATION
METRES



7031

The Shell Company of Australia Limited
METALS DIVISION

E.L. 8/77/RIANA

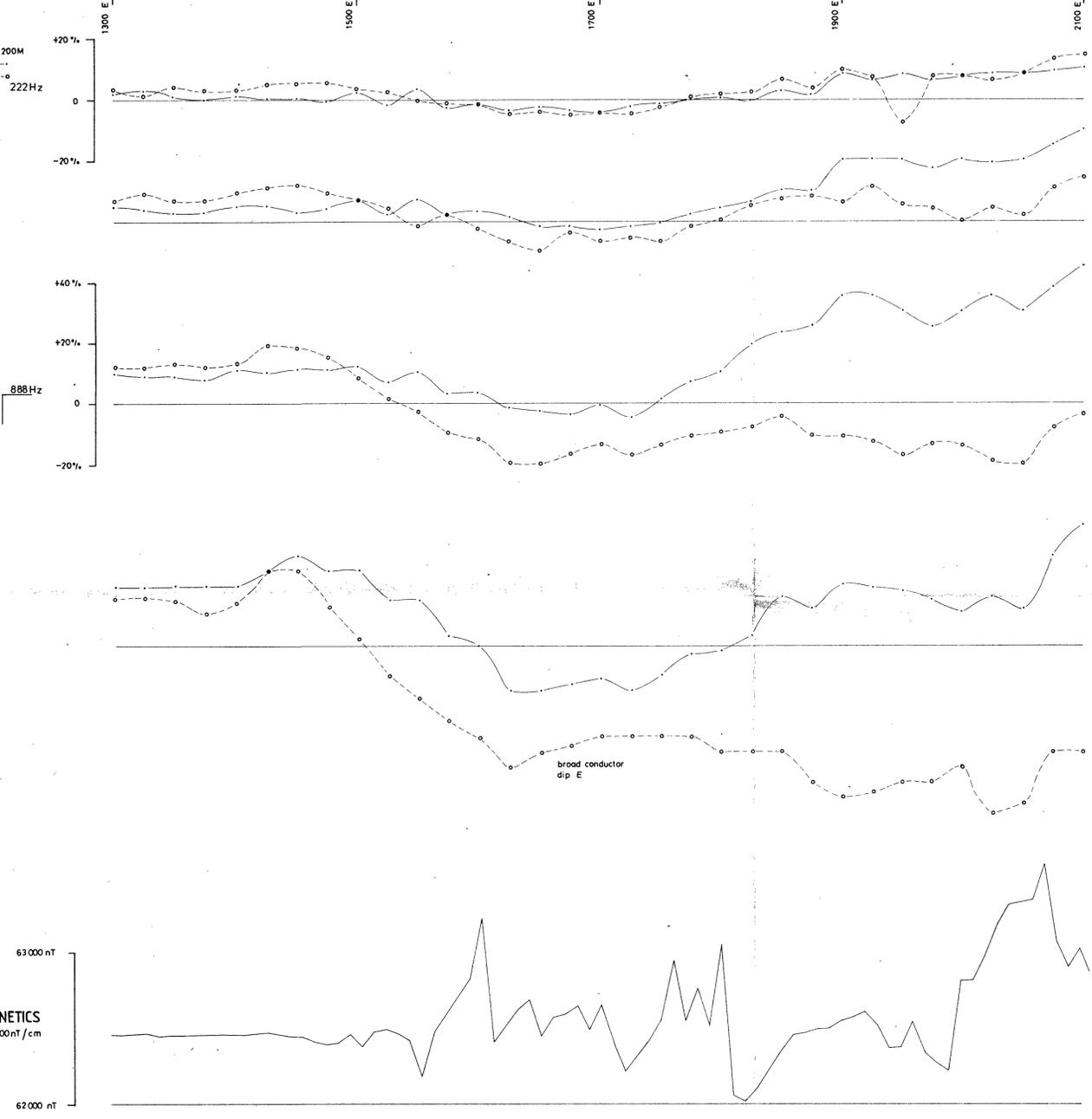
NATION: AUSTRALIA
LINE: 700 N
MAX-MIN
GROUND MAGNETICS
BOUGUER GRAVITY
ELEVATION

SCALE	1:2500	DATE	17-9-82
AUTHOR	G. BAKES	DRAWN	H.L.S.
OFFICE	DEWONPORT	REP. No.	
ENCL. No.		DRG. No.	D/M/82/130

514147

MAX-MIN

COIL SEPARATION = 200M
IN PHASE
OUT PHASE



GROUND MAGNETICS

READING SCALE = 200 nT/cm



The Shell Company of Australia Limited
METALS DIVISION

SCALE	1:2500	DATE	28-10-82
AUTHOR	G. GAMES	DRAWN	H.L.S.
OFFICE	DEVONPORT	REP. No.	
ENCL. No.		DRG. No.	D/M804/141

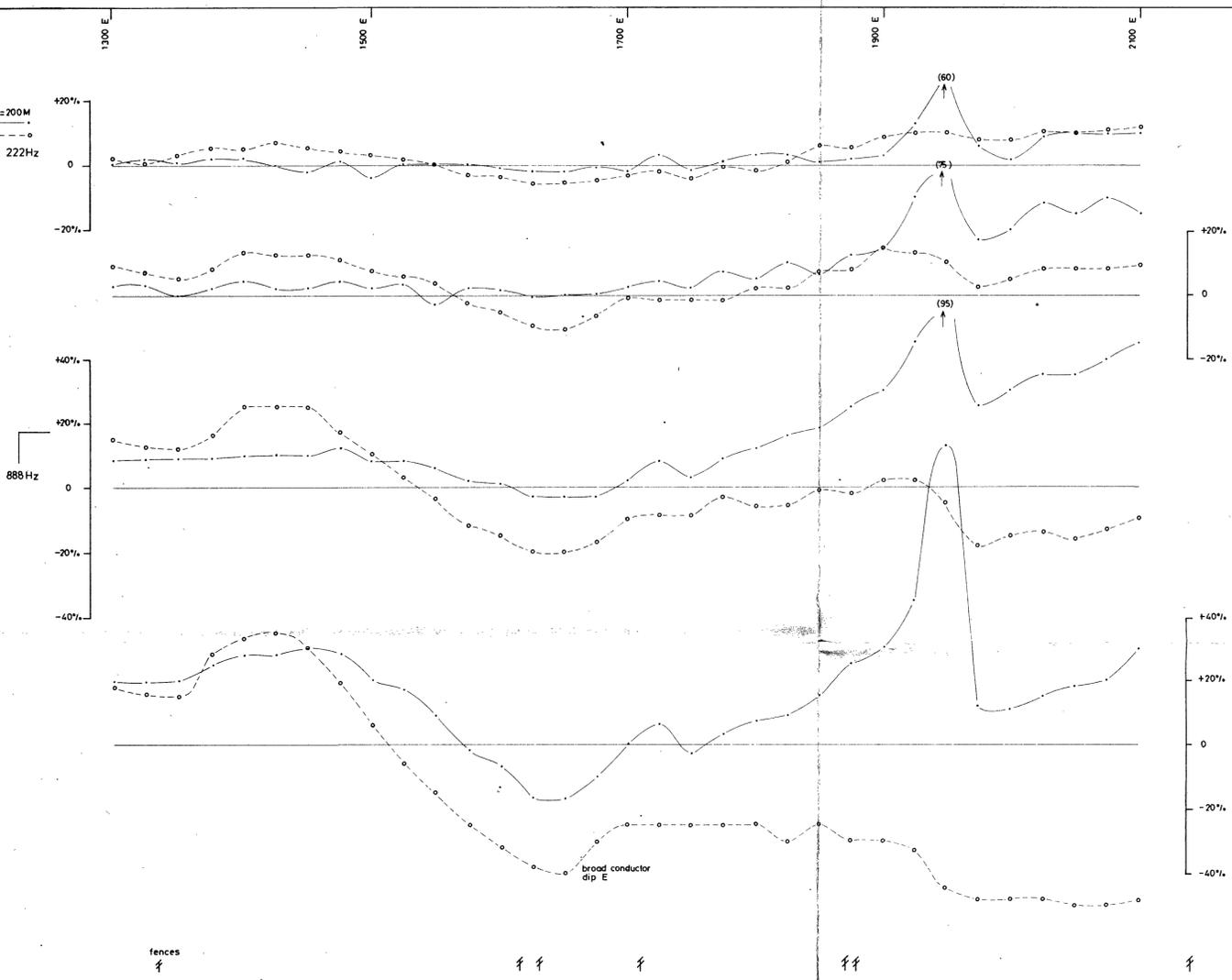
E.L. 8/77 RIANA
NATONE - LINE 650N
- MAX-MIN
- GROUND MAGNETICS



514148
83-2040

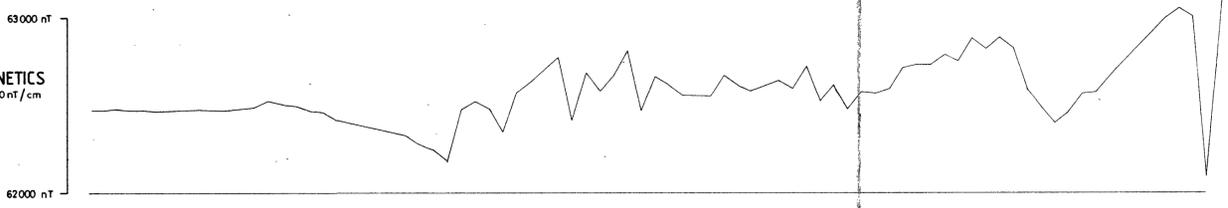
MAX-MIN

COIL SEPARATION = 200M
IN PHASE
OUT PHASE



GROUND MAGNETICS

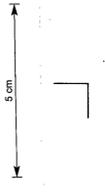
READING SCALE = 200 nT/cm



7033

The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77	RIANA
NATONE - LINE 600 N	
- MAX-MIN	
- GROUND MAGNETICS	
SCALE 1:12500	DATE 27-10-82
AUTHOR G. OAKES	DRAWN H.L.S.
OFFICE DEVONPORT	REP. No.
ENCL. No.	DRG. No. D/M0094/140

514149



83-2040

800 N 900 N 1000 N 1100 N 1200 N 1300 N 1400 N 1500 N 1600 N 1700 N 1800 N

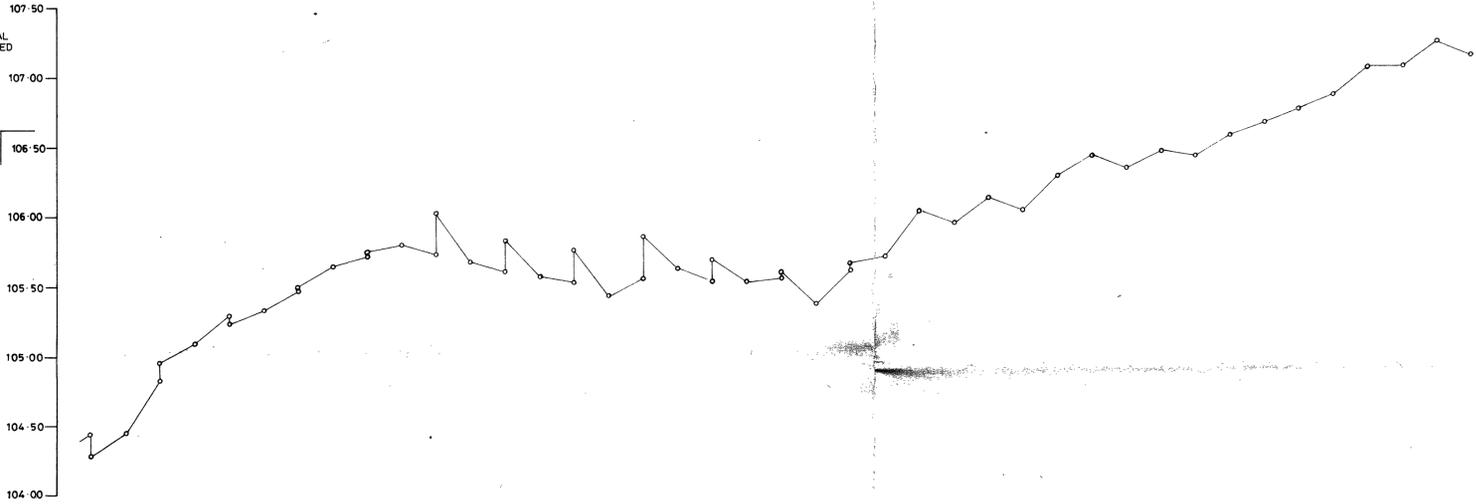
7034



The Shell Company of Australia Limited	
METALS DIVISION	
E.L. 8/77 RIANA	
NATONE	
LINE 1200 E	
- BOUGUER GRAVITY	
- ELEVATION	
- GROUND MAGNETICS	
- MAX-MIN	
SCALE 1:2500	DATE 15-9-82
AUTHOR G. DAKES	DRAWN H.L.S.
OFFICE DEVONPORT	REP. No.
ENCL. No.	DRG. No. 0/10004/128A

BOUGUER GRAVITY

DENSITY = 2.70
READING SCALE = MGAL
NOT TERRAIN CORRECTED



ELEVATION METRES

100
80



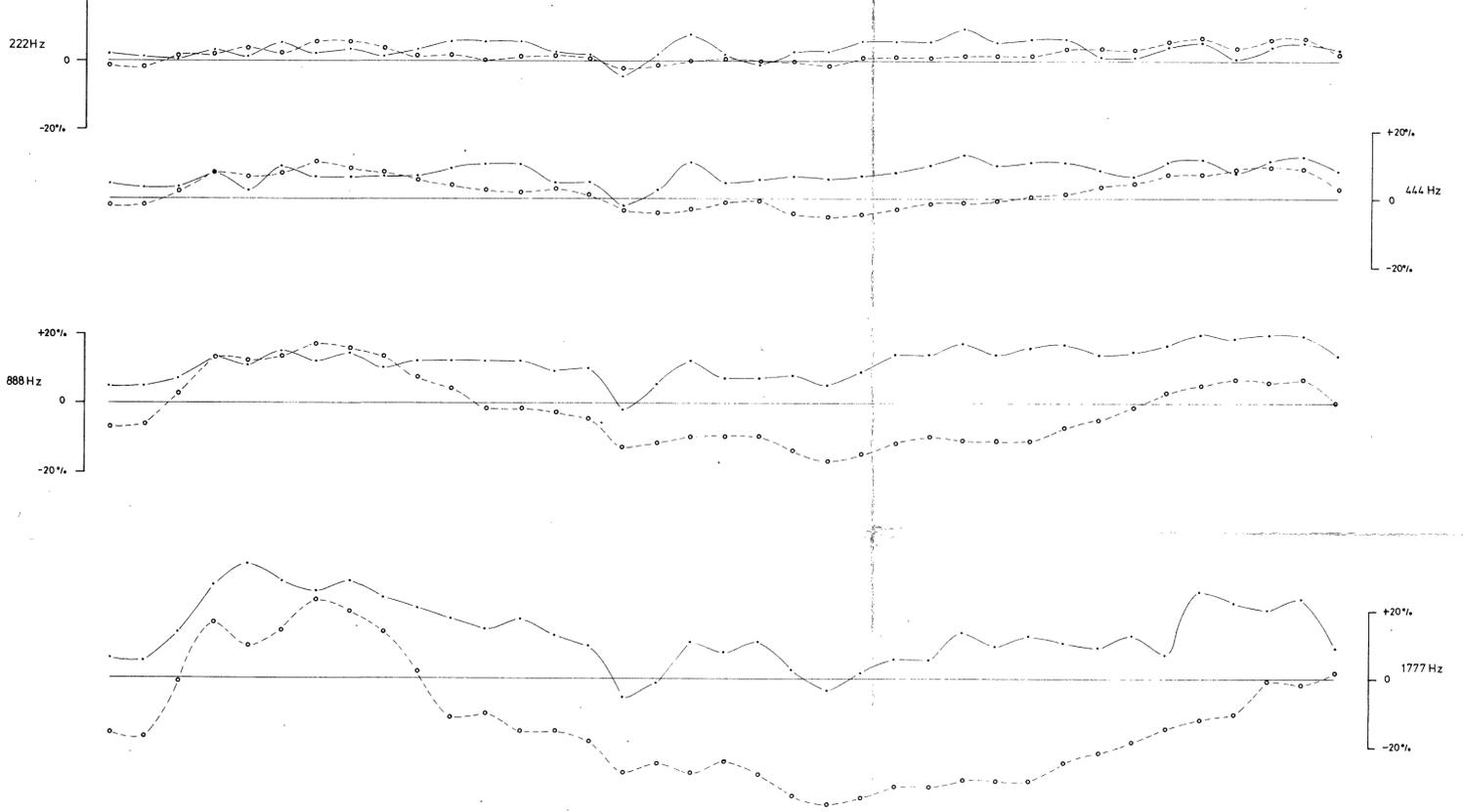
GROUND MAGNETICS

READING SCALE = 200nT/cm



MAX-MIN

COIL SEPARATION = 200M
IN PHASE (solid line)
OUT PHASE (dashed line)

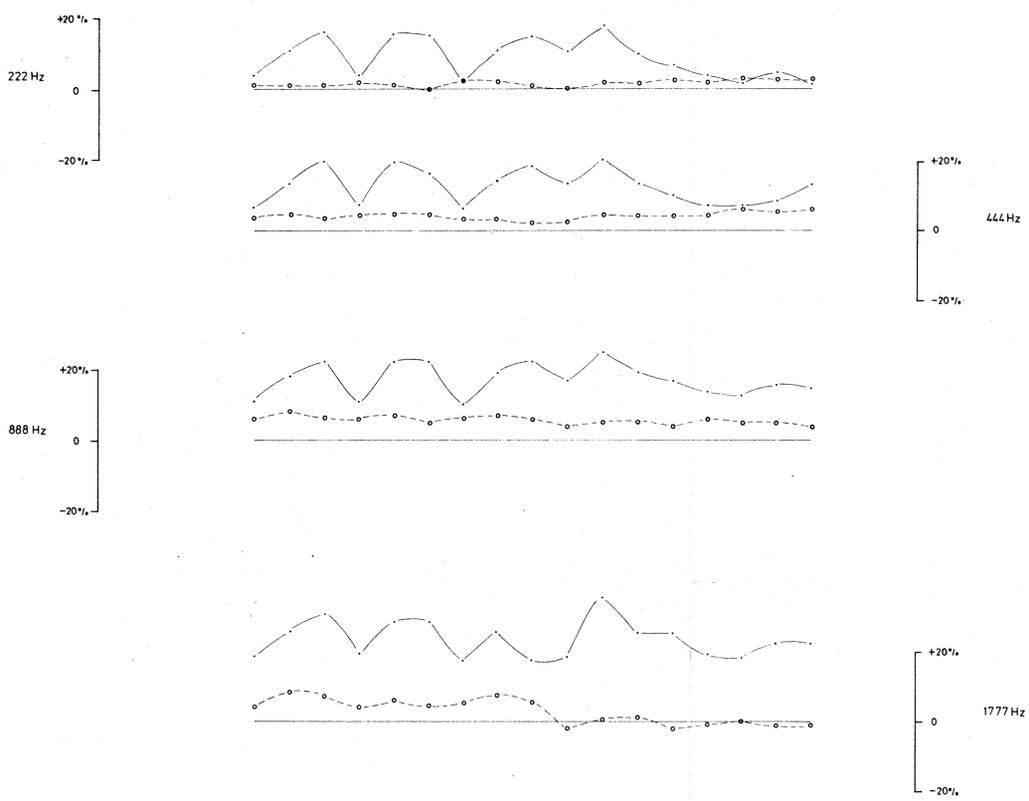


fences fence & road

514150
5 cm

83-2040

MAX-MIN
 COIL SEPARATION = 200M
 IN PHASE ———
 OUT PHASE - - - -



7039

The Shell Company of Australia Limited
 METALS DIVISION

E.L. 8/77 RIANA
 NATONE - LINE 1000 E
 - MAX-MIN
 - GROUND MAGNETICS

SCALE	1: 2500	DATE	8-11-82
AUTHOR	G. OAKES	DRAWN	R.L.S.
OFFICE	DEWONPORT	REP. No.	
ENCL. No.		DRG. No.	D7/M004746

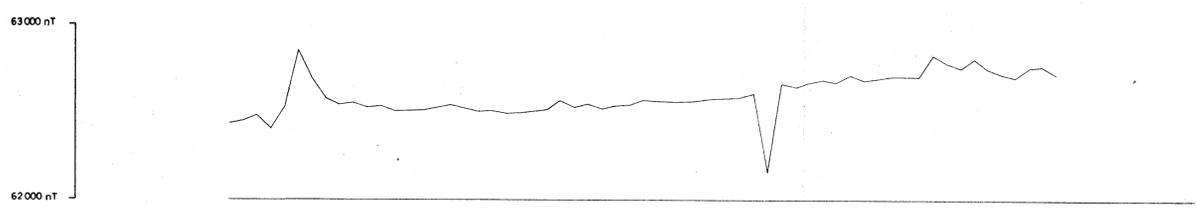
514152



83-2040

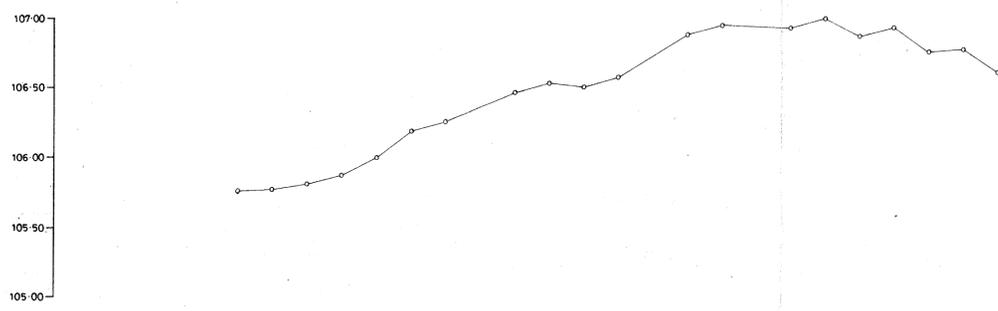
GROUND MAGNETICS

READING SCALE = 200 nT/cm



BOUGUER GRAVITY

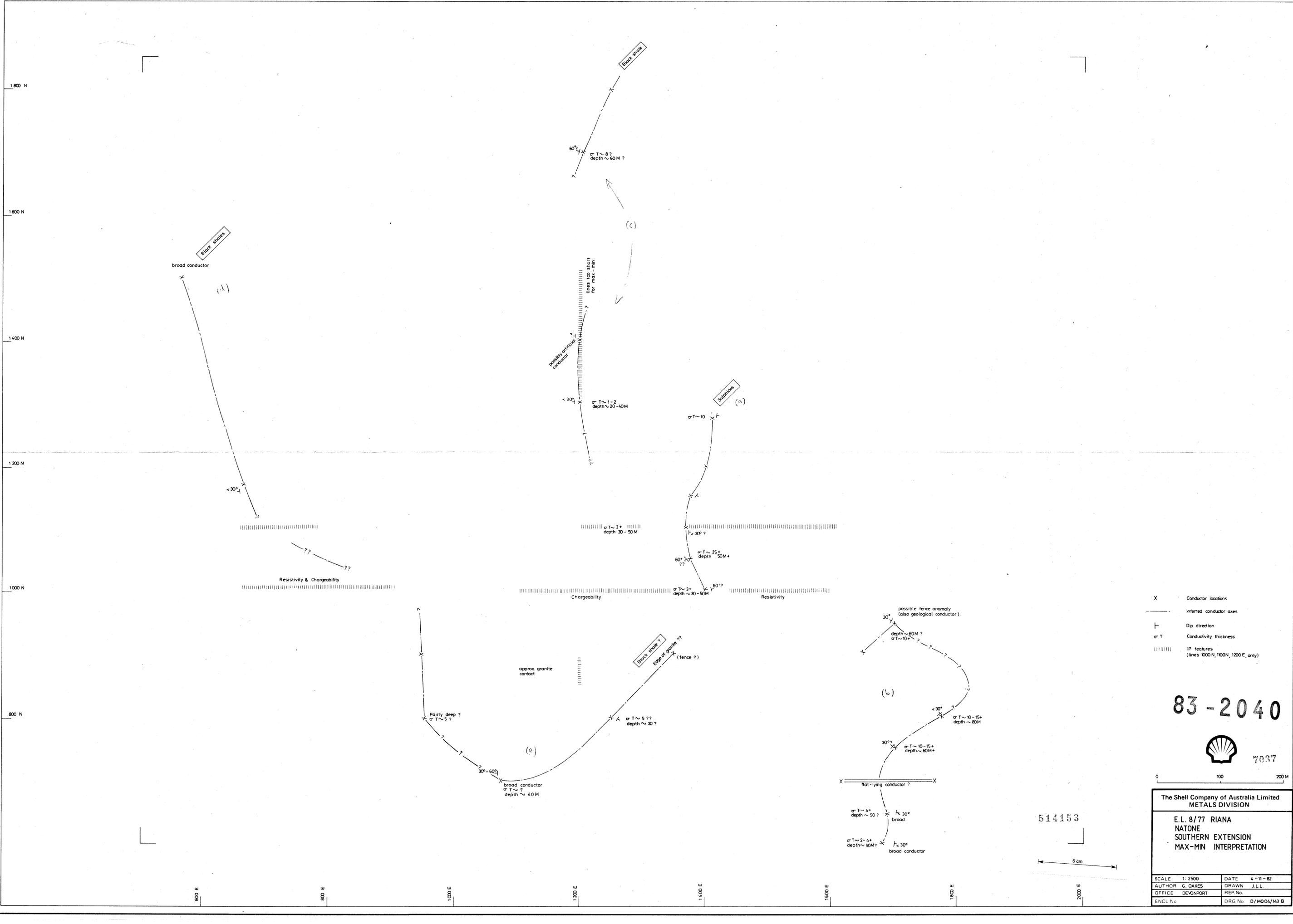
DENSITY = 2.70
 READING SCALE = MAGL



ELEVATION

METRES



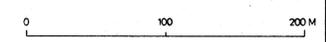


- X Conductor locations
- Inferred conductor axes
- ┆ Dip direction
- σ-T Conductivity thickness
- ||||| IP features (lines 1000 N, 1100 N, 1200 E, only)

83-2040

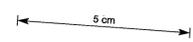


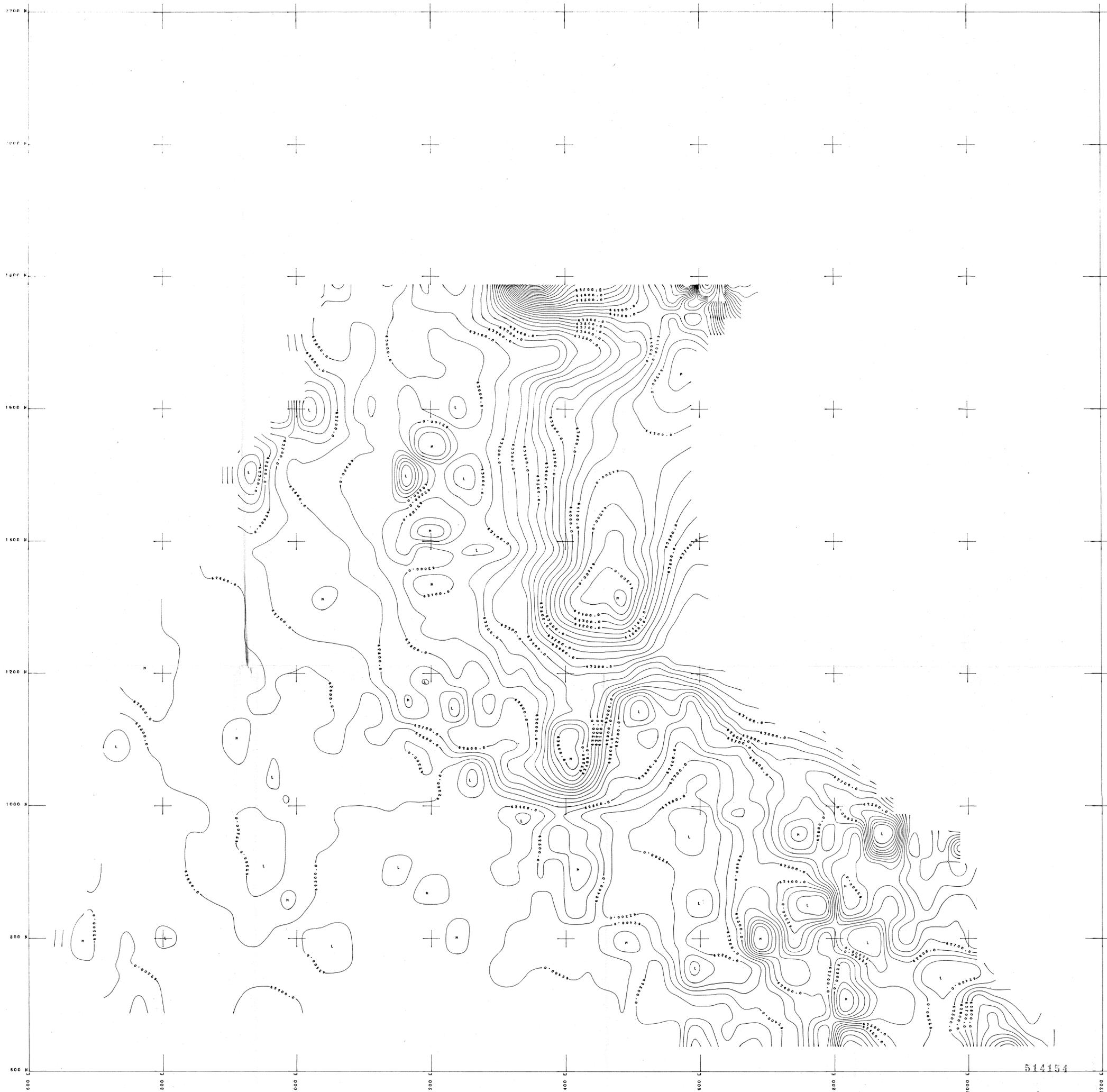
7037



The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE SOUTHERN EXTENSION MAX-MIN INTERPRETATION	
SCALE 1:2500	DATE 4-11-82
AUTHOR G. OAKES	DRAWN J.L.L.
OFFICE DEVONPORT	REF. No.
ENCL. No.	DRG. No. D/MQ04/143 B

514153





83-2040



7038

SHELL COMPANY OF AUSTRALIA
METALS DIVISION
NATONE
SOUTHERN EXTENSION
GROUND MAGNETICS

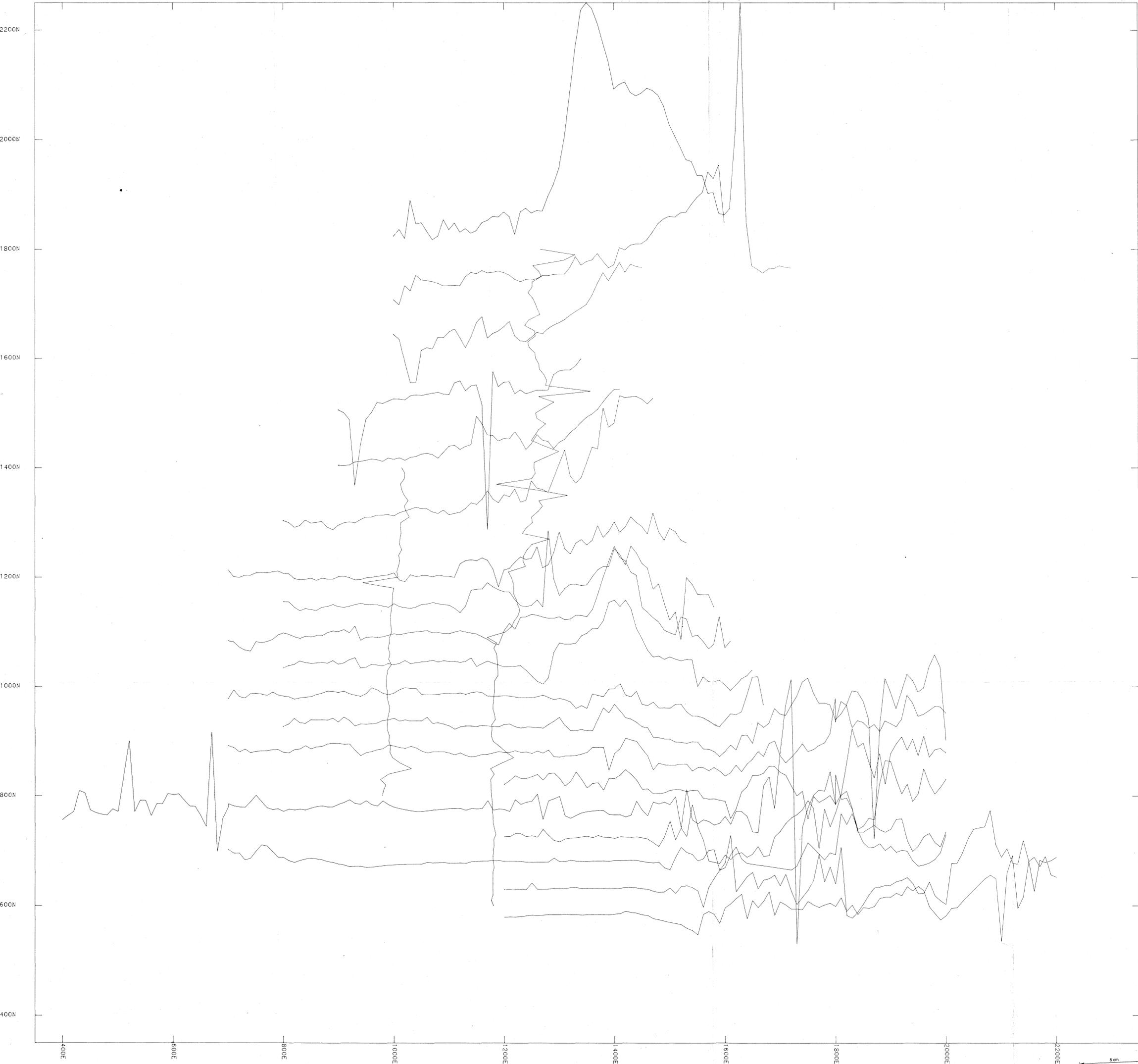
SCALE: 1 : 2500.

FIG. NO:	REPT. NO:
ENCL. NO:	DRG. NO:
DATE: 11/1/83	AUTHOR: G O
DRAWN: DIMQCH/160	OFFICE:

514154

5 cm

PROGRAM GEOCOR
 STACKED PROFILE PLOT
 NATONE GROUND MAGNETICS - FINA
 PROCESSED ON: MON. NOV 01 1982
 BEGINNING AT: 12:03:11
 READING SCALE: 200.00 NT/CM
 DATUM OF 62600.0 NT SUBTRACTED

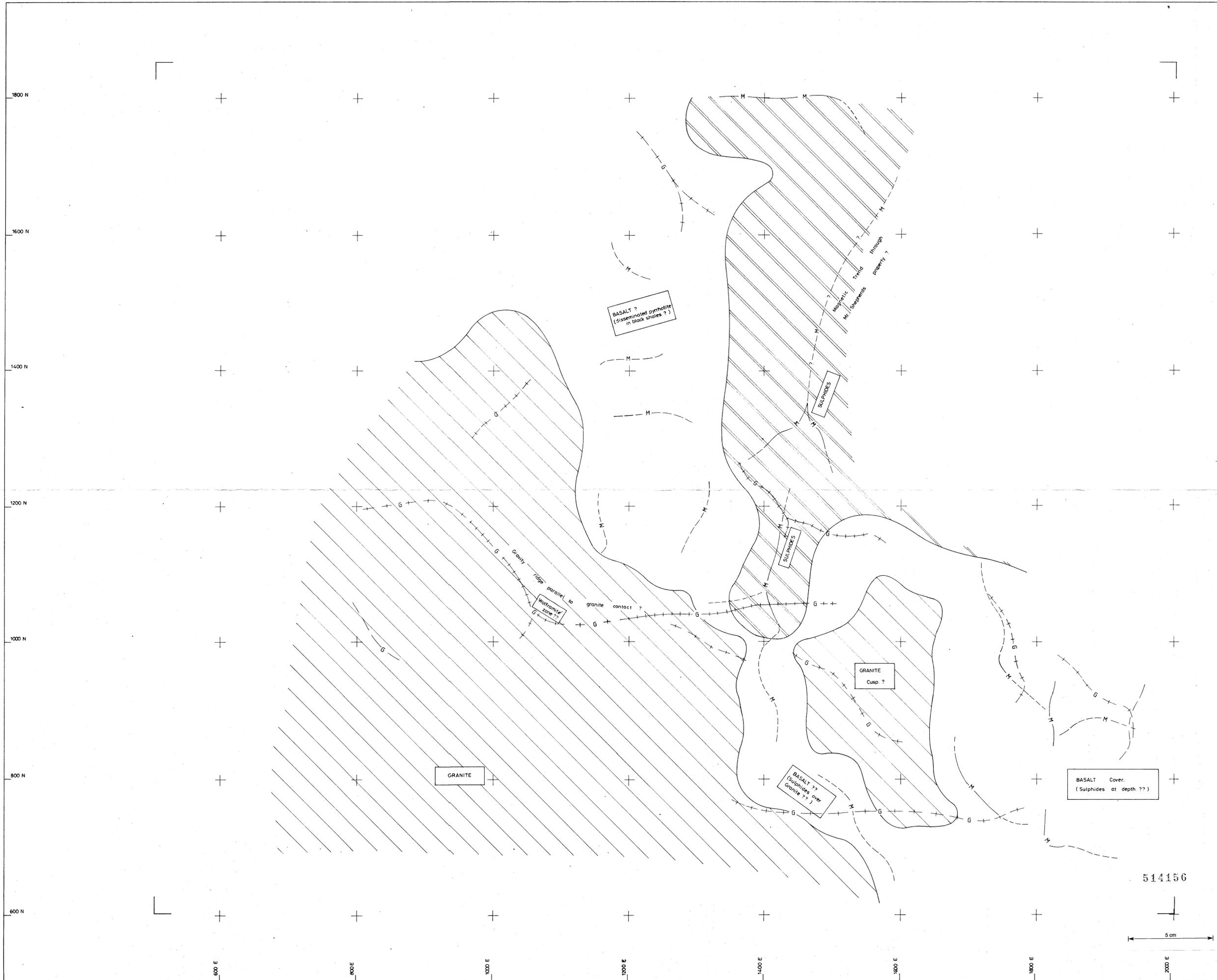


83-2040

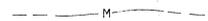
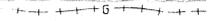


7039

514155	
SHELL COMPANY OF AUSTRALIA METALS DIVISION	
NATONE SOUTHERN EXTENSION GROUND MAGNETICS STACKED PROFILES	
SCALE 1 : 2500.00	
FIG. NO:	REPT. NO:
ENCL. NO:	DRG. NO:
DATE: 11/7/82	AUTHOR: G.O.
DRAWN: D.M.P.	OFFICE:



LEGEND

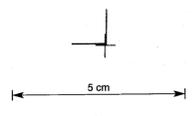
-  MAGNETIC TRENDS
-  GRAVITY TRENDS
-  AREA OF LOW MAGNETIC RELIEF
-  MAIN MAGNETIC HIGH ZONE
-  ZONE OF NOISY, LOW ORDER MAGNETIC FEATURES
-  POSSIBLE CAUSE OF MAGNETIC OR GRAVITY TREND

83-2040

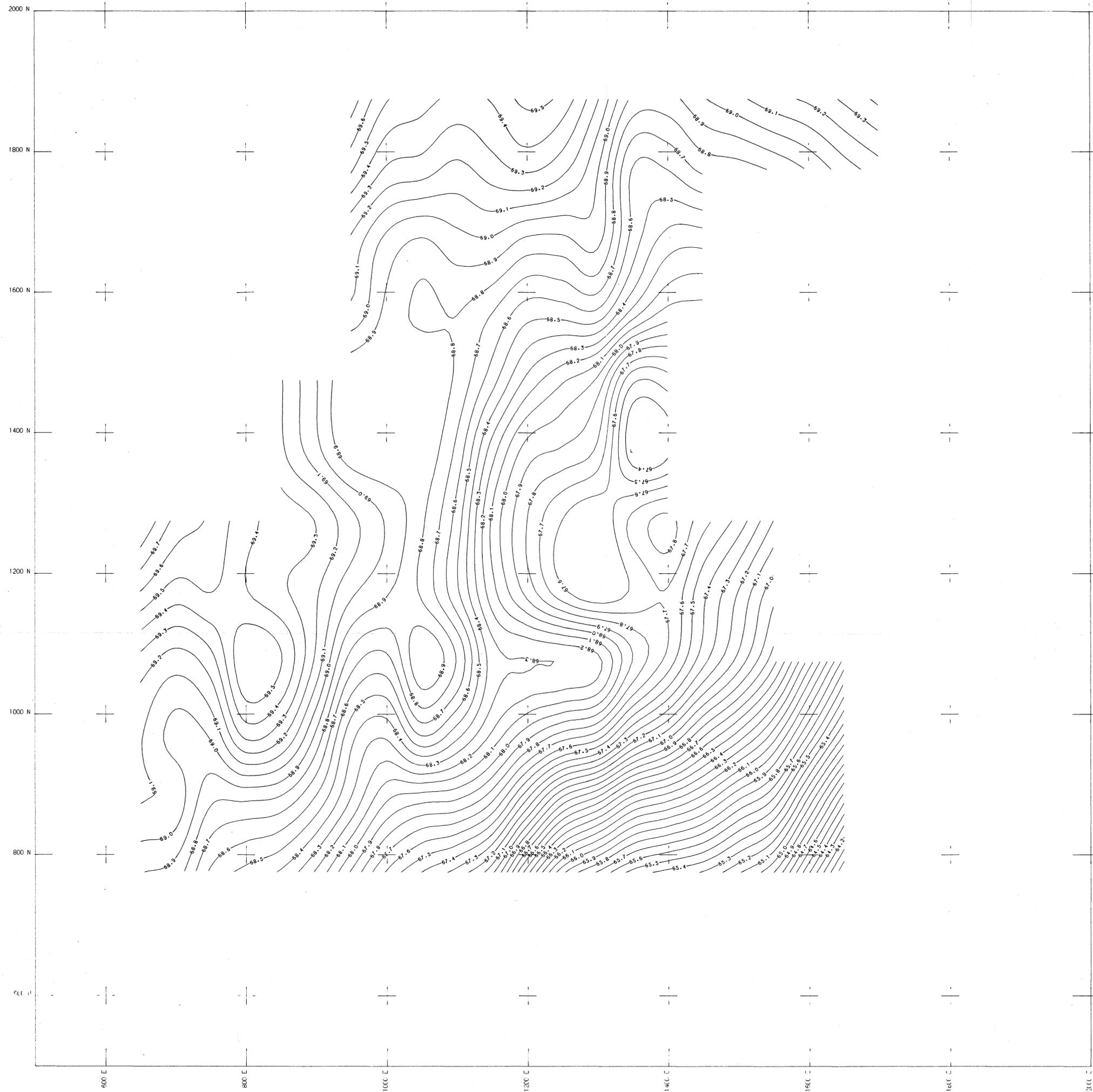


7040

514156



The Shell Company of Australia Limited METALS DIVISION	
E.L. 8/77 RIANA NATONE SOUTHERN EXTENSION GRAVITY AND MAGNETIC TRENDS	
SCALE 1:2500	DATE 5-1-83
AUTHOR G. DAKES	DRAWN J.L.L.
OFFICE DEVONPORT	REP. No.
ENCL No.	DRG No. D/MQ04/153



83-2040

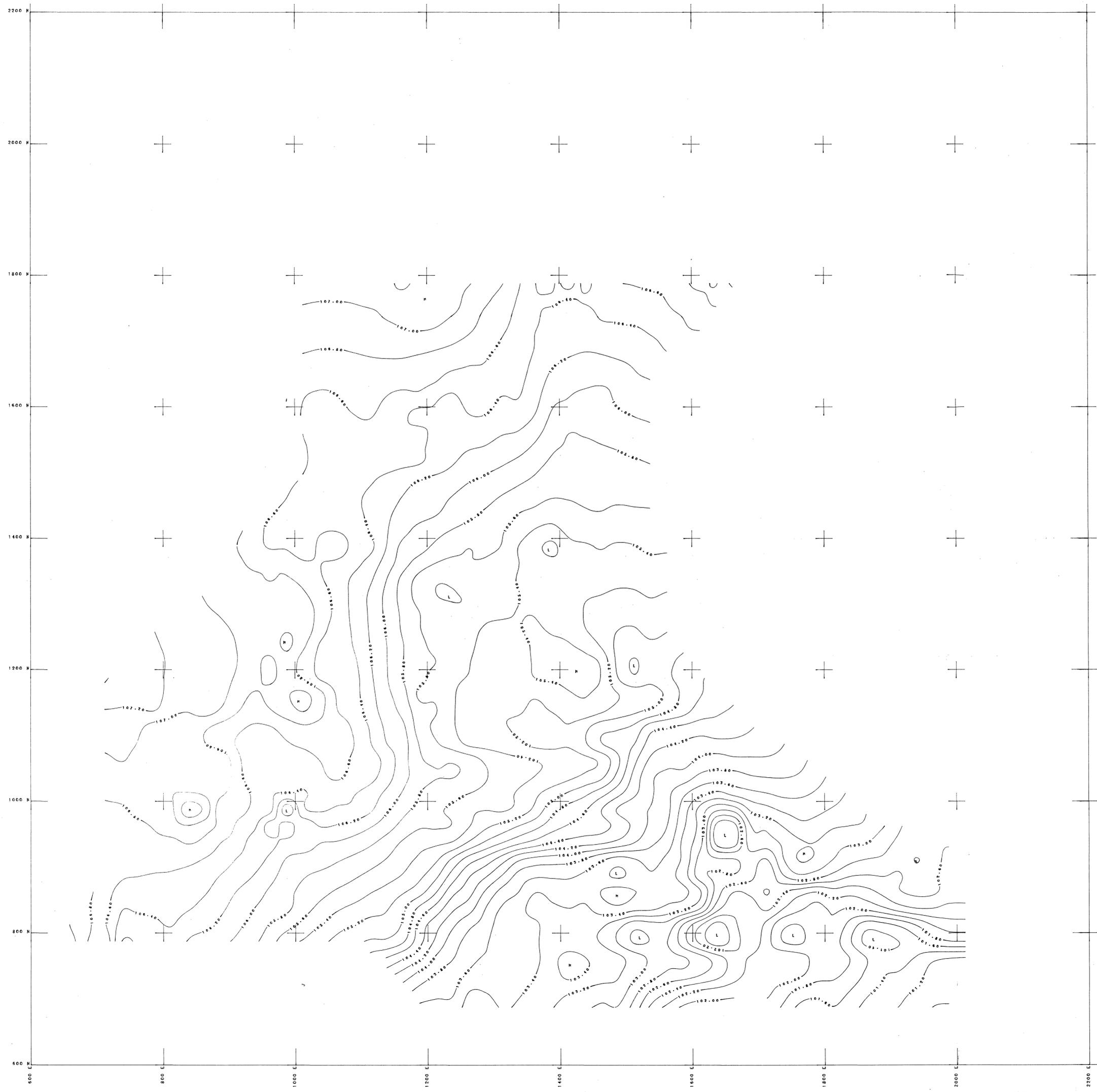


514157

7041

SHELL COMPANY OF AUSTRALIA METALS DIVISION	
NATONE BOUGUER GRAVITY	
DENSITY = 2.7 NO TERRAIN CORRECT	
SCALE: 1 : 2500.	
FIG. NO:	REPT. NO:
ENCL. NO:	DRG. NO: D/M004/122
DATE:	AUTHOR:
DRAWN:	OFFICE:

5 cm



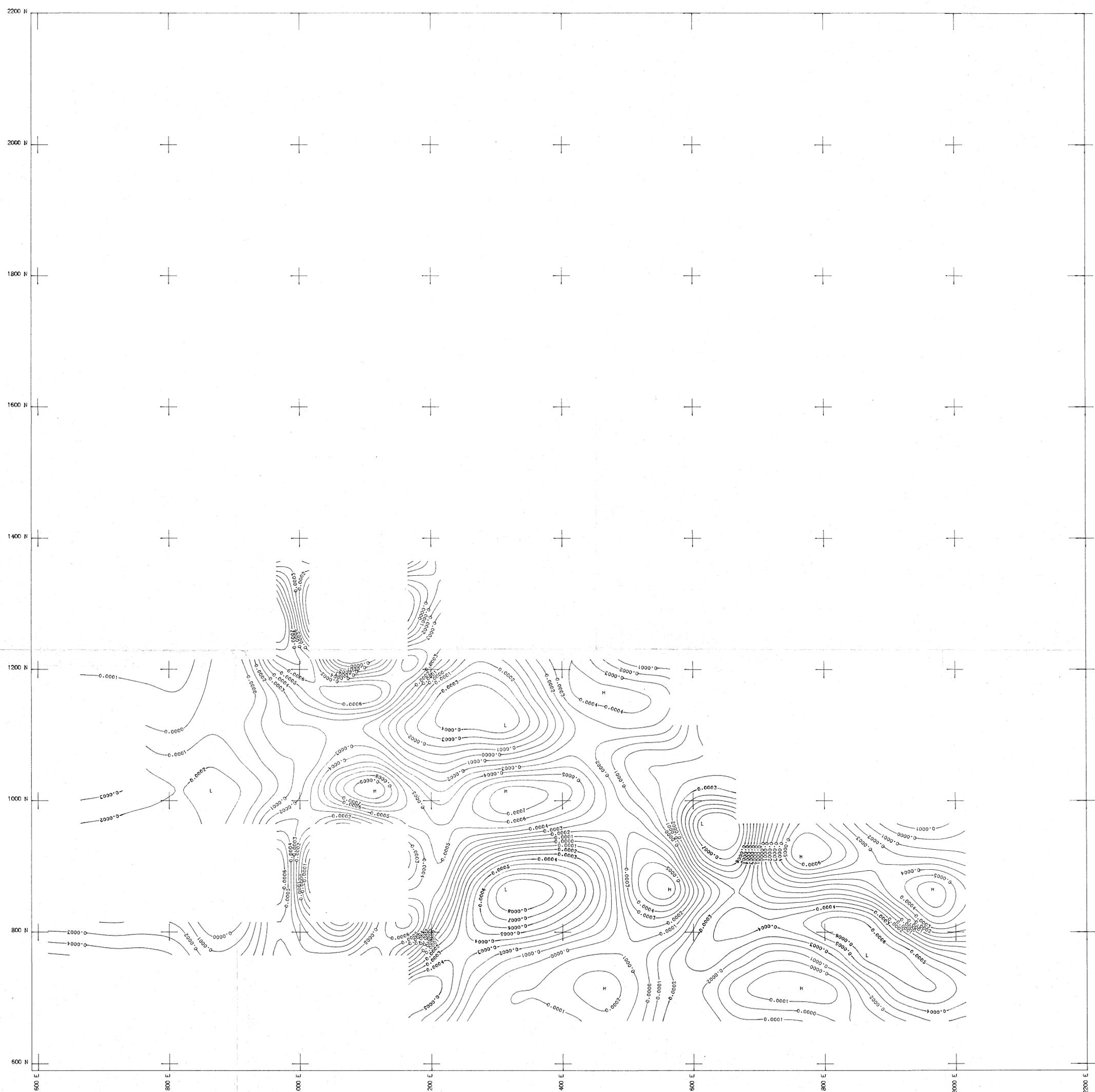
83-2040



514158 7042

SHELL COMPANY OF AUSTRALIA METALS DIVISION	
NATONE SOUTHERN EXTENSION GRAVITY	
SCALE: 1 : 2500.	
FIG. NO:	REPT. NO:
ENCL. NO:	DRG. NO:
DATE: 11/7/83	AUTHOR: G.D.
DRAWN: D/MAR/1162	OFFICE:

5 cm



83-2040



514159		7043	
SHELL COMPANY OF AUSTRALIA METALS DIVISION			
NATONE SOUTHERN EXTENSION			
GRAVITY 2ND VERT. DERIV.			
SCALE: 1 : 2500.			
FIG. NO:	REPT. NO:		
ENCL. NO:	DRG. NO:		
DATE: 1/7/65	AUTHOR: G.O.		
DRAWN: D/MCOA/163	OFFICE:		