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THE SHELL COMPANY OF AUSTRALIA LIMITED  
METALS DIVISION

EXPLORATION LICENCE 8/77 - RIANA

PROGRESS REPORT ON EXPLORATION DURING THE PERIOD

1/1/80 - 31/7/81

MICROFILMED

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*aeromagnetic survey*

*E.M.*

*82-1728 - 80 V/P*

*83-1929 - Unavailable*

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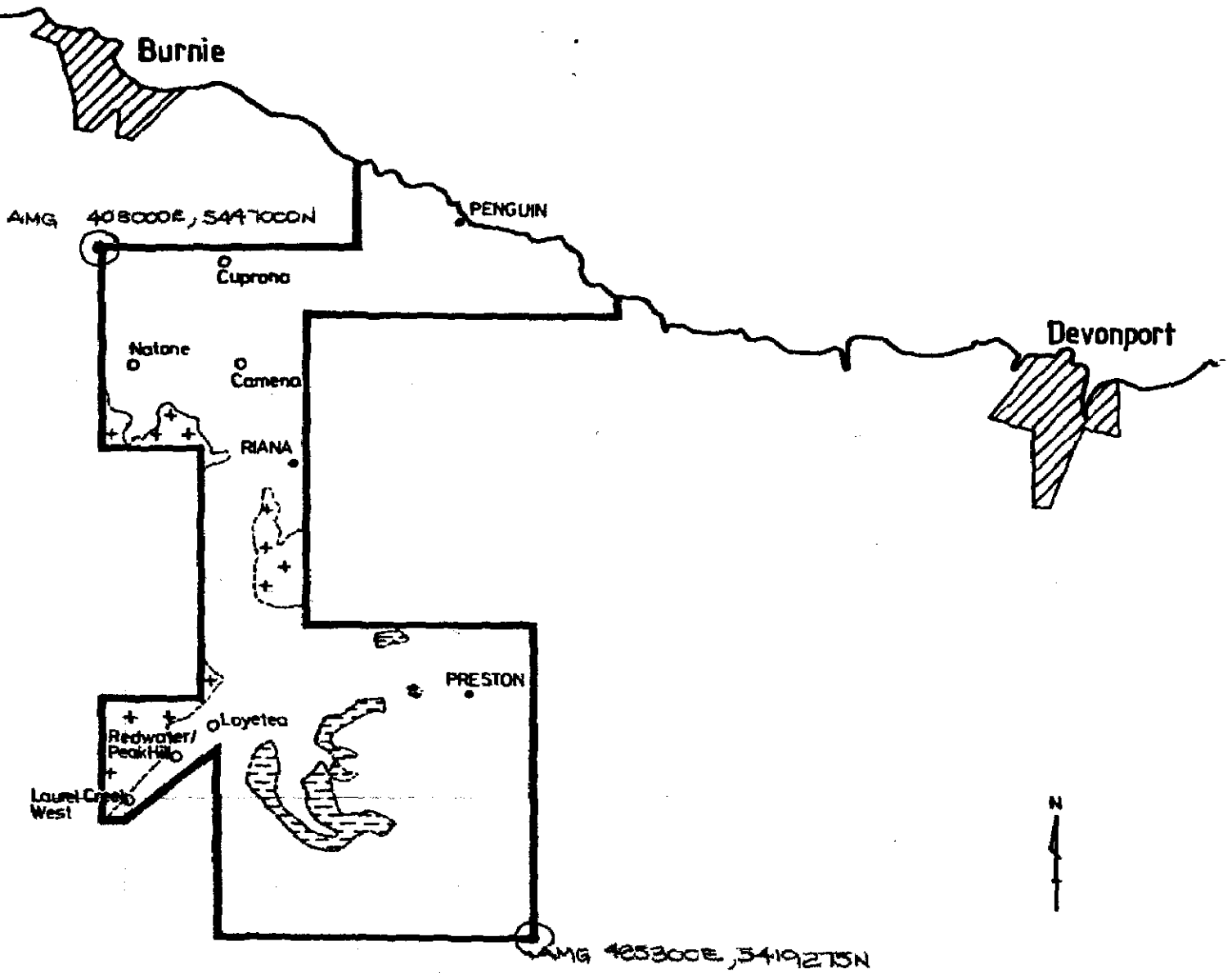
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AMG REFERENCE POINTS ADDED

## BASS STRAIT



## LEGEND

- Gordon Limestone
- Housestop Granite
- Prospect

MOINA

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The Shell Company of Australia Limited  
METALS DIVISION

E.L. 8/77 RIANA

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

FIG. 1

1. SUMMARY

Since January of 1980, the Shell Company of Australia, in Joint Venture with the Commonwealth Aluminium Corporation Limited, has carried on exploration begun by the Commonwealth Aluminium Corporation Limited, in 1977, on Exploration Licence 8/77, Riana. The search has been directed to tin, tungsten and base metal mineralization.

The initial work undertaken by Shell on E.L. 8/77, Riana took the form of an airborne magnetic and radiometric survey, which was designed to locate Bischoff- or Moina-type magnetic responses. The airborne geophysical data was evaluated and a number of anomalies on E.L. 8/77, Riana fall into three groups:

1. Those magnetic features which together form an anomalous magnetic and radiometric belt that delineates the south-eastern edge of the Housetop Granite.
2. Those anomalies associated with Cambrian Ironstones and old mine workings.
3. Those anomalies that are associated with basalt, or do not obviously relate to a particular geological environment.

Initial follow-up (gridding, soil sampling, ground magnetics, mapping) on anomalies such as 4042/1 Laurel Creek West, 4142/2 Loyetee East, 4142/11 Loyetee West, 4044/1 Natone, 4144/1 Cuprona and 4144/2 Camena was completed. Further work has been undertaken at several of these prospects, e.g. Natone and Cuprona, and is recommended for others, e.g. Laurel Creek West and Loyetee. At Redwater (anomaly 4142/1), work begun by Comalco has been continued and expanded, to include further ground magnetic work, drilling and downhole geophysical surveys.

As yet, only a small number of anomalies have been ground checked, those being anomalies that occur over prospective geological environments, e.g. adjacent to the margin of the Housetop Granite, or are possibly related to known mineralization, e.g. Natone and Cuprona. The anomalies not yet investigated represent part of the Shell Company's ongoing exploration programme.

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## 2. INTRODUCTION

Exploration Licence 8/77, Riana, covering an area of 197sq. km. south and southwest of Penguin, was granted to Comalco Limited on 5th August, 1977. In April, 1979, two extensions of 52 sq. km. and 67 sq. km. to the Exploration Licence were granted, bringing the area covered by E.L. 8/77 to 316sq. km. During 1979, the title of the E.L. was transferred to the Commonwealth Aluminium Corporation Limited, a wholly owned subsidiary of Comalco. The present E.L. boundary is shown in Fig. 1.

In January of 1980, the Shell Company of Australia became the operating partner of a Joint Venture with the Commonwealth Aluminium Corporation Limited, covering, amongst other licences, E.L. 8/77, Riana.

This report describes the search for tin, tungsten and base metal mineralization in E.L. 8/77, Riana since the Shell Company became the operating partner of the Joint Venture in 1980. E.L. 8/77, Riana, together with E.L. 1/76, Guildford, E.L. 4/77, Highclere and E.L. 14/80, Hayes Peak constitute the Housetop Joint Venture.

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3. TOPOGRAPHY & ACCESS

Most of the area covered by E.L. 8/77, Riana consists of undulating basalt hills, dissected by north flowing rivers in deep valleys and gorges. Most of the area (particularly the Tertiary basalt) is cleared to semicleared private land. Those areas which are covered by bush are serviced by many 4WD tracks. Loyetee Peak (Ordovician conglomerate) is the highest peak at 700 metres above sea level. Basal Ordovician rocks form ridges elsewhere in the licence, but they do not project much above the high basalt plateau at about 400 metres above sea level. Sealed roads to and in the area are numerous and access is easily gained from Burnie and Devonport.

#### 4. REGIONAL GEOLOGY

E.L. 8/77, Riana is partially covered by three one mile Geology sheets, viz., Sheffield (Jennings, 1959), Devonport (Burns, 1963) and Burnie (Gee, 1967). A fourth one mile sheet covering the rest of the licence, St. Valentines, is in preparation. The St. Valentines area is covered by a composite one mile sheet prepared by Comalco.

This composite sheet is still being used by Shell as the basic geology of the area. The regional geology of the licence has been adequately covered by many authors including Twelvetreets (1903, 1909); Burns (1964); Jennings (1959, 1979); Gee (1977) and Williams and Turner (1974).

The oldest rocks on the licence are the Proterozoic Ulverstone Metamorphics, which form part of the Forth Nucleus (Williams and Turner, 1974), and are comprised of quartzite, schist and conglomerate. These rocks outcrop along the coast in the eastern most extension of the licence. To the west of the Forth Nucleus and on the eastern side of the Dial Range outcrop sandstones and mudstones of the Rocky Cape Group. These are unconformably overlain by the north-south trending belt of Cambrian sediments and acid to basic volcanics deposited in the Dial Range Trough (Burns, 1964). Iron, copper and cobalt mineralization is associated with the early volcanics in the Penguin area.

To the west of the Dial Range, the oldest rocks present are the Proterozoic Burnie Formation, which are a north east trending folded sequence of siltstones, thought by Gee (1977) to be turbidites. Overlying these rocks, presumably unconformably, is a thin siliceous and ferruginous siltstone formation which is well exposed in the Blythe River between Natone and Cuprona, and along Penguin Creek. This unit is thought to be Cambrian in age and is the host to the siliceous hematite lenses at the Blythe River Iron Deposit and Rutherfords Iron Deposits at Natone. These iron deposits have a character that is part sedimentary (formed possibly under near shore, oxide facies conditions) and part tectonic breccia (remobilization during or after sedimentation along faults flanking the Cambrian basin?) (Gee, 1977).

013

Cambrian acid volcanics, typical of the "Mt. Read Volcanic Belt", outcrop in the southern extension to the licence, near Loyetee.

A thick sequence of Ordovician conglomerate, sandstone and limestone outcrops in the Gunns Plains area a few kilometres east of the Housetop Granite. Basalt covered limestone occurs at the Redwater Prospect in contact with the granite south of Loyetee in the triangular shaped westward protruding part of the licence.

Possible Silurian sediments outcrop in the axis of a broad syncline in the Gunns Plains area.

The Devonian Housetop Granite outcrops over large areas. It is pale adamellite, and at least two phases have been mapped by Porter (1972). Tin-tungsten-fluorine mineralization is associated with this granite but no greisenization is known on the licence. The only known greisens occur south of Hampshire.

Tertiary basalt is extensive, and drilling indicates that the pre-basalt topography was rugged, the basalt in places having filled steep sided valleys.

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## 5. PREVIOUS INVESTIGATIONS

Twelvetrees (1903, 1909) made mention of the mining fields of north western Tasmania, especially the Dial Ranges and Gunns Plains districts.

In the 1950s and 1960s the area received some attention in the search for iron ores. The BMR carried out an airborne magnetic survey (Goodeve, 1955) and the Highclere Iron deposit was investigated by ground magnetics and drilling by the Mines Department (Jack, 1965). Core was analysed for Fe, Si, Al, Ti, Mn, P, S, V but not for Sn, W or F.

A statewide BMR gravity survey conducted in the late 1960's(?) covers part of the area. BMR airborne scintillometer traversing did not cover the licence area.

As part of a B.Sc. honours project, Sheehan (1969) carried out a gravity survey in northern Tasmania, and included the eastern part of the Housetop Granite in this survey.

In 1972 Conzinc Rio Tinto of Australia Exploration (CRAE) carried out ground scintillometer work over the Housetop Granite, chiefly in areas just east of E.L. 4/77, but did not detect any significant mineralization. (Porter, 1972). CRAE carried out more detailed exploration including drilling in the southern extension (Porter, 1974, 1975, 1976).

From 1972 to 1974 Australia and New Zealand Exploration Co. (ANZECO) carried out exploration in the area over E.L. 1/69 held by Tasminex N.L. A copy of parts of reports of work done in those areas not currently held by Tasminex in E.L. 17/68 was kindly given to us by Anzeco. (Brandt, 1973, 1974). The work done was chiefly examination of stream sediment panned concentrates for the presence of scheelite. Tasminex drilled two short diamond drill holes at the Redwater Prospect.

Mining and exploration of silver-lead mineralization on the coast in the Penguin area has been carried out since 1867. Mining activity ceased in about 1910. Since then the area has been little explored except for ground magnetic, radiometric and induced polarization geophysical surveys by BHP (Hewitt, 1968).

Hematite and limonite deposits in the Penguin Creek area have been intermittently explored and mined since 1884 (Atkinson, 1958B, Burns, 1961, Jennings, 1968, Longman, 1962A, Smith, 1960).

Magnetite deposits and copper mineralization in underlying Cambrian rocks in the Cuprona - Natone area have also been the subject of intermittent mining and investigation (Blake, 1958A, B; Boyd et al 1919; Clarke and Bainbridge, 1967; Darby, 1900; Eadie, 1964; Everard, 1962; MacDonald, 1965; Noldart, 1966; Nye, 1937; Pickands Mather, 1967A, B; Quest Exploration, 1966; Twelvetrees & McIntosh Reid, 1919). Minops drilled three diamond drill holes at Natone under E.L. 13/68 (Erdmanis, 1969) following an induced polarization survey (Goudie & Hallof, 1969) and Tasminex investigated the same area in 1970 under E.L. 9/72.

The magnetite deposits were also covered by the BMR regional aeromagnetic and followup ground surveys (Goodeve, 1955: Keunecke, 1959).

In 1977, Comalco applied for, and were granted the Exploration Licence 8/77 Riana. All work done on this E.L. to the end of 1979 is summarized in a report by G. Weste (1979). Briefly, Comalco Exploration was concerned chiefly with an extensive stream sediment sampling programme that covered many of the Comalco licences, including E.L. 8/77. Several anomalous areas were pinpointed, however not all were followed-up or checked. Comalco carried out reconnaissance over areas of known mineralization within E.L. 8/77, e.g. Redwater, Penguin and Neptune Mines, Tasmanian Iron Mines, Copper King, Blythe Iron and Natone Iron. Of these the only area followed-up in detail was Redwater. Work here involved gridding, ground magnetics and I.P. surveys and finally drilling.

It was at this point that Shell took over as management of E.L. 8/77.

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## 6. AIRBORNE SURVEY

In March of 1980, Shell commissioned Geometrics to fly an airborne magnetic and radiometric survey of approximately 6800 line kilometres, over E.L. 8/77 and nearby licences. The object of the survey was to locate Moina- or Bischoff-type magnetic responses in areas held by Shell and Comalco.

The data was initially evaluated by geological staff at Devonport and anomalies that occurred over prospective lithologies and structural locations were given priority for ground follow-up. All airborne data were later checked, modelled and evaluated by Dr. Geoff Dickson, a consulting geophysicist. His recommendations are to be found in his five reports. Those parts of the reports pertaining to E.L. 8/77, Riana may be found in Appendix 1.

The exploration policy for E.L. 8/77, and the other Tasmania E.L.'s held by Shell/Comalco, has centred around the ground follow-up of favourable airborne anomalies located by the Geometrics survey. Broadly speaking, the anomalies in E.L. 8/77 may be divided into three groups based on location and geological setting.

GROUP 1 : A number of strong magnetic features that together form an anomalous magnetic and radiometric belt, which delineates the south eastern margin of the Housetop Granite (Refer Fig. 2). This belt runs approximately 8 km, from Laurel Creek, in the south, to Loyetee, in the north. At present, three separate areas within the belt have been gridded: Redwater/Peak Hill (4142/1), Loyetee (4142/2 and 4141/11) and Laurel Creek West (4042/1). An exploration summary of each area is to be found in this report.

Prior to the airborne survey, much work was done at Redwater by Comalco, as it was thought that the area was prospective for Kara-type magnetite-scheelite skarns. Magnetite skarn was found to outcrop at Redwater, but drill intersections to date have contained very little tungsten or tin.

## BASS STRAIT

Burnie

PENGUIN

Devonport

RIANA

PRESTON

MOINA

## LEGEND



Garden Limestone



Housetop Granite

## ANOMALIES

- 1. Redwater/Pink Hill 4142/1
- 2. Leyton 4142/2471
- 3. Laurel Creek West 4042/1

— Approx. location of South East Housetop Granite magnetic feature.

0 5 10K

The Shell Company of Australia Limited  
METALS DIVISION

**E.L. 8/77 RIANA**

LOCATION OF GROUP  
1 ANOMALIES.

SCALE 1:25000 DATE 11/11

AUTHOR L.D.B. DRAWN H.L.R.

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5 cm

FIG. 2

018

The Geometrics airborne survey has now outlined a larger area of interest than that initially explored at Redwater. Eventually the whole 8 km long belt is to be ground checked, for the presence of magnetite skarn and possible sulphide replacement mineralization.

GROUP 2 : Those anomalies associated with Cambrian ironstones and old mine workings. Two such anomalies that have had some ground follow-up are 4044/1, Natone and 5 km along strike to the NE, 4144/1, Cuprona, which are both spatially associated with outcrops of hematitic cherts and cherty ironstones (Refer Fig. 3). In both cases the anomaly is not centred on the ironstone but slightly away from it, and in both cases, the anomaly is not far from old copper workings. (Rutherford's Copper at Natone, and Copper King at Cuprona). Thus, the NE trending unit that is host to the ironstones at Natone and Cuprona is also host to many small copper and iron workings. Fairly continuous exploration has occurred in these areas over the years. However, no deep holes have been drilled, as the main interest was as a possible source of iron ore.

To the south of Penguin occurs several large iron mines, viz., Iron Cliffs, Tasmanian Iron Mines etc. The mines cover the Cambrian Ironcliffs Limonite, and the PreCambrian Penguin Hematite. As at Natone and Cuprona, the ironstones are exposed on the southeastern edge of the Proterozoic sequence. These two units have no magnetic signature that was picked up by the airborne survey, but the areas will be examined to determine whether they are possible correlatives of the units at Natone and Cuprona.

Anomalies 4244/1, Penguin and 4244/2, Neptune, both cover old silver and lead workings along the coast east of Penguin township. These workings are not associated with iron oxide minerals (such as those found in the ironstones), but are in association with iron sulphides (mainly pyrite) and carbonates (Montgommery, 1896; Hughes, 1953). It is thought that these anomalies may be associated with basic to ultrabasic rocks.

## BASS STRAIT

Burnie

PENGUIN

Devonport

RIANA

PRESTON

MOTNA

## LEGEND



Ordovician



Pre Cambrian

## ANOMALIES

- 1. Natone 404411
- 2. Cuprona 414411
- 3. Neptune 424412
- 4. Penguin 424411
- 5. Iron cliffs / Tasmanian iron mines.

0 5 10K

The Shell Company of Australia Limited  
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E.L. 8/77 RIANA

LOCATION OF GROUP  
2 ANOMALIES.

SCALE 1:20000 DATE 10-1-81

AUTHOR L.D.S. DRAWN H.L.H.

OFFICE Devonport REP.No.

DRG No. DM002/068

5 cm

FIG. 3

020

GROUP 3 : Those anomalies that are associated with basalt or do not obviously relate to any particular geological environment. The anomalies include 4142/3, 4142/4, 4142/5, 4142/6, 4142/7, 4142/8, 4143/1, 4143/2, 4143/3, 4143/4, 4144/2, 4144/3, 4244/3 and these have been assigned lower priority with respect to ground follow-up. In most cases, a reconnaissance ground magnetic line is all that is planned, and of the abovementioned anomalies, only one has been ground checked to date at 4144/2 Camena (Refer Sect. 9.1).

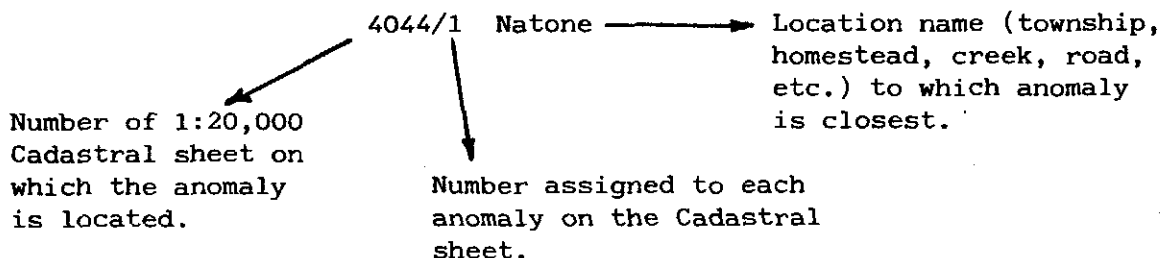
The breaking up of anomalies into groups has allowed a priority for ground follow-up to be placed on each anomaly.

The anomalies in groups one and two have so far been given higher priority than those of group three.

The following summary on exploration activities is made on the basis of each individual prospect. However, prospects will be grouped together under the three above mentioned group.

#### Naming of Anomalies

In Appendix 1, a catalogue of anomalies may be found showing number, name, location, work done, work recommended and geology. The system of assigning number and name to anomalies is as follows:



7. GROUP 1 : GROUND FOLLOW-UP ALONG THE SOUTH-EASTERN EDGE OF  
THE HOUSETOP GRANITE

7.1. REDWATER PROSPECT

7.1.1. Summary of Comalco Investigations

The presence of tin bearing magnetite skarn near the junction of Puffers and Redwater Creeks led to the establishment of a grid over the Redwater Prospect. After the gridding, soil sampling, ground magnetics and I.P. surveys were carried out (for details see G. Weste, 1979). An evaluation of the geophysical data was made to determine the possibility of a Kara-type scheelite skarn or a Renison-type pyrrhotite-cassiterite skarn being present.

Three diamond drill holes were drilled on the Redwater Prospect by Comalco. Holes RED 1 and RED 2 both intersected magnetite skarn and wriggilite in Gordon limestone, however assay results were not encouraging. A third hole RED 3, was drilled into a broad magnetic high. This hole was terminated due to bad ground (Refer plan D/MQ04/053 for drill hole locations and Appendix 2 for summary logs).

7.1.2. Summary of Shell Investigations

Grid extensions - A second aeromagnetic anomaly in the Redwater area, not covered by the Comalco grid, was located during the initial evaluation of the Geometrics airborne survey. The Comalco grid was extended to the south to cover this anomaly (4142/1) at Peak Hill Farm, and a ground magnetics survey was carried out, line spacing of 100m, station spacing of 25m and the bearing of the lines being  $078^{\circ}$  magnetic, but no soil sampling was done due to extensive basalt cover. (Refer plan D/MQ04/014 for stacked magnetic profiles over Peak Hill Farm Grid). The response over this anomaly was a 'noisy' one, indicating a fairly thick basalt cover in the area.

Drilling - As drill hole RED 3 was terminated early, it did not test the magnetic anomaly on line 6100N as intended. (Refer Fig. 4). Fifty metres to the east of the magnetic anomaly, along line 6100N, the Comalco I.P. survey had outlined a chargeability high with an associated

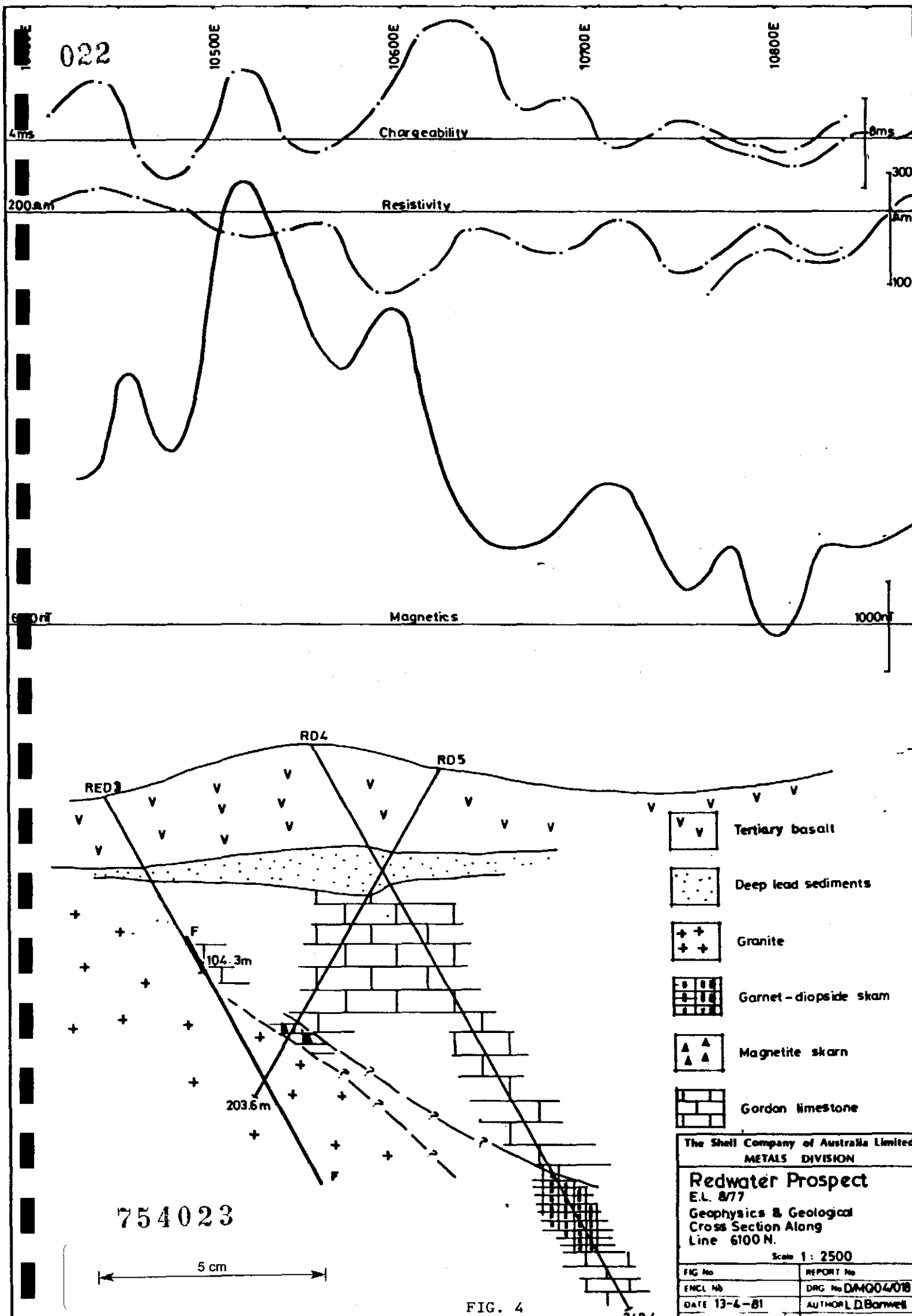


FIG. 4

resistivity low. Diamond drill hole RD 4 was drilled to test this I.P. anomaly, which is also associated with a cusp on the eastern edge of the main magnetic anomaly. (Refer plan D/MQ04/036).

Hole RD 4 was collared at 6100mN/10500mE, inclination  $60^{\circ}$  towards azimuth  $080^{\circ}$ M, and was drilled to a depth of 349.4m.

A summary log is as follows:

| <u>Interval(m)</u> | <u>Lithology</u>                                                                                  |
|--------------------|---------------------------------------------------------------------------------------------------|
| 0.0 - 65.7         | Tertiary basalt.                                                                                  |
| 65.7 - 82.0        | Tertiary deep lead deposits including sandstone and conglomerate.                                 |
| 82.0 - 86.2        | Tertiary brown palaeosoil.                                                                        |
| 86.2 - 267.2       | Ordovician, grey, impure recrystallized limestone with abundant clayey cave fill.                 |
| 267.2 - 274.3      | <u>Garnet-diopside skarn.</u>                                                                     |
| 274.3 - 289.3      | <u>Brecciated garnet-diopside skarn</u> , cross-cut by Tertiary basalt feeder channels and dykes. |
| 289.3 - 308.1      | <u>Garnet-diopside skarn</u> , cross-cut by Tertiary basalt dykes and feeder channels.            |
| 308.1 - 328.9      | Extensively recrystallized limestone, cross-cut by Tertiary basalt dykes and feeder channels.     |
| 328.9 - 349.4      | Recrystallized limestone.                                                                         |

Fillet samples of limestone and half core samples of skarn were sent to Amdel for analysis. Sn and W values were uniformly low, and no other elements were present at encouraging levels. For detailed geological logs and assays of RD 4 refer Appendix 3 and plans D/MQ04/035a and b. The core was photographed and measured for magnetic susceptibility. Results are available in Appendix 4.

Drill hole RD 5 was then collared at 6100mN/10620mE, with an inclination of  $60^{\circ}$ , towards azimuth of  $260^{\circ}$ M and drilled to a depth of 203.6m. This hole was designed to test the magnetic anomaly missed by RED 3 (Refer Fig. 3 and plan D/MQ04/036). A summary log is as follows:

024

754025

| <u>Interval(m)</u> | <u>Lithology</u>                                                                                  |
|--------------------|---------------------------------------------------------------------------------------------------|
| 0.0 - 54.9         | Tertiary basalt.                                                                                  |
| 54.9 - 74.0        | Tertiary deep lead deposits - fine clayey material to conglomerate.                               |
| 74.0 - 80.8        | Tertiary brown palaeosoil.                                                                        |
| 80.8 - 153.0       | Ordovician, grey, recrystallized limestone with occasional clayey cave fill and skarnified bands. |
| 153.0 - 154.2      | Extensively weathered <u>skarn</u> .                                                              |
| 154.2 - 159.8      | Limestone.                                                                                        |
| 159.8 - 168.2      | Extensively weathered <u>garnet-diopside</u> and <u>magnetite skarn</u> .                         |
| 168.2 - 182.8      | Granite - quartz-orthoclase-biotite-plagioclase.                                                  |
| 182.8 - 183.8      | Greisen - quartz-feldspar-chlorite-muscovite-biotite.                                             |
| 183.8 - 186.3      | Granite.                                                                                          |
| 186.3 - 191.7      | Fault zone.                                                                                       |
| 191.7 - 203.6      | Granite.                                                                                          |

Fillet samples of limestone and granite and half-core samples of skarn were analysed by Amdel. Sn and W values were low as are all other elements. (Refer App. 3). The core was photographed and measured for magnetic susceptibility (Refer App. 4).

Downhole Geophysical Surveys - Drill holes RD 4 and RD 5 were logged using a downhole magnetometer. Both holes were cased with P.V.C. piping to a depth of 90m and 80m respectively. It was hoped that geophysical data could be collected across the skarn intervals, as well as through the Tertiary basalt cover. Unfortunately both holes caved below the casing and logging of the skarn intersection in both holes was not possible. The holes were logged as deep as possible - 90m for RD 4 and 130m for RD 5. The information is presently being assessed by computer at A.H.O. and results are awaited. The study may indicate whether the ground magnetic anomaly reflects the basalt or deeper magnetite skarn mineralization.

#### 7.1.3. Conclusions

The work done by Shell at Redwater was designed to follow-up Comalco work and to test geophysical anomalies. Diamond drill hole RD 5 indicated the presence of magnetite skarn, but possibly not in sufficient quantity to account for the ground magnetic anomaly. It may be that a larger body of skarn is present, than is indicated by RD 5. This, by itself is encouraging, but unfortunately, the geochemistry of the skarn is very disappointing. All drill holes,

both Comalco and Shell, gave low Sn and W values when assayed. While initially the area looked prospective for the presence of Kara-style mineralization, the lack of high tungsten and tin values downgrades the potential of the Redwater prospect.

## 7.2. LAUREL CREEK WEST

### 7.2.1. General

Laurel Creek West (anomaly 4042/1) represents the south western end of the 8 km long, highly magnetic belt which delineates the south eastern edge of the Housetop Granite. The prospect covers the contact between the Devonian Housetop Granite and Ordovician sediments (mainly quartzites). A large area of the prospect is covered by Tertiary basalt. Field relationships and actual lithologies are difficult to determine, due to lack of outcrop, and logging of auger sample chips provided the basis for a rough geological map of the area. Inaccessibility was also a problem at this prospect as most of the western half of the grid is covered by very dense 'horizontal scrub'.

The major part of the grid was established in late 1980, however it was found that this initial grid did not completely cover the aeromagnetic feature. An extension was recently made to the grid that allowed total ground coverage of the anomaly.

### 7.2.2. Gridding

The grid at Laurel Creek West covers an area of 1.1 sq. km. and consists of east/west trending grid lines, with a line spacing of 100m and a peg spacing of 50m. The base line was pegged along 348°M.

### 7.2.3. Geological Mapping

Due to limited outcrop, very little surface mapping was possible. Chips from the soil sample auger holes were logged by I. Buchhorn, who was then able to produce a rough geological map of the prospect. The attitude of the sedimentary rocks and the nature of

the sediment-granite contact were difficult to determine.

#### 7.2.4. Soil Sampling

Soil sampling was done at 50 metre intervals along the grid lines. A total of 190 samples were taken, with an average soil sample depth of 0.7 metres (range 0.05m - 2.3m). The samples were dry sieved with the -80# portion being sent away for analysis. Analyses were done by Comlabs and included Cu, Pb, Zn, Ni, Fe, Mn, Sn, W (for analytical method refer App. 5). For geochemical results refer plans D/MQ04/049, 050 and 051, for contoured results refer plans D/MQ04/057 to 063.

Overlapping Cu, Pb, Zn, Ni and Fe anomalies occur at this prospect. They form roughly linear trends, running north-south, parallel and to the east of the magnetic feature and the granite contact. Sn and W values are fairly low and sporadic, with highest values being recorded over the granite.

#### 7.2.5. Ground Magnetism Survey

Readings were taken every 25 metres along the 100 metre spaced grid lines with a Geometrics 4816 proton precession magnetometer. All readings were corrected for diurnal drift using base station readings. The ground magnetic data and contours are plotted on plan D/MQ04/043.

The main feature of the magnetism is a long (approx. 1km), narrow, very intense belt of highs and associated lows, that delineates the edge of the granite. The width of the feature suggests that the source of the anomaly is shallow, probably less than 50 metres and narrow. The geology plus magnetism suggests that the source is a narrow skarn on the contact of Ordovician sediments with the granite.

#### 7.2.6. Drilling

A percussion drill hole is to be drilled in the very near future with a view to testing the ground magnetic anomaly. The hole will be located as near as practicable to 2225N/2275E, and will be drilled until granite is reached.

027

754028

#### 7.2.7. Conclusions

The geology and ground magnetics seem to indicate the presence of a skarn against the edge of the Housetop Granite. The patchy, but high, Sn and W values recorded in soil above the granite suggest that the skarn next to the granite may be mineralized. At the moment it is impossible to predict whether what is present at Laurel Creek West is similar to the Redwater Prospect (i.e. a magnetite skarn against the granite, but with only very low tin and/or tungsten content) or whether the skarn will be mineralized. The drilling of a percussion hole should provide the assay information necessary to decide whether further cored drilling is warranted.

#### 7.3. LOYETEA

##### 7.3.1. General

Loyetea (aeromagnetic anomalies 4142/2 and 4142/11) forms the northern part of the 8 km magnetic belt running from Laurel Creek West, through Redwater to Loyetea. The Loyetea prospect covers a 4 sq. km. area which encompasses two smaller discrete magnetic highs within the larger magnetic anomaly.

Most of the prospect is covered by fairly flat grazing land with some cultivated fields. No work was possible over some of the cultivated fields and this has resulted in 'gaps' in the coverage of the area. The gaps will be filled in when weather and planting time permit.

On both the eastern and western margins of the prospect, the topography becomes very steep and access becomes limited due to very dense vegetation.

##### 7.3.2. Gridding

Gridding at Loyetea covers approximately 4 sq. km. and lines run north-south, with a 200 metre line spacing. The baseline was pegged along 78°M. Station spacing along the lines is 50 metres, and slope correction data may be seen on plans D/MQ04/038 and 052.

For convenience due to the size of the area involved, the grid was split in half, producing a western and an eastern portion.

### 7.3.3. Geological Mapping

The prospect at Loyetee is partially covered by Tertiary basalt. The basalt rarely outcrops, but is seen as float or weathered to a deep red soil. In most areas the basalt is thin (less than 2-3 metres), and in many cases hand augering went through weathered basalt cover into the sub-strata.

Apart from the basalt, three other rock types outcrop at Loyetee: Cambrian volcanics, Ordovician conglomerate and Devonian Housatonic Granite. Granite outcrops along the western margin of the prospect, intruding a sequence of Cambrian volcanics (mainly crystalline acid to intermediate(?) tuffs). Along the eastern margin of the prospect, Roland conglomerate outcrops form a ridge between the volcanics and a deeply weathered broad limestone valley further to the east at Gunns Plains.

Outcrop in the area is poor, and structural relations are difficult to determine.

To the south Ordovician limestone has been intersected in drill core at Redwater. There the limestone, sandstone and conglomerate are part of a synclinal feature. The presence of Cambrian volcanics to the north at Loyetee may indicate that an anticline, associated with the syncline, has exposed the volcanics in the nose of the anticline and the ridge-forming conglomerates on the eastern limb. This also suggests that the folds in the area have a north easterly trend (approximately parallel to the granite contact). (Refer Fig. 5).

The structure postulated is only speculative, as much of the area concerned is covered by Tertiary basalt, and few outcrops are present where the attitude of the beds can be measured.

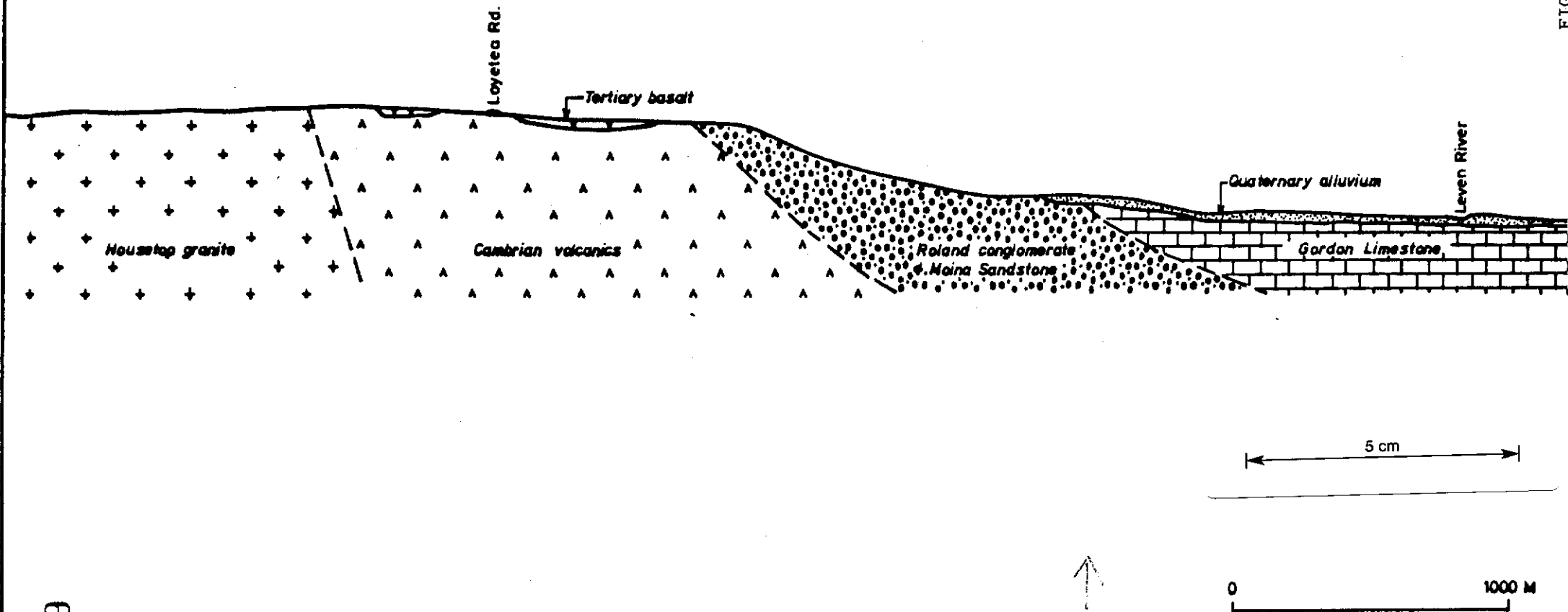
411 000 M E

412 000 M E

413 000 M E

414 000 M E

415 000 M E



The Shell Company of Australia Limited  
METALS DIVISION

Schematic east-west cross  
section along line 428 000 M N  
(line 8000 N on Loyetee grid)  
from Loyetee prospect to  
Leven River (Gunns Plains)

|                   |              |
|-------------------|--------------|
| SCALE 1:20 000    | DATE 16-9-81 |
| AUTHOR L.D.B.     | DRAWN H.L.H. |
| OFFICE DEVONPORT. |              |

FIG. 5

#### 7.3.4. Soil Sampling

A soil sampling programme was undertaken along all grid lines at a 50 metre interval. In most cases hand augering broke through the thin Tertiary basalt cover, thus allowing sampling of the sub-strata which was generally Cambrian volcanics. Average soil sample depth was 1.5 metres with the deepest being 4 metres. (Refer plans D/MQ04/038 and 052). 386 samples were dry sieved with the -80 mesh portion being sent away for analysis. Analyses included Sn, W, Cu, Pb, Zn, Fe, Mn, Bi, Ni and results are plotted on plans D/MQ04/045, 046, 047, 054, 055, 056.

The soil sampling revealed patchy, low-order Cu-Pb-Zn anomalies over the Cambrian volcanics. These anomalies will be re-sampled to ensure that they are not analytical errors. Sn and W are uniformly low (less than 30ppm) over the whole prospect with the exception of a few patchy higher values over the granite.

#### 7.3.5. Ground Magnetism

A magnetism survey was undertaken at Loyetee to ground locate the airborne anomalies. The survey was done along all grid lines at a 25 metre station spacing. Results are plotted on plans D/MQ04/037, 039, 042, 048.

The two main magnetic peaks within the Loyetee anomaly were successfully ground located. Apart from these, the main feature of the magnetism was the very noisy response. Contouring of the data is almost impossible, therefore the results are presented as stacked profiles. A 3000 to 4000 nT anomaly was picked up on the western part of the prospect near the granite contact. A check of magnetic susceptibilities of the Cambrian volcanics that outcrop over the anomaly gives an average value of  $10,000 \times 10^{-6}$  cgs units with a range of  $2000 - 15000 \times 10^{-6}$  cgs units. Elsewhere on the prospect susceptibilities of the volcanics range from  $200$  to  $3000 \times 10^{-6}$  cgs units. These high values probably explain the anomalies in this area, however, no modelling of the data has been done to date.

C301

#### 7.3.6. Conclusions

Loyetee is part of the magnetic belt running along the south-eastern edge of the Housetop Granite. This belt contains magnetite skarns at Redwater, and surficially, Loyetee looks promising. However, the geology at Loyetee shows little or no potential for the presence of replacement-type skarns as the interpreted structure demonstrates the absence of limestone.

This of course does not rule out the possibility of Cu-Pb-Zn mineralization in the volcanics, but the geochemistry gives little support for this idea.

As yet, no full evaluation of the prospect has been made as not all information has been collected. At present, the whole magnetic belt remains a very prospective area with potential for replacement skarns but it would appear that this potential is limited to the areas south of Loyetee, where Gordon limestone occurs near or adjacent to the granite.

#### 7.4. PROPOSED INVESTIGATIONS

Work on the south eastern margin of the Housetop Granite will continue as investigations to date indicate that the area is prospective for tin-tungsten mineralization. The next area for follow-up is the rest of the aeromagnetic trend between the Redwater and Loyetee grids. This zone is considered more prospective, being further away from the granite contact than the three previously investigated prospects and it may prove more favourable for sulphide facies replacement (Mt. Bischoff-, Renison-type) than those areas at the edge of the granite which have developed oxide-faces skarns of the Kara- or Moina-type.

8. GROUP 2 : GROUND FOLLOW-UP OVER IRONSTONES & OLD MINING AREAS

8.1. NATONE

8.1.1. General

The grid at Natone covers the northern half of aeromagnetic anomaly 4044/1. The southern half of this anomaly was not covered by Shell due to difficulties with a Mr. Shepherd which still have not been resolved. Thus, the ground work undertaken by Shell is not comprehensive, with over half the area of interest being south of our grid. It may be possible to gain limited access to the southern area but this would certainly not occur until summer. Our recent work has been concentrated on and around an outcrop of ironstone and hematitic cherts which was mined around the turn of the century as a source of iron ore.

In the past, a considerable amount of work has been done at Natone including magnetic surveys by the BMR (Refer plan D/MQ04/064) (Eadie, 1964, Keunecke, 1959), and exploration by Minops (Erdmanis, 1969, Goudie & Hallof, 1969, Hughes, 1969) and Tasminex (Grace, 1972). Several strong tungsten soil anomalies were found to exist, however, drilling by both Minops and Tasminex failed to locate any mineralization of interest.

8.1.2. Gridding

A grid, covering approximately 0.5 sq. km. was established at Natone with a base line bearing of  $30^{\circ}$ M, lines running northwest-southwest and at 100 metre spacings. Station spacing along the line was 50 metres. An extra two lines were established at 50 metre line spacing, after the original work, over the main magnetic features.

8.1.3. Geological Mapping

The prospect at Natone consists mainly of grazing paddocks with some cultivated fields, and as such, geological outcrop is very limited. The logging of auger chips and the mapping of outcrops has allowed a geological map to be produced at a 1:5000 scale (Refer plan

D/MQ04/078). Most of the prospect is covered by Tertiary basalt. The basalt does not generally outcrop, but forms a deep red soil seen throughout the fields. Other outcropping rock types include "ironstone", chert and siliceous siltstone. The "ironstone" consists of hematitic cherts, cherty ironstone and quartz-ironstone breccias. It is difficult to determine the actual relationships between the ironstones and the other rocks at Natone, but it appears that the cherts and siltstones underlie the ironstone.

#### 8.1.4. Soil Sampling

Hand auger samples were taken at 50 metre intervals along all grid lines, with an average sample depth of 1.5 metres. 124 samples were then dry sieved and the -80 mesh portion sent away for analysis. Analyses were by Comlabs and included Cu, Pb, Zn, Ni, Sn, W, Mn and Fe. Geochemical results and contours are plotted on plans D/MQ04/023 to 029.

The soil sampling revealed only very patchy anomalous values and little or no consistency between elements. This, however, was not totally unexpected due to the extensive basalt cover. One interesting trend which emerged was that the high tungsten values occurred around the ironstone outcrop. This supported earlier findings by Tasminex (Grace, 1972).

#### 8.1.5. Ground Magnetism Survey

A total field magnetic survey was undertaken using a proton precession magnetometer. Readings were taken at 25 metre intervals along all grid lines, with readings being corrected for diurnal drift using base station readings. Ground magnetic values, contours and stack profiles are plotted on plans D/MQ04/010 to 013. The survey revealed two intense magnetic features, one centred on 1800N/1350E and the other on 1750N/1600E. The former feature occurs over an outcrop of hematite-bearing cherts, while the latter is basalt covered. Together these two features make up the northern half of aeromagnetic anomaly 4044/1.

A comparison between our recent magnetic survey and the vertical field magnetic survey, undertaken by the BMR in 1962, (Refer plan D/MQ04/064) shows very good correlation. This BMR survey is now being used to assist in an overall evaluation of the Natone anomaly and to determine whether it will be necessary to continue negotiations with Mr. Shepherd.

Along with the magnetic survey each outcropping rock type was tested for magnetic susceptibility, to allow more accurate modelling of the magnetic data. Results were as follows:

Basalts : average value  $200 \times 10^{-6}$  cgs units  
           maximum value  $400 \times 10^{-6}$  cgs units

Ironstones : range  $50 \times 10^{-6}$  to  $45,000 \times 10^{-6}$  cgs units  
              generally  $(1000 \text{ to } 8000) \times 10^{-6}$  cgs units

Cherty sediments : 0 to  $10 \times 10^{-6}$  cgs units

#### 8.1.6. Rock Chip Sampling - Petrology & Geochemistry

The exact nature of the ironstones at Natone has long been in doubt, with no one being really sure if they were sedimentary rocks or a product of metasomatism, and what, if any, genetic relationship existed between the ironstones and the siliceous sediments. Therefore, a rock chip sampling programme was initiated, with both petrological and geochemical analysis being done on the suite collected. The suite consisted of ironstones and cherts from Natone and ironstones from Cuprona (Refer section 8.2). 15 samples were sent to Amdel for analysis by semi-quantative emission spectroscopy. In all, 38 elements were analysed for and results may be seen in Appendix 6.A. Several interesting results emerged, the most notable being high tungsten and antimony values in the ironstones, particularly at Natone. This led to several elements being checked, using the more accurate XRF method. The elements checked were W, Sb, Hg and Bi (for results see Appendix 6.A). Re-assaying showed that the antimony and mercury content of the rocks were unusually high, though the tungsten content was not quite as high as originally indicated.

Fourteen ironstone samples were sent to Central Mineralogical Services (CMS) for petrological analysis. CMS was asked to comment on the possible genesis of these rocks and the petrological report is included in Appendix 6.B. It is worth noting that this report stresses the sedimentary nature of these rocks, and describes the rocks as being completely devoid of metasomatic effects.

The geochemistry, however, indicates that the rocks have been affected by fluids introducing elements such as W, Sb and Hg, all of which are present in greater quantities than would be expected in a sedimentary or isochemically metamorphosed rock. Therefore, the suite of rock samples were sent away for gossan analysis by A. Whittle. A copy of his report is included in Appendix 6.B. In this report, Dr. Whittle suggests that none of the ironstones can be classed as gossans, and places them into two categories.

- 1) Moderately recrystallized equivalents of silica facies banded iron formation (BIF) metasediments.
- 2) More strongly metamorphosed silica, and silica-carbonate facies BIF metasediments.

He postulates an origin of the W, Sb and Hg as being emanated from a submarine felsic volcanic source, as the ironstone samples contain some recrystallized exhalative silica.

#### 8.1.7. VLF Survey

A VLF survey was carried out at Natone using North West Cape as F, and Japan as F<sub>2</sub>. Readings were taken at 25 metre intervals along lines 1800N and 1600E. For results see Appendix 7. The results of this survey were very inconclusive; however, it is possible that there were instrument problems and a second survey is planned.

036

#### 8.1.8. Minops Data

The recent acquisition of Minops data, with details of an Induced Polarization survey done by McPhar in 1969, will be of considerable assistance in planning future work at Natone (Refer Appendix 8. ). The I.P. survey covered all of anomaly 4044/1 and approximately the same area as the BMR magnetic survey. The survey showed up one particularly strong I.P. anomaly, most of which unfortunately lies on the property to which we have been denied access. It is planned to survey two I.P. lines over that part of the original I.P. anomaly which occurs outside this property. A percussion drill hole may then be drilled to test the I.P. feature if we can re-establish the original McPhar results.

Minops drilled three holes at the Natone prospect, prior to the I.P. survey. This core is held by the Mines Department in Hobart, and a visit was made to inspect the core and test it for magnetic susceptibility (Refer Appendix 9.B). The core is similar to that from the Buckby Prospect to the SW on E.L. 4/77. It consists of limestones, cherts, calc-silicate rock and andalusite hornfels. Nearly all these rocks show some degree of alteration, and sulphides are present (mainly pyrrhotite and pyrite - refer Appendix 9.A). An approach has been made to the Mines Department to borrow all the available Natone core, so as to allow detailed logging, sampling for petrological analysis and fillet sampling to be done, to try to discover the possible source of the anomalous antimony and mercury in the ironstones.

#### 8.1.9. Conclusions

There is currently no satisfactory explanation of the geophysics at Natone, and while drilling has been done previously, the I.P. anomalies were not adequately tested. The ironstones at Natone warrant further investigation to try to locate the source of the anomalous antimony, mercury and tungsten.

037

A percussion drill hole is proposed at Natone to test the strong I.P. anomaly, and if the assay results are encouraging a deep, cored hole through the ironstone may be justified. Should results be promising, a further attempt will be made to gain access to the land held by Mr. Shepherd.

## 8.2. CUPRONA

### 8.2.1. General

The Cuprona prospect partially covers aeromagnetic anomaly 4144/1. As at Natone, ironstones outcrop at Cuprona, and it was initially thought that these were the source of the magnetic feature. The grid at Cuprona was first centred on the ironstone outcrops but when the final version of the airborne magnetic data was received, it was found that the anomaly was not centred on the ironstones, but on two hills slightly to the south.

As with Natone, Cuprona has been the site of many small scale mining operations in the past, including Blythe River Iron and the Copper King Deposits. The BMR and Tasmanian Mines Department have, over the years, shown considerable interest in the Cuprona area, chiefly as a possible source of iron ore (Blake, 1958A; Everard, 1962; Keunecke, 1959; Noldart, 1966). Drilling has been carried out by the Mines Department, but was mainly confined to shallow holes into the ironstone outcrop. Exploration by many companies (including Kathleen Investments, 1965; Pickands Mather, 1967; Quest Exploration, 1966) has also been fairly extensive.

### 8.2.2. Gridding

A grid covering approximately 0.5sq. km. was established at Cuprona. Grid lines were spaced at 100 metres and the baseline was pegged through 20<sup>0</sup>M. Peg spacing along the line was 50 metres.

### 8.2.3. Geological Mapping

As with most prospects on the Riana licence, outcrop is limited at Cuprona as the main land use is grazing and cropping.

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However, the deeply incised Blythe River exposes Precambrian Burnie Formation sediments (shales and siltstones) and the ironstones. It is only along the river that these rock types are exposed, and Tertiary basalt covers the remainder of the prospect.

#### 8.2.4. Soil Sampling

A soil sampling programme was carried out at 50 metre intervals along all grid lines. A total of 119 samples were dry sieved and the -80 mesh portion was sent away for analysis. Elements analysed for were Cu, Pb, Zn, Ni, Fe, Mn, Sn and W (values and contours are plotted on plans D/MQ04/022, 030, 031, 032, 033 and 034).

In the main values are patchy and of low order, with little consistency between elements. This was not unexpected due to the extensive basalt cover over the area. Coincident low-order Sn, W and Cu anomalies occurred partially over and around the ironstone outcrop. This is similar to the results at Natone.

#### 8.2.5. Ground Magnetism

A ground magnetism survey was carried out at 25 metre intervals along all grid lines at Cuprona. Readings were corrected for diurnal drift using base station readings. Results (stacked profiles, values and contours) are plotted on plans D/MQ04/007, 009, 015, 020 and 021.

Poor magnetic response was recorded over the ironstones. Later petrological studies revealed hematite and limonite to be the dominant iron-bearing phases at Cuprona, magnetite being present in only minute amounts. The northern half of the aeromagnetic anomaly was successfully ground located over a high basalt hill. As with most anomalies over basalt, the feature was very broad and the response was noisy. It was deemed unnecessary to grid the southern half of the anomaly (also occurring over a steep basalt hill), however, a reconnaissance line was done over this hill, and the more northerly feature. These two lines were then modelled (Refer App. 10).

Magnetic susceptibility measurements of rock outcrops were taken at Cuprona, to allow more accurate modelling of the magnetics. Basalt susceptibilities were of the order of  $(200 \text{ to } 400) \times 10^{-6}$  cgs units, while ironstone susceptibilities were slightly lower,  $(50 \text{ to } 100) \times 10^{-6}$  cgs units).

#### 8.2.6. Rock Chip Sampling - Petrology & Geochemistry

The ironstone outcrop at Cuprona was rock chip sampled and sent for petrological and geochemical analysis with rocks of similar lithology from Natone (Refer text section 7.1. and Appendix 6). The ironstones at Cuprona are described as hematite jaspilites and cherty (quartz) ironstones (Refer Appendix 6.B).

As with the Natone rocks, gossan analysis was done by A. Whittle, and an exhalative volcanic origin for the anomalous antimony and mercury content has been postulated (Refer Appendix 6.B).

#### 8.2.7. Drilling

Much of the ground work on E.L. 8/77, Riana has been done in areas of basalt cover. The magnetic anomaly at Cuprona was chosen as a site for a vertical percussion drill hole to test through the basalt and check the underlying rocks. It was also hoped to gain further information concerning the physical properties of the Tertiary basalt that may affect magnetic responses. By the end of June, the hole had been advanced to 84 metres, all in basalt, with magnetic susceptibilities ranging from  $300 \text{ to } 3000 \times 10^{-6}$  cgs units.

#### 8.2.8. Conclusions

The unusual geochemistry of the ironstones at Cuprona makes this prospect interesting, even though the geophysics here is not as favourable as at Natone. The drilling of the percussion drill hole at Cuprona may allow information to be gained on the extent of the ironstone and the underlying rocks. If follow-up at Natone proves successful, this will encourage further work at Cuprona.

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A correlation of all available work, past and present, at Cuprona, and the similar environment at Natone will proceed so as to ascertain the potential of these prospects.

### 8.3. PROPOSED INVESTIGATIONS

Though the hematite and limonite deposits south of Penguin are not related to an airborne magnetic or radiometric feature, authors in the past (Montgomery, 1896; Hughes, 1953) have noted the similarity between these rocks and those seen at Natone and Cuprona. Therefore, if any significantly encouraging results are returned from Natone and Cuprona, a study of the iron-stones south of Penguin will be undertaken.

The anomalies over the old Penguin and Neptune mines will be examined in due course, to determine their source.

## 9. GROUP 3

### 9.1. CAMENA - ANOMALY 4144/2

#### 9.1.1. General

The Camena anomaly corresponds to an alluvium covered valley of the Blythe River, with Tertiary basalts forming the valley sides. The sub-basalt geology is probably Ordovician chert and conglomerate, occurring very close to the Housetop Granite contact. The relatively broad alluvial valley is in itself atypical, since the Blythe River is normally very narrow and deeply incised.

#### 9.1.2. Ground Magnetic Survey

A single 1 km E-W ground magnetic traverse across the anomaly revealed a broad, high amplitude anomaly of around 64000 nT with no significantly lower background values being obtained. The high values would be typical of a magnetite-bearing basalt, and in fact, the magnetic profile has the characteristic noisy signature of basalts. Refer Figs. 6 and 7.

However, rare basalt float is non-magnetic, and not an obvious anomaly source. In addition, modelling of the airborne anomaly indicates a deep 600 - 800 metre source, rather than a shallow basalt source.

#### 9.1.3. Interpretation & Conclusions

The Camena anomaly is a deep source, probably due to a basic/ultrabasic intrusive. The ground magnetic profile gives a high amplitude anomaly, to which a basalt 'magnetic noise' component is added. Shallow source, localized highs appear to correspond to basalt plateau edges.

In view of the excessive depth and size of the source body, no further follow-up work is proposed at Camena.

**3,000 N**

414 000 E



5 cm

20

2

FIG. 6

|                                        |               |
|----------------------------------------|---------------|
| The Shell Company of Australia Limited |               |
| METALS DIVISION                        |               |
| E.L.8/77 RIANA                         |               |
| ANOMALY 4144/2 CAMENA                  |               |
| LOCATION OF GROUND                     |               |
| MAGNETIC TRAVERSE                      |               |
| Scale 1 : 20000                        |               |
| FIG. No                                | REPORT No.    |
| ENCL No                                | DRG No D/MOOL |
| DATE 23-10-81                          | AUTHOR L.D.B. |

754044

043

64500 -

64000 -

63500 -

1000E

1100E

1200E

1300E

1400E

1500E

1600E

1700E

1800E

1900E

2000E

power  
line

5 cm



|                                        |                   |
|----------------------------------------|-------------------|
| The Shell Company of Australia Limited |                   |
| METALS                                 | DIVISION          |
| RIANA                                  | EL. 8/77          |
| CAMENA                                 | ANOMALY 3         |
| PROTON PRECESSION MAGNETOMETRY         |                   |
| FIG No                                 | Scale 1:5000      |
| ENCL No                                | REPORT No         |
| DATE 16.12.80                          | DWG No D M004.015 |
|                                        | AUTHOR S. HOLLIV  |



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9.2. FURTHER GROUND FOLLOW-UP

Many anomalies have been chosen by Dr. G. Dickson in his reports, but have been given a low order of priority with regards ground follow-up. In most cases, a single line of ground magnetics will be sufficient to allow modelling of each anomaly. Those that have obviously basaltic sources will be disregarded, while others will be investigated further with more extensive gridding magnetics and soil sampling.

## 10. CONCLUSIONS

Evaluation of all airborne data collected has now been completed, and follow-up of some of the anomalies chosen is well underway. To date, ground follow-up has been confined to those anomalies that are more obviously prospective, with respect to structural and geological environment.

As Comalco had established the presence of magnetite skarn at Redwater, the south eastern margin of the Housetop Granite seemed prospective for Kara- or Moina-type skarn bodies. The magnetics associated with the contact between the Devonian granite and the Ordovician sediments is a strong, well defined feature, and the previous work done at Redwater provided an encouraging basis for further exploration in this area. As yet, exploration results have not denied the prospectivity of this region and work here will continue.

Group Two magnetic anomalies, being associated with areas of ironstone outcrops and known mineralization (Natone, Cuprona, Penguin, Neptune), seemed to be good targets for further exploration. Both Natone and Cuprona have proved interesting with respect to the ironstones and their geochemical characteristics, and while much work in the past has been done on the ironstones, it was generally done with a view to these rocks being possible sources of iron ore. The ironstones are now being investigated as a lead to possibly associated unknown mineralization. With this in mind, work will continue.

The ongoing exploration programme on E.L. 8/77, Riana will involve continuing work on Group One and Group Two anomalies, initial ground follow-up of Group Three magnetic anomalies, and follow-up of stream sediment sampling work done by Comalco. Comalco carried out a very extensive stream sediment sampling programme over, amongst other licences, E.L. 8/77, Riana. Little follow-up to this programme was undertaken by Comalco, and to date, Shell has not fully utilized the large amount of data collected. Thus, follow-up of stream sediment anomalies will constitute an important part of the exploration programme. As the more obvious magnetic anomalies have been investigated, a coupling of the data from the stream sediment sampling programme and the airborne magnetic and radiometric survey may prove useful in

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assigning the priority for follow-up of anomalies, and further exploration on E.L. 8/77, Riana.

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Geologist.

REFERENCES

- ATKINSON, W.J. (1958B). Iron deposits of the Burnie-Penguin area, the preliminary investigation of Rio Australian Exploration Pty. Ltd. Tas. Dept. Mines Open File Rep. Q28/1
- BLAKE, F. (1958A). Blythe River and Cuprona Iron areas. Tas. Dept. Mines Tech. Rep. 2:25-33.
- BLAKE, F. (1958B). Rutherford's Iron Area, Natone. Tas. Dept. Mines Tech. Rep. 2:19-22.
- BOYD, GIBSON, YOUNG (1919). Report of experts on the Blythe River Iron deposits (Commonwealth Parliament). Tas. Dept. Mines Open File Rep. Q28/4.
- BRANDT, R.T. (1973). Report on the results of exploration on E.L. 1/69 Jan. 72 - Sept. 73. Australia & New Zealand Expl. Co.
- BRANDT, R.T. (1974A). Report on the results of exploration on E.L. 17/68 Oct. 71 - May 74. Australia & New Zealand Expl. Co.
- BRANDT, R.T. (1974B). Final report on exploration licence 1/69 for the period Sept. 73 - June 74. Australia & New Zealand Expl. Co.
- BURNS, K.L. (1957). The geology of the Nook-Gunns Plains area. Unpubl. B.Sc. Hons. Thesis Univ. of Tas.
- BURNS, K.L. (1960). Cambrian lithostratigraphy, Nook-Preston-Penguin area. Tas. Dept. Mines Tech. Rep. 4:46-49.
- BURNS, K.L. (1961). The Iron Cliffs Mine, Penguin. Tas. Dept. Mines Tech. Rep. 5:117-136. Plus 2 maps.
- BURNS, K.L. (1963B). Devonport map sheet 1:63,360 series. Geological Atlas. Tas. Dept. Mines.
- BURNS, K.L. (1964). One mile geological map series K/55-6-29 D'port Explan. Rep. Geol. Surv. Tas.
- CLARKE, D., BAINBRIDGE, I. (1967). The Blythe River Iron Deposits. Tas. Dept. Mines Open File Rep. Q28/1.
- DARBY, J.H. (1900). Blythe River Iron Mines. Tas. Dept. Mines Open File Rep. Q28/5.
- EADIE, E.N. (1964). Natone magnetic survey Tasmania, 1962. Bur. Min. Resources Aust. Rec. 1964/14.
- ERDMANIS, J. (1969). Progress report to 30 Sept. 1969 on E.L. 13/68 & E.L. 14/68. Minops Pty. Ltd. Tas. Dept. Mines Open File Rep. Q28/16.
- EVERARD, G. (1962). Petrological notes, specimens from Blythe River. Tas. Dept. Mines Tech. Rep. 6:88.
- EVERARD, G. (1963A). Petrological notes, specimens from Penguin collected by K.L. Burns. Tas. Dept. Mines Tech. Rep. 7:104-105.

- EVERARD, G. (1963B). Petrological notes on specimens from Dial Range collected by S.M. Rowe. Tas. Dept. Mines Tech. Rep. 7:105-106.
- GEE, R.D., (1967). Burnie Map Sheet. 1:63,360 series. Geological Atlas. Tas. Dept. Mines.
- GEE, R.D., (1977). One mile geological map series, Burnie. Explan. Rep. Geol. Surv. Tas.
- GOODEVE, P.E. (1955). Preliminary report on Aeromagnetic survey over Hampshire & Blythe River areas, Tasmania. Bur. Min. Resou. Aust. Rec. 1955/106.
- GOUDIE, M.A., HALLOF, P.G. (1969). Report on the Induced Polarization & Resistivity survey in the Natone area of Tasmania for Minops Pty. Ltd. McPhar Geophysics Pty. Ltd. Tas. Dept. Mines Open File Rep. Q28/13.
- GRACE, D.P. (1972a). Tasminex N.L. Natone area Phase 1 Report. Tas. Dept. Mines open File Rep. Q28/22.
- GRACE, D.P. (1972b). Dial Range Area. Prospecting report. Tasminex N.L. E.L.9/72. Tas. Dept. Mines Open File Rep. Q29/12.
- HEWITT, W.V. (1968). Geophysical survey Penguin Beach E.L. 15/65. B.H.P. Co. Ltd. Tas. Dept. Mines Open File Rep. Q29/4.
- HUGHES, T.D. (1953b). The Dial Range Mineral Field. Unpubl. Trans. Tas. Dept. Mines.
- HUGHES, T.D. (1957). Limestones in Tasmania. Tas. Dept. Mines Geol. Surv. Min. Resources 10:149-154.
- HUGHES, T.D. (1959). Alleged Uranium Occurrence at Riana. Tas. Dept. Mines Tech. Rep. 3:33-34.
- HUGHES, T.D. (1961). Magnetite deposits at Loyetee. Tas. Dept. Mines Tech. Rep. 5:98-99.
- HUGHES, T.D. (1969). Natone Area - E.L.14/68 & E.L.13/68 for Minops Pty. Ltd. Tas. Dept. Mines Open File Rep. Q28/15.
- JACK, R. (1965A). Drilling results, Hampshire Iron Ore deposits. Tas. Dept. Mines Tech. Rep. 9:22-25.
- JACK, R. (1965B). Natone Manganese deposit. Tas. Dept. Mines Tech. Rep. 9:20-21.
- JACK, R. (1965C). Highclere Iron deposit. Tas. Dept. Mines Tech. Rep. 9:37-42.
- JENNINGS, I.B. et al (1959). Sheffield Map sheet, 1:63,360 series. Geological Atlas. Tas. Dept. Mines.
- JENNINGS, D.J. (1968). Iron Ore at Penguin Creek, a magnetometer survey. Tas. Dept. Mines Tech. Rep. 12:43-44.
- KEUNECKE, O. (1959). Magnetic survey of the Natone, Blythe River-Cuprona & Highclere Iron Ore deposits, NW Tasmania. Bur. Min. Res. Aust. Rec. 1959/11.

- LEAMAN, D.E. (1973). Applied geophysics in Tasmania, Part 1. Summary of surveys and rock properties. Bull. Aust. Soc. Expl. Geophys. Vol. 4 No.2/3 p. 27-58.
- LONGMAN, M.J. (1962A). Iron ore at Penguin Creek. Tas. Dept. Mines Tech. Rep. 6:18-20.
- MANSON, W. St. C, LIDDY, J., JAMES, P.L. (1962). Ore dressing investigation R386. Blythe River Iron ore beneficiation. Tas. Dept. Mines Tech. Rep. 6:214-222.
- MATTHEWS, W.L. (1964). Geology of the Penguin area. Tas. Dept. Mines Tech. Rep. 9:96-101.
- MATTHEWS, W.L. (1977). Examination of Groom's & Lonah slips, near Penguin. Tas. Dept. Mines Tech. Rep. 20:159-164.
- MINOPS PTY. LTD. (1969). Composite plan, Natone area and schedule of proposed holes. Tas. Dept. Mines Open File Rep. Q28/14.
- MONTGOMERY, A. (1896). Report on the mineral fields of the Gawler River, Penguin, Dial Range, Mt. Housetop, Table Cape, Cam River and portion of the Arthur River districts. Tas. Rep. Secretary Mines 1895-6:i-xx.
- MacDONALD, E.H. (1965). Blythe River Iron Ore Deposits for Kathleen Investments. Tas. Dept. Mines Open File Rep. Q28/8.
- McDOUGALL, I., LEGGO, P.J., (1965). Isotopic age determinations on granitic rocks from Tasmania. J. Geol. Soc. Aust. 12:295-332.
- NOLDART, A.J. (1966). Cuprona Iron Deposit. Tas. Dept. Mines Tech. Rep. 10:55-64 plus map.
- NYE, P.B. (1937). Blythe River Iron deposits. Tas. Dept. Mines Open File Rep. Q28/6.
- PEARSON, A. (1927). The Housetop area. Laurel Creek & Blythe River districts. Tas. Dept. Mines Open File Rep. Q36/4.
- PICKANDS MATHER PTY. LTD. (1967A). Report on Copper King Mine, Cuprona. Tas. Dept. Mines Open File Rep. Q28/9.
- PORTER, T.M. (1972). E.L.4/72 Highclere, NW Tasmania, Final Report. CRA Expl. Pty. Ltd. Tas. Dept. Mines Open File Rep. Q28/19
- PORTER, T.M. (1974). E.L.19/72, Nietta. Progress report No.1. CRAE. Tas. Dept. Mines Open File Rep. Q37/33.
- PORTER, T.M. (1975). E.L.19/72, Nietta. Progress report No.2. CRAE. Tas. Dept. Mines Open File Rep. Q37/34.
- PORTER, T.M. (1976). E.L.19/72, Nietta. Progress report No.3. CRAE. Tas. Dept. Mines Open File Rep.
- QUEST EXPLORATION PTY. LTD. (1966). General appraisal of Copper King Mine, Natone. Tas. Dept. Mines Open File Rep. Q28/12.
- ROWE, S.M. (1963). Black's Manganese Deposits, Dial Range. Tas. Dept. Mines Tech. Rep. 7:49-54.

- SHEEHAN, G.M. (1969). The gravity field in the Sheffield area. Unpubl. B.Sc. Hons. Thesis Univ. of Tas.
- SMITH, J.H. (1899). Report on the Penguin & Dial Range Mineral Fields. Ann. Rep. Sec. Min. Tas. for 1898-99.
- SMITH, W.C. (1960). Penguin Creek deposits & Iron Cliffs lode geological report. BHP Co. Ltd. Tas. Dept. Mines Open File Rep. Q29/1.
- THUREAU, G. (1882). Northwestern mineral deposits. Tas. House Ass. Pap. 43 for 1882.
- TWELVETREES, W.H. (1901). Report on the Blythe River iron ore deposit. Rep. Sec. Mines Tas. 1900-91.
- TWELVETREES, W.H. (1903). Report on the Dial Range and some other mineral districts on the NW coast Tas. Tas. Dept. Mines Rep. No.5.
- TWELVETREES, W.H. (1906). Ann. Rep. Sec. Min. Tas. for 1905.
- TWELVETREES, W.H. (1909). Gunns Plains, Alma & other mining fields, Northwest coast. Geol. Surv. Tas. Bull. 5.
- TWELVETREES, W.H. & REID, A.M. (1919). The iron ore deposits of Tasmania. Miner Resour. Geol. Surv. Tas. No.6.
- WESTE, G. (1979). E.L. 8/77, Riana. Report on all Investigations to Dec. 1979. Commonwealth Aluminium Corp. Ltd.
- WHITING, J.D. (1970). Tasminex N.L. Natone Copper/Iron Prospect, Tasmania. by Hall Ralph & Ass. P/L. Dept. Mines Tas. Open File Rep. Q28/23.
- WILLIAMS, E. & TURNER, N.J. (1973). Burnie map sheet 1:250,000 series, Geol. Atlas. Tas. Dept. Mines.
- WILLIAMS, E. & TURNER, N.J. (1974). Geological Atlas 1:250,000 series, Burnie. Explan Rep. Geol. Surv. Tas.

APPENDIX 1GEOMETRICS AIRBORNE MAGNETICS & RADIOMETRICS  
SURVEY

- A. Those parts of Dr. G. Dickson's Reports  
pertaining to E.L. 8/77, Riana.
- B. Shell catalogue of anomalies, indicating  
numbering system and location.

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December 3, 1980.

**TASMANIAN AEROMAGNETICS -****RADIOMAGNETIC SURVEYS****PROGRESS REPORT****1.0 Comments on Programme to date.**

1.1 We have, at this date, a copy of all twenty-six sheets of the aeromagnetic data contoured at a scale of 1:20,000. However, of these only nine are of an acceptable quality, and of these, two need to be re-contoured in final form. The major error in the data is one of navigation or transposition of photographic "picks" to base plan. The result is, the contour plans are "torn" in many places. A less important, but uncorrectible source of error lies in variation of altitude over magnetic basalt. This results in a "noisy" map.

At this stage, following talks with Rod Gardener of Geometrics, we believe the problems are in hand and we should receive a good deal of the data in final form before Christmas.

The outstanding sheets are:

| <u>Sheet</u> | <u>Priority for Completion</u> |
|--------------|--------------------------------|
| 4340         | 7                              |
| 4242         | -                              |
| 4241         | 5                              |
| 4240         | 4                              |
| 4239         | 6                              |
| 4143         | -                              |
| 4142         | 2                              |

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| <u>Sheet</u> | <u>Priority for Completion</u> |
|--------------|--------------------------------|
| 4141         | 2                              |
| 4140         | -                              |
| 4139         | -                              |
| 4044         | 9                              |
| 4042         | 1                              |
| 4041         | 3                              |
| 3943         | 8                              |
| 3940         | -                              |
| 3840         | -                              |
| 4339         | -                              |

1.2 Splicing in of earlier data, and the production of a smaller scale map cannot proceed until the final maps are available. At this stage, I believe mid-January is the earliest date for this.

1.3 The regional work cannot proceed until 1.2 is completed.

1.4 We have examined the airborne data relating to the twenty anomalies selected by the Devonport staff. A discussion of the results of our examination follows in another section

2.0 Ground Follow-up.

Ground follow up should consist of:

- a) A surface examination, and it is vital that susceptibility measurements be taken whenever possible. Our rating of the anomalies is heavily dependent on knowing the susceptibility of the surface rocks.

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- b) Magnetometer survey to:
  - i) verify ground location;
  - ii) further evaluate the target.\*
- c) Ground EM examination of target. To this end, we have contacted Wolf Tschaikowsky of Geoterrex to arrange field tests using the lightweight Max-min EM System. Tests can be planned for mid-December and suitable test sites over known mineralisation should be considered. Cost for the Max-min System will be about \$200/day for one man and equipment. A two-man crew is normally required, three may be required in rough terrain. The system should be capable of seeing reasonably good conductors to a depth of 70-80 metres; perhaps more in reasonable terrain. Careful line preparation is required, as this is a frequency system, and the pegs need to be chained.

### 3.0 Method of Rating the Aeromagnetic Anomalies.

We have given anomalies a higher rating where the interpreted parameters begin to approach those observed over Moina and Mt. Bischoff. In evaluating the effect of the basaltic topography, we have used a value of  $1500 \times 10^{*-6}$  cgs. units. If this is in error at any particular location, our rating will be seriously effected. In particular, anomaly site 4, Cuprona, is probably related to topography,

← prob  
the high  
This usually  
are - 500 m

- \* Generally, the width of a magnetic body cannot be resolved when it is buried to a depth greater than its width. We tend, therefore, to overstate the widths of airborne anomalies. Thin targets, whether they be horizontal or vertical, are more likely to represent mineralisation than wide targets.

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but this cannot be a basaltic source. Susceptibility measurements are highly desirable here.

At Moina an anomaly of 1300 gammas is observed, accompanied by a small but noticeable K channel high. Instead of interpreting for the susceptibility, K, we use a parameter K', which is proportional to susceptibility, and we note a value of 900. At Mt. Bischoff, the amplitude is 700 gammas and K' is approximately 600. We therefore consider any anomaly, which is not obviously formational, with a K' value of, say, 400-500, to be significant, and more particularly so if the potassium channel is elevated.

Our two-dimensional models of reasonable basaltic topography (again we stress using 1500 cgs. units) cannot yield a K' value of 500. 50-100 would be a more likely value.

A copy of the results over Moina and Mt. Bischoff, along with some of the models are included.

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NOTES ON SELECTED ANOMALIES.

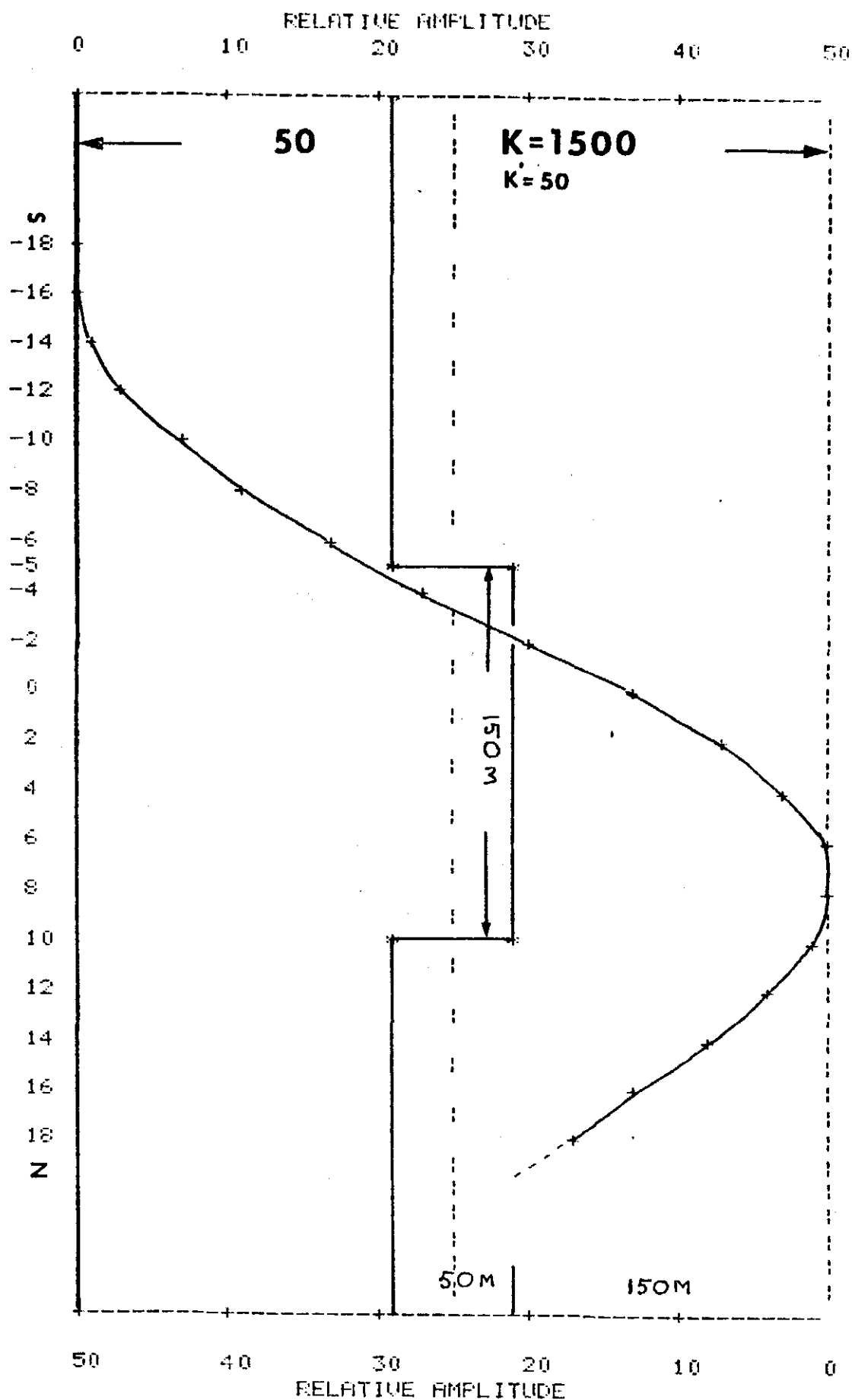
| <u>Anomaly Number</u> | <u>Name</u>                                                     | <u>Comments</u>                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                     | Upper Stowport<br><br><i>more likely a dyke</i>                 | East side of Emu River. K' is not high @ 200. Anomaly looks formational and the trend cuts the Emu River. Source is close to surface - may represent a buried channel. No immediate K channel response.                                                                                                                                                                                                       |
| 2                     | Natone<br><i>follow up</i>                                      | If associated with a <del>channel</del> <sup>true</sup> then <sup>5-100 ft 2 m</sup> not a strongly magnetic one. K' 400-500. No topo effects. Faulted to the south and probably to the north. Slight increase in K channel probably sediments.                                                                                                                                                               |
| 3                     | Camena                                                          | Source is strongly magnetic with K'- 600-900. Depth of burial 600-800 m. Suggests an ultramafic source. Uncertain exploration potential.                                                                                                                                                                                                                                                                      |
| 4                     | Cuprona<br><i>Follow up</i><br><br><i>delineate dyke on map</i> | Although an obvious topographic association, it cannot be basalt with susceptibility of 1500 cgs. The anomaly requires about 15,000 to be topographic. It does fit ultramafic range. Solutions suggest near-surface source. K channel slightly elevated - perhaps due to sediments. <u>Could source be the same as Camena.</u><br><br><i>Cuprona is dyke source spatially associated with Natone hole. /6</i> |

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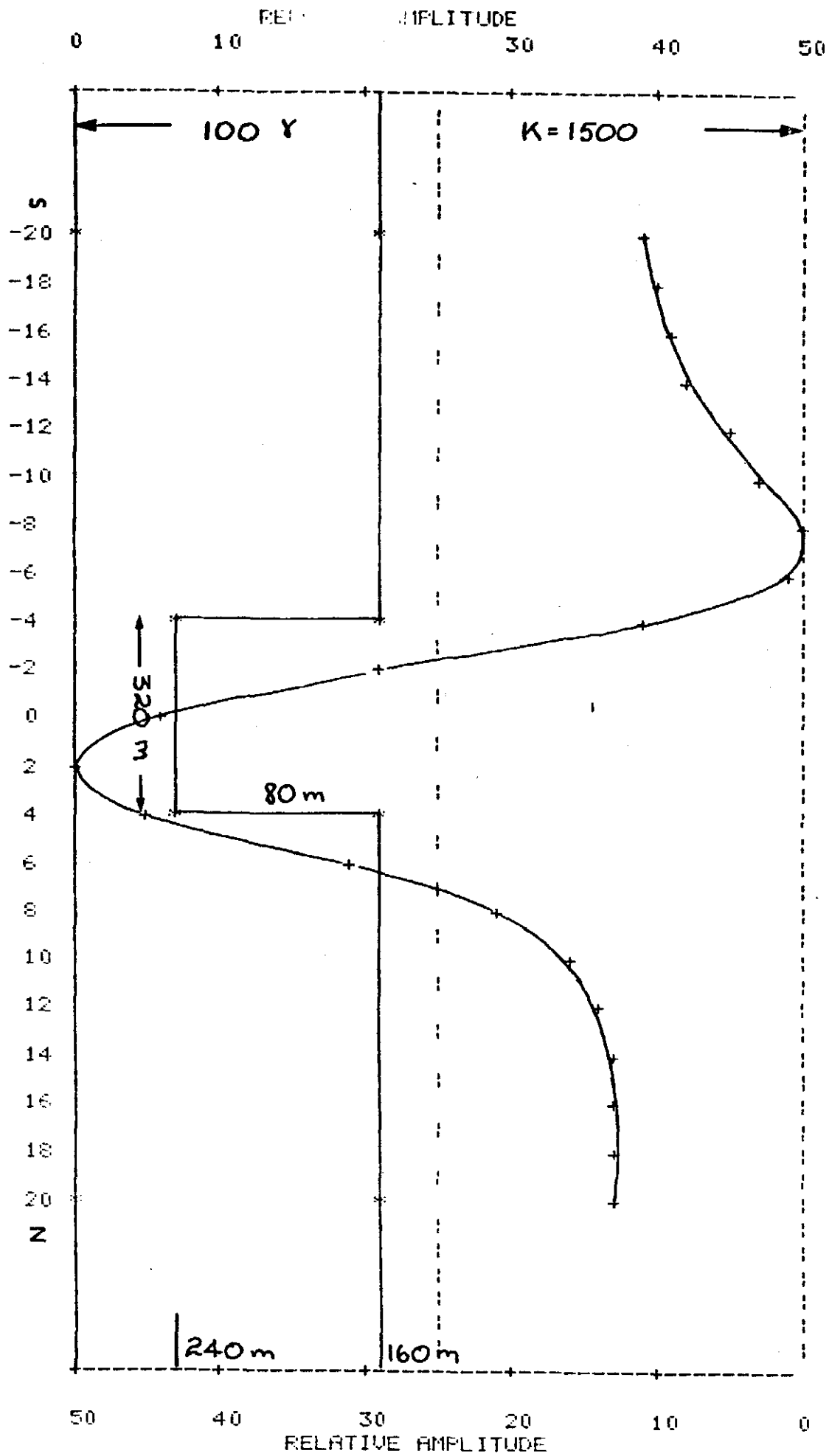
| <u>Anomaly Number</u> | <u>Name</u>                                                                                                                          | <u>Comments</u>                                                                                                                                                                                                                                                                        |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5                     | Highclere                                                                                                                            | Not positioned.                                                                                                                                                                                                                                                                        |
| 6                     | Buckby                                                                                                                               | Not positioned. Ground data available and report noted.                                                                                                                                                                                                                                |
| 7.                    | Redwater*<br>drill tested<br>AES 1, 2<br>no follow up                                                                                | In valley and no obvious topographic relationship. K'-850 and therefore high. Magnetite skarn. At a granite contact. Suggest near surface.                                                                                                                                             |
| 8.                    | Peak Hill*<br>ground mag completed<br>The source<br>basalt hill<br>with suscept<br>up to $1000 \times 10^{-6}$<br>gridding completed | Source buried about 60 m. Looks like wide source - <u>needs ground mag check</u> . K' is moderate @ 400. Cannot be basalt hill @ 1500 cgs. Needs susceptibility check. Cambrian volcanics to the south. Perhaps source is in volcanics. <i>stratigraphy indicate sub-Tb Gordon Lst</i> |
| 9                     | Laurel Creek*<br>follow up current<br>correct →                                                                                      | Fairly high amplitude for depth. 3D body and depths incorrect. Suggest K' is high. Anomaly in a valley on NE fault zone. K channel locally low but anomaly occurs in granitic environment.                                                                                             |
| 10                    | Laurel Creek*<br>follow up current<br>granite outcrops                                                                               | Anomaly source close to surface on local hill. K' is high 700-800. On granite contact and NE fault zone. Looks good.                                                                                                                                                                   |

December 3, 1980.

| <u>Anomaly<br/>Number</u> | <u>Name</u>                                                                              | <u>Comments</u>                                                                                                                                                                                                                                 |
|---------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11                        | Laurel Creek *<br><i>follow up.<br/>good structural<br/>error</i>                        | Looks to be formational. K' is low. Occurs in granite, some structure apparent. Could be topographic over slightly magnetic granite. - <i>not zone, prospective</i>                                                                             |
| 12                        | Alps Road                                                                                | Low amplitude @ 80 gammas over topographic feature in basalt. 140 m. clearance over 300 m. wide hill. No follow up.                                                                                                                             |
| 13                        | Taylor Flat                                                                              | Looks like topographic effect over basaltic cover. K', 60-70. Source at surface. Geology certainly basalt.                                                                                                                                      |
| 14                        | Wilmot River *<br><i>for follow up</i>                                                   | Located on Flt. 60. Helicopter low @ 80 m. Shape fits the hill, but amplitude too high for 1500 cgs. material. K' = 300; looks a little low. <u>Need susceptibility information.</u> <u>Needs another model.</u> Slight deviation in K channel. |
| 15                        | Nietta River<br><i>follow up completed</i><br><br><i>No c/c<br/>to the low suscep. →</i> | Helicopter low @ 75-80 m. clearance. Anomaly not placed correctly for hill effect and amplitude @ 750 too high for K - 1500 cgs. K'=400-500 is moderate. Need susceptibility information. No K channel elevation in area.                       |



MODEL SCALE + = 669.058 GAMMAS/UNIT  
 FIELD SCALE F = 0 GAMMAS/UNIT  
 DEPTH SCALE \* = .7 METRES/UNIT  
 SUSCEPTIBILITY = 1 CGS UNITS



061

81

TOTAL MAG

K' ~ 900

1000

MOINA

MOINA

↓ AIR-Ed

7270

T.C

K

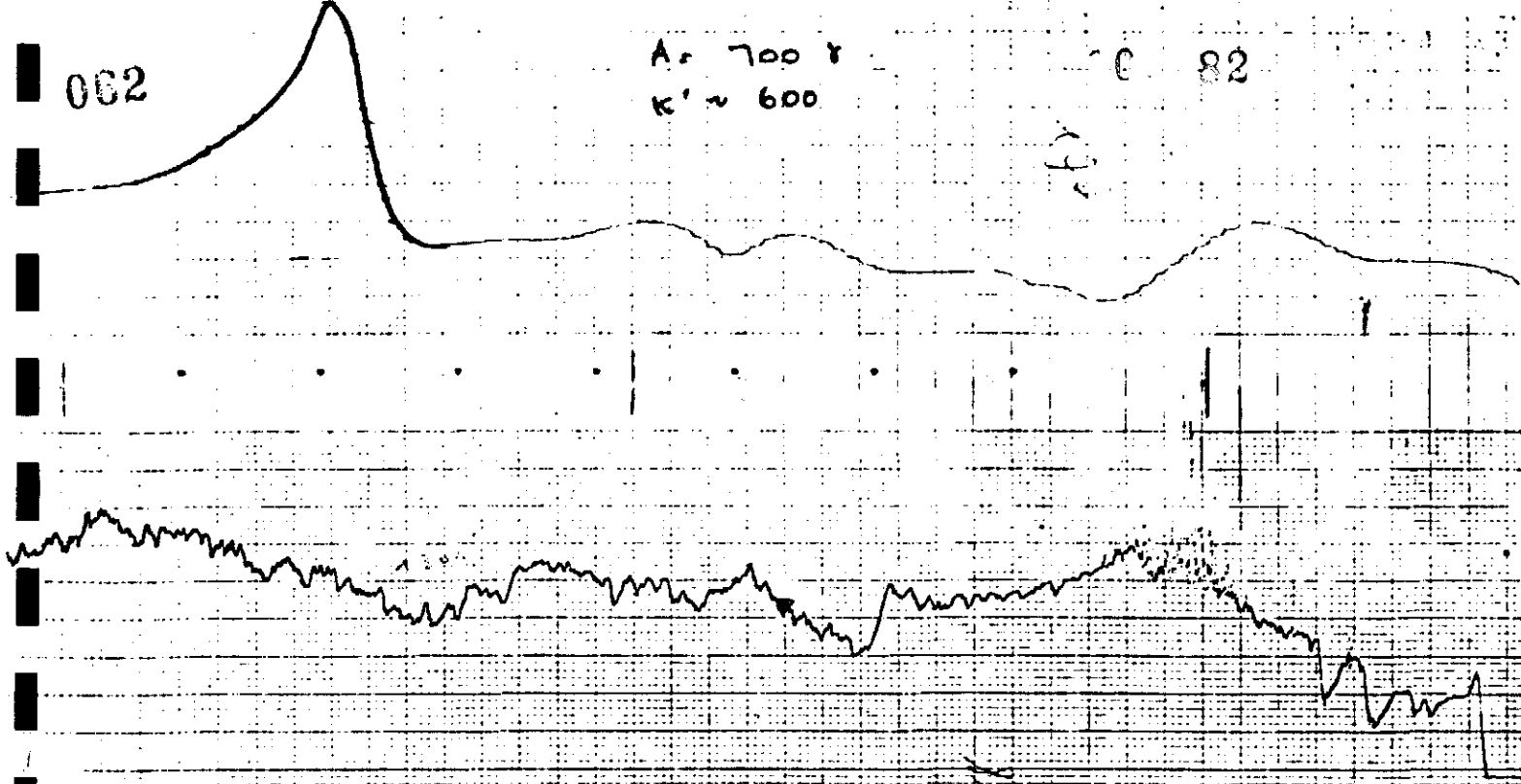
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754062

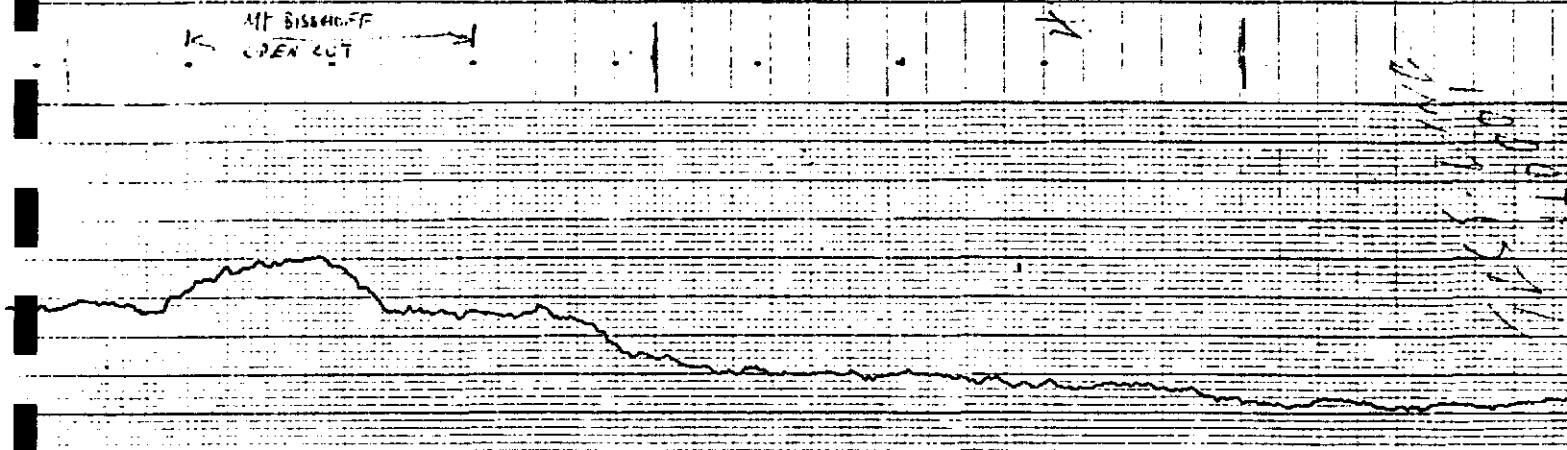
002

A. 700 x  
K' ~ 600

0 82

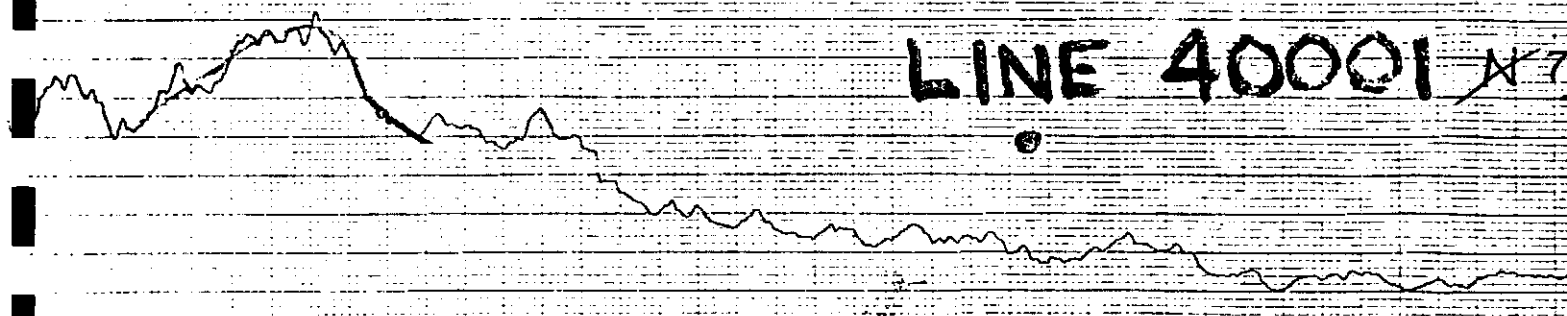


MT BISCHOFF  
OPEN CUT

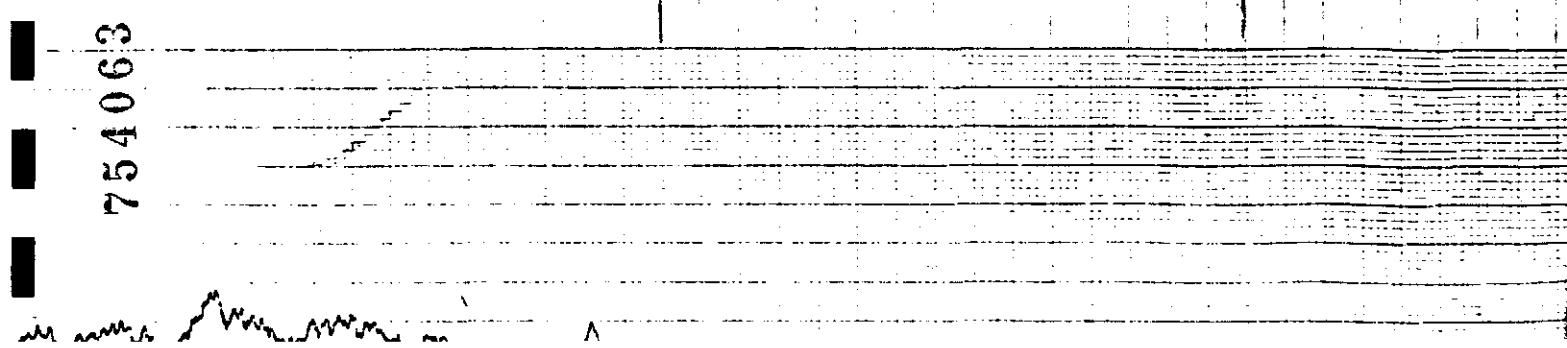


MT BISCHOFF

LINE 40001 X7



754063



063

6. 83

#1 Upper. Stom part

A = 360  
H = 100  
W = 175

K' = 200

line 233C / 4044

FL 10

line altimeter

100 m

← E

4700

REVER  
S  
B

4693

754064

064

00 84

4-210

000000

150 150

K-380 TOST VCM H-11

Line 233E / 400A

Ref 10

2. Natone

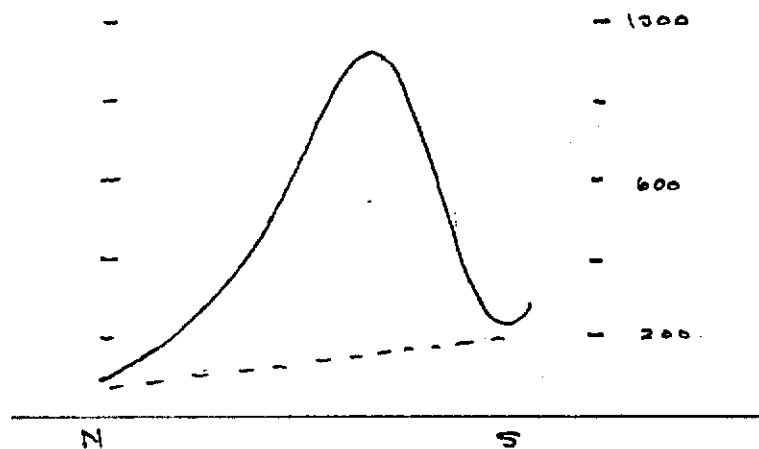
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← E

4705

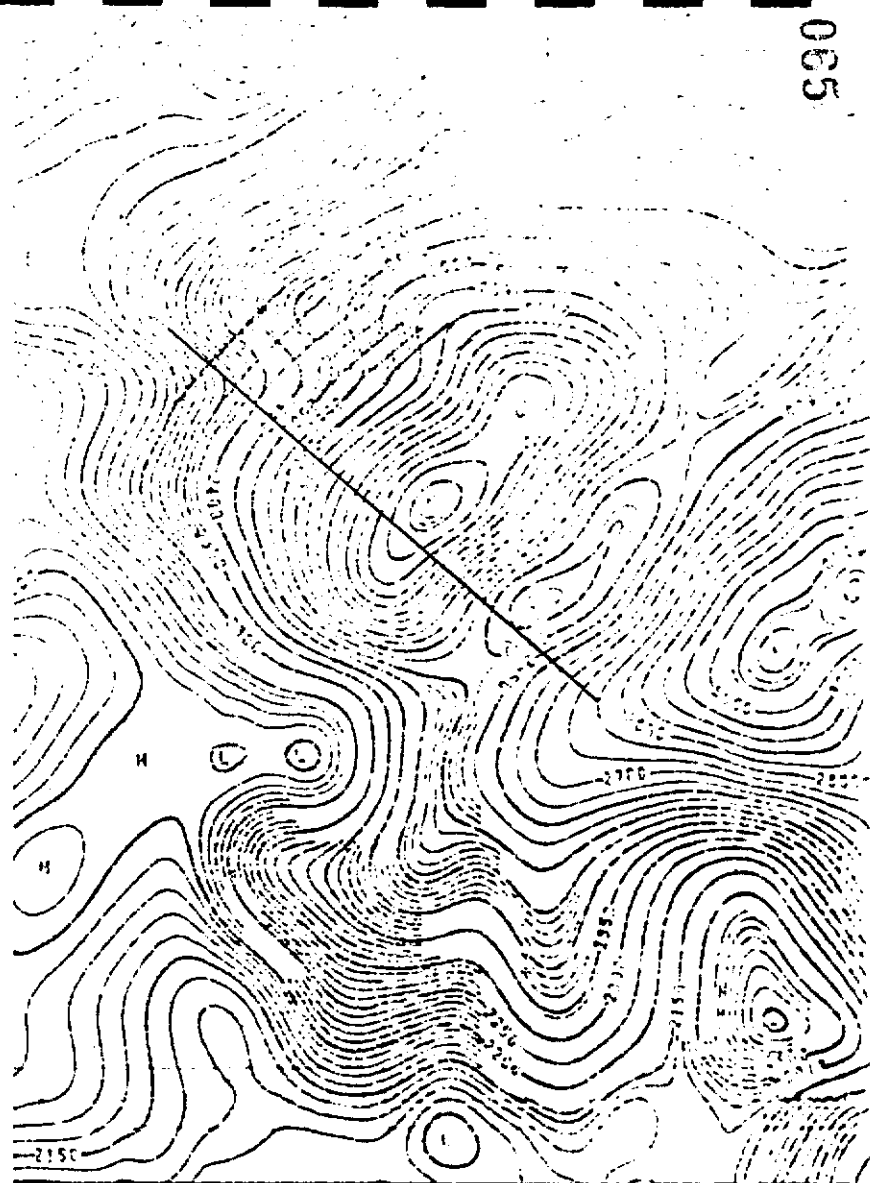
4700

754065



$A \sim 800$   
 $D \sim 180m$   
 $W \sim 260$   
 $K' \sim 550$

#2, MATONE



066

CAMINA

86

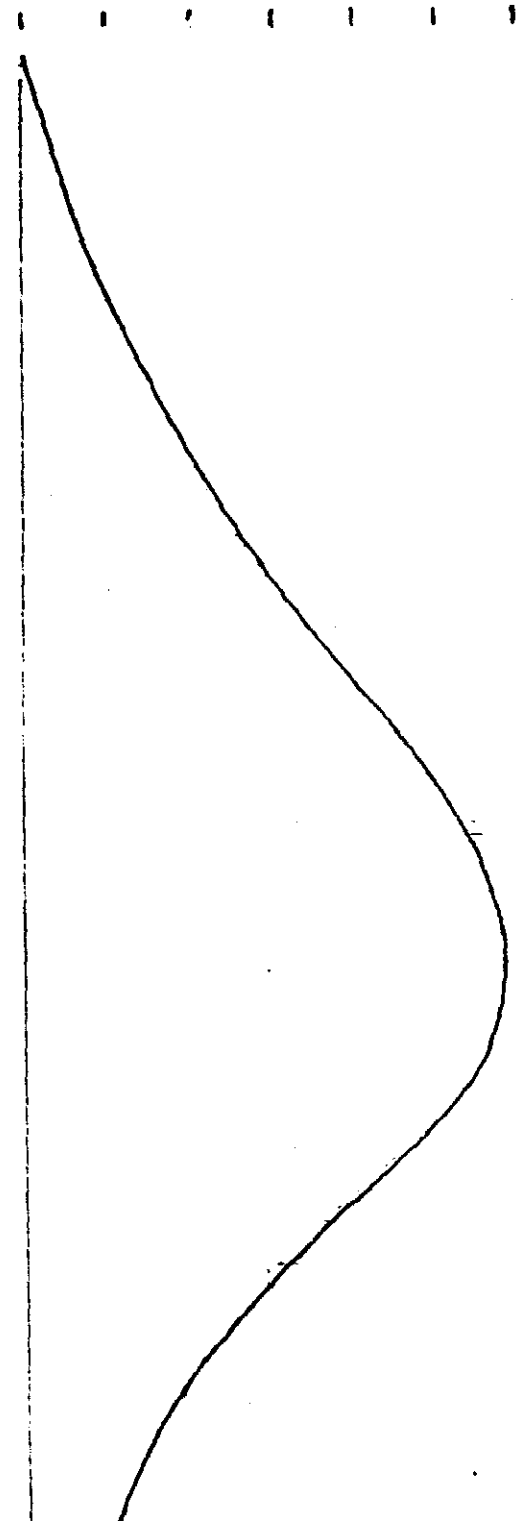
4.00

4.710

754067

087

754068



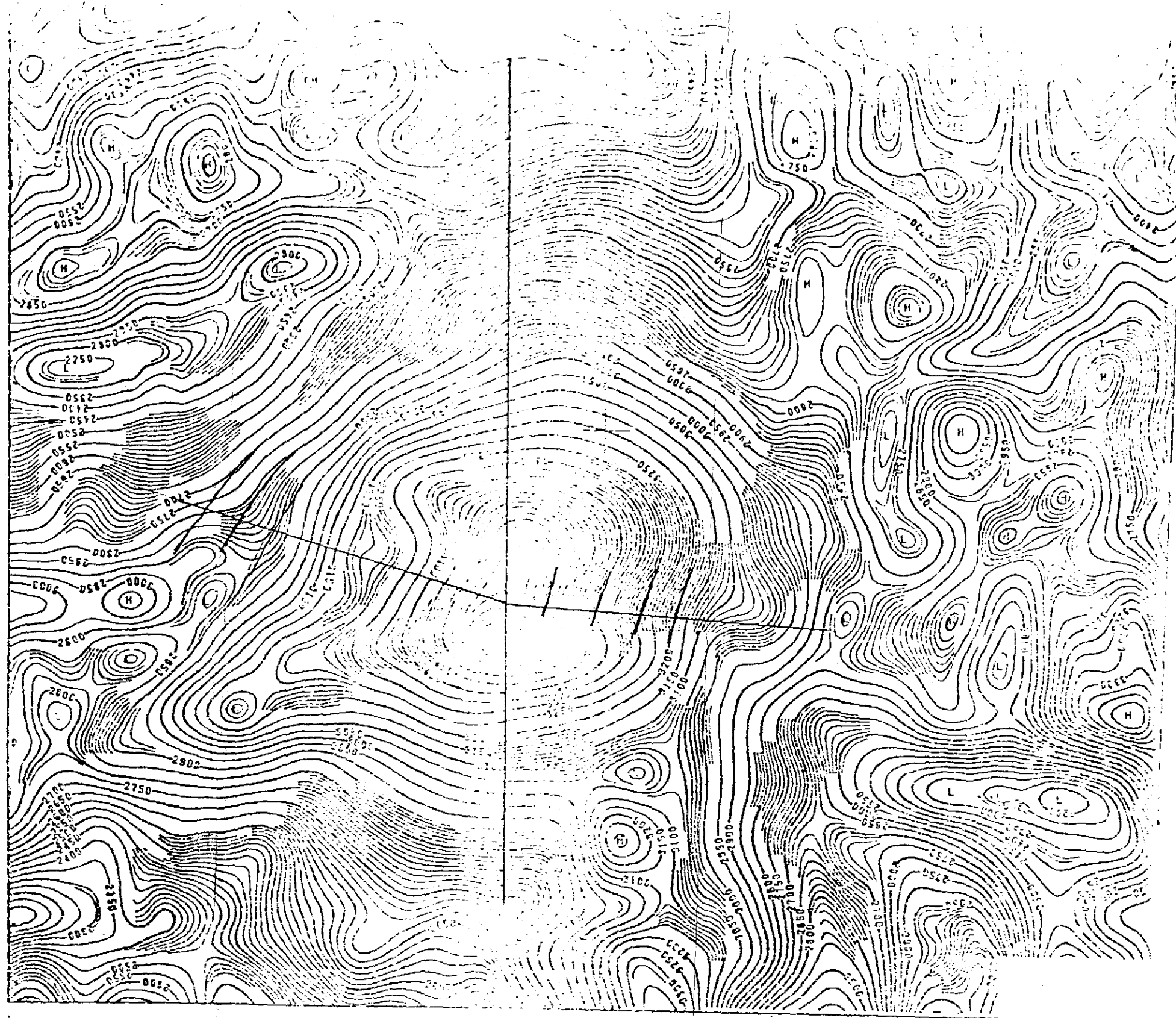
1200  
800  
400  
0

A = 1200  
D = 800m  
W = 1100  
K = 400

87

5442000 N

5440000 N

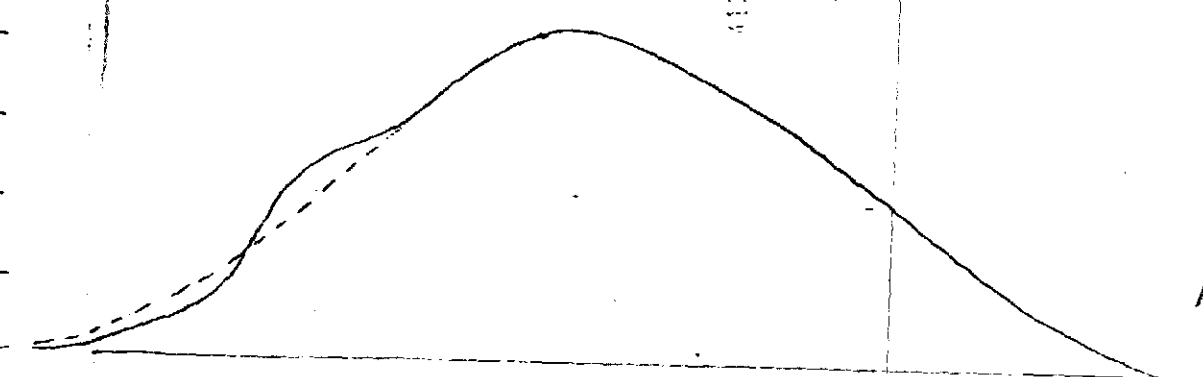


5440000 N

800

400

0



A = 850  
D = 700m  
W = 1000  
K = 550



F217

1m 221E / 4144

# 2

CUPRONA

LINEA ALT.

01.05

← E

 $A = 1600$  $H = 150m$  $W = 300m$   $W_T = 300$  $K = 800$ Requires  $K \sim 15.6$ 

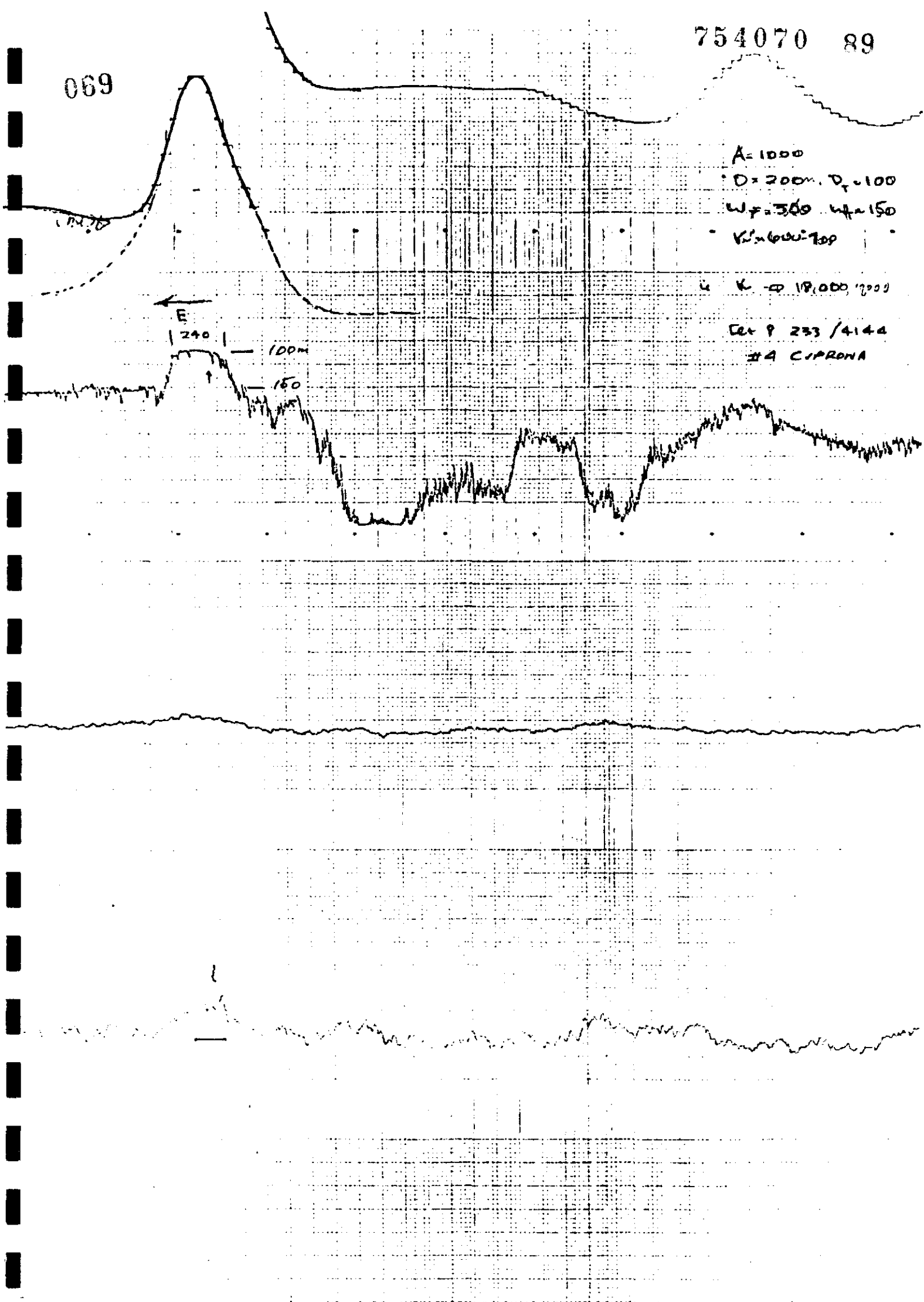
700m

60m

128m

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 $\frac{1}{16}$   
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069



A ~ 6008

W = 100

D = 80 ?

REDONALIER

ABT = 150 : 300

K' = 850

See Line  
14N

Ref 27

12 133

→ N

1006

9770

754071

90

020

071

#7

#8

#8 A = 850

W = 400m

D = 180  
200m

K' = 400

PEAK HILL

K. n 10 cgs.

(basalt) @ DILL. RED.

Satall thickness = 40meters

(~ @ Fid 90852 Line 12)

Fid 97180 Line 13

← N.

Fid 23

1st 1st

9760

754072

072

A = 300

92

D = 100

$\pi = 2\pi m$   $\lambda = 100$

$\omega = 100$

$k' = \text{high?}$

South

Feb 28

mi 55

Laurel Creek #9

$\sim 200m$

350

350

754073

073

93

f = 1100  
W = 100  
W = 50  
S = 100-500

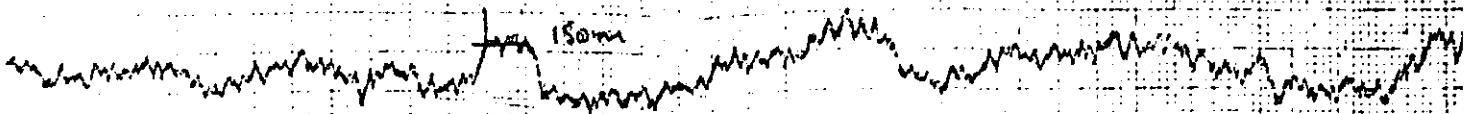
d. 2. 5000

FLT 28

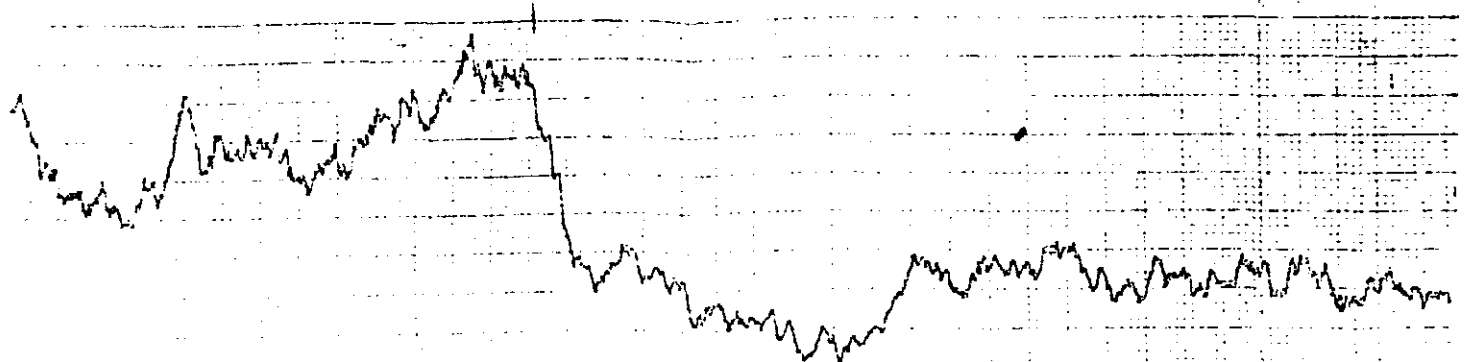
in 6N

#10 LAUREL CREEK

#10  
← N



50



754074



## G.O. DICKSON &amp; ASSOCIATES PTY. LTD.

18 ELMIE STREET,  
HAWTHORN, 3122  
Telephone: 818 1782

March 18, 1981.

TASMANIAN AEROMAGNETIC &  
RADIOMETRIC SURVEYS

PROGRESS REPORT III - BLOCK NO. 2

1.0 Introduction. We have examined the analogue records for the flight lines covering Block 2, as set out on the one inch to one mile aeromagnetic transparency. The report has been set out on a sheet by sheet basis similar to the format of Report II. Four sheets, namely 4142, 4143, 4242 & 4243 were reviewed in the course of examining the records covering Block 2.

2.0 Summary for Block 2. The results for this block are again disappointing in that no particularly strong or well-shaped anomalies are present. More than for Block 1, however, we notice that rather weak magnetic anomalies occur with high potassium background. For the most part, the causative bodies appear to be flat dipping and formational. These are best seen on the south part of sheet 4142. A list of the more intriguing anomalies follows; reference should be made to the notes which follow.

| <u>Sheet</u>    | <u>Anomaly List</u>                                               |
|-----------------|-------------------------------------------------------------------|
| 4242 → E.L 8/77 | No anomalies of interest.                                         |
| 4142 → E.L 8/77 | 46.2615, 44.2717, 41.6452,<br>36.6749, 34.6868, 19.9830, 16.9617. |
| 4243            | No anomalies of interest.                                         |
| 4143            | 33.6907.                                                          |

## Tasmanian Surveys, Progress Report III. March 18, 1981.

3.0 Anomaly Description.3.1 Sheet No. 4242.Anomaly No.

49.2420

Comments

Basalt remnant on cambrian sediments. No follow up.

3.2 Sheet No. 4142.Anomaly No. :

47.5

Comments

Basalt.

4142/4

46.2615

basalt on Og

↑

high gradient

✓

455

same as 4142/4

Elevated potassium trace; suggest cambrian sediments/volcanics. Mag response seems to be over K, trace high. Response may only be basalt (see 475), but needs a check. The mag high incorrectly placed for a topographic effect.

Same area as above. Very weak magnetics, but it looks like cambrian sediments.

4142/5

44.2717

t greywacke

Potassium trace very high. Looks like granite, but could be tuffaceous sediments. Very weak magnetics, probably flat-lying. Difficult to explain. Does not look like basalt.

Not located 435

assume same as

4142/5

Same as above.

42N/

4142/6

41.6452

t greywacke

Again, strong K channel response with weak magnetics. Flat dip south K' low at 112. Requires follow up.

## Tasmanian Surveys, Progress Report III. March 18, 1981.

|        | <u>Anomaly No.</u>                                                   | <u>Comments.</u>                                                                                                                                                                                                                                                                                                                                                              |
|--------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4142/7 | 35.6814<br>36.6749                                                   | Mag for both profiles looks to be related to helicopter clearance. I would normally assume this to be the case; however, the potassium trace is very high, and for 355 requires the source to be at surface. It could be an unusual situation with sediments faulted on top of basalts? Requires a field check. Neither of the anomalies are obviously related to topography. |
|        | ← greywacke                                                          |                                                                                                                                                                                                                                                                                                                                                                               |
| 4142/8 | 34.6868                                                              | Weak magnetics, and again related to helicopter clearance. K trace very high. Dips look to be flat. Some explanation required. 33 S is the same.                                                                                                                                                                                                                              |
|        | ← greywacke                                                          |                                                                                                                                                                                                                                                                                                                                                                               |
| 4142/2 | 19.9380                                                              | Magnetic signature over cambrian sediments. 18N the same.<br>Post basalt source, subcrop <u>granite</u>                                                                                                                                                                                                                                                                       |
| 4142/1 | 16.9617                                                              | Refer to earlier report - Peak Hill anomaly. Peak Hill anomalies included for reference.<br>basalt o/c                                                                                                                                                                                                                                                                        |
|        | 1<br>this anomaly is 600m E<br>of Redbank to 800m NE<br>of Peak Hill |                                                                                                                                                                                                                                                                                                                                                                               |
| 3.3    | Sheet No. 4243.                                                      |                                                                                                                                                                                                                                                                                                                                                                               |

No anomalies of interest.

## Tasmanian Surveys, Progress Report III. March 18, 1981.

3.4 Sheet No. 4143.

| <u>Anomaly No.</u>                         | <u>Comments</u>                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4143/1 33.6907                             | Reasonably strong anomaly, but poor shape. Looks to be formational, flat south dips required. Susceptibility looks to be fairly high at 800. Anomaly occurs on north side of relatively small hill and no obvious correlation with topography. Granites or sediments occur about 1 km. to the north. <i>basalt on Dg, E + Or conglom</i> |
| 4142/3 34.6892<br><i>LOWANA CK anomaly</i> | Related to topography and almost certainly basalt capping a hill top. — see <i>Lowana CK 4142/3 basalt hill, but also some Dg, Dg + fault</i>                                                                                                                                                                                            |
| 4143/1 34.6898                             | Same feature as 33.6907. No obvious explanation.                                                                                                                                                                                                                                                                                         |



G.O. DICKSON for  
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078

94

495

Blaas Remnaat

5/4242

492480

4247

4242

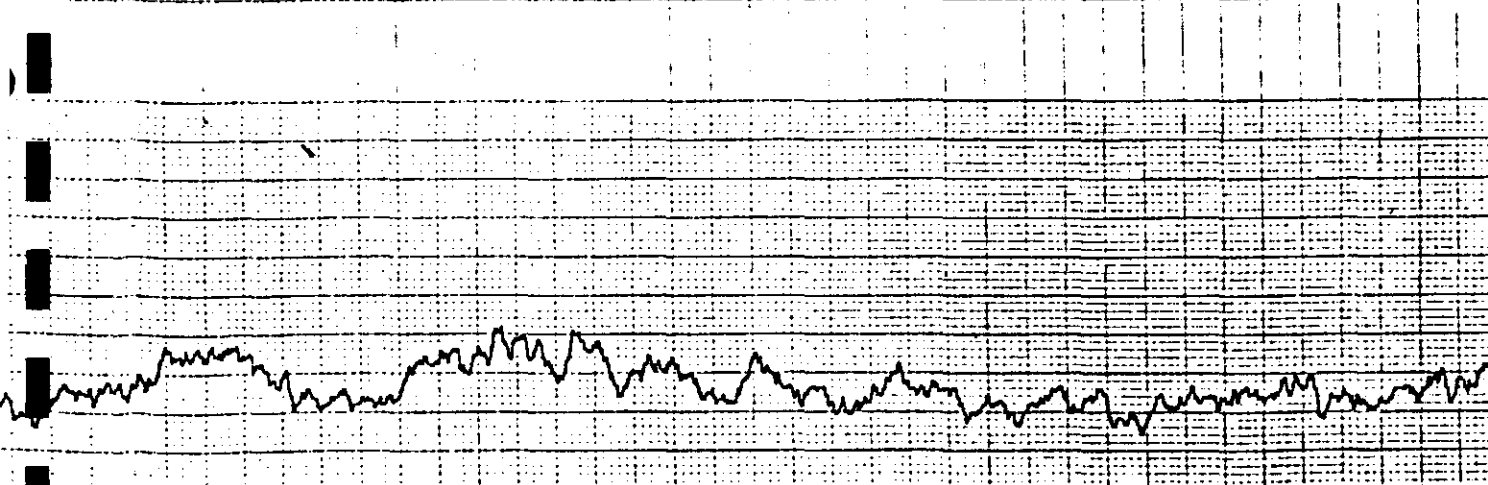
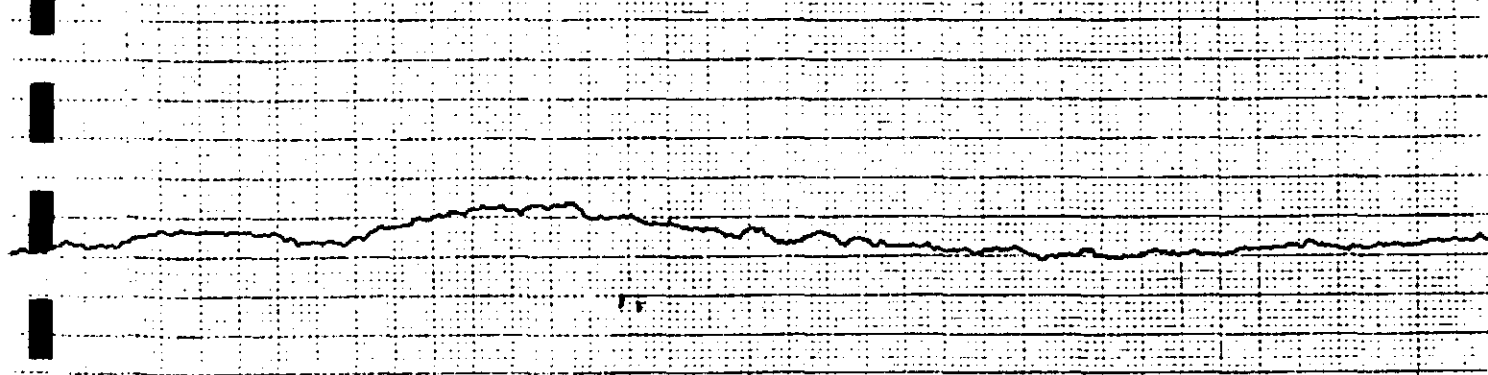
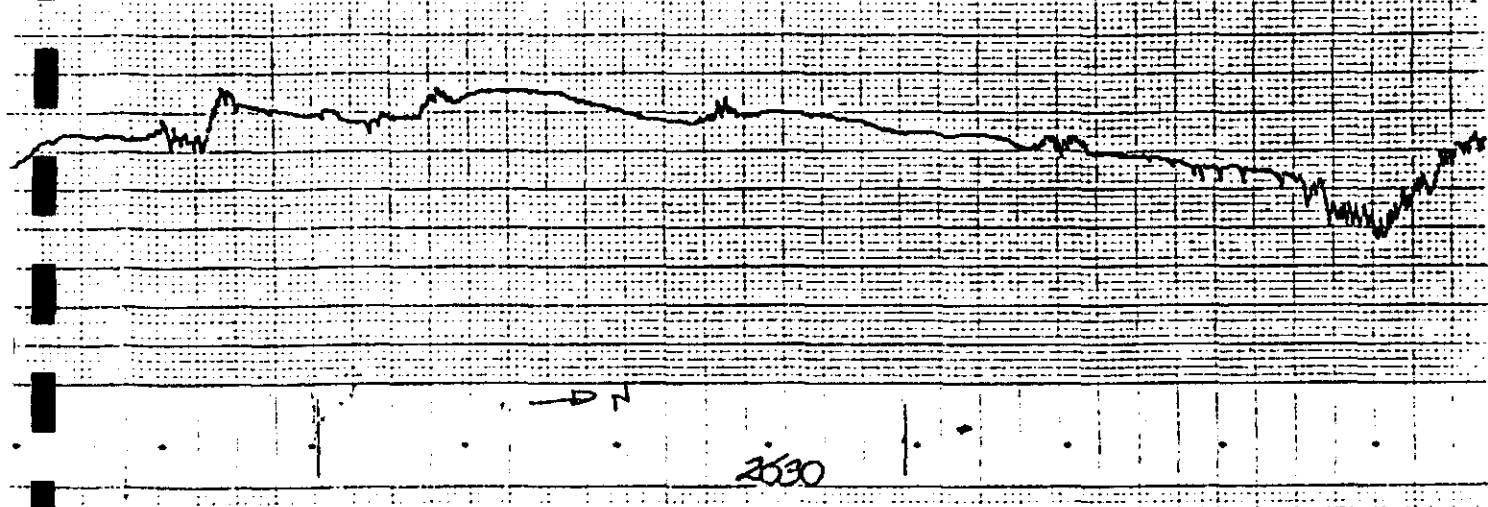
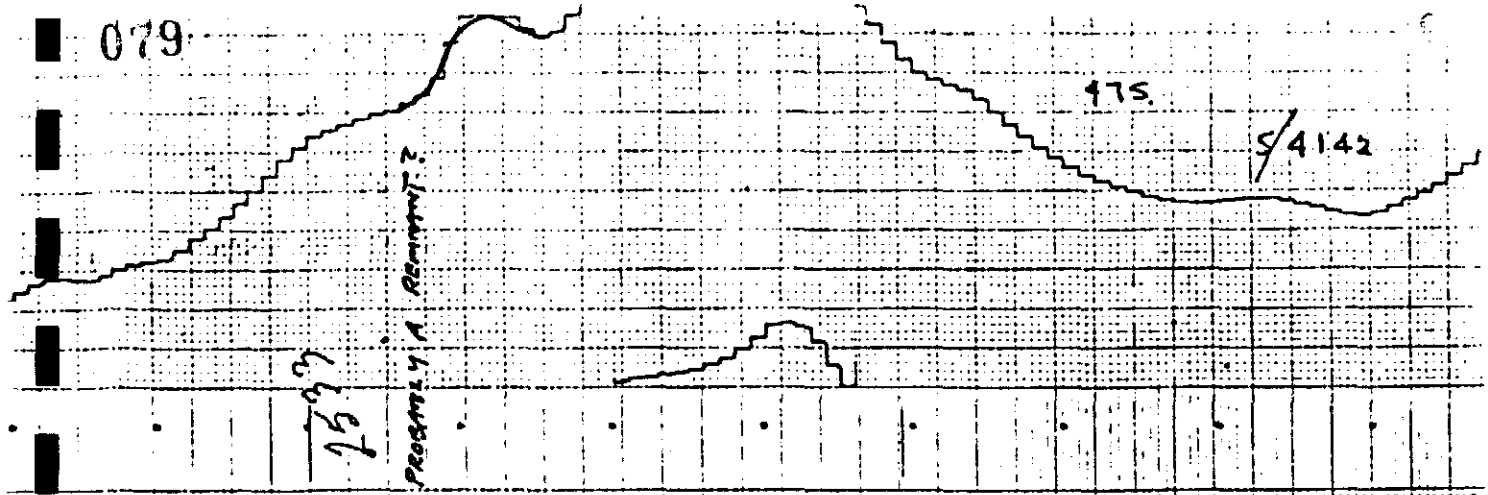
N

2480

754079

079

95

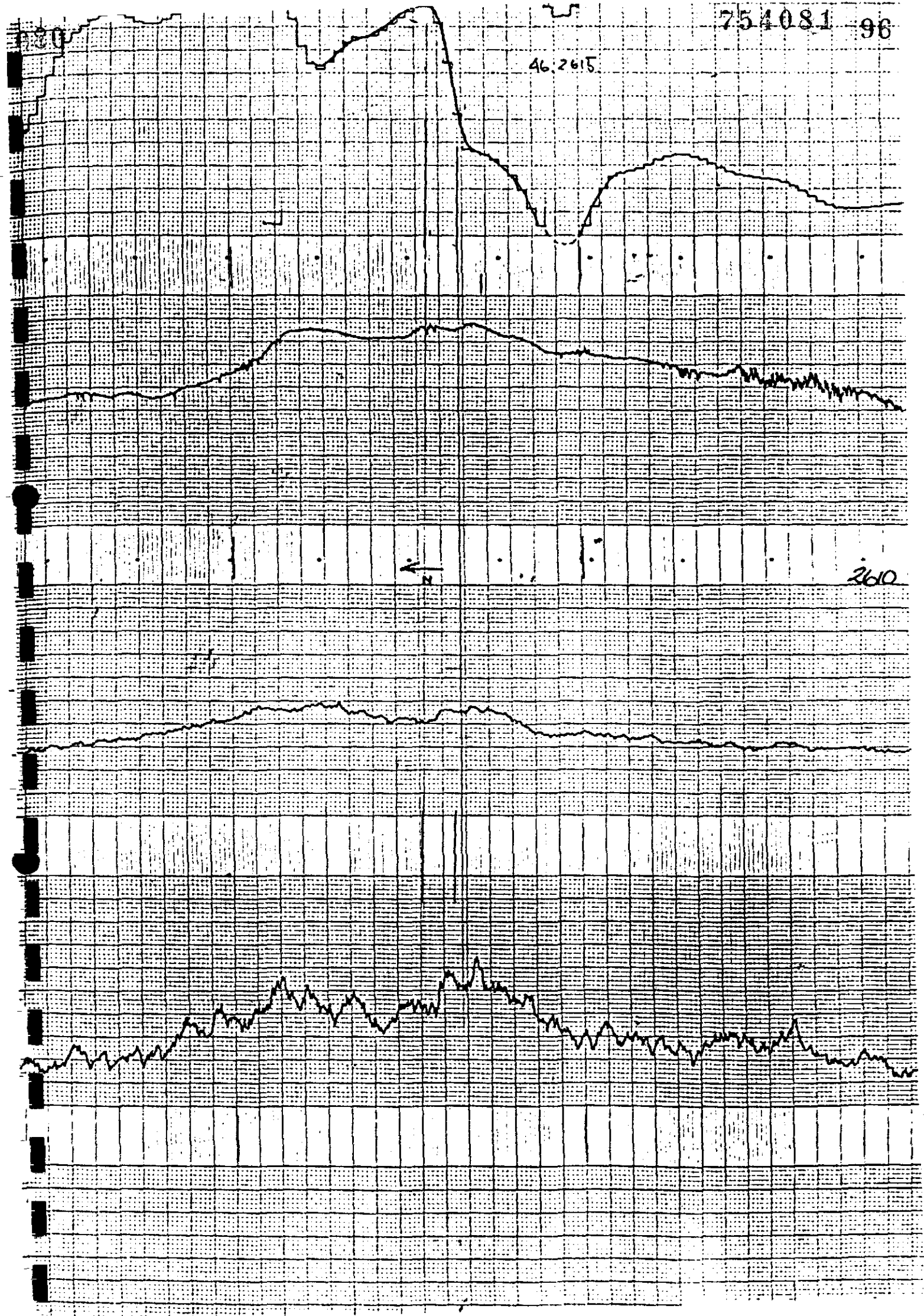


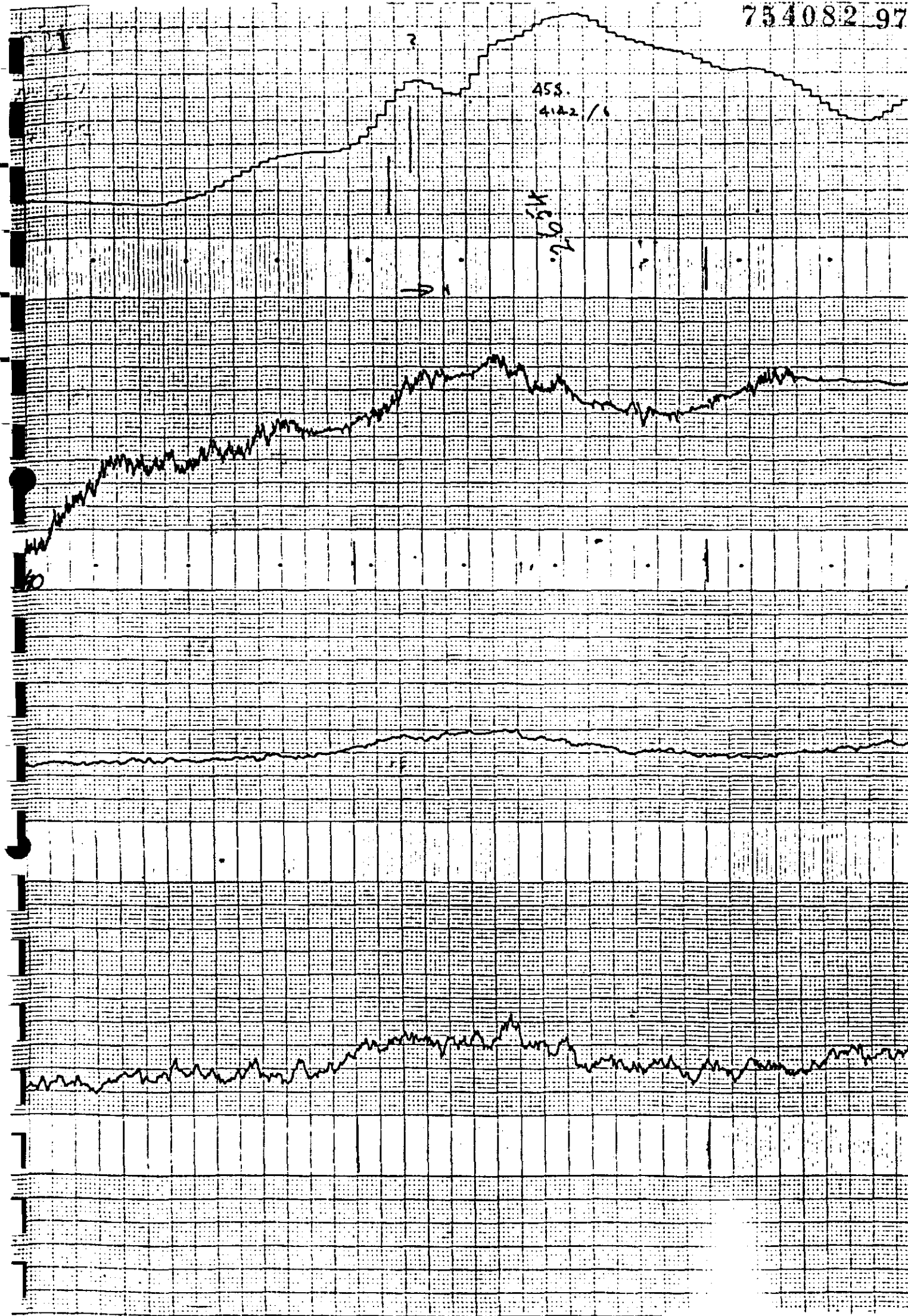
754080

754081 96

46.2615

2610





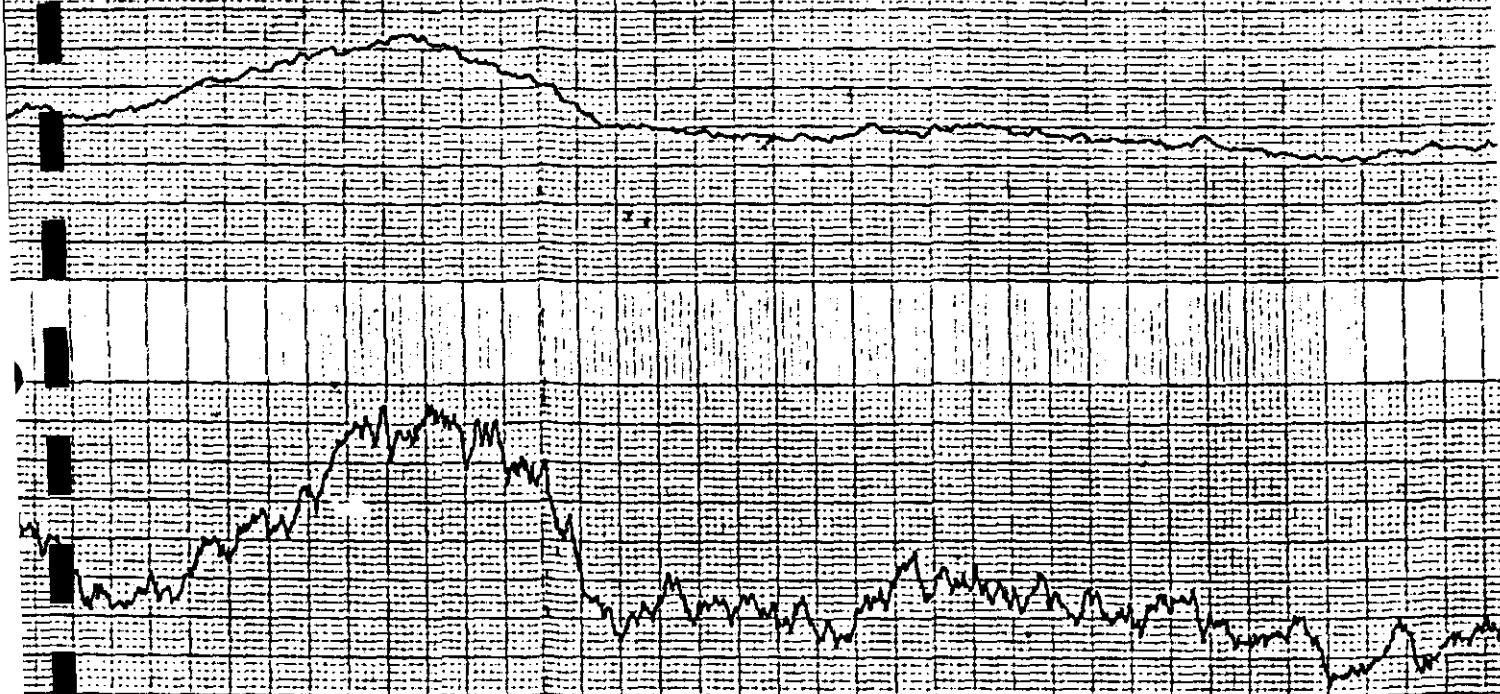
082

44H  
44-2117



2117  
←

2110



43.5 / 4.42 / 6

2780

+ 4.142

2780

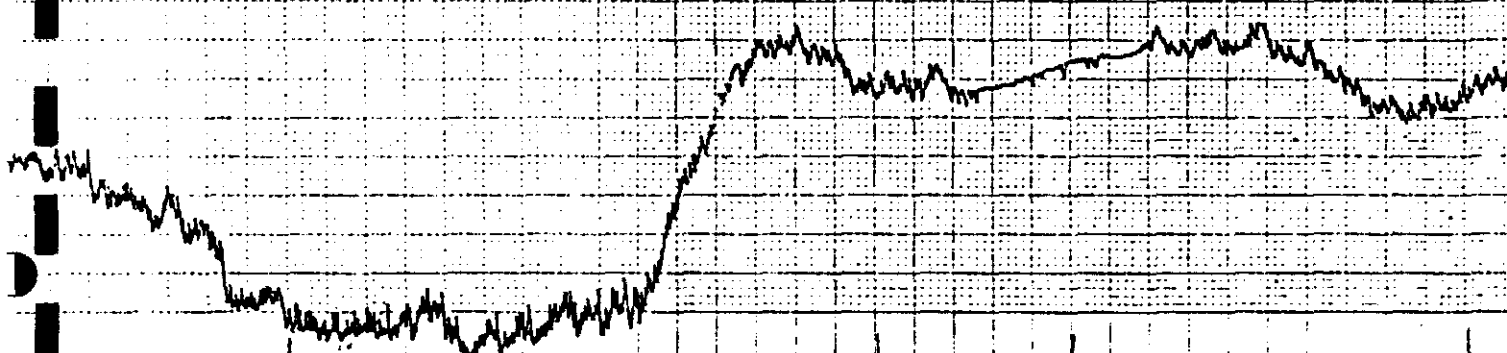
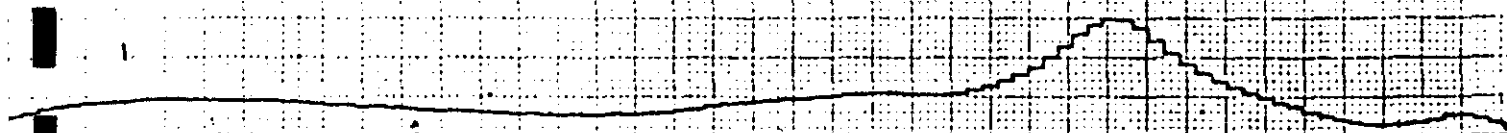
← S



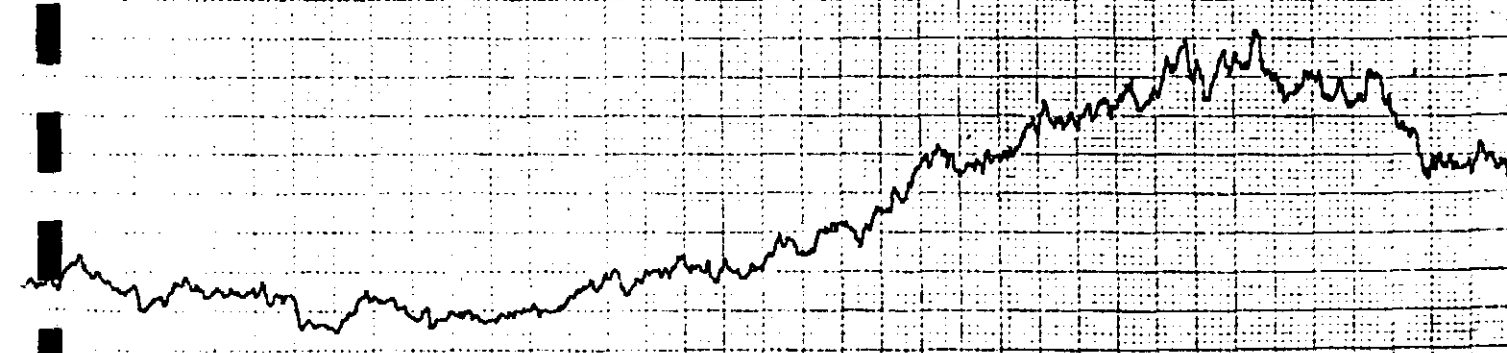
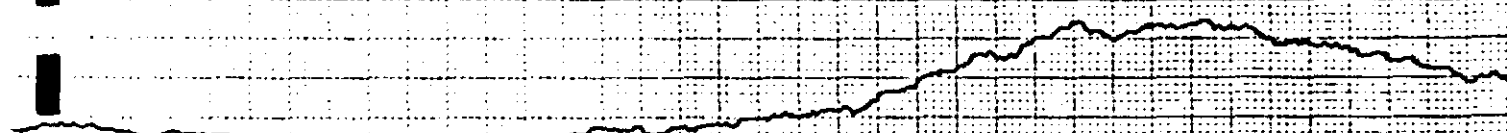
084

754085

42 N / 41.42 / 100



2830



085

415.

754086 101

41,6452

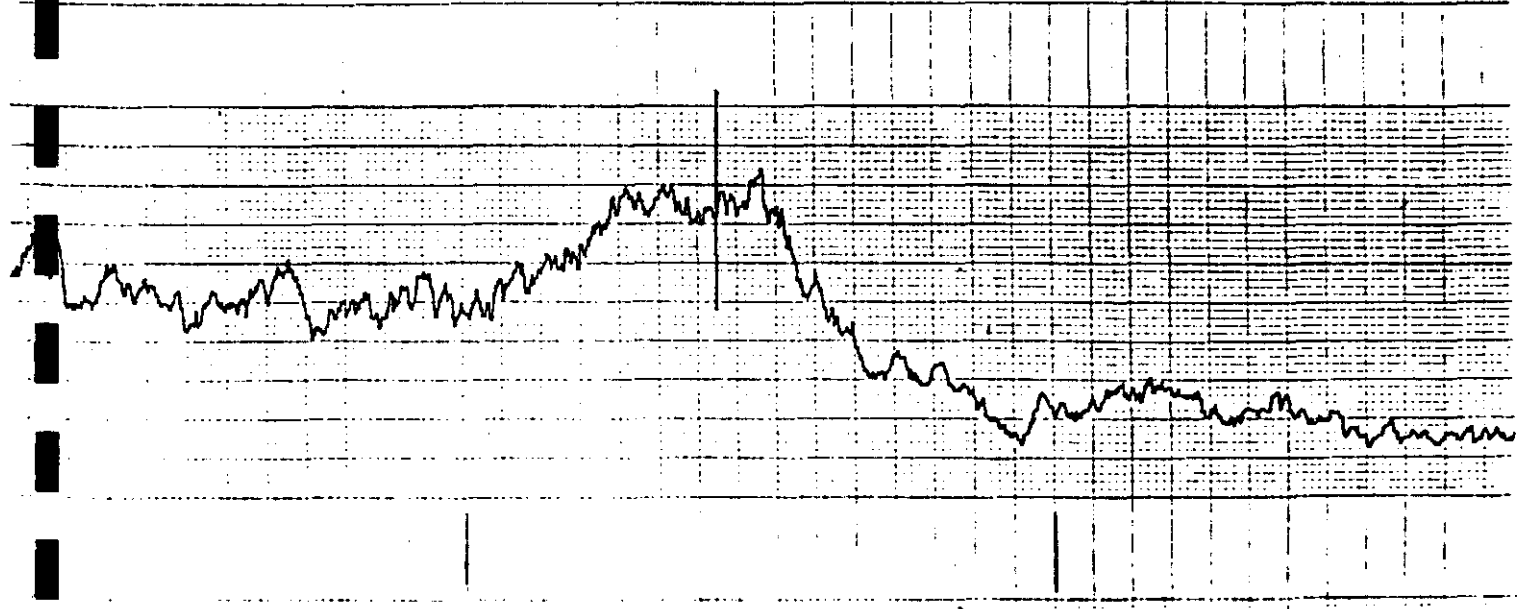
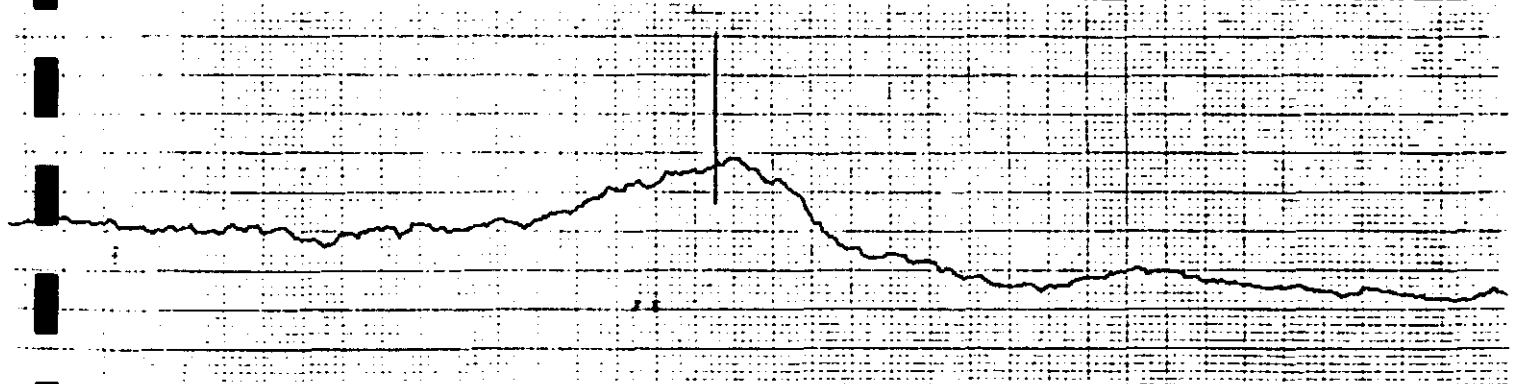
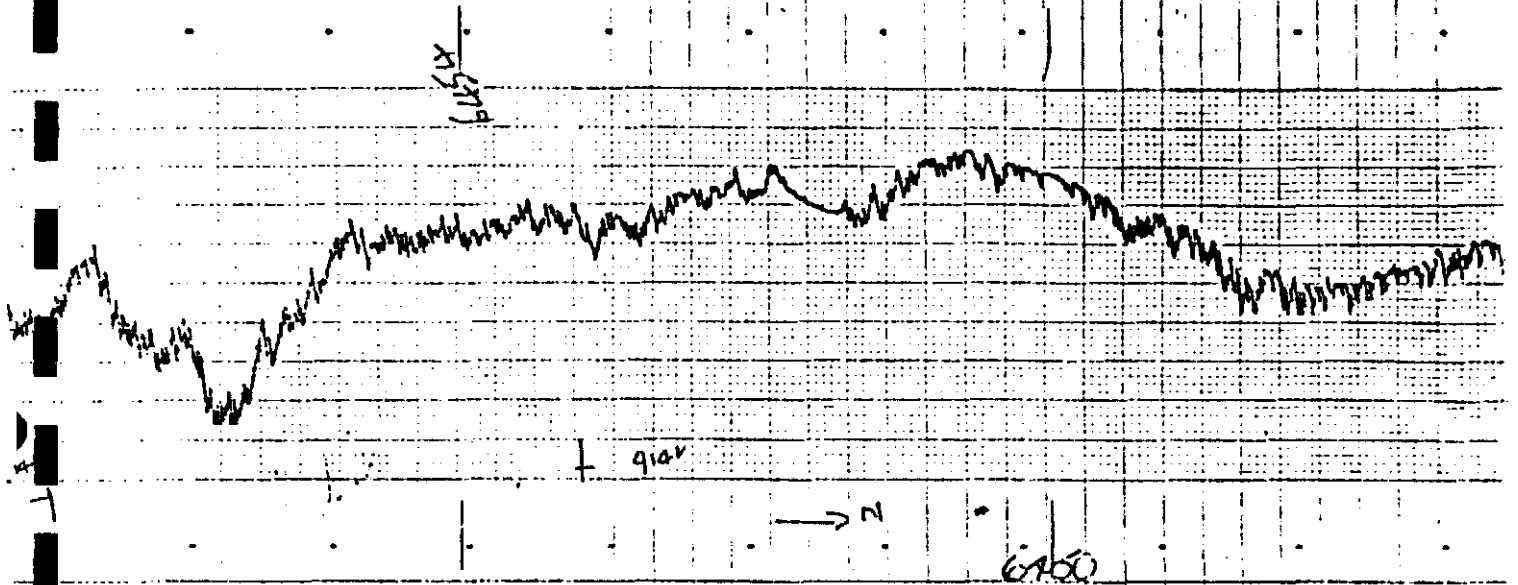
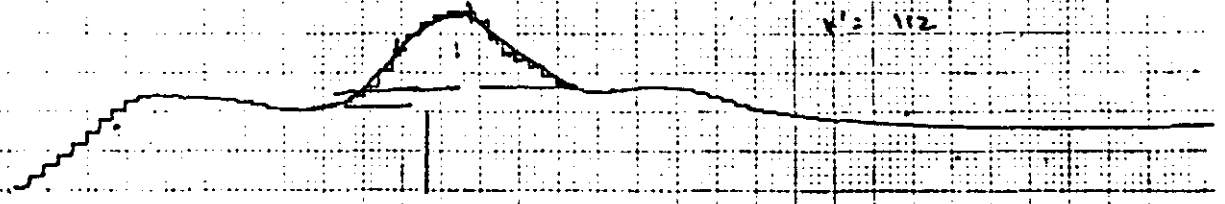
150r

$W=200$

$D=150$

$R=30$

$K'=112$

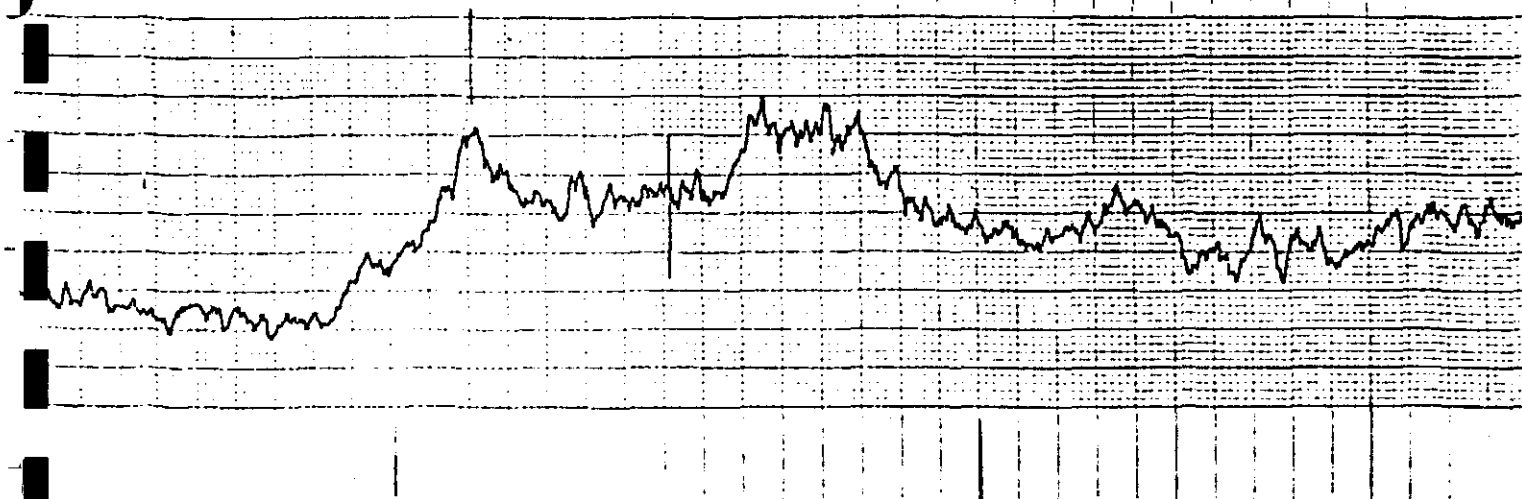
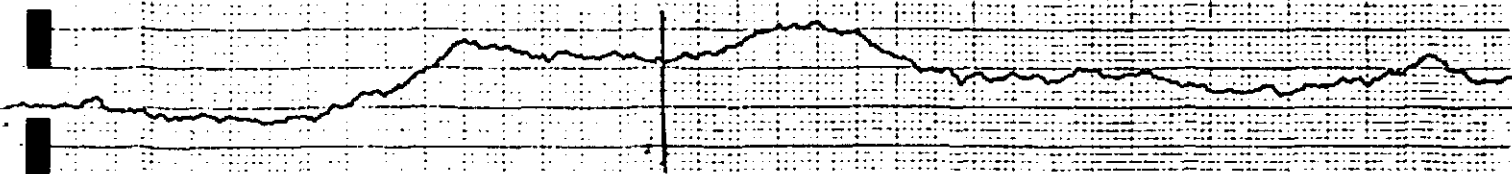
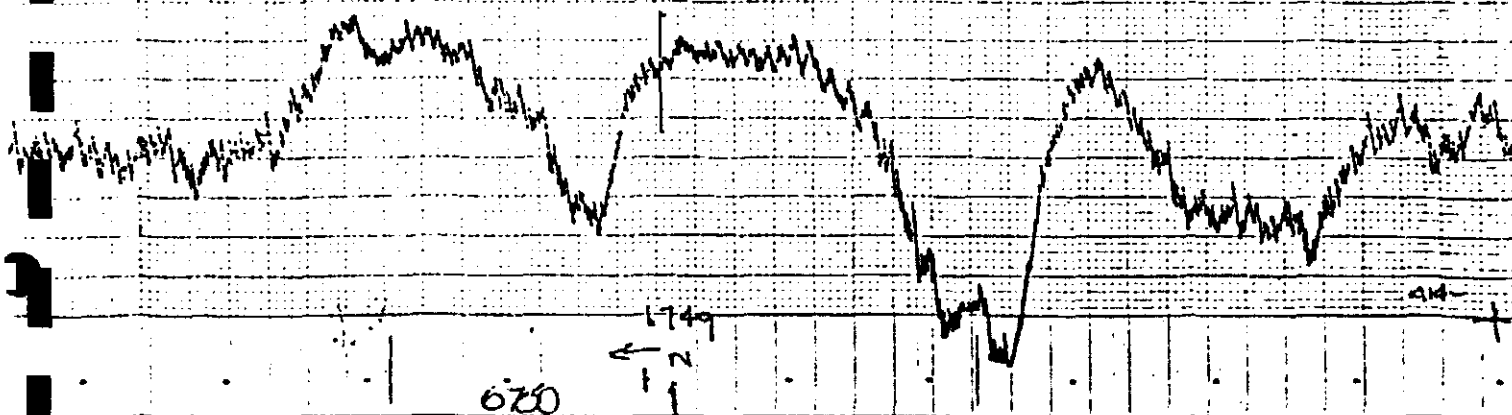
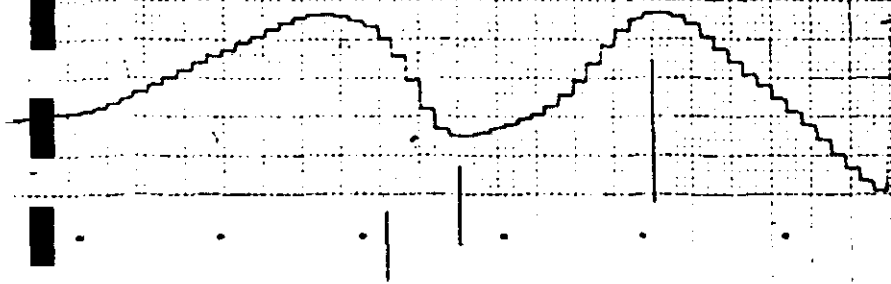


086

754087 10

L 36H

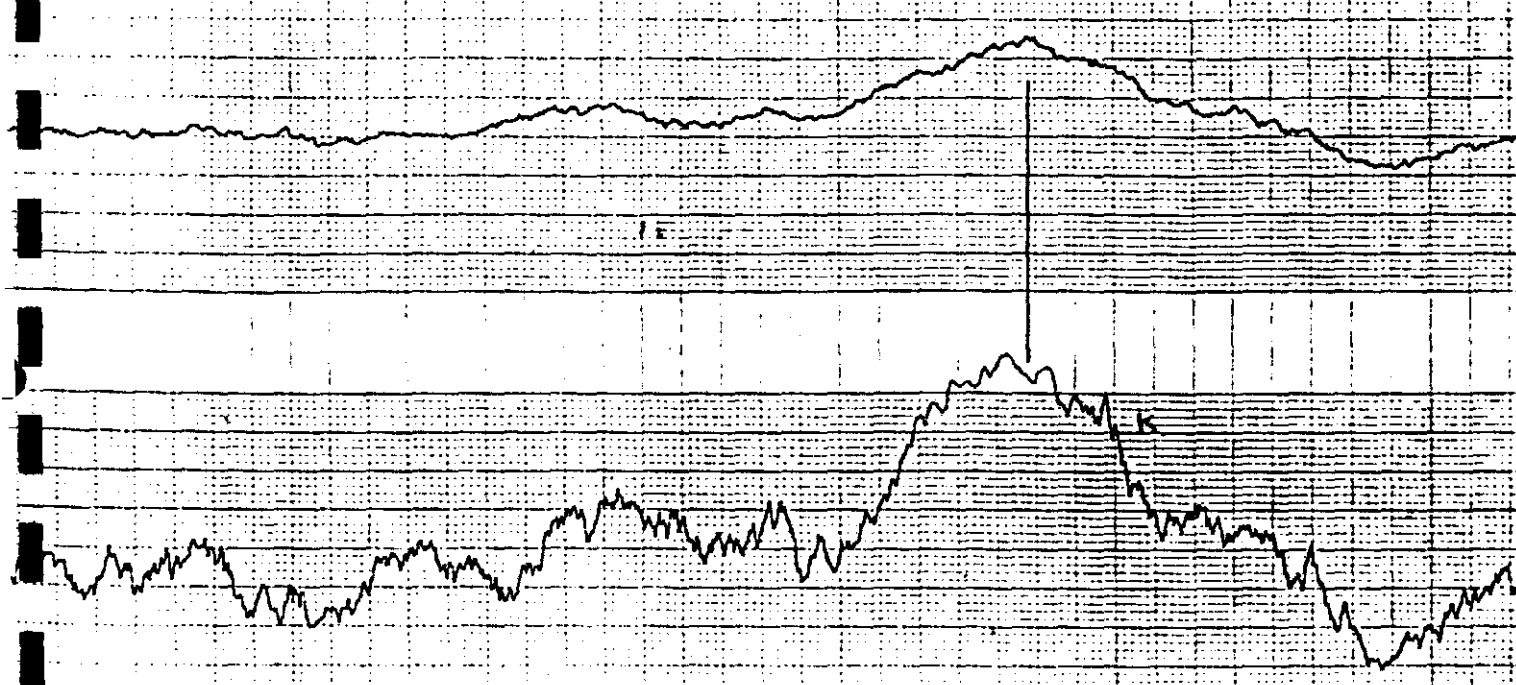
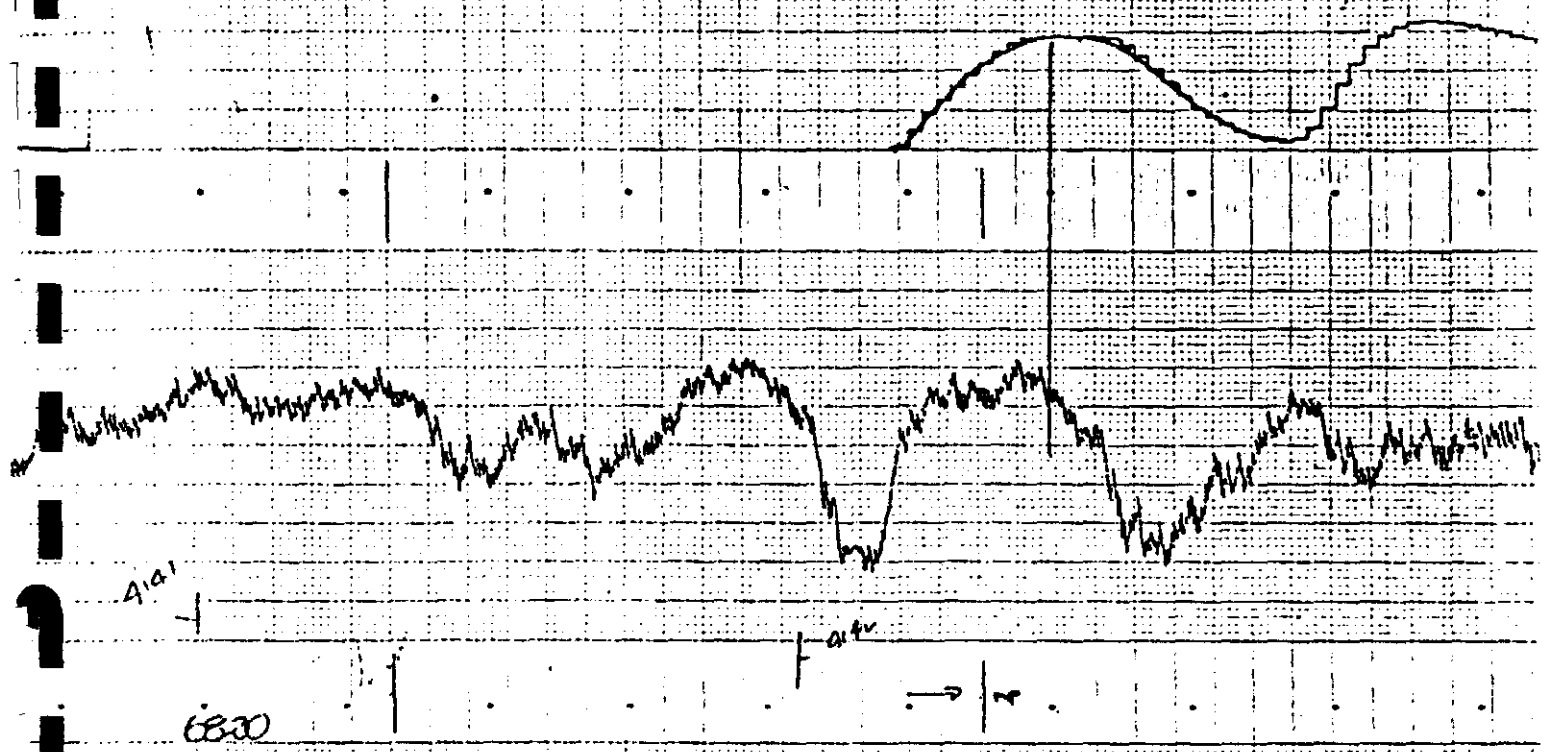
36.6749



087

754088  
355/41210

35-1914



088

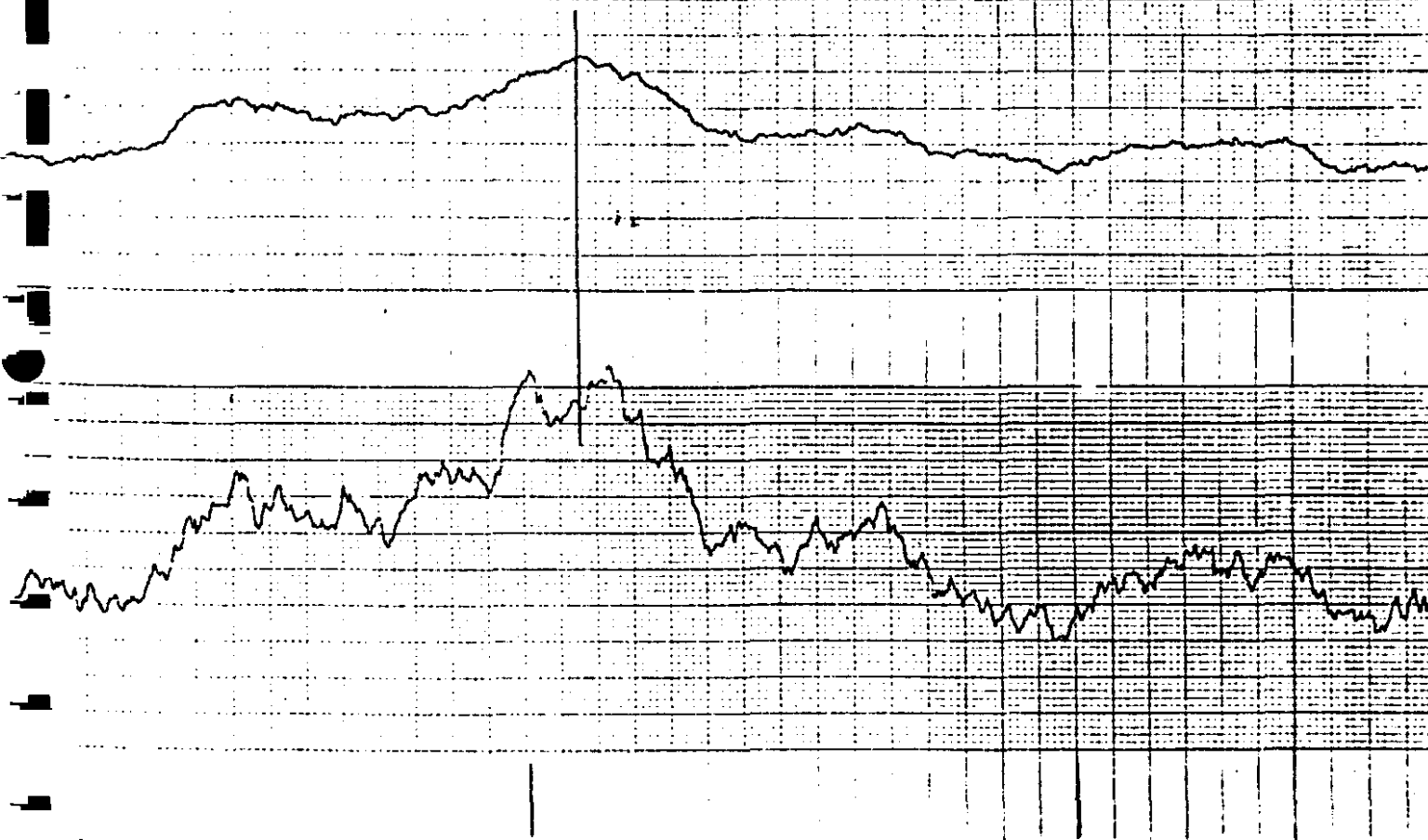
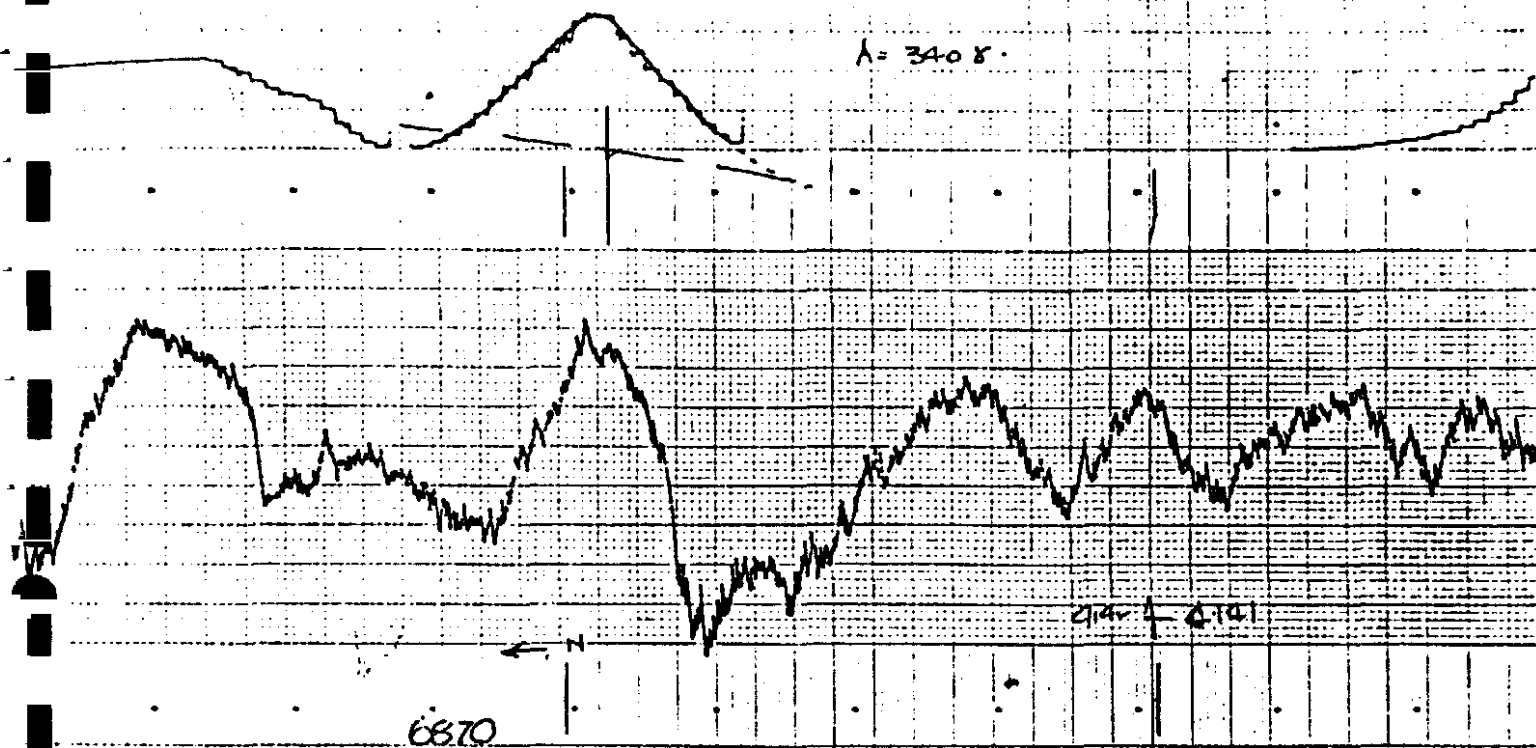
754089

104

34N.

34.6868

$\lambda = 3408.$

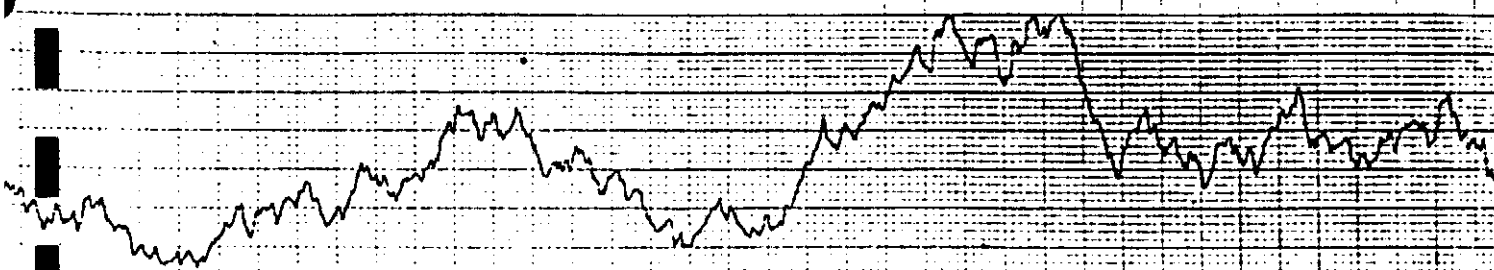
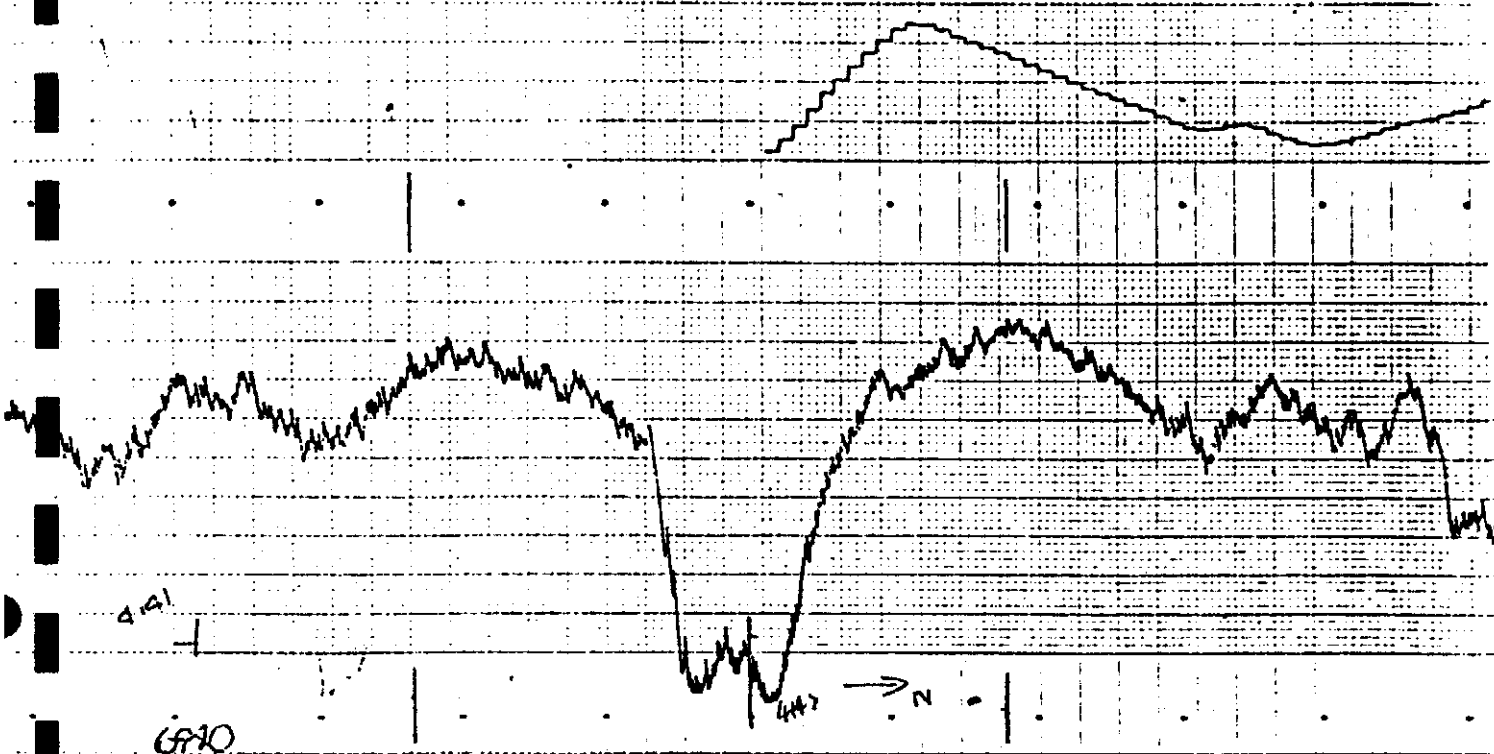


089

754090

335 / 9112

105



020

195

19.9380

/ 412

754091

195

2

9380

912

1.1 1.1 1.1

091

10

195

19.9380

/ 4122

754092

195

2

9380

9122

4122

092

108

Sec. 8N

16 N. / 4142 / 181.26

A. 720

W. 190 m.

D. 160 Side of

Mr. Ho. a 2.11

K: 56

16.9617

754093

N

9620

Tuffaceous  
Sed., Cambrian?  
or.  
near by base

K

093

#8

Reference only.  
See earlier reports.

9760

094

33.6907

414

A. 640

W. 370

D. 300

X. 800

H

6910

6907

N

754095

095

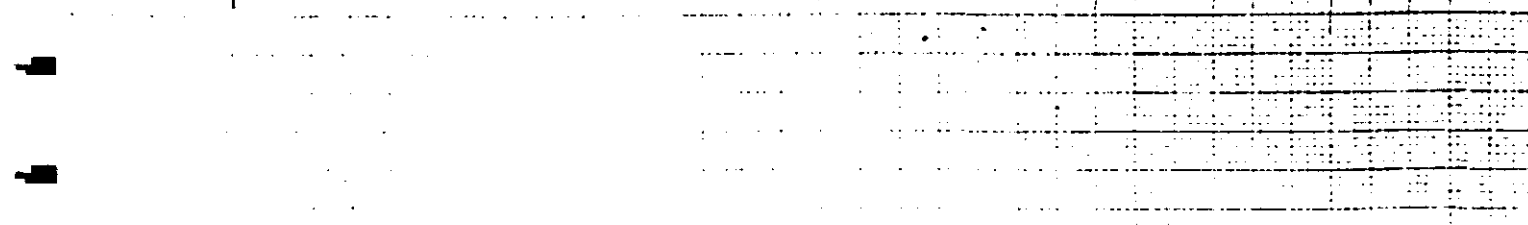
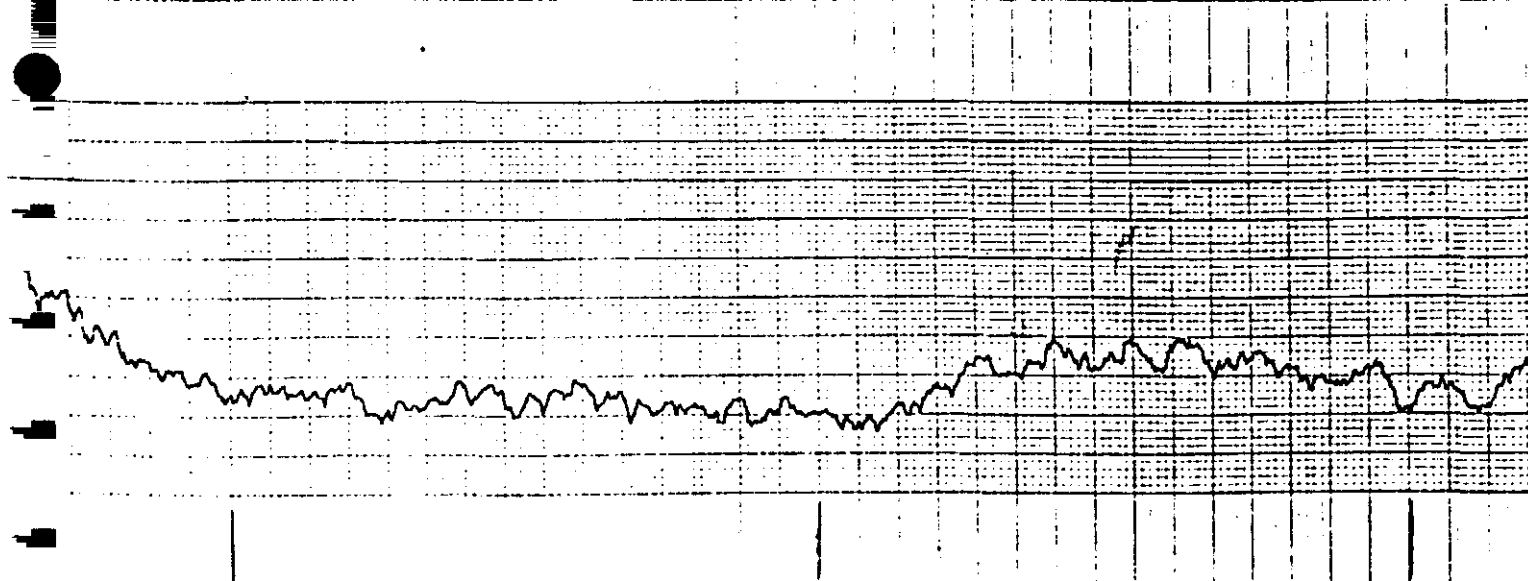
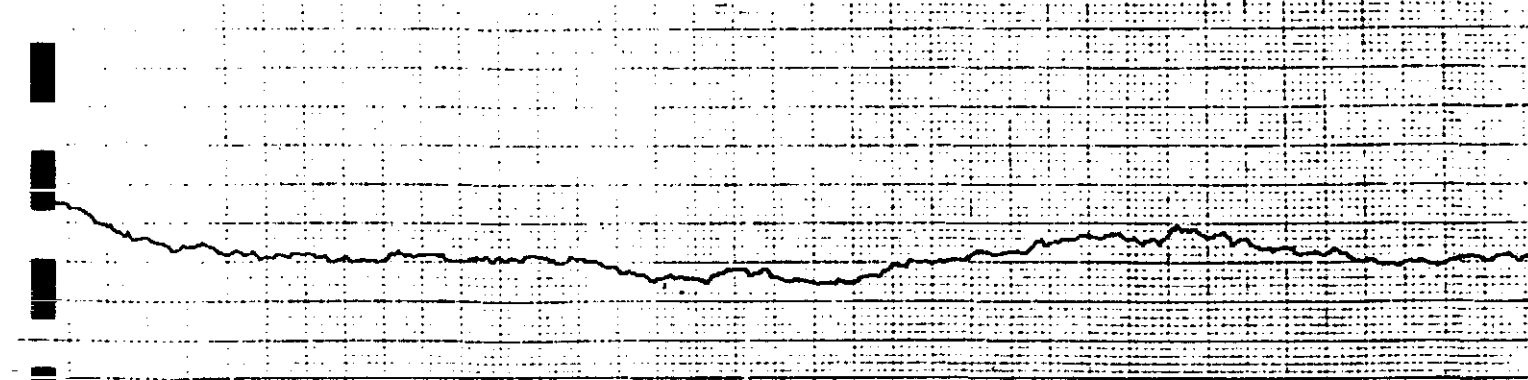
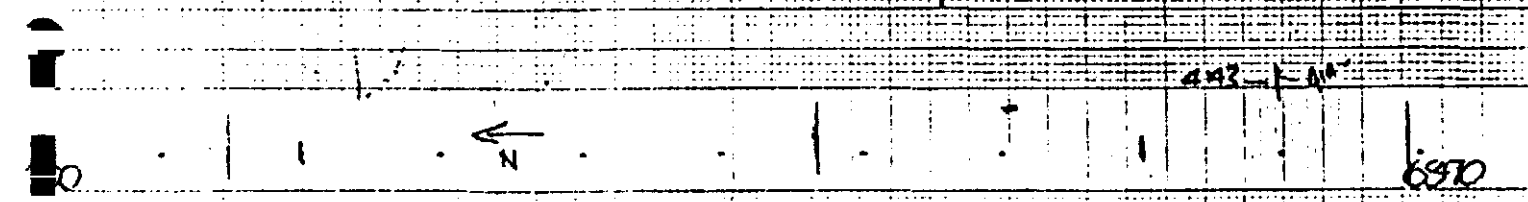
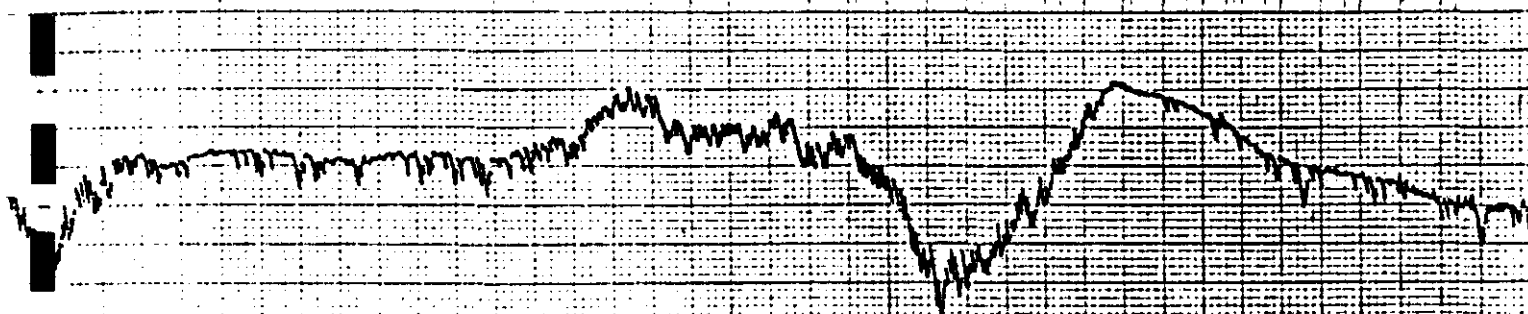
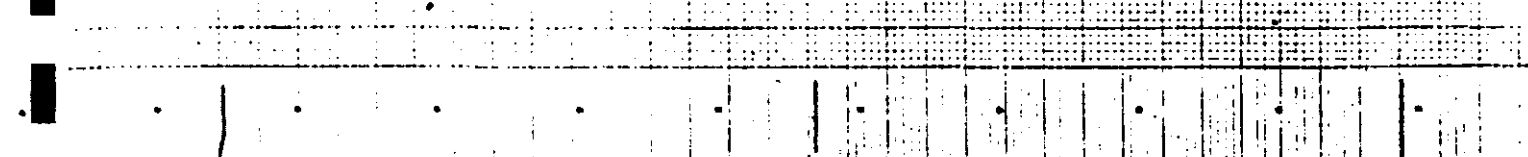
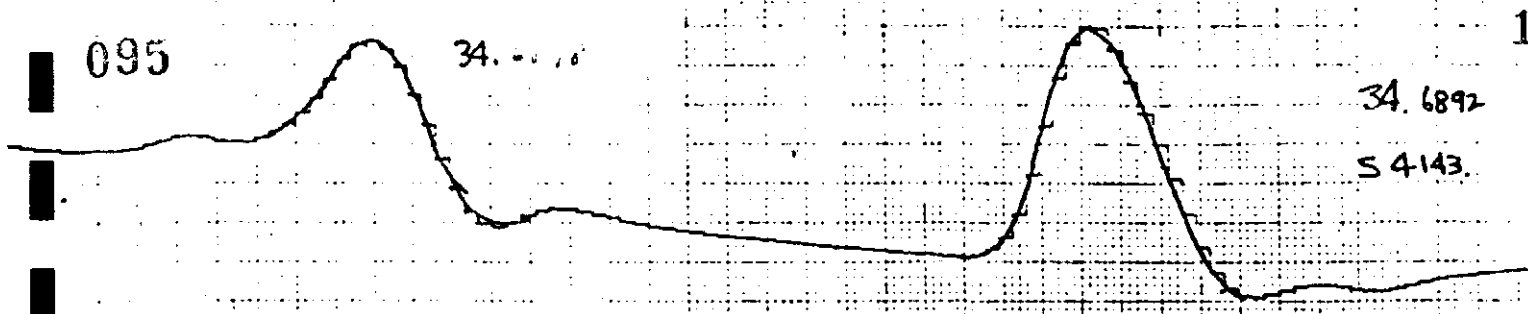
34. . . .

34. 6892

S 4143.

111

754096



096

house Creek

112

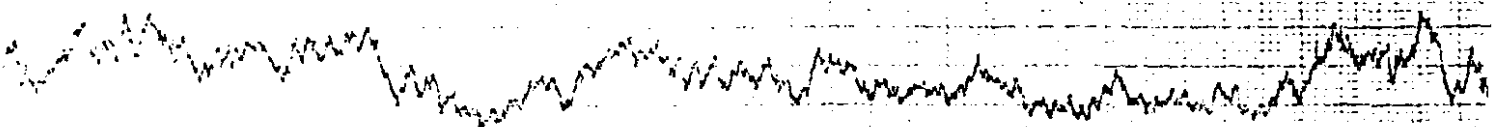
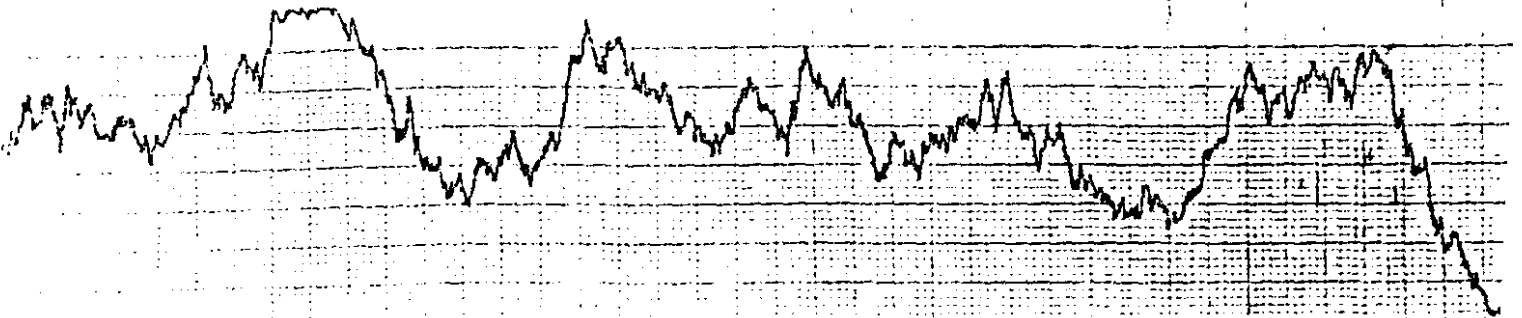
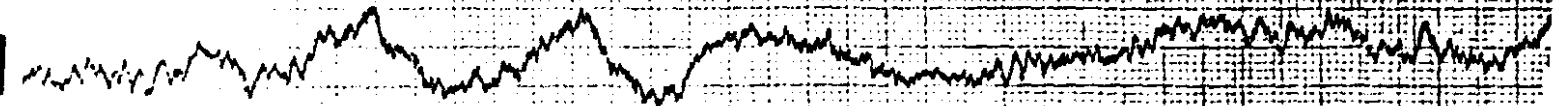
FRT 28

754097

→ incert

110

170



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Telephone: 818 1782

June 22, 1981.

**TASMANIAN AEROMAGNETIC &****RADIOMETRIC SURVEYS****PROGRESS REPORT V - BLOCK NO. 4**

1.0 Introduction. We have examined the contour maps and analogue records for the flight lines of this block.

Anomalies selected for follow-up, or discussion in text, are located on the 1 inch to 1 mile map. Except for this departure, the format remains unaltered since the last report.

2.0 Summary for Block 4. The sheets included in this report are shown on the accompanying diagram. Sheets 4143, 4142 and 4242 were examined earlier and the results summarised in a progress report on Block 2. These results have been included for the sake of completeness.

In contrast to earlier reports, the anomalies of interest have been located on the 1 inch to 1 mile maps as well as the 1:20,000 original sheets. The analogue record traces are included so that the exact location of any anomaly may be established.

2.1 Regional Summary of Block 4. An attempt has been made, on this occasion, to summarise the aeromagnetic data on a regional scale. This is simply a first, broad breakdown, of the magnetic units and I recognise that any interpretation placed on this breakdown is arguable. Nevertheless, I believe it could be a useful contribution at this stage.

Without doubt, that which controls the magnetic character of the maps, is the present day topography. The magnetic high trends marked on the map generally follow high topography, river valleys appear as magnetic lows. The magnetic pattern then, does not necessarily reflect the structural trends. There are many places, however, where I believe the magnetics are reflecting structure. In some cases the present drainage even cuts across the basalt flooded valleys of the tertiary. (S4242, NE Corner).

Clearly, the Housetop Granite is the dominant structural feature of the area covered by this block. The magnetic units are set about the granite and may be referenced with respect to the granite.

#### Western Unit.

The magnetics west and north-west of the Housetop Granite differ from other areas of this block, in that strong north-west and west-north-west breaks occur, which I assume pre-present faults. Faults, or structural breaks can be seen in other areas of this block, but they do not appear to be so strong. F2 is a fairly clear fault which goes well to the south. Some acid plugs may intrude close to the line of this lineament. F1 marks the trace of another magnetic lineament, which strikes sub-parallel to the faults of the western unit, but which can be traced well to the east. I believe this could be a significant feature.

Several strong anomalies occur in this western unit, other than the obvious anomalies associated with magnetic skarn mineralisation at Kara and Highclere. They are anomalies 1, 3 and 5 of sheet 3944 and 3 and the anomaly unnumbered, mid low, sheet, 3943 and striking east-west. These appear to be buried valley features, but if so, the susceptibility of the material is higher than anything so far measured and documented to my knowledge.

Central Trends.

Trends A1 and A2 are both arcuate and very strong features. Their arcuate nature and proximity to the granite is such that I believe both are intimately associated with the mechanics of the emplacement of the Housetop Granite. I believe they represent marginal fracture systems at different periods of granite emplacement.

The fact that the rock units of A1 are polarised in both the positive and negative senses suggests that the fracture has been active over an extended period of time.

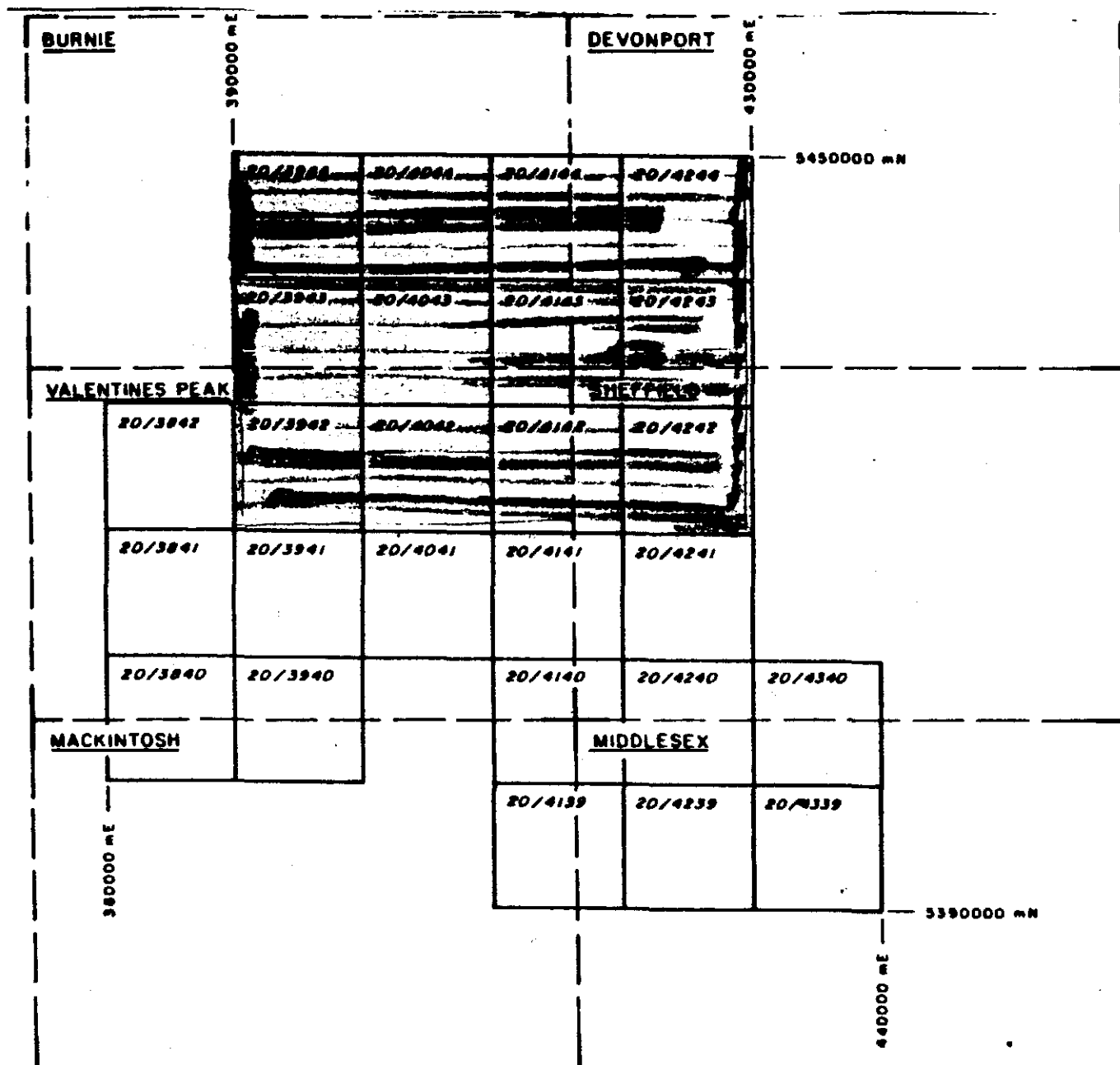
The strength of the anomalies of A2, the symmetric position with respect to the skarns of the Western Unit and the granite, leads me to believe the entire magnetic feature deserves follow-up.

It may be worth considering flying A2 with an airborne EM system.

The magnetic pattern of the North Eastern area of the block is dominated by the Camena anomaly. There is some evidence for a radiating pattern about Camena. I suggest that this may be the centre the basalts of the north-east.

The anomalies at the northern end of A1 as it approaches Camena are worth follow-up.

In certain cases, isolated magnetic anomalies can be identified as basalt capping on hilltops. Where this is the case, I have labelled them Tb. I believe whole magnetic complexes are simply basalt-capped hills with no anomalies of interest. These are labelled as remnants (Rm) on the map. I believe they are of no further exploration interest.



INDEX TO 1: 63,360 SHEET COVER

5 cm

## Tasmanian Surveys - Progress Report V

June 22, 1981.

3.2 Sheet No. 4044.Anomaly No.Comments

4, 227.4323

RAWLINGS Hill

Anomaly is associated with a fairly large hill - although the helicopter has contoured the line I suspect a topographic effect.

1, 233.4699

NATONE

East side of Emu River. Reported on in earlier report.

754103 102

113 ④ 4044.

227 E

65769

0.33

Almost certainly  
topographic.  
Flight over a  
substantiated hill.

103

114

4044

233E



4600

4700

East Side of  
Emu River  
in Cambrian  
no obvious  
reason, for it

no channel

754104

104

Tasmanian Surveys - Progress Report V

June 22, 1981.

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3.3 Sheet No. 4144

Anomaly No.

Comments

3, 237.4793  
MIDGLEY FALLS

Obviously a very strong anomaly and clearly cannot be due to basalt cover. Possibility of a link with anomaly 1.

Note that anomalies 1 and 2 have been reported on in progress report 1, dated December 3, 1980.\*

\* NOTE. Anomaly 1 = Cuprona  
Anomaly 2 - Camena

105

115

③

4144

287.

4700

754106

## Tasmanian Surveys - Progress Report V

June 22, 1981.

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3.4 Sheet 4244.Anomaly No.Comments

No anomalies of interest.

## Tasmanian Surveys - Progress Report V

June 22, 1981.

3.7 Sheet No. 4143.Anomaly No.Comments

1, 258.57115

WATTLE GROVE

Strong anomaly, clearly very high susceptibility, but probably small source. Rock type shown as Devonian granite.

2, 243,51275

SPOTT'S RD.

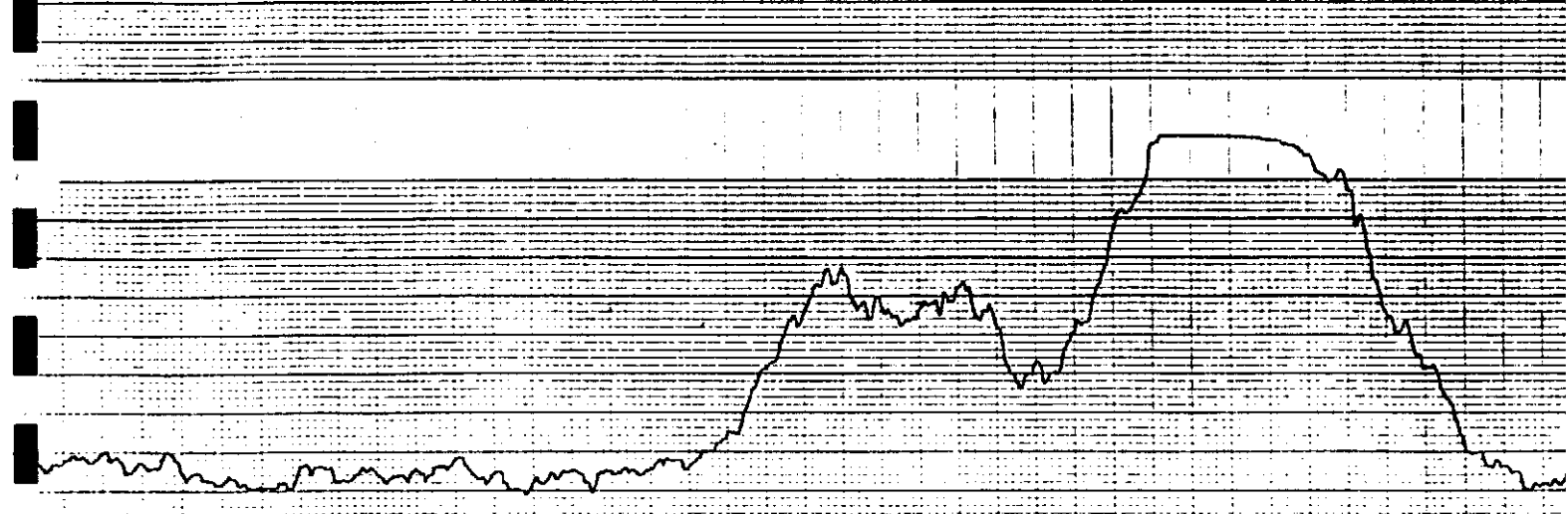
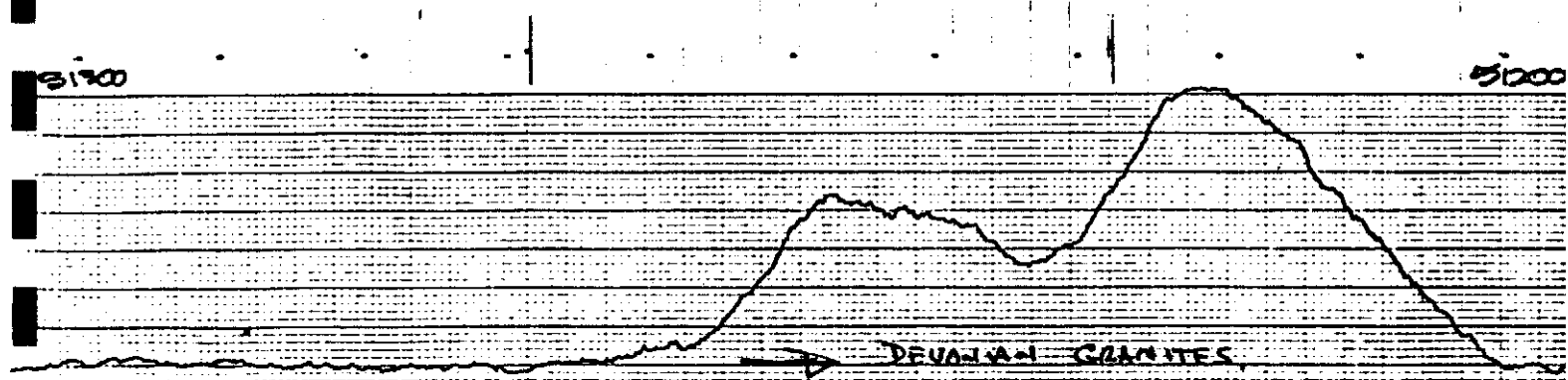
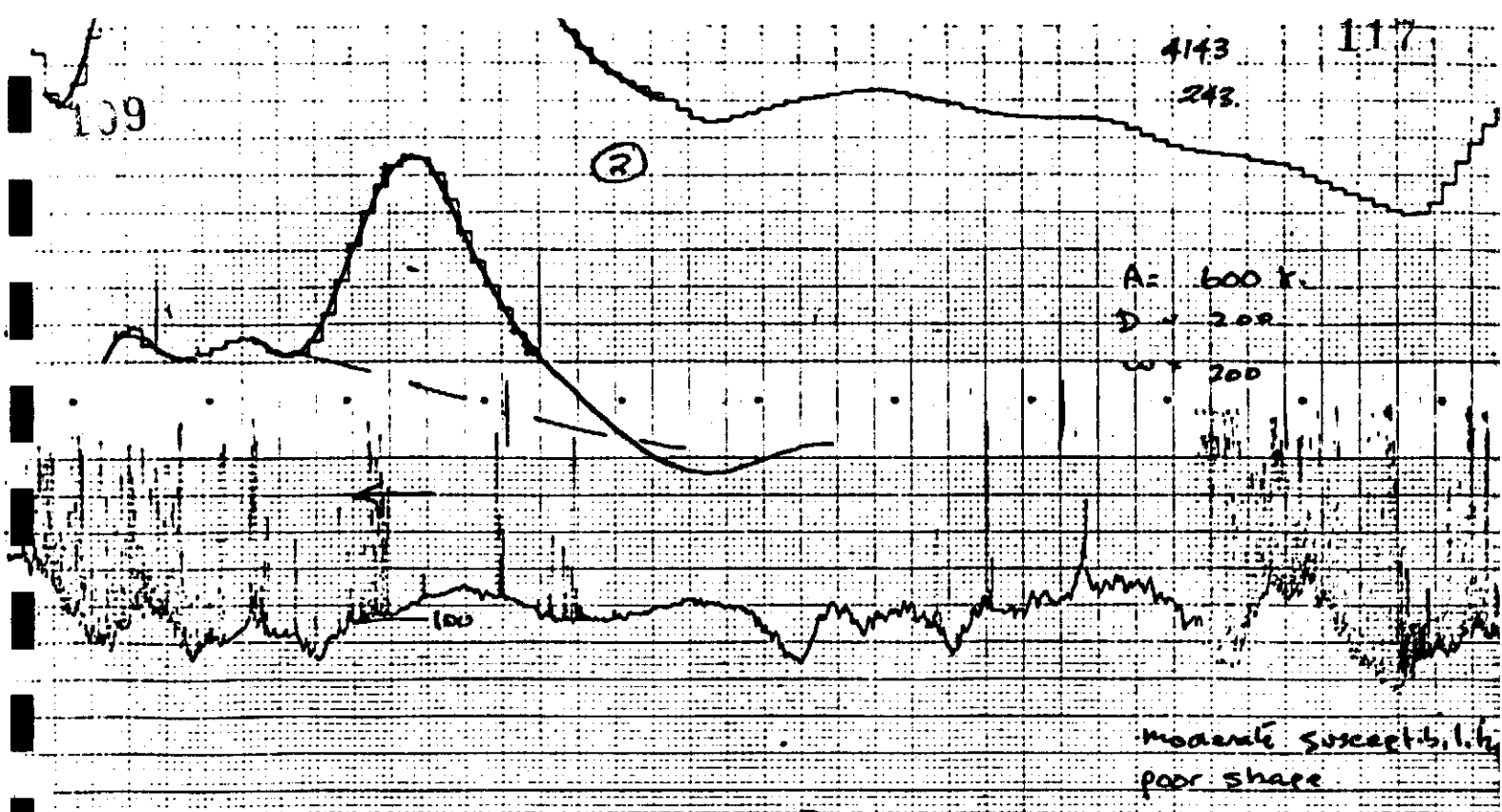
Moderate susceptibility. Looks too high to be basalt. Granites immediately to the south. Note magnetic anomaly to the north also.

3, 261.4908

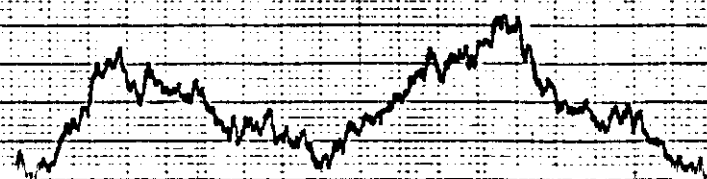
SOUTH RIANA

A check against topography suggests that the anomaly is simply due to basalt capping. No follow-up. Looks like multiple source anomaly.





754110

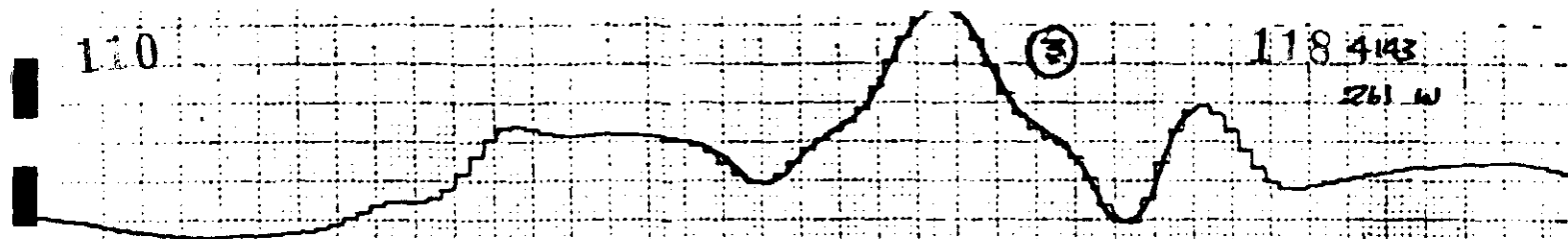


110

(3)

118 4143

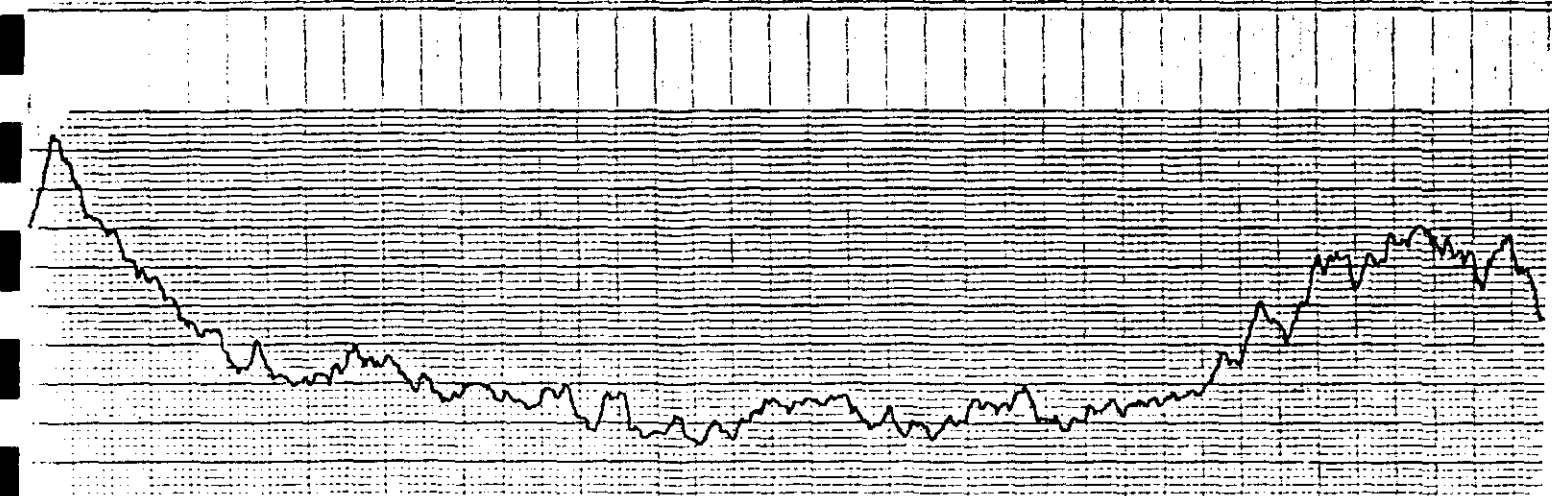
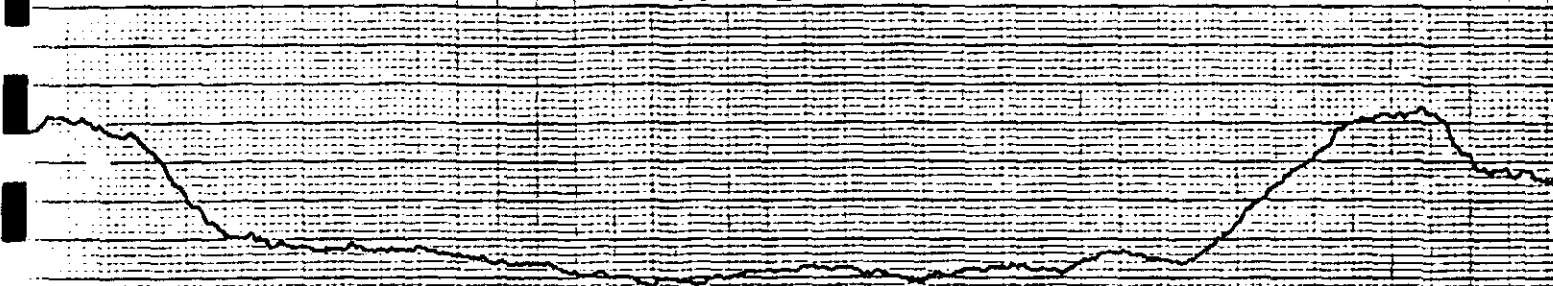
261 W



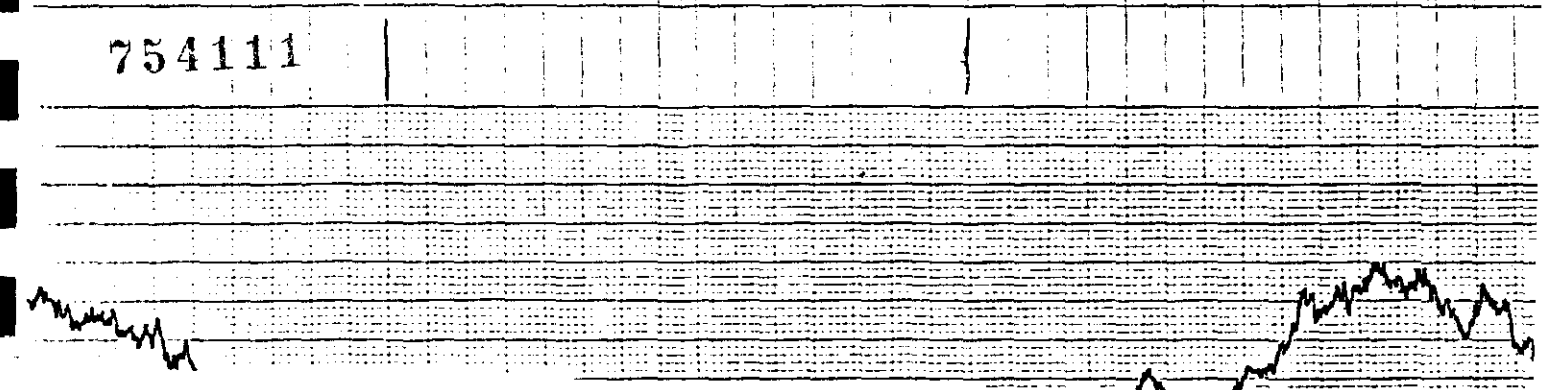
← W

looks like multiple  
source. Poor shape  
may only be basal  
capping.

40100



754111



## Tasmanian Surveys - Progress Report V

June 22, 1981.

3.9 Sheet No. 4042.

The anomalous magnetic features on this sheet have generally been recognised. We note the granite itself appears to be more magnetic than we have noticed on sheets further to the south.

Anomaly No.Comments

1, 6.2870

*LAUREL Ck W.*

Almost certainly a magnetite skarn. "Laurel Creek".

2, 5.348

*LAUREL Ck W.*

Anomaly occurs in a topographic low. Amplitude only 300 gammas, but potassium is fairly high. 1 and 2 could be ground checked at the same time. I expect both will be very small.

3,

No analogue records. Anomaly occurs in the area of earlier flying. Obviously very strong. Magnetite skarn.

4, Line 316

*BLYNNE RD*

Weak anomaly, probably within sediments, potassium channel moderately elevated.

5, 303.12990

Kara East, magnetite skarn.

112

119

4042.  
671.

LAMBL CR58

①

6.28.70.

300

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754113

113

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4042

A = 800

(2)

E. 349

TOPOGRAPHIC HOW  
RIVER OR CREEK  
MAY BE A FAULT

Narrow Gouge

754114

114

754115

121

4042

LINE 8K W

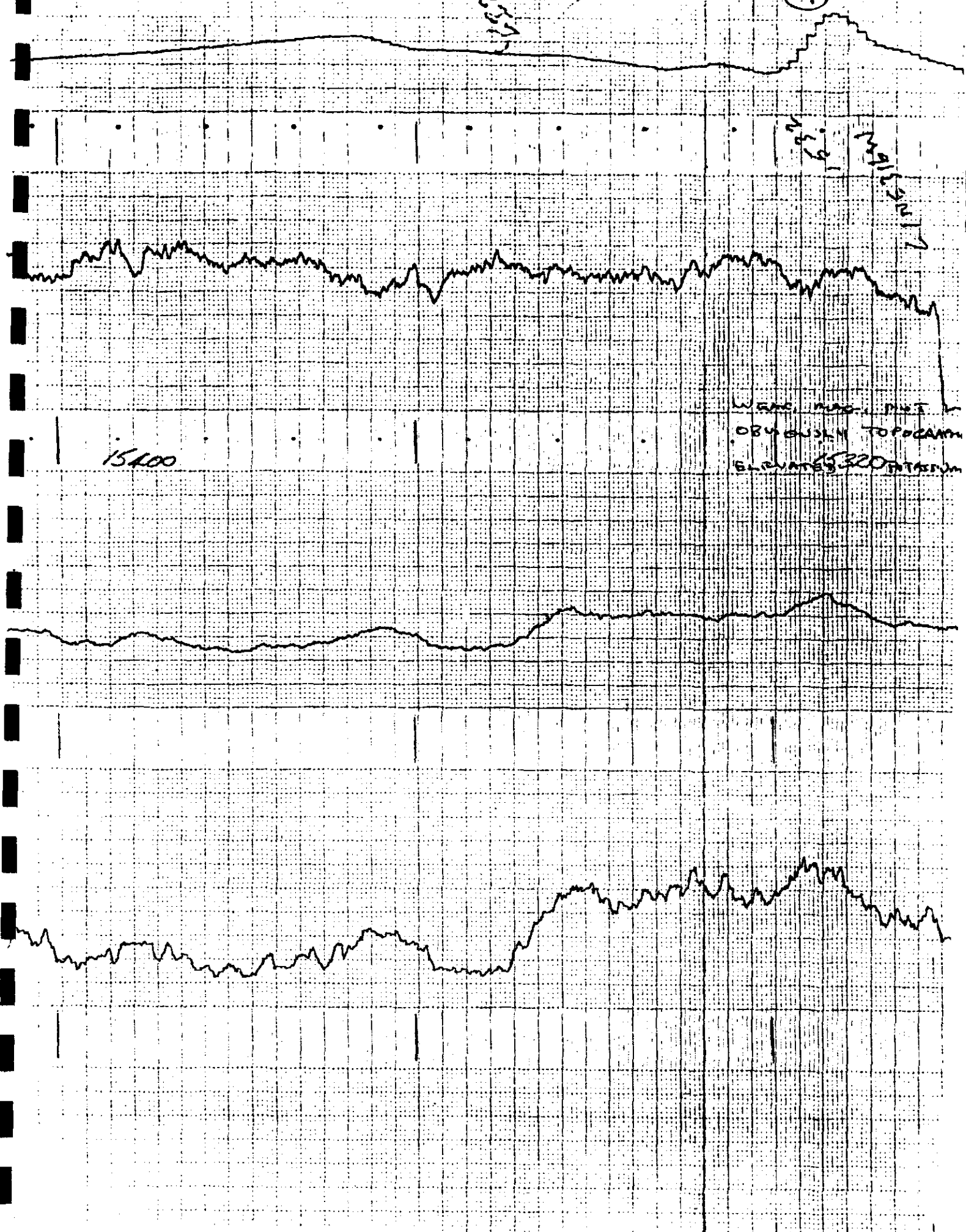
(4)

05051

1521  
1521  
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15400

WEAK MAG. INT. IN  
OBS. BUSBY TOPOGRAPHY  
ELEVATED 3200 FT. AT 114



115

754116

122

4042

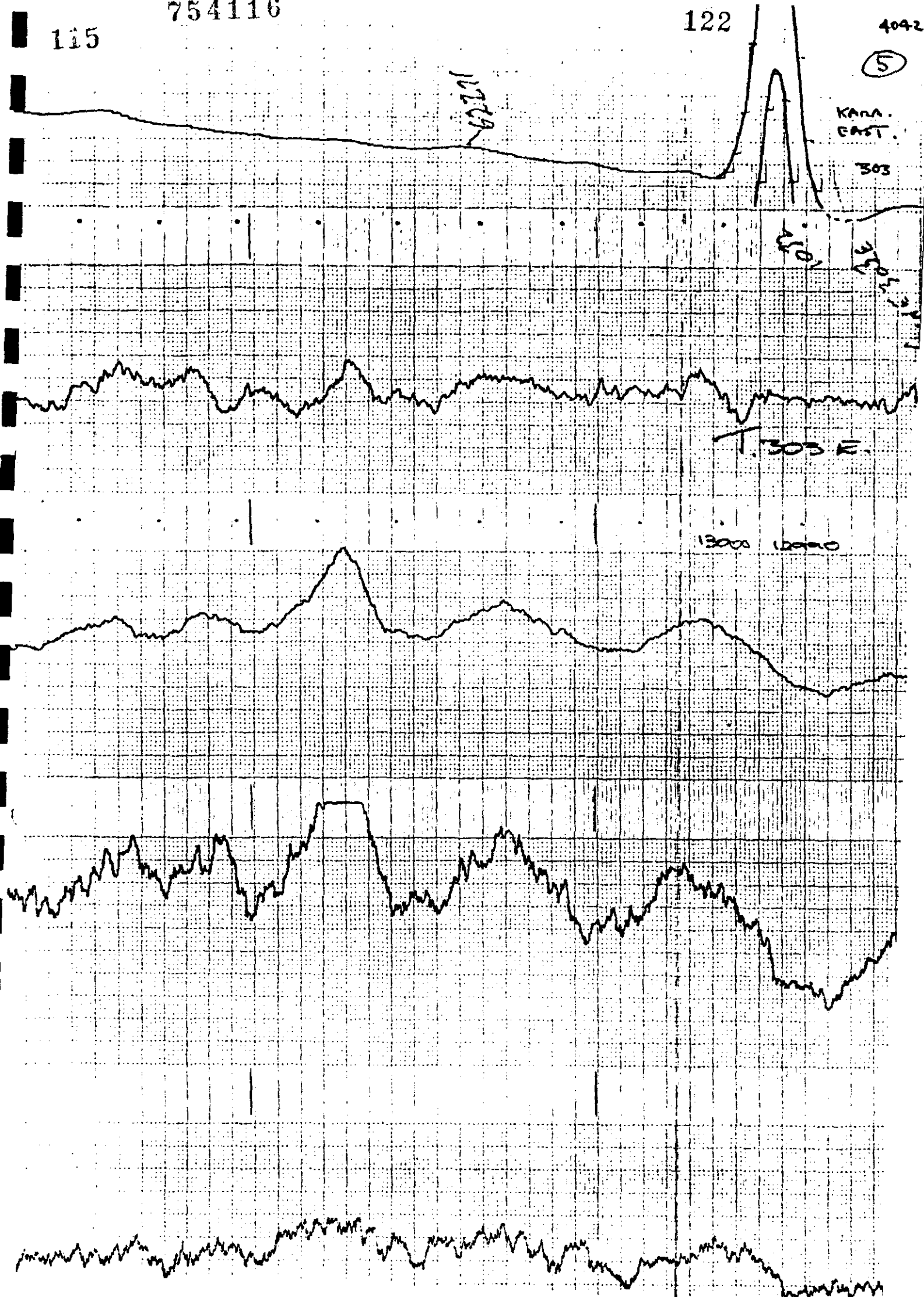
(5)

KANA  
EAST

303

T. 303 E.

1300 1200



Tasmanian Surveys - Progress Report V

June 22, 1981.

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Sheets 4142 and 4242.

These two sheets were examined earlier and the comments included in the report on Block 2, dated March 18, 1981.



G.O. DICKSON

G.O. DICKSON & ASSOC.

APPENDIX 2

COMALCO DRILL HOLES RED 1, RED 2 & RED 3

Summary logs & assays

Hole No : COMALCO RED 1

**COLLAR CO-ORDINATES:** 10912E/64135N

COLLAR R.L.:

MAP/PHOTO REFERENCE: .....

**DRILLING SUMMARY:**

[illegible]

764121

LOCATION CODE : MQ 04

COLLAR R.L. : .....

|                                                                                                |                 |                                                                                                |           |                                                                                                |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |             |           |    |       |       |       |                     |                  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |
|------------------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|-----------|----|-------|-------|-------|---------------------|------------------|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------|--|
| LOCATION : .....<br>MAP/PHOTO REFERENCE : .....                                                |                 |                                                                                                |           |                                                                                                |         | DATE STARTED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | APRIL 1979     |             | HOLE SIZE |    | FROM  | TO    | TOTAL | CORE STORAGE        |                  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |
|                                                                                                |                 |                                                                                                |           |                                                                                                |         | DATE FINISHED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | MAY 1979       |             | NON CORE  |    |       |       |       |                     | NO OF TRAYS      | 9                                                                                              |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |
|                                                                                                |                 |                                                                                                |           |                                                                                                |         | TOTAL DEPTH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 58.85m         |             |           |    |       |       |       |                     | SAMPLE STORAGE   |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |
| HOLE SURVEY DATA                                                                               |                 |                                                                                                |           |                                                                                                |         | LOGGED BY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | G. Weste       |             | CORE      | HQ | 0m    | 4.5m  | 4.5m  | ASSAY LAB.          | Amde]            |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |
| INSTRUMENT :                                                                                   |                 |                                                                                                |           |                                                                                                |         | CONTRACTOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Comalco        |             |           | NQ | 4.5m  | 41.36 | 36.86 | ASSAY REPORTS       |                  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |
| DEPTH                                                                                          | INSTRUMENT      |                                                                                                | ACID ETCH |                                                                                                | REMARKS | RIG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | JOY HD22 Diam. |             |           | BQ | 41.36 | 58.85 | 17.49 |                     |                  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |
|                                                                                                | INCL.           | AZ.                                                                                            | INCL.     | AZ.                                                                                            |         | DRILL CREW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | J. James       |             | CASING    |    |       |       |       |                     | MIN. & PET. LAB. |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |
| COLLAR                                                                                         | 55 <sup>u</sup> | 103                                                                                            |           |                                                                                                |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | L. Gardam      |             |           |    |       |       |       | MIN. & PET. REPORTS |                  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |
|                                                                                                |                 |                                                                                                |           |                                                                                                |         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                | CASING LEFT |           |    |       |       |       |                     |                  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |
|                                                                                                |                 |                                                                                                |           |                                                                                                |         | GRAPHIC/LETTER SYMBOL LOGGING KEY <table border="0"> <tr> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> </tr> <tr> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> </tr> <tr> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> </tr> <tr> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> </tr> <tr> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> </tr> <tr> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> <td><div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div></td> <td></td> </tr> </table> |                |             |           |    |       |       |       |                     |                  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  | <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> |  |
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|                                                                                                |                 |                                                                                                |           |                                                                                                |         | STRUCTURE / ALTERATION CODE<br>B BEDDING<br>J JOINTING<br>C CLEAVAGE<br>F FOLIATION<br>sh SHEARING<br>q QUARTZ VEINS<br>O OXIDATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |             |           |    |       |       |       |                     |                  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |                                                                                                |  |

**DRILLING SUMMARY :**

DIAMOND DRILL LOG - SAMPLING RECORD

MOLE 77 RED

754122

# DRILL LOG SHEET

Hole No : COMALCO RED 3

PROJECT : REDWATER

COLLAR CO-ORDINATES : 10440E/6100N

LOCATION CODE : MQ 04

COLLAR R.L. :

LOCATION :

MAP/PHOTO REFERENCE :

## HOLE SURVEY DATA

INSTRUMENT :

| DEPTH  | INSTRUMENT |     | ACID ETCH |     | REMARKS |
|--------|------------|-----|-----------|-----|---------|
|        | INCL.      | AZ. | INCL.     | AZ. |         |
| COLLAR | 60°        | 78° |           |     |         |

|               |                |             |  |      |    |       |                     |      |
|---------------|----------------|-------------|--|------|----|-------|---------------------|------|
| DATE STARTED  | MAY 1979       | HOLE SIZE   |  | FROM | TO | TOTAL | CORE STORAGE        |      |
| DATE FINISHED | JUNE 1979      | NON CORE    |  |      |    |       | NO OF TRAYS         | 9    |
| TOTAL DEPTH   | 104.1m         |             |  |      |    |       | SAMPLE STORAGE      |      |
| LOGGED BY     | G. Weste       | CORE        |  |      |    |       | ASSAY LAB.          | Amel |
| CONTRACTOR    | Comalco        |             |  |      |    |       | ASSAY REPORTS       |      |
| RIG           | JOY HD22 Diam. |             |  |      |    |       | MIN. & PET. LAB.    |      |
| DRILL CREW    | J. James       | CASING      |  |      |    |       | MIN. & PET. REPORTS |      |
|               | L. Gardam      |             |  |      |    |       |                     |      |
|               |                | CASING LEFT |  |      |    |       |                     |      |

## GRAPHIC/LETTER SYMBOL LOGGING KEY

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STRUCTURE / ALTERATION CODE  
B BEDDING  
J JOINTING  
C CLEAVAGE  
F FOLIATION  
sh SHEARING  
q QUARTZ VEINS  
O OXIDATION

DRILLING SUMMARY :

DIAMOND DRILL LOG - SAMPLING RECORD

754124

APPENDIX 3

DIAMOND DRILL HOLES RD 4 & RD 5

Logs & Assay Sheets

# DRILL LOG SHEET

Hole No : RD. 4

PROJECT : REDWATER

COLLAR CO-ORDINATES : 6100mN/10500mE

LOCATION CODE : MQ 04

COLLAR R.L. : 443m

LOCATION :

MAP/PHOTO REFERENCE :

## HOLE SURVEY DATA

INSTRUMENT :

| DEPTH  | INSTRUMENT |      | ACID ETCH |     | REMARKS |
|--------|------------|------|-----------|-----|---------|
|        | INCL.      | AZ.  | INCL.     | AZ. |         |
| COLLAR | 60°        | 080° |           |     |         |
| 150m   | 61°        | 073° |           |     |         |
| 220m   | 59°        | -    |           |     |         |
| 265m   | 58°        | 057° |           |     |         |
| 311m   | 60°        | 068° |           |     |         |
| 349m   | 59°        | 077° |           |     |         |

|               |              |             |            |      |        |        |                     |      |
|---------------|--------------|-------------|------------|------|--------|--------|---------------------|------|
| DATE STARTED  | 14-12-80     | HOLE SIZE   |            | FROM | TO     | TOTAL  | CORE STORAGE        |      |
| DATE FINISHED | 10- 2-81     | NON CORE    |            |      |        |        | NO OF TRAYS         | 48   |
| TOTAL DEPTH   | 349.4m       |             |            |      |        |        | SAMPLE STORAGE      |      |
| LOGGED BY     | L.D. Banwell | CORE        |            |      |        |        | ASSAY LAB.          | Amel |
| CONTRACTOR    | A.D.D.       | NQ          |            | 0    | 100m   | 100m   | ASSAY REPORTS       |      |
| RIG           | Mindrill F30 | BQ          |            | 100m | 349.4m | 249.4m |                     |      |
| DRILL CREW    | M. Blight    | CASING      |            |      |        |        | MIN. & PET. LAB.    |      |
|               | N. Bellinger | NQ          |            | 0    | 100m   | 100m   | MIN. & PET. REPORTS |      |
|               |              | CASING LEFT | PVC piping | 0    | 80m    | 80m    |                     |      |

## GRAPHIC/LETTER SYMBOL LOGGING KEY

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## STRUCTURE / ALTERATION CODE

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

DRILLING SUMMARY :

| From   | To     | Interval<br>(m) | Core<br>Rec'd | %<br>Rec | Sample<br>No. | Compos<br>No. | Assays |     |                  |     |    |     |    |       | Weighted Assays/Ratios |  |  |  | % Estimates |  |  |  | Core Angles |  |  |                                                               | T.S.<br>Alt P.S | Description |
|--------|--------|-----------------|---------------|----------|---------------|---------------|--------|-----|------------------|-----|----|-----|----|-------|------------------------|--|--|--|-------------|--|--|--|-------------|--|--|---------------------------------------------------------------|-----------------|-------------|
|        |        |                 |               |          |               |               | Sn     | W   | CaF <sub>2</sub> | Cu  | Pb | Zn  | Mo | Au    |                        |  |  |  |             |  |  |  |             |  |  |                                                               |                 |             |
| 0.00   | 11.22  | 11.22           | 9.08          | 81       |               |               |        |     |                  |     |    |     |    |       |                        |  |  |  |             |  |  |  |             |  |  | Moderately weathered Tertiary basalt.                         |                 |             |
| 11.22  | 20.64  | 9.42            | 6.51          | 69       |               |               |        |     |                  |     |    |     |    |       |                        |  |  |  |             |  |  |  |             |  |  | Palaeosol.                                                    |                 |             |
| 20.64  | 60.53  | 39.89           | 39.89         | 100      |               |               |        |     |                  |     |    |     |    |       |                        |  |  |  |             |  |  |  |             |  |  | Tertiary basalt with abundant zeolite veins and geoids.       |                 |             |
| 60.53  | 65.73  | 5.20            | 4.26          | 82       |               |               |        |     |                  |     |    |     |    |       |                        |  |  |  |             |  |  |  |             |  |  | Weathered Tertiary basalt.                                    |                 |             |
| 65.73  | 82.03  | 16.30           | 6.89          | 42       |               |               |        |     |                  |     |    |     |    |       |                        |  |  |  |             |  |  |  |             |  |  | Tertiary deep lead deposits, incl. greyhilly, silt. to congl. |                 |             |
| 82.03  | 86.14  | 4.11            | 3.42          | 83       |               |               |        |     |                  |     |    |     |    |       |                        |  |  |  |             |  |  |  |             |  |  | Clayey palaeosol.                                             |                 |             |
| 86.14  | 96.00  | 9.86            | 8.41          | 84       | 1401          |               | <1     | <50 |                  | 8   | 15 | 20  | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 96.00  | 106.00 | 10.00           | 9.04          | 90       | 1402          |               | <1     | <50 |                  | 4   | 25 | 40  | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 106.00 | 116.00 | 10.00           | 9.48          | 95       | 1403          |               | <1     | <50 |                  | 2   | 20 | <20 | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 116.00 | 126.00 | 10.00           | 6.89          | 69       | 1404          |               | <1     | <50 |                  | 3   | 30 | 40  | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 126.00 | 136.00 | 10.00           | 8.21          | 82       | 1405          |               | <1     | <50 |                  | 2   | 10 | <20 | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 136.00 | 146.00 | 10.00           | 8.05          | 80       | 1406          |               | <1     | <50 |                  | <1  | 15 | <20 | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 146.00 | 156.00 | 10.00           | 7.79          | 78       | 1407          |               | <1     | <50 |                  | 3   | 25 | 40  | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 156.00 | 166.00 | 10.00           | 9.10          | 91       | 1408          |               | <1     | <50 |                  | 3   | 15 | 40  | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 166.00 | 176.00 | 10.00           | 8.91          | 89       | 1409          |               | <1     | <50 |                  | 2   | 15 | <20 | <3 | 0.01  |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 176.00 | 186.00 | 10.00           | 8.48          | 85       | 1410          |               | <1     | <50 |                  | 4   | 15 | 40  | <3 | 0.02  |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 186.00 | 196.00 | 10.00           | 8.67          | 87       | 1411          |               | <1     | <50 |                  | 2   | 60 | <20 | <3 | 0.01  |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 196.00 | 206.00 | 10.00           | 9.90          | 99       | 1412          |               | <1     | <50 |                  | 2   | 60 | 150 | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 206.00 | 216.00 | 10.00           | 10.00         | 100      | 1413          |               | <1     | <50 |                  | 4   | 40 | 80  | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 216.00 | 226.00 | 10.00           | 9.84          | 98       | 1414          |               | <1     | <50 |                  | 3   | 40 | 250 | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 226.00 | 236.00 | 10.00           | 10.00         | 100      | 1415          |               | <1     | <50 |                  | 3   | 30 | 40  | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 236.00 | 246.00 | 10.00           | 10.00         | 100      | 1416          |               | <1     | <50 |                  | 3   | 20 | 250 | <3 | 0.01  |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 246.00 | 256.00 | 10.00           | 10.00         | 100      | 1417          |               | <1     | <50 |                  | 3   | 80 | 150 | <3 | 0.05  |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 256.00 | 267.20 | 11.20           | 11.20         | 100      | 1418          |               | <1     | <50 |                  | 4   | 60 | 80  | <3 | 0.01  |                        |  |  |  |             |  |  |  |             |  |  | LIMESTONE - recrystallized, with occasional clayey cavefill.  |                 |             |
| 267.20 | 269.20 | 2.00            | 2.00          | 100      | 1432          | C1            | 36     | <10 |                  | 110 | 20 | 65  | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN - garnet-diopside.                                      |                 |             |
| 269.20 | 271.20 | 2.00            | 2.00          | 100      | 1433          | C1            | 22     | 10  | 20               | 8   | 15 | 70  | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN - garnet-diopside.                                      |                 |             |
| 271.20 | 272.70 | 1.50            | 1.50          | 100      | 1434          | C1            | 18     | <10 |                  | 16  | 25 | 100 | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN - garnet-diopside.                                      |                 |             |
| 272.70 | 274.30 | 1.60            | 1.60          | 100      | 1435          | C1            | 40     | <10 |                  | 12  | 30 | 160 | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN - garnet-diopside.                                      |                 |             |
| 274.30 | 275.80 | 1.50            | 1.50          | 100      | 1436          | C2            | 18     | 15  |                  | 10  | 35 | 120 | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN - garnet-diopside - brecciated.                         |                 |             |
| 275.80 | 276.10 | .30             | .30           | 100      | 1419          |               | <1     | <50 |                  | 60  | 2  | 40  | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | BASALT.                                                       |                 |             |
| 276.10 | 278.10 | 2.00            | 2.00          | 100      | 1437          | C2            | 26     | <10 |                  | 4   | 55 | 110 | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN - garnet-diopside - brecciated.                         |                 |             |
| 278.10 | 279.40 | 1.30            | 1.30          | 100      | 1438          | C2            | 32     | <10 | 20               | 30  | 25 | 65  | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN - garnet-diopside.                                      |                 |             |
| 279.40 | 279.50 | .10             | .10           | 100      | 1420          |               | <1     | <50 |                  | 80  | 15 | 200 | <3 | 0.06  |                        |  |  |  |             |  |  |  |             |  |  | BASALT.                                                       |                 |             |
| 279.50 | 280.10 | .60             | .60           | 100      | 1438          | C2            | 32     | <10 |                  | 30  | 25 | 65  | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN - garnet-diopside - brecciated.                         |                 |             |
| 280.10 | 282.10 | 2.00            | 2.00          | 100      | 1439          | C2            | 20     | <10 |                  | 75  | 20 | 100 | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN - garnet-diopside - brecciated.                         |                 |             |
| 282.10 | 283.10 | 1.00            | 1.00          | 100      | 1421          |               | <1     | <50 |                  | 60  | 1  | <20 | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | BASALT.                                                       |                 |             |
| 283.10 | 283.30 | .20             | .20           | 100      | 1440          | C3            | 12     | <10 |                  | 24  | 15 | 70  | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN - garnet-diopside - brecciated.                         |                 |             |
| 283.30 | 283.80 | .50             | .50           | 100      | 1422          |               | <1     | <50 |                  | 60  | 4  | <20 | <3 | 0.02  |                        |  |  |  |             |  |  |  |             |  |  | BASALT.                                                       |                 |             |
| 283.80 | 285.30 | 1.50            | 1.50          | 100      | 1441          | C3            | 4      | <10 | 20               | 12  | 15 | 25  | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN - garnet-diopside - brecciated.                         |                 |             |
| 285.30 | 286.80 | 1.50            | 1.50          | 100      | 1442          | C3            | 16     | 10  |                  | 8   | 20 | 100 | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN - garnet-diopside - brecciated.                         |                 |             |
| 286.80 | 288.20 | 1.40            | 1.40          | 100      | 1443          | C3            | 6      | <10 |                  | 8   | 10 | 60  | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN.                                                        |                 |             |
| 288.20 | 289.30 | 1.10            | 1.10          | 100      | 1423          |               | <1     | <50 |                  | 80  | 6  | <20 | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | BASALT.                                                       |                 |             |
| 289.30 | 290.80 | 1.50            | 1.50          | 100      | 1444          | C4            | 16     | 10  |                  | 6   | 15 | 85  | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN - brecciated.                                           |                 |             |
| 290.80 | 292.20 | 1.40            | 1.40          | 100      | 1445          | C4            | 12     | <10 | 16               | 24  | 30 | 160 | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN.                                                        |                 |             |
| 292.20 | 292.80 | .60             | .60           | 100      | 1475          | C4            | <4     | 25  |                  | 26  | 5  | 110 | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN.                                                        |                 |             |
| 292.80 | 294.40 | 1.60            | 1.60          | 100      | 1424          |               | <1     | <50 |                  | 60  | 10 | 40  | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | BASALT.                                                       |                 |             |
| 294.40 | 296.40 | 2.00            | 2.00          | 100      | 1446          | C5            | 10     | <10 |                  | 4   | 20 | 80  | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN.                                                        |                 |             |
| 296.40 | 298.40 | 2.00            | 2.00          | 100      | 1447          | C5            | 6      | <10 |                  | <2  | 40 | 60  | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN.                                                        |                 |             |
| 298.40 | 300.40 | 2.00            | 1.99          | 99       | 1448          | C5            | 6      | <10 | 12               | 2   | 70 | 130 | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN.                                                        |                 |             |
| 300.40 | 302.40 | 2.00            | 1.99          | 99       | 1449          | C5            | 6      | <10 |                  | <2  | 35 | 65  | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN.                                                        |                 |             |
| 302.40 | 304.40 | 2.00            | 2.00          | 100      | 1450          | C5            | 4      | <10 |                  | 2   | 25 | 60  | 4  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN.                                                        |                 |             |
| 304.40 | 305.50 | 1.10            | 1.10          | 100      | 1451          | C5            | <4     | <10 |                  | <2  | 20 | 48  | 2  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN.                                                        |                 |             |
| 305.50 | 306.45 | .95             | .95           | 100      | 1425          |               | <1     | <50 |                  | 60  | 1  | 40  | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | BASALT.                                                       |                 |             |
| 306.45 | 306.75 | .30             | .30           | 100      | 1452          | C6            | 4      | <10 |                  | 2   | 25 | 55  | 2  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN.                                                        |                 |             |
| 306.75 | 306.90 | .15             | .15           | 100      | 1426          |               | <1     | <50 |                  | 60  | 6  | <20 | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | BASALT.                                                       |                 |             |
| 306.90 | 307.05 | .15             | .15           | 100      | 1453          | C6            | 4      | <10 | 12               | <2  | 65 | 110 | 1  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN.                                                        |                 |             |
| 307.05 | 308.15 | 1.10            | 1.10          | 100      | 1427          |               | <1     | <50 |                  | 60  | <1 | <20 | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  | BASALT.                                                       |                 |             |
| 308.15 | 309.05 | .90             | .90           | 100      | 1454          | C6            | <4     | <10 |                  | 14  | 45 | 90  | 2  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  | SKARN.                                                        |                 |             |
| 309.05 | 313.57 | 4.52            | 4.52          | 100      | 1428          |               | <1     | <50 |                  | 60  | 2  | <20 | 3  |       |                        |  |  |  |             |  |  |  |             |  |  |                                                               |                 |             |

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| From   | To     | Interl<br>(m) | Core<br>Rec'd | %<br>Rec | Sample<br>No. | Compos<br>No. | Assays |      |     |      |      |      |      |       | Weighted As |
|--------|--------|---------------|---------------|----------|---------------|---------------|--------|------|-----|------|------|------|------|-------|-------------|
|        |        |               |               |          |               |               | Ag     | As   | Ni  | Cr   | Mn   | Ti   | Bi   | Ba    |             |
| 0.00   | 11.22  | 11.22         | 9.08          | 81       |               |               |        |      |     |      |      |      |      |       |             |
| 11.22  | 20.64  | 9.42          | 6.51          | 69       |               |               |        |      |     |      |      |      |      |       |             |
| 20.64  | 60.53  | 39.89         | 38.89         | 100      |               |               |        |      |     |      |      |      |      |       |             |
| 60.53  | 65.73  | 5.20          | 4.26          | 82       |               |               |        |      |     |      |      |      |      |       |             |
| 65.73  | 82.03  | 16.30         | 6.89          | 42       |               |               |        |      |     |      |      |      |      |       |             |
| 82.03  | 86.14  | 4.11          | 3.42          | 83       |               |               |        |      |     |      |      |      |      |       |             |
| 86.14  | 96.00  | 9.86          | 8.41          | 84       | 1401          |               | .1     | < 50 | 30  | 60   | 300  | 1000 | < 1  | 400   |             |
| 96.00  | 106.00 | 10.00         | 9.04          | 90       | 1402          |               | < .1   | < 50 | 15  | 20   | 250  | 600  | < 1  | < 700 |             |
| 106.00 | 116.00 | 10.00         | 9.48          | 95       | 1403          |               | < .1   | < 50 | 20  | 20   | 300  | 200  | < 1  | 700   |             |
| 116.00 | 126.00 | 10.00         | 6.89          | 69       | 1404          |               | .8     | < 50 | 5   | 20   | 500  | 400  | < 1  | 400   |             |
| 126.00 | 136.00 | 10.00         | 6.21          | 82       | 1405          |               | .1     | < 50 | 15  | 40   | 250  | 400  | < 1  | 200   |             |
| 136.00 | 146.00 | 10.00         | 8.05          | 80       | 1406          |               | < .1   | < 50 | 5   | 20   | 100  | 300  | < 1  | < 200 |             |
| 146.00 | 156.00 | 10.00         | 7.79          | 78       | 1407          |               | .1     | < 50 | 30  | 60   | 150  | 600  | < 1  | 700   |             |
| 156.00 | 166.00 | 10.00         | 9.10          | 91       | 1408          |               | < .1   | < 50 | 40  | 60   | 200  | 800  | < 1  | 200   |             |
| 166.00 | 176.00 | 10.00         | 8.91          | 89       | 1409          |               | .6     | < 50 | 40  | 60   | 500  | 600  | < 1  | 200   |             |
| 176.00 | 186.00 | 10.00         | 8.48          | 85       | 1410          |               | < .1   | < 50 | 20  | 60   | 150  | 400  | < 1  | < 700 |             |
| 186.00 | 196.00 | 10.00         | 8.67          | 87       | 1411          |               | < .1   | < 50 | 20  | 40   | 150  | 400  | < 1  | < 700 |             |
| 196.00 | 206.00 | 10.00         | 9.90          | 99       | 1412          |               | < .1   | < 50 | < 5 | 40   | 200  | 300  | < 1  | 600   |             |
| 206.00 | 216.00 | 10.00         | 10.00         | 100      | 1413          |               | < .1   | < 50 | 5   | 40   | 200  | 400  | < 1  | < 700 |             |
| 216.00 | 226.00 | 10.00         | 9.84          | 98       | 1414          |               | < .1   | < 50 | 5   | 40   | 300  | 600  | < 1  | < 700 |             |
| 226.00 | 236.00 | 10.00         | 10.00         | 100      | 1415          |               | < .1   | < 50 | 10  | 60   | 300  | 600  | < 1  | 200   |             |
| 236.00 | 246.00 | 10.00         | 10.00         | 100      | 1416          |               | < .1   | < 50 | 5   | 60   | 250  | 300  | < 1  | 200   |             |
| 246.00 | 256.00 | 10.00         | 10.00         | 100      | 1417          |               | < .1   | < 50 | < 5 | 20   | 300  | 300  | < 1  | < 700 |             |
| 256.00 | 267.20 | 11.20         | 11.20         | 100      | 1418          |               | < .1   | < 50 | 20  | 40   | 200  | 400  | < 1  | 200   |             |
| 267.20 | 269.20 | 2.00          | 2.00          | 100      | 1432          | C1            | < 1    | 170  | 10  | 40   | 1500 | 1500 | 20   | < 200 |             |
| 269.20 | 271.20 | 2.00          | 2.00          | 100      | 1433          | C1            | < 1    | 150  | 15  | 40   | 1500 | 1500 | 10   | < 700 |             |
| 271.20 | 272.70 | 1.50          | 1.50          | 100      | 1434          | C1            | < 1    | 150  | 15  | 40   | 1500 | 1500 | 10   | < 700 |             |
| 272.70 | 274.30 | 1.60          | 1.60          | 100      | 1435          | C1            | < 1    | 170  | 15  | 40   | 1500 | 1500 | 10   | < 200 |             |
| 274.30 | 275.80 | 1.50          | 1.50          | 100      | 1436          | C2            | < 1    | 160  | 40  | 20   | 1000 | 2000 | 20   | < 700 |             |
| 275.80 | 276.10 | .30           | .30           | 100      | 1419          |               | < .1   | < 50 | 200 | 200  | 2000 | > 12 | < 1  | 800   |             |
| 276.10 | 278.10 | 2.00          | 2.00          | 100      | 1437          | C2            | < 1    | 140  | 20  | 20   | 1000 | 2000 | 20   | < 700 |             |
| 278.10 | 279.40 | 1.30          | 1.30          | 100      | 1438          | C2            | < 1    | 20   | 15  | 20   | 1000 | 2000 | 10   | < 200 |             |
| 279.40 | 279.50 | .10           | .10           | 100      | 1420          |               | .2     | < 50 | 100 | 200  | 200  | > 12 | < 1  | 200   |             |
| 279.50 | 280.10 | .60           | .60           | 100      | 1439          | C2            | < 1    | 20   | 15  | 20   | 1000 | 2000 | 10   | < 700 |             |
| 280.10 | 282.10 | 2.00          | 2.00          | 100      | 1439          | C2            | < 1    | 50   | 15  | 20   | 1000 | 2000 | 10   | < 200 |             |
| 282.10 | 283.10 | 1.00          | 1.00          | 100      | 1421          |               | < .1   | < 50 | 150 | 200  | 2000 | > 12 | < 1  | 400   |             |
| 283.10 | 283.30 | .20           | .20           | 100      | 1440          | C3            | < 1    | 20   | 25  | 20   | 800  | 1000 | 10   | < 200 |             |
| 283.30 | 283.80 | .50           | .50           | 100      | 1422          |               | .1     | < 50 | 150 | 200  | 1000 | > 12 | < 1  | 400   |             |
| 283.80 | 285.30 | 1.50          | 1.50          | 100      | 1441          | C3            | < 1    | 80   | 30  | 20   | 800  | 1000 | 10   | < 700 |             |
| 285.30 | 286.80 | 1.50          | 1.50          | 100      | 1442          | C3            | < 1    | 80   | 10  | 20   | 800  | 1000 | 10   | < 200 |             |
| 286.80 | 288.20 | 1.40          | 1.40          | 100      | 1443          | C3            | < 1    | < 20 | 20  | 20   | 800  | 1000 | 10   | < 200 |             |
| 288.20 | 289.30 | 1.10          | 1.10          | 100      | 1423          |               | .1     | < 50 | 150 | 200  | 1500 | > 12 | < 1  | 600   |             |
| 289.30 | 290.80 | 1.50          | 1.50          | 100      | 1444          | C4            | < 1    | < 20 | 15  | 60   | 800  | 3000 | 10   | < 200 |             |
| 290.80 | 292.20 | 1.40          | 1.40          | 100      | 1445          | C4            | < 1    | < 20 | 15  | 60   | 800  | 3000 | 10   | < 200 |             |
| 292.20 | 292.80 | .60           | .60           | 100      | 1475          | C4            | < 1    | < 20 | 160 | 60   | 800  | 3000 | 10   | < 200 |             |
| 292.80 | 294.40 | 1.60          | 1.60          | 100      | 1424          |               | .1     | < 50 | 200 | 200  | 800  | > 12 | < 1  | 600   |             |
| 294.40 | 296.40 | 2.00          | 2.00          | 100      | 1446          | C5            | < 1    | < 20 | 15  | 20   | 400  | 800  | 10   | < 200 |             |
| 296.40 | 298.40 | 2.00          | 2.00          | 100      | 1447          | C5            | < 1    | < 20 | 15  | 20   | 400  | 800  | 10   | < 200 |             |
| 298.40 | 300.40 | 2.00          | 1.99          | 99       | 1448          | C5            | < 1    | < 20 | 10  | 20   | 400  | 800  | 10   | < 200 |             |
| 300.40 | 302.40 | 2.00          | 1.99          | 99       | 1449          | C5            | < 1    | < 20 | 10  | 20   | 400  | 800  | 10   | < 200 |             |
| 302.40 | 304.40 | 2.00          | 2.00          | 100      | 1450          | C5            | < 1    | < 20 | 10  | 20   | 400  | 800  | 10   | < 200 |             |
| 304.40 | 305.50 | 1.10          | 1.10          | 100      | 1451          | C5            | < 1    | < 20 | 15  | 20   | 400  | 800  | 10   | < 200 |             |
| 305.50 | 306.45 | .95           | .95           | 100      | 1425          |               | < .1   | < 50 | 200 | 200  | 1500 | > 12 | < 1  | 600   |             |
| 306.45 | 306.75 | .30           | .30           | 100      | 1452          | C6            | < 1    | < 20 | 10  | 20   | 250  | 1000 | 10   | < 200 |             |
| 306.75 | 306.90 | .15           | .15           | 100      | 1426          |               | < .1   | < 50 | 200 | 250  | 1500 | > 12 | < 1  | 400   |             |
| 306.90 | 307.05 | .15           | .15           | 100      | 1453          | C6            | < 1    | < 20 | 20  | < 20 | 250  | 1000 | 10   | < 200 |             |
| 307.05 | 308.15 | 1.10          | 1.10          | 100      | 1427          |               | < .1   | < 50 | 200 | 200  | 2000 | > 12 | < 1  | 700   |             |
| 308.15 | 309.05 | .90           | .90           | 100      | 1454          | C6            | < 1    | < 20 | 15  | < 20 | 250  | 1000 | < 10 | < 700 |             |
| 309.05 | 313.57 | 4.52          | 4.52          | 100      | 1428          |               | .2     | < 50 | 200 | 200  | 1000 | > 12 | < 1  | 400   |             |
| 313.57 | 315.50 | 1.93          | 1.92          | 99       | 1455          | C7            | < 1    | < 20 | 5   | 20   | 300  | 800  | 10   | < 200 |             |
| 315.50 | 317.50 | 2.00          | 2.00          | 100      | 1456          | C7            | < 1    | < 20 | 20  | 20   | 300  | 800  | 10   | < 200 |             |
| 317.50 | 319.50 | 2.00          | 2.00          | 100      | 1457          | C7            | < 1    | < 20 | 20  | 20   | 300  | 800  | 10   | < 200 |             |

754128

124

PROJECT: REDWATER

D-DRILL LOG - SAMPLING RECORD

HOLE NO. RD 4

| From   | To     | Interf<br>(m) | Core<br>Rec'd | %<br>Rec | Sample<br>No. | Compos<br>No. | Assays |     |                  |     |     |     |    |       | Weighted Assays/Ratios |  |  |  | % Estimates |  |  |  | Core Angles |  |  |  | T.S<br>Alt P.S | Description                                                                           |
|--------|--------|---------------|---------------|----------|---------------|---------------|--------|-----|------------------|-----|-----|-----|----|-------|------------------------|--|--|--|-------------|--|--|--|-------------|--|--|--|----------------|---------------------------------------------------------------------------------------|
|        |        |               |               |          |               |               | Sn     | W   | CaF <sub>2</sub> | Cu  | Pb  | Zn  | Mo | Au    |                        |  |  |  |             |  |  |  |             |  |  |  |                |                                                                                       |
| 319.50 | 321.50 | 2.00          | 1.98          | 99       | 1458          | C7            | 4      | 10  |                  | 10  | 40  | 180 | 2  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE                                                                             |
| 321.50 | 323.25 | 1.75          | 1.73          | 99       | 1459          | C7            | <4     | <10 |                  | 10  | 25  | 110 | 1  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE                                                                             |
| 323.25 | 323.90 | .65           | .64           | 99       | 1429          |               | <1     | <50 |                  | 60  | 8   | 100 | <3 | 0.01  |                        |  |  |  |             |  |  |  |             |  |  |  |                | BASALT                                                                                |
| 323.90 | 326.00 | 2.10          | 2.09          | 99       | 1460          | C7A           | <4     | <10 | .16              | 14  | 35  | 85  | 1  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE - extensively recrystallized                                                |
| 326.00 | 328.05 | 2.05          | 2.05          | 100      | 1461          | C7A           | 4      | <10 |                  | 10  | 35  | 48  | 2  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE                                                                             |
| 328.05 | 328.75 | .70           | .70           | 100      | 1430          |               | <1     | 50  |                  | 80  | 10  | 150 | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  |  |                | BASALT                                                                                |
| 328.75 | 328.95 | .20           | .19           | 95       | 1462          | C8            | 6      | <10 |                  | 6   | 40  | 60  | 1  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE - extensively recrystallized                                                |
| 328.95 | 329.05 | .10           | .09           | 90       | 1431          |               | <1     | 100 |                  | 80  | 4   | 80  | <3 | <0.01 |                        |  |  |  |             |  |  |  |             |  |  |  |                | BASALT                                                                                |
| 329.05 | 331.00 | 1.95          | 1.80          | 92       | 1463          | C8            | 6      | <10 | .20              | 24  | 25  | 120 | 2  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE - extensively recrystallized, often sheared and fractured showing secondary |
| 331.00 | 333.00 | 2.00          | 1.98          | 99       | 1464          | C8            | 10     | 10  |                  | 14  | 25  | 75  | 1  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE calcite veining with some pyrite.                                           |
| 333.00 | 334.50 | 1.60          | 1.60          | 100      | 1465          | C8            | 8      | <10 |                  | 24  | 25  | 100 | 10 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE - as above                                                                  |
| 334.50 | 336.50 | 1.90          | 1.90          | 100      | 1466          | C9            | 4      | <10 | .08              | 16  | 25  | 75  | 2  | 0.05  |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE - as above                                                                  |
| 336.50 | 338.45 | 1.95          | 1.95          | 100      | 1467          | C9            | 4      | <10 |                  | 12  | 15  | 38  | <1 | 0.05  |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE - as above                                                                  |
| 338.45 | 340.50 | 2.05          | 2.05          | 100      | 1468          | C10           | <4     | <10 |                  | 150 | 20  | 40  | 1  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE - as above                                                                  |
| 340.50 | 342.60 | 2.10          | 2.10          | 100      | 1469          | C10           | <4     | 15  | .08              | 18  | 15  | 30  | 3  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE - as above                                                                  |
| 342.60 | 344.69 | 2.09          | 2.09          | 100      | 1470          | C10           | <4     | <10 |                  | 14  | 10  | 20  | 1  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE - as above                                                                  |
| 344.69 | 346.37 | 1.68          | 1.68          | 100      | 1471          | C11           | <4     | <10 | .08              | 10  | 5   | 6   | 1  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE - as above                                                                  |
| 346.37 | 346.80 | .43           | .43           | 100      | 1472          | C12           | <4     | 10  | .20              | 20  | 200 | 150 | <1 | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | STILY MARL                                                                            |
| 346.80 | 348.00 | 1.20          | 1.20          | 100      | 1473          | C13           | 10     | <10 | .04              | 14  | 15  | 38  | 1  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE - extensively recrystallized and brecciated.                                |
| 348.00 | 349.60 | 1.60          | 1.60          | 100      | 1474          | C14           | <4     | <10 | .08              | 8   | 20  | 32  | 1  | <0.05 |                        |  |  |  |             |  |  |  |             |  |  |  |                | LIMESTONE - extensively recrystallized and brecciated.                                |

| From   | To     | Interf<br>(m) | Core<br>Rec'd | %<br>Rec | Sample<br>No. | Compos<br>No. | Assays |      |     |      |      |      |      |       | Weighted Assay |  |  |
|--------|--------|---------------|---------------|----------|---------------|---------------|--------|------|-----|------|------|------|------|-------|----------------|--|--|
|        |        |               |               |          |               |               | Ag     | As   | Ni  | Cr   | Mn   | Ti   | Bi   | Ba    |                |  |  |
| 319.50 | 321.50 | 2.00          | 1.98          | 99       | 1458          | C7            | < 1    | < 20 | < 5 | 20   | 300  | 800  | < 10 | < 200 |                |  |  |
| 321.50 | 323.25 | 1.75          | 1.73          | 99       | 1459          | C7            | < 1    | < 20 | 15  | 20   | 300  | 800  | < 10 | < 200 |                |  |  |
| 323.25 | 323.90 | .65           | .64           | 99       | 1429          |               | < 1    | < 50 | 200 | 200  | 1500 | > 1% | < 1  | 400   |                |  |  |
| 323.90 | 326.00 | 2.10          | 2.09          | 99       | 1460          | C7A           | < 1    | < 20 | 20  | 20   | 100  | 1500 | 40   | < 200 |                |  |  |
| 326.00 | 328.05 | 2.05          | 2.05          | 100      | 1461          | C7A           | < 1    | < 20 | 10  | 20   | 100  | 1500 | 20   | < 200 |                |  |  |
| 328.05 | 328.75 | .70           | .70           | 100      | 1430          |               | < 1    | < 50 | 200 | 200  | 800  | > 1% | < 1  | 600   |                |  |  |
| 328.75 | 328.95 | .20           | .19           | 95       | 1462          | C8            | < 1    | < 20 | 45  | 20   | 200  | 800  | 10   | 200   |                |  |  |
| 328.95 | 329.05 | .10           | .09           | 90       | 1431          |               | < 1    | < 50 | 200 | 200  | 1000 | > 1% | < 1  | 600   |                |  |  |
| 329.05 | 331.00 | 1.95          | 1.80          | 92       | 1463          | C8            | < 1    | < 20 | 15  | < 20 | 200  | 800  | 20   | < 200 |                |  |  |
| 331.00 | 333.00 | 2.00          | 1.98          | 99       | 1464          | C8            | < 1    | < 20 | 15  | < 20 | 200  | 800  | < 10 | < 200 |                |  |  |
| 333.00 | 334.60 | 1.60          | 1.60          | 100      | 1465          | C8            | < 1    | 80   | 30  | < 20 | 200  | 800  | 10   | < 200 |                |  |  |
| 334.60 | 336.50 | 1.90          | 1.90          | 100      | 1466          | C9            | < 1    | 30   | 25  | < 20 | 150  | 400  | 10   | < 200 |                |  |  |
| 336.50 | 338.45 | 1.95          | 1.95          | 100      | 1467          | C9            | < 1    | < 20 | 25  | < 20 | 150  | 400  | 10   | < 200 |                |  |  |
| 338.45 | 340.50 | 2.05          | 2.05          | 100      | 1468          | C10           | < 1    | < 20 | 20  | < 20 | 80   | 400  | 20   | < 200 |                |  |  |
| 340.50 | 342.60 | 2.10          | 2.10          | 100      | 1469          | C10           | < 1    | < 20 | 15  | < 20 | 80   | 400  | 20   | < 200 |                |  |  |
| 342.60 | 344.69 | 2.09          | 2.09          | 100      | 1470          | C10           | < 1    | < 20 | 10  | < 20 | 80   | 400  | 20   | < 200 |                |  |  |
| 344.69 | 346.37 | 1.68          | 1.68          | 100      | 1471          | C11           | < 1    | < 20 | < 5 | < 20 | 60   | 400  | 10   | < 200 |                |  |  |
| 346.37 | 346.80 | .43           | .43           | 100      | 1472          | C12           | < 1    | < 20 | 90  | < 20 | 300  | 1000 | 10   | < 200 |                |  |  |
| 346.80 | 348.00 | 1.20          | 1.20          | 100      | 1473          | C13           | < 1    | < 20 | 20  | < 20 | 50   | 200  | 10   | < 200 |                |  |  |
| 348.00 | 349.60 | 1.60          | 1.60          | 100      | 1474          | C14           | < 1    | < 20 | 5   | < 20 | 150  | 200  | 10   | < 200 |                |  |  |

Hole No : RD 5

**COLLAR CO-ORDINATES:** 5100mN/10620mE

COLLAR R.L.: 430m (approx.)

|                                   |                   |            |                  |            |                |                                                                                                                                                              |              |                    |            |             |               |               |                                |                             |
|-----------------------------------|-------------------|------------|------------------|------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------|------------|-------------|---------------|---------------|--------------------------------|-----------------------------|
| <b>LOCATION :</b> .....           |                   |            |                  |            |                | <b>DATE STARTED</b>                                                                                                                                          | 16-2-81      | <b>HOLE SIZE</b>   |            | <b>FROM</b> | <b>TO</b>     | <b>TOTAL</b>  | <b>CORE STORAGE</b>            |                             |
| <b>MAP/PHOTO REFERENCE:</b> ..... |                   |            |                  |            |                | <b>DATE FINISHED</b>                                                                                                                                         | 21-3-81      | <b>NON CORE</b>    |            |             |               |               | <b>Nº OF TRAYS</b>             | 26                          |
|                                   |                   |            |                  |            |                | <b>TOTAL DEPTH</b>                                                                                                                                           | 203.6m       |                    |            |             |               |               | <b>SAMPLE STORAGE</b>          |                             |
| <b>HOLE SURVEY DATA</b>           |                   |            |                  |            |                | <b>LOGGED BY</b>                                                                                                                                             | L.D. Banwell | <b>CORE</b>        |            |             |               |               | <b>ASSAY LAB.</b>              | AmdeI                       |
| <b>INSTRUMENT :</b>               |                   |            |                  |            |                | <b>CONTRACTOR</b>                                                                                                                                            | A.D.D.       | <b>NQ</b>          |            | <b>O</b>    | <b>88m</b>    | <b>88m</b>    | <b>ASSAY REPORTS</b>           |                             |
| <b>DEPTH</b>                      | <b>INSTRUMENT</b> |            | <b>ACID ETCH</b> |            | <b>REMARKS</b> | <b>RIG</b>                                                                                                                                                   | Mindrill F30 | <b>BQ</b>          |            | <b>88m</b>  | <b>203.6m</b> | <b>115.6m</b> |                                |                             |
| <b>COLLAR</b>                     | <b>INCL.</b>      | <b>AZ.</b> | <b>INCL.</b>     | <b>AZ.</b> |                | <b>DRILL CREW</b>                                                                                                                                            | M. Blight    | <b>CASING</b>      |            |             |               |               |                                | <b>MIN. &amp; PET. LAB.</b> |
| 90m                               | 60°               | 260°       |                  |            |                |                                                                                                                                                              | D. Short     |                    |            |             |               |               | <b>MIN. &amp; PET. REPORTS</b> |                             |
| 140m                              | 59°               | -          |                  |            |                |                                                                                                                                                              |              | <b>CASING LEFT</b> | PVC piping | <b>O</b>    | <b>88m</b>    | <b>88m</b>    |                                |                             |
| 198m                              | 58°               | 283°       |                  |            |                |                                                                                                                                                              |              |                    |            |             |               |               |                                |                             |
|                                   |                   |            |                  |            |                | <b>GRAPHIC / LETTER SYMBOL LOGGING KEY</b>                                                                                                                   |              |                    |            |             |               |               |                                |                             |
|                                   |                   |            |                  |            |                | <div style="display: flex; justify-content: space-around;"> <div> </div> <div> </div> <div> </div> </div>                                                    |              |                    |            |             |               |               |                                |                             |
|                                   |                   |            |                  |            |                | <div style="display: flex; justify-content: space-around;"> <div> </div> <div> </div> <div> </div> </div>                                                    |              |                    |            |             |               |               |                                |                             |
|                                   |                   |            |                  |            |                | <div style="display: flex; justify-content: space-around;"> <div> </div> <div> </div> <div> </div> </div>                                                    |              |                    |            |             |               |               |                                |                             |
|                                   |                   |            |                  |            |                | <div style="display: flex; justify-content: space-around;"> <div> </div> <div> </div> <div> </div> </div>                                                    |              |                    |            |             |               |               |                                |                             |
|                                   |                   |            |                  |            |                | <div style="display: flex; justify-content: space-around;"> <div> </div> <div> </div> <div> </div> </div>                                                    |              |                    |            |             |               |               |                                |                             |
|                                   |                   |            |                  |            |                | <div style="display: flex; justify-content: space-around;"> <div> </div> <div> </div> <div> </div> </div>                                                    |              |                    |            |             |               |               |                                |                             |
|                                   |                   |            |                  |            |                | <b>STRUCTURE / ALTERATION CODE</b><br>B BEDDING                      O OXIDATION<br>J JOINTING<br>C CLEAVAGE<br>F FOLIATION<br>sh SHEARING<br>q QUARTZ VEINS |              |                    |            |             |               |               |                                |                             |

**DRILLING SUMMARY:**

| From   | To     | Interl<br>(m) | Core<br>Rec'd | %<br>Rec | Sample<br>No. | Compos<br>No. | Assays |     |                  |     |    |     |    | Weighted Assays/Ratios |  |  | % Estimates |  |  | Core Angles |  |  | T.S<br>Alt P.S                                                                               | Description |
|--------|--------|---------------|---------------|----------|---------------|---------------|--------|-----|------------------|-----|----|-----|----|------------------------|--|--|-------------|--|--|-------------|--|--|----------------------------------------------------------------------------------------------|-------------|
|        |        |               |               |          |               |               | Sn     | W   | CaF <sub>2</sub> | Cu  | Pb | Zn  | Mo | Au                     |  |  |             |  |  |             |  |  |                                                                                              |             |
| 0.00   | 21.89  | 21.89         | 8.58          | 39       |               |               |        |     |                  |     |    |     |    |                        |  |  |             |  |  |             |  |  | BASALT SOIL - extensively weathered.                                                         |             |
| 21.89  | 22.84  | .95           | .95           | 100      |               |               |        |     |                  |     |    |     |    |                        |  |  |             |  |  |             |  |  | TERTIARY BASALT                                                                              |             |
| 22.84  | 28.21  | 5.37          | 5.37          | 100      |               |               |        |     |                  |     |    |     |    |                        |  |  |             |  |  |             |  |  | TERTIARY BASALT - very weathered                                                             |             |
| 28.21  | 51.10  | 22.89         | 22.89         | 100      |               |               |        |     |                  |     |    |     |    |                        |  |  |             |  |  |             |  |  | TERTIARY BASALT - with small vugs and veins of zeolites.                                     |             |
| 51.10  | 53.80  | 1.70          | 1.70          | 100      |               |               |        |     |                  |     |    |     |    |                        |  |  |             |  |  |             |  |  | PALAEOSOL - very poorly developed                                                            |             |
| 53.80  | 54.90  | 1.10          | .82           | 75       |               |               |        |     |                  |     |    |     |    |                        |  |  |             |  |  |             |  |  | TERTIARY BASALT                                                                              |             |
| 54.90  | 69.50  | 14.60         | 5.80          | 40       |               |               |        |     |                  |     |    |     |    |                        |  |  |             |  |  |             |  |  | TERTIARY DEEP LEAD DEPOSITS - fine clayey material to conglomerate                           |             |
| 69.50  | 74.00  | 4.50          | 2.51          | 56       |               |               |        |     |                  |     |    |     |    |                        |  |  |             |  |  |             |  |  | SAND - unconsolidated                                                                        |             |
| 74.00  | 80.80  | 6.80          | 5.02          | 74       |               |               |        |     |                  |     |    |     |    |                        |  |  |             |  |  |             |  |  | PALAEOSOL - clayey.                                                                          |             |
| 80.80  | 90.00  | 9.20          | 9.20          | 100      | 1479          |               | <1     | <30 |                  | 3   | 6  | <20 | <3 | <.01                   |  |  |             |  |  |             |  |  | LIMESTONE - recrystallized, occasional clayey cave fill & skarnified bands (garnets present) |             |
| 90.00  | 100.00 | 10.00         | 9.51          | 95       | 1480          |               | <1     | <30 |                  | 1   | 6  | 40  | <3 | <.01                   |  |  |             |  |  |             |  |  | LIMESTONE - as above                                                                         |             |
| 100.00 | 110.00 | 10.00         | 9.29          | 93       | 1481          |               | <1     | <30 |                  | 3   | 6  | <20 | <3 | <.01                   |  |  |             |  |  |             |  |  | LIMESTONE - as above                                                                         |             |
| 110.00 | 120.00 | 10.00         | 8.45          | 85       | 1482          |               | <1     | <30 |                  | 1   | 10 | <20 | <3 | <.01                   |  |  |             |  |  |             |  |  | LIMESTONE - as above                                                                         |             |
| 120.00 | 130.00 | 10.00         | 9.97          | 100      | 1483          |               | <1     | <30 |                  | 1   | 20 | 40  | <3 | <.01                   |  |  |             |  |  |             |  |  | LIMESTONE - as above                                                                         |             |
| 130.00 | 140.00 | 10.00         | 8.62          | 86       | 1484          |               | <1     | <30 |                  | 1   | 10 | <20 | <3 | <.01                   |  |  |             |  |  |             |  |  | LIMESTONE - as above                                                                         |             |
| 140.00 | 150.00 | 10.00         | 9.05          | 90       | 1485          |               | <1     | <30 |                  | <1  | 20 | 20  | <3 | <.01                   |  |  |             |  |  |             |  |  | LIMESTONE - as above                                                                         |             |
| 150.00 | 153.00 | 3.00          | 2.56          | 85       | 1486          |               | <1     | <30 |                  | 2   | 20 | 40  | <3 | <.01                   |  |  |             |  |  |             |  |  | LIMESTONE - as above                                                                         |             |
| 153.00 | 154.20 | 1.20          | 1.20          | 100      | 2036          | C8            | 6      | <10 | 0.62             | 34  | 65 | 180 | <1 | 0.05                   |  |  |             |  |  |             |  |  | SKARN - very weathered                                                                       |             |
| 154.20 | 159.82 | 5.62          | 5.62          | 100      | 1486          |               | <1     | <30 |                  | 2   | 20 | 40  | <3 | <.01                   |  |  |             |  |  |             |  |  | LIMESTONE - recrystallized                                                                   |             |
| 159.82 | 160.80 | .98           | .98           | 100      | 1494          |               | 22     | 15  |                  | 44  | 50 | 290 | 1  |                        |  |  |             |  |  |             |  |  | SKARN - extensively weathered & sheared, clay minerals dominate                              |             |
| 160.80 | 161.20 | .40           | .40           | 100      | 1495          | C1            | 50     | 20  | 0.46             | 95  | 50 | 260 | 2  | 0.06                   |  |  |             |  |  |             |  |  | SKARN - as above                                                                             |             |
| 161.20 | 161.80 | .60           | .54           | 90       | 1496          |               | 26     | 25  |                  | 55  | 60 | 400 | 2  |                        |  |  |             |  |  |             |  |  | SKARN - as above                                                                             |             |
| 161.80 | 162.30 | .50           | .50           | 100      | 1497          |               | 10     | 30  |                  | 38  | 40 | 330 | 2  |                        |  |  |             |  |  |             |  |  | SKARN - as above                                                                             |             |
| 162.30 | 162.96 | .66           | .66           | 100      | 1498          | C2            | 150    | 15  | 0.24             | 44  | 45 | 450 | 3  | 0.06                   |  |  |             |  |  |             |  |  | SKARN - with narrow bands (up to 10cm) & small clumps of massive magnetite                   |             |
| 162.96 | 164.03 | 1.07          | 1.07          | 100      | 1499          | C3            | 320    | 25  | 0.12             | 42  | 20 | 250 | 7  | 0.06                   |  |  |             |  |  |             |  |  | MAGNETITE SKARN - coarse grained, weathered                                                  |             |
| 164.03 | 164.85 | .82           | .81           | 99       | 1500          | C4            | 34     | 20  | 0.42             | 44  | 35 | 250 | 2  | 0.04                   |  |  |             |  |  |             |  |  | SKARN - minor magnetite                                                                      |             |
| 164.85 | 165.85 | 1.00          | .73           | 73       | 2001          |               | 60     | 15  |                  | 46  | 35 | 270 | 1  |                        |  |  |             |  |  |             |  |  | GARNET - DIOPSIDE SKARN - ext. weathered, relic features preserved, bands of magnetite       |             |
| 165.85 | 166.90 | 1.05          | .77           | 73       | 2002          | C5            | 110    | <10 | 0.36             | 40  | 20 | 170 | <1 | 0.06                   |  |  |             |  |  |             |  |  | GARNET - DIOPSIDE SKARN                                                                      |             |
| 166.90 | 167.40 | .50           | .36           | 73       | 2003          |               | 60     | 10  |                  | 140 | 45 | 390 | 2  |                        |  |  |             |  |  |             |  |  | GARNET - DIOPSIDE SKARN                                                                      |             |
| 167.40 | 167.80 | .40           | .29           | 73       | 2004          |               | 80     | 30  |                  | 170 | 25 | 420 | 1  |                        |  |  |             |  |  |             |  |  | GARNET - DIOPSIDE                                                                            |             |
| 167.80 | 168.20 | .40           | .38           | 95       | 2005          | C6            | 150    | 50  | 0.08             | 240 | 70 | 270 | 12 | 0.14                   |  |  |             |  |  |             |  |  | MAGNETITE SKARN - weathered                                                                  |             |
| 168.20 | 169.23 | 1.03          | .98           | 95       | 1487          |               | 10     | 150 |                  | 40  | 10 | 100 | <3 | <.01                   |  |  |             |  |  |             |  |  | GRANITE - extensively weathered mainly clay minerals present.                                |             |
| 169.23 | 169.48 | .25           | .24           | 95       | 1488          |               | <1     | <30 |                  | 10  | 3  | <20 | <5 | <.01                   |  |  |             |  |  |             |  |  | GRANITE - as above                                                                           |             |
| 169.48 | 176.14 | 6.66          | 6.66          | 100      | 1489          |               | <1     | <30 |                  | 10  | 3  | <20 | <3 | <.01                   |  |  |             |  |  |             |  |  | GRANITE - pink, quartz-orthoclase-biotite-plagioclase                                        |             |
| 176.14 | 182.80 | 6.66          | 6.66          | 100      | 1490          |               | <1     | 90  |                  | 15  | 6  | <20 | <3 | <.01                   |  |  |             |  |  |             |  |  | GRANITE - as above                                                                           |             |
| 182.80 | 183.81 | 1.01          | 1.01          | 100      | 2006          | C7            | 110    | 60  | 0.12             | 12  | 20 | 210 | 2  | 0.06                   |  |  |             |  |  |             |  |  | GREISEN - green, quartz-feldspar-chlorite-muscovite-biotite                                  |             |
| 183.81 | 186.28 | 2.47          | 2.47          | 100      | 1491          |               | <1     | <30 |                  | 10  | 6  | <20 | <3 | <.01                   |  |  |             |  |  |             |  |  | GRANITE - pink, quartz-orthoclase-biotite-plagioclase                                        |             |
| 186.28 | 191.66 | 5.38          | 5.09          | 95       | 1492          |               | <1     | <30 |                  | <1  | 6  | <20 | 18 | <.01                   |  |  |             |  |  |             |  |  | FAULT ZONE - altered granite: chlorite-quartz-feldspar                                       |             |
| 191.66 | 203.60 | 11.94         | 11.83         | 99       | 1493          |               | <1     | 100 |                  | 30  | 10 | <20 | <9 | <.01                   |  |  |             |  |  |             |  |  | GRANITE - light grey to pink quartz-orthoclase-biotite-plagioclase                           |             |

Sheet of Sheets

754132

| From   | To     | Interf<br>(m) | Core<br>Rec'd | Z<br>Rec | Sample<br>No. | Compos<br>No. | Assays |     |      |     |       |      |      |      | Weighted Assays/Ratio |  |  |
|--------|--------|---------------|---------------|----------|---------------|---------------|--------|-----|------|-----|-------|------|------|------|-----------------------|--|--|
|        |        |               |               |          |               |               | Ag     | As  | Ba   | Cr  | Mn    | Ti   | Bi   | Fe%  |                       |  |  |
| 0.00   | 21.89  | 21.89         | 8.58          | 39       |               |               |        |     |      |     |       |      |      |      |                       |  |  |
| 21.89  | 22.84  | .95           | .95           | 100      |               |               |        |     |      |     |       |      |      |      |                       |  |  |
| 22.84  | 28.21  | 5.37          | 5.37          | 100      |               |               |        |     |      |     |       |      |      |      |                       |  |  |
| 28.21  | 51.10  | 22.89         | 22.89         | 100      |               |               |        |     |      |     |       |      |      |      |                       |  |  |
| 51.10  | 53.80  | 1.70          | 1.70          | 100      |               |               |        |     |      |     |       |      |      |      |                       |  |  |
| 53.80  | 54.90  | 1.10          | .82           | 75       |               |               |        |     |      |     |       |      |      |      |                       |  |  |
| 54.90  | 69.50  | 14.60         | 5.80          | 40       |               |               |        |     |      |     |       |      |      |      |                       |  |  |
| 69.50  | 74.00  | 4.50          | 2.51          | 56       |               |               |        |     |      |     |       |      |      |      |                       |  |  |
| 74.00  | 80.80  | 6.80          | 5.02          | 74       |               |               |        |     |      |     |       |      |      |      |                       |  |  |
| 80.80  | 90.00  | 9.20          | 9.20          | 100      | 1479          |               | 4      | <50 | <200 | 20  | 200   | 400  | <1   |      |                       |  |  |
| 90.00  | 100.00 | 10.00         | 9.51          | 95       | 1480          |               | 8      | <50 | <200 | 20  | 200   | 600  | <1   |      |                       |  |  |
| 100.00 | 110.00 | 10.00         | 9.29          | 93       | 1481          |               | 2      | <50 | <200 | <20 | 200   | 300  | <1   |      |                       |  |  |
| 110.00 | 120.00 | 10.00         | 8.45          | 85       | 1482          |               | 1      | <50 | <200 | 20  | 200   | 300  | <1   |      |                       |  |  |
| 120.00 | 130.00 | 10.00         | 9.97          | 100      | 1483          |               | 2      | <50 | <200 | 40  | 300   | 400  | <1   |      |                       |  |  |
| 130.00 | 140.00 | 10.00         | 8.62          | 86       | 1484          |               | 1      | <50 | <200 | <20 | 250   | 300  | <1   |      |                       |  |  |
| 140.00 | 150.00 | 10.00         | 9.05          | 90       | 1485          |               | 1      | <50 | <200 | <20 | 200   | 300  | <1   |      |                       |  |  |
| 150.00 | 153.00 | 3.00          | 2.56          | 85       | 1486          |               | 1      | <50 | <200 | <20 | 600   | 400  | <1   |      |                       |  |  |
| 153.00 | 154.20 | 1.20          | 1.20          | 100      | 2036          | C8            | <1     | <20 | <200 | 60  | 2500  | 3000 | <10  | 3.10 |                       |  |  |
| 154.20 | 159.82 | 5.62          | 5.62          | 100      | 1486          |               | 1      | <50 | <200 | <20 | 600   | 400  | <1   |      |                       |  |  |
| 159.82 | 160.80 | .98           | .98           | 100      | 1494          |               | 1      | 110 |      |     |       | 10   | 2.50 |      |                       |  |  |
| 160.80 | 161.20 | .40           | .40           | 100      | 1495          | C1            | <1     | 330 | 200  | 60  | 500   | 6000 | 30   | 5.10 |                       |  |  |
| 161.20 | 161.80 | .60           | .54           | 90       | 1496          |               | 1      | 220 |      |     |       | 10   | 4.30 |      |                       |  |  |
| 161.80 | 162.30 | .50           | .50           | 100      | 1497          |               | <1     | 70  |      |     |       | 10   | 3.20 |      |                       |  |  |
| 162.30 | 162.96 | .66           | .66           | 100      | 1498          | C2            | 1      | 140 | <200 | 60  | 100   | 1000 | 60   | 9.30 |                       |  |  |
| 162.96 | 164.03 | 1.07          | 1.07          | 100      | 1499          | C3            | 1      | <20 | <200 | 20  | 10000 | 1000 | 120  | 34.4 |                       |  |  |
| 164.03 | 164.85 | .82           | .81           | 99       | 1500          | C4            | 1      | 150 | 600  | 60  | 300   | 6000 | 40   | 5.30 |                       |  |  |
| 164.85 | 165.85 | 1.00          | .73           | 73       | 2001          |               | 1      | 140 |      |     |       | 40   | 5.00 |      |                       |  |  |
| 165.85 | 166.90 | 1.05          | .77           | 73       | 2002          | C5            | 1      | <20 | <200 | 20  | 1500  | 3000 | 20   | 5.10 |                       |  |  |
| 166.90 | 167.40 | .50           | .36           | 73       | 2003          |               | 1      | 180 |      |     |       | 30   | 6.30 |      |                       |  |  |
| 167.40 | 167.80 | .40           | .29           | 73       | 2004          |               | 1      | 50  |      |     |       | 40   | 11.0 |      |                       |  |  |
| 167.80 | 168.20 | .40           | .38           | 95       | 2005          | C6            | 1      | 210 | <200 | 20  | 4000  | 800  | 230  | 31.8 |                       |  |  |
| 168.20 | 169.23 | 1.03          | .98           | 95       | 1487          |               | <1     | <50 | <200 | <20 | 600   | 1000 | 6    |      |                       |  |  |
| 169.23 | 169.48 | .25           | .24           | 95       | 1488          |               | <1     | <50 | 400  | <20 | 150   | 1000 | <1   |      |                       |  |  |
| 169.48 | 176.14 | 6.66          | 6.66          | 100      | 1489          |               | 2      | <50 | <200 | <20 | 100   | 1500 | <1   |      |                       |  |  |
| 176.14 | 182.80 | 6.66          | 6.66          | 100      | 1490          |               | 4      | <60 | <200 | <20 | 80    | 1500 | <1   |      |                       |  |  |
| 182.80 | 183.81 | 1.01          | 1.01          | 100      | 2006          | C7            | 1      | <20 | <100 | 20  | 2800  | 2000 | <10  | 10.4 |                       |  |  |
| 183.81 | 186.28 | 2.47          | 2.47          | 100      | 1491          |               | <1     | <50 | 100  | <20 | 80    | 1500 | <1   |      |                       |  |  |
| 186.28 | 191.66 | 5.38          | 5.09          | 95       | 1492          |               | 4      | <50 | <200 | <20 | 250   | 2000 | <1   |      |                       |  |  |
| 191.66 | 203.60 | 11.96         | 11.83         | 99       | 1493          |               | 4      | <50 | 200  | <20 | 100   | 1500 | <1   |      |                       |  |  |

APPENDIX 4

REDWATER HOLES

RED 1, RED 2, RED 3, RD 4, RD5

SUSCEPTIBILITY LOGS

**SHELL COMPANY OF AUSTRALIA LTD.**

PAGE 1 OF 3 PAGES

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 DRILL HOLE N° 

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COLLAR COORDS      41      47      48      49      55      56

INSTRUMENT 

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| DEPTH<br>(METRES) |  |    |  | ①<br>READING<br>10 <sup>-6</sup> cgs | CORE DIAM<br>mm. | ②<br>CORE SIZE<br>CORR. FACT. | ③<br>DENSITY<br>CORR. | (① × ② × ③)<br>CORRECTED<br>READING K | GEOLOGY<br>(ANALOGUE) |
|-------------------|--|----|--|--------------------------------------|------------------|-------------------------------|-----------------------|---------------------------------------|-----------------------|
|                   |  | 1  |  | 0                                    | 4                | 7.6                           |                       |                                       |                       |
|                   |  | 2  |  | 35000                                |                  |                               |                       | 63000                                 | Basalt                |
|                   |  | 3  |  | 25000                                |                  |                               |                       | 45000                                 | Graybill              |
|                   |  | 4  |  | 25000                                |                  |                               |                       | 45000                                 |                       |
|                   |  | 5  |  | 25000                                |                  |                               |                       | 45000                                 |                       |
|                   |  | 6  |  | 30000                                |                  |                               |                       | 54000                                 |                       |
|                   |  | 7  |  | 25000                                |                  |                               |                       | 45000                                 |                       |
|                   |  | 8  |  | 35000                                |                  |                               |                       | 63000                                 |                       |
|                   |  | 9  |  | 30000                                |                  |                               |                       | 54000                                 | Clay                  |
|                   |  | 10 |  | 30000                                |                  |                               |                       | 54000                                 |                       |
|                   |  | 11 |  | 5000                                 |                  |                               |                       | 9000                                  | silt & clay           |
|                   |  | 12 |  | 35000                                |                  |                               |                       | 63000                                 |                       |
|                   |  | 13 |  | 3000                                 |                  |                               |                       | 5400                                  |                       |
|                   |  | 14 |  | 20000                                |                  |                               |                       | 36000                                 | Magnetite, silt       |
|                   |  | 15 |  | 25000                                |                  |                               |                       | 45000                                 |                       |
|                   |  | 16 |  | 25000                                |                  |                               |                       | 45000                                 |                       |
|                   |  | 17 |  | 60000                                |                  |                               | 108000                |                                       |                       |
|                   |  | 18 |  | 35000                                |                  |                               |                       | 63000                                 |                       |
|                   |  | 19 |  | 15000                                |                  |                               |                       | 27000                                 |                       |
|                   |  | 20 |  | 15000                                |                  |                               |                       | 27000                                 |                       |
|                   |  | 22 |  | 20000                                |                  |                               |                       | 36000                                 |                       |
|                   |  | 24 |  | 40                                   | 37.0             |                               |                       | 84                                    | Recrystallized        |
|                   |  | 26 |  | 10                                   |                  |                               |                       | 21                                    | Limestone             |
|                   |  | 28 |  | 10                                   |                  |                               |                       | 21                                    |                       |
|                   |  | 30 |  | 15                                   |                  |                               |                       | 32                                    |                       |
|                   |  | 32 |  | 5                                    |                  |                               |                       | 10                                    |                       |
|                   |  | 34 |  | 5                                    |                  |                               |                       | 10                                    |                       |
|                   |  | 36 |  | 5                                    |                  |                               |                       | 10                                    |                       |
|                   |  | 38 |  | 10                                   |                  |                               |                       | 21                                    |                       |
|                   |  | 40 |  | 5                                    |                  |                               |                       | 10                                    |                       |
|                   |  | 42 |  | 5                                    |                  |                               |                       | 10                                    |                       |
|                   |  | 44 |  | 10                                   |                  |                               |                       | 21                                    |                       |
|                   |  | 46 |  | 10                                   |                  |                               |                       | 21                                    |                       |
|                   |  | 48 |  | 5                                    |                  |                               |                       | 10                                    |                       |
|                   |  | 50 |  | 15                                   |                  |                               |                       | 32                                    |                       |
|                   |  | 52 |  | 30                                   |                  |                               |                       | 63                                    |                       |

DENSITY CORRECTION : NOT NECESSARY FOR  
SM-5 OR JH-5  
METERS.

DENSITY CORRECTION : NOT NECESSARY FOR  
SM - 5 OR JH - 5  
METERS

DENSITY CORRECTION : NOT NECESSARY FOR  
SM - 5 OR JH - 8  
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PAGE 1 OF 2 PAGES

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COLLAR COORDS 

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| 82 |  |   | 85 |

| DEPTH<br>(METRES) |    | ①<br>READING<br>10 <sup>-6</sup> cgs |      | CORE DIAM<br>mm. | ②<br>CORE SIZE<br>CORR. FACT. | ③<br>DENSITY<br>CORR. | ④ × ② × ⑤<br>CORRECTED<br>READING K | GEOLOGY<br>(ANALOGUE) |
|-------------------|----|--------------------------------------|------|------------------|-------------------------------|-----------------------|-------------------------------------|-----------------------|
|                   | 1  | 50                                   | 0000 | 47.6             |                               |                       | 90000                               | soil                  |
|                   | 2  | 65                                   | 0000 |                  |                               | 1                     | 17000                               | grayilly              |
|                   | 3  | 70                                   | 0000 |                  |                               | 1                     | 26000                               |                       |
|                   | 4  | 80                                   | 0000 |                  |                               | 1                     | 44000                               |                       |
|                   | 5  | 60                                   | 0000 |                  |                               | 1                     | 08000                               |                       |
|                   | 6  | 50                                   | 0000 |                  |                               |                       | 90000                               | clayey sand           |
|                   | 7  | 20                                   | 0000 |                  |                               |                       | 3600                                |                       |
|                   | 8  | 70                                   | 0000 |                  |                               |                       | 1260                                |                       |
|                   | 9  |                                      | 45   |                  |                               |                       | 81                                  |                       |
|                   | 10 |                                      | 200  |                  |                               |                       | 360                                 |                       |
|                   | 11 |                                      | 600  |                  |                               |                       | 1080                                |                       |
|                   | 12 |                                      | 700  |                  |                               |                       | 1260                                |                       |
|                   | 13 |                                      | 30   |                  |                               |                       | 54                                  |                       |
|                   | 14 |                                      | 40   |                  |                               |                       | 72                                  |                       |
|                   | 15 |                                      | 10   |                  |                               |                       | 18                                  | cavefill              |
|                   | 16 |                                      | 20   |                  |                               |                       | 36                                  |                       |
|                   | 17 |                                      | 15   |                  |                               |                       | 27                                  |                       |
|                   | 18 |                                      | 15   |                  |                               |                       | 27                                  |                       |
|                   | 19 |                                      | 10   |                  |                               |                       | 18                                  |                       |
|                   | 20 |                                      | 30   |                  |                               |                       | 54                                  | limestone             |
|                   | 22 |                                      | 20   |                  |                               |                       | 36                                  | alternating           |
|                   | 24 |                                      | 15   |                  |                               |                       | 27                                  | wriggite & cave       |
|                   | 26 | 60                                   | 0000 |                  |                               | 1                     | 08000                               | fil.                  |
|                   | 28 | 30                                   | 0000 |                  |                               |                       | 54000                               |                       |
|                   | 30 | 40                                   | 0000 |                  |                               |                       | 72000                               |                       |
|                   | 32 | 80                                   | 0000 |                  |                               | 1                     | 44000                               |                       |
|                   | 34 | 10                                   | 0000 |                  |                               | 1                     | 80000                               |                       |
|                   | 36 | 10                                   | 0000 |                  |                               | 1                     | 80000                               |                       |
|                   | 38 | 10                                   | 0000 |                  |                               | 1                     | 80000                               |                       |
|                   | 40 |                                      | 40   |                  |                               |                       | 72                                  | Calc-silicate skarn.  |
|                   | 42 |                                      | 60   | 37.0             |                               |                       | 126                                 |                       |
|                   | 44 |                                      | 5    |                  |                               |                       | 10                                  | Granite               |
|                   | 46 |                                      | 5    |                  |                               |                       | 10                                  |                       |
|                   | 48 |                                      | 5    |                  |                               |                       | 10                                  |                       |
|                   | 50 |                                      | 10   |                  |                               |                       | 21                                  |                       |
|                   | 52 |                                      | 350  |                  |                               |                       | 735                                 |                       |

DENSITY CORRECTION : NOT NECESSARY FOR  
SM - 5 OR JH - 8  
METERS

DENSITY CORRECTION : NOT NECESSARY FOR  
SM - 5 OR JH - 5  
METERS.

DENSITY CORRECTION : NOT NECESSARY FOR  
SN - 6 OR JH - 6  
METERS

DENSITY CORRECTION : NOT NECESSARY FOR  
SM-6 OR JH-8  
METERS.

## Magnetic Susceptibility Measurements

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PAGE 1 OF 6 PAGES

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DRILL HOLE N° 

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COLLAR COORDS

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|    |  |  | 6 | 1 | 0 | 0  |
| 41 |  |  |   |   |   | 47 |

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|    |  | 1 | 0 | 5 | 0 | 0  |
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 62 65

| DEPTH<br>(METRES) |  |    | ①<br>READING<br>10 <sup>-6</sup> cgs | ②<br>CORE DIAM<br>mm. | ③<br>CORE SIZE<br>CORR. FACT. | ④<br>DENSITY<br>CORR. | ⑤<br>CORRECTED<br>READING K | ⑥<br>GEOLOGY<br>(ANALOGUE) |
|-------------------|--|----|--------------------------------------|-----------------------|-------------------------------|-----------------------|-----------------------------|----------------------------|
|                   |  | 3  | 3 0 0                                | 4 7.6                 |                               |                       | 5 1 0                       | Basalt                     |
|                   |  | 4  | 3 0 0                                |                       |                               |                       | 5 4 0                       |                            |
|                   |  | 5  | 3 0 0                                |                       |                               |                       | 5 4 0                       |                            |
|                   |  | 6  | 3 0 0                                |                       |                               |                       | 5 4 0                       |                            |
|                   |  | 7  | 2 0 0                                |                       |                               |                       | 3 6 0                       |                            |
|                   |  | 8  | 2 5 0                                |                       |                               |                       | 4 5 0                       |                            |
|                   |  | 9  | 2 5 0                                |                       |                               |                       | 4 5 0                       |                            |
|                   |  | 10 | 2 5 0                                |                       |                               |                       | 4 5 0                       |                            |
|                   |  | 11 | 2 0 0                                |                       |                               |                       | 3 6 0                       |                            |
|                   |  | 12 |                                      | 5                     |                               |                       | 9                           |                            |
|                   |  | 13 | 5 5 0                                |                       |                               |                       | 9 9 0                       |                            |
|                   |  | 14 |                                      | 1 5                   |                               |                       | 2 7                         |                            |
|                   |  | 15 | 2 0 0                                |                       |                               |                       | 3 6 0                       |                            |
|                   |  | 16 | 2 0 0                                |                       |                               |                       | 3 6 0                       |                            |
|                   |  | 17 | 2 0 0 0                              |                       |                               |                       | 3 6 0 0                     |                            |
|                   |  | 18 | 6 0 0                                |                       |                               |                       | 1 0 8 0                     |                            |
|                   |  | 19 | 6 5 0                                |                       |                               |                       | 1 1 7 0                     |                            |
|                   |  | 20 | 2 0 0 0                              |                       |                               |                       | 3 6 0 0                     |                            |
|                   |  | 22 | 1 5 0 0                              |                       |                               |                       | 2 7 0 0                     |                            |
|                   |  | 24 | 2 5 0 0                              |                       |                               |                       | 4 5 0 0                     |                            |
|                   |  | 26 | 6 0 0 0                              |                       |                               |                       | 1 0 8 0 0                   |                            |
|                   |  | 28 | 1 5 0 0                              |                       |                               |                       | 2 7 0 0                     |                            |
|                   |  | 30 | 8 0 0                                |                       |                               |                       | 1 4 0 0                     |                            |
|                   |  | 32 | 1 5 0 0                              |                       |                               |                       | 2 7 0 0                     |                            |
|                   |  | 34 | 8 0 0                                |                       |                               |                       | 1 4 0 0                     |                            |
|                   |  | 36 | 8 0 0                                |                       |                               |                       | 1 4 0 0                     |                            |
|                   |  | 38 | 7 0 0                                |                       |                               |                       | 1 2 6 0                     |                            |
|                   |  | 40 | 6 0 0                                |                       |                               |                       | 1 0 8 0                     |                            |
|                   |  | 42 | 6 5 0                                |                       |                               |                       | 1 1 7 0                     |                            |
|                   |  | 44 | 6 5 0                                |                       |                               |                       | 1 1 7 0                     |                            |
|                   |  | 46 | 4 5 0                                |                       |                               |                       | 8 1 0                       |                            |
|                   |  | 48 | 6 5 0                                |                       |                               |                       | 1 1 7 0                     |                            |
|                   |  | 50 | 9 0 0                                |                       |                               |                       | 1 6 2 0                     |                            |
|                   |  | 52 | 8 0 0                                |                       |                               |                       | 1 4 4 0                     |                            |
|                   |  | 54 | 8 0 0                                |                       |                               |                       | 1 4 4 0                     |                            |
|                   |  | 56 | 1 5 0 0                              |                       |                               |                       | 2 7 0 0                     |                            |

**SIZE CORRECTION :**  
**(MULTIPLY READING)**

| METER | SM-5  | JH-5  |
|-------|-------|-------|
| HQ    | x 1.5 | x 1.8 |
| BQ    | x 1.8 | x 2.1 |

DENSITY CORRECTION : NOT NECESSARY FOR  
SM-5 OR JH-5  
METERS.

## Magnetic Susceptibility Measurements

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DRILL HOLE N° 

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33 40

**COLLAR COORDS**

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|-------------------|--|--|---|---|---|-------------------|
|                   |  |  | 6 | 1 | 0 | 0                 |
| <small>41</small> |  |  |   |   |   | <small>47</small> |

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N

|                   |  |  |   |   |   |   |                   |
|-------------------|--|--|---|---|---|---|-------------------|
|                   |  |  | 1 | 0 | 5 | 0 | 0                 |
| <small>49</small> |  |  |   |   |   |   | <small>55</small> |

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| DEPTH<br>(METRES) |  |    |   | ①<br>READING<br>10 <sup>-8</sup> cgs | CORE DIAM<br>mm. | ②<br>CORE SIZE<br>CORR. FACT. | ③<br>DENSITY<br>CORR. | (① × ② × ③)<br>CORRECTED<br>READING K | GEOLOGY<br>(ANALOGUE) |
|-------------------|--|----|---|--------------------------------------|------------------|-------------------------------|-----------------------|---------------------------------------|-----------------------|
|                   |  | 5  | 8 | 1 0 0 0                              | 4 7.6            |                               |                       | 18 0 0                                | Basalt                |
|                   |  | 6  | 0 | 2 0 0 0                              |                  |                               |                       | 36 0 0                                |                       |
|                   |  | 6  | 2 | 2 5 0 0                              |                  |                               |                       | 45 0 0                                |                       |
|                   |  | 6  | 4 | 1 5 0 0                              |                  |                               |                       | 27 0 0                                |                       |
|                   |  | 6  | 6 |                                      | 5                |                               |                       | 9                                     | sandstone             |
|                   |  | 6  | 8 |                                      | 5                |                               |                       | 9                                     | conglomerate          |
|                   |  | 7  | 0 |                                      | 0                |                               |                       | 0                                     |                       |
|                   |  | 7  | 2 |                                      | 5                |                               |                       | 9                                     |                       |
|                   |  | 7  | 4 |                                      | 5                |                               |                       | 9                                     |                       |
|                   |  | 7  | 6 |                                      | 5                |                               |                       | 9                                     |                       |
|                   |  | 7  | 8 |                                      | 1 0              |                               |                       | 18                                    |                       |
|                   |  | 8  | 0 |                                      | 5                |                               |                       | 9                                     |                       |
|                   |  | 8  | 2 |                                      | 1 0              |                               |                       | 18                                    | Limestone             |
|                   |  | 8  | 4 |                                      | 1 5              |                               |                       | 27                                    |                       |
|                   |  | 8  | 6 |                                      | 5                |                               |                       | 9                                     |                       |
|                   |  | 8  | 8 |                                      | 5                |                               |                       | 9                                     |                       |
|                   |  | 9  | 0 |                                      | 5                |                               |                       | 9                                     |                       |
|                   |  | 9  | 2 |                                      | 2 0              |                               |                       | 36                                    |                       |
|                   |  | 9  | 4 |                                      | 3 5              | 3 7.0                         |                       | 74                                    |                       |
|                   |  | 9  | 6 |                                      | 1 0              |                               |                       | 21                                    |                       |
|                   |  | 9  | 8 |                                      | 1 0              |                               |                       | 21                                    |                       |
|                   |  | 10 | 0 |                                      | 5                |                               |                       | 10                                    |                       |
|                   |  | 10 | 2 |                                      | 5                |                               |                       | 10                                    |                       |
|                   |  | 10 | 4 |                                      | 1 5              |                               |                       | 32                                    |                       |
|                   |  | 10 | 6 |                                      | 5                |                               |                       | 10                                    |                       |
|                   |  | 10 | 8 |                                      | 5                |                               |                       | 10                                    |                       |
|                   |  | 11 | 0 |                                      | 5                |                               |                       | 10                                    |                       |
|                   |  | 11 | 2 |                                      | 5                |                               |                       | 10                                    |                       |
|                   |  | 11 | 4 |                                      | 5                |                               |                       | 10                                    |                       |
|                   |  | 11 | 6 |                                      | 5                |                               |                       | 10                                    |                       |
|                   |  | 11 | 8 |                                      | 2 0              |                               |                       | 42                                    |                       |
|                   |  | 12 | 0 |                                      | 1 0              |                               |                       | 21                                    |                       |
|                   |  | 12 | 2 |                                      | 5                |                               |                       | 10                                    |                       |
|                   |  | 12 | 4 |                                      | 5                |                               |                       | 10                                    |                       |
|                   |  | 12 | 6 |                                      | 5                |                               |                       | 10                                    |                       |
|                   |  | 12 | 8 |                                      | 5                |                               |                       | 10                                    |                       |

**SIZE CORRECTION :**  
**(MULTIPLY READING)**

| METER | SM-6  | JH-6  |
|-------|-------|-------|
| NO    | x 1.5 | x 1.0 |
| BO    | x 1.8 | x 2.1 |

DENSITY CORRECTION : NOT NECESSARY FOR  
SM - 5 OR JH - 5  
METERS.

## Magnetic Susceptibility Measurements

REC. TYPE ☐ ☐

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| 8  | 1 | 0 | 1 | 2 | 2  |
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DRILL HOLE N° 

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COLLAR COORDS 

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|  |  |  | 6 | 1 | 0 | 0 |
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52 65

| ①<br>DEPTH<br>(METRES) |  |   |   | ②<br>READING<br>10 <sup>-8</sup> cgs |  | CORE DIAM<br>mm. |   | ③<br>CORE SIZE<br>CORR. FACT. |   | ④<br>DENSITY<br>CORR. |   | (① × ② × ③)<br>CORRECTED<br>READING K |   | ⑤<br>GEOLOGY<br>(ANALOGUE) |           |
|------------------------|--|---|---|--------------------------------------|--|------------------|---|-------------------------------|---|-----------------------|---|---------------------------------------|---|----------------------------|-----------|
|                        |  | 1 | 3 | 0                                    |  |                  | 3 | 5                             | 3 | 7                     | 0 |                                       | 7 | 4                          | Limestone |
|                        |  | 1 | 3 | 2                                    |  |                  | 1 | 5                             |   |                       |   |                                       | 3 | 2                          |           |
|                        |  | 1 | 3 | 4                                    |  |                  | 1 | 0                             |   |                       |   |                                       | 2 | 1                          |           |
|                        |  | 1 | 3 | 6                                    |  |                  |   | 5                             |   |                       |   |                                       | 1 | 0                          |           |
|                        |  | 1 | 3 | 8                                    |  |                  |   | 5                             |   |                       |   |                                       | 1 | 0                          |           |
|                        |  | 1 | 4 | 0                                    |  |                  | 1 | 0                             |   |                       |   |                                       | 2 | 1                          |           |
|                        |  | 1 | 4 | 2                                    |  |                  | 2 | 5                             |   |                       |   |                                       | 5 | 2                          |           |
|                        |  | 1 | 4 | 4                                    |  |                  | 1 | 0                             |   |                       |   |                                       | 2 | 1                          |           |
|                        |  | 1 | 4 | 6                                    |  |                  | 2 | 0                             |   |                       |   |                                       | 4 | 2                          |           |
|                        |  | 1 | 4 | 8                                    |  |                  | 2 | 0                             |   |                       |   |                                       | 4 | 2                          |           |
|                        |  | 1 | 5 | 0                                    |  |                  | 1 | 5                             |   |                       |   |                                       | 3 | 2                          |           |
|                        |  | 1 | 5 | 2                                    |  |                  |   | 5                             |   |                       |   |                                       | 1 | 0                          |           |
|                        |  | 1 | 5 | 4                                    |  |                  | 5 | 0                             |   |                       |   |                                       | 1 | 0                          | 5         |
|                        |  | 1 | 5 | 6                                    |  |                  | 6 | 0                             |   |                       |   |                                       | 1 | 0                          | 5         |
|                        |  | 1 | 5 | 8                                    |  |                  | 1 | 0                             |   |                       |   |                                       | 2 | 1                          |           |
|                        |  | 1 | 6 | 0                                    |  |                  | 8 | 0                             |   |                       |   |                                       | 6 | 3                          |           |
|                        |  | 1 | 6 | 2                                    |  |                  | 4 | 0                             |   |                       |   |                                       | 8 | 4                          |           |
|                        |  | 1 | 6 | 4                                    |  |                  | 4 | 5                             |   |                       |   |                                       | 2 | 4                          |           |
|                        |  | 1 | 6 | 6                                    |  |                  | 4 | 0                             |   |                       |   |                                       | 8 | 4                          |           |
|                        |  | 1 | 6 | 8                                    |  |                  |   | 5                             |   |                       |   |                                       | 1 | 0                          |           |
|                        |  | 1 | 7 | 0                                    |  |                  |   | 5                             |   |                       |   |                                       | 1 | 0                          |           |
|                        |  | 1 | 7 | 2                                    |  |                  | 4 | 5                             |   |                       |   |                                       | 9 | 4                          |           |
|                        |  | 1 | 7 | 4                                    |  |                  |   | 6                             |   |                       |   |                                       | 1 | 0                          |           |
|                        |  | 1 | 7 | 6                                    |  |                  |   | 5                             |   |                       |   |                                       | 1 | 0                          |           |
|                        |  | 1 | 7 | 8                                    |  |                  |   | 0                             |   |                       |   |                                       |   | 0                          |           |
|                        |  | 1 | 8 | 0                                    |  |                  | 2 | 5                             |   |                       |   |                                       | 5 | 2                          |           |
|                        |  | 1 | 8 | 2                                    |  |                  | 2 | 5                             |   |                       |   |                                       | 5 | 2                          |           |
|                        |  | 1 | 8 | 4                                    |  |                  | 2 | 5                             |   |                       |   |                                       | 5 | 2                          |           |
|                        |  | 1 | 8 | 6                                    |  |                  | 1 | 5                             |   |                       |   |                                       | 3 | 2                          |           |
|                        |  | 1 | 8 | 8                                    |  |                  | 3 | 0                             |   |                       |   |                                       | 6 | 3                          |           |
|                        |  | 1 | 9 | 0                                    |  |                  |   | 5                             |   |                       |   |                                       | 1 | 0                          |           |
|                        |  | 1 | 9 | 2                                    |  |                  | 1 | 0                             |   |                       |   |                                       | 2 | 1                          |           |
|                        |  | 1 | 9 | 4                                    |  |                  | 1 | 0                             |   |                       |   |                                       | 2 | 1                          |           |
|                        |  | 1 | 9 | 6                                    |  |                  | 3 | 0                             |   |                       |   |                                       | 6 | 3                          |           |
|                        |  | 1 | 9 | 8                                    |  |                  | 2 | 0                             |   |                       |   |                                       | 4 | 2                          |           |
|                        |  | 2 | 0 | 0                                    |  |                  | 1 | 5                             |   |                       |   |                                       | 3 | 2                          |           |

High core loss.

12

18

24

30

**SIZE CORRECTION :**  
**(MULTIPLY READING)**

| METER | SM-5  | JH-6  |
|-------|-------|-------|
| HQ    | x 1.5 | x 1.5 |
| BQ    | x 1.5 | x 2.1 |

DENSITY CORRECTION : NOT NECESSARY FOR  
SM-5 OR JH-8  
METERS.

**SHELL COMPANY OF AUSTRALIA LTD.**

## Magnetic Susceptibility Measurements

REC. TYPE 

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PAGE 4 OF 6 PAGES

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| AREA |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | R | E | D | W | A | T | E | R |
|------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|---|---|---|---|---|---|---|

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| 8 | 1 | 0 | 1 | 2 | 2 |
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**DRILL HOLE N°**

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27 32 N 33 E

COLLAR COORDS

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|    |  |  | 6 | 1 | 0 | 0  |
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|    |  |  | 1 | 0 | 5 | 0 | 0  |
| 49 |  |  |   |   |   |   | 55 |

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| 62 |  | C | B | 65 |
|----|--|---|---|----|

| DEPTH<br>(METRES) |   |   | ①<br>READING<br>10 <sup>-6</sup> cgs | CORE DIAM<br>mm. | ②<br>CORE SIZE<br>CORR. FACT. | ③<br>DENSITY<br>CORR. | (① × ② × ③)<br>CORRECTED<br>READING K | GEOLOGY<br>(ANALOGUE) |   |   |                  |
|-------------------|---|---|--------------------------------------|------------------|-------------------------------|-----------------------|---------------------------------------|-----------------------|---|---|------------------|
|                   | 2 | 0 | 2                                    | 2                | 0                             | 3                     | 7                                     | 0                     | 1 | 2 | limestone        |
|                   | 2 | 0 | 4                                    |                  | 5                             |                       |                                       |                       | 1 | 0 |                  |
|                   | 2 | 0 | 6                                    | 2                | 0                             |                       |                                       |                       | 4 | 2 |                  |
|                   | 2 | 0 | 8                                    |                  | 0                             |                       |                                       |                       |   | 0 |                  |
|                   | 2 | 1 | 0                                    |                  | 1                             | 5                     |                                       |                       | 3 | 2 |                  |
|                   | 2 | 1 | 2                                    |                  | 1                             | 5                     |                                       |                       | 3 | 2 |                  |
|                   | 2 | 1 | 4                                    |                  | 1                             | 5                     |                                       |                       | 3 | 2 |                  |
|                   | 2 | 1 | 6                                    |                  | 5                             |                       |                                       |                       | 1 | 0 |                  |
|                   | 2 | 1 | 8                                    |                  | 0                             |                       |                                       |                       |   | 0 |                  |
|                   | 2 | 2 | 0                                    |                  | 5                             |                       |                                       |                       | 1 | 0 |                  |
|                   | 2 | 2 | 2                                    | 3                | 5                             |                       |                                       |                       | 7 | 4 |                  |
|                   | 2 | 2 | 4                                    |                  | 5                             |                       |                                       |                       | 1 | 0 |                  |
|                   | 2 | 2 | 6                                    |                  | 5                             |                       |                                       |                       | 1 | 0 |                  |
|                   | 2 | 2 | 8                                    | 3                | 0                             |                       |                                       |                       | 6 | 3 |                  |
|                   | 2 | 3 | 0                                    | 3                | 0                             |                       |                                       |                       | 6 | 3 |                  |
|                   | 2 | 3 | 2                                    | 3                | 0                             |                       |                                       |                       | 6 | 3 |                  |
|                   | 2 | 3 | 4                                    |                  | 5                             |                       |                                       |                       | 1 | 0 |                  |
|                   | 2 | 3 | 6                                    |                  | 1                             | 0                     |                                       |                       | 2 | 1 |                  |
|                   | 2 | 3 | 8                                    |                  | 1                             | 0                     |                                       |                       | 2 | 1 |                  |
|                   | 2 | 4 | 0                                    |                  | 0                             |                       |                                       |                       |   | 0 |                  |
|                   | 2 | 4 | 2                                    |                  | 5                             |                       |                                       |                       | 1 | 0 |                  |
|                   | 2 | 4 | 4                                    | 2                | 0                             |                       |                                       |                       | 4 | 2 |                  |
|                   | 2 | 4 | 6                                    |                  | 1                             | 5                     |                                       |                       | 3 | 2 |                  |
|                   | 2 | 4 | 8                                    | 2                | 5                             |                       |                                       |                       | 5 | 2 |                  |
|                   | 2 | 5 | 0                                    |                  | 1                             | 0                     |                                       |                       | 2 | 1 |                  |
|                   | 2 | 5 | 2                                    | 2                | 5                             |                       |                                       |                       | 5 | 2 |                  |
|                   | 2 | 5 | 4                                    |                  | 1                             | 0                     |                                       |                       | 2 | 1 |                  |
|                   | 2 | 5 | 6                                    |                  | 1                             | 5                     |                                       |                       | 3 | 2 |                  |
|                   | 2 | 5 | 8                                    |                  | 1                             | 0                     |                                       |                       | 2 | 1 |                  |
|                   | 2 | 6 | 0                                    | 2                | 0                             |                       |                                       |                       | 4 | 2 |                  |
|                   | 2 | 6 | 2                                    |                  | 5                             |                       |                                       |                       | 1 | 0 |                  |
|                   | 2 | 6 | 4                                    |                  | 5                             |                       |                                       |                       | 1 | 0 |                  |
|                   | 2 | 6 | 6                                    |                  | 5                             |                       |                                       |                       | 1 | 0 |                  |
|                   | 2 | 6 | 8                                    |                  | 5                             |                       |                                       |                       | 1 | 0 |                  |
|                   | 2 | 7 | 0                                    |                  | 5                             |                       |                                       |                       | 1 | 0 | Garnet, diopside |
|                   | 2 | 7 | 2                                    | 1                | 0                             |                       |                                       |                       | 2 | 1 | skarn.           |

**SIZE CORRECTION :**  
**(MULTIPLY READING)**

| METER | SM-5  | JH-6  |
|-------|-------|-------|
| NQ    | x 1.5 | x 1.6 |
| BQ    | x 1.0 | x 2.1 |

DENSITY CORRECTION : NOT NECESSARY FOR  
SM - 5 OR JH - 5  
METERS.

**SHELL COMPANY OF AUSTRALIA LTD.**

## Magnetic Susceptibility Measurements

REC. TYPE 

|  |  |
|--|--|
|  |  |
|--|--|

PAGE 5 OF 6 PAGES

[illegible]

DATE 8 1 0 1 3 0

DRILL HOLE N° 

|  |  |  |  |  |   |   |   |
|--|--|--|--|--|---|---|---|
|  |  |  |  |  | R | D | 4 |
|--|--|--|--|--|---|---|---|

  
33 40

**COLLAR COORDS**

|    |  |  |   |   |   |    |
|----|--|--|---|---|---|----|
|    |  |  | 6 | 1 | 0 | 0  |
| 41 |  |  |   |   |   | 47 |

|    |
|----|
| N  |
| 48 |

|    |  |   |   |   |   |    |
|----|--|---|---|---|---|----|
|    |  | 1 | 0 | 5 | 0 | 0  |
| 49 |  |   |   |   |   | 55 |

|    |
|----|
| E  |
| 56 |

INSTRUMENT 

|    |  |   |   |   |    |
|----|--|---|---|---|----|
| 57 |  | J | H | 8 | 61 |
|----|--|---|---|---|----|

 RECORDED BY 

|    |   |   |   |    |
|----|---|---|---|----|
| 62 | A | D | M | 65 |
|----|---|---|---|----|

| DEPTH<br>(METRES) |   |   |   | ①<br>READING<br>10 <sup>-6</sup> cgs | CORE DIAM<br>mm. | ②<br>CORE SIZE<br>CORR. FACT. | ③<br>DENSITY<br>CORR. | ④ = ② × ③<br>CORRECTED<br>READING K | GEOLOGY<br>(ANALOGUE) |
|-------------------|---|---|---|--------------------------------------|------------------|-------------------------------|-----------------------|-------------------------------------|-----------------------|
|                   | 2 | 7 | 4 |                                      | 1 5 3 7.0        |                               |                       | 3 2                                 | skarn                 |
|                   | 2 | 7 | 6 |                                      | 1 0              |                               |                       | 2 1                                 |                       |
|                   | 2 | 7 | 8 |                                      | 1 5              |                               |                       | 3 2                                 |                       |
|                   | 2 | 8 | 0 |                                      | 5                |                               |                       | 1 0                                 |                       |
|                   | 2 | 8 | 2 | 5 5 0                                |                  |                               | 1 1                   | 5 5                                 | basalt                |
|                   | 2 | 8 | 4 |                                      | 5                |                               |                       | 1 0                                 | skarn                 |
|                   | 2 | 8 | 6 |                                      | 1 0              |                               |                       | 2 1                                 | skarn                 |
|                   | 2 | 8 | 8 | 2 0 0 0                              |                  |                               | 4 0                   | 0 0                                 | basalt                |
|                   | 2 | 9 | 0 |                                      | 5                |                               |                       | 1 0                                 | skarn                 |
|                   | 2 | 9 | 2 |                                      | 5                |                               |                       | 1 0                                 |                       |
|                   | 2 | 9 | 4 |                                      | 5                |                               |                       | 1 0                                 |                       |
|                   | 2 | 9 | 6 |                                      | 5                |                               |                       | 1 0                                 |                       |
|                   | 2 | 9 | 8 |                                      | 5                |                               |                       | 1 0                                 |                       |
|                   | 3 | 0 | 0 |                                      | 1 0              |                               |                       | 2 1                                 |                       |
|                   | 3 | 0 | 2 |                                      | 6 0              |                               |                       | 1 2 6                               |                       |
|                   | 3 | 0 | 4 |                                      | 5 0              |                               |                       | 1 0 5                               |                       |
|                   | 3 | 0 | 6 | 1 0 0 0                              |                  |                               | 2 1                   | 0 0                                 | basalt                |
|                   | 3 | 0 | 8 |                                      | 7 0              |                               |                       | 1 4 7                               | skarn                 |
|                   | 3 | 1 | 0 | 1 5 0 0                              |                  |                               | 3 1                   | 5 0                                 | Basalt                |
|                   | 3 | 1 | 2 | 1 0 0                                |                  |                               | 2 1                   | 0                                   | Basalt                |
|                   | 3 | 1 | 4 |                                      | 4 5              |                               |                       | 9 4                                 | Recrystallized        |
|                   | 3 | 1 | 6 |                                      | 4 5              |                               |                       | 9 4                                 | limestone             |
|                   | 3 | 1 | 8 | 3 0 0 0                              |                  |                               | 6 8                   | 0 0                                 | Basalt                |
|                   | 3 | 2 | 0 |                                      | 2 0              |                               |                       | 4 2                                 | limestone             |
|                   | 3 | 2 | 2 |                                      | 5                |                               |                       | 1 0                                 |                       |
|                   | 3 | 2 | 4 |                                      | 2 0              |                               |                       | 4 2                                 |                       |
|                   | 3 | 2 | 6 |                                      | 2 0              |                               |                       | 4 2                                 |                       |
|                   | 3 | 2 | 8 | 1 5 0 0                              |                  |                               | 3 1                   | 5 0                                 | basalt                |
|                   | 3 | 3 | 0 |                                      | 4 5              |                               |                       | 9 4                                 | limestone             |
|                   | 3 | 3 | 2 |                                      | 5 5              |                               |                       | 1 1 5                               |                       |
|                   | 3 | 3 | 4 |                                      | 1 0              |                               |                       | 2 1                                 |                       |
|                   | 3 | 3 | 6 |                                      | 5                |                               |                       | 1 0                                 |                       |
|                   | 3 | 3 | 8 |                                      | 5                |                               |                       | 1 0                                 |                       |
|                   | 3 | 4 | 0 |                                      | 1 0              |                               |                       | 2 1                                 |                       |
|                   | 3 | 4 | 2 |                                      | 1 0              |                               |                       | 2 1                                 |                       |
|                   | 3 | 4 | 4 |                                      | 5                |                               |                       | 1 0                                 |                       |

**SIZE CORRECTION :**  
(MULTIPLY READING)

| METER | SM-6  | JH-6  |
|-------|-------|-------|
| NQ    | x 1.5 | x 1.8 |
| BQ    | x 1.8 | x 2.1 |

DENSITY CORRECTION : NOT NECESSARY FOR  
SM-6 OR JH-6  
METERS.





PAGE 2 OF 4 PAGES

|   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
| R | E | D | W | A | T | E | R |
|---|---|---|---|---|---|---|---|

|  |  |  |  |  |   |   |   |
|--|--|--|--|--|---|---|---|
|  |  |  |  |  | R | D | S |
|--|--|--|--|--|---|---|---|



|  |   |   |   |
|--|---|---|---|
|  | A | D | M |
|--|---|---|---|

core loss  
fuddle

DENSITY CORRECTION : NOT NECESSARY FOR  
SM - 6 OR JH - 6  
METERS

DENSITY CORRECTION : NOT NECESSARY FOR  
SM - 8 OR JH - 8  
METERS

DENSITY CORRECTION : NOT NECESSARY FOR  
SM - 5 OR JH - 6  
METERS

APPENDIX 5

GEOCHEMICAL LABORATORIES &amp; METHODS USED

A. SOIL SAMPLES: All soil samples were sent to Comlabs for analysis. Elements analysed for and methods used are as follows:

| <u>Element</u> | <u>Method</u> | <u>Range of detection</u> |
|----------------|---------------|---------------------------|
| Sn             | XRF 1         | 4 ppm - 1%                |
| W              | XRF 1         | 10 ppm - 1%               |
| Bi             | AAS 1         | 10 ppm - 1%               |
| Cu             | AAS 1         | 4 ppm - 1%                |
| Ni             | AAS 1         | 4 ppm - 1%                |
| Pb             | AAS 1         | 4 ppm - 1%                |
| Zn             | AAS 1         | 2 ppm - 1%                |
| Fe             | AAS 2         | 4 ppm - 10%               |
| Mn             | AAS 2         | 4 ppm - 10%               |

B. DIAMOND DRILL CORE: All samples were sent to Amdel for analysis. Emission spectroscopy was the method used for many composite samples. It must be stressed that this method is only semi-quantative and results are only approximate. Composited samples over unmineralized areas were analysed by emission spect. for the following elements (detection limits in ppm in brackets).

A 1 Ba(200), Be(1), Co(5), Cr(20), Mn(10), Mo(3), Ni(5), Ta(100), Ti(100), W(50)

A 2 Ag(0.1), As(50), Bi(1), Cd(3), Cu(1), Ga(1), Pb(1), Sb(30), Sn(1), Zn(20).

Au was also analysed for in the composites by AAS, with a detection limit of 0.01 ppm.

Other samples were analysed as follows:

| <u>Element</u> | <u>Method</u> | <u>Range (ppm)</u>                  |
|----------------|---------------|-------------------------------------|
| Sn             | XRF           | 4 - 10 000                          |
| W              | XRF           | 10 - 10 000                         |
| Bi             | AAS           | 10 - 10 000                         |
| Cu             | AAS           | 2 - 10 000                          |
| Pb             | AAS           | 5 - 5 000                           |
| Zn             | AAS           | 2 - 10 000                          |
| Ni             | AAS           | 5 - 10 000                          |
| Fe             | AAS           | 5 - 10 000 - diluted to read to 10% |
| Ag             | AAS           | 1 - 250                             |
| Mo             | AAS           | 1 - 250                             |
| As             | AAS           | 20 - 10 000                         |
| Au             | AAS           | 0.1 - ~10                           |

$\text{CaF}_2$  was also analysed for using a selective ion electrode method. Emission spect. was done on the samples for the following elements:

Ba(200), Be(1), Ce(300), Co(5), Cr(20), Mn(10), Ta(100), Ti(100), V(10), La(50)

ROCK CHIP SAMPLES: Initially, rock chip samples were analysed semi-quantitatively using Emission Spectroscopy. Several elements were then checked using a more accurate method, namely XRF. Those elements checked were W, Sb, Bi and Hg.

APPENDIX 6

## NATONE &amp; CUPRONA ROCK CHIP SAMPLES

- a) Geochemical Assays
- b) Petrological Report

Note on numbering samples:

Geochem:    Samples 2007, 2008, 2009 are cherts from Natone.  
                 Samples 2010 to 2015 are ironstones from Natone.  
                 Samples 2016 to 2021 are ironstones from Cuprona

Petrology: Samples 2022 to 2028 are ironstones from Cuprona  
                 Samples 2029 to 2031 are cherts from Natone.  
                 Samples 2032 to 2035 are ironstones from Natone.

\* A1A2A3

Result

in

Sample

No.

1

2

3

| SAMPLE NO.  | 2007 | 08 | 09 | 10  | 11  | 12  | 2013 | SAMPLE NO.  | 2007    | 08      | 09      | 10      | 11      | 12      | 2013    |
|-------------|------|----|----|-----|-----|-----|------|-------------|---------|---------|---------|---------|---------|---------|---------|
| A1 Ba (200) | x    | x  | x  | x   | x   | x   | x    | A2 In (10)  | x       | x       | x       | x       | x       | x       | x       |
| Be (1)      | x    | x  | x  | x   | x   | x   | x    | Pb (1)      | 30      | 15      | 15      | 10      | 10      | 15      | 20      |
| Ce (300)    | x    | x  | x  | x   | x   | x   | x    | Sb (30)     | 100     | 60      | 30      | 30      | 30      | 30      | 30      |
| Co (5)      | x    | x  | x  | x   | x   | x   | x    | Sn (1)      | 3       | 6       | 3       | x       | x       | 8       | 10      |
| Cr (20)     | x    | x  | x  | 40  | 80  | x   | 80   | Zn (20)     | x       | x       | x       | x       | x       | x       | x       |
| La (50)     | x    | x  | x  | 50  | x   | x   | x    |             |         |         |         |         |         |         |         |
| Mn (10)     | 40   | 60 | 60 | 80  | 100 | 300 | 100  | A3 Au (3)   |         |         |         |         |         |         |         |
| Mo (3)      | x    | x  | x  | x   | x   | x   | 3    | P (100)     |         |         |         |         |         |         |         |
| Nb (20)     | x    | x  | x  | x   | x   | x   | x    | Te (20)     |         |         |         |         |         |         |         |
| Ni (5)      | x    | x  | x  | x   | 100 | 80  | 100  | Tl (1)      |         |         |         |         |         |         |         |
| Sc (3)      | x    | x  | x  | x   | x   | x   | x    |             |         |         |         |         |         |         |         |
| Sr (50)     | x    | x  | x  | x   | x   | x   | x    | A4 Li (1)   |         |         |         |         |         |         |         |
| Ta (100)    | x    | x  | x  | x   | x   | x   | x    | Na (50)     |         |         |         |         |         |         |         |
| Th (100)    | x    | x  | x  | x   | x   | x   | x    |             |         |         |         |         |         |         |         |
| Ti (100)    | 100  | x  | x  | 200 | x   | x   | x    | A5 Cs (30)  |         |         |         |         |         |         |         |
| V (10)      | x    | x  | x  | 80  | 100 | 40  | 100  | K (5)       |         |         |         |         |         |         |         |
| W (50)      | x    | x  | x  | x   | 100 | 50  | 100  | Rb (10)     |         |         |         |         |         |         |         |
| Y (10)      | x    | 60 | x  | x   | x   | x   | x    |             |         |         |         |         |         |         |         |
| Yb (1)      | x    | 6  | x  | x   | x   | x   | x    |             |         |         |         |         |         |         |         |
| Zr (10)     | x    | x  | x  | 100 | 200 | 100 | 250  |             |         |         |         |         |         |         |         |
|             |      |    |    |     |     |     |      | A8 B (3)    |         |         |         |         |         |         |         |
| A2 Ag (0.1) | x    | x  | x  | x   | x   | x   | x    |             |         |         |         |         |         |         |         |
| As (50)     | x    | x  | x  | x   | x   | x   | x    | A9 Al (100) | 600     | 300     | 300     | 10000   | 800     | 600     | 1500    |
| Bi (1)      | x    | x  | x  | x   | x   | x   | x    | Ca (100)    | 100     | x       | x       | x       | x       | 600     | x       |
| Cd (3)      | x    | x  | x  | x   | x   | x   | x    | Fe (100)    | 1500    | 1000    | 5000    | >>10000 | >>10000 | >>10000 | >>10000 |
| Cu (1)      | 6    | 3  | 20 | 4   | x   | 6   | 10   | Mg (100)    | 300     | 300     | 100     | 200     | x       | 100     | 100     |
| Ga (1)      | x    | x  | x  | x   | x   | x   | x    | Si (100)    | >>10000 | >>10000 | >>10000 | >>10000 | >>10000 | >>10000 | >>10000 |
| Ge (1)      | 2    | 2  | x  | x   | x   | x   | x    |             |         |         |         |         |         |         |         |

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate analytical technique. X = Not detected at limit quoted

\* A1, A2, A3, A4, A5, A7, A8 & A9 results in units unless otherwise stated. Limits in brackets.

| SAMPLE NO. |          |     |     |     |     |     |     | SAMPLE NO. |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
|------------|----------|-----|-----|-----|-----|-----|-----|------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----|-----|-----|-----|------|------|
| 2014       |          |     |     |     |     |     |     | 2014       |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
| 15         |          |     |     |     |     |     |     | 15         |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
| 16         |          |     |     |     |     |     |     | 16         |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
| 17         |          |     |     |     |     |     |     | 17         |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
| 18         |          |     |     |     |     |     |     | 18         |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
| 19         |          |     |     |     |     |     |     | 19         |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
| 2020       |          |     |     |     |     |     |     | 2020       |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
| A1         | Ba (200) | X   | X   | X   | X   | X   | X   | X          | A2       | In (10)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | X    | X   | X   | X   | X   | X    | X    |
|            | Be (1)   | X   | X   | X   | /   | /   | /   | /          | Pb (1)   | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | X    | 3   | 40  | 30  | 15  | 20   |      |
|            | Ce (300) | X   | X   | X   | X   | X   | X   | X          | Sb (30)  | X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | X    | X   | 100 | 150 | 30  | 100  |      |
|            | Co (5)   | X   | X   | 5   | X   | X   | 5   | 10         | Sn (1)   | X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | X    | X   | 8   | 6   | 8   | 6    |      |
|            | Cr (20)  | 20  | 40  | 20  | X   | 20  | 40  | 40         | Zn (20)  | X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | X    | X   | X   | X   | X   | X    |      |
|            | La (50)  | X   | 100 | X   | X   | X   | X   | X          |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
|            | Mn (10)  | 200 | 250 | 60  | 60  | 40  | 100 | 30         | A3       | Au (3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |     |     |     |     |      |      |
|            | Nb (3)   | X   | X   | 6   | X   | X   | 3   | X          | P (100)  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
|            | Nb (20)  | X   | X   | X   | X   | X   | X   | X          | Te (20)  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
|            | Ni (5)   | 60  | 80  | 150 | 100 | 80  | 100 | 150        | Tl (1)   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
|            | Sc (3)   | X   | X   | X   | X   | X   | X   | X          |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
|            | Sr (50)  | X   | X   | X   | X   | X   | X   | X          | A4       | Li (1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |     |     |     |     |      |      |
|            | Ta (100) | X   | X   | X   | X   | X   | X   | X          | Na (50)  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
|            | Th (100) | X   | X   | X   | X   | X   | X   | X          |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
|            | Ti (100) | 100 | X   | X   | X   | X   | 100 | X          | A5       | Cs (30)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |     |     |     |     |      |      |
|            | V (10)   | 40  | 80  | 60  | 60  | 60  | 80  | 60         | K (5)    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
|            | W (50)   | 100 | 100 | 100 | 50  | X   | 100 | 100        | Rb (10)  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
|            | Y (10)   | X   | X   | X   | X   | X   | X   | 20         |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
|            | Yb (1)   | X   | X   | X   | X   | X   | X   | 2          |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
| Zr (10)    | 150      | 150 | 200 | 100 | 80  | 250 | 250 |            |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |      |     |     |     |     |      |      |
| A2         | Ag (0.1) | X   | X   | 0.2 | X   | X   | 0.1 | X          | A8       | B (3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |     |     |     |     |      |      |
|            | As (50)  | X   | X   | 150 | X   | X   | X   | X          | A9       | Al (100)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1500 | 800 | 600 | 600 | 600 | 1000 | 1000 |
|            | Bi (1)   | X   | X   | /   | X   | X   | X   | X          | Ca (100) | X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 200  | X   | X   | X   | 200 | X    |      |
|            | Cd (3)   | X   | X   | X   | X   | X   | X   | X          | Fe (100) | >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>& |      |     |     |     |     |      |      |

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate analytical technique. X = Not detected at limit quoted

156

754157

\* A1 A2 A3

Results in ~~mm~~ unless otherwise stated. ~~Detected~~ limits in ~~black~~

| SAMPLE NO. | 2021     |     |  |  |  |  |  |  |  | SAMPLE NO. | 2021     |         |  |  |  |  |  |  |  |
|------------|----------|-----|--|--|--|--|--|--|--|------------|----------|---------|--|--|--|--|--|--|--|
| A1         | Ba (200) | X   |  |  |  |  |  |  |  | A2         | In (10)  | X       |  |  |  |  |  |  |  |
|            | Be (1)   | X   |  |  |  |  |  |  |  |            | Pb (1)   | 20      |  |  |  |  |  |  |  |
|            | Ce (300) | X   |  |  |  |  |  |  |  |            | Sb (30)  | 60      |  |  |  |  |  |  |  |
|            | Co (5)   | X   |  |  |  |  |  |  |  |            | Sn (1)   | 3       |  |  |  |  |  |  |  |
|            | Cr (20)  | 20  |  |  |  |  |  |  |  |            | Zn (20)  | X       |  |  |  |  |  |  |  |
|            | La (50)  | X   |  |  |  |  |  |  |  | A3         | Au (3)   |         |  |  |  |  |  |  |  |
|            | Mn (10)  | 40  |  |  |  |  |  |  |  |            | P (100)  |         |  |  |  |  |  |  |  |
|            | Nb (3)   | 3   |  |  |  |  |  |  |  |            | Te (20)  |         |  |  |  |  |  |  |  |
|            | Nb (20)  | X   |  |  |  |  |  |  |  |            | Tl (1)   |         |  |  |  |  |  |  |  |
|            | Ni (5)   | 80  |  |  |  |  |  |  |  | A4         | Li (1)   |         |  |  |  |  |  |  |  |
|            | Sc (3)   | X   |  |  |  |  |  |  |  |            | Na (50)  |         |  |  |  |  |  |  |  |
|            | Sr (50)  | X   |  |  |  |  |  |  |  | A5         | Cs (30)  |         |  |  |  |  |  |  |  |
|            | Ta (100) | X   |  |  |  |  |  |  |  |            | K (5)    |         |  |  |  |  |  |  |  |
|            | Th (100) | X   |  |  |  |  |  |  |  |            | Rb (10)  |         |  |  |  |  |  |  |  |
|            | Ti (100) | X   |  |  |  |  |  |  |  | A8         | B (3)    |         |  |  |  |  |  |  |  |
|            | V (10)   | 60  |  |  |  |  |  |  |  |            |          |         |  |  |  |  |  |  |  |
|            | W (50)   | 50  |  |  |  |  |  |  |  |            |          |         |  |  |  |  |  |  |  |
|            | Y (10)   | X   |  |  |  |  |  |  |  | A9         | Al (100) | 300     |  |  |  |  |  |  |  |
|            | Yb (1)   | X   |  |  |  |  |  |  |  |            | Ca (100) | 200     |  |  |  |  |  |  |  |
|            | Zr (10)  | 100 |  |  |  |  |  |  |  |            | Fe (100) | > 10000 |  |  |  |  |  |  |  |
| A2         | Ag (0.1) | 0.1 |  |  |  |  |  |  |  |            | Mg (100) | X       |  |  |  |  |  |  |  |
|            | As (50)  | X   |  |  |  |  |  |  |  |            | Si (100) | > 10000 |  |  |  |  |  |  |  |
|            | Bi (1)   | X   |  |  |  |  |  |  |  |            |          |         |  |  |  |  |  |  |  |
|            | Cd (3)   | X   |  |  |  |  |  |  |  |            |          |         |  |  |  |  |  |  |  |
|            | Cu (1)   | 3   |  |  |  |  |  |  |  |            |          |         |  |  |  |  |  |  |  |
|            | Ga (1)   | X   |  |  |  |  |  |  |  |            |          |         |  |  |  |  |  |  |  |
|            | Ge (1)   | /   |  |  |  |  |  |  |  |            |          |         |  |  |  |  |  |  |  |

Results are semi-quantitative. Elements apparently present in concentrations of economic interest should be redetermined by an appropriate accurate analytical technique. X = Not detected at limit quoted

157

754158

158

FORM 6

JOB

4837/81

AMDEL ANALYTICAL SERVICE

Results in ppm unless otherwise stated

BATCH NO. 1754159

| TT | Sample No. | AU    |  |  |  |  |  |  |  |
|----|------------|-------|--|--|--|--|--|--|--|
| 1  | 2007       | <0.01 |  |  |  |  |  |  |  |
| 2  | 08         | <0.01 |  |  |  |  |  |  |  |
| 3  | 09         | 0.01  |  |  |  |  |  |  |  |
| 4  | Std        |       |  |  |  |  |  |  |  |
| 5  | 10         | <0.01 |  |  |  |  |  |  |  |
| 6  | 11         | <0.01 |  |  |  |  |  |  |  |
| 7  | 12 X       | <0.01 |  |  |  |  |  |  |  |
| 8  | 13         | <0.01 |  |  |  |  |  |  |  |
| 9  | 14         | <0.01 |  |  |  |  |  |  |  |
| 10 | 15         | <0.01 |  |  |  |  |  |  |  |
| 11 | 16         | <0.01 |  |  |  |  |  |  |  |
| 12 | 17         | <0.01 |  |  |  |  |  |  |  |
| 13 | 18         | <0.01 |  |  |  |  |  |  |  |
| 14 | 19         | <0.01 |  |  |  |  |  |  |  |
| 15 | 20         | <0.01 |  |  |  |  |  |  |  |
| 16 | 2021       | <0.01 |  |  |  |  |  |  |  |
| 17 | 12 X       |       |  |  |  |  |  |  |  |
| 18 | Blank      |       |  |  |  |  |  |  |  |
| 19 |            |       |  |  |  |  |  |  |  |
| 20 | CODE       | C3/3  |  |  |  |  |  |  |  |



Analysis code B1/1

Report AC 5430/81

Page 1

NATA Certificate

Order NQ04/LB/9

Results in ppm

| Sample     | Sb  | W    |
|------------|-----|------|
| 2007       | <4  | <10  |
| 2008       | <4  | <10  |
| 2009       | <4  | <10  |
| 2010       | 160 | 15   |
| 2011       | 250 | 20   |
| 2012       | 46  | 25   |
| 2013       | 200 | 20   |
| 2014       | 210 | 25   |
| 2015       | 140 | 15   |
| 2016       | 55  | <10  |
| 2017       | 48  | <10  |
| 2018       | 38  | <10  |
| 2019       | 75  | 15   |
| 2020       | 65  | <10  |
| 2021       | 80  | 10   |
| Detn limit | (4) | (10) |



Analysis code B1/2

Report AC 5807/81

Page 1

NATA Certificate

Order NQ04/LM/9

Results in ppm

| Sample | Hg |
|--------|----|
| 2007   | <3 |
| 2008   | <3 |
| 2009   | <3 |
| 2010   | <3 |
| 2011   | <3 |
| 2012   | 5  |
| 2013   | 11 |
| 2014   | <3 |
| 2015   | 9  |
| 2016   | <3 |
| 2017   | <3 |
| 2018   | 3  |
| 2019   | 14 |
| 2020   | 9  |
| 2021   | 6  |

Detn limit (3)

Results for sample nos. 2010-2021 subject to error due to unresolved matrix difficulties.



Analysis code B1/1

Report AC 5807/81

Page 2

NATA Certificate

Order NQ04/LM/9

Results in ppm

| Sample | Bi |
|--------|----|
| 2007   | <4 |
| 2008   | <4 |
| 2009   | <4 |
| 2010   | 6  |
| 2011   | <4 |
| 2012   | 8  |
| 2013   | <4 |
| 2014   | <4 |
| 2015   | <4 |
| 2016   | <4 |
| 2017   | <4 |
| 2018   | <4 |
| 2019   | <4 |
| 2020   | <4 |
| 2021   | <4 |

|            |     |
|------------|-----|
| Detn limit | (4) |
|------------|-----|

Results for sample nos. 2011-2021 subject to error due to unresolved matrix difficulties.

## Central Mineralogical Services



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

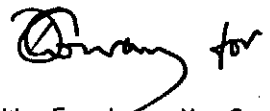
Ms. L. Banwell  
Geologist  
The Shell Co. of Aust. Ltd.  
Metals Division  
P.O. Box 860  
DEVONPORT / TAS. 7310

13th May, 1981

### REPORT CMS 81/4/10

|                 |                                   |
|-----------------|-----------------------------------|
| YOUR REFERENCE: | Sample Despatch<br>No. MQ04/LB/10 |
| DATE RECEIVED:  | 6th April, 1981                   |
| SAMPLE NOS.:    | 2022 - 2035                       |
| SUBMITTED BY:   | L. Banwell                        |
| WORK REQUESTED: | Petrology                         |

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

  
H.W. Fander, M. Sc.

REPORT CMS 81/4/10Notes:

Fourteen specimens were received for petrological examination and are briefly described in the attached tables. Descriptions incorporate data from stereobinocular and petrological microscopic examination of representative thin-sections and offcuts. Specimen 2034 was examined mineragraphically to confirm the presence of magnetite (as against maghemite).

Summary

In general, these rocks exhibit a low temperature quartz-hematite ( $\pm$  goethite) paragenesis with localised evidence (2034) that this is in part secondary after magnetite. The rocks exhibit a variety of textures consistent with a chemical sedimentary mode of origin. The bulk can be classified as hematitic cherts, cherty ironstones or hematite jaspilites, dependant on the relative abundance of quartz and Fe-oxides and on the fabric (with jaspilite indicating at least a crude banding).

These rocks are variably fractured and quartz-veined. Deformation effects are relatively marked in the Natone suite (2029-2035), which may be brecciated. This weak, but essentially prograde phenomenon may related to the apparently localised magnetite-rich zones in the relatively siliceous Natone facies.

Iron facies, in general, are completely devoid of Fe-silicates, carbonates and metasomatic effects. These features, although representing negative evidence, tend to confirm these rocks as essentially a jaspilitic sedimentary facies.

D. Cowan, B. Sc.

|                      |                                                                                                                                                                                         |                                                                                                  |                                                                               | Central Mineralogical Services                                                                                                                      |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Sample No.           | Classification - Composition                                                                                                                                                            | Fabric                                                                                           | Accessories                                                                   | Comments                                                                                                                                            |
| 2022<br>(T.S. 36642) | Hematite Jaspilite. Semi-limonitised hematite and cherty, microcrystalline quartz in varying, but overall near-equant proportions. Frequent quartz veinlets ( $\pm$ specular hematite). | Crude, millimetric-scale banding, faint relict micronodular textures. Discontinuous veinlets.    | Minor traces magnetite (or ?maghemite).                                       | Hematite fine-to ultrafinely-grained. Incipiently recrystallized relict chemical sedimentary textures.                                              |
| 2023                 | Cherty Ironstone. Semi-massive hematite with patches of cherty quartz, irregular cavity fillings, crude veins of variably hematite-stained granular quartz. Minor late limonite.        | Variably nodular to crudely banded, slumped/irregular.                                           | Minor traces magnetite, argillic inclusions in quartz.                        | Close affinities with 2022, but only crudely banded. Cavity-filling quartz is crystallized chalcedony in part with micro-acicular hematite.         |
| 2024                 | Hematite Jaspilite. Partly limonitised hematite slightly subordinate microgranular quartz.                                                                                              | "Microquartzitic" (recrystallized cherty quartz). Variably banded, relict colloform, nodular.    | Minor traces magnetite.                                                       | Sparse "diagenetic" quartz veinlets, minor late hematitic microveinlets. Weak, but pervasive recrystallization of quartz, otherwise very similar to |
| 2025                 | Hematitic Chert. Microgranular quartz, subordinate, extensively limonitised hematite. Minor late veinlets of specular hematite.                                                         | "Quartzitic", sim. 2024, but slightly coarser-grained. Relict micro-nodular, colloform textures. | Minor traces magnetite.                                                       | Relatively siliceous ironstone facies. Mildly recrystallized, analogous to 2024, with fine flaky hematite healing late microfractures.              |
| 2026                 | Hematite Jaspilite. Massive to chert-laminated, extensively limonitised hematite. Sporadic segmented zones, aggregates, of vein-type quartz.                                            | Fractured to brecciated, discontinuous banding. Strongly stressed vein-quartz.                   | Minor traces magnetite. Rare microscopic carbonate inclusions in vein-quartz. | Cherty component mildly recrystallized, similar to 2024, 2025. Vein-quartz of hydrothermal character in contrast to 2022, 2023.                     |
| 2027                 | Hematite Jaspilite. Extensively limonitised hematite, subordinate to minor cherty quartz, sparse fine-grained vein-quartz.                                                              | Deformed, crude to distinct banding, patchy crude relict colloform features.                     | Minor traces magnetite.                                                       | Incipiently recrystallized, relatively massive iron facies. Deformation similar to 2026, partly masked by development of goethite after hematite.   |
| 2028                 | Quartz Ironstone. Moderately limonitised hematite with cherty, microcrystalline and fine granular, cavity-filling quartz in varying proportions.                                        | Spongy to semi-massive Fe-oxide. "Cockade", colloform, zoned cavity-fillings.                    | Minor traces magnetite.                                                       | Minor quartz-healed fractures contemporaneous with hematitic quartz cavity-fillings. Textural affinities with 2023.                                 |
| 2029                 | Recrystallized Chert. Microgranular quartz with frequent quartz veinlets, cavity-fillings.                                                                                              | Essentially massive apart from veinlets, etc.                                                    | Minor traces ultrafine limonite (goethite).                                   | Limonite primary in part, locally defines very crude banding. Also weakly mobilised into late, incipiently stylolitic films.                        |
| 2030<br>(T.S. 36650) | Recrystallized Chert. Microgranular quartz with frequent quartz veinlets, sparse fine to ultrafine goethite, hematite.                                                                  | Very similar to 2029, incipiently banded (Fe-oxides).                                            | -----                                                                         | Closely related to 2029. Slightly more ferruginous in comparison, and this represents the only real contrast.                                       |
|                      |                                                                                                                                                                                         |                                                                                                  |                                                                               |                                                                                                                                                     |



CONSULTING MINERALOGISTS

ALICK W. G. WHITTLE, M.SC., PH.D.

P.O. BOX 102  
STANSBURY, S.A. 5582  
PHONE (088) 52 4281

MINERALOGICAL REPORT

SHELL 6 / 81

Samples 2038 - 2046 : Devenport, Tas.

Ms Lynne Barwell, 29.6.81.

O.N. MQ04/LB/1F.

\* \* \* \*

DISTRIBUTION

Copies 1, 2 : Ms L. Barwell  
Shell Company of Australia Limited (Metals)  
P.O. Box 860

DEVENPORT 7310.

The report provides from polished sections, descriptions and classifications for ironstone samples which were submitted by Ms L. Barwell.

#### S U M M A R Y

None of these ironstones can be classed as gossans. There are two categories. The first includes the moderately re-crystallised equivalents of silica facies B.I.F. metasediments; and the second includes more strongly metamorphosed silica, and silica-carbonate facies B.I.F. metasediments.

None embodies either sulphide boxwork, or the goethite replicas of the fine phase syngenetic sulphides which occasionally exist in this type of chemically-formed cherty banded iron formation.

If base metal anomalies do exist in these samples, their presence may only be attributed to the scavenging capacity of iron oxides and hydrates, from ground waters, in the supergene environment.

\* \* \* \* \*

MODERATELY RECRYSTALLISED B.I.F.2038 Banded iron formation : silica facies B.I.F.

Specularite, and fine grained granoblastic quartz intergrowths, together constitute this metasediment. The quartz has a red jaspilitic colour due to the presence of minute hematite inclusions.

A discontinuous foliated structure may be seen. This is a palimpsest slumped bedding feature which was developed in the original sediment between the layers of chert, and the iron oxide-rich cherty bands.

This recrystallised B.I.F. exhibits no gossanous features which are relevant to syngenetic sulphides.

2039 Specularite-rich silica facies B.I.F.

Palimpsest bedding is scarcely apparent in this recrystallised metasediment. The principal mass of the B.I.F. is made up of specularite-rich cherty bands which, in the recrystallised rock, appear as intergrowths of 80 - 90% specularite within 20 - 10% of a granoblastic quartz medium.

Scattered through the principal iron oxide-rich granoblastic quartz intergrowths, there are iron oxide-deficient jaspilite pellets. Within these silica-rich pellets, palimpsest bedding is manifest in the mode of distribution of the 5 - 10% iron oxides and iron hydrates of only a few microns grain size. The presence of the pelletal jaspilite fragments

indicates that the original B.I.F. may have had an inter-formational breccia structure.

There are no gossanous features.

2040     Specularite-rich silica minor silicate-facies B.I.F.

There is evidence of a more advanced state of recrystallisation in this B.I.F. Along some of the foliae, the iron oxides appear as specularite flakes of 1 - 2 mm length.

The present manifestation of the original structure in this sediment, is indicative of both slumped bedding, and of the presence of pelletal ferruginous chert, as in 2039. There are along some of the slumped foliae, small numbers of oxidised, decomposed and ferruginised silicates. Small amounts of sericite were therefore present amongst the chert; but the chemically-formed iron oxides were the principal components of most lamellae in the original sediment.

Gossanous characteristics are not present in the rock.

2041     Oxidised brecciated B.I.F. and chert.     *Nature*

Both oxidation and hydration in the supergene environment were facilitated by the brecciated structure in this rock.

It is not gossanous. The bulk of the breccia consists of hydrated (limonitic) specularite-rich chert; amongst which there are numerous small (2 - 6 mm) fragments of light-coloured

iron oxide-deficient recrystallised chert. It is probable that thin chert lamellae were, prior to brecciation, present amongst thicker and more prominent specularite-rich cherty layers.

There are no gossanous characteristics.

2042      Slump-folded silica facies B.I.F., with meta-authigenic quartz euhedra.

Slump folding is revealed from polished section examination of the apparently massive specularite-rich recrystallised chert. The content of recrystallised iron oxides, presently manifest in the specularite intergrowths in this rock, generally exceeds 90%. Only a very small proportion of interstitial chert exists amongst the specularite crystals. Randomly-distributed in 1 - 2 cm clusters there are however, about 10% total of quartz euhedra.

The size and habit of the quartz euhedra indicate that these were formed in the original B.I.F. as authigenic components. Their size was probably enlarged during the ensuing metamorphic recrystallisation. The quartz crystals are red in colour, and partly leached, because they embody minute iron oxide inclusions.

Gossanous features are absent from this rock.

\* \* \* \* \*

STRONGLY RECRYSTALLISED B.I.F.2043 Magnetite (martite) - rich carbonate-silica facies B.I.F.

The texture, structure and composition in this rock contrast with those of all of the former samples. Because of more extensive recrystallisation in the hypogene environment, the original syngenetic iron oxides appear as magnetite, rather than as specularite. Subsequent exposure in the supergene environment led to the partial oxidation (martitisation) of the magnetite.

Aggregates of variably martitised magnetite subhedra, with enclosed irregularly shaped zones of complete oxidation and hydration (limonitic zones), make up the bulk of the rock. Irregularly shaped coarsely granulose quartz intergrowths, as well as remnant leached carbonate intergrowths, are scattered amongst the martite mass. These quartz and carbonate intergrowths are the strongly recrystallised fragments of slump-brecciated chert and thin dolomite lamellae in the original B.I.F.

There are no gossanous features; but small proportions of rhombic carbonate boxwork are present.

2044 Martite-rich silica facies B.I.F.

Remnants of an inherent slump structure can be distinguished in this rock. It was strongly recrystallised; and although now extensively oxidised, it did originally consist

mainly of small martite euhedra.

Small slump-brecciated fragments of iron oxide-deficient thin chert layers, are scattered amongst the dominant martite mass.

There are no gossanous features.

2045 Magnetite (martite) - rich carbonate-silica facies B.I.F.

The only significant differences between this rock and 2043, are in its coarser granularity due to very extensive recrystallisation; and in the somewhat larger proportions of slump-brecciated portions of iron oxide-deficient chert and dolomite lamellae.

It is not gossanous. There are no sulphide boxwork structures; but some rhombic carbonate boxwork is however, present.

2046 Massive martite : magnetite - rich B.I.F., with portions of slump-brecciated silica and carbonate lamellae.

The rock has characteristics which are comparable with those of 2045. In this example, the magnetite was recrystallised to grain sizes of 2 - 4 mm. The contents of recrystallised fragments of chert and carbonate lamellae, are less than in 2045.

No gossanous features are present.

*A.W.G. Whittle* A.W.G. WHITTLE  
14th July 1981.

CONSULTING MINERALOGISTS

ALICK W. G. WHITTLE, M.SC., PH.D.

P.O. BOX 102  
STANSBURY, S.A. 6582  
PHONE (088) 52 4281

ADDENDUM TO REPORT

SHELL 6/81

(L.D. Banwell, Devenport)

The re-examination of the polished sections of samples 2038 - 2046 revealed no textural or mineralogical evidence for hydrothermal activity or metasomatism.

During the re-examination one gold particle of 6 x 4 microns size was detected in the quartz component of sample 2041. This single grain may not register in analysis because its isolation may preclude its inclusion in a sample for analysis.

However the minute inclusion of gold in quartz is significant in that it suggests that the chert from which the quartz was derived by recrystallisation, may have been an exhalative silica.

Furthermore, some of the quartz contains minute blebs of goethite of a few microns, or smaller size : these could be oxidised fine sulphosalt inclusions which embody trace amounts of antimony.

Banded ironstones of the silica facies can be shown in some instances, especially when they contain fine phase sulphosalts, sulphides, or baryte, to have formed from chert which had an exhalative silica origin at a submarine volcanic centre. In such examples sparse gold and silver, as well as fine sulphides may be enclosed in the chert (exhalative silica). Antimony in particular may be associated with minute blebs of galena in these cherty iron formations.

I would postulate that your B.I.F. samples embody at least some recrystallised exhalative silica; and that the low levels of antimony, mercury, tungsten and gold emanated with the silica from a submarine felsic volcanic source, as telethermal associates.

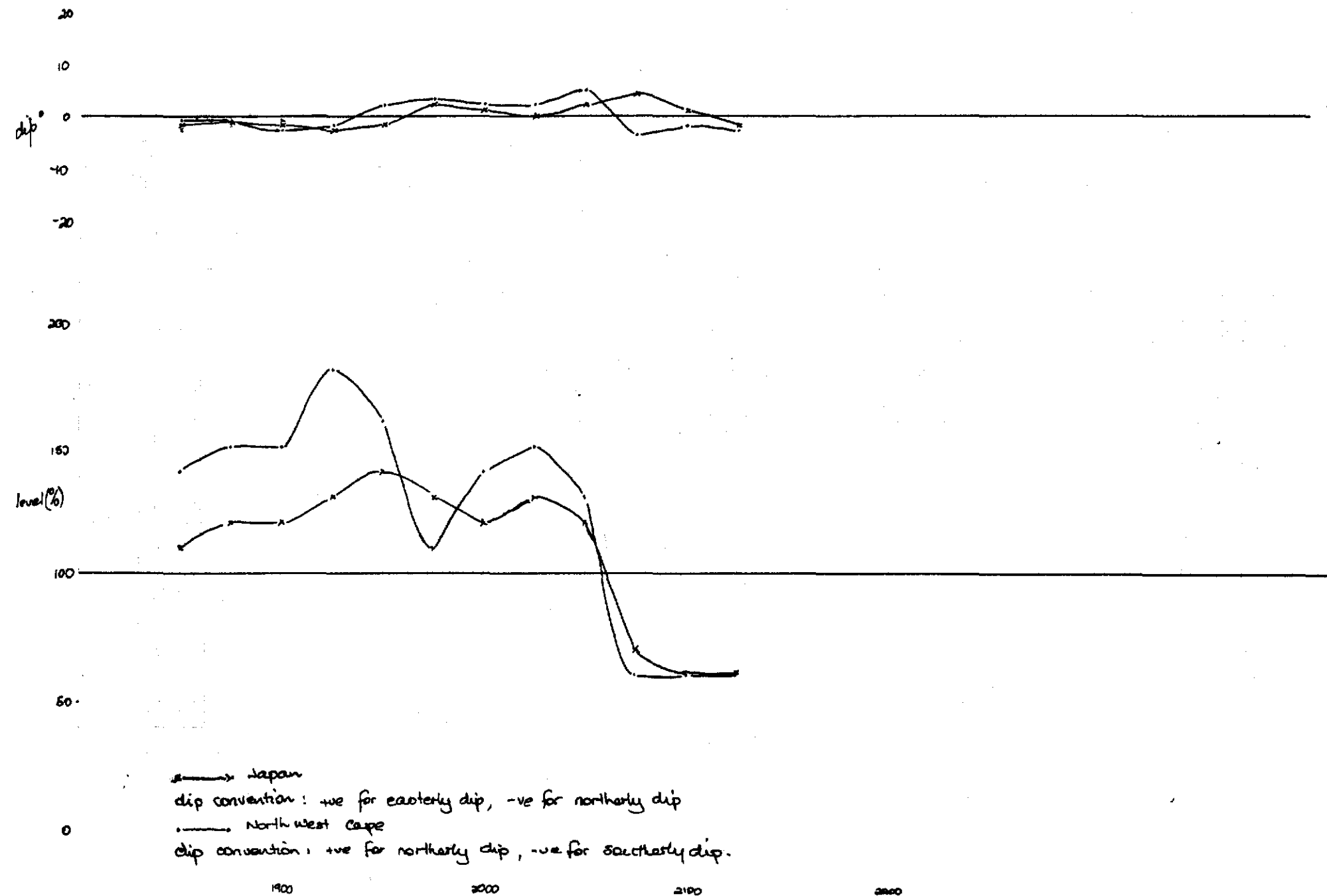
*...A.W.G. Whittle*

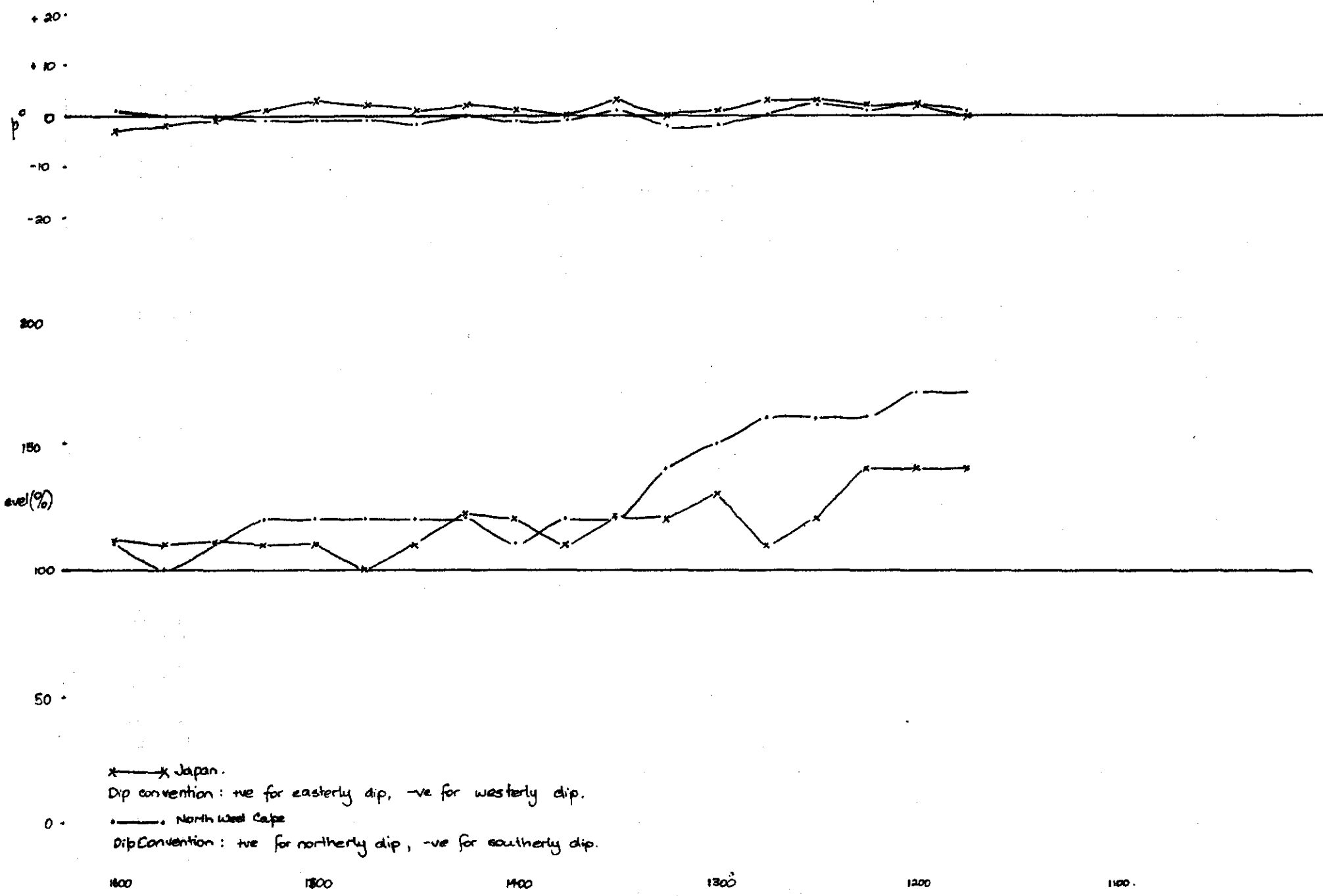
A.W.G. WHITTLE  
11th August 1981.

APPENDIX 7

NATONE

VLF SURVEY ALONG LINE 1600E & 1800N





APPENDIX 18

## MINOPS DATA

McPhar I.P. Survey

**McPHAR GEOPHYSICS**

**REPORT ON THE  
INDUCED POLARIZATION  
AND RESISTIVITY SURVEY  
IN THE  
NATONE AREA OF TASMANIA  
FOR  
MINOPS PTY. LTD.**

---

**1. INTRODUCTION**

At the request of Minops Proprietary Ltd., an induced polarisation and resistivity survey has been carried out on the company's Natone project in N.W. Tasmania.

Iron ore deposits have been known to exist in the area since 1919. The magnetic surveys found several anomalies and several locations were suggested for diamond drill holes to test the anomalies. Two holes were drilled; the sulphides chalcopyrite and pyrrhotite were found in association with pyrite, magnetite, limonite and hematite.

With the discovery of the sulphides, the anomalies took on an added interest, and the induced polarisation and resistivity survey was planned to test the magnetic anomalies and to try to find economic concentrations of ore. (In 1959 a government aeromagnetic survey was carried out and this was followed up in 1959 by a ground magnetic survey).

The deposits occur in Precambrian sedimentary rocks, sharply folded and faulted into anticlines and synclines with a northeasterly trend.

- 2 -

The sediments are unconformably overlain by Ordovician conglomerates and intruded by Devonian granites. The intrusive granites are considered to be genetically related to the iron deposits. All of these rock units have been covered by basalt flows of Tertiary age.

The iron deposits are mainly hematite with some magnetite and appear to be connected with a fracture or shear zone striking northeast.

## 2. PRESENTATION OF RESULTS

The induced polarization and resistivity results are shown on the following enclosed data plots. The results are plotted in the manner described in the notes preceding this report.

| <u>Line</u> | <u>Electrode Intervals</u> | <u>Dwg.No.</u> |
|-------------|----------------------------|----------------|
| 10+00S      | 200 feet                   | IP 5341-1      |
| 10+00S      | 100 feet                   | IP 5341-2      |
| 12+50S      | 200 feet                   | IP 5341-3      |
| 12+50S      | 100 feet                   | IP 5341-4      |
| 15+00S      | 200 feet                   | IP 5341-5      |
| 15+00S      | 100 feet                   | IP 5341-6      |
| 17+50S      | 200 feet                   | IP 5341-7      |
| 17+50S      | 100 feet                   | IP 5341-8      |
| 20+00S      | 300 feet                   | IP 5341-9      |
| 20+00S      | 200 feet                   | IP 5341-10     |
| 23+00S      | 300 feet                   | IP 5341-11     |
| 23+00S      | 200 feet                   | IP 5341-12     |
| 23+00S      | 100 feet                   | IP 5341-13     |

- 3 -

| <u>Line</u> | <u>Electrode Intervals</u> | <u>Dwg. No.</u> |
|-------------|----------------------------|-----------------|
| 26+00S      | 300 feet                   | IP 5341-14      |
| 26+00S      | 200 feet                   | IP 5341-15      |
| 26+00S      | 100 feet                   | IP 5341-16      |
| 27+50S      | 300 feet                   | IP 5341-17      |
| 27+50S      | 200 feet                   | IP 5341-18      |
| 29+50S      | 200 feet                   | IP 5341-19      |
| 29+50S      | 100 feet                   | IP 5341-20      |
| 32+50S      | 300 feet                   | IP 5341-21      |
| 32+50S      | 200 feet                   | IP 5341-22      |
| 35+00S      | 200 feet                   | IP 5341-23      |
| 37+50S      | 200 feet                   | IP 5341-24      |
| 40+00S      | 200 feet                   | IP 5341-25      |

Enclosed with this report is Dwg. I. P. P. 4536, a plan map of the area at a scale of 1" = 400'. The definite and possible induced polarization anomalies are indicated by solid and broken bars respectively on this plan map as well as the data plots. These bars represent the surface projection of the anomalous zones as interpreted from the location of the transmitter and receiver electrodes when the anomalous values were measured.

Since the induced polarization measurement is essentially an averaging process, as are all potential methods, it is frequently difficult to exactly pinpoint the source of an anomaly. Certainly, no anomaly can be located with more accuracy than the spread length; i. e. when using 200' spreads the position of a narrow sulphide body can only be determined to lie

- 4 -

between two stations 200' apart. In order to locate sources at some depth, larger spreads must be used, with a corresponding increase in the uncertainties of location. Therefore, while the centre of the indicated anomaly probably corresponds fairly well with source, the length of the indicated anomaly along the line should not be taken to represent the exact edges of the anomalous material.

Geological information was obtained from publications of the Australian Bureau of Mineral Resources, Geology and Geophysics.

### 3. DISCUSSION OF RESULTS

Broad anomalies were found on every line of the survey. These anomalies for the most part lie within the large magnetic high, but several also lie outside or extend beyond it, indicating the presence of a non-magnetic source. The two drill holes proved that the strong magnetic highs are associated with magnetite, so the non-magnetic sources must be sulphides.

A zone from a non-magnetic source is indicated at the eastern end of Line 12+50S, Line 15+00S and Line 17+00S. Line 12+50S and Line 15+00S would have to be extended to the east to obtain complete data to outline the anomaly. The source appears to be at a depth of more than 1 unit (200 feet) on the two northernmost lines and at a depth between 100 feet and 200 feet on Line 17+50S.

An anomaly of interest is centred at about station 300E on Line 26+00S with the electrode interval at 100 feet. It is strong and well-shaped. The source of this anomaly can be traced on Line 27+50S (the deep anomaly

- 5 -

centred at approximately 200E (Dwg. 5341-18), Line 29+50S (Dwg. 5341-20), Line 32+50S (Dwg. 5341-22, centre 200E) Line 35+00S (Dwg. 5341-23, centre 200E). The source appears to be at a depth greater than 200 feet (1 unit) and is in a weak area of the magnetic high.

#### 4. CONCLUSIONS AND RECOMMENDATIONS

Drilling has confirmed the presence of sulphides in the Natone iron deposits and the induced polarization and resistivity survey has shown anomalies over the greatest part of the large magnetic high over the deposits. Anomalies have also been found outside of the magnetic high and it is suggested that drilling test some of these anomalies.

- 1) A 45 degree hole collared at 400+50E on Line 26+00S, drilled to a depth of 200 feet, should test the source of the anomaly on this line. This source is very weakly magnetic.
- 2) Vertical holes should be drilled at a) station 1000W, Line 10+00S b) station 1200W, Line 20+00S and station 900W, Line 23+00S to test the broad, strong anomalies lying outside of the magnetic high. The anomalies are strongest on  $n = 3$  or  $n = 4$  so the drill holes should reach a total depth of at least 2 units, or 400 feet.
- 3) Line 12+50S and Line 15+00S should be extended to complete the data on the source of the anomalies on these lines. The source is deeper to the north, therefore electrode intervals of 200 feet should be used. The same anomaly on Line 17+50S is better defined with electrode intervals of 100 feet. The pattern line seems to indicate either the end of the source or else it is off the end of the source.

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McPHAR GEOPHYSICS PTY. LTD.

*Marion A. Goudie*  
Marion A. Goudie,  
Geologist.

*Philip G. Hall*  
Philip G. Hall,  
Geophysicist.

Dated: October 14, 1969

APPENDIX 9

MINOPS DRILL HOLES NDDH 1, 2 & 3

- a) LOGS & ASSAY SHEETS
- b) SUSCEPTIBILITY LOGS

PROJECT: NATONE

CORE SIZES: 0 - 195 NQ? 48mm diam.

LOGGED BY: P.ASKINS

HOLE NO: N.D.D.H.1.

195 - 315 BW? 40mm

August 1977

DRILLED: MINOPS

754188

187

| FROM                    | TO    | DESCRIPTION                                                                                                                                                                                                                |
|-------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Feet and tenths of Feet |       |                                                                                                                                                                                                                            |
| 0                       | 107.5 | SOIL, RUBBLE of limonite-rich gossanous in places siliceous brecciated material. - CW magnetite - po skarn? Some basalt frags above 70 - could be caved from upper part of hole?                                           |
| 107.5                   | 185.0 | CALC SILICATE ROCK, SW - CW, generally off white, mono-mineralic pyroxene - equant grains H around 4 - 5. In places with pale lime yellow epidote (?) alteration or weathering. Some limonite on fractures after py or po. |
| 185.0                   | 190.0 | JASPEROID - MW limonitic siliceous brecciated material with layering at 70°.                                                                                                                                               |
| 190.0                   | 195.0 | LIMESTONE - Fr, white and grey, m-crs, distinctive gneissic appearance, grey areas greater insol content - silty. Disseminated po, f-m, common in dark layers. Layering 30° - 50°.                                         |
| 195.0                   | 196.0 | CALC SILICATE ROCK, Frst, as above.                                                                                                                                                                                        |
| 196.0                   | 242.0 | LIMESTONE - as above with irregular calc silicate rock, Fr, in places (pale uniform massive in photos)                                                                                                                     |
| 242.0                   | 262.0 | CHERTY - SILTSTONE, Fr, dark to pale grey, f - f has typical f wispy cherty layering in places.                                                                                                                            |
| 262.0                   | 269.0 | LIMESTONE - Fr, highly altered. Consists of well bedded limestone with much chl wollast? . po, act?, irregular, replacing original calcite. Bedding 40°.                                                                   |
| 269.0                   | 273.0 | CHERT, Fr, pale grey to creamish, wispy f layering irregular and brecciated.                                                                                                                                               |
| 273.0                   | 305.0 | QUARTZITE, Fr, pale grey, f-m, massive; occasional patches chert suggest that this quartzite is altered chert. A little po associated with weak fractures in places.                                                       |
| 305.0                   | 309.0 | CHERT, Fr, pale grey, creamish, off white, mostly finely bedded 60° - 80°.                                                                                                                                                 |
| 309.0                   | 311.0 | ALTERED CHERT, Fr, Irregular development of f-m wollastonite?, po, py. Probably originally calcareous cherty bed.                                                                                                          |
| 311.0                   | 315.0 | ANDALUSITE HORNFELS, Fr, dark grey, f - f with crystals andalusite up to 2mm concentrated in bedding, at 30° - 90°.                                                                                                        |
| END OF HOLE             |       |                                                                                                                                                                                                                            |

PROJECT: NATONE

HOLE NO: N.D.D.H.2.

DRILLED: MINOPS

CORE SIZES: 0 - 20 H ? 67 mm  
20 - 75 NQ ? 48 mm  
139 - 195 BW ? 40 mm  
195 - 305 AQ & AX 25 - 30 mm varies possibly due triple tube  
305 - AX ? 30 mm

LOGGED BY: P. ASKINS

August 1977

100

| FROM                    | TO    | DESCRIPTION                                                                                                                                                                                                                                                                        |
|-------------------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Feet and tenths of Feet |       |                                                                                                                                                                                                                                                                                    |
| 0                       | 20.0  | IRONSTONE - consists of massive hem - lim                                                                                                                                                                                                                                          |
| 20.0                    | 75.0  | SILTSTONE - CLAYSTONE, MW - CW, off white to buff, massive - Tertiary unconsol sediment?                                                                                                                                                                                           |
| 75.0                    | 139.0 | CORE MISSING                                                                                                                                                                                                                                                                       |
| 139.0                   | 221.0 | IRONSTONE - mostly massive hematite recovered                                                                                                                                                                                                                                      |
| 221.0                   | 252.0 | LIMONITIC IRONSTONE - Is CW equivalent of rock below                                                                                                                                                                                                                               |
| 252.0                   | 265.0 | TRANSITION TO                                                                                                                                                                                                                                                                      |
| 265.0                   | 305.0 | ACTINOLITE - PYRRHOTITE ROCK - HW, m, buff, massive, consists of weathering actinolite with variable amounts of po, py which has broken down to $\text{FeSO}_4$ in core trays (See photo)                                                                                          |
| 305.0                   | 328.5 | ALTERED LIMESTONE, Fr, m, white to pale greenish. Consists of "marble" with patchy actinolite - tremolite, m - crs, and patchy disseminated m po. Patch with crs musc, greisen like, at 307.                                                                                       |
| 328.5                   | 478.0 | ALTERED LIMESTONE - CHERT "CONGLOMERATE", Fr. Consists of pebbles up to a few cm across mostly rounded, of chert, siliceous sandstone/siltstone, in limestone matrix, or vice versa; variously altered to pale calc silicate minerals (trem - act?) with patchy disseminated m po. |
| 478.0                   | -     | CORE MISSING                                                                                                                                                                                                                                                                       |
| END OF HOLE             |       |                                                                                                                                                                                                                                                                                    |

754189

PROJECT: NATONE

CORE SIZES: 0 - 160 48 mm

LOGGED BY: P.ASKINS

HOLE NO: N.D.D.H.3.

160 - 240 40 mm

August 1977.

DRILLED: MINOPS

240 - 30 mm

FROMTODESCRIPTIONFeet and tenths of Feet

|         |           |                                                                                                                                                                                                                                                                      |
|---------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0       | 56        | RUBBLE. Some recovered lumps of basalt                                                                                                                                                                                                                               |
| 56      | 76        | SILTY SOIL, RUBBLE, with some lumps of basalt                                                                                                                                                                                                                        |
| 76      | around 90 | SOIL, RUBBLE with much limonitic ironstone                                                                                                                                                                                                                           |
| ound 90 | " 139     | SILTSTONE, CLAYSTONE, unconsol. Similarly to Tertiary siltstone etc at Moina                                                                                                                                                                                         |
| " 139   | " 325     | GOSSANS. CW soft to hard siliceous vuggy. Hard siliceous vuggy material is jaspery and brecciated with preserved limonite in vugs in places. - obviously originally contained around 10% sulphide. Probably originally was cherty unit similar to that in N.D.D.H.2. |
| " 325   | " 326     | ANDALUSITE HORNFELS - only a few pieces in tray. Similar to that in N.D.D.H.1.                                                                                                                                                                                       |
| " 326   | " 369     | CORE MISSING                                                                                                                                                                                                                                                         |

END OF HOLE 369 ACCORDING TO TRAY

754190

## NATONE CORE ANALYSES

| HOLE NO           | SAMPLE       | LOG | Sn<br>ppm | W<br>ppm | Au<br>ppm | F<br>% | Be<br>ppm                                                                                        | Co<br>ppm | Cr<br>ppm | Mn<br>ppm | Ni<br>ppm | Sc<br>ppm | Ti<br>ppm | V<br>ppm | Y<br>ppm | Zr<br>ppm | Ag<br>ppm | As<br>ppm | Bi<br>ppm | Cu<br>ppm | Ga<br>ppm | Pb<br>ppm | Sb<br>ppm | Zn<br>ppm |  |
|-------------------|--------------|-----|-----------|----------|-----------|--------|--------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|
| NDDH. 1           | 86 - 107.5'  |     | 32        | 20       | -0.05     | -0.1   | 1                                                                                                | 100       | 80        | 5000      | 80        | 3         | 1000      | 100      | 30       | 100       | 0.3       | 600       | 7         | 200       | 3         | 30        | 30        | 250       |  |
|                   | 268 - 268.2' |     | 4         | -10      | -0.05     | 0.3    | -1                                                                                               | 30        | 30        | 300       | 30        | 3         | 500       | 70       | -10      | 50        | -0.1      | -50       | -1        | 100       | 15        | 5         | -30       | 80        |  |
| NDDH. 2           | 139 - 221    |     | 26        | 30       | 0.10      | -0.1   | -1                                                                                               | 10        | 30        | 500       | 50        | -3        | 100       | 70       | -10      | 100       | 0.1       | -50       | 5         | 30        | -1        | 10        | 200       | 500       |  |
|                   | 221 - 251    |     | 8         | 20       | -0.05     | -0.1   | 1                                                                                                | 10        | 20        | 300       | 80        | -3        | 100       | 70       | -10      | 100       | -0.1      | -50       | 7         | 250       | -1        | 20        | -30       | 1000      |  |
|                   | 251 - 265    |     | -4        | 70       | 0.15      | -0.1   | 1                                                                                                | 25        | 100       | 200       | 100       | -3        | 100       | 50       | -10      | 100       | 0.7       | -50       | 250       | 800       | -1        | 20        | -30       | 700       |  |
|                   | 265 - 305    |     | 14        | -10      | -0.05     | -0.1   | -1                                                                                               | 15        | 80        | 1000      | 100       | -3        | 250       | 70       | -10      | 100       | -0.1      | -50       | 1         | 300       | -1        | 5         | -30       | 1500      |  |
| NDDH. 3           | 160 - 315    |     | 12        | 10       | -0.05     | -0.1   | 1                                                                                                | 10        | 20        | 3000      | 50        | -3        | 100       | 20       | -10      | 30        | 1.0       | -50       | 1         | 150       | -1        | 20        | -30       | 100       |  |
| DETECTION LIMIT   |              |     | 4         | 10       | 0.05      | 0.1    | 1                                                                                                | 5         | 20        | 10        | 5         | 3         | 100       | 10       | 10       | 10        | 0.1       | 50        | 1         | 1         | 1         | 30        | 30        | 250       |  |
| ANALYSES BY AMDEL |              |     | B1        | B1       | C3        | E3     |                                                                                                  |           |           |           |           |           |           |          |          |           |           |           |           |           |           |           |           |           |  |
| METHOD            |              |     | XRF       | XRF      | AAS       | SIE    | A1                    A 2                    SEMI-QUANTITATIVE                    SPECTROGRAPHIC |           |           |           |           |           |           |          |          |           |           |           |           |           |           |           |           |           |  |

Each sample interval was also analysed by semi-quantitative spectrographic means for the following elements, but each element was below the limit of detection shown in brackets:

Ba (200); Ce (300); La (100); Mo (3); Nb (20); Sr (50);  
Ta (100); Th (100); Yb (1); Cd (3); Ge (3); In (10).

REPORT CMS 77/9/6

Because examinations were confined to thin sections supplied, the descriptions are somewhat restricted, particularly where K-feldspar staining tests could not be carried out.

NDDH1:180m

This is an almost monomineralic diopside rock, and its fabric suggests that it is a skarn.

Apart from occasional small patches of yellowish chlorite, usually with associated traces of goethite, the rock consists of interlocking anhedral patches of pale diopside averaging 0.3mm in size. These are randomly orientated and featureless. The chlorite patches are very probably an alteration product of another, unknown calc-silicate mineral or perhaps forsterite; diagnostic relict textures are absent.

Very occasional prismatic diopside crystals are intergrown with tremolite. Microfractures occur in places, with films of goethite.

NDDH1:200m

This rock may be termed an impure marble, or a diopside-forsterite marble; it appears to have composition banding, not so distinct in thin section but doubtless much more noticeable in hand specimen.

The bands consist of medium crystalline calcite (a positive calcite-stain was obtained on a very small exposed edge on the slide) alternating with granular to prismatic diopside; both types of bands are several millimetres wide. Much thinner, discontinuous bands or streaks of forsterite olivine are interspersed, occurring mainly in the calcite. The olivine is characteristically incipiently serpentinised and is dark, presumably due to pigmentation by ultrafine ?magnetite.

Intergranular, highly irregular small patches and shreds of pyrrhotite are present in places and may have been derived from primary/?syngenetic pyrite.

DENSITY CORRECTION : NOT NECESSARY FOR  
SM - 5 OR JH - 8  
METERS.

## Magnetic Susceptibility Measurements

REC. TYPE 

|  |  |
|--|--|
|  |  |
|--|--|

PAGE 1 OF 4 PAGES

[illegible]

DATE 

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| Y | Y | M | M | D | D |
| 8 | 1 | 0 | 3 | 2 | 6 |

DRILL HOLE N° 

|  |  |  |   |   |   |   |   |
|--|--|--|---|---|---|---|---|
|  |  |  | N | D | D | H | I |
|--|--|--|---|---|---|---|---|

COLLAR COORDS      41      44      1      7      0      0      47      N      N      48

55
E  
  408650  
K  
49
55
55
55

INSTRUMENT 

|  |  |   |   |   |
|--|--|---|---|---|
|  |  | J | H | 8 |
|--|--|---|---|---|

  
57 61

RECORDED BY 

|  |   |   |   |
|--|---|---|---|
|  | H | D | B |
|--|---|---|---|

  
62 65

| DEPTH<br>( <del>DEPTH</del> ) <i>feet</i> | ①<br>READING<br>10 <sup>-6</sup> cgs | CORE DIAM<br>mm. | ②<br>CORE SIZE<br>CORR. FACT. | ③<br>DENSITY<br>CORR. | (① × ② × ③)<br>CORRECTED<br>READING K | GEOLOGY<br>(ANALOGUE) |
|-------------------------------------------|--------------------------------------|------------------|-------------------------------|-----------------------|---------------------------------------|-----------------------|
|-------------------------------------------|--------------------------------------|------------------|-------------------------------|-----------------------|---------------------------------------|-----------------------|

[illegible]

**SIZE CORRECTION :**  
**(MULTIPLY READING)**

| METER | SM-5  | JH-8  |
|-------|-------|-------|
| NQ    | K 1.5 | K 1.0 |
| BO    | K 1.5 | K 2.1 |

DENSITY CORRECTION : NOT NECESSARY FOR  
SM - 8 OR JH - 8  
METERS.



**DENSITY CORRECTION : NOT NECESSARY FOR  
SM - 6 OR JH - 8  
METERS.**

DENSITY CORRECTION : NOT NECESSARY FOR  
SM-5 OR JH-8  
METERS.

## Magnetic Susceptibility Measurements

REC. TYPE 

|  |  |
|--|--|
|  |  |
|--|--|

PAGE 2 OF 2 PAGES

[illegible]

DATE 

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 8 | 1 | 0 | 3 | 2 | 6 |
|---|---|---|---|---|---|

 DRILL HOLE NO 

|  |  |  |   |   |   |   |   |
|--|--|--|---|---|---|---|---|
|  |  |  | N | O | D | H | 3 |
|--|--|--|---|---|---|---|---|

COLLAR COORDS      41      47      48      49      55      56

INSTRUMENT 57 J # 8 61 RECORDED BY 62 L D B 65

| DEPTH<br>(METRES) |  |     | ①<br>READING<br>10 <sup>-6</sup> cgs | CORE DIAM<br>mm. | ②<br>CORE SIZE<br>CORR. FACT. | ③<br>DENSITY<br>CORR. | (① × ② × ③)<br>CORRECTED<br>READING K | GEOLOGY<br>(ANALOGUE) |
|-------------------|--|-----|--------------------------------------|------------------|-------------------------------|-----------------------|---------------------------------------|-----------------------|
|                   |  | 300 | 400                                  | 30               |                               |                       |                                       | Gossan                |
|                   |  | 310 | 10                                   |                  |                               |                       |                                       |                       |
|                   |  | 312 | 20                                   |                  |                               |                       |                                       |                       |
|                   |  | 315 | 400                                  |                  |                               |                       |                                       |                       |
|                   |  | 317 | 20                                   |                  |                               |                       |                                       |                       |
|                   |  | 319 | 25                                   |                  |                               |                       |                                       |                       |
|                   |  | 323 | 80                                   |                  |                               |                       |                                       |                       |
|                   |  | 325 | 300                                  |                  |                               |                       |                                       |                       |
|                   |  | 330 | 10                                   | ↓                |                               |                       |                                       | Andalusite hornfels   |

**SIZE CORRECTION :**  
**(MULTIPLY READING)**

| METER | SM-5  | JH-8  |
|-------|-------|-------|
| NQ    | x 1.6 | x 1.8 |
| BQ    | x 1.8 | x 2.1 |

DENSITY CORRECTION : NOT NECESSARY FOR  
SM - 5 OR JH - 5  
METERS.

APPENDIX 10

Cuprona - Modelling of Ground Magnetics, by G. Oakes. DMN/1

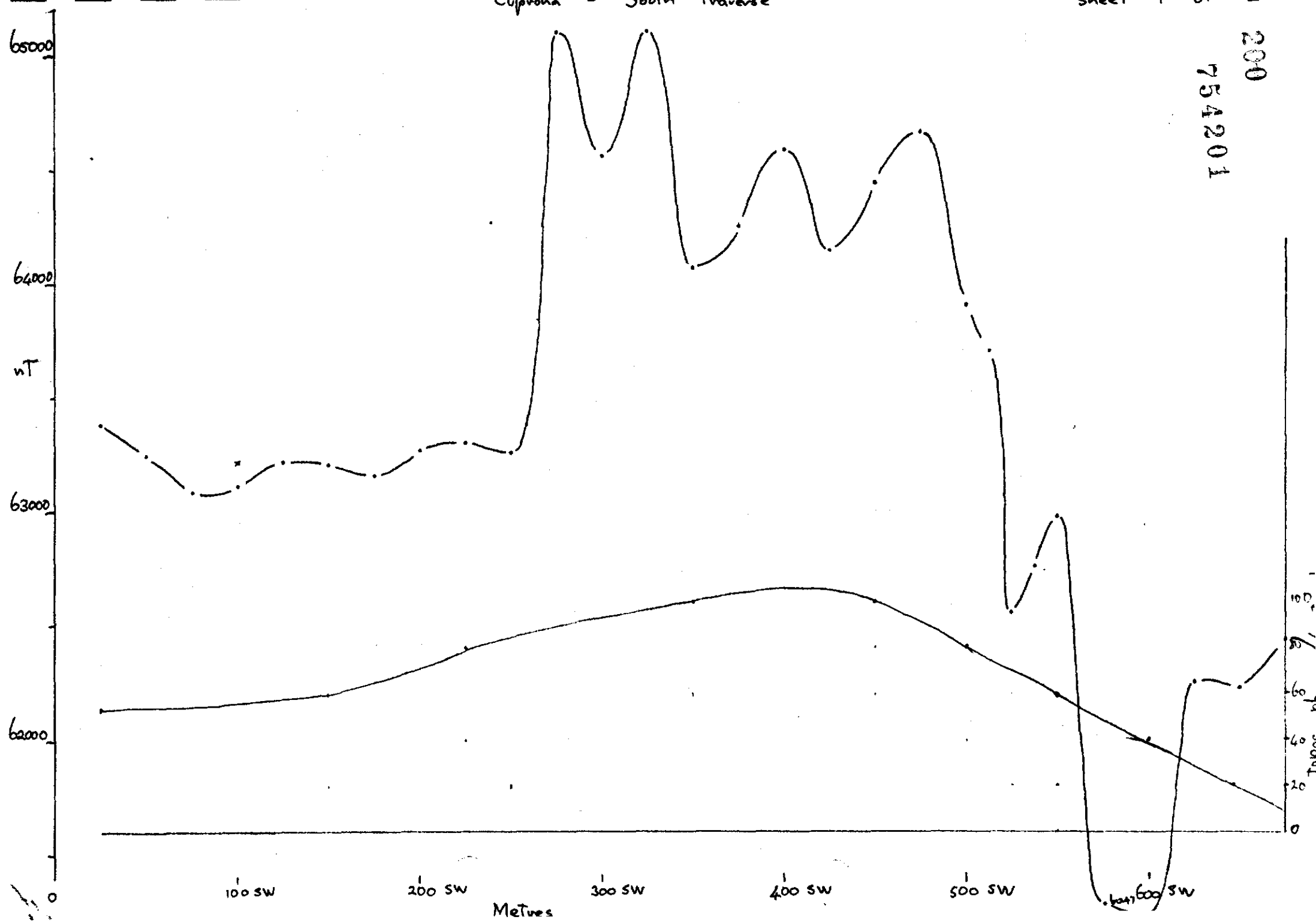
Cuprona - (Anomaly 4144/1)

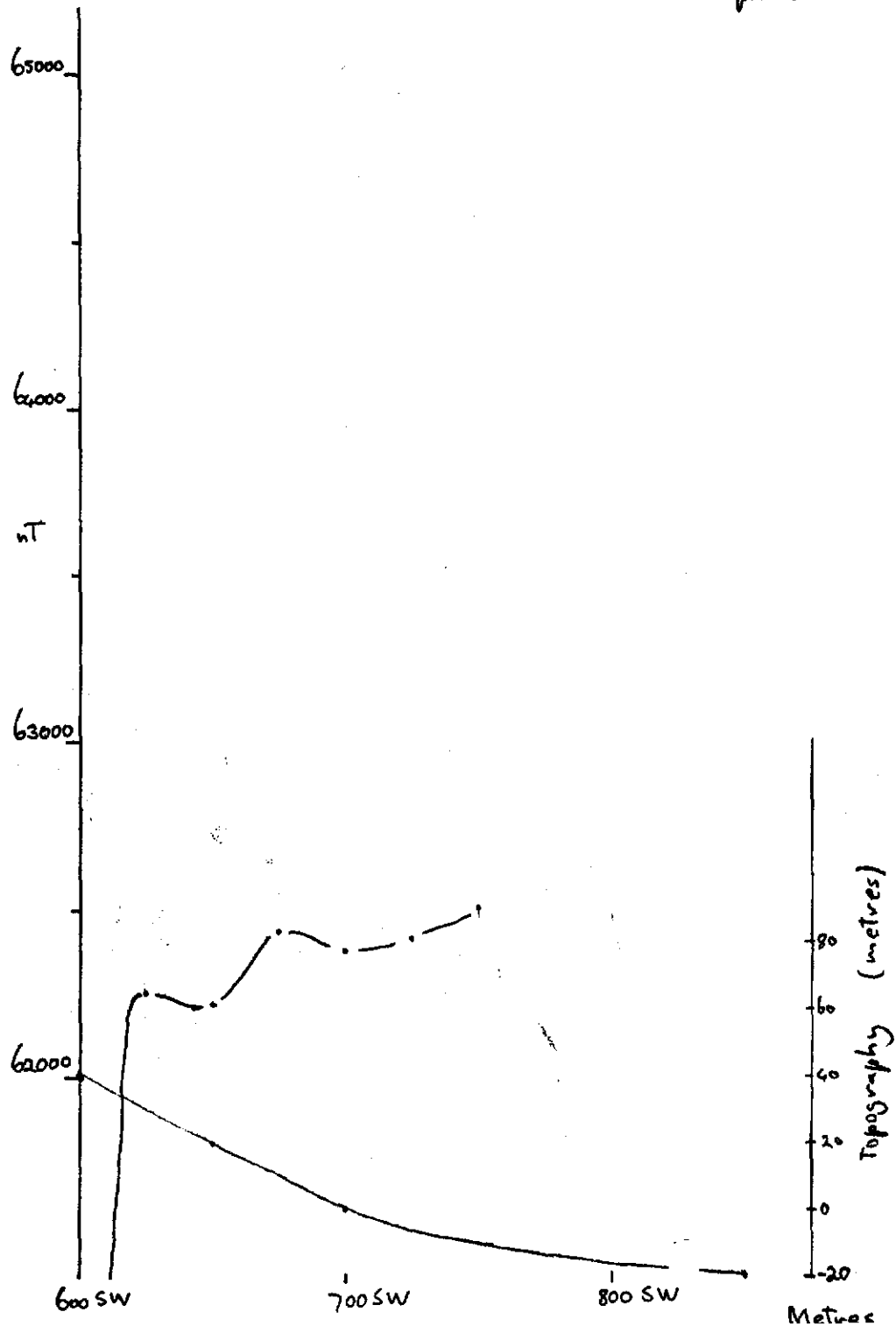
Two ground magnetic traverses were done across the Cuprona airborne anomaly. This anomaly trends northwest to southeast is 300 metres wide and has an amplitude of 1600nT, yielding a  $K^1$  value of 800. There is a small potassium channel high associated with the anomaly. The anomaly was interpreted to have a near surface source with some topographic association, although susceptibilities of the order of  $15000 \times 10^{-6}$  cgs units were required for the anomaly to be purely topographic in origin.

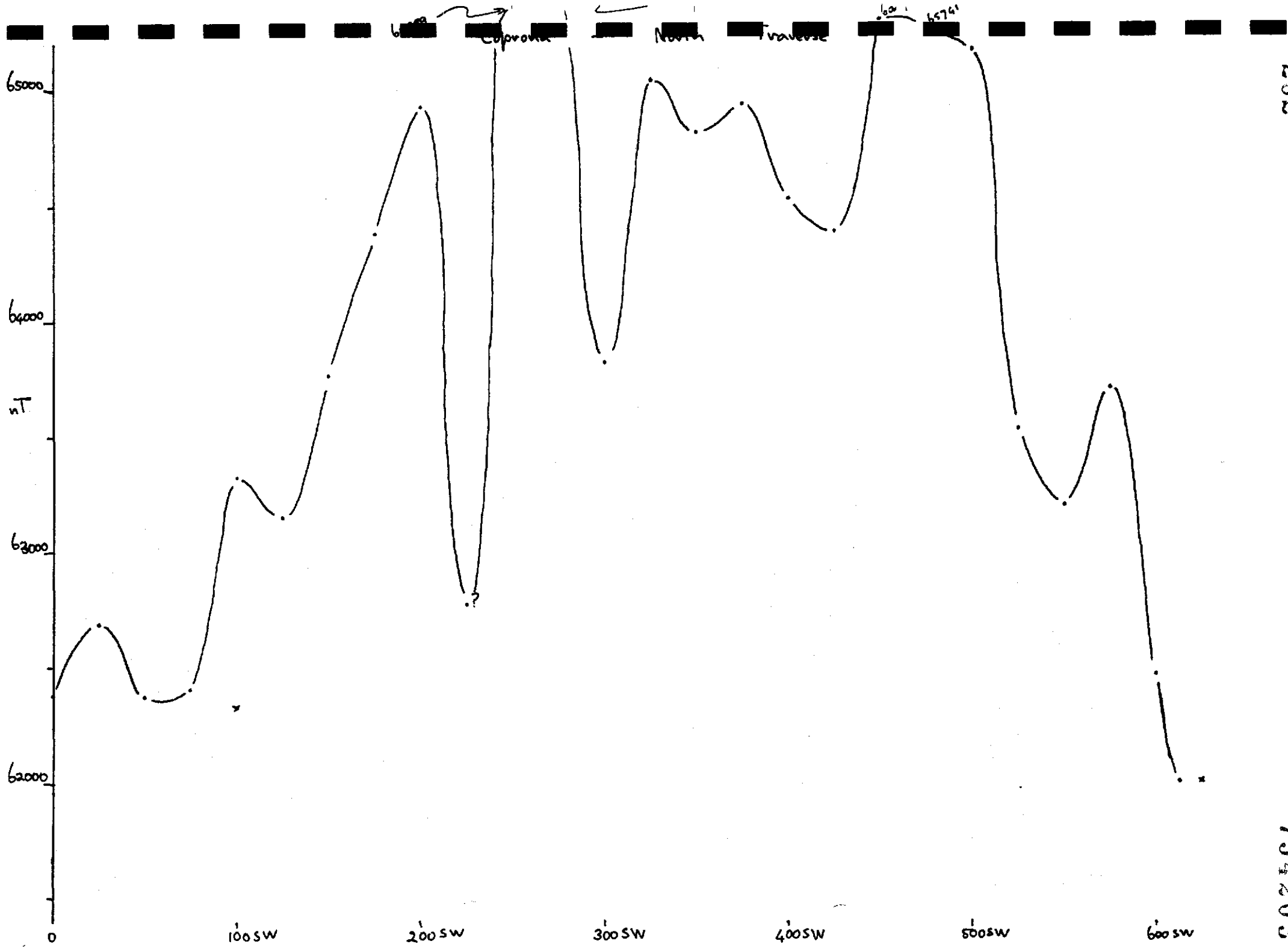
The southern ground traverse (see Fig. 1) gave a 2000 nT anomaly of width between 400 and 500 metres, overlying a hill which is approximately 100 metres high. Basalt float in the area was measured to have a susceptibility of  $200-800 \times 10^{-6}$  cgs units. The northern traverse yielded a larger, broader anomaly but also contained more noise, reflecting the variable susceptibility of the near-surface basalts.

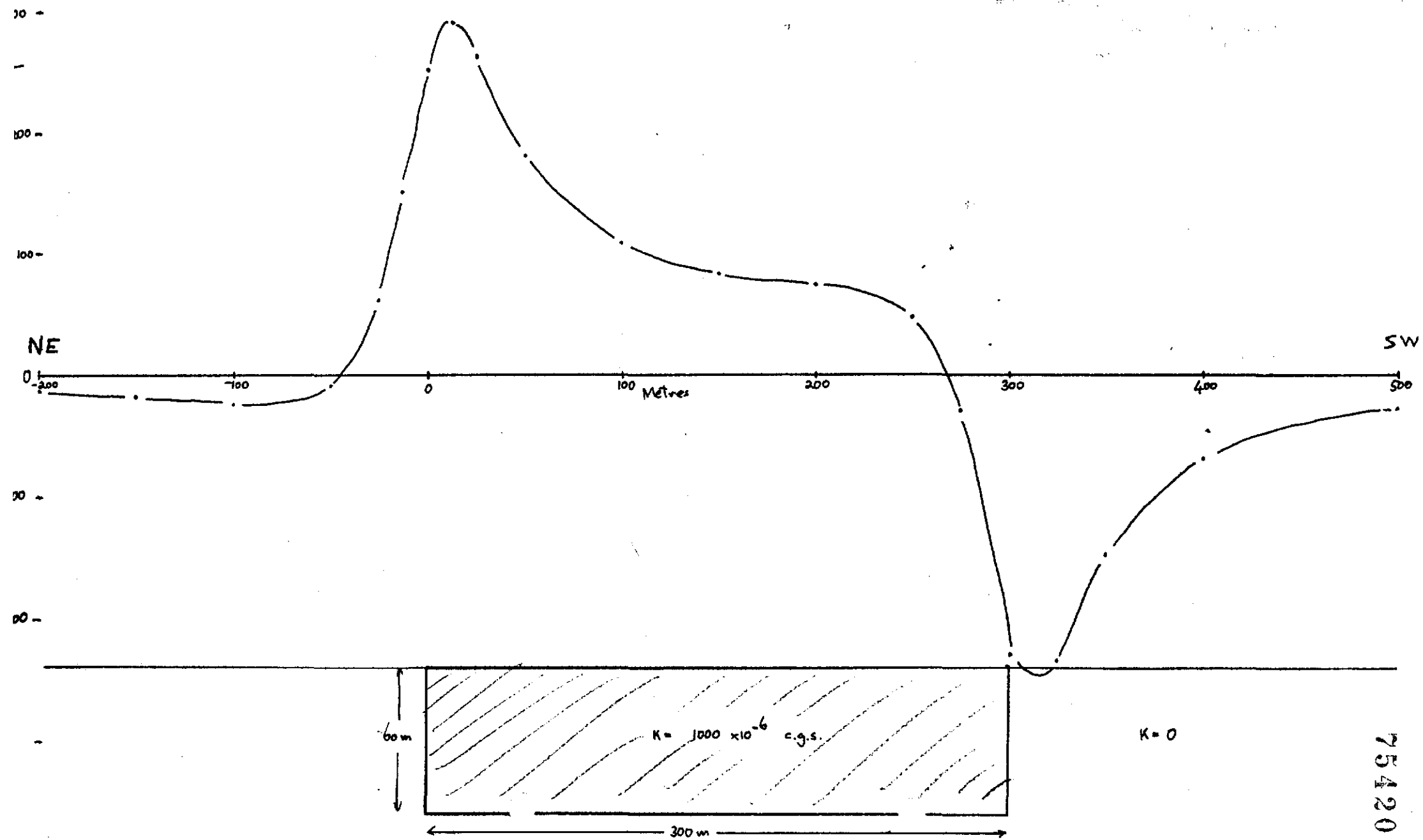
Figure 1 gives a model anomaly for a 300 metre wide, 60 metre high hill of infinite strike length and a susceptibility contrast of  $1000 \times 10^{-6}$  cgs units. Comparison contrast shape of this anomaly with the southern profile from Cuprona indicates that the Cuprona anomaly is strongly related to topography. Comparison of the amplitudes, however, shows that a susceptibility contrast of the order of  $7000 \times 10^{-6}$  cgs units is required for the observed anomaly to be purely topographic. This value is much higher than the measured susceptibility of basalt at surface along the traverse, or from boreholes elsewhere in northern Tasmania. The  $7000 \times 10^{-6}$  cgs units figure is however well within the average basalt susceptibility range.

It thus seems probable that the Cuprona anomaly is caused by non-outcropping high susceptibility basalts/dolerite (or possibly ultramafics) forming the Cuprona Hill.









APPENDIX 11

B.M.R. NATONE MAGNETIC SURVEY REPORT

Accompanied by plan D/MQ04/064

RECORD No. 1964/14

NATONE MAGNETIC SURVEY,  
TASMANIA 1962

by

*E.N. EADIE*

The information contained in this report has been obtained by the Department of National Development as part of the policy of the Commonwealth Government to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus or statement without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

|                 | Page |
|-----------------|------|
| <u>SUMMARY</u>  |      |
| 1. INTRODUCTION | 1    |
| 2. RESULTS      | 1    |
| 3. REFERENCE    | 1    |

ILLUSTRATION

Plate 1. Locality map and traverse plan, showing vertical magnetic contours (Drawing No.K55/B7-64)

SUMMARY

At the request of the Tasmanian Department of Mines, an aeromagnetic survey of selected areas in north-western Tasmania was done by the Bureau of Mineral Resources Geology and Geophysics during 1955 and 1956 to assist in the exploration for iron ore.

A ground magnetic survey of iron deposits at Natone was made by the Bureau during 1957.

During March 1962 some additional magnetic traverses at Natone were surveyed to obtain more detailed information about the anomalies observed during the 1957 survey.

The additional magnetic work has not in general modified the original indications very much, but has outlined the anomalies in more detail, and with greater certainty.

### 1. INTRODUCTION

At the request of the Tasmanian Department of Mines, an aeromagnetic survey of selected areas in north-western Tasmania was done by the Bureau of Mineral Resources, Geology and Geophysics during 1955 and 1956. The purpose of this survey was to assist in the exploration for iron ore.

Following this aeromagnetic survey, ground magnetic surveys were made of selected areas during 1957. Among these was a survey of iron deposits at Natone. The purpose of this survey was to determine more exactly the position of the deposits. The results of the survey were described by Keunecke (1959).

In order to outline in greater detail the anomalies observed during the 1957 survey some additional magnetic traverses were surveyed during March 1962 using an ABEM MZ-4 torsion magnetometer. Readings were taken along the traverses at intervals of 25 ft. As a check, some of the traverses from the 1957 survey were resurveyed; the magnetic results of both surveys were in good agreement.

The positions of additional traverses, and also of those which were resurveyed, are shown on Plate 1. As much of the Natone area is under cultivation, most of the pegs from the 1957 survey had been destroyed by 1962. The baseline was relocated and pegging was necessary not only of the new traverses, but also of those which were repeated. A permanent mark consisting of a length of piping, was inserted at 00 and at 2433S on the baseline (see Plate 1).

The magnetic readings were taken by B.N. Eadie, geophysicist of the Bureau assisted by one field assistant. Pegging of the traverses was done by surveyor R. Grace of the Department of the Interior, assisted by two chainmen.

### 2. RESULTS

The magnetic results for the Natone area are shown on Plate 1 as contours of vertical magnetic field using a contour interval of 500 gammas and a scale of 200 ft to 1 inch. These contours include the results of both the 1957 and the 1962 surveys.

A comparison of this contour plan with that given by the earlier survey (Keunecke, 1959, Plate 4) shows that the additional magnetic work has not resulted in any major change to the original results. The anomaly centred about 2000S/500W has been outlined more accurately. Two of the new traverses, viz. 2750S and 3250S, have given more-detailed information on the large anomaly previously recorded south of Traverse 2300S. On Traverse 3250S the body causing this anomaly is shown to be narrower than previously supposed. The results on Traverse 2750S support the suggestion by Keunecke (1959) that the anomaly at about 200E is due to a separate body.

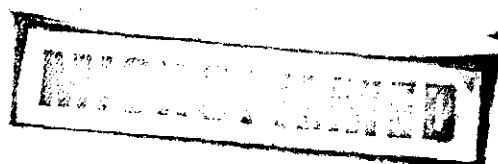
### 3. REFERENCE

- |              |      |                                                                                                                                                                       |
|--------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| KEUNECKE, O. | 1959 | Magnetic survey of the Natone, Blythe River - Cuprona, and Highclere iron ore deposits, north-western Tasmania. <u>Bur. Min. Resour. Aust. Rec. 1959/11 (unpubl).</u> |
|--------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|

LIST OF PLANS

754209

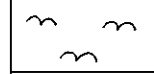
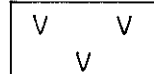
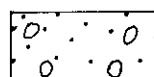
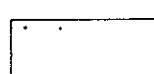
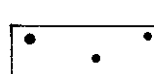
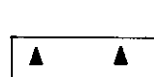
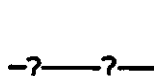
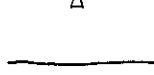
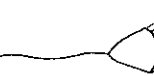
| <u>TITLE</u>                                                                                            | <u>DRAWING No.</u> | <u>SCALE</u> |
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| Redwater Prospect - Geology & Drill Hole Locations                                                      | D/MQ 04/053        | 1:2,500      |
| Redwater Grid - Peak Hill Farm                                                                          | D/MQ 04/014        | 1:2,500      |
| Redwater Prospect - Section through Line 6100N - Geology & Geophysics                                   | D/MQ 04/036        | 1:1,000      |
| Redwater Prospect - Section through Line 6100N - Drill holes RED 3, RD 4, & RD 5 - Geology              | D/MQ 04/035A       | 1: 500       |
| Redwater Prospect - Section through Line 6100N - Drill holes RED 3, RD 4, & RD 5 - Geochem. Assays Sn/W | D/MQ 04/035B       | 1: 500       |
| Laurel Creek West - Soil Geochemistry - Cu, Pb, Zn                                                      | D/MQ 04/049        | 1:2,500      |
| Laurel Creek West - Soil Geochemistry - Sn, W                                                           | D/MQ 04/050        | 1:2,500      |
| Laurel Creek West - Soil Geochemistry - Ni, Fe                                                          | D/MQ 04/051        | 1:2,500      |
| Laurel Creek West - Soil Geochemistry Contours - Fe%                                                    | D/MQ 04/057        | 1:2,500      |
| Laurel Creek West - Soil Geochemistry Contours - Ni                                                     | D/MQ 04/058        | 1:2,500      |
| Laurel Creek West - Soil Geochemistry Contours - Zn                                                     | D/MQ 04/059        | 1:2,500      |
| Laurel Creek West - Soil Geochemistry Contours - W                                                      | D/MQ 04/060        | 1:2,500      |
| Laurel Creek West - Soil Geochemistry Contours - Sn                                                     | D/MQ 04/061        | 1:2,500      |
| Laurel Creek West - Soil Geochemistry Contours - Cu                                                     | D/MQ 04/062        | 1:2,500      |
| Laurel Creek West - Soil Geochemistry Contours - Pb                                                     | D/MQ 04/063        | 1:2,500      |
| Laurel Creek West - Total Field Contours                                                                | D/MQ 04/043        | 1:2,500      |
| Loyetee Prospect - Eastern Portion - Slope Corrections & Soil Sample Depths                             | D/MQ 04/038        | 1:2,500      |
| Loyetee Prospect - Western Portion - Slope Corrections & Soil Sample Depths                             | D/MQ 04/052        | 1:2,500      |

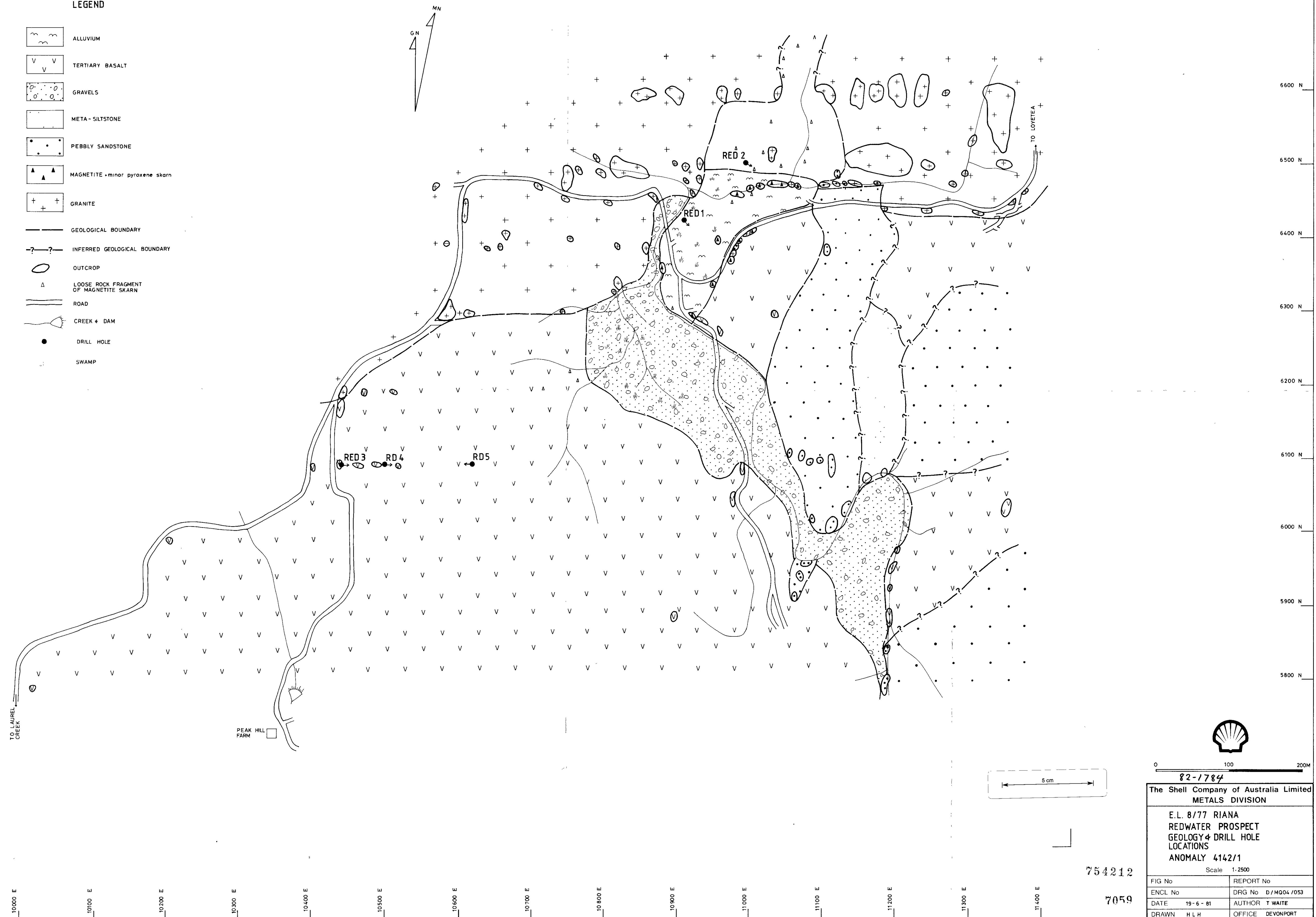


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| Loyetee Prospect - Eastern Portion<br>Soil Geochemistry - Ni, Fe     | D/MQ 04/045        | 1:2,500      |
| Loyetee Prospect - Eastern Portion<br>Soil Geochemistry - Sn, W      | D/MQ 04/046        | 1:2,500      |
| Loyetee Prospect - Eastern Portion<br>Soil Geochemistry - Cu, Pb, Zn | D/MQ 04/047        | 1:2,500      |
| Loyetee Prospect - Western Portion<br>Soil Geochemistry - Sn, W      | D/MQ 04/054        | 1:2,500      |
| Loyetee Prospect - Western Portion<br>Soil Geochemistry - Cu, Pb, Zn | D/MQ 04/055        | 1:2,500      |
| Loyetee Prospect - Western Portion<br>Soil Geochemistry - Ni, Fe     | D/MQ 04/056        | 1:2,500      |
| Loyetee Prospect - Eastern Portion<br>Ground Magnetic Values         | D/MQ 04/037        | 1:2,500      |
| Loyetee Prospect - Eastern Portion<br>Stacked Magnetic Profiles      | D/MQ 04/039        | 1:2,500      |
| Loyetee Prospect - Western Portion<br>Ground Magnetics               | D/MQ 04/042        | 1:2,500      |
| Loyetee West - Magnetic Profiles                                     | D/MQ 04/048        | 1:2,500      |
| Natone Anomaly 4044/1<br>B.M.R. Vertical field magnetic contours     | D/MQ 04/064        | 1:2,500      |
| Natone - Outcrop Geology & Grid Location                             | D/MQ 04/078        | 1:5,000      |
| Natone - Soil Geochemistry - Cu, Pb, Sn,<br>Zn, W, Fe                | D/MQ 04/023        | 1:2,500      |
| Natone - Soil Geochemistry - Fe% Contours                            | D/MQ 04/024        | 1:2,500      |
| Natone - Soil Geochemistry - Zn Contours                             | D/MQ 04/025        | 1:2,500      |
| Natone - Soil Geochemistry - Sn Contours                             | D/MQ 04/026        | 1:2,500      |
| Natone - Soil Geochemistry - W Contours                              | D/MQ 04/027        | 1:2,500      |
| Natone - Soil Geochemistry - Pb Contours                             | D/MQ 04/028        | 1:2,500      |
| Natone - Soil Geochemistry - Cu Contours                             | D/MQ 04/029        | 1:2,500      |
| Natone - Proton Precession Magnetometry<br>Sheet 1 - Profiles        | D/MQ 04/010        | 1:2,500      |
| Natone - Proton Precession Magnetometry<br>Sheet 2 - Profiles        | D/MQ 04/011        | 1:2,500      |
| Natone - Magnetic Contours                                           | D/MQ 04/012        | 1:2,500      |
| Natone - Magnetics                                                   | D/MQ 04/013        | 1:2,500      |

| <u>TITLE</u>                                                                                         | <u>DRAWING No.</u> | <u>SCALE</u> |
|------------------------------------------------------------------------------------------------------|--------------------|--------------|
| Cuprona Anomaly - Proton Precession<br>Magnetometry Lines 00N, 100N & 150N                           | D/MQ 04/007        | 1:2,500      |
| Cuprona - Proton Precession Magnetometry<br>Lines 1900N, 2000N, 2100N, 2200N, 2300N<br>2400N & 2500N | D/MQ 04/009        | 1:2,500      |
| Cuprona - Airborne Magnetic Anomaly 4041/11<br>Reconnaissance Ground Magnetics                       | D/MQ 04/015        | 1:2,500      |
| Cuprona Prospect - Ground Magnetic Values                                                            | D/MQ 04/020        | 1:2,500      |
| Cuprona Prospect - Ground Magnetic Contours                                                          | D/MQ 04/021        | 1:2,500      |
| Cuprona - Soil Geochemistry -<br>Cu, Pb, Zn, Sn, W                                                   | D/MQ 04/022        | 1:2,500      |
| Cuprona - Soil Geochemistry - Cu Contours                                                            | D/MQ 04/030        | 1:2,500      |
| Cuprona - Soil Geochemistry - Pb contours                                                            | D/MQ 04/031        | 1:2,500      |
| Cuprona - Soil Geochemistry - Sn Contours                                                            | D/MQ 04/032        | 1:2,500      |
| Cuprona - Soil Geochemistry - Zn Contours                                                            | D/MQ 04/033        | 1:2,500      |
| Cuprona - Soil Geochemistry - W Contours                                                             | D/MQ 04/034        | 1:2,500      |

# LEGEND

-  ALLUVIUM
-  TERTIARY BASALT
-  GRAVELS
-  META-SILTSTONE
-  PEBBLY SANDSTONE
-  MAGNETITE + minor pyroxene skarn
-  GRANITE
-  GEOLOGICAL BOUNDARY
-  INFERRED GEOLOGICAL BOUNDARY
-  OUTCROP
-  LOOSE ROCK FRAGMENT OF MAGNETITE SKARN
-  ROAD
-  CREEK + DAM
-  DRILL HOLE
-  SWAMP



0 100 200M

82-1784

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METALS DIVISION

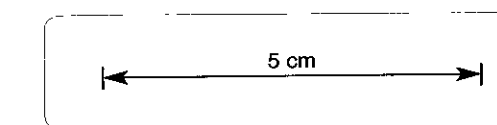
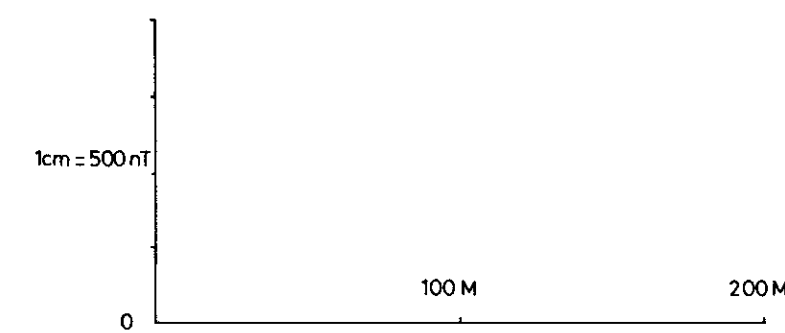
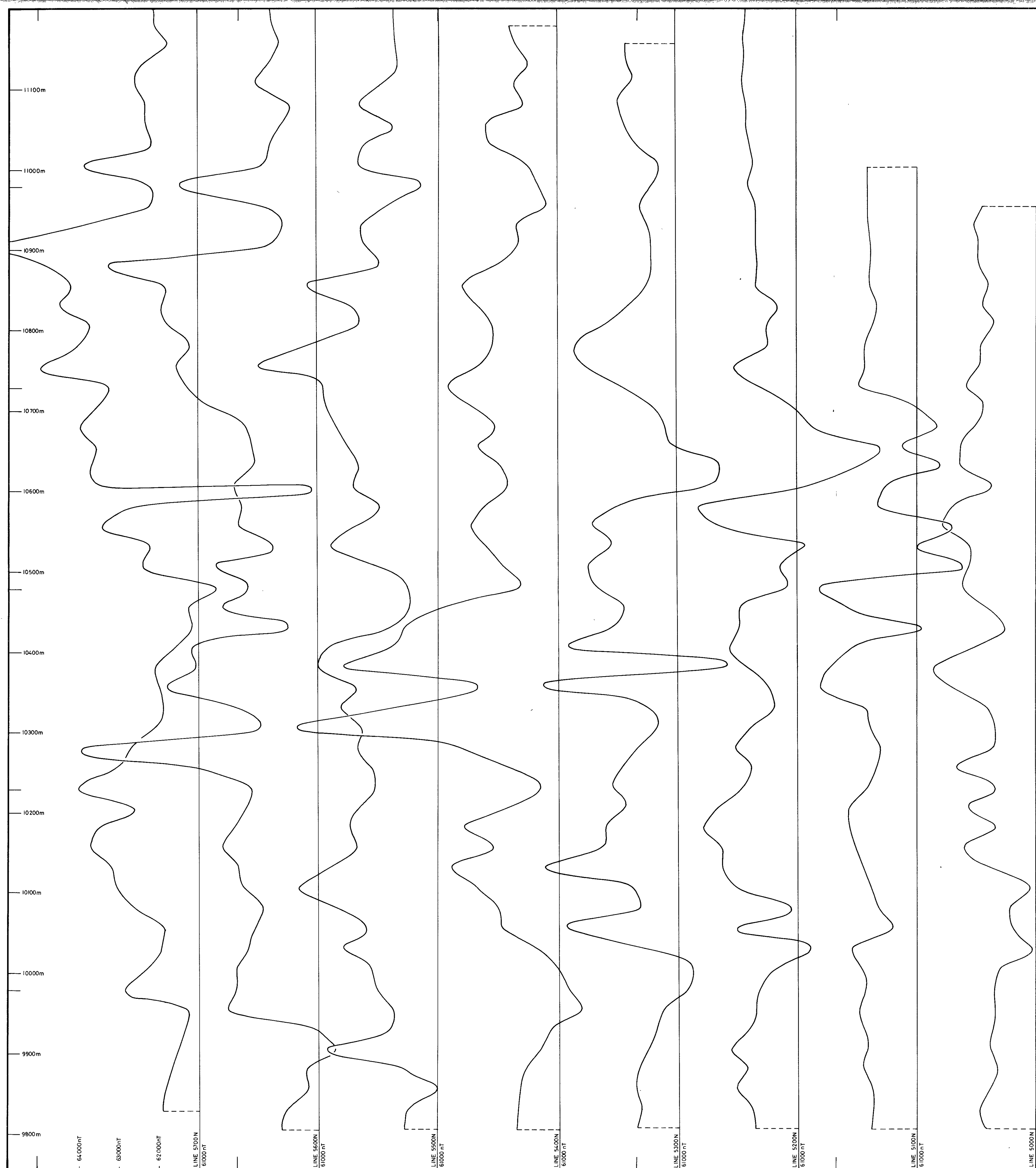
E.L. 8/77 RIANA  
REDWATER PROSPECT  
GEOLOGY & DRILL HOLE  
LOCATIONS  
ANOMALY 4142/1

Scale 1:2500

|              |                   |
|--------------|-------------------|
| FIG No       | REPORT No         |
| ENCL No      | DRG No D/MQ04/053 |
| DATE 19-6-81 | AUTHOR T WAITE    |
| DRAWN H L H  | OFFICE DEVONPORT  |

754212

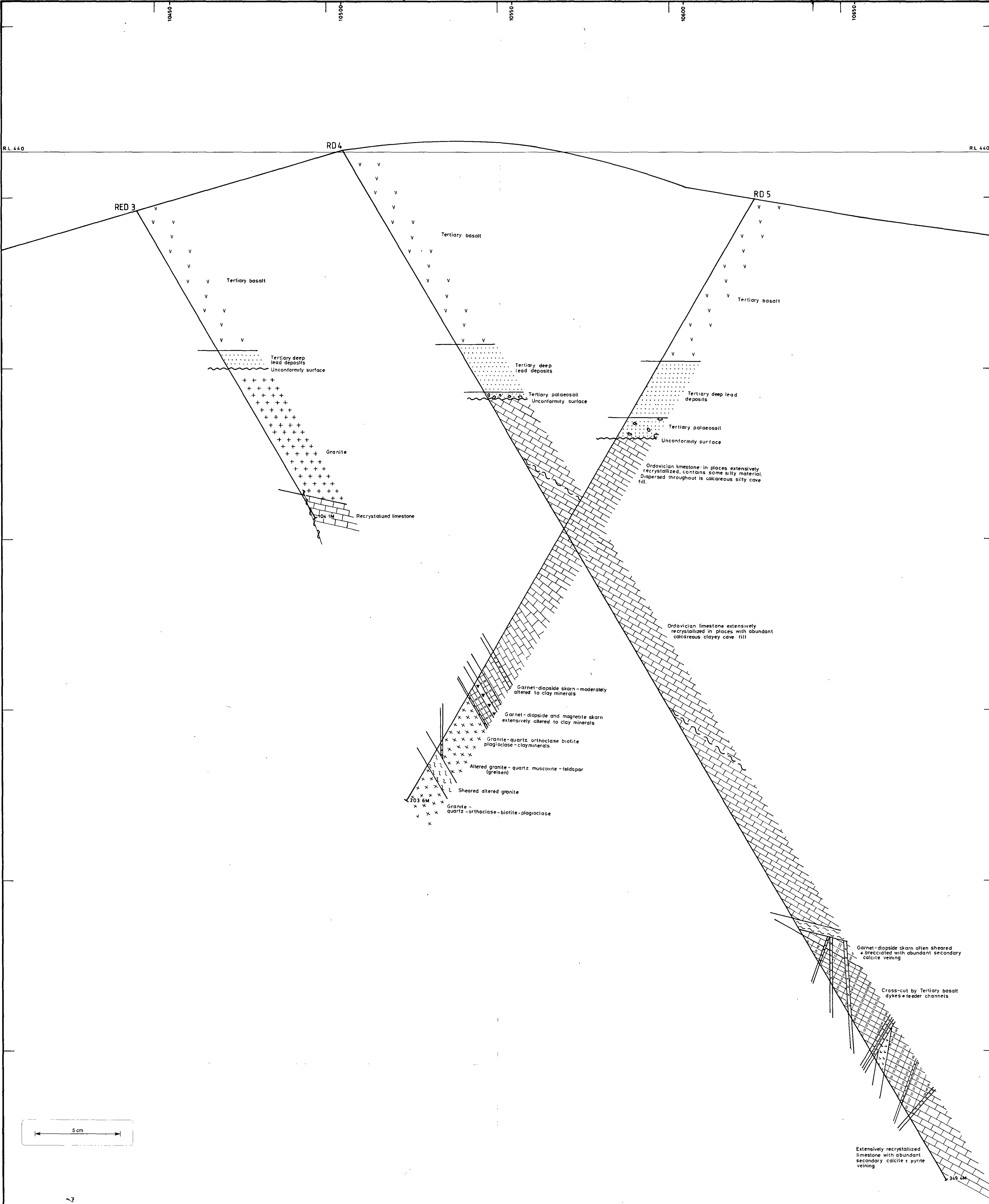
7059



754213  
7060

|                                                                                                                           |                      |
|---------------------------------------------------------------------------------------------------------------------------|----------------------|
| 82-1784                                                                                                                   |                      |
| The Shell Company of Australia Limited<br>METALS DIVISION                                                                 |                      |
| E.L. 8/77 RIANA<br>ANOMALY 4142/1<br>PEAK HILL FARM SECTION<br>REDWATER GRID<br>STACKED MAGNETICS PROFILE<br>Scale 1:2500 |                      |
| FIG. No.                                                                                                                  | REPORT No.           |
| ENCL. No.                                                                                                                 | DRG. No. D/MQ 04/014 |
| DATE 20-3-81                                                                                                              | AUTHOR               |
| DRAWN O HEDDITCH                                                                                                          | OFFICE DEVONPORT     |





754215

7062

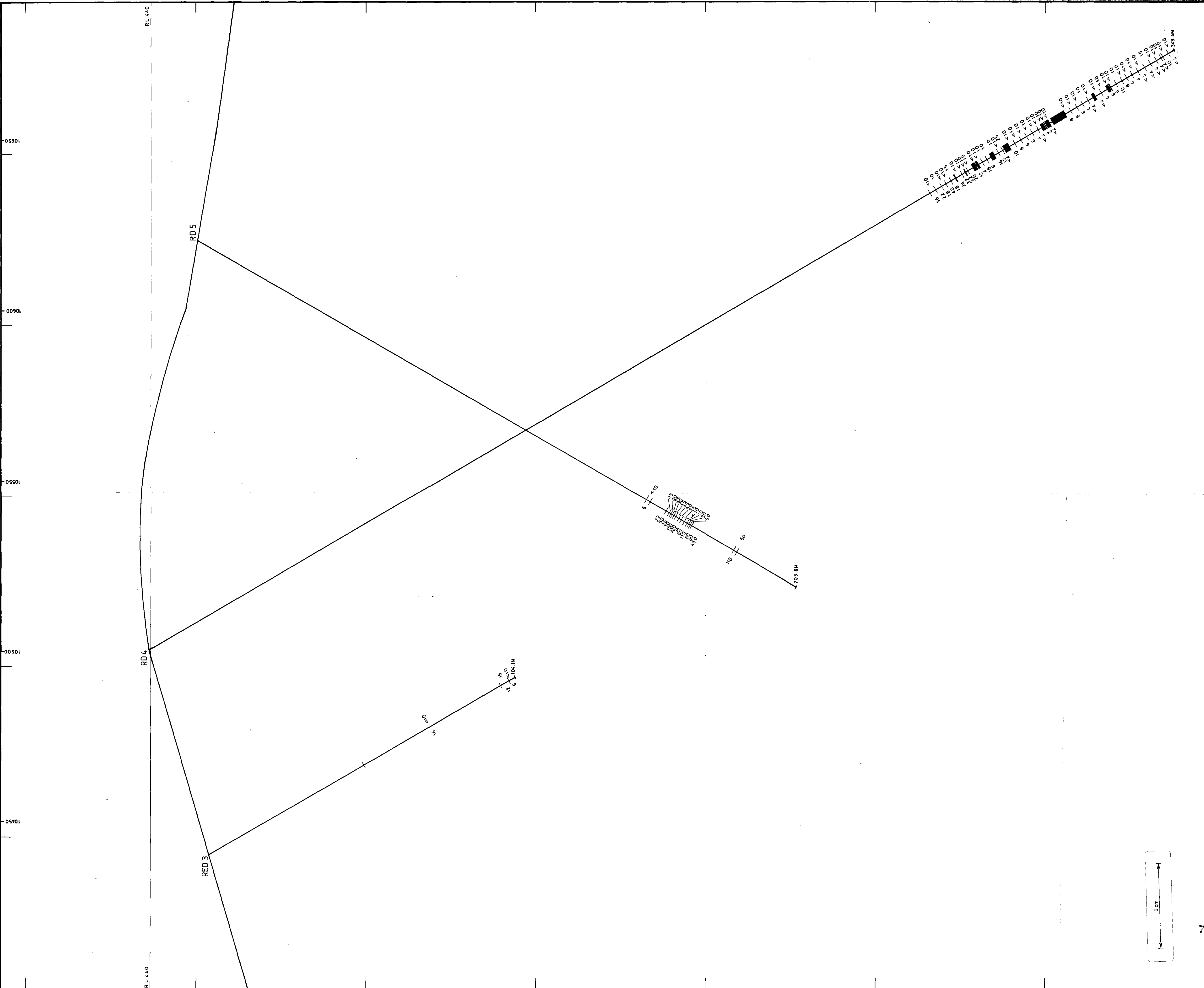
42-1784.

0 20M

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RIANA E.L. 8/77  
REDWATER PROSPECT  
LINE 6100N  
DRILL HOLES RED 3, RD4, RD5.  
ANOMALY 4142/1  
Scale - 1:500

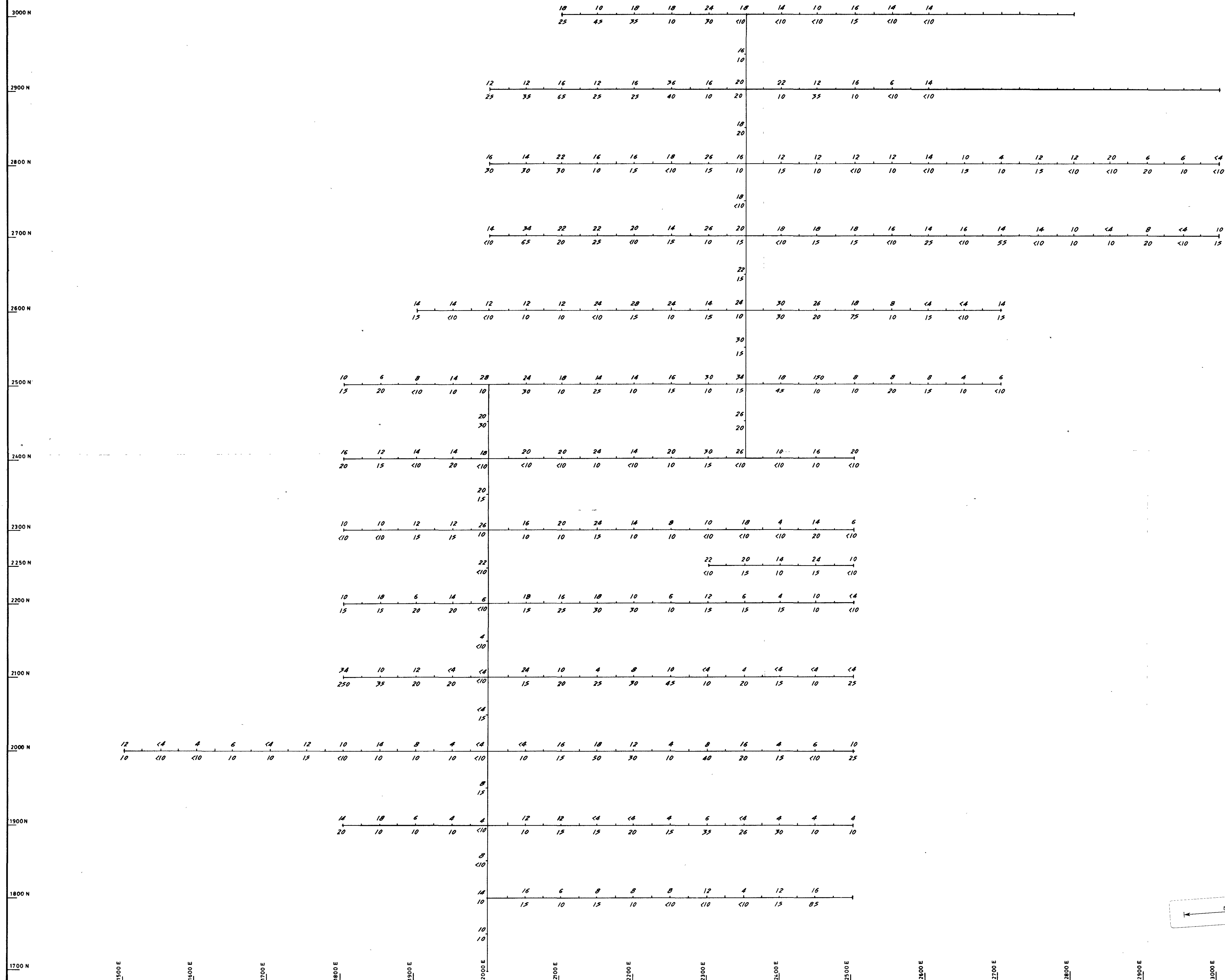
|              |                     |
|--------------|---------------------|
| FIG. No.     | REPORT No.          |
| ENCL. No.    | DRG. No. D/MQ/035 A |
| DATE 5-5-81  | AUTHOR L.D. BANWELL |
| DRAWN K.L.H. | OFFICE DEPARTMENT   |



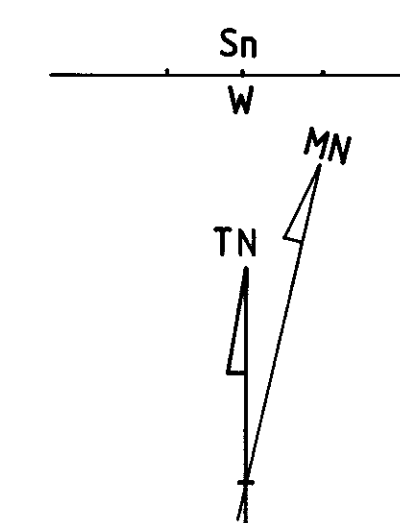
754216  
7063

| The Shell Company of Australia Limited<br>METALS DIVISION                                                |                       |
|----------------------------------------------------------------------------------------------------------|-----------------------|
| RIANA E.L. 8/77<br>REDWATER PROSPECT<br>LINE 6100N<br>DRILL HOLES RED3, RD4, RD5.<br>GEOCHEM ASSAYS Sn/W |                       |
| Scale 1:500                                                                                              |                       |
| FIG. No.                                                                                                 | REPORT No.            |
| ENCL. No.                                                                                                | DRG. No. D/MQ04/035 B |
| DATE 5-5-81                                                                                              | AUTHOR L.D. BANWELL.  |
| DRAWN H.L.H.                                                                                             | OFFICE DEVONPORT.     |





NOTE: Analyses in ppm.



82-1784

0 100 200m

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METALS DIVISION

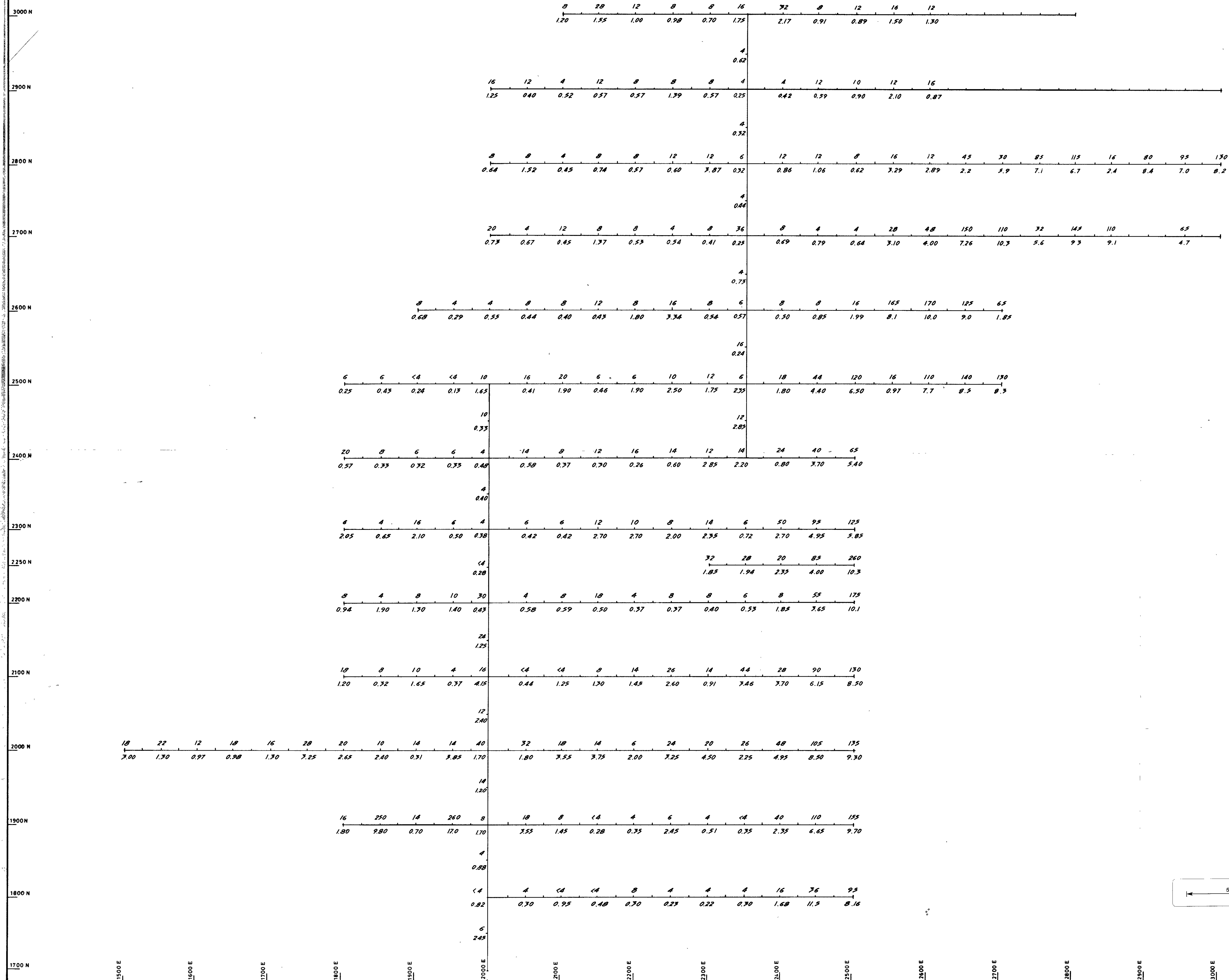
E.L. 8/77 RIANA  
LAUREL CREEK WEST  
SOIL GEOCHEMISTRY  
Sn, W.  
ANOMALY 4042/1

Scale: 1:2500

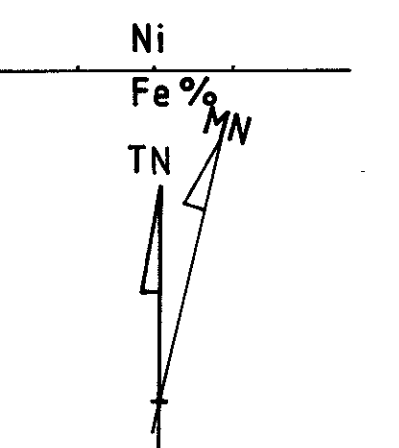
|              |                     |
|--------------|---------------------|
| FIG. No.     | REPORT No.          |
| ENCL. No.    | DRG. No. D/MQ04/050 |
| DATE 21-5-81 | AUTHOR L.D. BANWELL |
| DRAWN H.L.H. | OFFICE DEVONPORT    |

754218

7065



NOTE: Analyses in ppm.



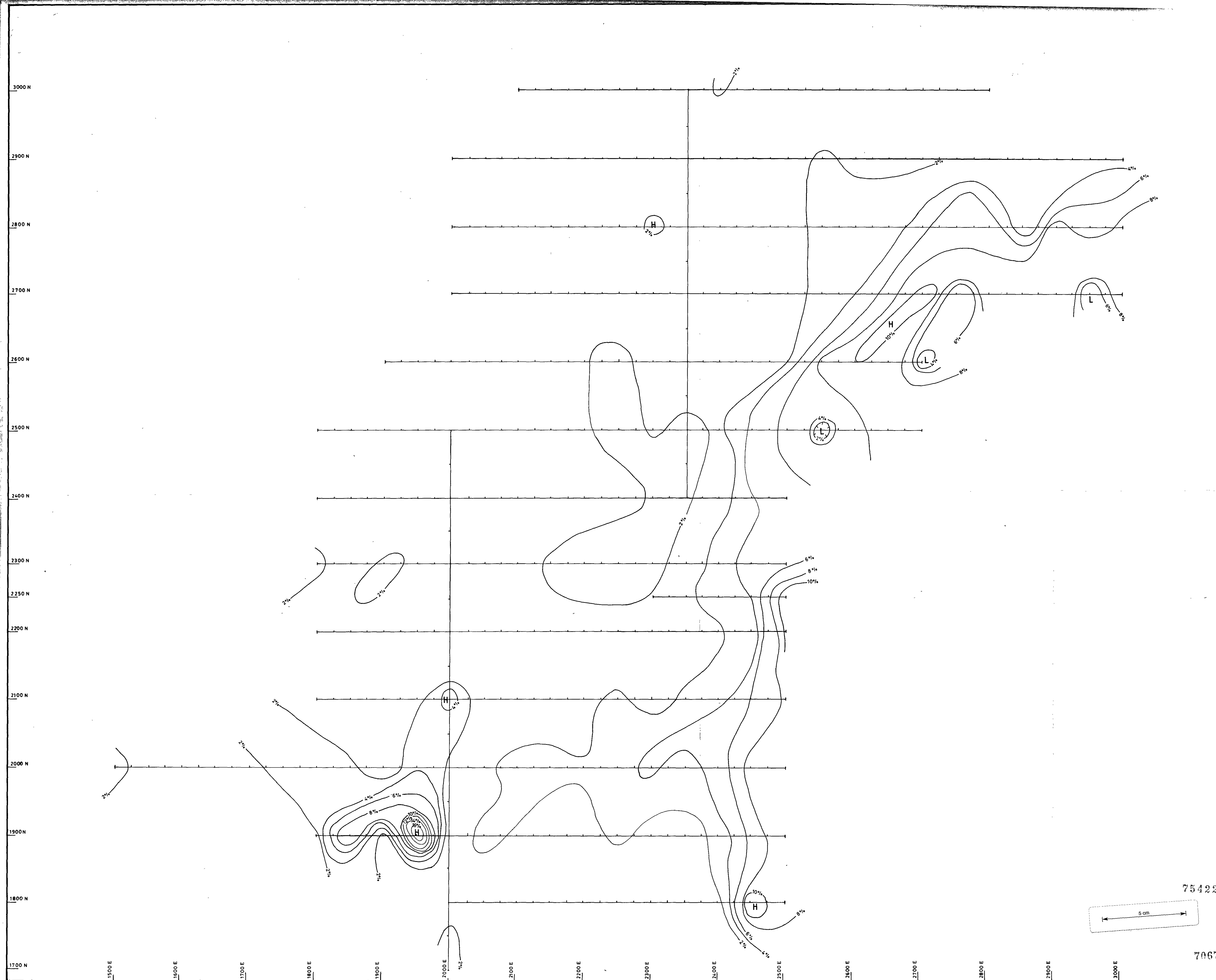
82-1784

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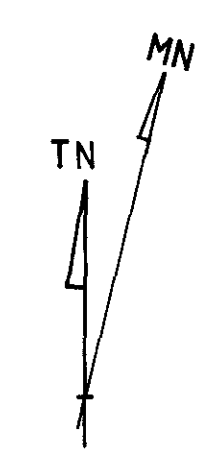
754210

|                                                                                        |                     |
|----------------------------------------------------------------------------------------|---------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                              |                     |
| E.L. 8/77 RIANA<br>LAUREL CREEK WEST<br>SOIL GEOCHEMISTRY<br>Ni, Fe.<br>ANOMALY 4042/1 |                     |
| Scale 1:2500                                                                           |                     |
| FIG. No.                                                                               | REPORT No.          |
| ENCL. No.                                                                              | DRG. No. D/MQ04/051 |
| DATE 21-5-81                                                                           | AUTHOR L.D. BANWELL |
| DRAWN H.L.H.                                                                           | OFFICE DEVONPORT    |

7066

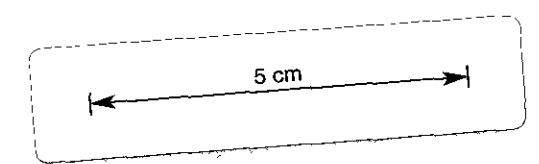


NOTE: Analyses in %



82-1784

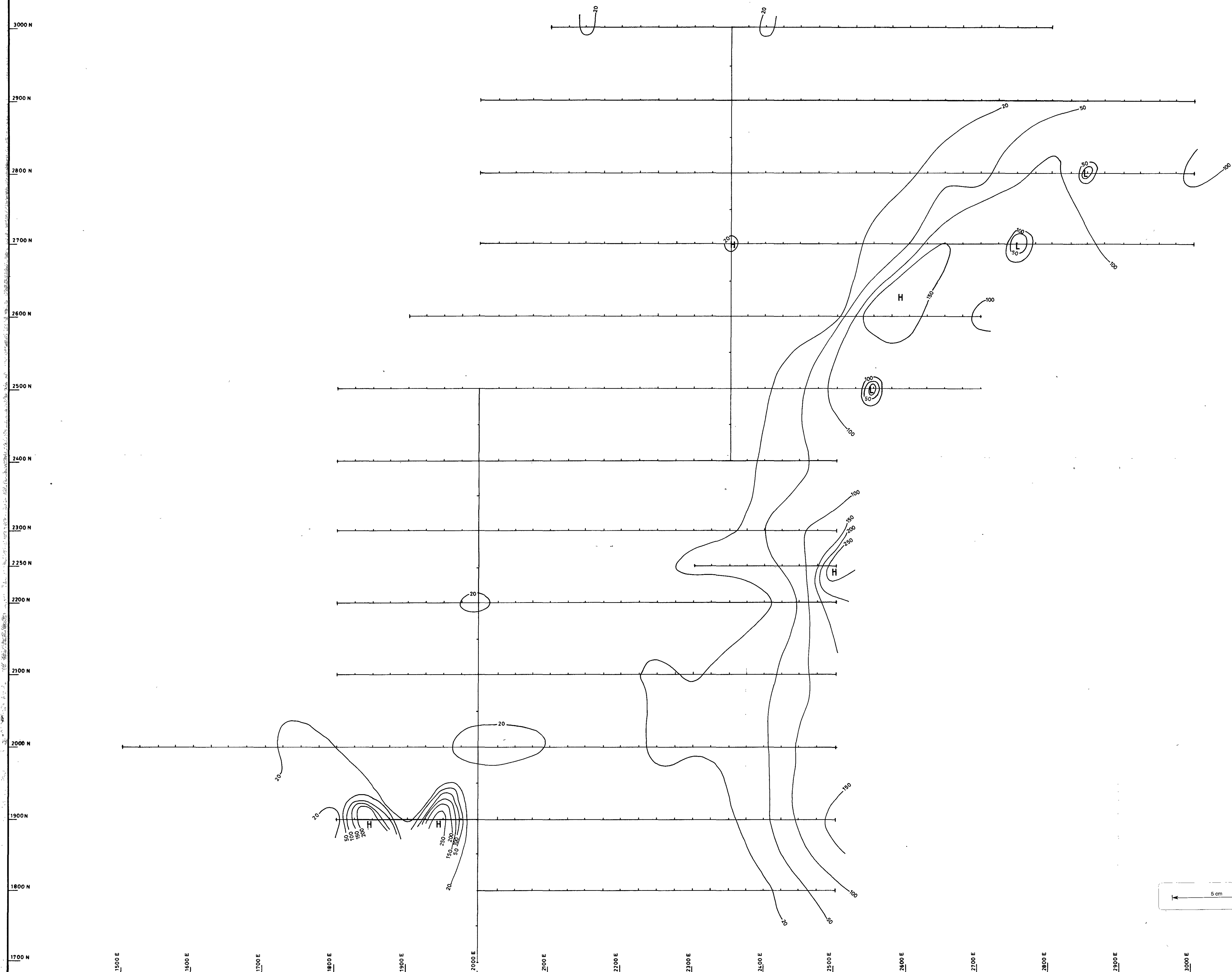
0 100 200M



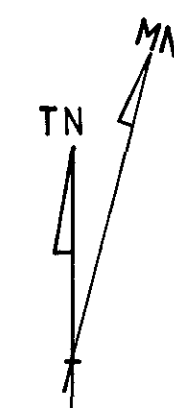
754220

7067

|                                                                                                             |                     |
|-------------------------------------------------------------------------------------------------------------|---------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                                                   |                     |
| E.L. 8/77 RIANA<br>LAUREL CREEK WEST<br>SOIL GEOCHEMISTRY CONTOURS<br>Fe%<br>ANOMALY 4042/1<br>Scale 1:2500 |                     |
| FIG. No.                                                                                                    | REPORT No.          |
| ENCL. No.                                                                                                   | DRG. No. D/MQ04/057 |
| DATE 21-5-81                                                                                                | AUTHOR L D BANWELL  |
| DRAWN H L H                                                                                                 | OFFICE DEVONPORT    |



NOTE: Analyses in ppm.



82-1784

0 100 200M

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METALS DIVISION

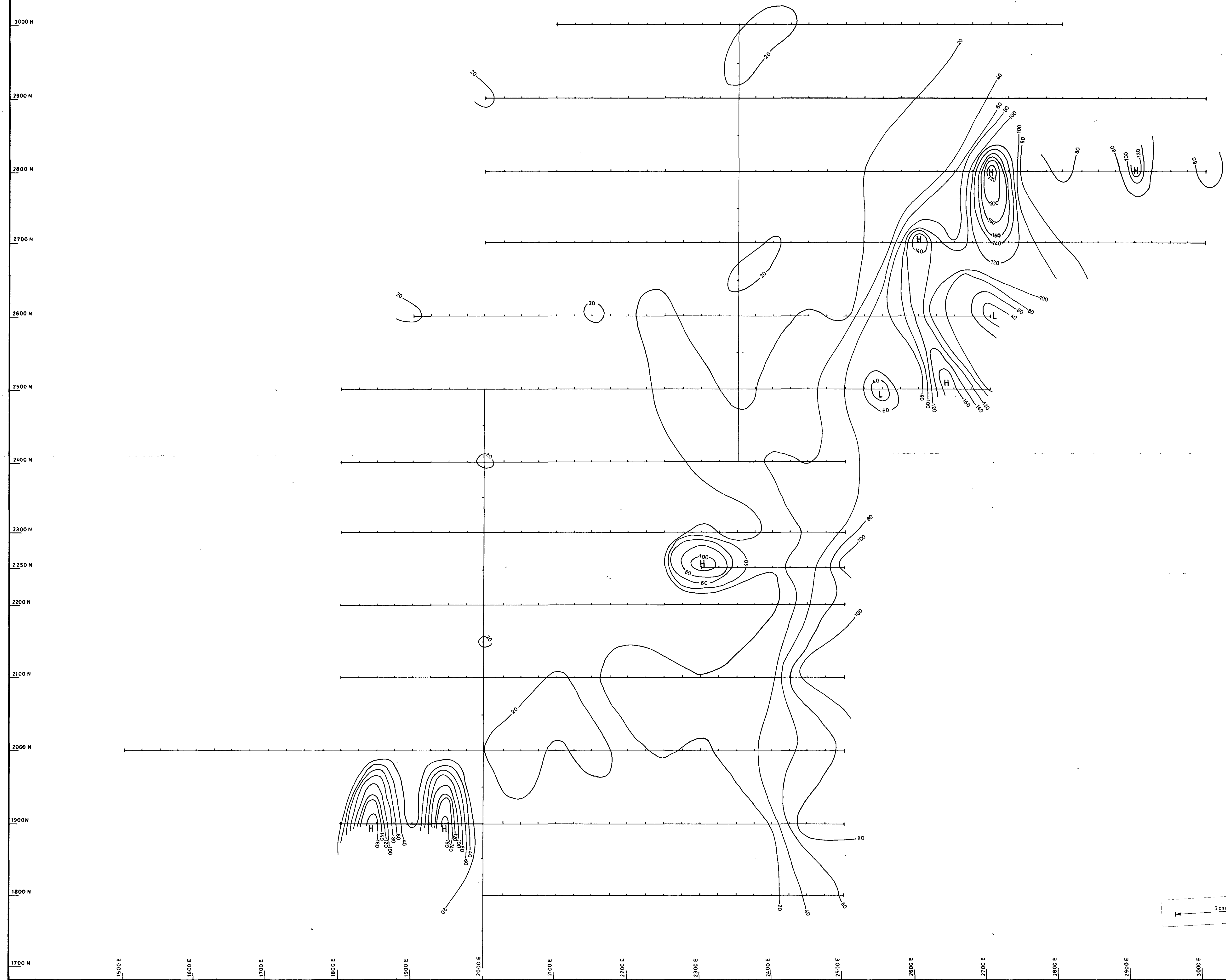
E.L. 8/77 RIANA  
LAUREL CREEK WEST  
SOIL GEOCHEMISTRY CONTOURS  
Ni  
ANOMALY 4042/1

Scale 1:2500

|              |                     |
|--------------|---------------------|
| FIG. No.     | REPORT No.          |
| ENCL. No.    | DRG. No. D/MQ04/058 |
| DATE 21-5-81 | AUTHOR L.D. BANWELL |
| DRAWN H.L.H. | OFFICE DEVONPORT    |

754221

7068



NOTE: Analyses in ppm

TN

MN

82-1784

0 100 200m

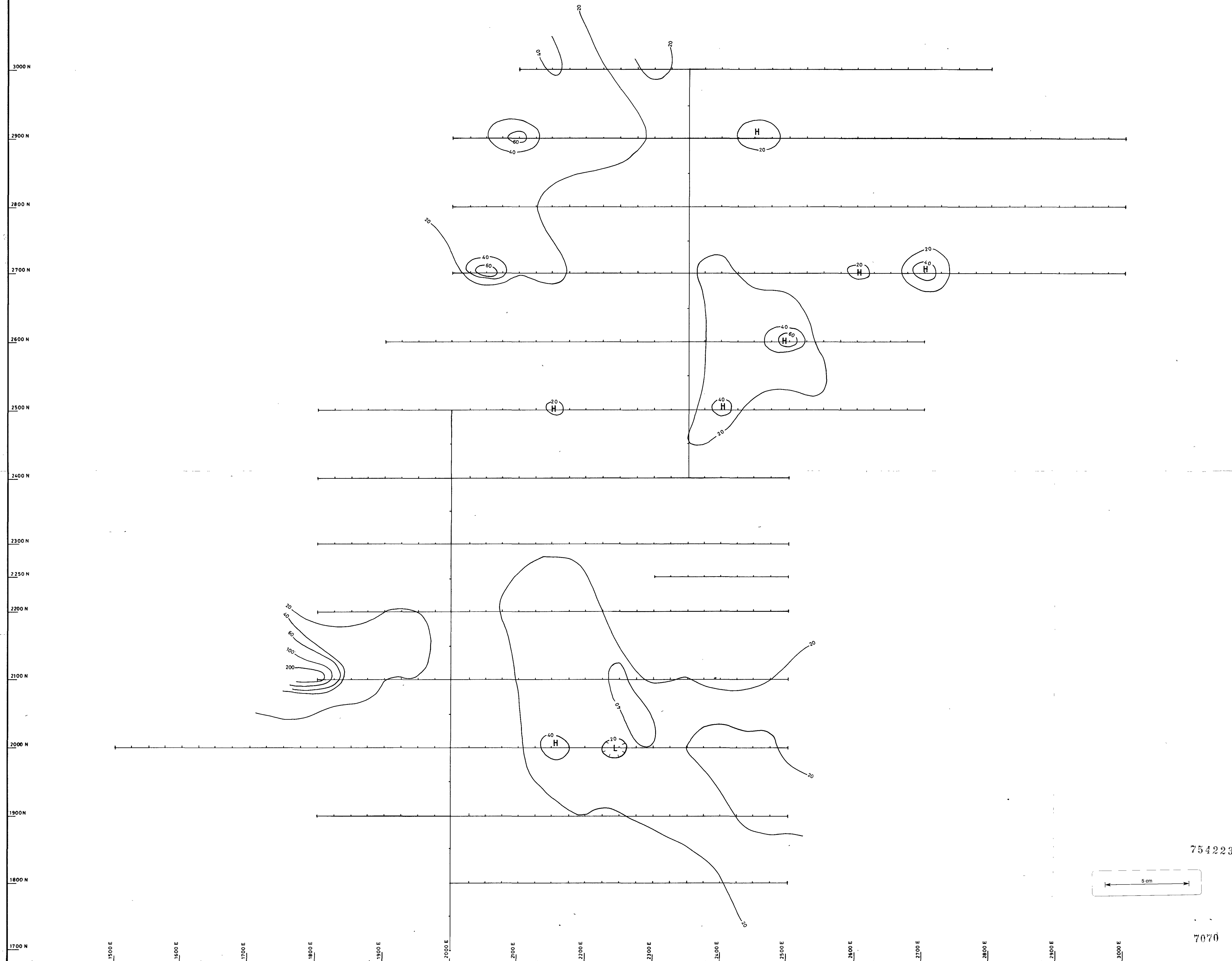
The Shell Company of Australia Limited  
METALS DIVISION

E.L. 8/77 RIANA  
LAUREL CREEK WEST  
SOIL GEOCHEMISTRY CONTOURS  
Zn  
ANOMALY 4042/1  
Scale 1:2500

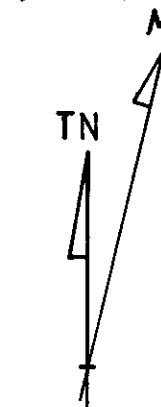
|              |                     |
|--------------|---------------------|
| FIG. No.     | REPORT No.          |
| ENCL. No.    | DRG. No. D/HQ04/059 |
| DATE 21-5-81 | AUTHOR L.D. BANWELL |
| DRAWN H.L.H. | OFFICE DEVONPORT    |

754222

7069



NOTE: Analyses in ppm



82-1784

0 100 200M

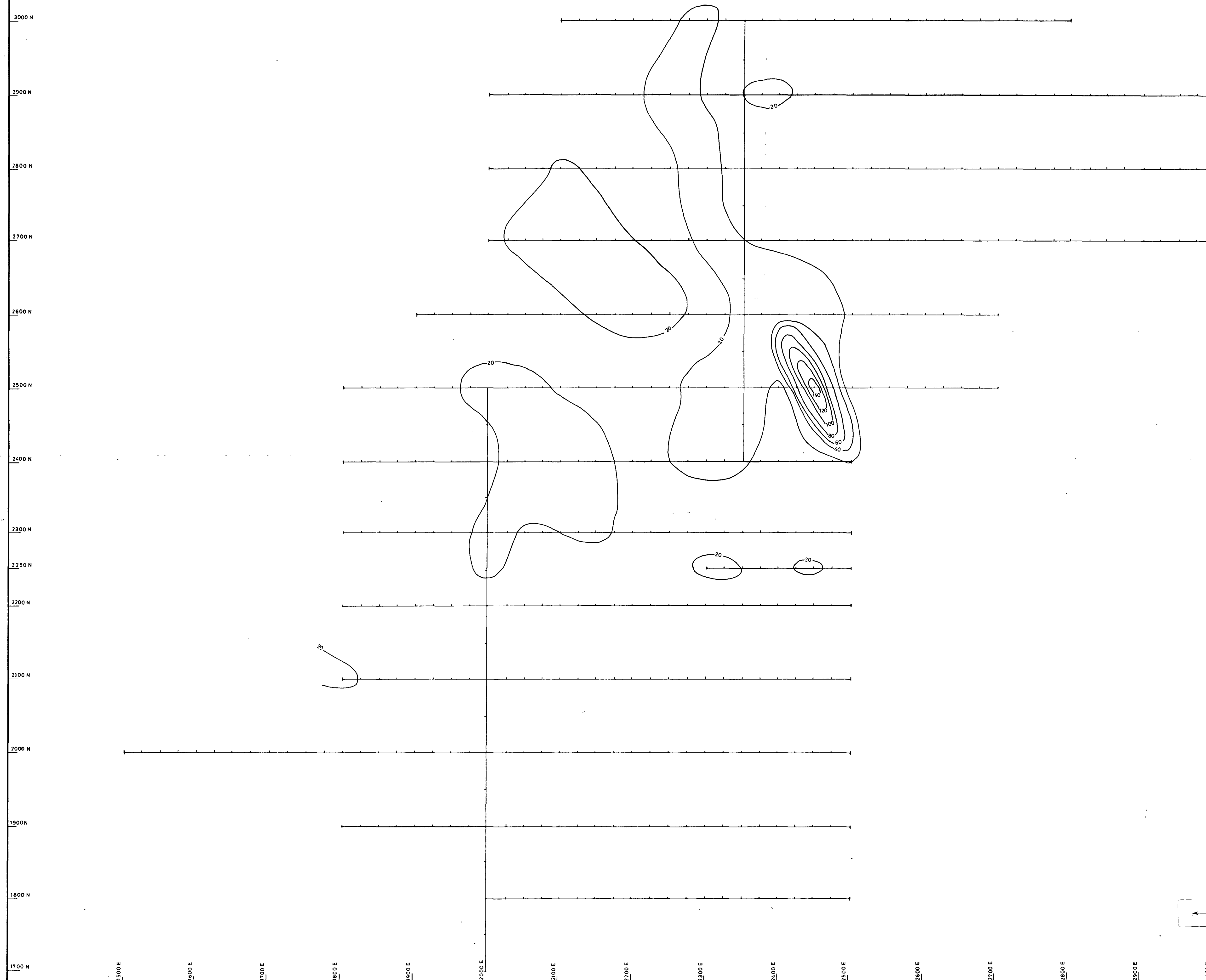
754223

The Shell Company of Australia Limited  
METALS DIVISION

EL 8/77 RIANA  
LAUREL CREEK WEST  
SOIL GEOCHEMISTRY CONTOURS  
W  
ANOMALY 4042/1  
Scale 1:2500

|              |                     |
|--------------|---------------------|
| FIG. No.     | REPORT No.          |
| ENCL. No.    | DRG. No. D/MQ04/060 |
| DATE 21-5-81 | AUTHOR L D BANWELL  |
| DRAWN H L H  | OFFICE DEVONPORT    |

7070



NOTE: Analyses in ppm



82-1784

0 100 200M

The Shell Company of Australia Limited  
METALS DIVISION

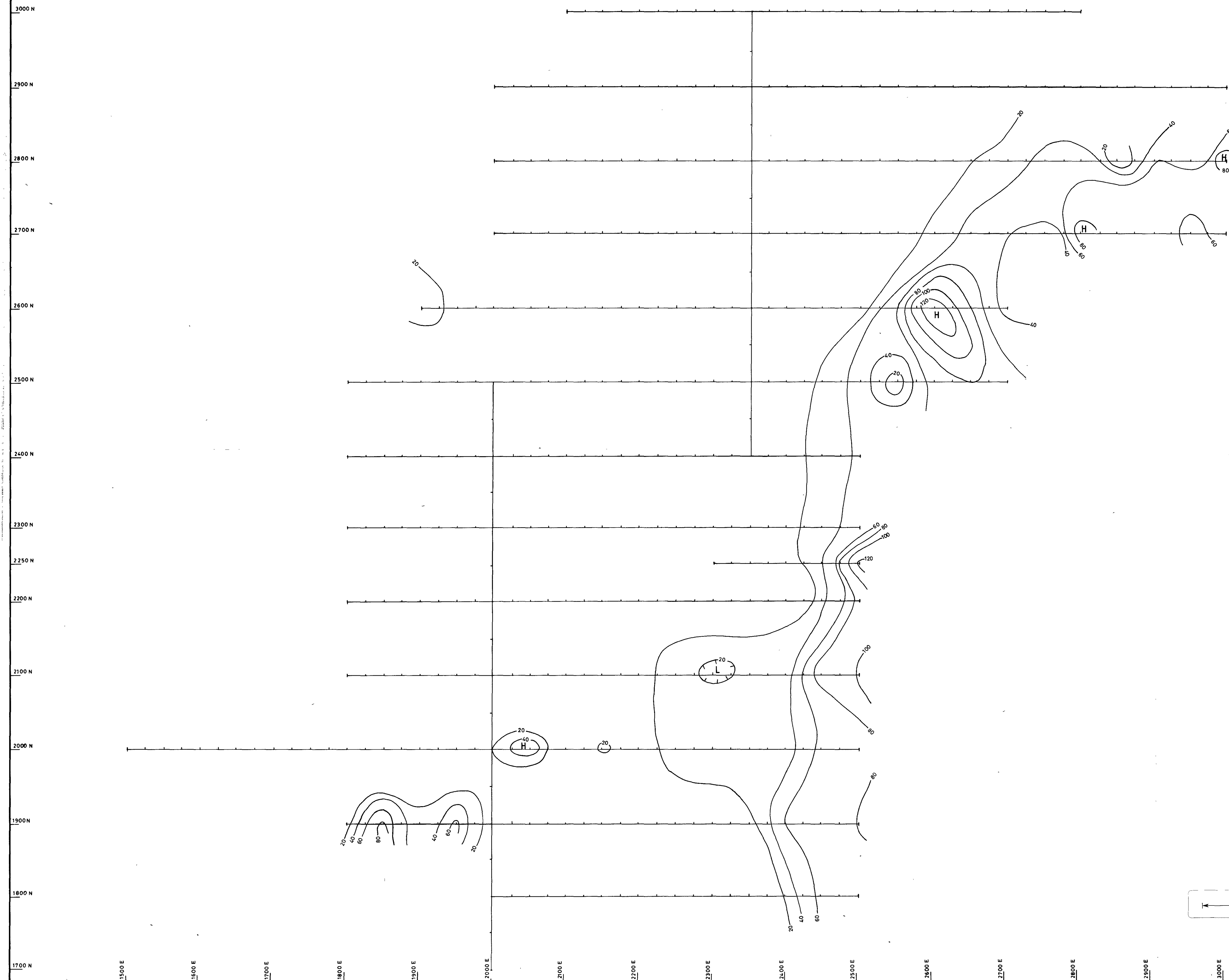
E.L. 8/77 RIANA  
LAUREL CREEK WEST  
SOIL GEOCHEMISTRY CONTOURS  
Sn  
ANOMALY 4042/1

Scale 1:2500

|              |                     |
|--------------|---------------------|
| FIG No.      | REPORT No.          |
| ENCL No.     | DRG. No. D/MQ04/061 |
| DATE 21-5-81 | AUTHOR L.D. BANWELL |
| DRAWN H.L.H. | OFFICE DEVONPORT    |

754224

7071



NOTE: Analyses in ppm



82-1784

0 100 200M

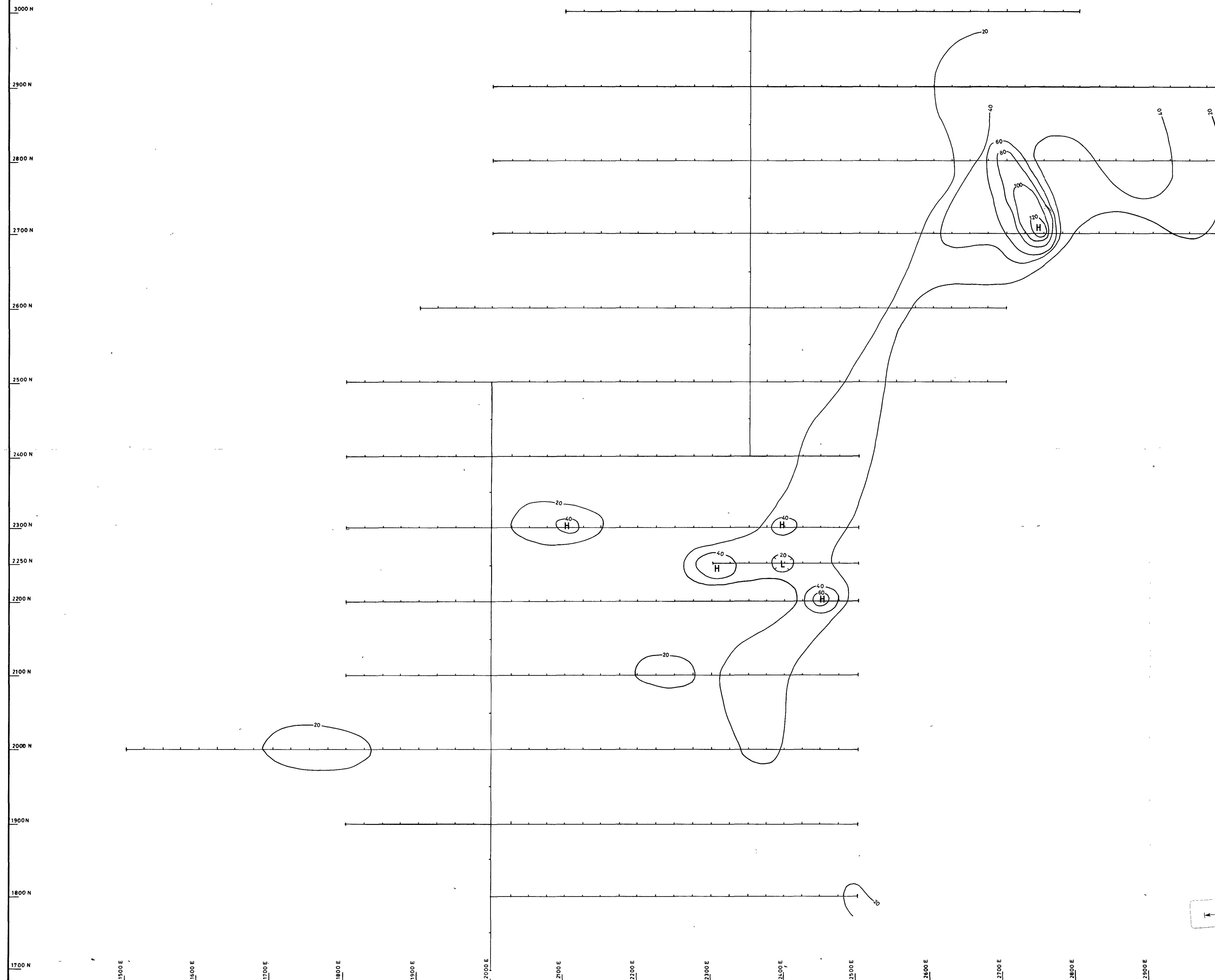
The Shell Company of Australia Limited  
METALS DIVISION

E.L. 8/77 RIANA  
LAUREL CREEK WEST  
SOIL GEOCHEMISTRY CONTOURS  
Cu  
ANOMALY 4042/1  
Scale 1:2500

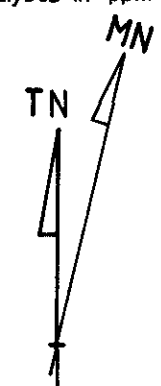
|              |                     |
|--------------|---------------------|
| FIG. No.     | REPORT No.          |
| ENCL. No.    | DRG. No. D/MQ04/062 |
| DATE 21-5-81 | AUTHOR L.D. BANWELL |
| DRAWN H.L.H. | OFFICE DEVONPORT    |

754225

7072



NOTE: Analyses in ppm



82-1784

0 100 200m

The Shell Company of Australia Limited  
METALS DIVISION

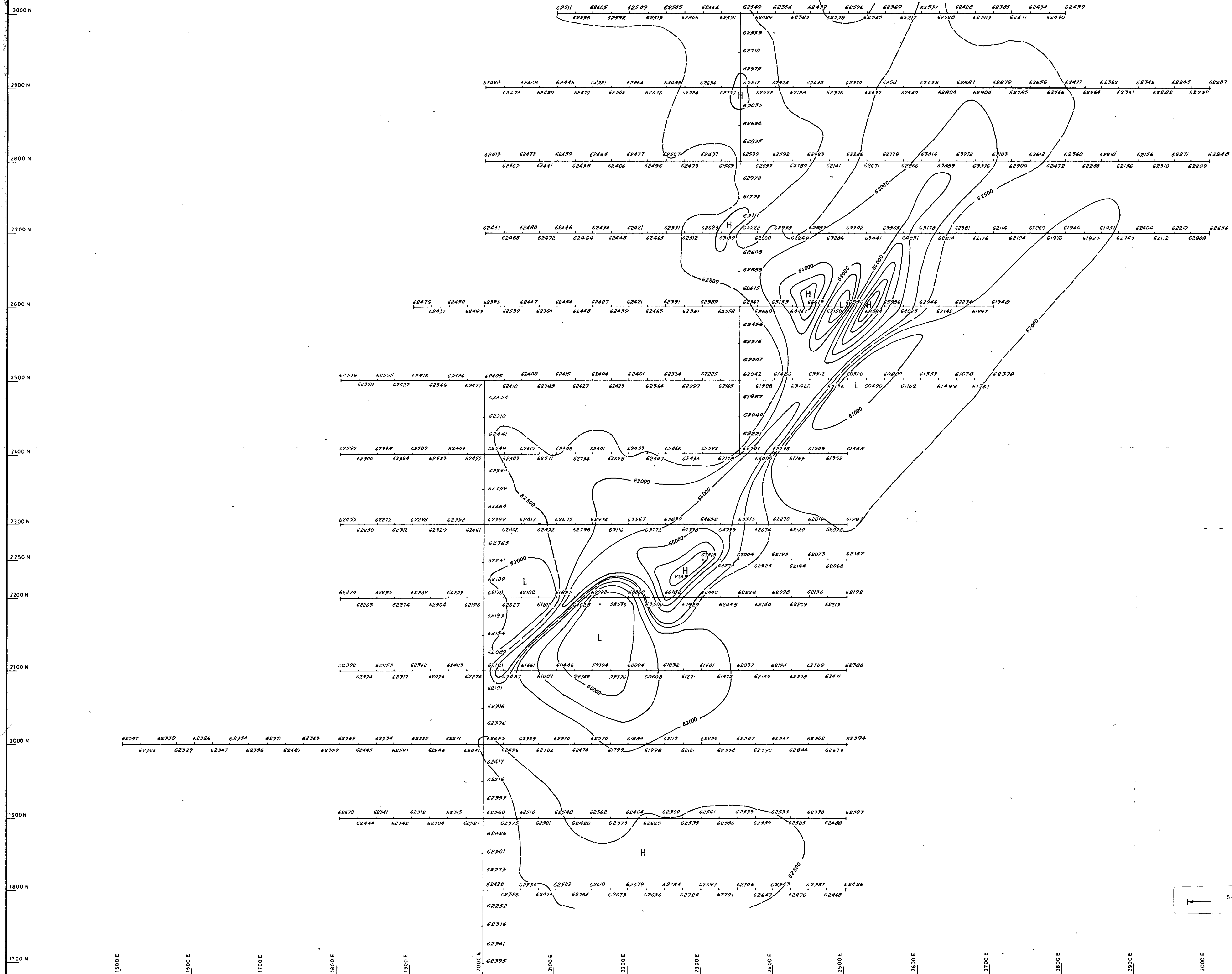
E.L. 8/77 RIANA  
LAUREL CREEK WEST  
SOIL GEOCHEMISTRY CONTOURS  
Pb  
ANOMALY 4042/1

Scale 1:2500

|              |                     |
|--------------|---------------------|
| FIG. No.     | REPORT No.          |
| ENCL. No.    | DRG. No. D/MQ04/063 |
| DATE 21-5-81 | AUTHOR L.D. BANWELL |
| DRAWN H.L.H. | OFFICE DEVONPORT    |

754226

7073

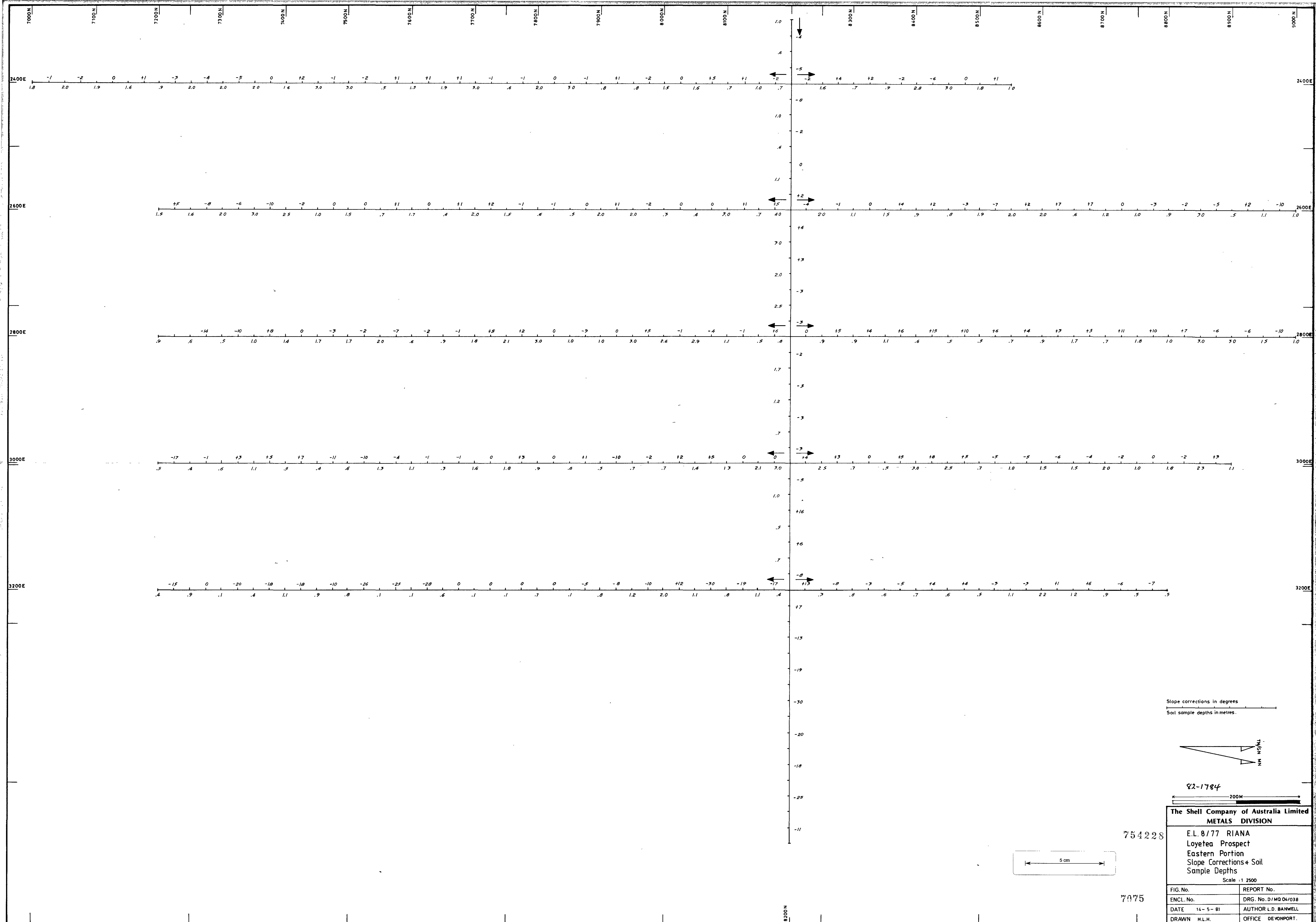


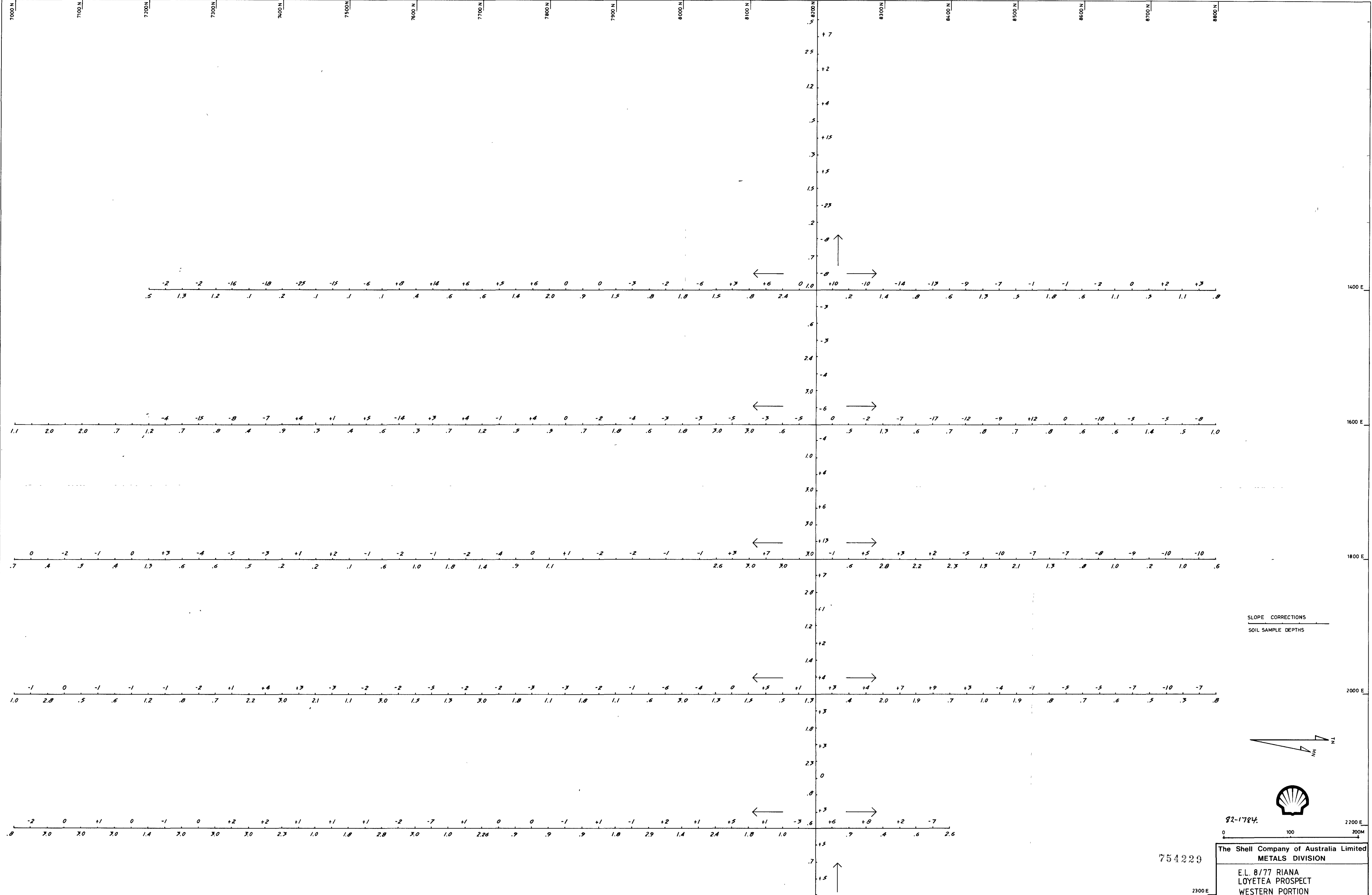
82-1784

754227

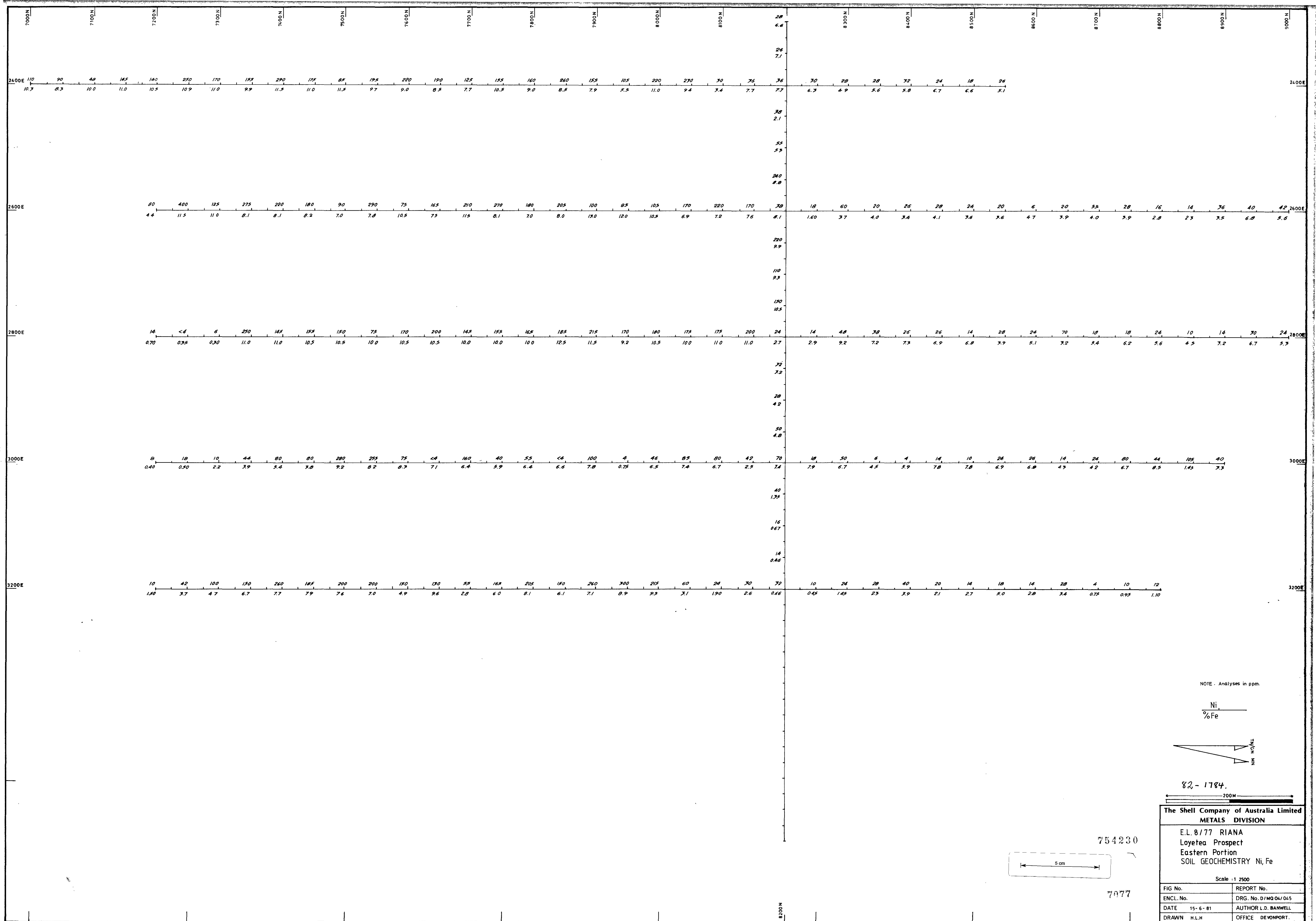
7074

|                                                                              |                     |
|------------------------------------------------------------------------------|---------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                    |                     |
| EL 8/77 RIANA<br>LAUREL CREEK WEST<br>TOTAL FIELD CONTOURS<br>ANOMALY 4042/1 |                     |
| Contour interval = 1000nT<br>Scale 1:2500                                    |                     |
| FIG No.                                                                      | REPORT No.          |
| ENCL No.                                                                     | DRG No. D/M004/043  |
| DATE 21-5-81                                                                 | AUTHOR N.HUNGERFORD |
| DRAWN H.L.H.                                                                 | OFFICE DEVONPORT    |



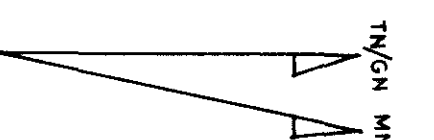


|                                                                                                     |                    |
|-----------------------------------------------------------------------------------------------------|--------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                                           |                    |
| E.L. 8/77 RIANA<br>LOYETEA PROSPECT<br>WESTERN PORTION<br>SLOPE CORRECTIONS &<br>SOIL SAMPLE DEPTHS |                    |
| Scale 1:2500                                                                                        |                    |
| FIG No                                                                                              | REPORT No          |
| ENCL No                                                                                             | DRG No D/MQ04/052  |
| DATE 19-6-81                                                                                        | AUTHOR L D BANWELL |
| DRAWN H L H                                                                                         | OFFICE DEVONPORT   |



NOTE: Analyses in ppm.

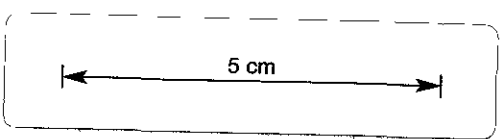
Ni  
%Fe



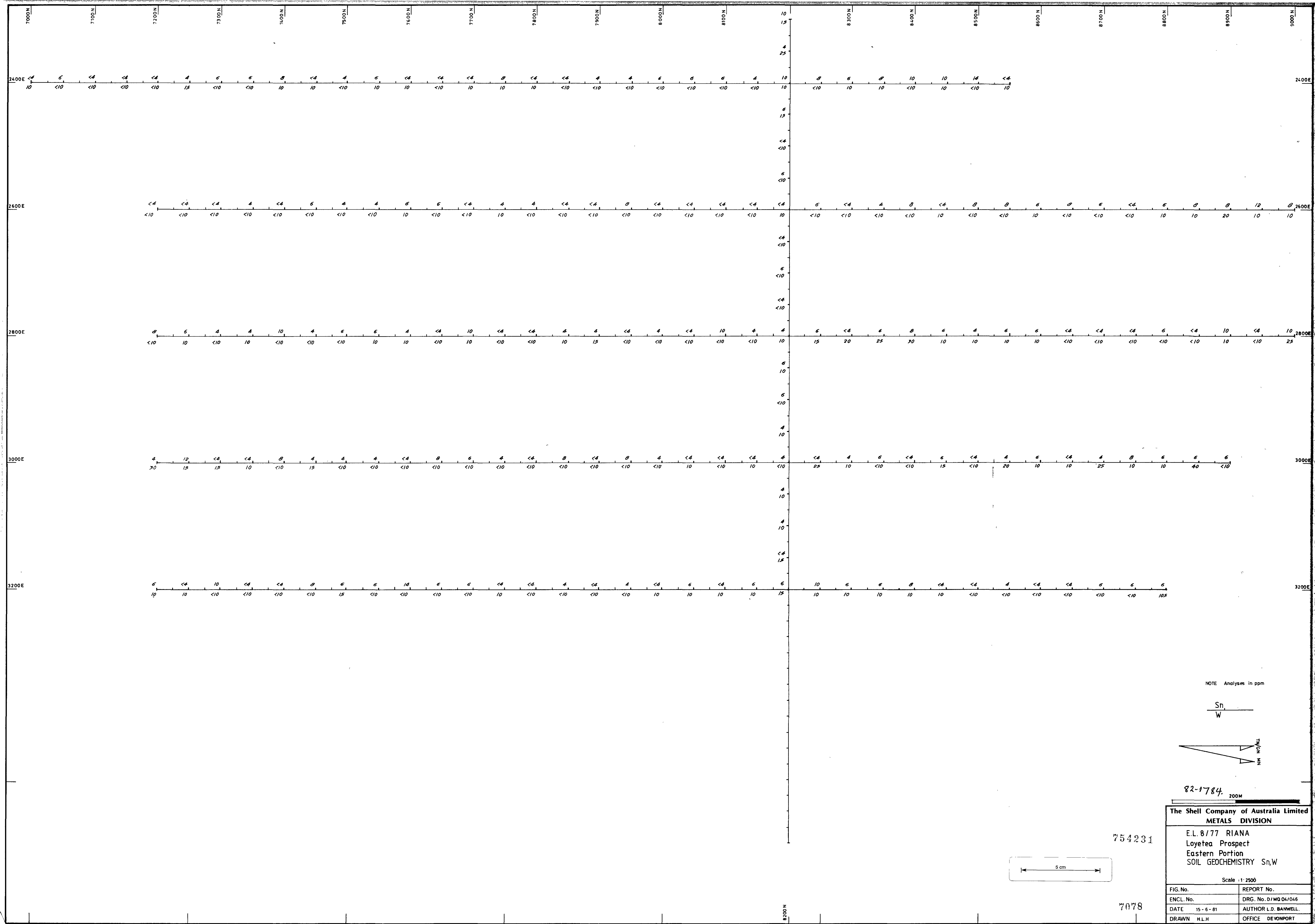
82-1784.

|                                                                                    |                      |
|------------------------------------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                          |                      |
| E.L. 8/77 RIANA<br>Loyetee Prospect<br>Eastern Portion<br>SOIL GEOCHEMISTRY Ni, Fe |                      |
| Scale 1:2500                                                                       |                      |
| FIG No.                                                                            | REPORT No.           |
| ENCL. No.                                                                          | DRG. No. D/MQ 04/045 |
| DATE 15-6-81                                                                       | AUTHOR L.D. BANWELL  |
| DRAWN H.L.H.                                                                       | OFFICE DEVONPORT.    |

754230

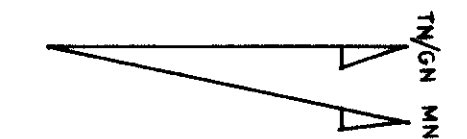


7077



NOTE Analyses in ppm

$\frac{Sn}{W}$

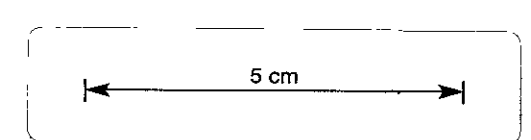


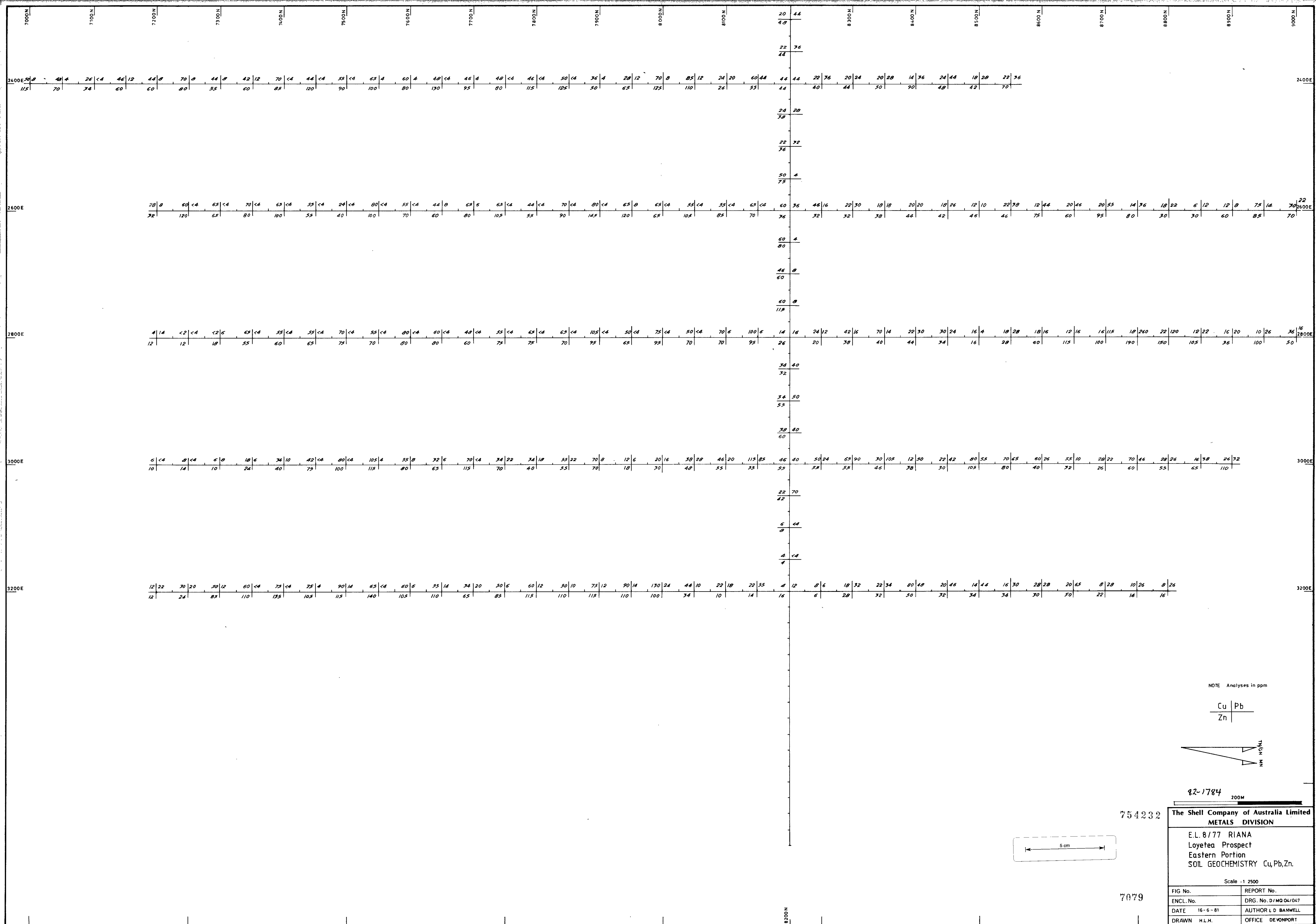
82-1784

|                                                                                            |                      |
|--------------------------------------------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                                  |                      |
| E.L. 8177 RIANA<br>Loyetee Prospect<br>Eastern Portion<br>SOIL GEOCHEMISTRY $\frac{Sn}{W}$ |                      |
| Scale 1:2500                                                                               |                      |
| FIG. No.                                                                                   | REPORT No.           |
| ENCL. No.                                                                                  | DRG. No. D/MQ 04/046 |
| DATE 15-6-81                                                                               | AUTHOR L.D. BANWELL  |
| DRAWN H.L.H.                                                                               | OFFICE DEVONPORT     |

754231

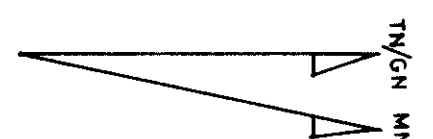
7078





NOTE Analyses in ppm

Cu Pb  
Zn



82-1784

754232

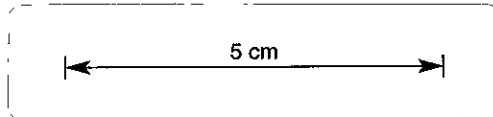
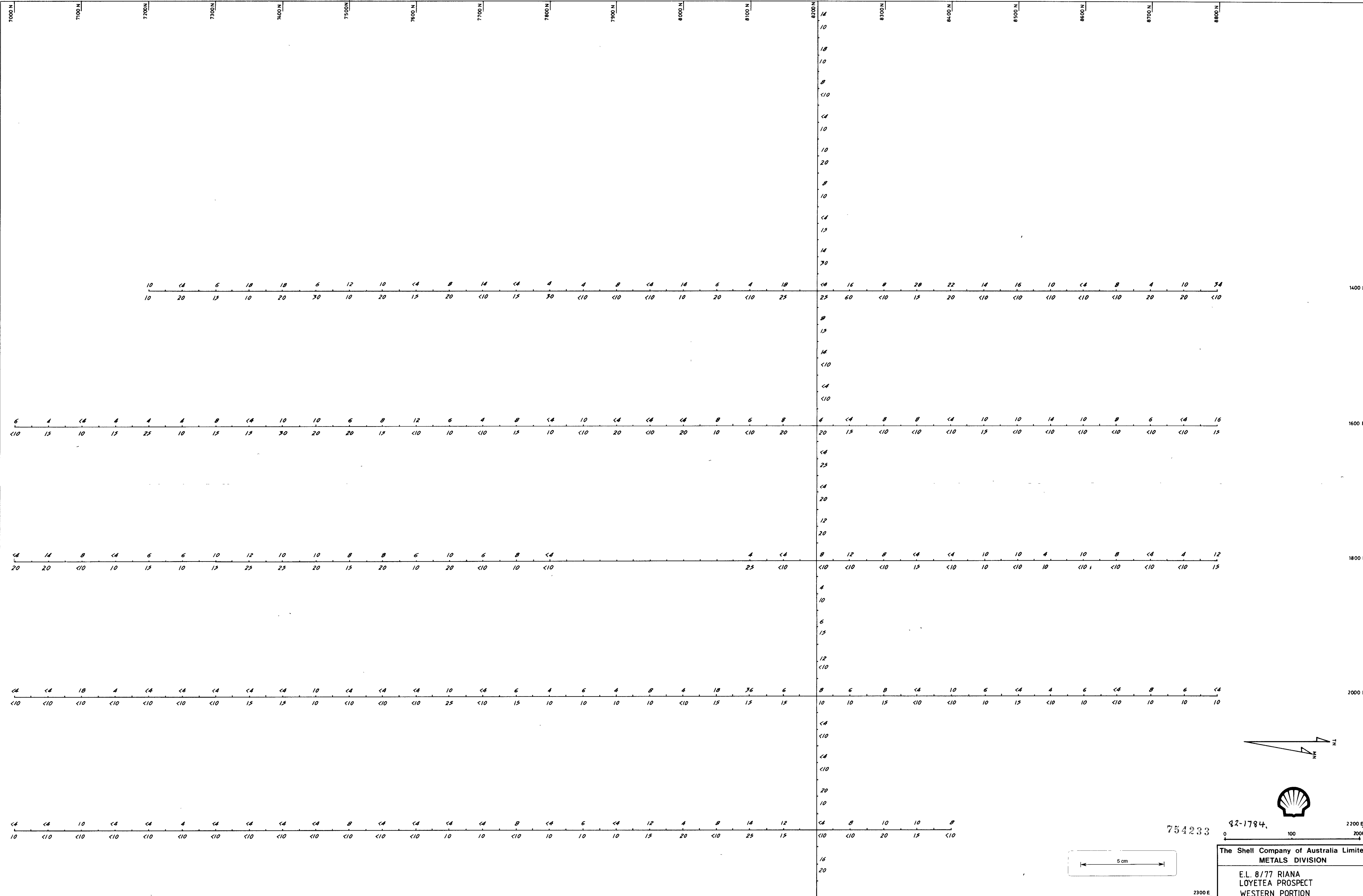
The Shell Company of Australia Limited  
METALS DIVISION

E.L. 8/77 RIANA  
Loyetee Prospect  
Eastern Portion  
SOIL GEOCHEMISTRY Cu,Pb,Zn.

Scale 1:2500

|              |                      |
|--------------|----------------------|
| FIG. No.     | REPORT No.           |
| ENCL. No.    | DRG. No. D/MQ 04/047 |
| DATE 16-6-81 | AUTHOR L.D. BANWELL  |
| DRAWN H.L.H. | OFFICE DEVONPORT     |

7079



NOTE Analyses in ppm

Sn  
W

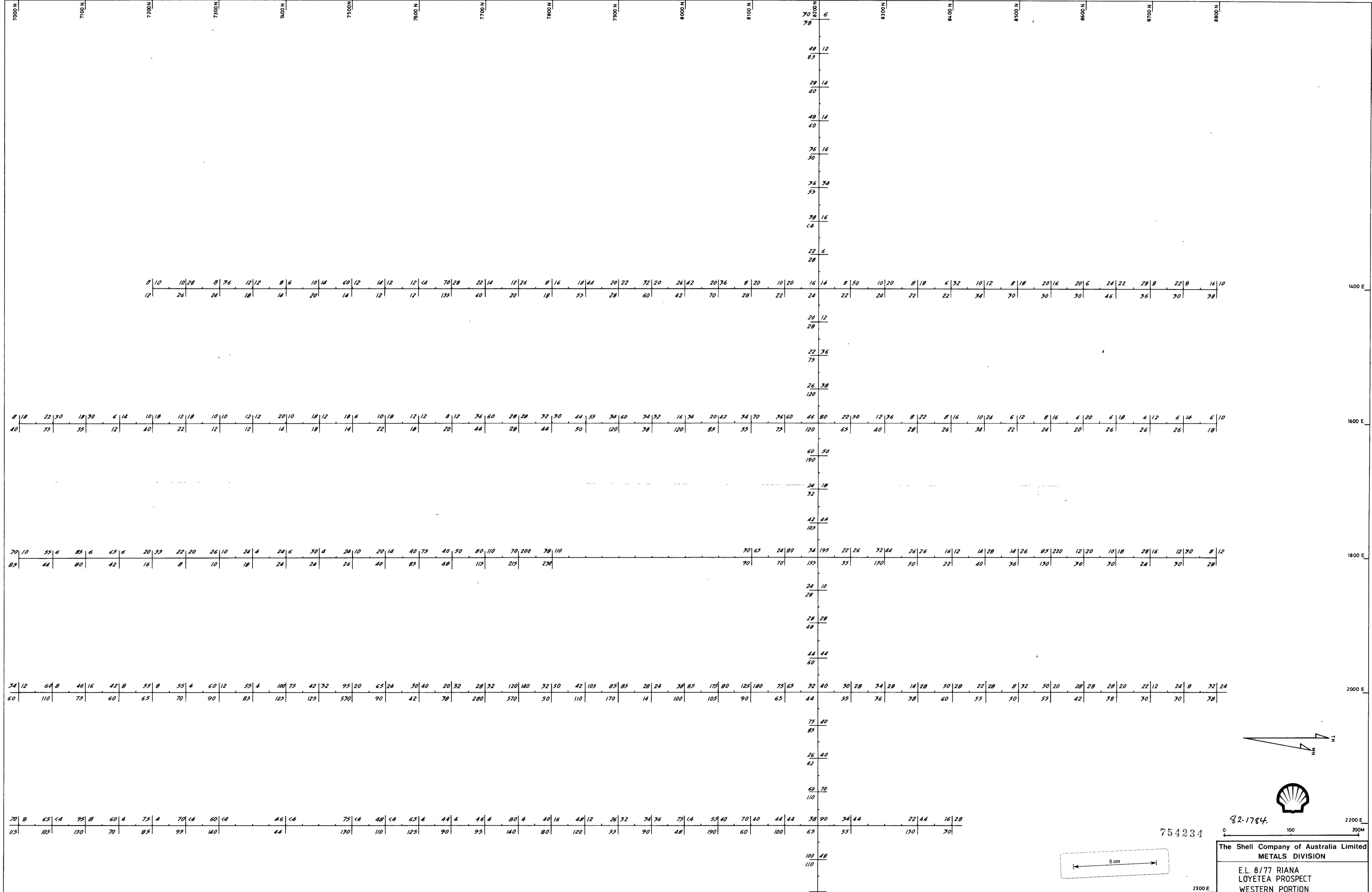
754233

82-1784



|                                                                                   |                    |
|-----------------------------------------------------------------------------------|--------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                         |                    |
| E.L. 8/77 RIANA<br>LOYETEA PROSPECT<br>WESTERN PORTION<br>SOIL GEOCHEMISTRY Sn,W. |                    |
| Scale 1:2500                                                                      |                    |
| FIG No                                                                            | REPORT No          |
| ENCL No                                                                           | DRG No D/MQ04/054  |
| DATE 25-6-81                                                                      | AUTHOR L D BANWELL |
| DRAWN H L H                                                                       | OFFICE DEVONPORT   |

7080



NOTE Analyses in ppm

Cu | Pb  
Zn |

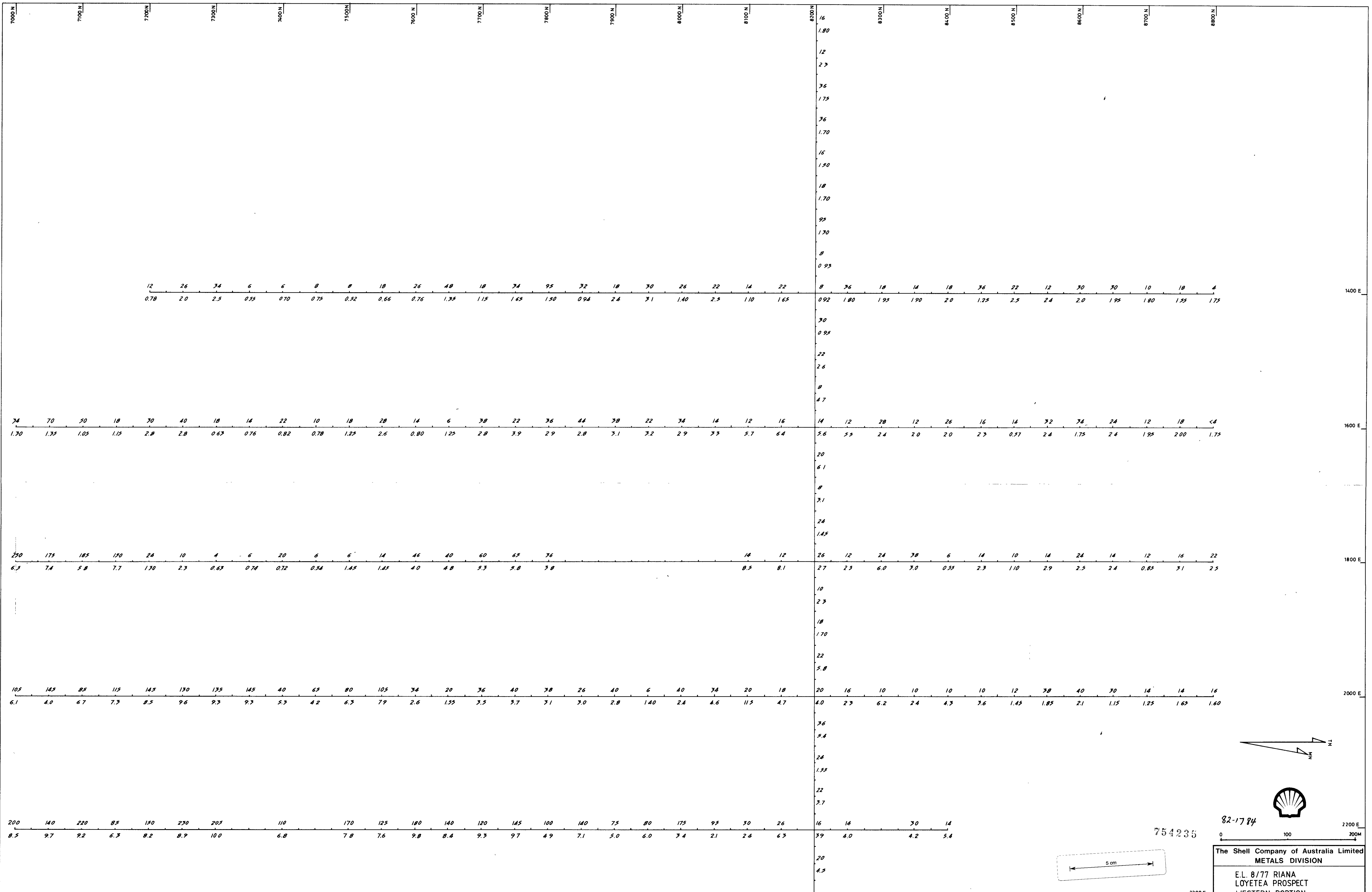
7081

82-1784

754234

Scale 1:2500

|                                                                                       |                    |
|---------------------------------------------------------------------------------------|--------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                             |                    |
| E.L. 8/77 RIANA<br>LOYETEA PROSPECT<br>WESTERN PORTION<br>SOIL GEOCHEMISTRY Cu,Pb,Zn. |                    |
| FIG No                                                                                | REPORT No          |
| ENCL No                                                                               | DRG No D/MQ04/055  |
| DATE 25-6-81                                                                          | AUTHOR L D BANWELL |
| DRAWN H L H                                                                           | OFFICE DEVONPORT   |

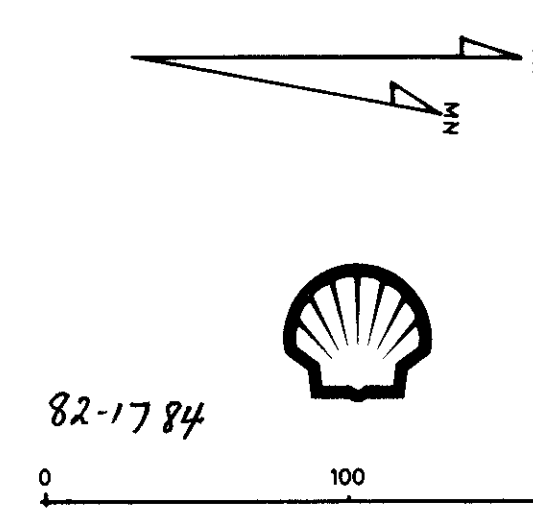


NOTE: Analyses in ppm

Ni

Fe%

7082



82-1784

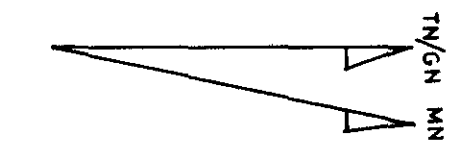
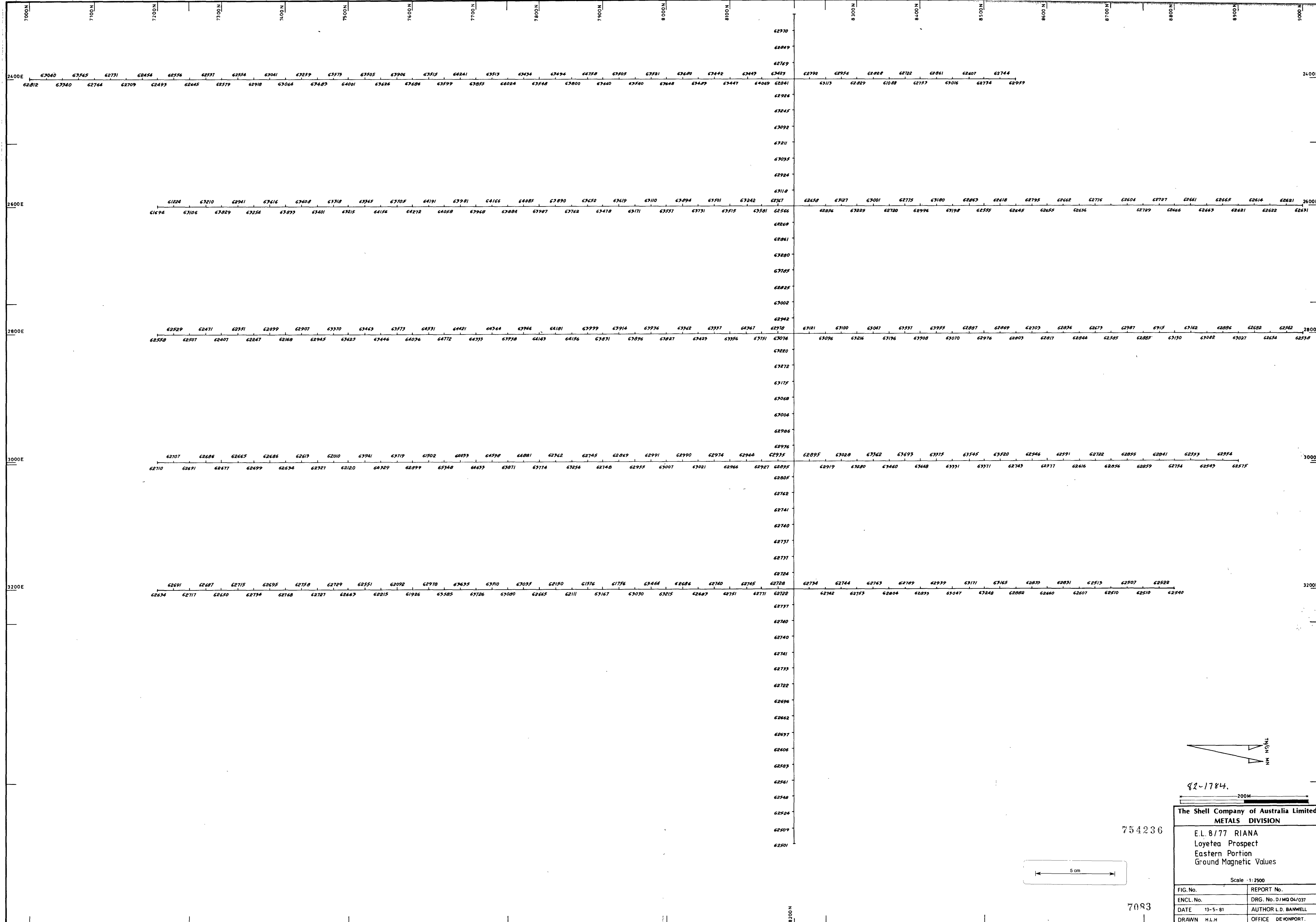
754235

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METALS DIVISION

E.L. 8/77 RIANA  
LOYETEA PROSPECT  
WESTERN PORTION  
SOIL GEOCHEMISTRY Ni, Fe.

Scale 1:2500

|              |                    |
|--------------|--------------------|
| FIG No       | REPORT No          |
| ENCL No      | DRG No D/MQ04/056  |
| DATE 26-6-81 | AUTHOR L.D BANWELL |
| DRAWN H.L.H  | OFFICE DEVONPORT   |



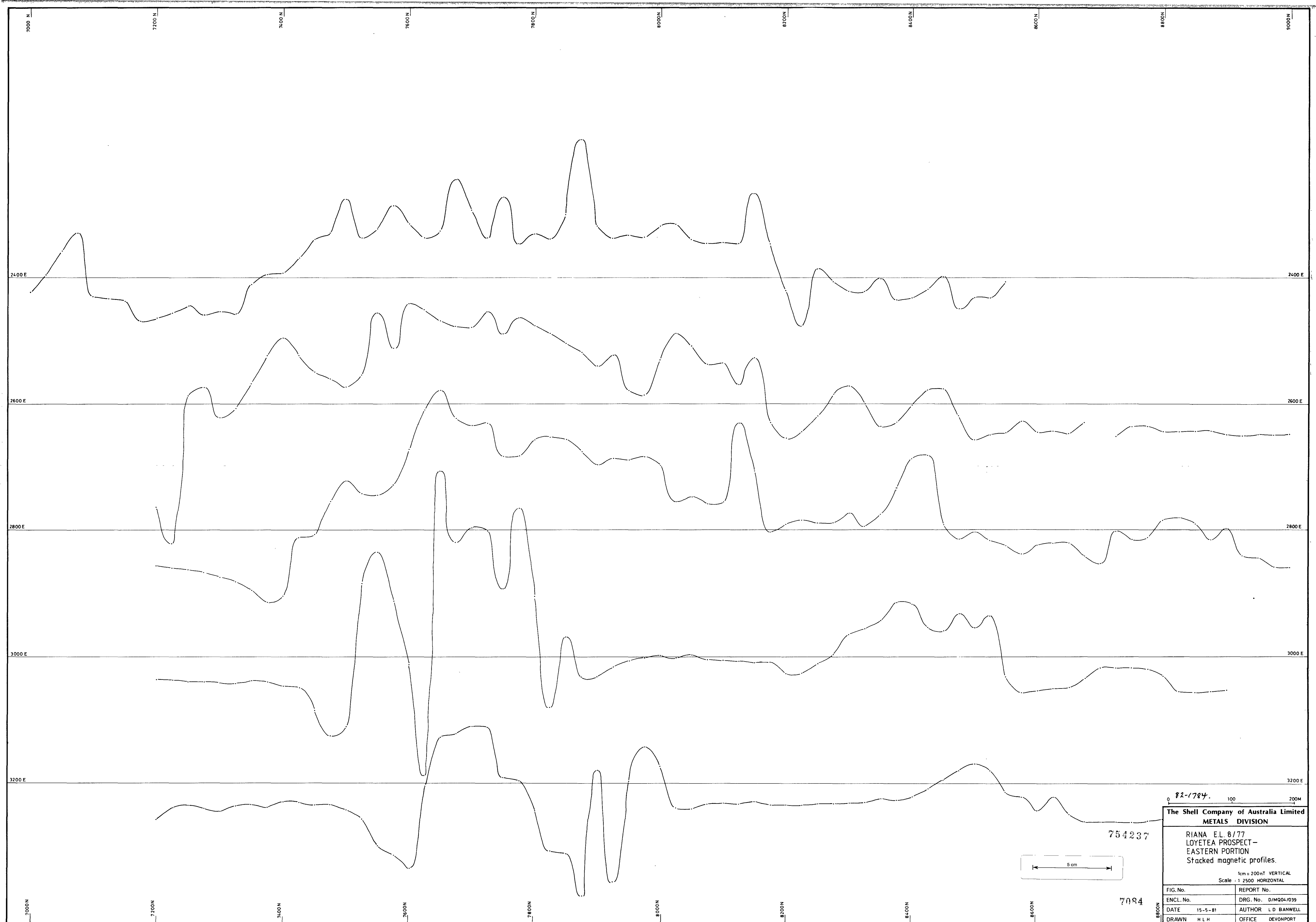
82-1784.

200M

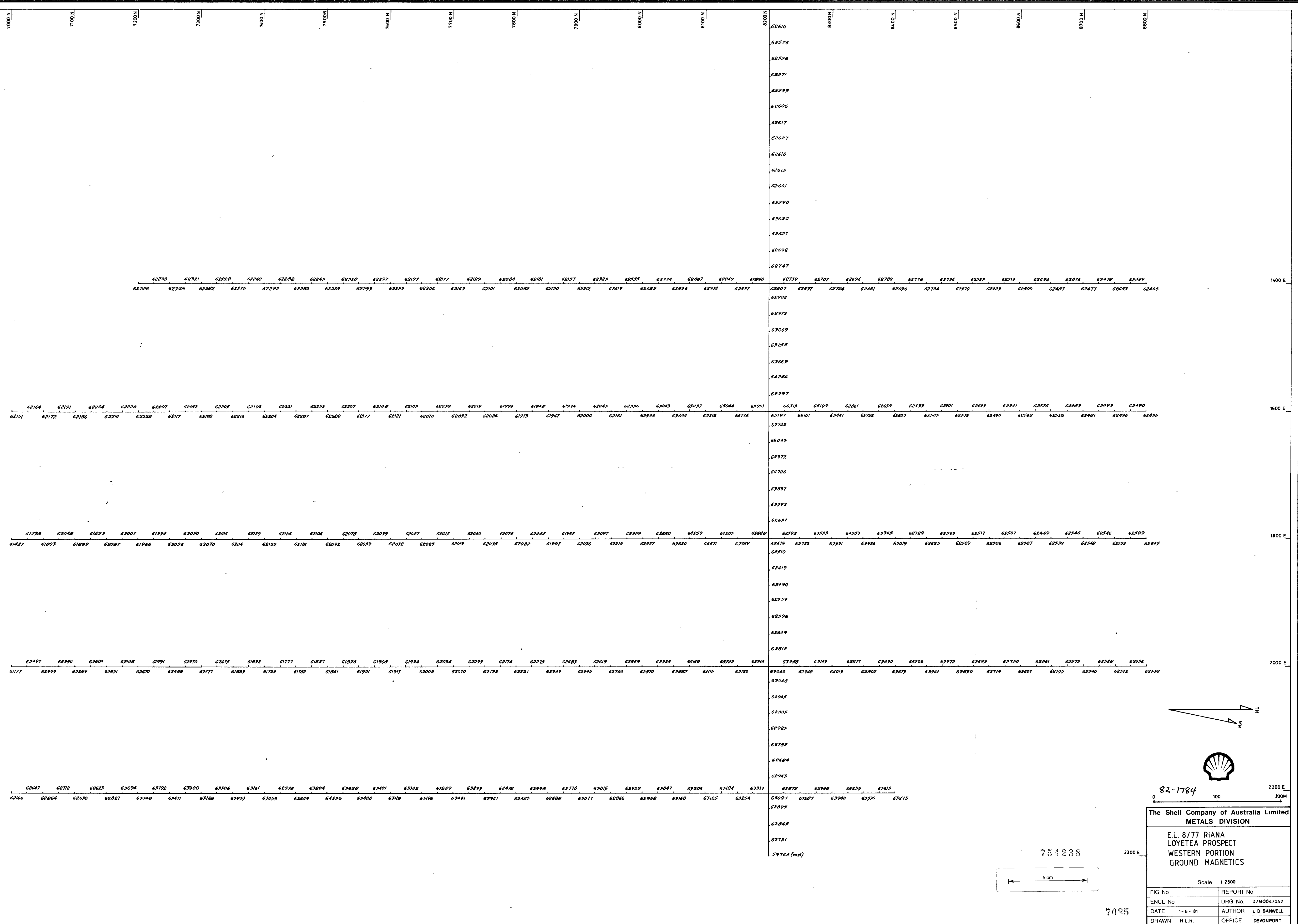
754236

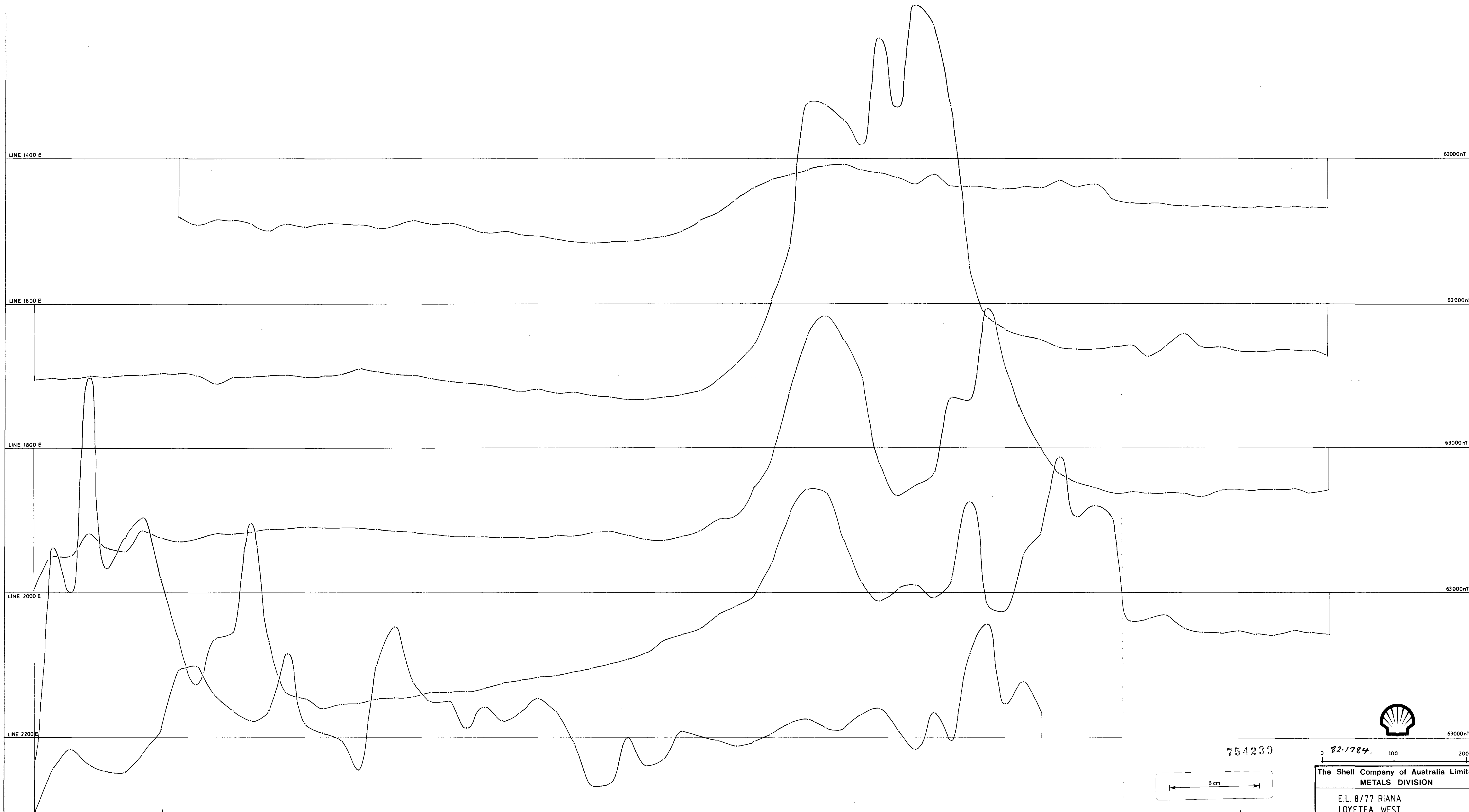
7083

|                                                                                  |                      |
|----------------------------------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                        |                      |
| E.L. 8/77 RIANA<br>Loyetea Prospect<br>Eastern Portion<br>Ground Magnetic Values |                      |
| Scale 1:2500                                                                     |                      |
| FIG. No.                                                                         | REPORT No.           |
| ENCL. No.                                                                        | DRG. No. D/MQ 04/037 |
| DATE 13-5-81                                                                     | AUTHOR L.D. BARNWELL |
| DRAWN H.L.H.                                                                     | OFFICE DEVONPORT.    |



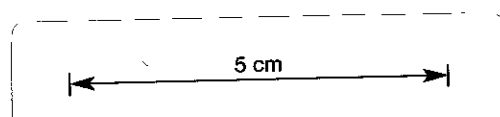
|                                                                                      |                     |
|--------------------------------------------------------------------------------------|---------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                            |                     |
| RIANA EL 8/77<br>LOYETEA PROSPECT -<br>EASTERN PORTION<br>Stacked magnetic profiles. |                     |
| 1cm = 200m VERTICAL<br>Scale - 1 2500 HORIZONTAL                                     |                     |
| FIG. No.                                                                             | REPORT No.          |
| ENCL. No.                                                                            | DRG. No. D/MQ04/039 |
| DATE 15-5-81                                                                         | AUTHOR L D BANWELL  |
| DRAWN H L H                                                                          | OFFICE DEVONPORT    |





754239

82-1784 100 200M



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METALS DIVISION

E.L. 8/77 RIANA  
LOYETEA WEST  
MAGNETIC PROFILES

1cm = 200nT VERTICAL  
1:2500 HORIZONTAL

|              |                    |
|--------------|--------------------|
| FIG No       | REPORT No          |
| ENCL No      | DRG No D/MQ04/04.8 |
| DATE 17-6-81 | AUTHOR L D BANWELL |
| DRAWN H L H. | OFFICE DEVONPORT   |

7086

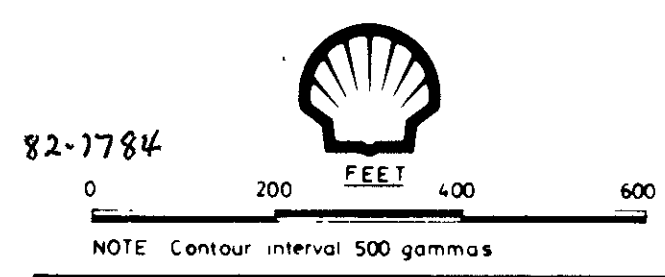


**GRID REFERENCES**

|          |                      |                                        |
|----------|----------------------|----------------------------------------|
| X NDDH 1 | 408650 E / 5441700 N | From Comalco<br>Riana report Dec. 1979 |
| X NDDH 2 | 408880 E / 5441900 N |                                        |
| X NDDH 3 | 408450 E / 5441600 N |                                        |

⊗ NDDH 1 Corrected positions from local information etc.

- LEGEND**
- CREEK
  - == ROAD
  - CONTOURS (thousands of gammas)
  - - - FENCE



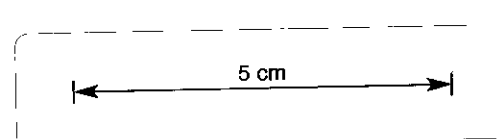
82-7784

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METALS DIVISION

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

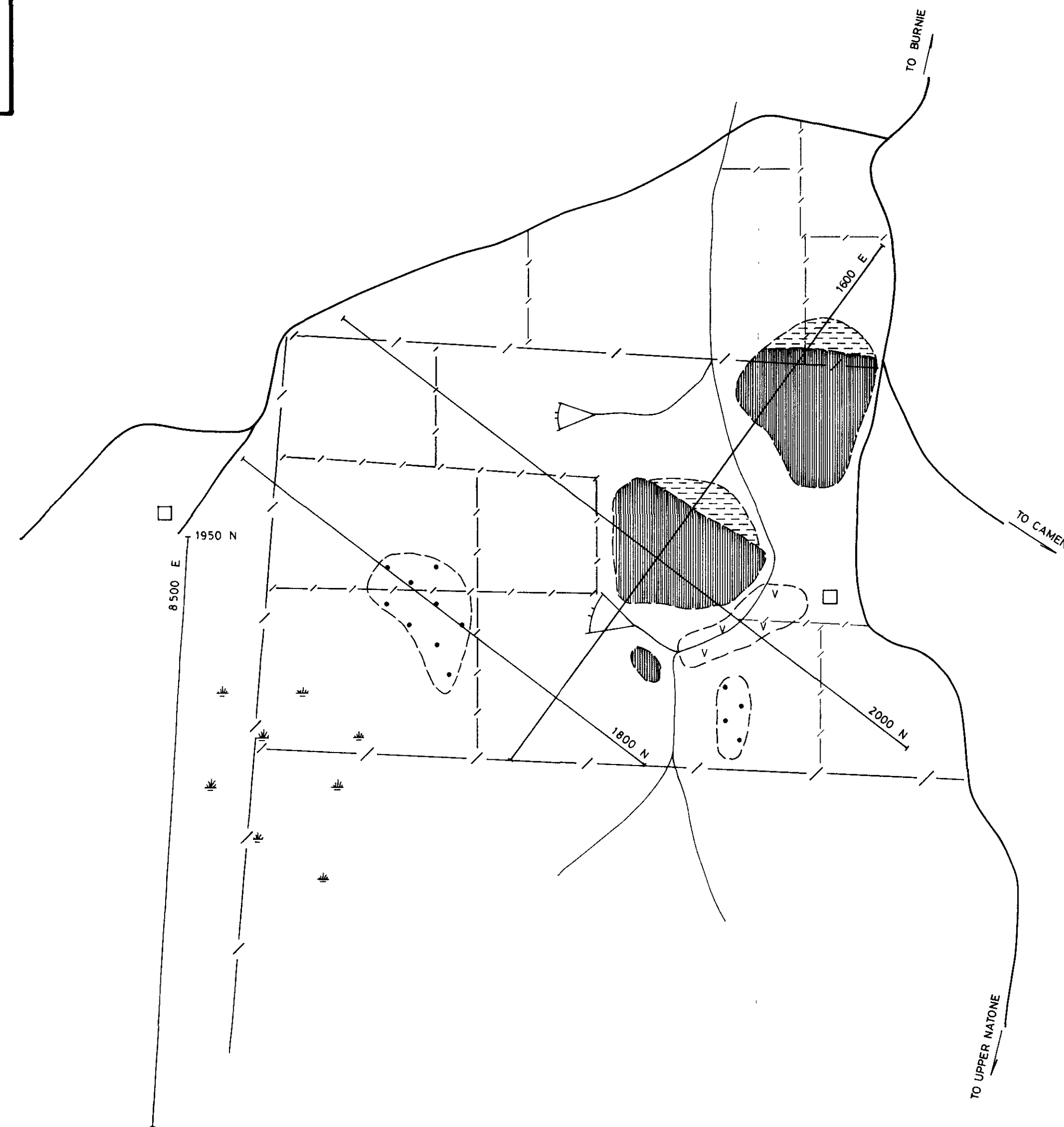
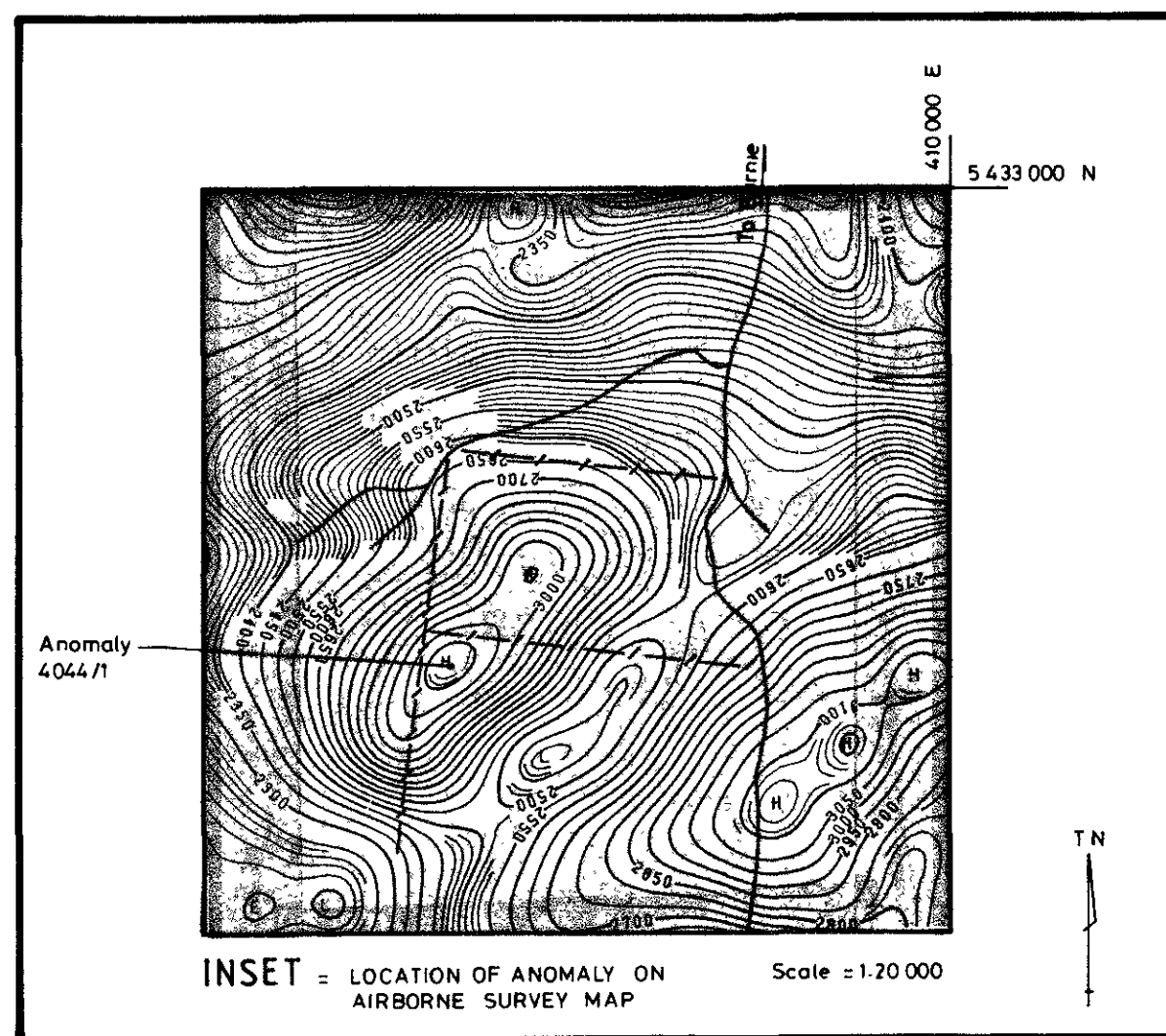
Scale: 1:2500

|              |                     |
|--------------|---------------------|
| FIG No.      | REPORT No.          |
| ENCL No.     | DRG No. D/MG04/064  |
| DATE 29-7-81 | AUTHOR L.D. BANWELL |
| DRAWN M.L.H. | OFFICE DEVONPORT    |



754240

7087



# LEGEND

- Tertiary basalt soil
- Tertiary basalt
- Chert
- Ironstone
- Siltstone
- Road
- Outcrop boundary
- Creek and dam
- Boundary fences
- Internal fences
- Swamp
- House



82-1784

0 100 200 M

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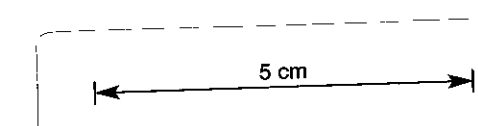
E.L. 8 / 77 RIANA  
ANOMALY 4044/1 NATONE  
OUTCROP GEOLOGY & GRID  
LOCATION

Scale 1:5000

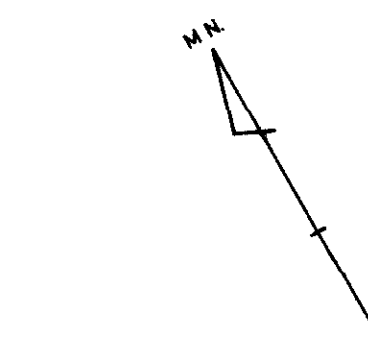
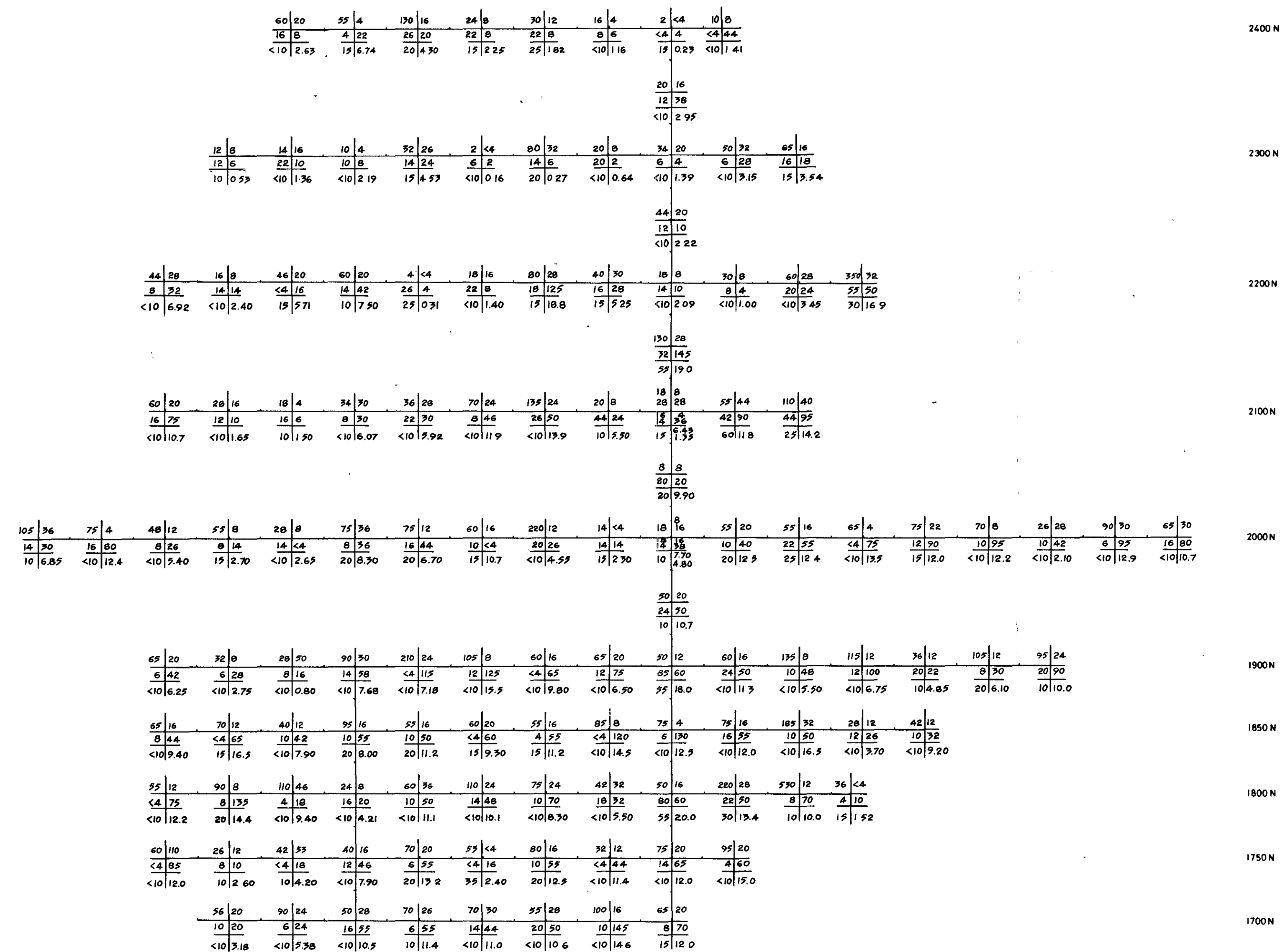
|               |                    |
|---------------|--------------------|
| FIG No        | REPORT No          |
| ENCL No       | DRG No D/MQ04/078  |
| DATE 22-10-81 | AUTHOR L D BANWELL |
| DRAWN H L H   | OFFICE DEVONPORT   |

754241

7088



1100E 1200E 1300E 1400E 1500E 1600E 1700E 1800E 1900E 2000E



NOTE: Analyses in ppm except Fe %

|    |    |
|----|----|
| Cu | Pb |
| Sn | Zn |
| W  | Fe |

754242

7089

5 cm

200M

82-1784

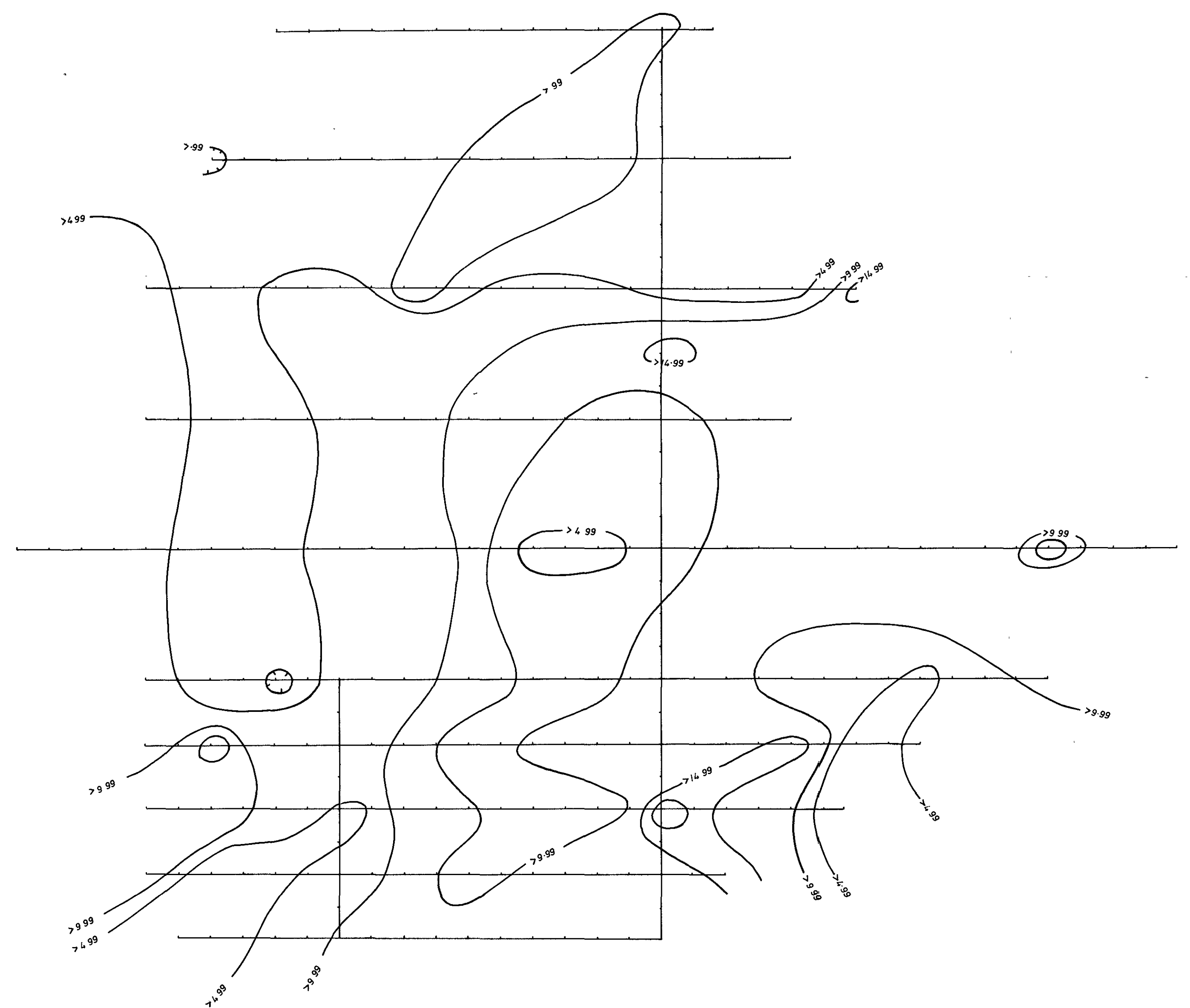
The Shell Company of Australia Limited  
METALS DIVISION

RIANA E.L. 8/77  
NATONE PROSPECT  
SOIL GEOCHEMISTRY  
ANOMALY 4044/1

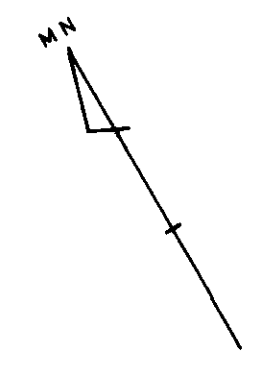
Scale: 1:2500

|              |                       |
|--------------|-----------------------|
| FIG. No.     | REPORT No.            |
| ENCL. No.    | DRG. No. 01/MQ 04/023 |
| DATE         | AUTHOR L D BANWELL    |
| DRAWN H L H. | OFFICE DEVONPORT      |

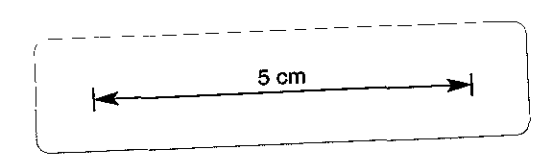
1100E 1200E 1300E 1400E 1500E 1600E 1700E 1800E 1900E 2000E



2400 N  
2300 N  
2200 N  
2100 N  
2000 N  
1900 N  
1850 N  
1800 N  
1750 N  
1700 N



NOTE: Contour Interval 5.00%  
> 9.99%  
> 4.99%  
> 9.99%  
> 14.99%  
> 19.99%  
82-1784  
200M

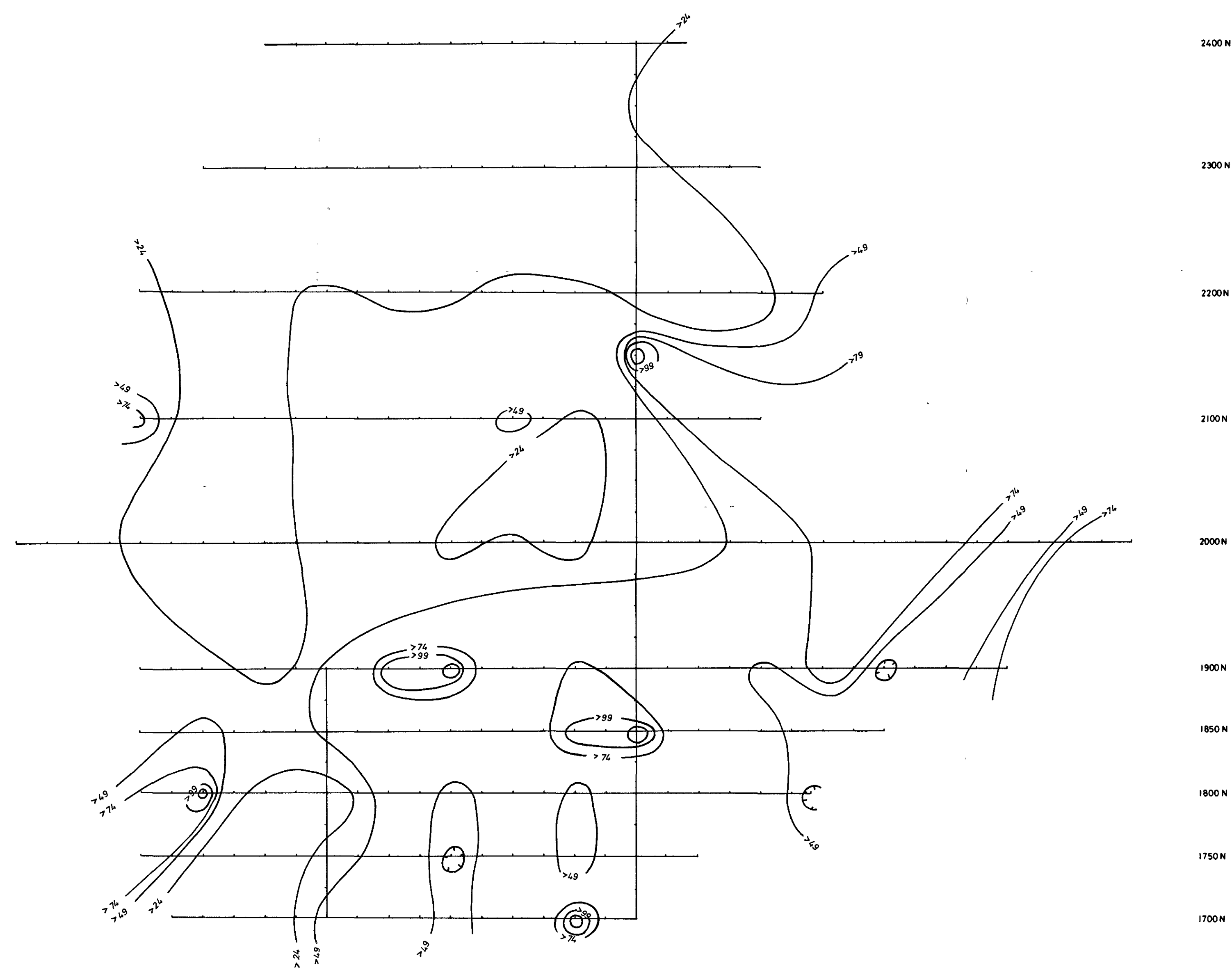


754243

7090

|                                                                                                     |                      |
|-----------------------------------------------------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                                           |                      |
| RIANA E.L. 8/77<br>NATONE PROSPECT<br>SOIL GEOCHEMISTRY<br>Fe (%)<br>ANOMALY 4044/1<br>Scale 1:2500 |                      |
| FIG. No.                                                                                            | REPORT No.           |
| ENCL. No.                                                                                           | DRG. No. D/MQ 04/024 |
| DATE 28-4-81                                                                                        | AUTHOR L D BANWELL   |
| DRAWN O HEDDITCH                                                                                    | OFFICE DEVONPORT     |

1100E 1200E 1300E 1400E 1500E 1600E 1700E 1800E 1900E 2000E



NOTE Contour Interval 25ppm  
 > 24, > 49, > 74, > 99, > 124.

82-1784

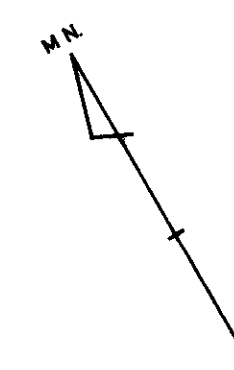
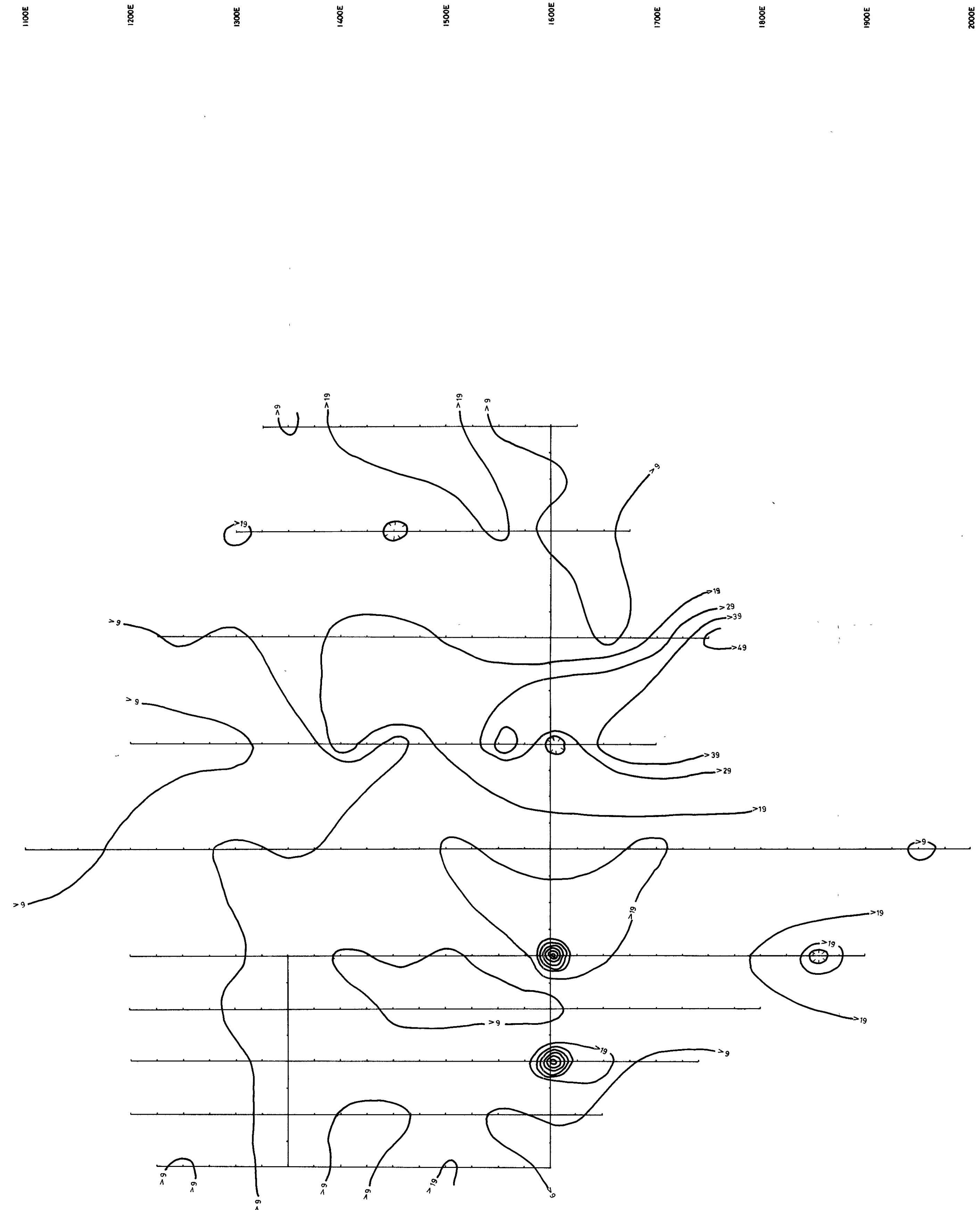
200M

754244

5 cm

7091

| The Shell Company of Australia Limited<br>METALS DIVISION                                             |                      |
|-------------------------------------------------------------------------------------------------------|----------------------|
| RIANA E.L. 8/77<br>NATONE PROSPECT<br>SOIL GEOCHEMISTRY<br>Zn (ppm)<br>ANOMALY 4044/1<br>Scale 1:2500 |                      |
| FIG. No.                                                                                              | REPORT No.           |
| ENCL. No.                                                                                             | DRG. No. D/MQ.04/025 |
| DATE 28-4-81                                                                                          | AUTHOR L D BANWELL   |
| DRAWN O. HEDDITCH                                                                                     | OFFICE DEVONPORT     |



2400 N  
2300 N  
2200 N  
2100 N  
2000 N  
1900 N  
1850 N  
1800 N  
1750 N  
1700 N

NOTE: Contour interval 10ppm.  
 > 9  
 > 19  
 > 29  
 > 39  
 > 49  
 > 59  
 > 69  
 > 79

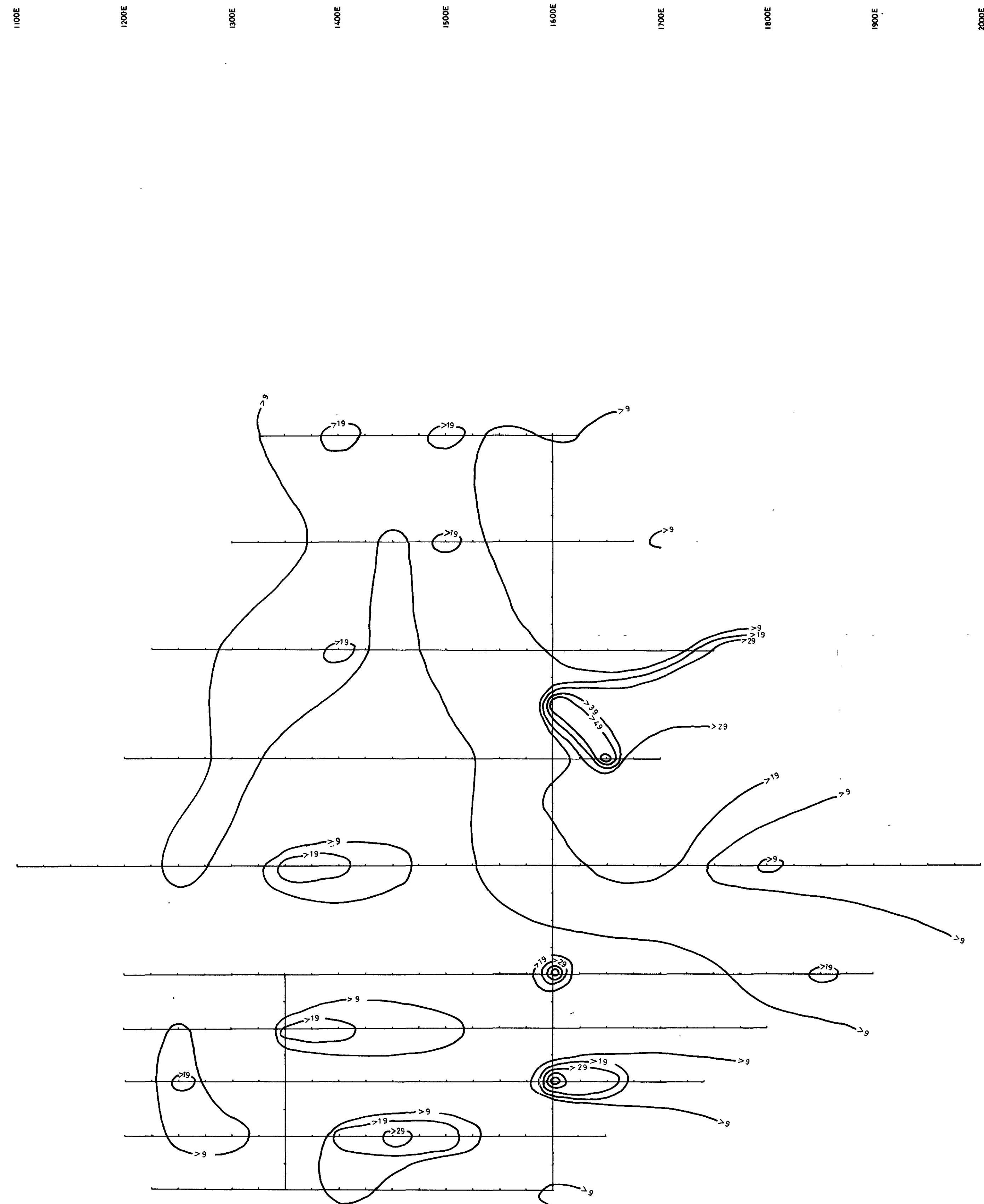
82-1784  
 200M

5 cm

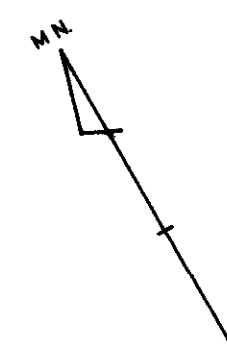
754245

7092

|                                                                                                        |                      |
|--------------------------------------------------------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                                              |                      |
| RIANA E.L. 8/77<br>NATONE PROSPECT<br>SOIL GEOCHEMISTRY<br>Sn(ppm)<br>ANOMALY 4044/1<br>Scale : 1 2500 |                      |
| FIG. No.                                                                                               | REPORT No.           |
| ENCL. No.                                                                                              | DRG. No. D/MQ 04/026 |
| DATE 29-4-81                                                                                           | AUTHOR L D BANWELL   |
| DRAWN H L H                                                                                            | OFFICE DEVONPORT     |



2400 N  
2300 N  
2200 N  
2100 N  
2000 N  
1900 N  
1850 N  
1800 N  
1750 N  
1700 N



NOTE: Contour interval 10 ppm.

9  
19  
29  
39  
49  
59

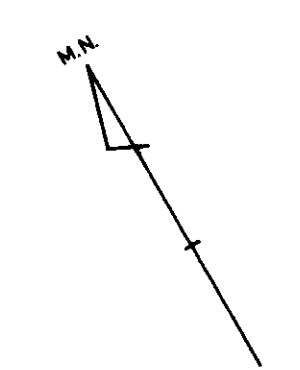
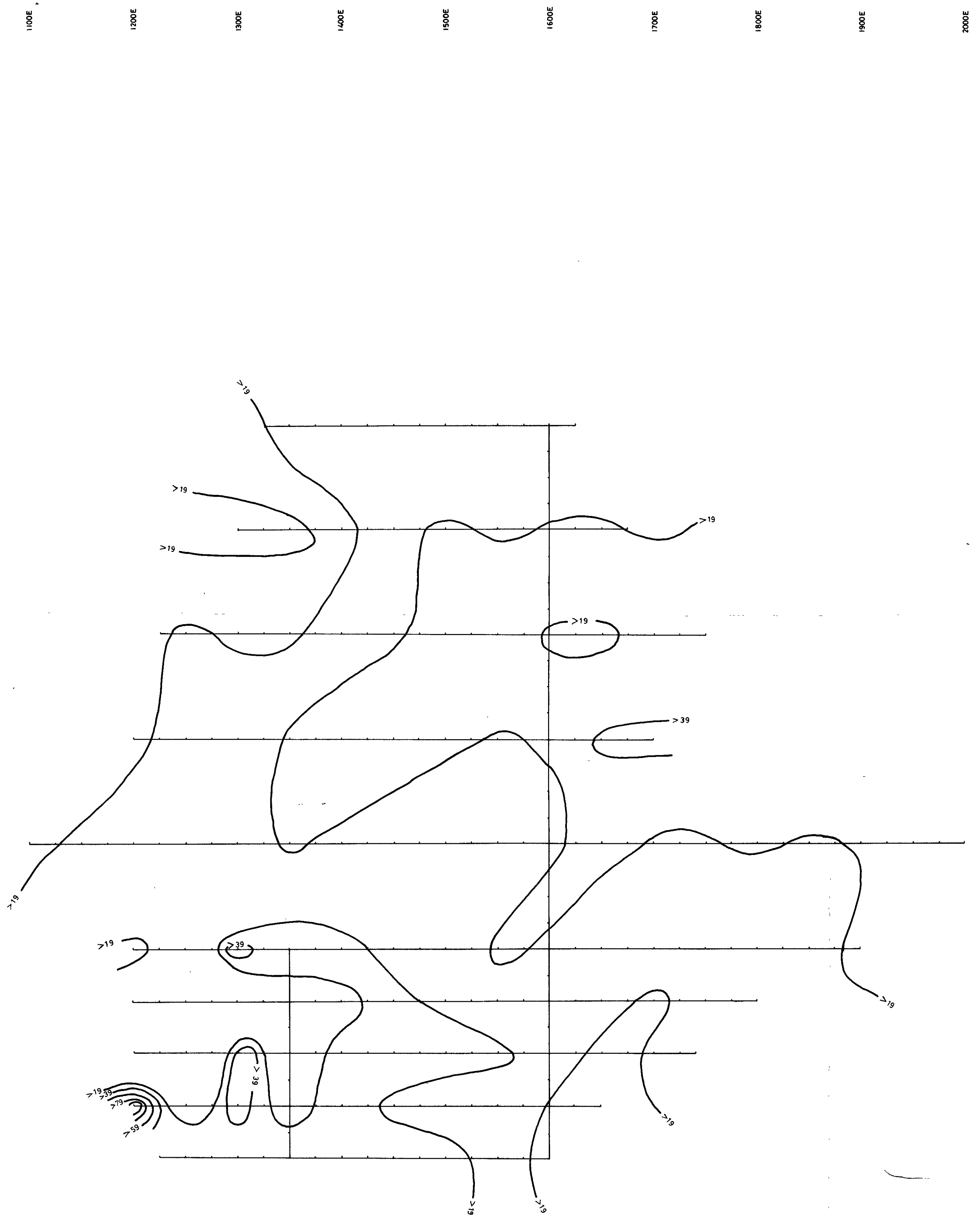
82-1784 200M

|                                                                                                      |                       |
|------------------------------------------------------------------------------------------------------|-----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                                            |                       |
| RIANA E.L. 8/77<br>NATONE PROSPECT<br>SOIL GEOCHEMISTRY<br>W (ppm)<br>ANOMALY 4044/1<br>Scale 1:2500 |                       |
| FIG. No.                                                                                             | REPORT No.            |
| ENCL. No.                                                                                            | DRG. No. 01/MQ 04/027 |
| DATE 29-4-81                                                                                         | AUTHOR L D BANWELL    |
| DRAWN H.L.H.                                                                                         | OFFICE DEVONPORT      |

751246

7093

5 cm



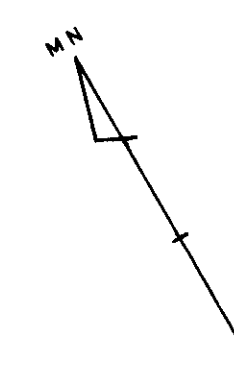
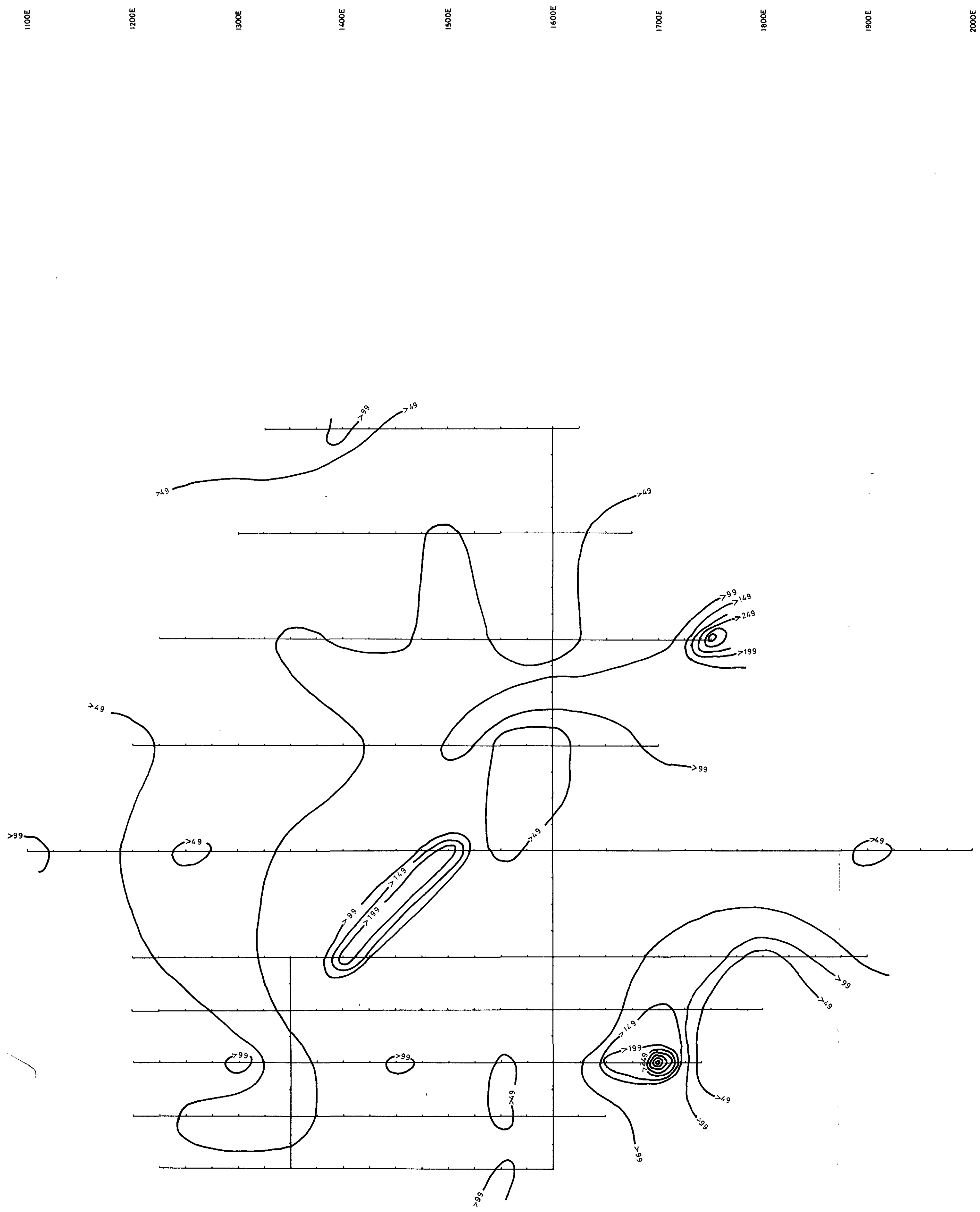
NOTE: Contour interval 20 ppm  
19  
39  
59  
79

82-1784  
200M

|                                                                                                       |                      |
|-------------------------------------------------------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                                             |                      |
| RIANA E.L. 8/77<br>NATONE PROSPECT<br>SOIL GEOCHEMISTRY<br>Pb (ppm)<br>ANOMALY 4044/1<br>Scale 1:2500 |                      |
| FIG. No.                                                                                              | REPORT No.           |
| ENCL. No.                                                                                             | DRG. No. D/MQ 04/028 |
| DATE 29-4-81                                                                                          | AUTHOR L.D. BANWELL  |
| DRAWN H.L.H.                                                                                          | OFFICE DEVONPORT     |

754247

7094



NOTE: Contour interval 50ppm.  
 > 49  
 > 99  
 > 149  
 > 199  
 > 249  
 > 299  
 > 349

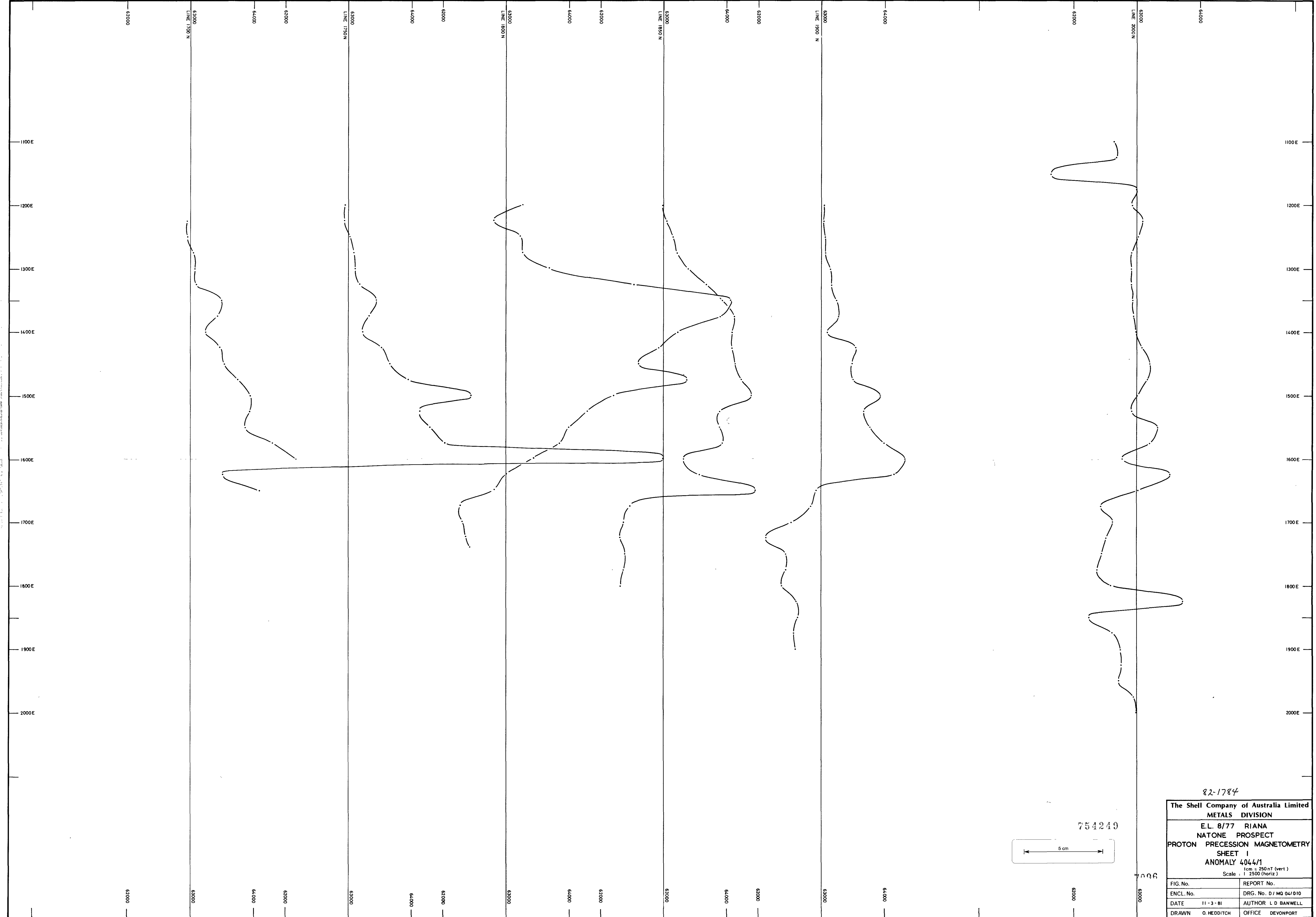
82-1784  
 200M

5 cm

754248

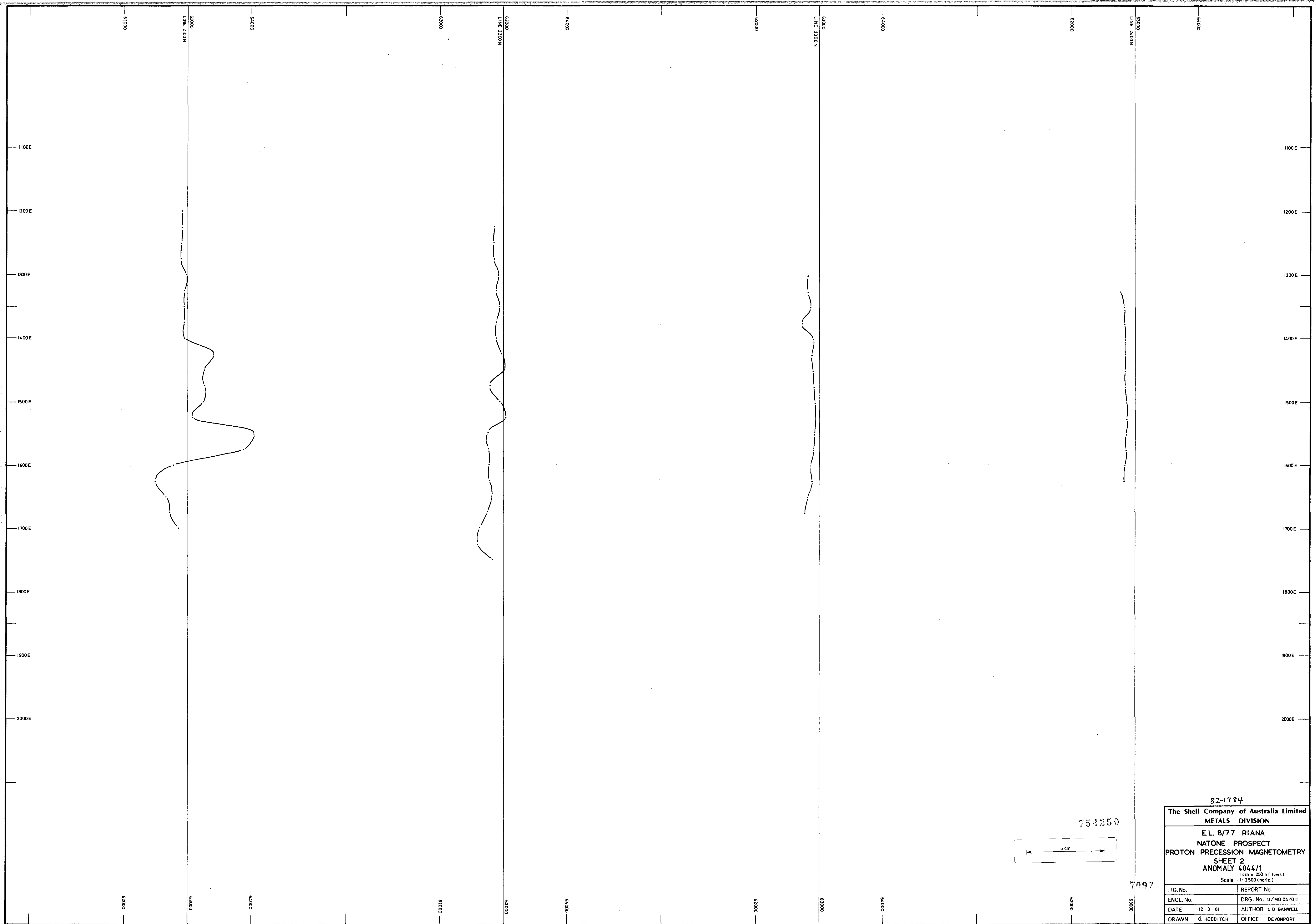
7095

|                                                                                                       |                      |
|-------------------------------------------------------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                                             |                      |
| RIANA E.L. 8/77<br>NATONE PROSPECT<br>SOIL GEOCHEMISTRY<br>Cu (ppm)<br>ANOMALY 4044/1<br>Scale 1:2500 |                      |
| FIG. No.                                                                                              | REPORT No.           |
| ENCL. No.                                                                                             | DRG. No. D/MQ 04/029 |
| DATE 29-4-81                                                                                          | AUTHOR L.D. BANWELL  |
| DRAWN H.L.H.                                                                                          | OFFICE DEVONPORT     |



82-1784

|                                                                                                   |                        |
|---------------------------------------------------------------------------------------------------|------------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                                         |                        |
| E.L. 8/77 RIANA<br>NATONE PROSPECT<br>PROTON PRECESSION MAGNETOMETRY<br>SHEET 1<br>ANOMALY 4044/1 |                        |
| 1cm = 250 nT (vert)<br>Scale 1:2500 (horiz)                                                       |                        |
| FIG. No.                                                                                          | REPORT No.             |
| ENCL. No.                                                                                         | DRG. No. D / MQ 04/010 |
| DATE 11-3-81                                                                                      | AUTHOR L D BANWELL     |
| DRAWN O. HEDDITCH                                                                                 | OFFICE DEVONPORT       |



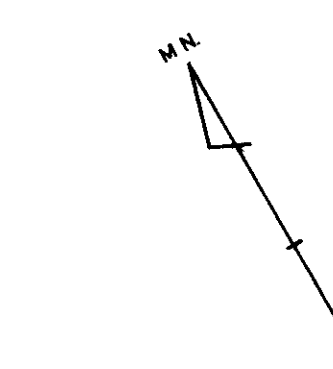
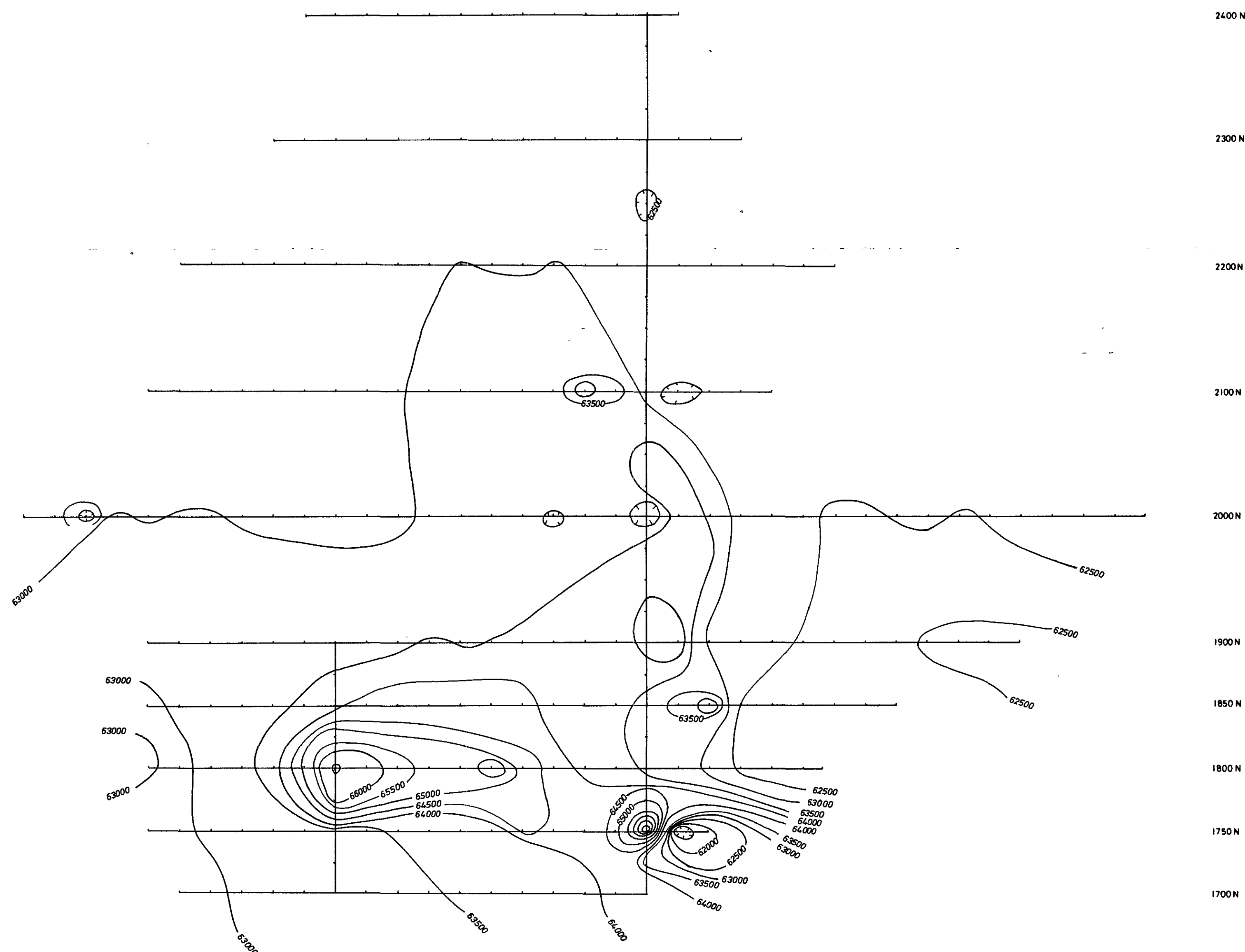
754250

7097

82-1784

|                                                                                                                                                                   |                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                                                                                                         |                      |
| E.L. 8/77 RIANA<br>NATONE PROSPECT<br>PROTON PRECESSION MAGNETOMETRY<br>SHEET 2<br>ANOMALY 4044/1<br><small>(cm = 250 nT (vert)<br/>Scale 1:2500 (horiz.)</small> |                      |
| FIG. No.                                                                                                                                                          | REPORT No.           |
| ENCL. No.                                                                                                                                                         | DRG. No. D/MQ 04/011 |
| DATE 12-3-81                                                                                                                                                      | AUTHOR L D BANWELL   |
| DRAWN G HEDDITCH                                                                                                                                                  | OFFICE DEVONPORT     |

1100E 1200E 1300E 1400E 1500E 1600E 1700E 1800E 1900E 2000E

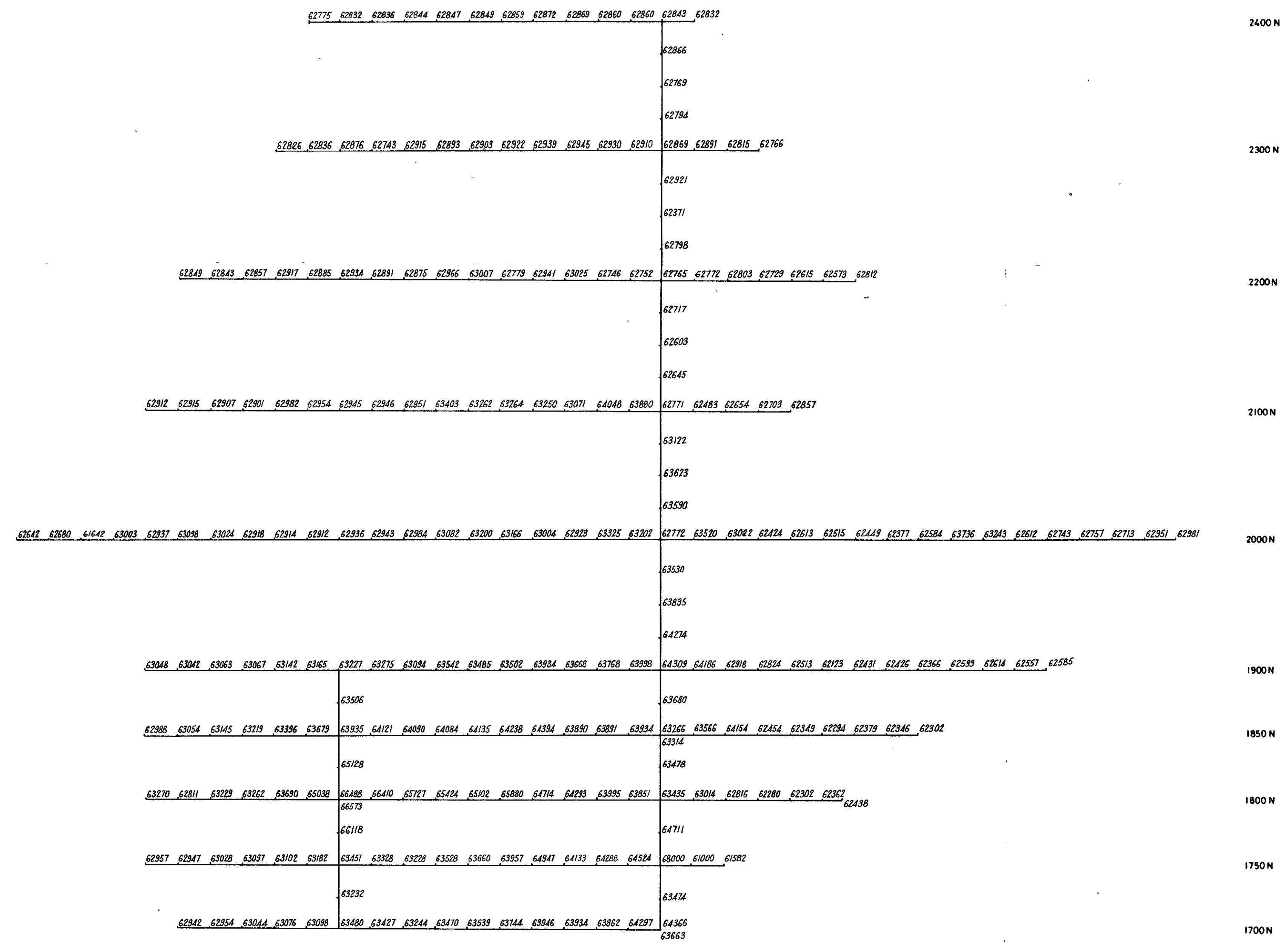


82-1784  
200M

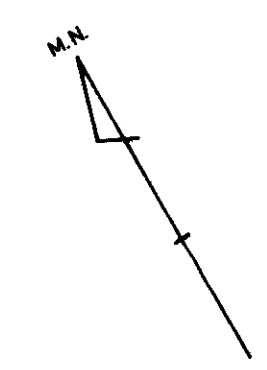
5 cm

|                                                                           |                       |
|---------------------------------------------------------------------------|-----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                 |                       |
| RIANA E.L. 8/77<br>NATONE PROSPECT<br>MAGNETIC CONTOURS<br>ANOMALY 4044/1 |                       |
| Contour Interval 500 nT<br>Scale 1:2500                                   |                       |
| FIG. No.                                                                  | REPORT No.            |
| ENCL. No.                                                                 | DRG. No. 01/MQ 04/012 |
| DATE 18-3-81                                                              | AUTHOR L D BANWELL    |
| DRAWN O. HEDDITCH                                                         | OFFICE DEVONPORT      |

1100E 1200E 1300E 1400E 1500E 1600E 1700E 1800E 1900E 2000E



2400 N  
2300 N  
2200 N  
2100 N  
2000 N  
1900 N  
1850 N  
1800 N  
1750 N  
1700 N

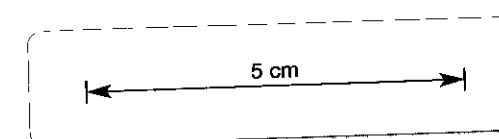


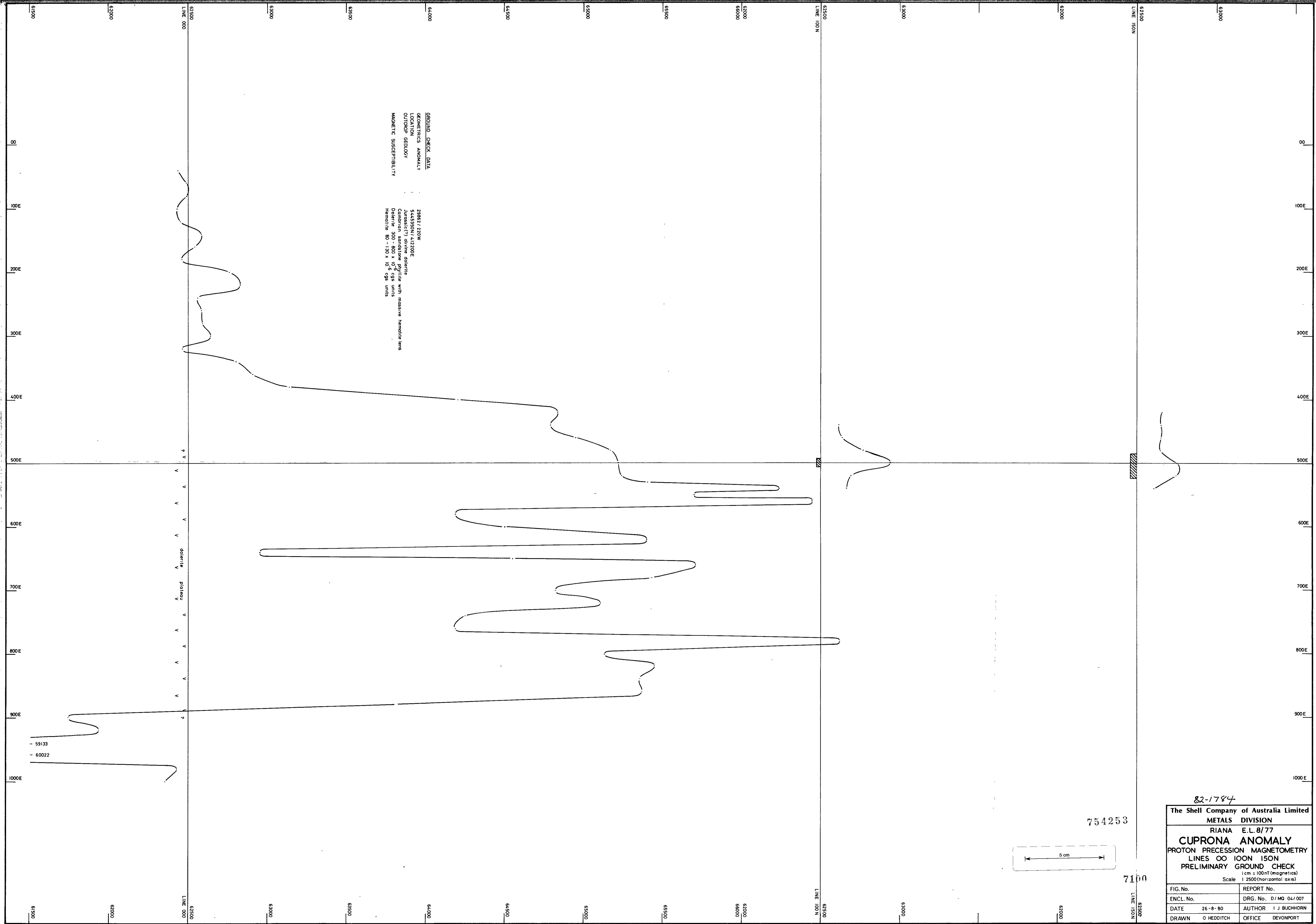
82-1784  
200M

|                                                                   |                      |
|-------------------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION         |                      |
| RIANA E.L. 8/77<br>NATONE PROSPECT<br>MAGNETICS<br>ANOMALY 4044/1 |                      |
| Scale 1:2500                                                      |                      |
| FIG. No.                                                          | REPORT No.           |
| ENCL. No.                                                         | DRG. No. D/MQ 04/013 |
| DATE 18 - 3 - 81                                                  | AUTHOR L. D. BANWELL |
| DRAWN Q. HEDDITCH                                                 | OFFICE DEVONPORT     |

754252

7099

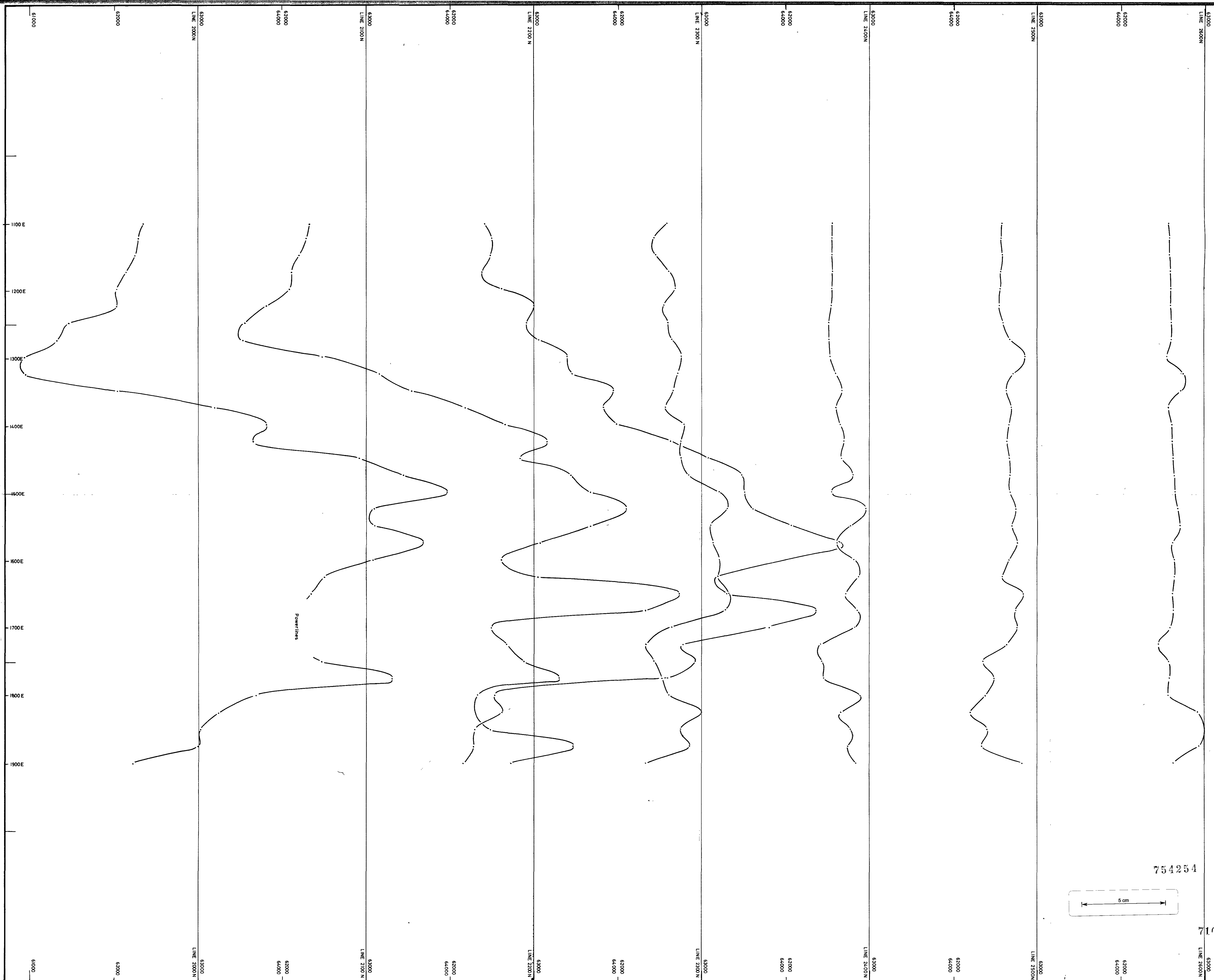




82-1784

The Shell Company of Australia Limited  
METALS DIVISION  
RIANA E.L. 8/77  
**CUPRONA ANOMALY**  
PROTON PRECESSION MAGNETOMETRY  
LINES 00 100N 150N  
PRELIMINARY GROUND CHECK  
1 cm = 100m (magnetics)  
Scale 1:2500 (horizontal axis)

|                  |                      |
|------------------|----------------------|
| FIG. No.         | REPORT No.           |
| ENCL. No.        | DRG. No. D/MQ 04/007 |
| DATE             | AUTHOR I J BUCHHORN  |
| DRAWN O HEDDITCH | OFFICE DEVONPORT     |

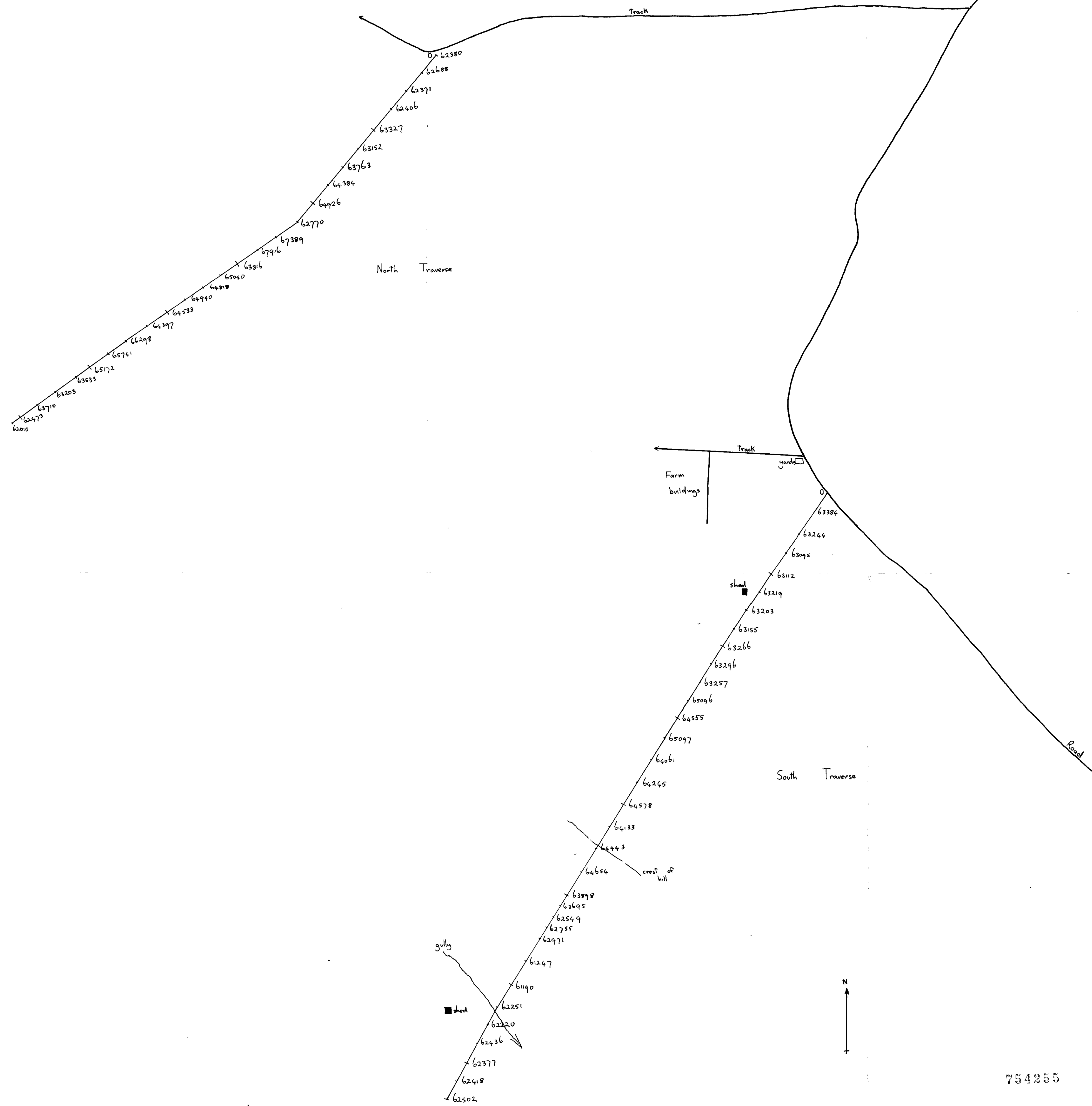


754254

7101

82-1784

|                                                              |                      |
|--------------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION    |                      |
| RIANA E.L. 8/77<br>CUPRONA<br>PROTON PRECESSION MAGNETOMETRY |                      |
| 1 cm = 200 nT (vert.)<br>Scale 1:2500 (horizontal)           |                      |
| FIG No.                                                      | REPORT No.           |
| ENCL. No.                                                    | DRG. No. 0/MQ 04/009 |
| DATE 8-1-81                                                  | AUTHOR S. HALLEY     |
| DRAWN O. HEDDITCH                                            | OFFICE DEVONPORT     |

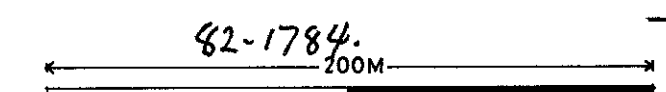
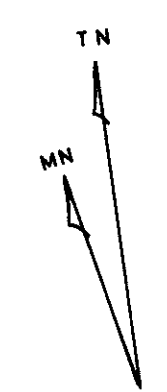
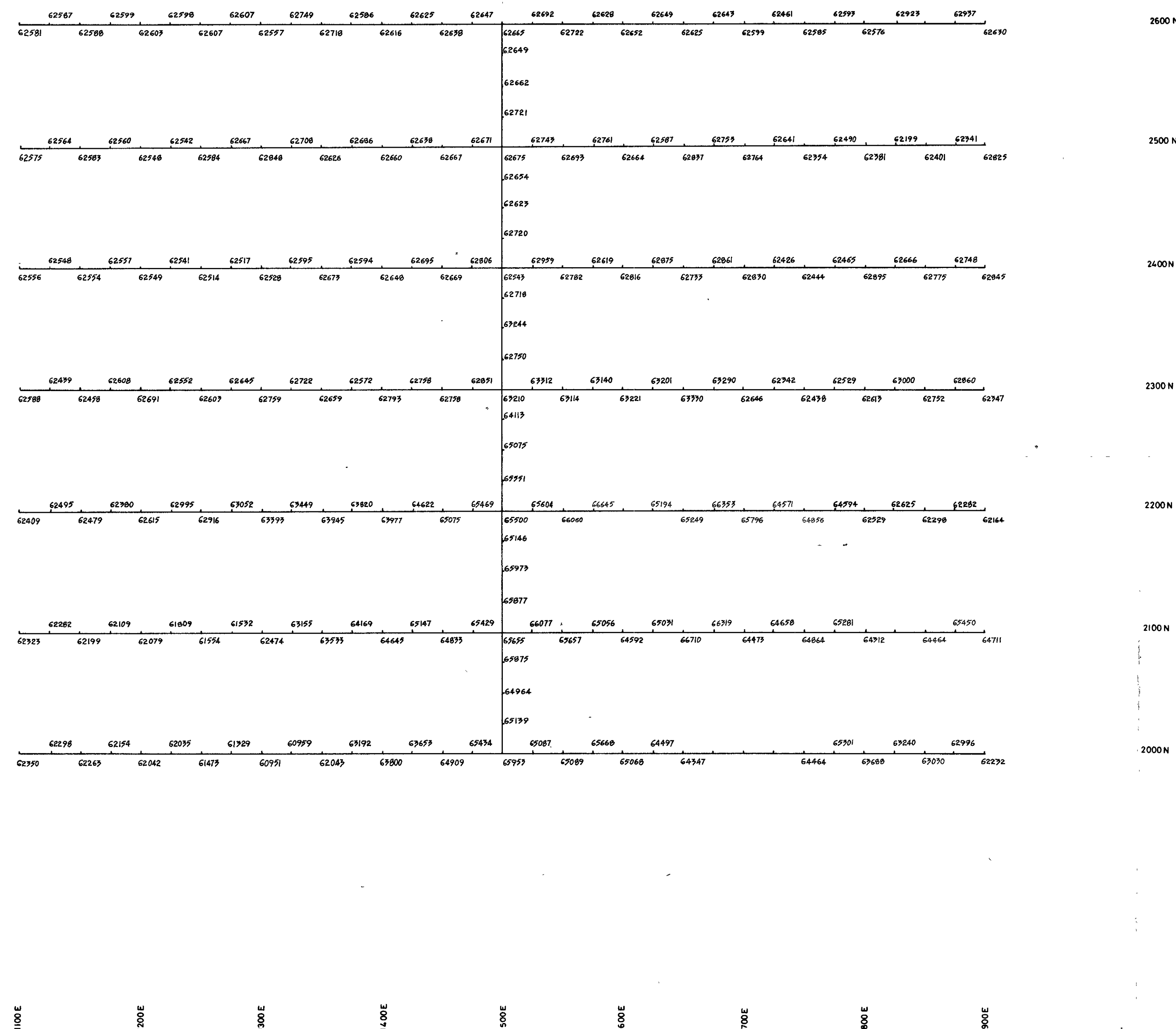


82-1784

| The Shell Company of Australia Limited<br>METALS DIVISION                                         |                      |
|---------------------------------------------------------------------------------------------------|----------------------|
| RIANA E.L. 8/77<br>AIRBORNE MAGNETIC ANOMALY<br>4041/1 CUPRONA<br>RECONNAISSANCE GROUND MAGNETICS |                      |
| Scale 1:2500                                                                                      |                      |
| FIG. No.                                                                                          | REPORT No.           |
| ENCL. No.                                                                                         | DRG. No. D/MQ 04/015 |
| DATE 25-3-81                                                                                      | AUTHOR G OAKES       |
| DRAWN G OAKES                                                                                     | OFFICE DEVONPORT     |

754255

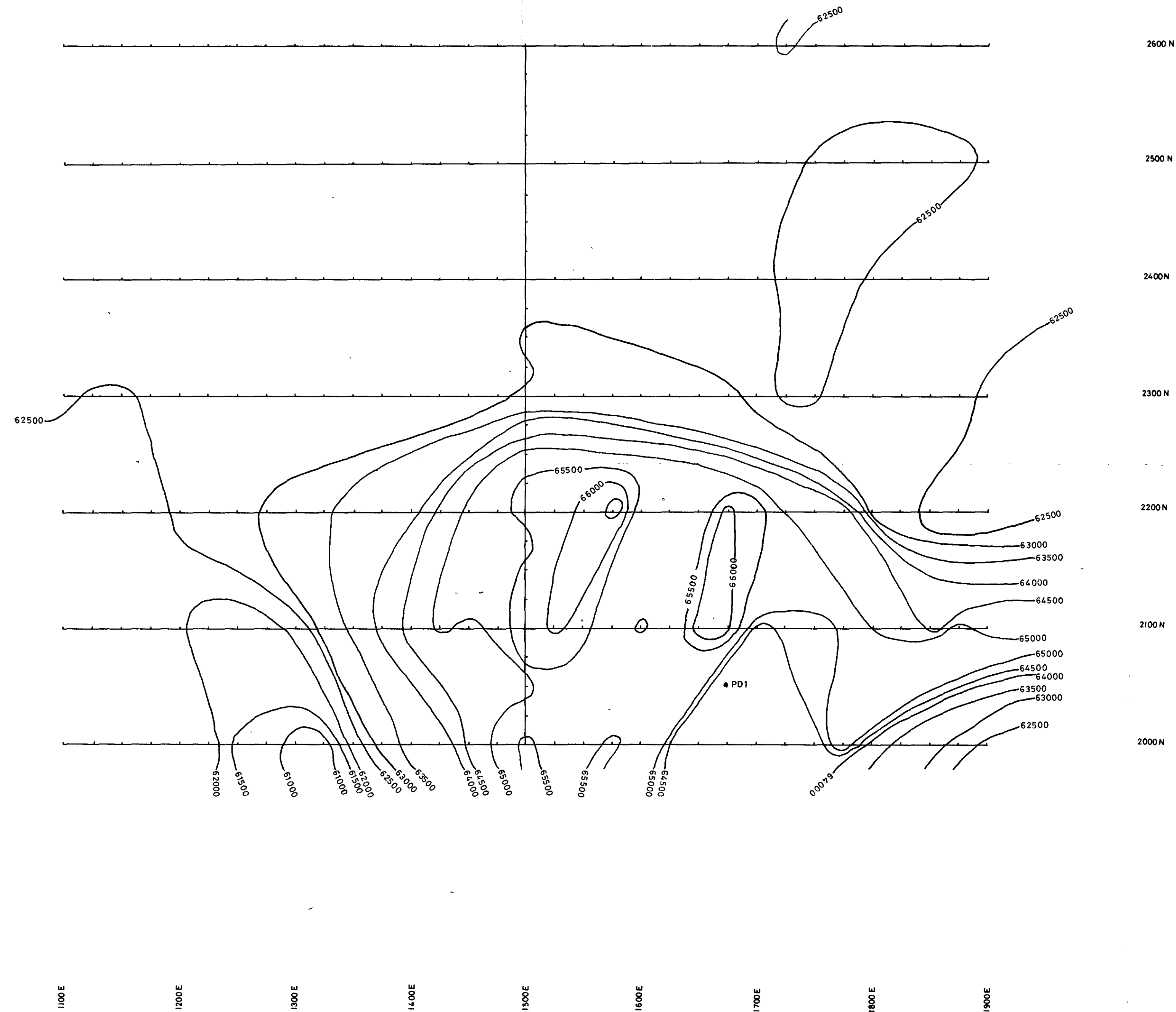
7102



754256

7103

|                                                                           |                      |
|---------------------------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION                 |                      |
| E L 8/77 RIANA<br>CUPRONA<br>PROSPECT<br>4144/1<br>GROUND MAGNETIC VALUES |                      |
| Scale : 1 2500                                                            |                      |
| FIG. No.                                                                  | REPORT No.           |
| ENCL. No.                                                                 | DRG. No. D/MQ 04/020 |
| DATE 16-4-81                                                              | AUTHOR L D. BANWELL  |
| DRAWN H L H.                                                              | OFFICE DEVONPORT     |

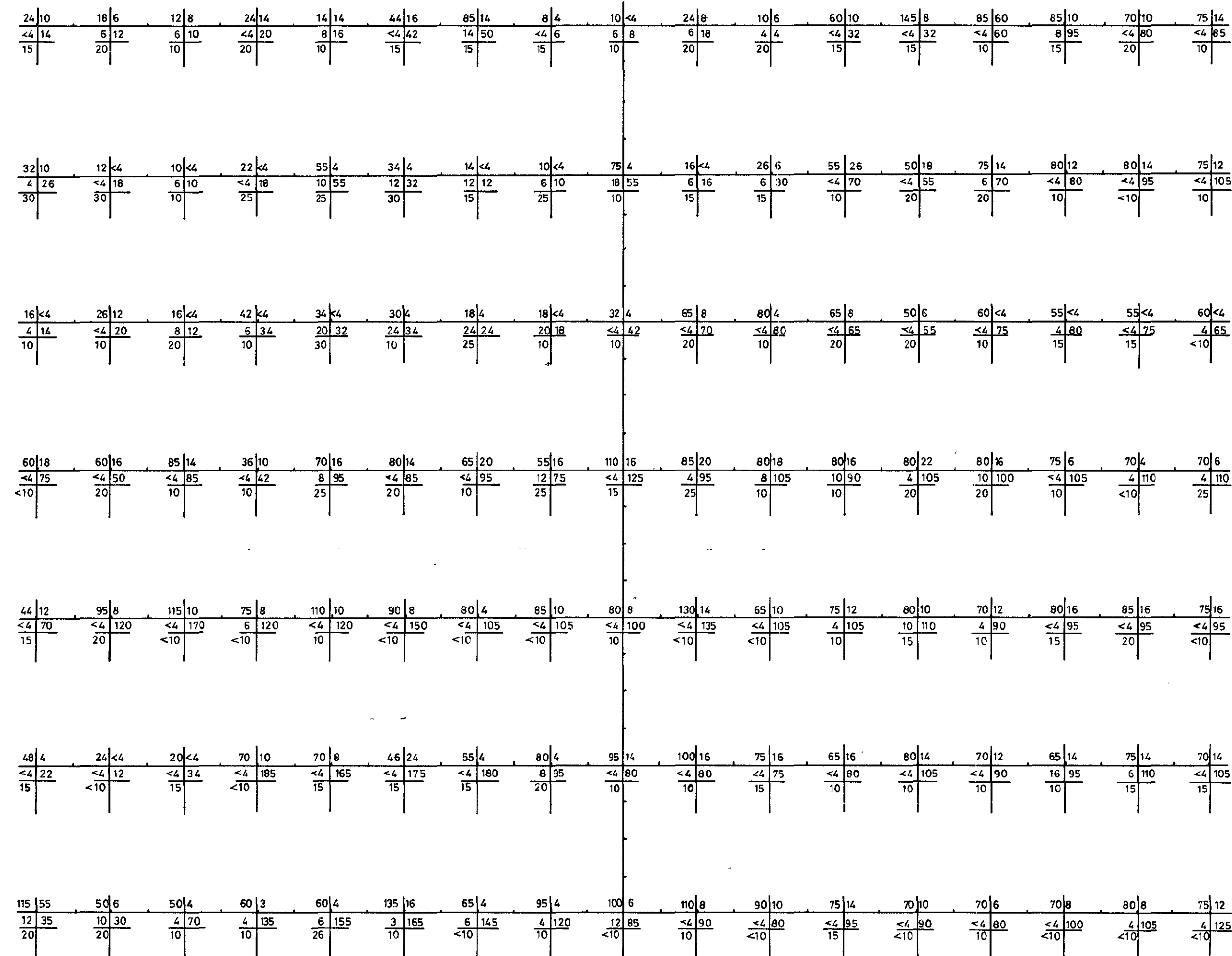


754257

82-1784  
200M

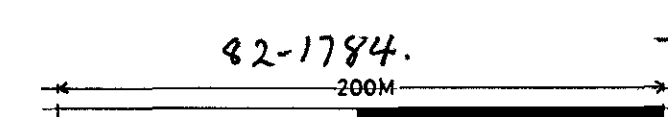
|                                                           |                      |
|-----------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION |                      |
| E L 8/77 RIANA<br>CUPRONA<br>PROSPECT<br>4144/1           |                      |
| GROUND MAGNETIC CONTOURS<br>Scale - 1:2500                |                      |
| FIG. No.                                                  | REPORT No.           |
| ENCL. No.                                                 | DRG. No. D/MQ 04/021 |
| DATE 16-4-81                                              | AUTHOR L D BANWELL   |
| DRAWN H L H.                                              | OFFICE DEVONPORT     |

7104



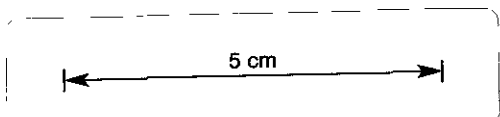
NOTE: Analyses in ppm.

|    |    |
|----|----|
| Cu | Pb |
| Sn | Zn |
| W  |    |

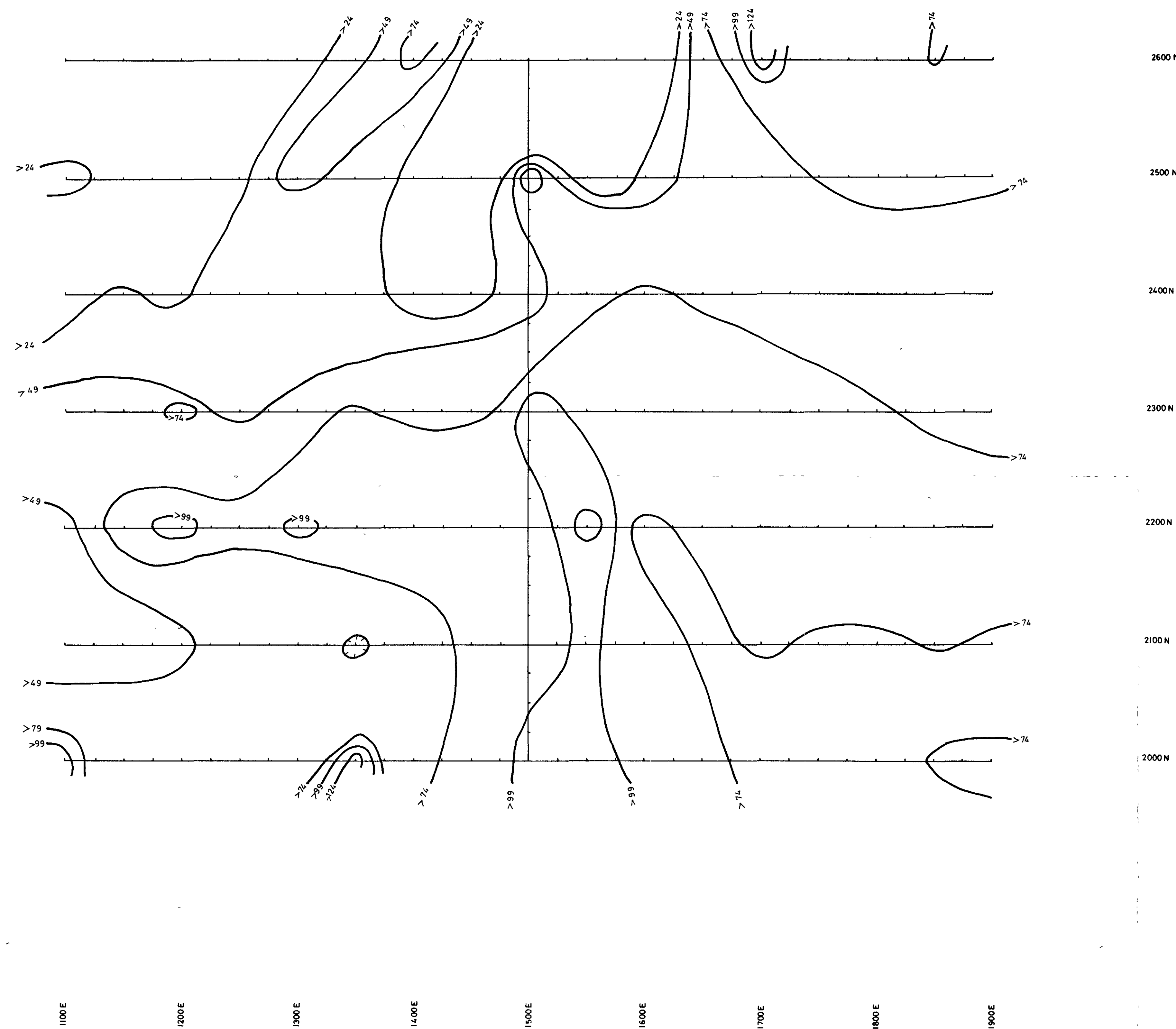


|                                                           |                      |
|-----------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION |                      |
| E L 8/77 RIANA<br>CUPRONA<br>SOIL GEOCHEMISTRY            |                      |
| Scale 1:2500                                              |                      |
| FIG. No.                                                  | REPORT No.           |
| ENCL. No.                                                 | DRG. No. D/MQ 04/022 |
| DATE 21-4-31                                              | AUTHOR L. D. BANWELL |
| DRAWN H. L. H.                                            | OFFICE DEVONPORT     |

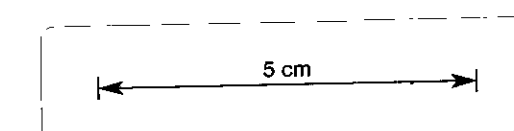
754258



7105



754250



7106

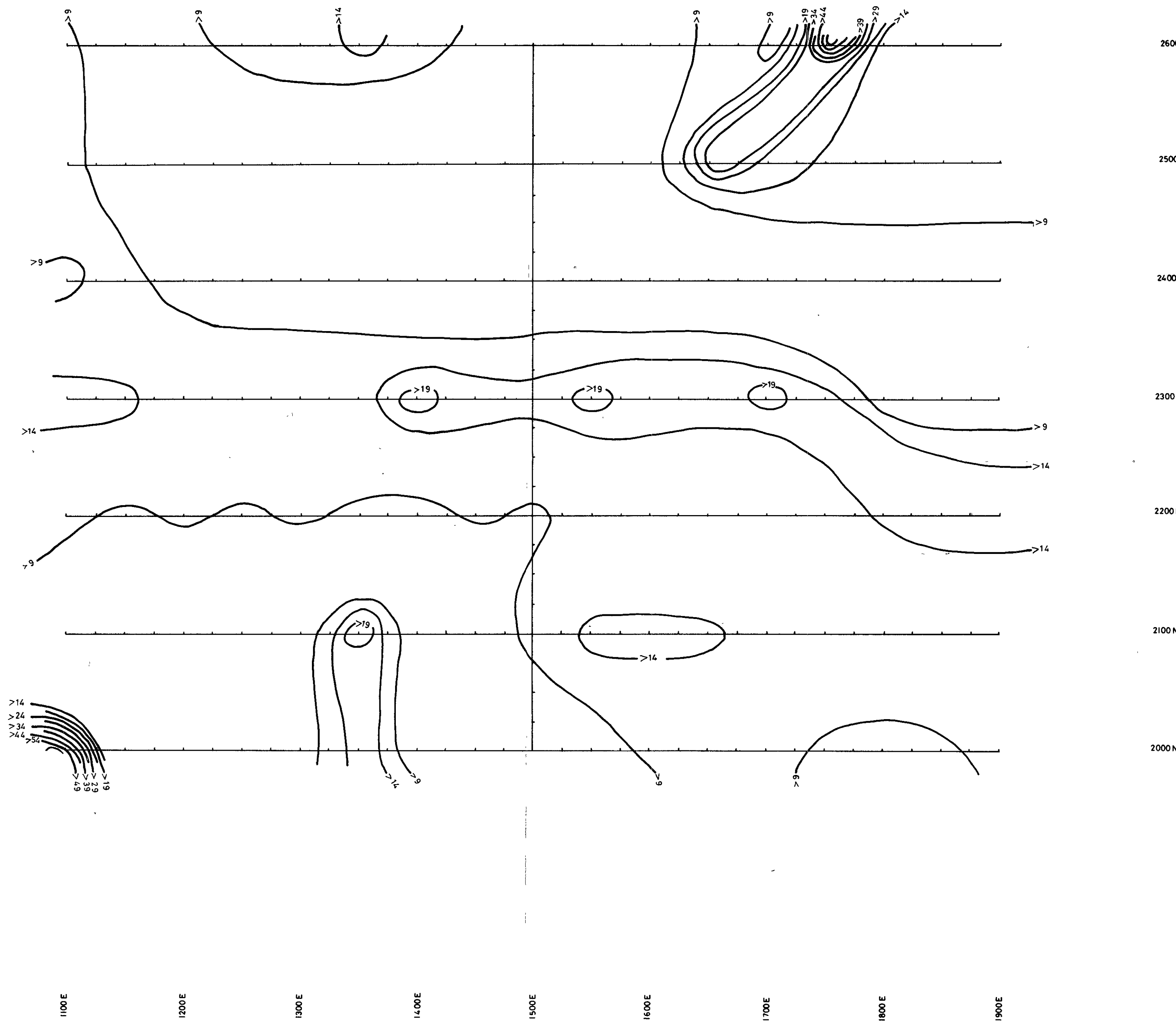
82-1784-200M

The Shell Company of Australia Limited  
METALS DIVISION

E L 8/77 RIANA  
CUPRONA  
SOIL GEOCHEMISTRY  
Cu (ppm)

Scale 1:2500

|              |                      |
|--------------|----------------------|
| FIG. No.     | REPORT No.           |
| ENCL. No.    | DRG. No. D/MQ 04/030 |
| DATE 30-4-81 | AUTHOR L D BANWELL   |
| DRAWN H.L.H  | OFFICE DEVONPORT     |



NOTE: Contour interval 5ppm.

> 9  
> 14  
> 19  
> 24

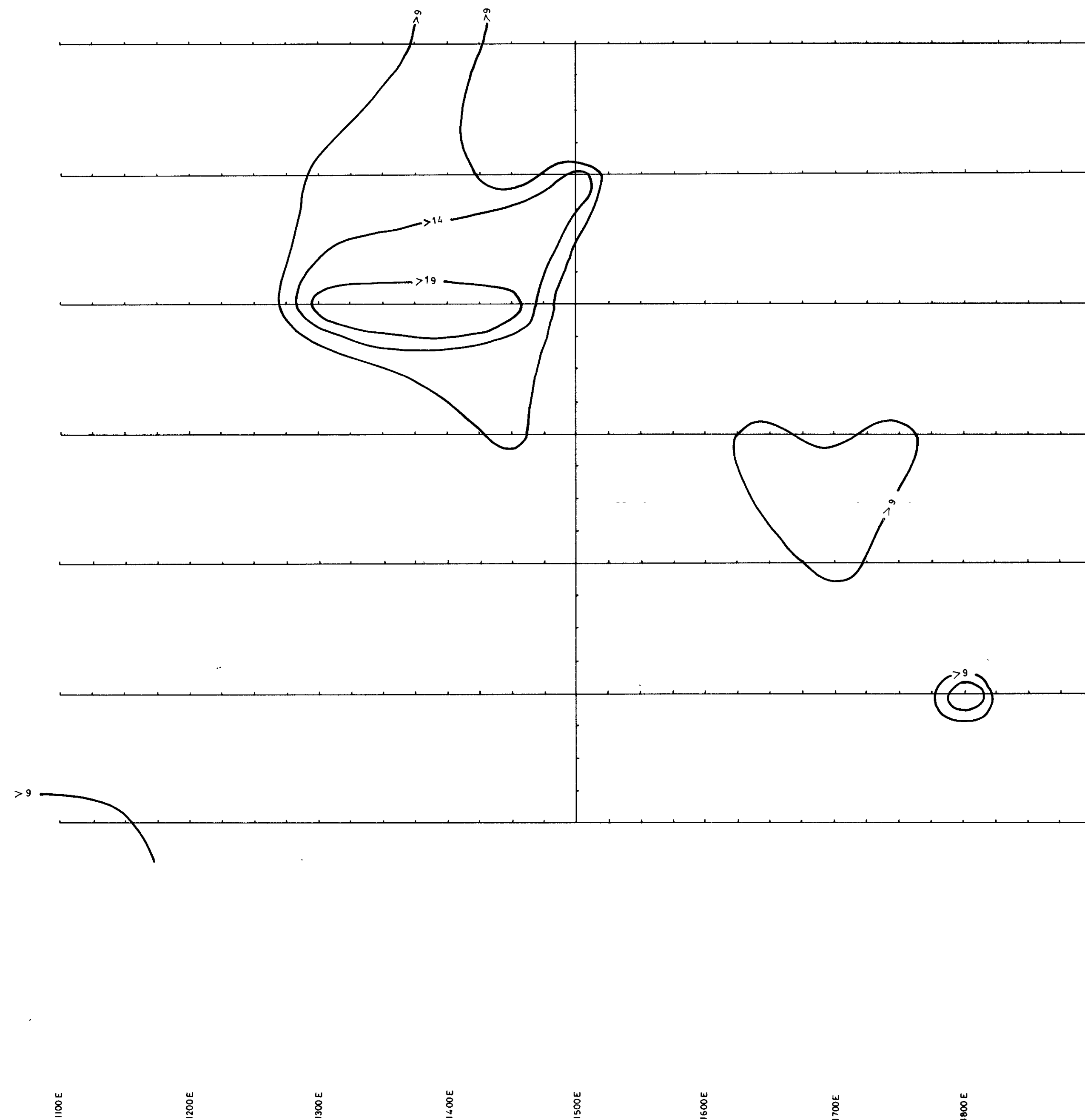
82-1784  
200M

5 cm

|                                                             |                      |
|-------------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION   |                      |
| E L. 8/77 RIANA<br>CUPRONA<br>SOIL GEOCHEMISTRY<br>Pb (ppm) |                      |
| Scale 1:2500                                                |                      |
| FIG. No.                                                    | REPORT No.           |
| ENCL. No.                                                   | DRG. No. D/MQ 04/031 |
| DATE 30-4-81                                                | AUTHOR L.D. BANWELL  |
| DRAWN H.L.H.                                                | OFFICE DEVONPORT     |

754200

7107

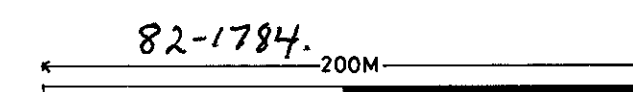


2600 N  
2500 N  
2400 N  
2300 N  
2200 N  
2100 N  
2000 N

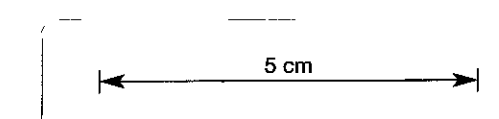


NOTE: Contour interval 5ppm  
> 9  
> 14  
> 19  
> 24

82-1784



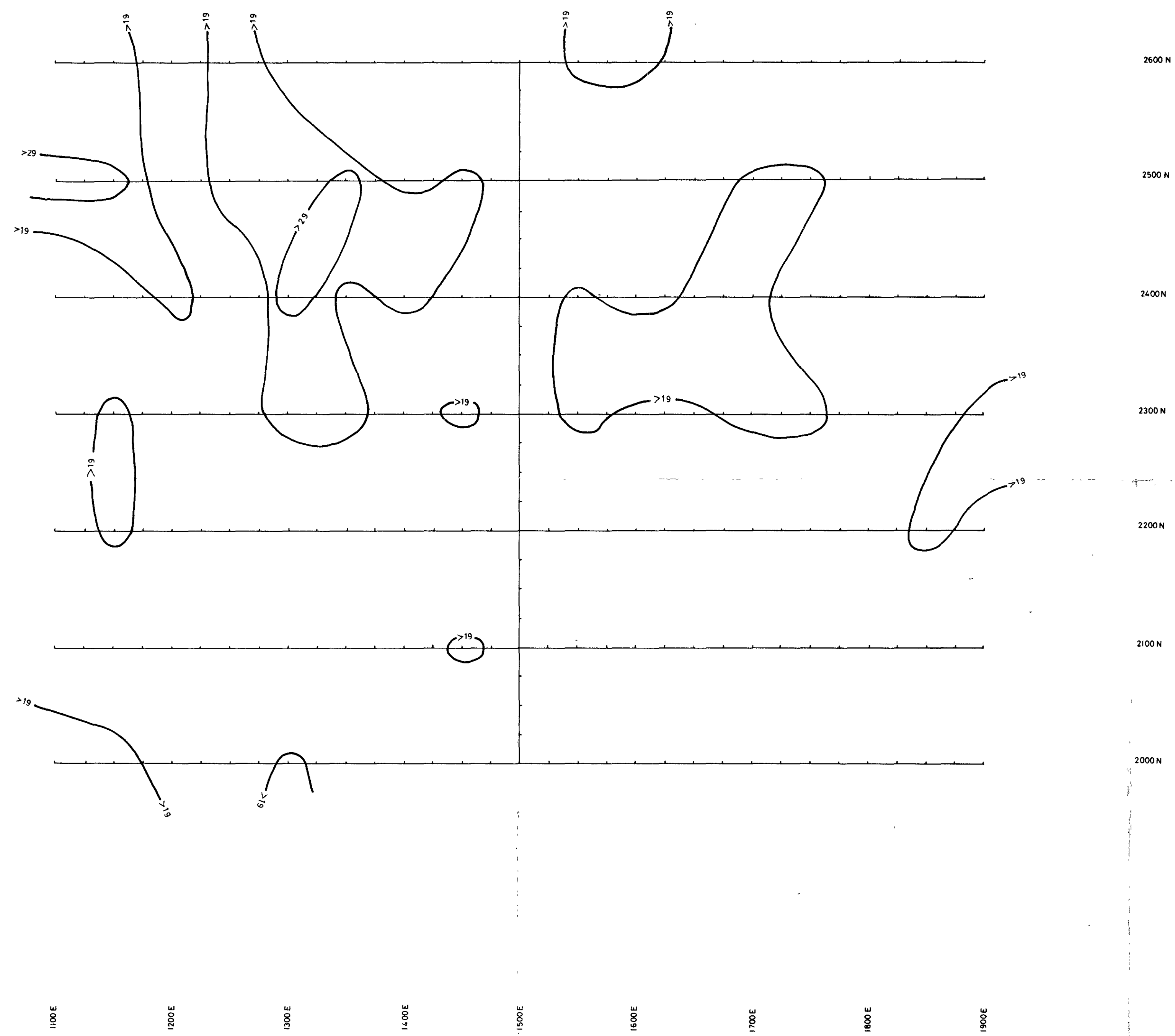
754261



7108

|                                                           |                      |
|-----------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION |                      |
| E L 8/77 RIANA<br>CUPRONA<br>SOIL GEOCHEMISTRY<br>Sn(ppm) |                      |
| Scale 1:2500                                              |                      |
| FIG. No.                                                  | REPORT No.           |
| ENCL. No.                                                 | DRG. No. D/MQ 04/032 |
| DATE 30-4-81                                              | AUTHOR L D BANWELL   |
| DRAWN H L H                                               | OFFICE DEVONPORT     |





NOTE: Contour interval 10 ppm.  
> 19  
> 29

82-1784  
200M

5 cm

754263

7110

|                                                           |                      |
|-----------------------------------------------------------|----------------------|
| The Shell Company of Australia Limited<br>METALS DIVISION |                      |
| E L 8/77 RIANA<br>CUPRONA                                 |                      |
| SOIL GEOCHEMISTRY<br>W (ppm)                              |                      |
| Scale 1:2500                                              |                      |
| FIG. No.                                                  | REPORT No            |
| ENCL. No                                                  | DRG. No. D/MQ 04/034 |
| DATE 1-4-81                                               | AUTHOR L D BAWWELL   |
| DRAWN H L H                                               | OFFICE DEVONPORT     |