

# Open File Envelope

## No. 5547

**EL 1224**

**HARCUS HILL**

**PROGRESS AND FINAL REPORTS TO LICENCE  
SURRENDER FOR THE PERIOD 24/2/84 TO 15/10/85**

Submitted by  
BHP Minerals Ltd  
1985

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**PRIMARY INDUSTRIES  
AND RESOURCES SA**

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Env. 5547

E.L. 1224 - Hareus Hill, S.A.

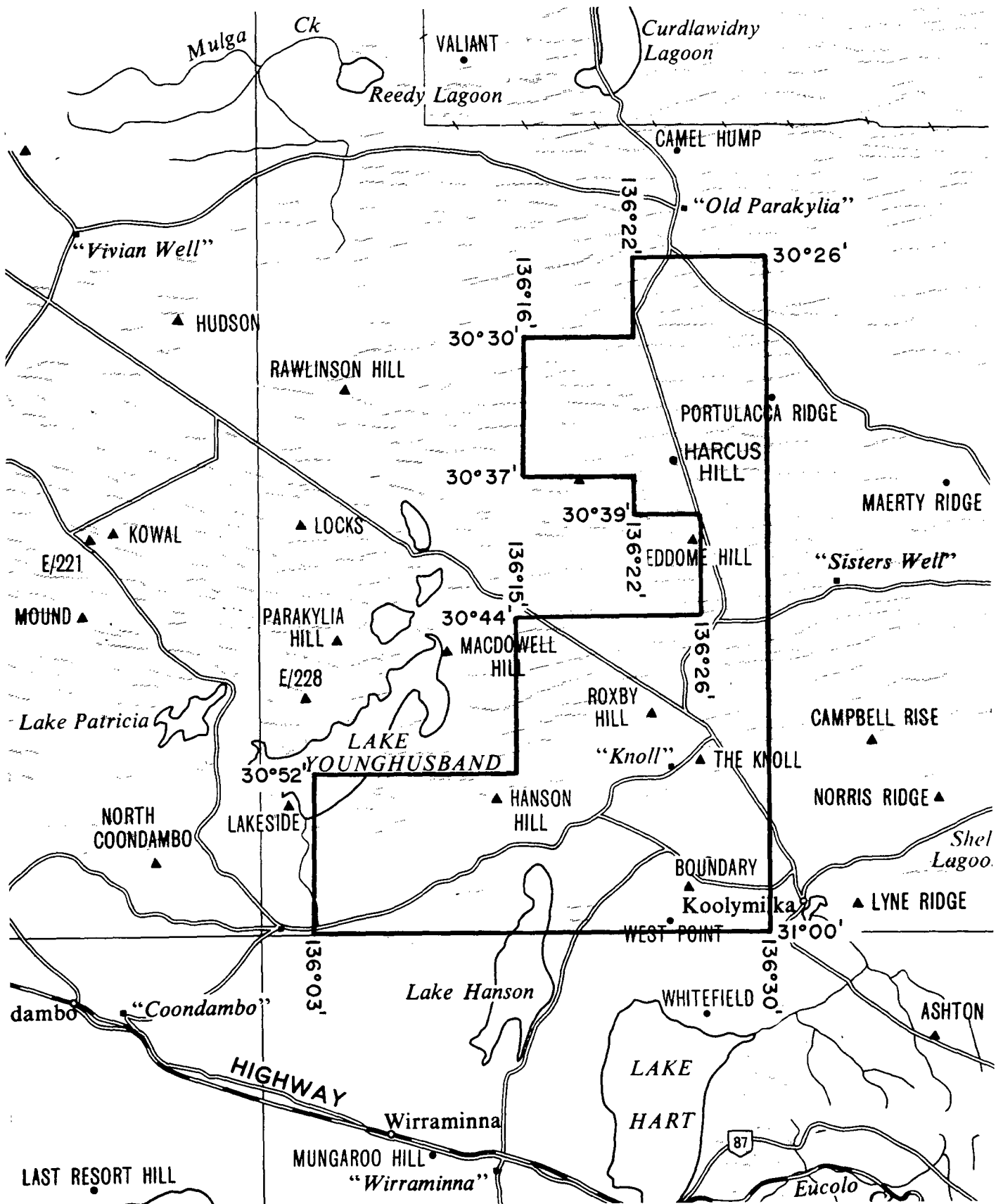
A located data tape of the aerial magnetic and radiometric survey flown by Austirex International Ltd. in July 1984 is held by Geophysics Branch, Department of Mines and Energy.

2 December 1985 (AWN)

5547 / 1

TITLE -	SCALE	PLAN NO.
<u>EL 1224,</u>		
<u>HARCUS HILL S.A.</u>		
<u>AEROMAGNETIC SURVEY - JULY, 1984</u>		
<u>Flown by AUSTIREX INT. LTD.</u>		
- Residual stacked magnetic profiles (9 plans)	1:50000	A-865 to A-873.
- Total magnetic intensity contours and flight paths. (18 plans - Sheet 1 to 18)	1:25000	A1-790 to <del>8</del> A1-807.

# SCHEDULE A



SCALE 1:500,000

KILOMETRES 10 0 10 20 30 40 50 KILOMETRES

**SURRENDERED**

APPLICANT: BHP MINERALS LIMITED

DM: 348/83

AREA: 1480 square kilometres (approx.)

1:250000 PLANS: KINGOONYA

LOCALITY: HARCUS HILL AREA - Approx. 65km northwest of Woomera

DATE GRANTED: 24.2.84

DATE EXPIRED: 23.2.85

EL No: 1224

[CR 4241]

EXPLORATION LICENCE 1224

HARCUS HILL, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 24TH MAY, 1984

CONTENTS

1. GENERAL
2. TITLE
3. WORK DONE
4. EXPENDITURE

FIGURES

1. E.L. 1224 Marcus Hill, S.A.  
Location Map

A4-354

136°00'

136°30'

0005

"Parakynid"

30°26'

Olympic Dam Mine

30°30'

30°30'

Harcus Hill

30°37'

30°39'

136°26'

"Locks Well"

30°44'

"Roxby Downs"

"Purple Downs"

30°52'

LAKE YOUNGHUSBAND

"Knoll"

"East Well"

E.L.1224

31°00'

31°00'

136°03'

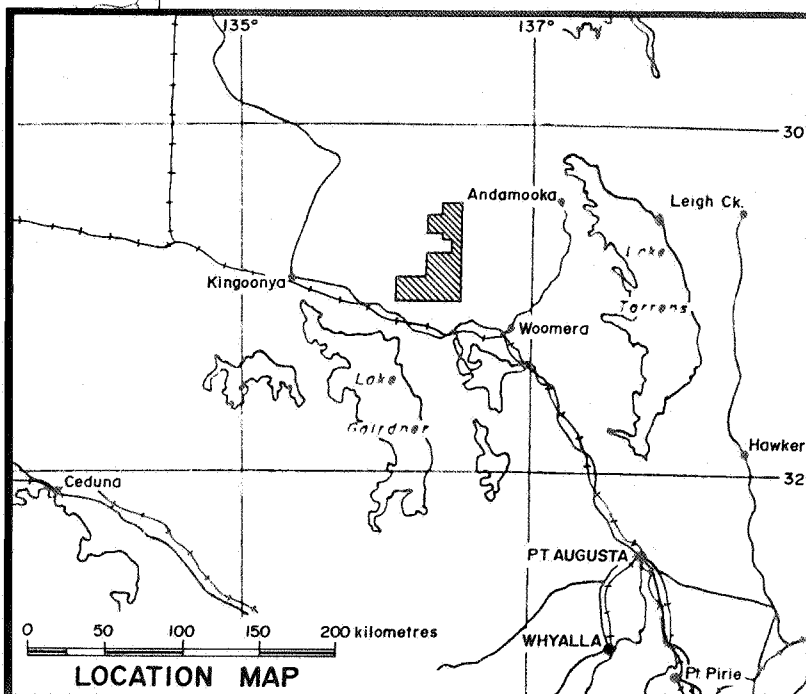
LAKE HANSON

N

E.L. boundary

SCALE 1:500,000

0 10 20 30 km



Centre  
Adelaide  
Date  
7-5-84

THE BROKEN HILL PROPRIETARY CO LTD  
E.L.1224 HARCUS HILL, S.A.  
LOCATION MAP

Project No  
6-D22-1  
Drawing No  
A4-354

EXPLORATION LICENCE 1224HARCUS HILL, SOUTH AUSTRALIAREPORT FOR THE QUARTER ENDED 24TH MAY, 19841. GENERAL STATEMENT

Exploration Licence 1224 was taken up primarily to test the diamond potential of the area. A subsidiary interest is the potential for base metal mineralization.

2. TITLE

Exploration Licence 1224 of 1480 square kilometres was granted to BHP Minerals Limited on 24th February, 1984 for one year. Its location is shown in Figure 1.

3. WORK DONE

An assessment of previous exploration in the area has been carried out. An aeromagnetic survey is considered to be the most effective method of exploration in this area. Some preliminary work is under way and an aeromagnetic survey is planned for the next quarter.

4. EXPENDITURE

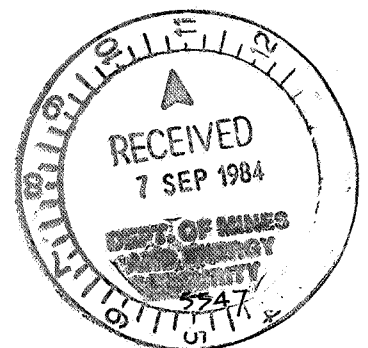
Expenditure debited to Exploration Licence 1224 to the end of May, 1984 was:-

Geophysics	197
Tenement fees	2,605
Services	520
Administration & Overheads	332
	<hr/>
	\$3,654

EXPLORATION LICENCE 1224

HARCUS HILL, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 24TH AUGUST, 1984





CONTENTS

1. GENERAL
2. TITLE
3. FIELD INVESTIGATIONS
  - 3.1 Aeromagnetic Survey
4. EXPENDITURE

FIGURES

1. E.L. 1224 Marcus Hill, S.A.  
Location Map

A4-354

EXPLORATION LICENCE 1224HARCUS HILL, SOUTH AUSTRALIAREPORT FOR THE QUARTER ENDED 24TH AUGUST, 19841. GENERAL STATEMENT

Exploration Licence 1224 was taken up primarily to test the diamond potential of the area. A subsidiary interest is the potential for base metal mineralisation.

2. TITLE

Exploration Licence 1224 of 1 480 square kilometres was granted to BHP Minerals Limited on 24th February, 1984 for one year. Its location is shown in Figure 1.

3. FIELD INVESTIGATIONS3.1 Aeromagnetic Survey

An aeromagnetic survey was flown over the whole exploration licence in July by Austirex International Ltd. The data (is) currently being processed and will be available shortly for interpretation. Ground follow-up of likely kimberlitic targets will be undertaken as soon as possible.

4. EXPENDITURE

Expenditure debited to Exploration Licence 1224 in the quarter ended 24th August, 1984 was:

Wages and Salaries	583
Geophysics	3,171
Sundries	5
Services	1,040
Administration and Overheads	239
	<hr/>
	\$5,038

Total expenditure on Exploration Licence 1224 to the 24th August is \$8,692.

EXPLORATION LICENCE 1224

HARCUS HILL, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 24TH NOVEMBER, 1984

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2. TITLE
3. FIELD INVESTIGATIONS
  - 3.1 Aeromagnetic Survey Interpretations
4. EXPENDITURE

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Location Map A4-354
2. E.L. 1224, Marcus Hill, S.A.  
Total Magnetic Intensity Contours 1:100,000 A1-718

EXPLORATION LICENCE 1224  
HARCUS HILL, SOUTH AUSTRALIA  
REPORT FOR THE QUARTER ENDED 24TH NOVEMBER, 1984

0012

1. GENERAL STATEMENT

Exploration Licence 1224 was taken up primarily to test the diamond potential of the area. A subsidiary interest is the potential for base metal mineralisation.

2. TITLE

Exploration Licence 1224 of 1480 square kilometres was granted to BHP Minerals Limited on 24th February, 1984, for one year. Its location is shown in Figure 1.

3. FIELD INVESTIGATIONS

3.1 Aeromagnetic Survey Interpretation

The data from the aeromagnetic survey flown by Austirex International Ltd. has now been processed and the interpretation was completed during November. The 1:100,000 scale Total Magnetic Intensity Contours are shown as Figure 2. A total of 13 magnetic anomalies have been interpreted and 10 of these have been selected as potential kimberlite targets and will be located by ground magnetics in the next quarter. The anomalies are listed below and shown on Figure 2.

<u>Anomalies to be located in the field</u>	<u>Anomalies not selected for field location</u>
---	--

<u>Anomaly No.</u>	<u>Amplitude</u>	<u>Anomaly No.</u>	<u>Amplitude</u>
1	15nT	4	50nT
1A	20nT	8	8nT
2	15nT	10	10nT
2A	20nT		
3	8nT		
5	15nT		
6	3nT		
7	10nT		
9	10nT		
11	6nT		

4. EXPENDITURE

Expenditure debited to Exploration Licence 1224 in the quarter ended 24th November, 1984, was:

Wages and Salaries	1,549
Field Support	129
Vehicles	55
Geophysics	52,754
Sundries	144
Administration and Services	1,755
	<hr/>
	\$56,386

Total expenditure on Exploration Licence 1224 to 30th November, 1984 is: \$65,488.

This report was submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 1224.

0014

SUPERVISION

Geology R. J. Taylor

Geophysics K. Forward

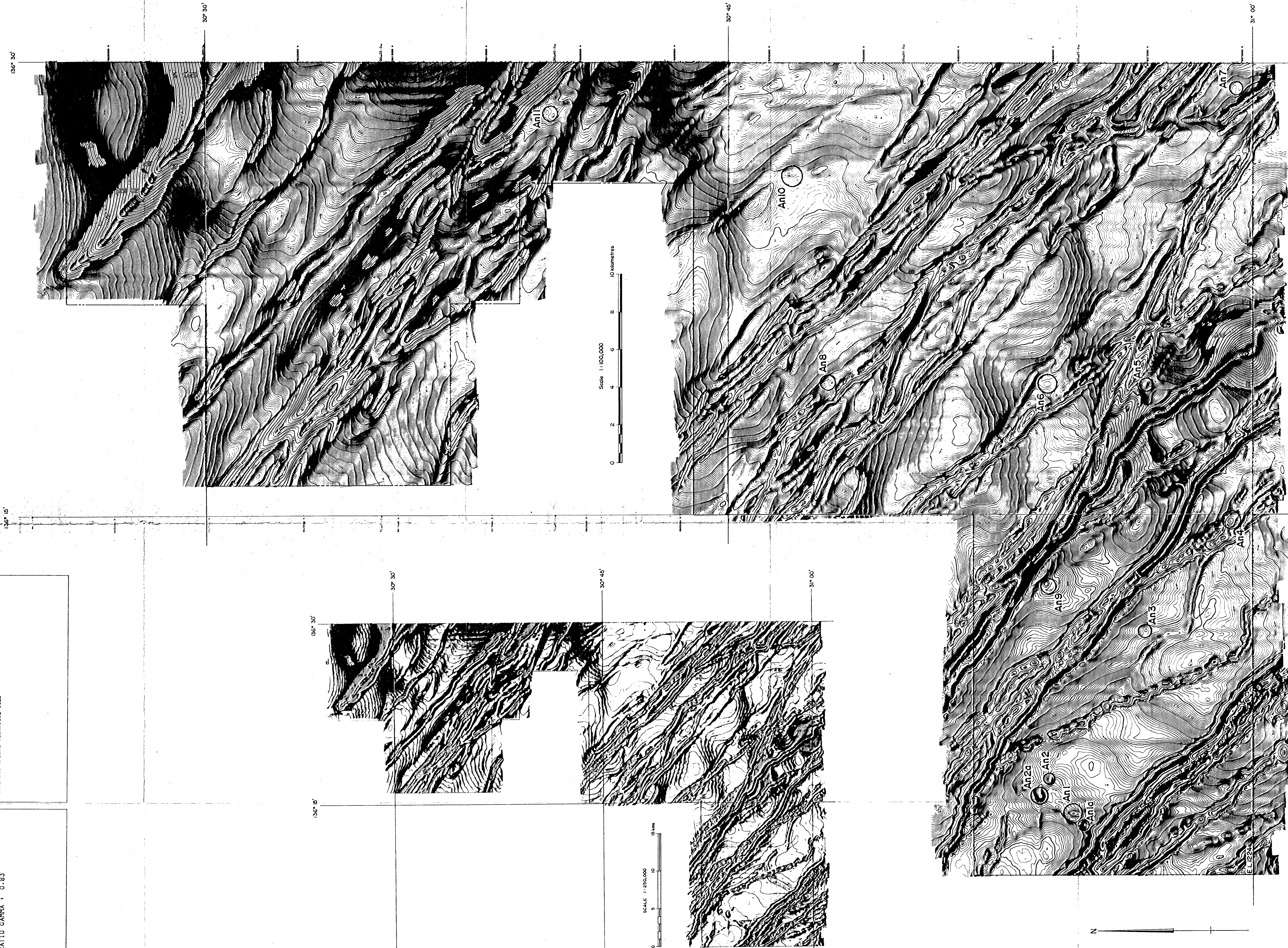
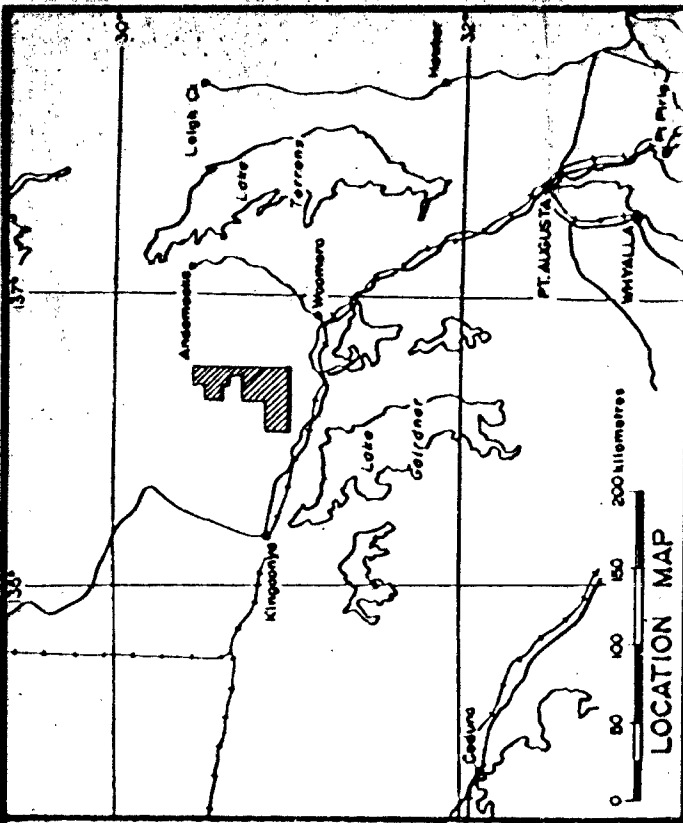


# DETAILS OF SURVEY

FLOWN BY : AUSTIREX INT. LTD.  
 DATE : JULY 1984  
 1:250,000 SHEET : KINGOONYA SH63-11  
 TENEMENT : E.L. 1224  
 PROJECTION IS TRANSVERSE MERCATOR. ANG ZONE : 53  
 LINE SPACING : 300m  
 SURVEY HEIGHT : 80m  
 MAGNETOMETER : GEOMETRICS 6813  
 COMPTON SCATTERING RATIO ALPHA : 0.30  
 COMPTON SCATTERING RATIO BETA : 0.45  
 COMPTON SCATTERING RATIO GAMMA : 0.83

# DETAILS OF PROCESSING

PROCESSED BY BHP EXPLORATION : CAMBERWELL  
 DIURNAL CORRECTION WAS DONE. BASE 57451 at  
 LOG REMOVED  
 ITERATIVE HEADING ERROR ADJUSTMENT (LINE BY LINE)  
 5000 FT ADDED TO DATA  
 DATA FILTERED AND CONTOURED USING PROGRAM GPCORL  
 CONTOUR INTERVAL : 10m  
 MESH SIZE 60m X 60m  
 SCAN : 900m  
 GRIDDING PARAMETERS :  
 MINIMUM ANOMALY AMPLITUDE 10mT  
 FILTER WAVE LENGTH : 900m  
 FILTER WAVE DISTANCE : 1200m  
 SMOOTHING USED : POLYNOMIAL SMOOTHING  
 SMOOTHING RADIUS : 120m  
 PIECEWISE SPLINE TECHNIQUE USED



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPARTMENT			
E.L.1224 HARCUS HILL, S.A. TOTAL MAGNETIC INTENSITY CONTOURS			
Revisions:	Prepared by: R J Taylor	Date: 20-12-84	Centre: Adelaide
	Drawn: S C Skipworth	Project No:	Drawing No:
	Checked:	6 - D22 - 7	A1-718A

5547-1



0015

EXPLORATION LICENCE 1224

HARCUS HILL, SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 24TH FEBRUARY, 1985

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1. GENERAL
2. TITLE
3. FIELD INVESTIGATIONS
  - 3.1. Ground Magnetic Surveys - Kimberlites.
4. EXPENDITURE

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Location Map A4-354
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Total Magnetic Intensity Contours 1:100,000 A1-718A
3. EL.1224, Harcus Hill, S.A.  
Ground Magnetic Contours A3-272

EXPLORATION LICENCE 1224HARCUS HILL, SOUTH AUSTRALIAREPORT FOR THE QUARTER ENDED 24TH FEBRUARY, 19851. GENERAL STATEMENT

Exploration Licence 1224 was taken up primarily to test the diamond potential of the area. A subsidiary interest is the potential for base metal mineralisation.

2. TITLE

Exploration Licence 1224 of 1480 square kilometres was granted to BHP Minerals Limited on 24th February, 1984, for one year. Its tenure has been extended for a further 12 months to 23rd February, 1986. (Fig. 1)

3. FIELD INVESTIGATIONS3.1. Ground Magnetic Surveys - Kimberlites

A ground magnetic survey of the ten selected aeromagnetic anomalies (Fig. 2) was completed in December, 1984. The anomalies were located and delineated using 3 or 4 one kilometre N-S traverses at 100 metre spacings. A total of 34.7 line kilometres of ground magnetic traverse were recorded taking readings every 10 metres (Fig. 3). A Scintrex MP2 magnetometer was used together with a base station magnetometer and corrections for diurnal variations were made.

Most of the anomalies were fairly well defined on the ground. The noise envelope made accurate depth determinations difficult, however depths to anomaly source seem to be 50 metres or more. None of the anomalies were considered to have a high priority as kimberlite targets. Most of them appear to be associated with larger structures rather than occurring as discrete plug-like

features. The results are summarised below:

<u>Anomaly</u>	<u>Amplitude</u>	<u>Depth</u> (m)	<u>Priority</u>	<u>Comments</u>
1	55nT	50-	Low 2	Well defined.
1A	80nT	50	Low 2	Well defined.
2	55nT	60+	Low 2	Well defined. Located in soft salt lake.
2A	105nT	50	Low 2	Well defined.
3	20nT	100	3	Fairly well defined.
5	60nT	80?	3	Well defined.
6	15nT	100?	3	Depth difficult due to noise.
7	20nT	100+	3	Not well defined.
9	40nT	50+	3	Well defined.
11	55nT	100?	3	Not well defined.

Four anomalies were selected for drill testing, namely anomalies 1, 1A, 2 and 2A. These have estimated depths to source of between 50 and 60 metres, but are low priority kimberlite targets. The drill testing of these anomalies is planned for March, 1985, and will be reported in the next quarterly report.

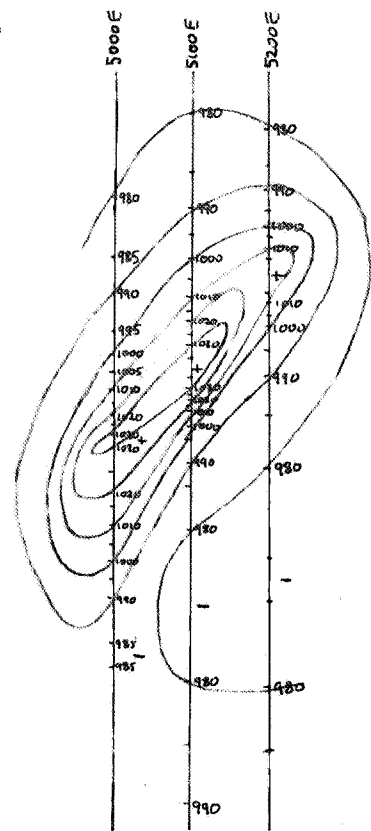
#### 4. EXPENDITURE

Expenditure debited to Exploration Licence 1224 in the quarter to the end of February, 1985 was:

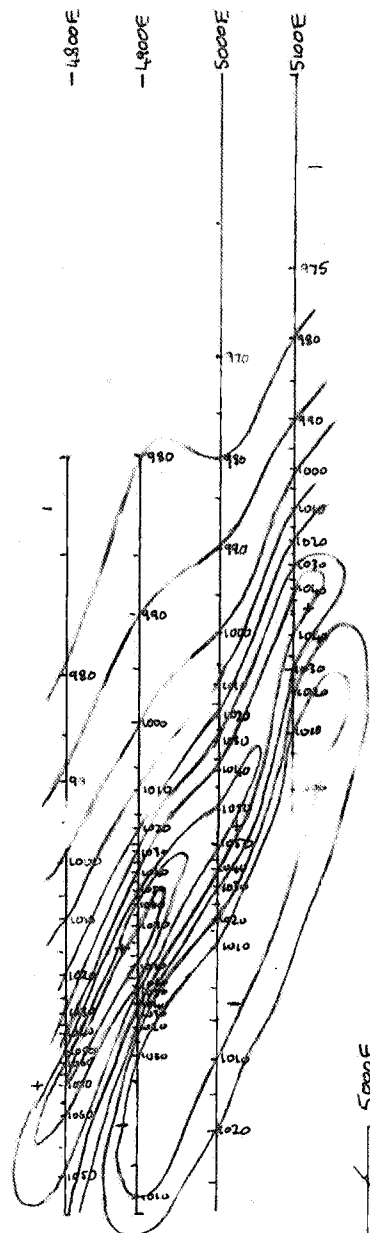
Salaries and Wages	\$2,271
Field Support	1,130
Vehicles	234
Geophysics	6,365
Maps	51
Tenement Fees	2,744
Overheads	638
	<hr/>
	\$13,434

The total expenditure to date in EL.1224 to the end of February, 1985 is \$78,922.

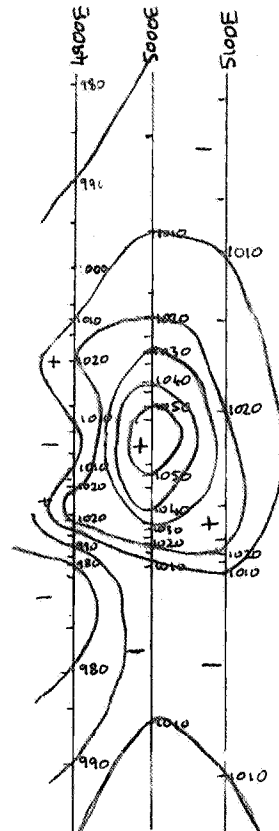
This report was submitted to the  
Department of Mines and Energy  
as required by Condition 4 of  
Exploration Licence 1224.



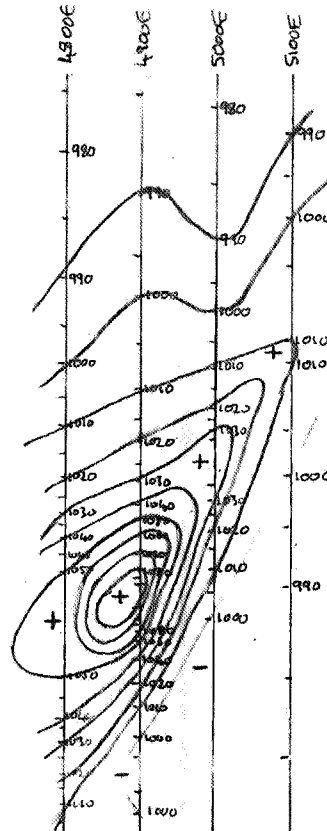
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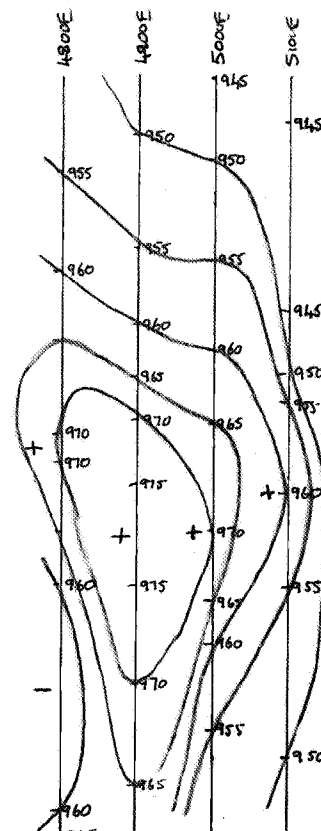
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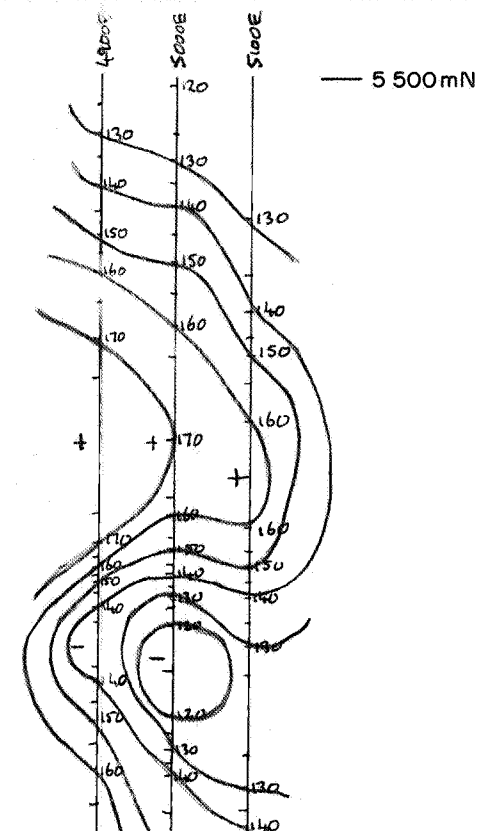
An 2



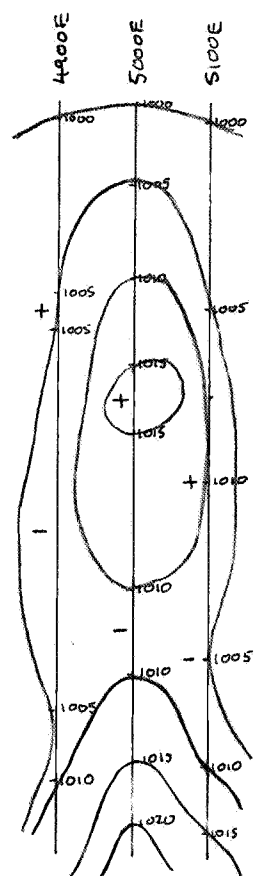
An 2A



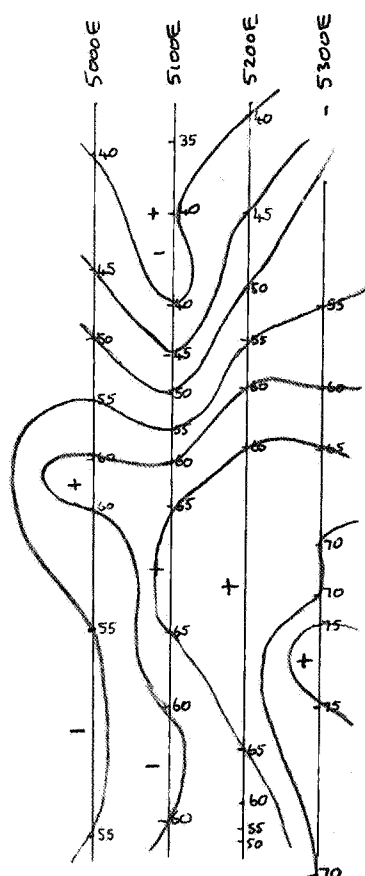
An 3



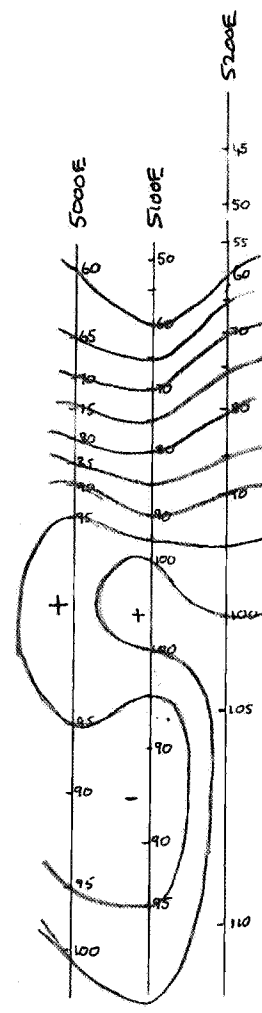
An 5



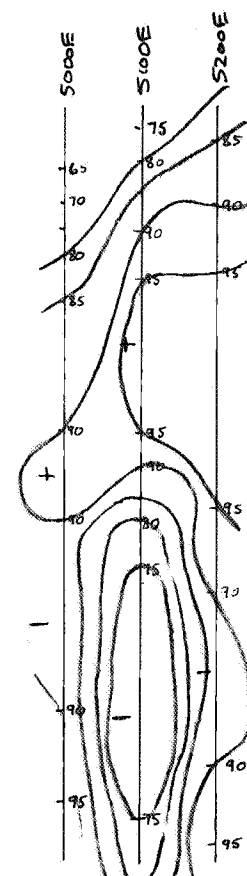
An 6



An 7



An 9



An 11

THE BROKEN HILL PROPRIETARY CO. LTD.  
EXPLORATION DEPARTMENT

E.L.1224 HARCUS HILL, S.A.  
GROUND MAGNETIC CONTOURS

Revisions:	Prepared by:	Centre: ADELAIDE	
	Date:	Project No	Drawing No
	Drawn:	6 - D22 - 17	A3 - 272

(CR 4649)

EXPLORATION LICENCE 1224

HARCUS HILL, SOUTH AUSTRALIA.

REPORT FOR THE QUARTER ENDED 24TH MAY, 1985.

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1. GENERAL
2. TITLE
3. FIELD INVESTIGATIONS
  - 3.1 Drilling.
  - 3.2 Base metal exploration.
4. EXPENDITURE.

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| 3. | EL.1224, Harcus Hill, S.A.<br>Anomaly Location Map.                         | A4-431  |
| 4. | EL.1224, Harcus Hill, S.A.<br>Magnetic data and drill hole locations.       | A3-277  |

APPENDIX

1. Detailed Geological Logs.



EXPLORATION LICENCE 1224HARCUS HILL, SOUTH AUSTRALIA.REPORT FOR THE QUARTER ENDED 24th MAY, 1985.1. GENERAL STATEMENT.

Exploration Licence 1224 was taken up primarily to test the diamond potential of the area. A subsidiary interest is the potential for base metal mineralization.

2. TITLE.

Exploration Licence 1224 of 1480 square kilometres was granted to BHP Minerals Limited on 24th February, 1984, for one year. Its tenure has been extended for a further 12 months to 23rd February, 1986. (Figure 1)

3. FIELD INVESTIGATIONS.3.1 Drilling.

From interpretation of the aeromagnetic data and subsequent ground magnetic surveys four low priority kimberlite targets were selected for drill testing. An Investigator Mark 5 drilling rig operated by Southern Drilling was used. The selected anomalies were 1, 1A, 2 and 2A which are located in the south-west of the Exploration Licence as shown in Figures 3 & 4. The drilling was carried out in March.

Two of these anomalies, 2 and 2A, proved to be inaccessible for the drilling rig, whereas anomalies 1 and 1A were drilled, but drilling difficulties prevented the anomaly source from being located. A total of 94 metres was drilled in 5 holes. The results are summarised overleaf:

## 2.

Anomaly	Hole	Estimated Target Depth (m)	Depth Drilled (m)	Comments
1	PHH1	50	16	Sand, Calcrete, sticky clay.
1	PHH2	50	12	Sand, calcrete, sticky clay.
1A	PHH3	50	39	Sand, calcrete, clays, gravel, water.
1A	PHH4	50	7	Sand, calcrete, dry loose sand.
1A	PHH5	50	20	Sand, Calcrete, sticky clay.

No evidence of kimberlite was found in any of the holes. The detailed geological logs are listed in Appendix 1. Holes PHH1, 2, 3 and 5 were terminated in sticky clay with loss of return and PHH4 showed a similar loss of air in loose dry sand. The stiff clays encountered are interpreted as either Tertiary or weathered Cretaceous sedimentary units overlying the Adelaidean basement.

#### Anomaly 2.

This anomaly was located in the centre of a salt pan on the southern margin of Lake Younghusband and was inaccessible with the drilling rig.

#### Anomaly 2A.

This anomaly was surrounded by high sand dunes and access was not possible for the drilling rig.

Further loam and stream sampling is planned to test parts of the Exploration Licence where these techniques will be warranted.

### 3.2 Base Metal Exploration.

A strong magnetic anomaly, the Lake Hanson anomaly, has been investigated as a potential target for Olympic Dam style mineralization. Its position has been delineated by a 5½ kilometre ground magnetometer and gravity traverse. (Figure 2). Details of this work will be

reported in the next quarter.

4. EXPENDITURE.

Expenditure debited to Exploration Licence 1224 in the quarter to the end of May 1985 was:-

	\$
Salaries and Wages	4,136
Field Support	1,076
Vehicles	776
Geophysics	780
Drilling	2,003
Grader Hire	400
Drafting	73
Maps, Photos.	110
Overheads	467
	<hr/>
	\$9,821
	<hr/>

The total expenditure to date in EL.1224 to the end of May 1985 is \$88,743.

This report was submitted to the Department of Mines and Energy as required by Condition 4 of Exploration Licence 1224.

APPENDIX 1.



DRILLHOLE: PHH 2

LOCATION: ANOMALY 1

TOTAL DEPTH: 12 m

0028

MAP REFERENCE: YOUNG HUSBAND 1:100,000

OPERATOR: SOUTHERN DRILLING

COORDINATES: 5100E 5100N

RIG: INVESTIGATOR MK V

LOGGED BY: R. J. TAYLOR

DATE: 14.3.85

CASING:

SWL:

D. H. INCLINATION	HOLE DIAM.	FROM	TO
VERTICAL	RAB	1	12

[illegible]

REMARKS: S - STRONG

M - MEDIUM

W - WEAK

PROJECT: EL 1244 HARCUS HILL

DRILLHOLE: PHH 3

LOCATION: ANOMALY 1A

TOTAL DEPTH: 39 m

0029

MAP REFERENCE: YOUNG HUSBAND 1:100,000

OPERATOR: SOUTHERN DRILLING

COORDINATES: 4900 E 4300N

RIG: INVESTIGATOR MK V

LOGGED BY: R. J. TAYLOR

DATE: 15.3.85

CASING:

SWL:

D. H. INCLINATION	HOLE DIAM.	FROM	TO
VERTICAL	RAB	0	39

SAMPLE NO	METREAGE	GEOLOGICAL DESCRIPTION	MAG	CO <sub>3</sub>
DEA 7836	0 - 2 m	Red sand, calcrete	W	M
7837	2 - 4 m	Sand, calcrete, clay	W	M
7838	4 - 6 m	Cream sandstone	-	-
7839	6 - 8 m	Hard sandstone with quartz pebbles	-	-
7841	8 - 10 m	Soft clay, sandstone, sandy clay	-	-
7842	10 - 12 m	Cream clay sand.	-	-
7843	12 - 14 m	Red brown gritty clay.	-	-
7844	14 - 16 m	" " " "	-	-
7845	16 - 18 m	" " " "	-	-
7846	18 - 20 m	Pink gritty clay	-	-
7847	20 - 22 m	" " "	-	-
7848	22 - 24 m	" " " plus quartz pebbles up to 1 cm	-	-
7849	24 - 26 m	Pink gritty clay	-	-
7850	26 - 28 m	Pink sandy clay.	-	-
7851	28 - 30	Grey green sandy clay	-	-
7852	30 - 32	Grey brown sandy clay	-	-
7853	32 - 34 m	" " " "	-	-
7854	34 - 36 m	Grey brown sandy clay with gypsum crystals	-	-
DEA 7855	36 - 38 m	Grey brown sandy clay with water.	-	-
	38 - 39 m	Large pebbles of sandstone, mud and water.		
		Loss of sample. Hole terminated.		

REMARKS: S - STRONG

M - MEDIUM

W - WEAK

DRILLHOLE: PHH 4

TOTAL DEPTH: 7 m

OPERATOR: SOUTHERN DRILLING

RIG: INVESTIGATOR MK V

DATE: 15.3.85

SWL:

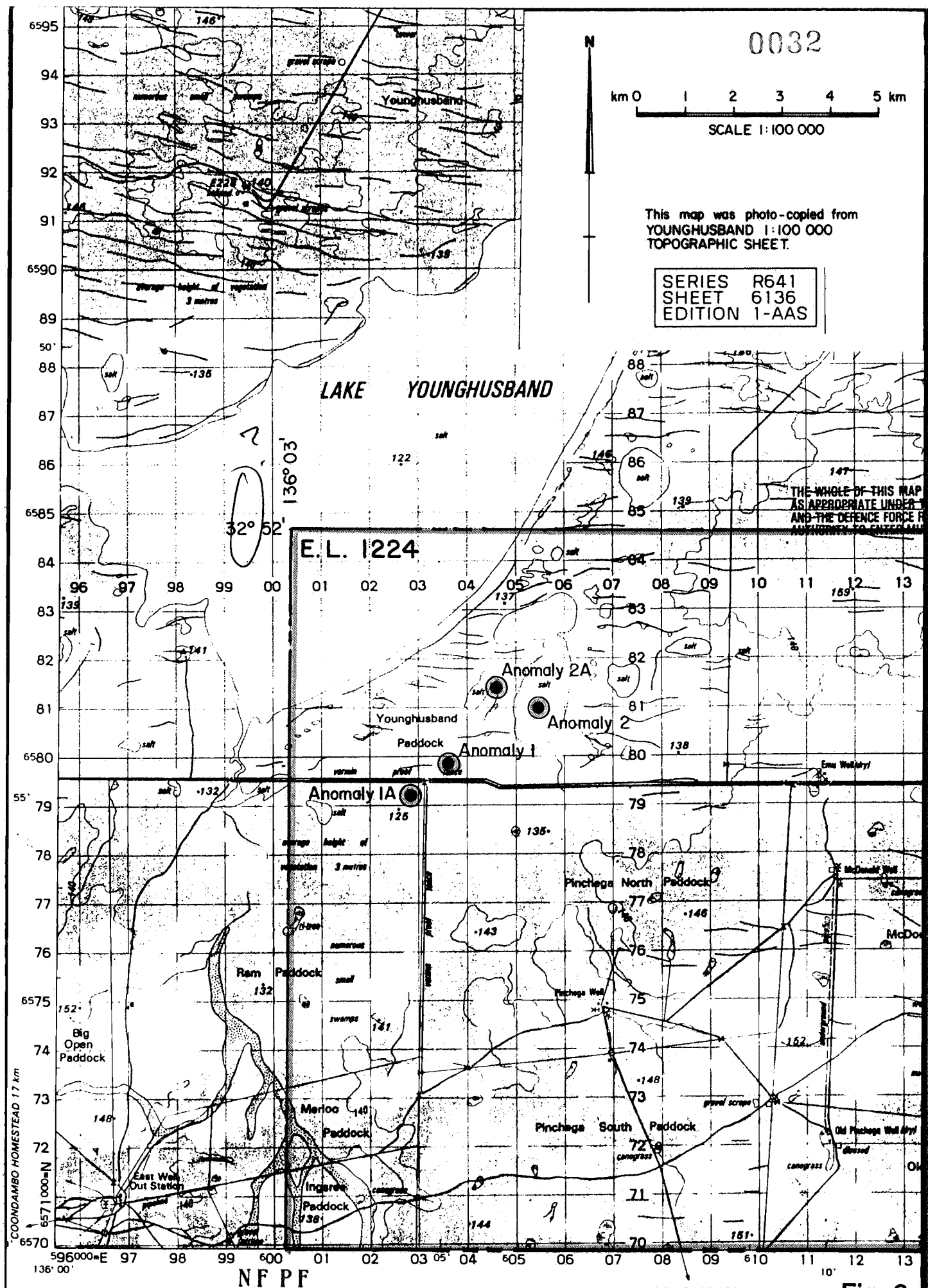
D. H. INCLINATION	HOLE DIAM.	FROM	TO
VERTICAL	RAB	0	7

[illegible]

W - WEAK







THE WHOLE OF THIS MAP  
AS APPROPRIATE UNDER  
AND THE DEFENCE FORCE  
AUTHORITY TO ENTER

PRODUCED by the Royal Australian Survey Corps under the direction of the Chief of the

Centre  
ADELAIDE

Date  
15.7.85

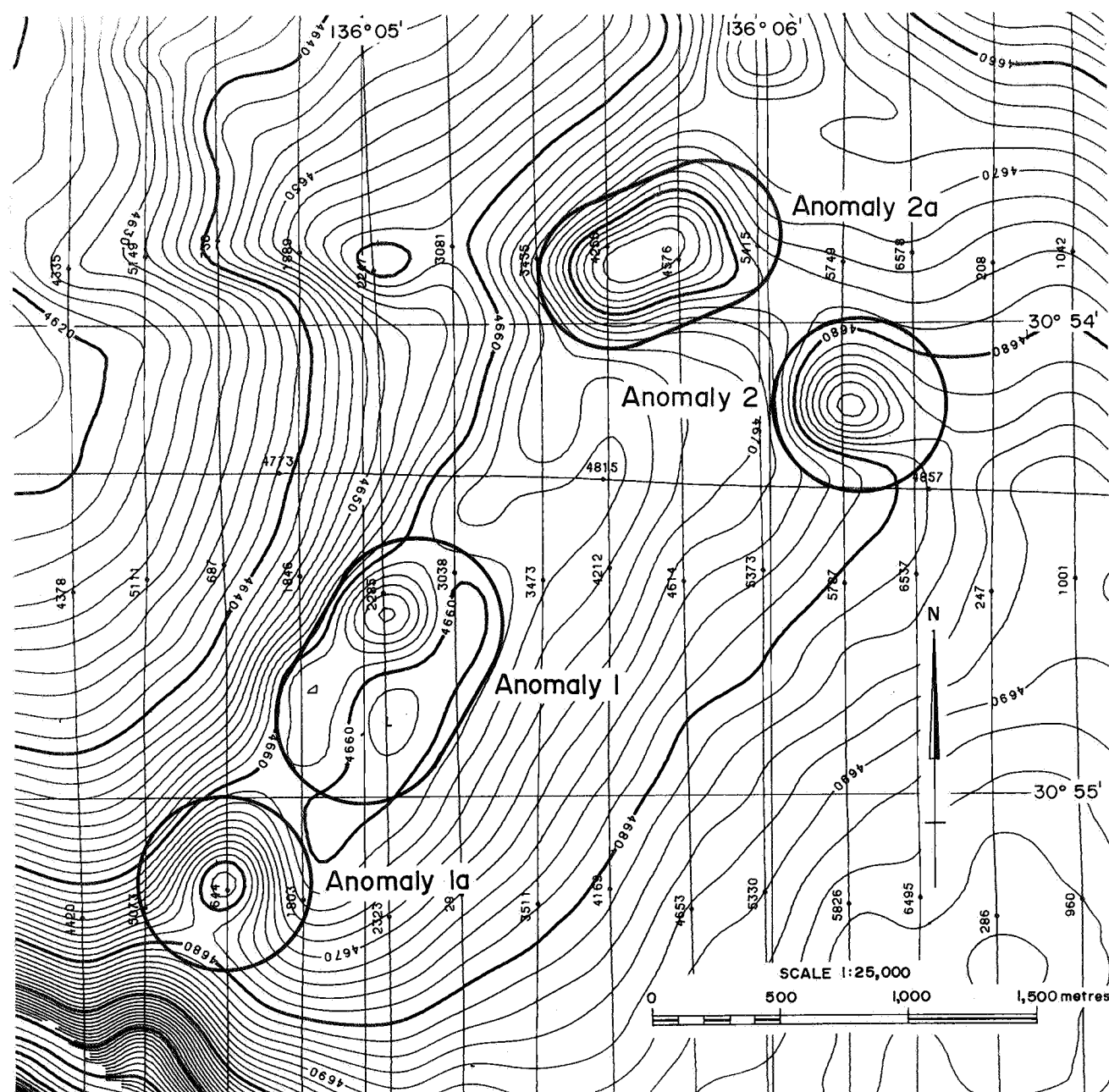
THE BROKEN HILL PROPRIETARY CO. LTD.  
E.L. 1224 HARCUS HILL, S.A.  
ANOMALY LOCATION MAP

Project No  
6-D22-18

Drawing No  
A4-431

Fig. 3

# TOTAL MAGNETIC INTENSITY CONTOURS



# GROUND MAGNETIC CONTOURS

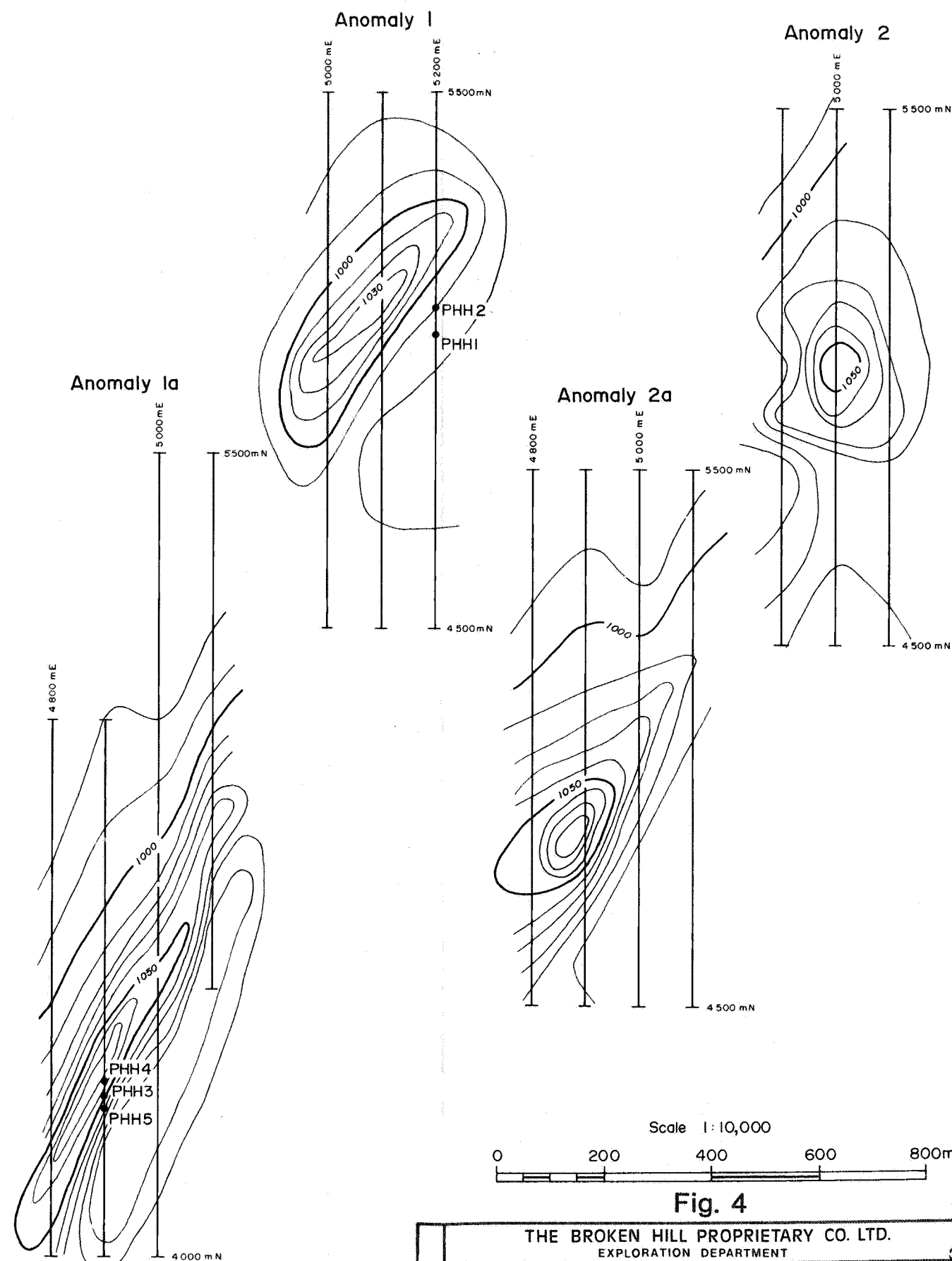
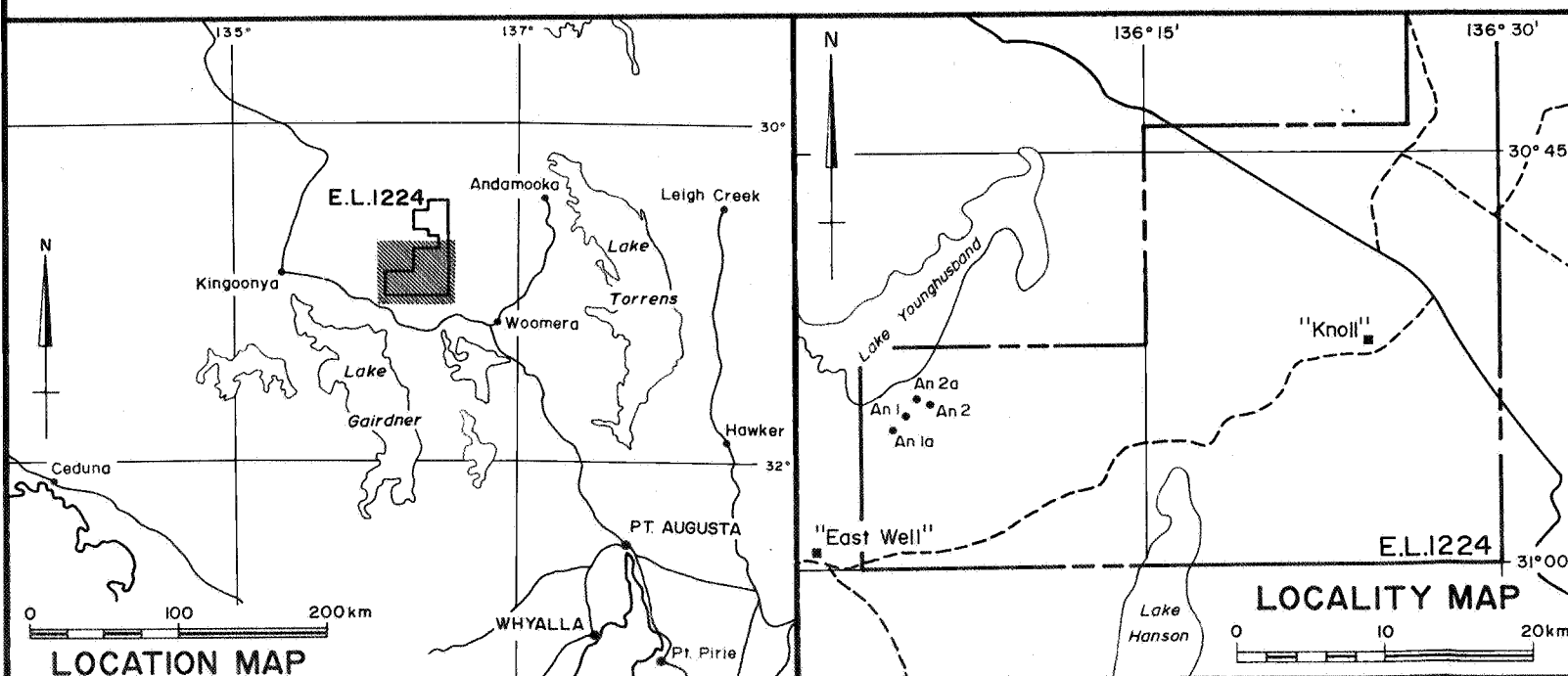


Fig. 4

THE BROKEN HILL PROPRIETARY CO. LTD.  
EXPLORATION DEPARTMENT

**E.L.1224 HARCUS HILL, S.A.**  
**MAGNETIC DATA AND DRILLHOLE LOCATIONS**

Prepared by: R J Taylor	Centre: ADELAIDE
Date: 15-7-85	Project No: 6-D22-19
Drawn: S C Skipworth	Drawing No: A3-277



LOCALITY MAP

EXPLORATION LICENCE 1224

HARCUS HILL, - SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 24th AUGUST, 1985.

By; R.J. Taylor  
M. Davies  
Adelaide.

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2. TITLE
3. FIELD INVESTIGATIONS
4. EXPENDITURE

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APPENDICES

1. Raw gravity data.

HARCUS HILL, - SOUTH AUSTRALIA

REPORT FOR THE QUARTER ENDED 24th AUGUST, 1985.

1. GENERAL STATEMENT

Exploration Licence 1224 was taken up primarily to test the diamond potential of the area. A subsidiary interest is the potential for base metal mineralization.

2. TITLE

Exploration Licence 1224 of 1480 square kilometres was granted to BHP Minerals Limited on 24th February, 1984, for one year. Its tenure has been extended for a further 12 months to February 23rd 1986. Figure 1 shows its location.

3. FIELD INVESTIGATIONS

No field work has been carried out during this quarter. A programme of loam and stream sampling is planned for later in the year.

3.1 Base Metal Exploration.

Figure 2 shows the location of the ground magnetometer and gravity traverse, completed over the Lake Hanson aeromagnetic anomaly. It also includes the calculated gravity profile and ground magnetometer profile. Figure 3 is a computer modelled depth to magnetic source estimate.

It was concluded that the weak gravity anomaly, coincident with a deep magnetic source did not warrant drill-testing.

4. EXPENDITURE

Expenditure debited to Exploration Licence 1224 in the quarter to the end of July (August) 1985 was:-

	\$
Salaries & Wages	1049
Field Support	251
Vehicles	152
Drafting	508
Overheads	25
	<hr/>
	\$1,985
	<hr/>

The total expenditure to date in E.L. 1224 to the end of July (August) is \$90,728.

APPENDICE 1

RAW GRAVITY DATA





[illegible]

[illegible]

# GRAVITY FIELD SHEET

0042

Loop 4

AREA Harcus Hill

GRID AN-1

Tenement No. 1224

Meter 11.1.1.2

Calibration 10941

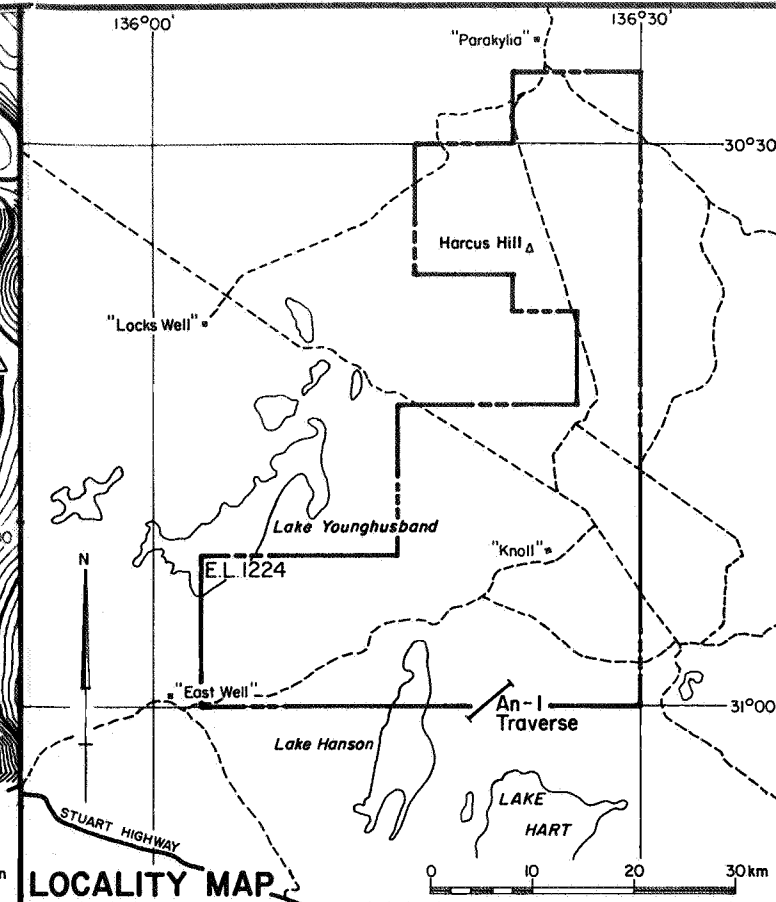
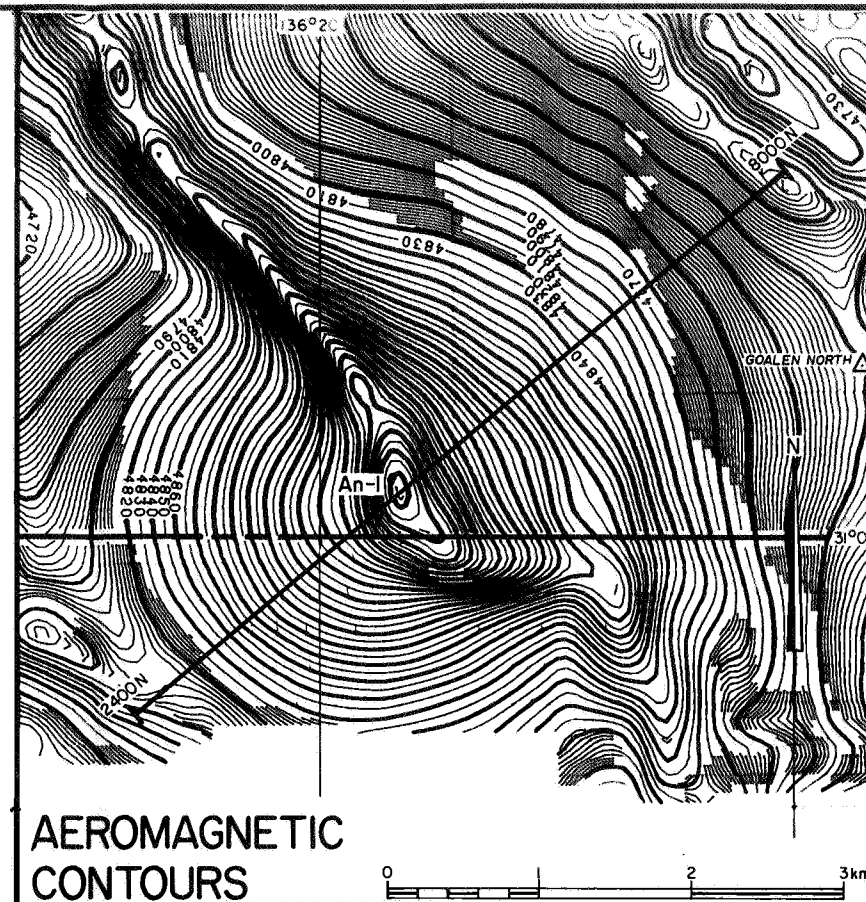
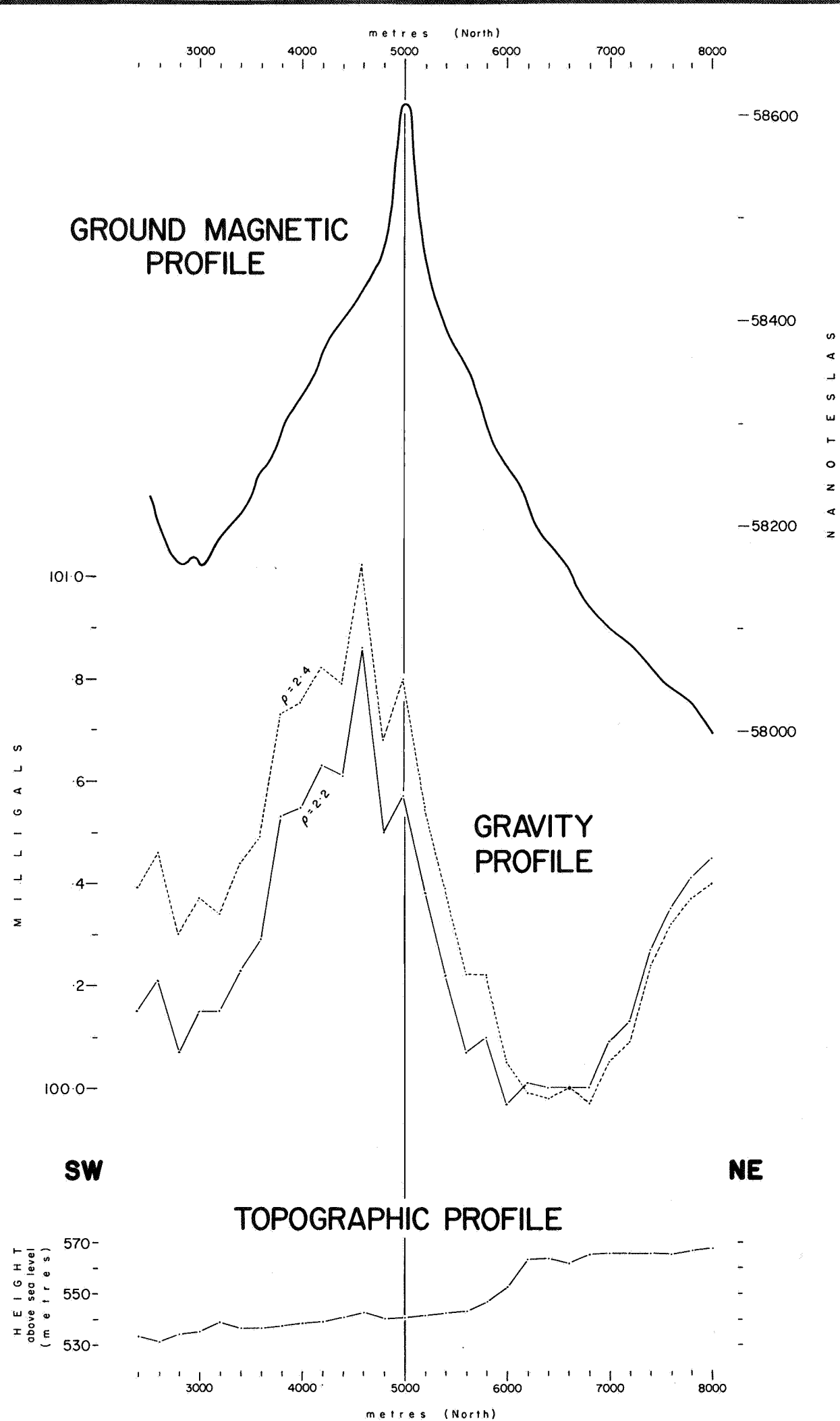
Operator           P. J.          

Date 1 6 80

LINE 1 Brg.           

from 3600 to 2400

[illegible]



#### NOTES : GROUND MAGNETICS

Traverse line has a bearing of 50° True.

Readings were taken every 25 metres using a Scintrex MP-2 magnetometer.

#### GRAVITY

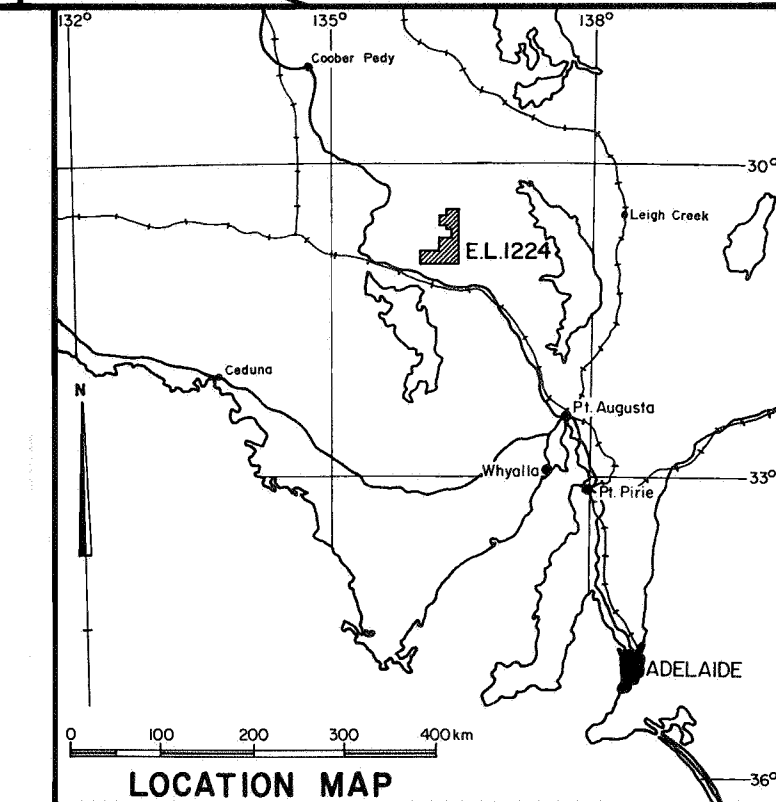
Readings were taken every 200 metres using a Sharpe G-154 gravitimeter.

$\rho = 2.2$  and  $2.4$

Reading at 6600N was assumed to be 100.00.

Optically levelled.

Levels tied to Trig point GOALEN NORTH, elevation 579m., A.H.D. Gravity not tied-in to State grid due to access difficulties on the Woomera Range.



#### PROFILE VERTICAL SCALES

Ground magnetics - 2 cm = 100 nanoTeslas

Gravity - 2 cm = 0.2 milligals

Topography - 2 cm = 40 metres (Vertical exaggeration 25:1)

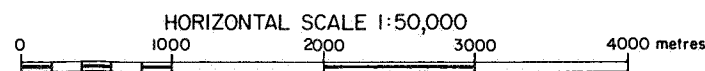


Fig. 2

THE BROKEN HILL PROPRIETARY CO. LTD.			
EXPLORATION DEPARTMENT			
E.L.1224 HARCUS HILL, S.A.			
LAKE HANSON ANOMALY An-1			
GEOPHYSICAL PROFILES			
Revisions:	Prepared by: M.B.Davies	Centre: ADELAIDE	
	Date: 19 - 9 - 85	Project No	Drawing No
	Drawn: A.R.Veale	6 - K28 - 2	A3-279

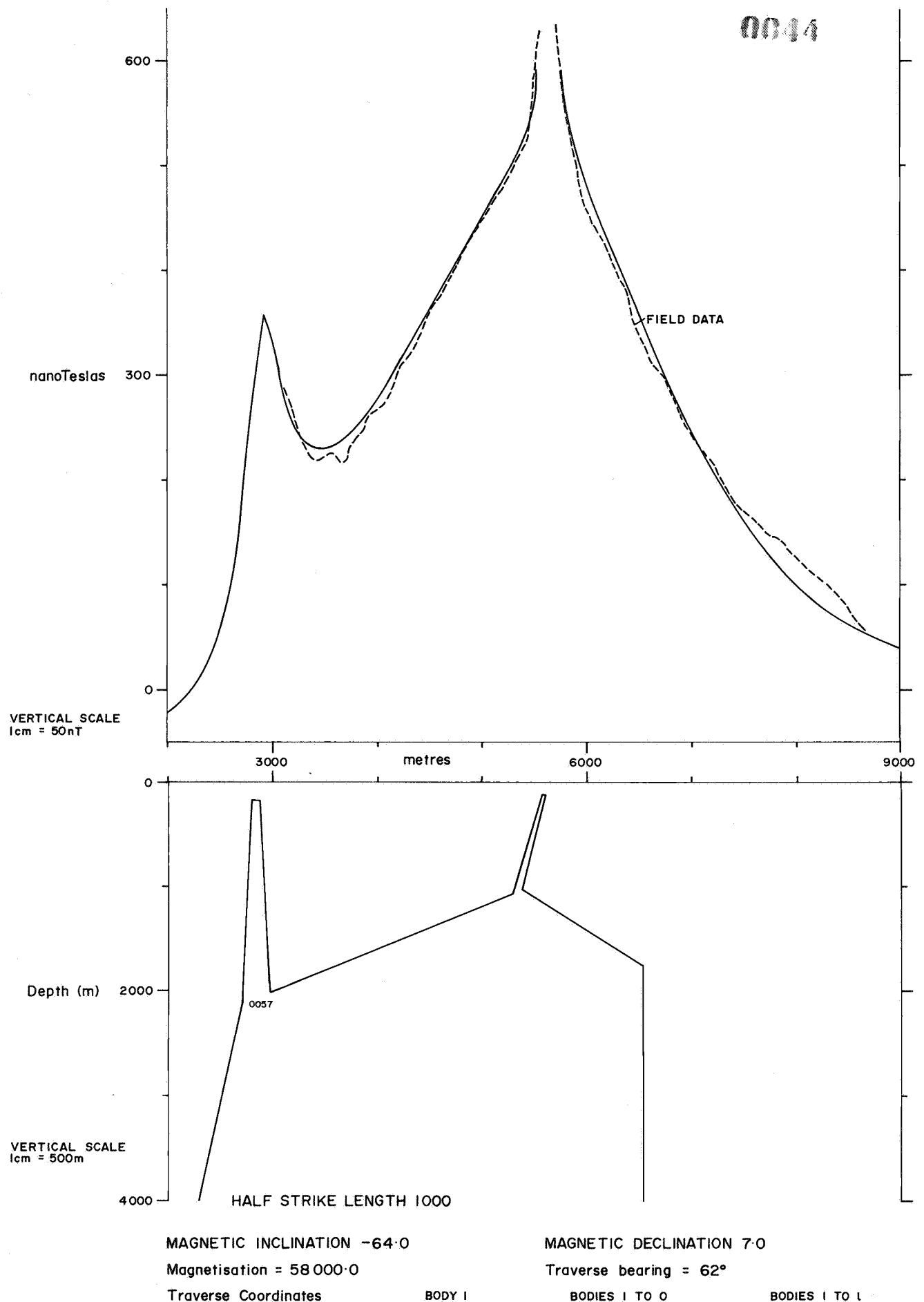


Fig. 3

NOTE : Modelled on the HP9845.

HORIZONTAL SCALE 1:50000

Centre  
ADELAIDE

Date  
16 - 9 - 85

THE BROKEN HILL PROPRIETARY CO. LTD.  
E.L1224 HARCUS HILL, S.A.  
LAKE HANSON ANOMALY  
DEPTH TO MAGNETIC SOURCE ESTIMATE

Project No  
6 - K28 - 1

Drawing No  
A4-433

EXPLORATION LICENCE 1224

HARCUS HILL - SOUTH AUSTRALIA

FINAL REPORT - OCTOBER 1985

BY: R.J. Taylor,  
ADELAIDE.

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APPENDICES

1. Raw Gravity Data.
2. Detailed Geological Logs.

EXPLORATION LICENCE 1224HARCUS HILL - SOUTH AUSTRALIA.FINAL REPORT - OCTOBER 1985.1. GENERAL STATEMENT.

Exploration Licence 1224 was taken up primarily to test the diamond potential of the area. A subsidiary interest was the potential for base metal mineralization. An aeromagnetic survey was flown and a number of anomalies delineated on the ground. Three of these were drill tested with negative results. The E.L. was relinquished in a letter dated 15th October, 1985.

2. TITLE.

Exploration Licence 1224, of 1480 square kilometres was granted to BHP Minerals Limited on 24th February, 1984 for one year. Its tenure was extended for a further 12 months on the 24th February, 1985 and the licence was relinquished on the 15th October, 1985. Figure 1 shows its location.

3. FIELD INVESTIGATIONS.3.1 Aeromagnetic Survey.

An aeromagnetic survey was flown over the whole exploration licence in July 1984 by Austirex International Ltd. The details of the Survey were as follows:-

Line Spacing	-	300 m
Survey Height	-	80 m
Magnetometer	-	Geometrics G 813
Tie Line Spacing	-	5 km
Flight Line direction	-	N - S
Minimum crystal size of spectrometer	-	16 litres.

All the processing and plotting of data was carried out by BHP Minerals Ltd. The Total Magnetic Intensity Contours are shown in Figure 2 at two scales, 100,000 and 250,000. The data is also shown at 50,000 scale on four sheets, Figures 3 to 6.

Interpretation of the aeromagnetic data showed that 10 anomalies could be selected as potential Kimberlite targets. In addition one deep magnetic anomaly, Lake Hanson (Figure 2), was selected as a potential base metal target to be tested for any coincident gravity response.

### 3.2 Ground Magnetic Surveys - Kimberlites.

A ground magnetic survey of the ten selected aeromagnetic anomalies (Figure 2) was completed in December, 1984. The anomalies were located and delineated using 3 or 4 one kilometre N-S traverses at 100 metre spacings. A total of 34.7 line kilometres of ground magnetic traverse were recorded taking readings every 10 metres (Figure 7). A Scintrex MP2 magnetometer was used together with a base station magnetometer and corrections for diurnal variations were made.

Most of the anomalies were fairly well defined on the ground. The noise envelope made accurate depth determinations difficult, however depths to anomaly source seem to be 50 metres or more. None of the anomalies were considered to have a high priority as kimberlite targets. Most of them appear to be associated with larger structures rather than occurring as discrete plug-like features. The results are summarised below:

<u>Anomaly</u>	<u>Amplitude</u>	<u>Depth</u>	<u>Priority</u>	<u>Comments</u>
1	55nT	50-	Low 2	Well defined.
1A	80nT	50	Low 2	Well defined.
2	55nT	60+	Low 2	Well defined. Located in soft salt lake.
2A	105nT	50	Low 2	Well defined.
3	20nT	100	3	Fairly well defined.
5	60nT	80?	3	Well defined.
6	15nT	100?	3	Depth difficult due to noise.
7	20nT	100+	3	Not well defined.
9	40nT	50+	3	Well defined.
11	55nT	100?	3	Not well defined.

Four anomalies were selected for drill testing, namely anomalies 1, 1A, 2 and 2A. These have estimated depths to source of between 50 and 60 metres, but are low priority kimberlite targets.

### 3.3 Base Metal Exploration.

Figure 8 shows the location of the ground magnetometer and gravity traverse, completed over the Lake Hanson aeromagnetic anomaly. It also includes the calculated gravity profile and ground magnetometer profile. Figure 9 is a computer modelled depth to magnetic source estimate.

It was concluded that the weak gravity anomaly, coincident with a deep magnetic source did not warrant drill-testing. Appendix 1 shows the raw gravity data.

### 3.4 Drilling.

From interpretation of the aeromagnetic data and subsequent ground magnetic surveys four low priority kimberlite targets were selected for drill testing. An Investigator Mark 5 drilling rig operated by Southern Drilling was used. The selected anomalies were 1, 1A, 2 and 2A which are located in the south-west of the Exploration Licence as shown in Figure 10. The drilling was carried out in March 1985.

Two of these anomalies, 2 and 2A, proved to be inaccessible for the drilling rig, whereas anomalies 1 and 1A were drilled, but drilling difficulties prevented the anomaly source from being located. A total of 94 metres was drilled in 5 holes. The results are summarised below:

Anomaly	Hole	Estimated Target Depth (m)	Depth Drilled (m)	Comments
1	PHH1	50	16	Sand, Calcrete, sticky clay.
1	PHH2	50	12	Sand, calcrete, sticky clay.
1A	PHH3	50	39	Sand, calcrete, clays, gravel, water.
1A	PHH4	50	7	Sand, calcrete, dry loose sand.
1A	PHH5	50	20	Sand, calcrete, sticky clay.

No evidence of kimberlite was found in any of the holes. The detailed geological logs are listed in Appendix 2. Holes PHH1, 2, 3 and 5 were terminated in sticky clay with loss of return and PHH4 showed a similar loss of air in loose dry sand. The stiff clays encountered are interpreted as either Tertiary or weathered Cretaceous sedimentary units overlying the Adelaidean basement.

#### Anomaly 2.

This anomaly was located in the centre of a salt pan on the southern margin of Lake Younghusband and was inaccessible with the drilling rig.

#### Anomaly 2A.

This anomaly was surrounded by high sand dunes and access was not possible for the drilling rig.

The bottom two samples in each drill hole, representing 4 metres, were analysed by Comlabs Pty. Ltd., for Ni, Co, Cr and Nb. The results are given below:-

Anomaly	Hole	Depth (m)	Ni	Co	Cr	Nb
1	PHH1	12-14	10	6	90	10
1	PHH1	14-16	12	6	155	9
1	PHH2	8-10	6	<4	90	10
1	PHH2	10-12	8	6	55	10
1A	PHH3	34-36	18	12	75	9
1A	PHH3	36-38	8	4	130	6
1A	PHH4	4-6	<4	<4	20	9
1A	PHH4	6-7	<4	<4	20	8
1A	PHH5	16-18	42	26	20	9
1A	PHH5	18-20	75	50	16	10

AAS1 AAS1 AAS2 XRF1

Comlabs Report COM 851598 dated 17.9.85.

4.

#### CONCLUSION.

No good potential kimberlite magnetic anomalies were interpreted from the aeromagnetic survey. The drill testing

of the selected low priority anomalies was inconclusive with regard to their source rock, but the presence of surface outcropping kimberlite was ruled out. The Lake Hanson magnetic anomaly did not warrant drill testing.

Therefore, in view of these conclusions no further work was considered warranted in E.L. 1224 and it was relinquished in a letter dated 15th October, 1985.

5. EXPENDITURE.

Expenditure debited to Exploration Licence 1224 for the months of August, September, October 1985 was:-

	\$
Salaries and Wages	2,500
Field Support	-
Equipment	160
Drafting	1,103
Overheads	188
	<hr/>
	\$3,951
	<hr/>

The total Expenditure to date in E.L. 1224 to the end of October 1985 is \$94,679.

APPENDIX 1

RAW GRAVITY DATA

# GRAVITY FIELD SHEET

0054

Loop 1

AREA HARCOS HILL

Meter 5-154

GRID AN-1

Calibration 10941

Tenement No 1224

Operator M M

LINE 1 Brg.           

from 6600 to 8000

Date 30/4/85

[illegible]



# GRAVITY FIELD SHEET

Loop 2

AREA Harris Hill

GRID AN-1

Tenement NR 1224

Meter Sharp G-154

Calibration 10941

Operator J.A.M

Date 11/5/85

0055

LINE 1 Brg.           

from 6600 to 5200

[illegible]

# GRAVITY FIELD SHEET

0056

Loop 3

AREA Harcus Hill

GRID AN-1

Tenement N<sup>o</sup> 1224

Meter Shorpe G154

Calibration .10941

Operator MM

Date 1/5/85

LINE 1 Brg.           

from 5200 to 3800

[illegible]



APPENDIX 2

DETAILED GEOLOGICAL LOGS

DRILLHOLE: PHH1

TOTAL DEPTH: 16 m 0059

OPERATOR: SOUTHERN DRILLING

RIG: INVESTIGATOR MK V

DATE: 14.3.85

SWL:

D. H. INCLINATION	HOLE DIAM.	FROM	TO
VERTICAL	RAB	1	16

[illegible]

REMARKS:	C - STRONG
----------	------------

M - MEDIUM

W - WEAK

DRILLHOLE: PHH 2

TOTAL DEPTH: 12 m

OPERATOR: SOUTHERN DRILLING

RIG: INVESTIGATOR MK V

DATE: 14.3.85

SWL:

W - WEAK

PROJECT: EL 1244 HARCUS HILL

DRILLHOLE: PHH 3

0061

LOCATION: ANOMALY 1A

TOTAL DEPTH: 39 m

MAP REFERENCE: YOUNG HUSBAND 1:100,000

OPERATOR: SOUTHERN DRILLING

COORDINATES: 4900 E 4300N

RIG: INVESTIGATOR MK V

LOGGED BY: R. J. TAYLOR

DATE: 15.3.85

CASING:

SWL:

D. H. INCLINATION	HOLE DIAM.	FROM	TO
VERTICAL	RAB	0	39

SAMPLE NO	METREAGE	GEOLOGICAL DESCRIPTION	MAG	CO <sub>3</sub>
DEA 7836	0 - 2 m	Red sand, calcrete	W	M
7837	2 - 4 m	Sand, calcrete, clay	W	M
7838	4 - 6 m	Cream sandstone	-	-
7839	6 - 8 m	Hard sandstone with quartz pebbles	-	-
7841	8 - 10 m	Soft clay, sandstone, sandy clay	-	-
7842	10 - 12 m	Cream clay sand.	-	-
7843	12 - 14 m	Red brown gritty clay.	-	-
7844	14 - 16 m	" " " "	-	-
7845	16 - 18 m	" " " "	-	-
7846	18 - 20 m	Pink gritty clay	-	-
7847	20 - 22 m	" " "	-	-
7848	22 - 24 m	" " " plus quartz pebbles up to 1 cm	-	-
7849	24 - 26 m	Pink gritty clay	-	-
7850	26 - 28 m	Pink sandy clay.	-	-
7851	28 - 30	Grey green sandy clay	-	-
7852	30 - 32	Grey brown sandy clay	-	-
7853	32 - 34 m	" " " "	-	-
7854	34 - 36 m	Grey brown sandy clay with gypsum crystals	-	-
DEA 7855	36 - 38 m	Grey brown sandy clay with water.	-	-
	38 - 39 m	Large pebbles of sandstone, mud and water.		
		Loss of sample. Hole terminated.		

REMARKS: S - STRONG

M - MEDIUM

W - WEAK

DRILLHOLE: PHH 4 0062

TOTAL DEPTH: 7 m

OPERATOR: SOUTHERN DRILLING

RIG: INVESTIGATOR MK V

DATE: 15.3.85

SWL:

D. H. INCLINATION	HOLE DIAM.	FROM	TO
VERTICAL	RAB	0	7

[illegible]

REMARKS: S - STRONG M - MEDIUM W - WEAK



0063

TOTAL DEPTH:

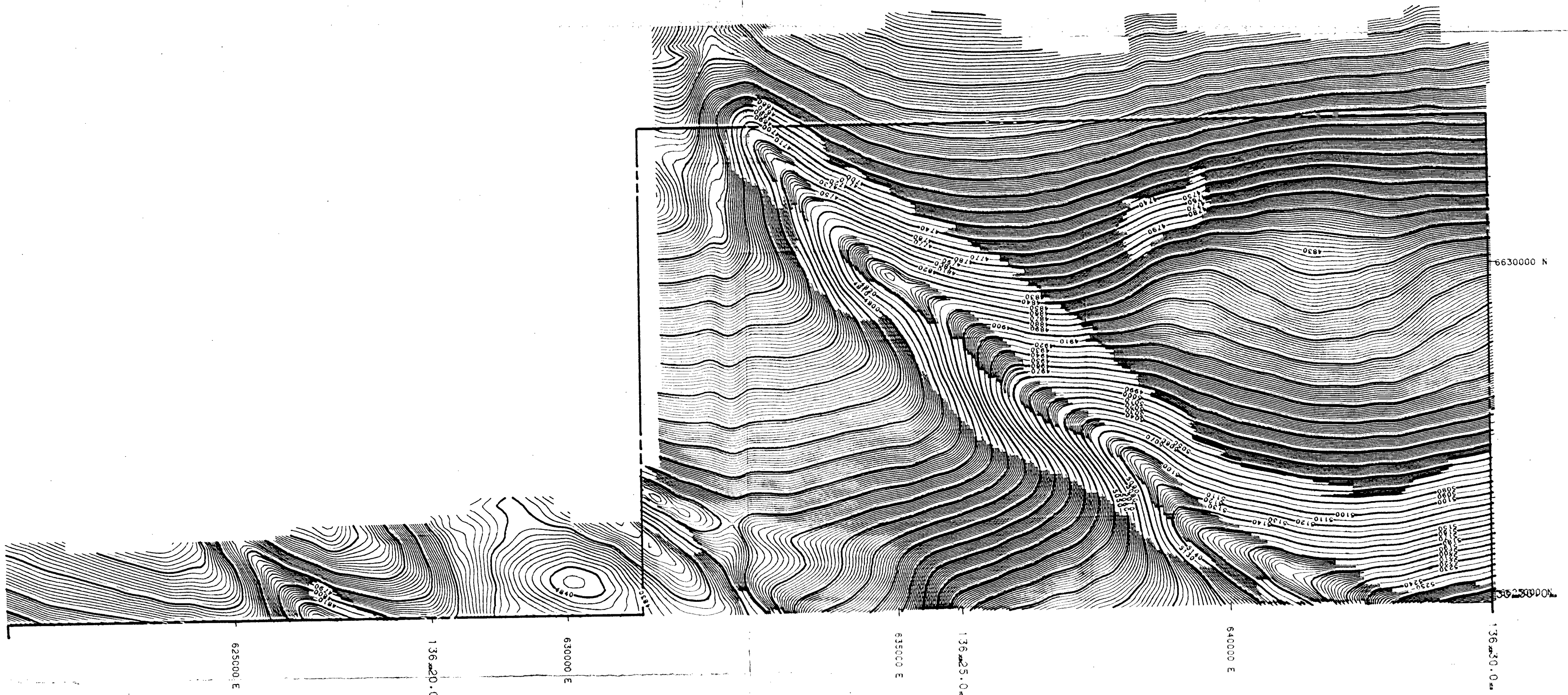
OPERATOR: SOUTHERN DRILLING

RIG: INVESTIGATOR MK V

DATE: 15.3.85

SWL:

[illegible]



PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

#### DETAILS OF SURVEY

FLOWN BY : AUSTIREX INT. LTD.  
DATE : JULY 1984  
1:250,000 SHEET : KINGOONYA SH53-11  
TENEMENT : E.L. 1224  
PROJECTION IS TRANSVERSE MERCATOR. AMG ZONE : 53

LINE SPACING : 300m  
SURVEY HEIGHT : 80m  
MAGNETOMETER : GEOMETRICS G613

COMPTON SCATTERING RATIO ALPHA : 0.30  
COMPTON SCATTERING RATIO BETA : 0.45  
COMPTON SCATTERING RATIO GAMMA : 0.83

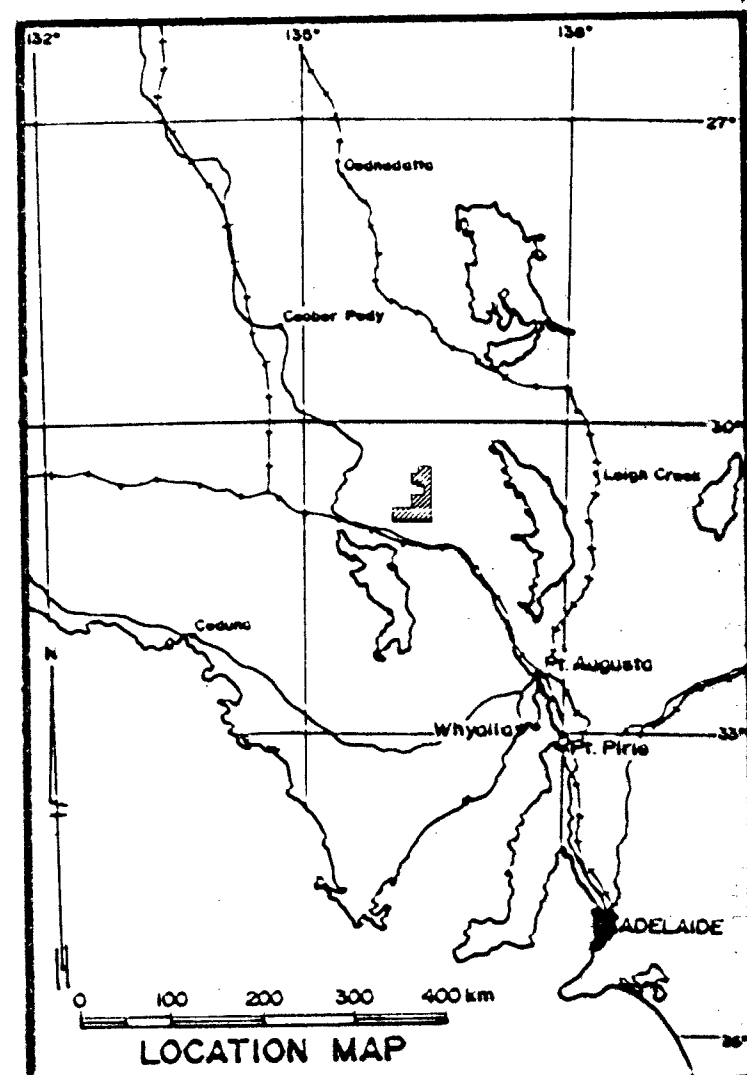
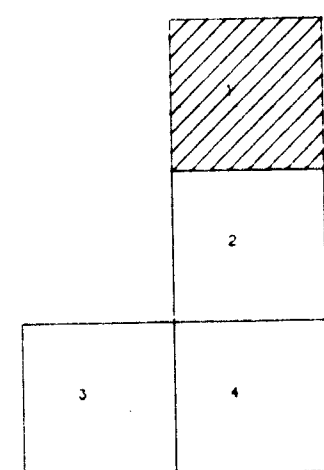
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ITERATIVE HEADING ERROR ADJUSTMENT (LINE BY LINE)  
5000 nT ADDED TO DATA  
DATA WAS GRIDDED AND CONTOURED USING GRID PROGRAM GPCGR  
TIE LINES WERE NOT CONTOURED  
CONTOUR INTERVAL 2 nT

GRIDDING PARAMETERS:  
SCAN DISTANCE 900 m  
CORRELATION USED : MINIMUM ANOMALY AMPLITUDE 10nT  
FILTER WAVE LENGTH 900m  
CORRELATION DISTANCE 1200m

PIECEWISE SPLINE TECHNIQUE USED  
RES. SIZE 50m x 50m  
SMOOTHING USED: POLYNOMIAL SMOOTHING  
SMOOTHING RADIUS 120 m

20-Oct-84  
21-Oct-84  
24-Oct-84  
4-Nov-84  
4-Nov-84



N  
↑

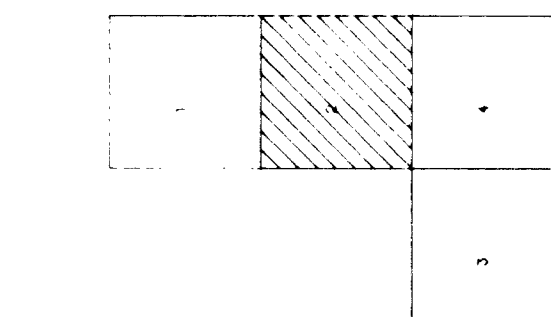
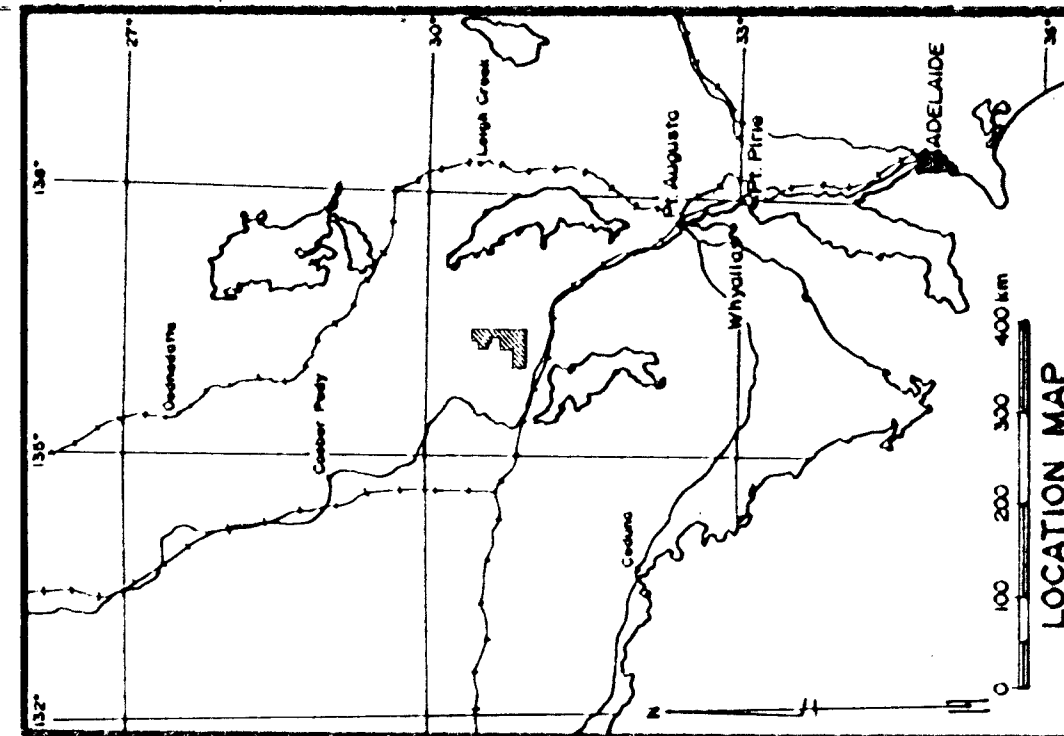
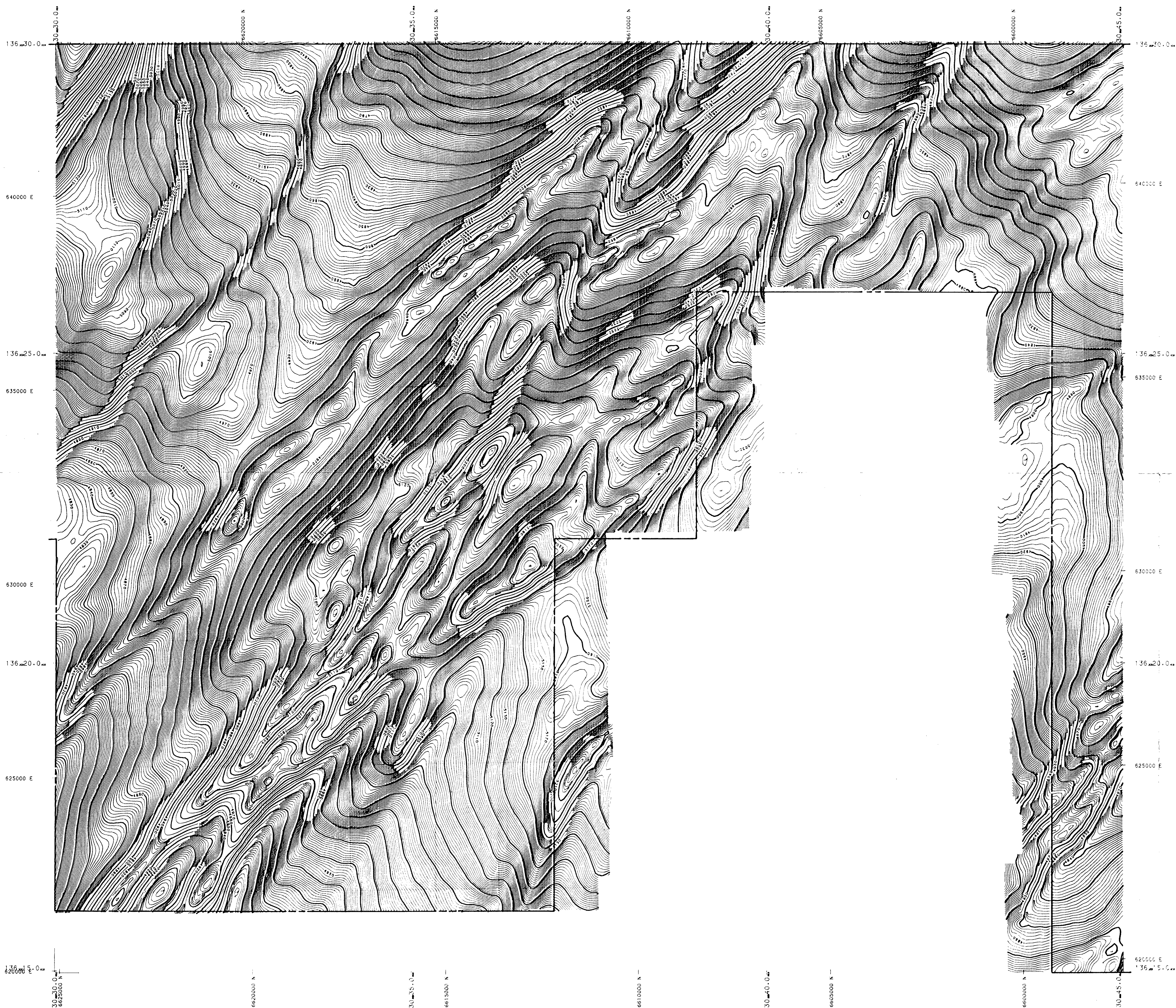
Fig. 3

THE BROKEN HILL PROPRIETARY CO. LTD.  
EXPLORATION DEPT.  
ELI224 HAROUS HILL S.A.  
TOTAL MAGNETIC INTENSITY CONTOURS

DRAWN: DATE: CHECKED: 6-022-3 A1-712

5547-2





PROCESSED BY BHP EXPLORATION & CAMERON  
DIURNAL CORRECTION WAS DONE. BASE 57451 nT  
10M REMOVED  
ITERATIVE HEADING ERROR ADJUSTMENT (LINE BY LINE)  
DATA WAS GRIDDED  
DATA WAS GRIDDED USING GRID PROGRAM GPGRI  
THE LINES WERE NOT CONTOURED  
CONTOUR INTERVAL 2 nT  
GRIDDED PARAMETERS  
SCAN DISTANCE 900 m  
CORRELATION USED  
MINIMUM ANNUAL AMPLITUDE 10nT  
FILTER WAVE LENGTH 300m  
FILTER WAVE LENGTH 1200m  
PIECEWISE SPLINE TECHNIQUE USED  
MESH SIZE 60m  
SMOOTHING USED  
SMOOTHING RADIUS 120 m

DETAILS OF SURVEY  
FLOWN BY : AUSTREX INT. LTD.  
DATE : JULY 1984  
1:250,000 SHEET : K:NGUNYA SH53-11  
TENEMENT : E.L. 1224  
PROJECTION : TRANSVERSE MERCATOR. AMG ZONE : 53  
LINE SPACING : 300m  
SURVEY HEIGHT : 80m  
MAGNETOMETER : GEOMETRICS G813  
COMPTON SCATTERING RATIO ALPHA : 0.30  
COMPTON SCATTERING RATIO BETA : 0.45  
COMPTON SCATTERING RATIO GAMMA : 0.83

PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

N

Fig-4  
THE BROKEN HILL PROPRIETARY CO. LTD.  
EXPLORATION DEPT.  
E.L.1224 HARCUS HILL S.A.  
TOTAL MAGNETIC INTENSITY CONTOURS  
2

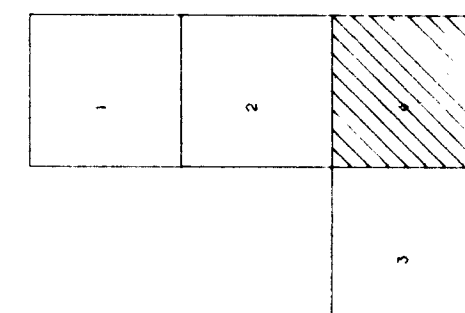
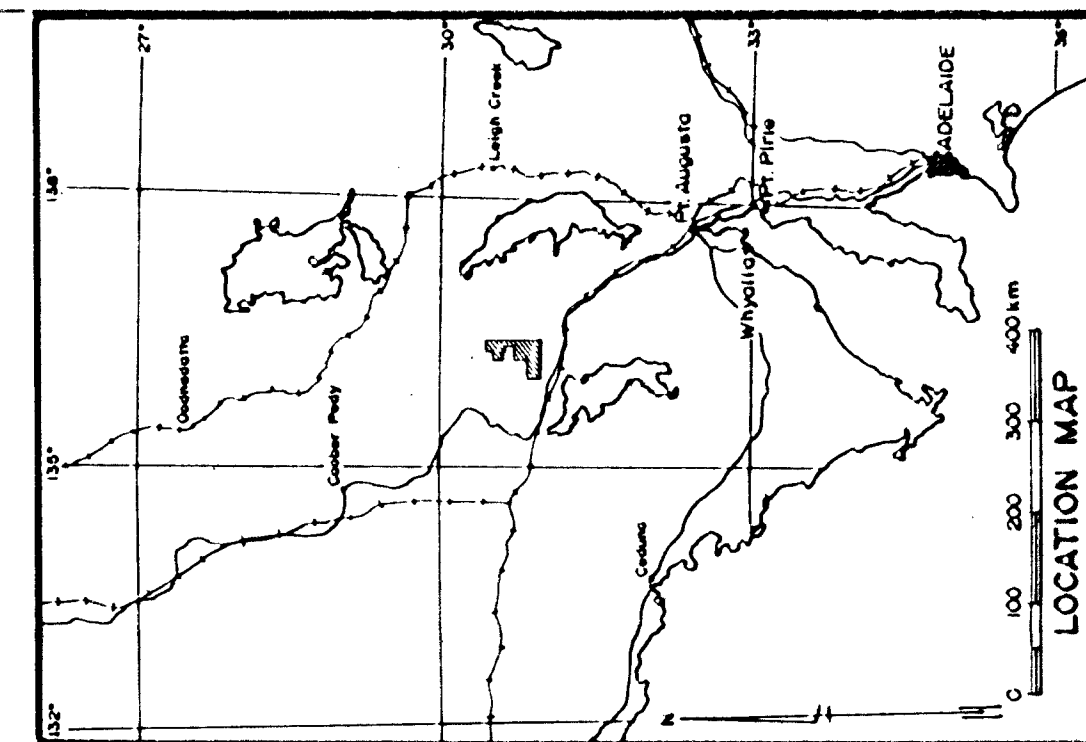
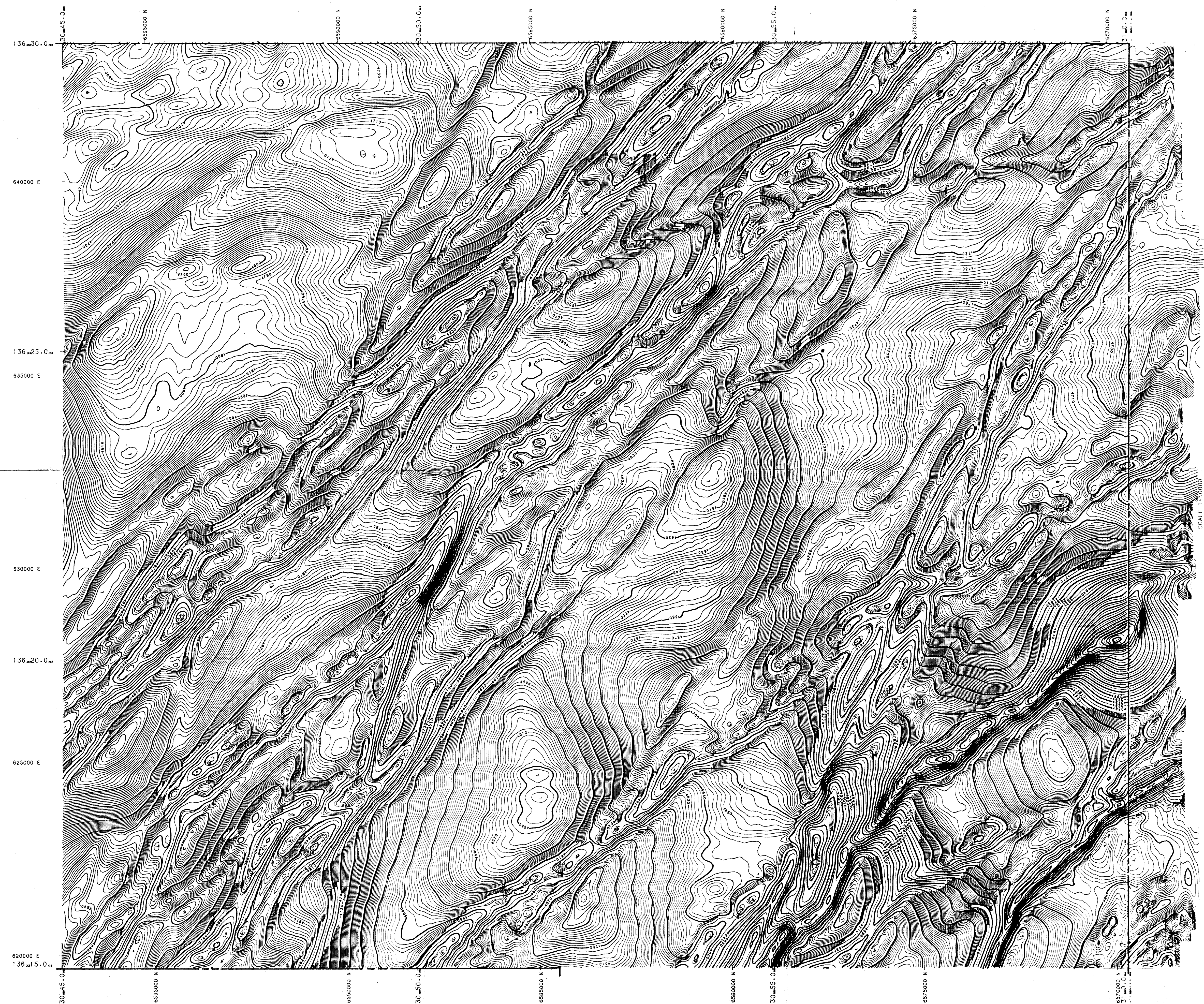
DRAWN:	DATE:	CENTRE:
TRACED:	PROJECT NO:	DRAWING NO:
CHECKED:	6-022-4	A1-713

5547-3









PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

#### DETAILS OF SURVEY

FLOWN BY : AUSTREX INT. LTD.  
DATE : JULY 1984  
1:250,000 SHEET : KINGONYA SH53-11  
TENERENT : E.L. 1224  
PROJECTION IS TRANSVERSE MERCATOR. ANG ZONE : 53  
LINE SPACING : 300m  
SURVEY HEIGHT : 80m  
MAGNETOMETER : GEOMETRICS G813  
COMPTON SCATTERING RATIO ALPHA : 0.30  
COMPTON SCATTERING RATIO BETA : 0.45  
COMPTON SCATTERING RATIO GAMMA : 0.83

#### DETAILS OF PROCESSING

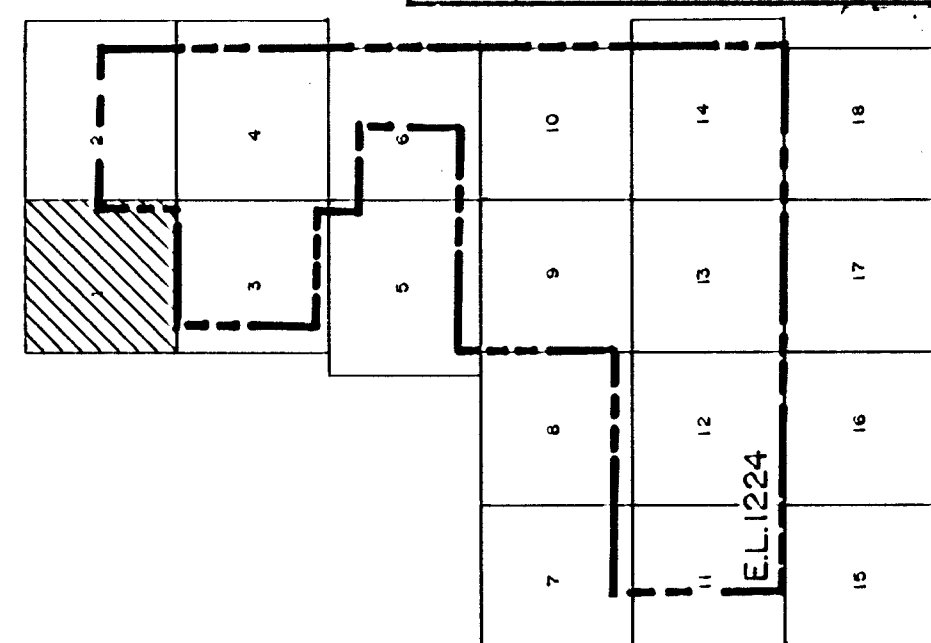
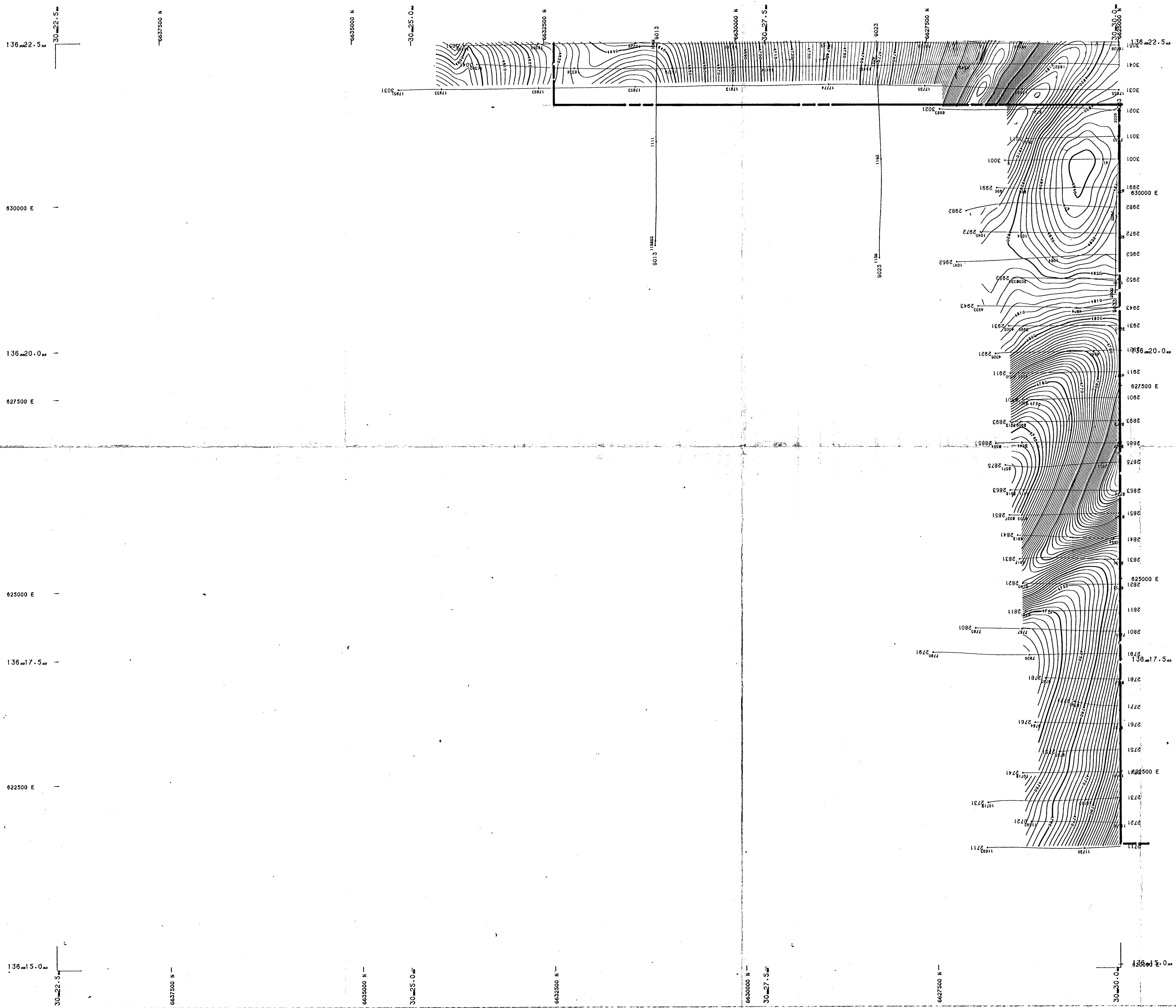
PROCESSED BY BHP EXPLORATION : CAMERONELL  
DIURNAL CORRECTION WAS DONE. BASE 57553 at  
100% REMOVED  
ITERATIVE HEADING ERROR ADJUSTMENT (LINE BY LINE)  
5000 at ADDED TO DATA  
DATA WAS GRIDDED AND CONTOURED USING GRID PROGRAM GPCORL  
LINE LINES WERE NOT CONTOURED  
GRIDGING PARAMETERS :  
SCAN DISTANCE 900  
CORRELATION USED : MINIMUM AMPLITUDE 10at  
CORRELATION DISTANCE 120m  
PIECEWISE SPLINE TECHNIQUE USED  
SMOOTHING USED : POLYNOMIAL SMOOTHING  
SMOOTHING RADIUS 120

N

THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPT		
E.L.1224 HARCUS HILL S.A. TOTAL MAGNETIC INTENSITY CONTOURS		
4		
DRAWN:	DATE:	CENTRE:
TRACED:	PROJECT NO:	DRAWING NO:
CHECKED:	6-022-6	A1-715

55475





PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

**DETAILS OF SURVEY**

DRAWN BY : AUSTREX INT. LTD.

DATE : JULY 1984

1:250,000 SHEET : KINGOONYA SH53-11

TENEMENT : E.L. 1224

PROJECTION IS TRANSVERSE MERCATOR. ANG. ZONE : 53

LINE SPACING : 300m

SURVEY HEIGHT : 80m

MAGNETOMETER : GEOMETRICS 6813

COMPTON SCATTERING RATIO ALPHA : 0.30

COMPTON SCATTERING RATIO BETA : 0.45

COMPTON SCATTERING RATIO GAMMA : 0.83

**DETAILS OF PROCESSING**

PROCESSED BY BHP EXPLORATION & CAMBERWELL

DIURNAL CORRECTION WAS DONE. BASE 57951 m

106F REMOVED

ITERATIVE HEADING ERROR ADJUSTMENT (LINE BY LINE)

5000 m ADDED TO DATA

DATA WAS GRIDDED AND CONTOURED USING PROGRAM OPORL

CONTOUR INTERVAL 2m

GRID SIZE 60m X 60m

GRIDDING PARAMETERS :

MINIMUM ANOMALY AMPLITUDE 10m

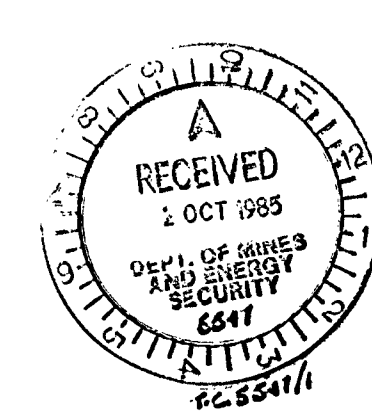
FILTER WAVE LENGTH 800m

CORRELATION DISTANCE 1200m

SMOOTHING USED : POLYNOMIAL SMOOTH

PIECEWISE SPLINE TECHNIQUE USED

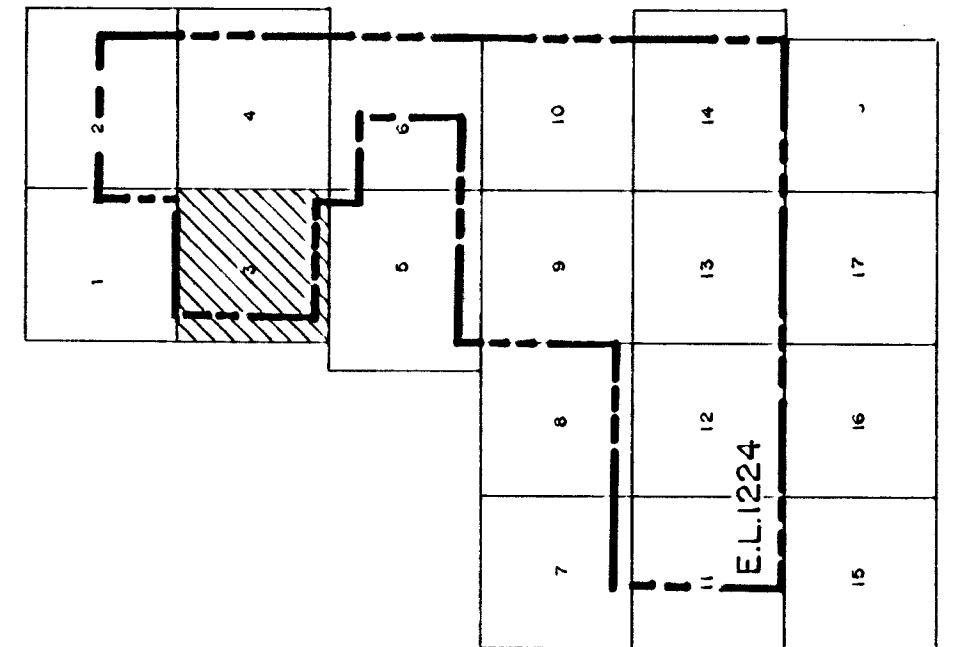
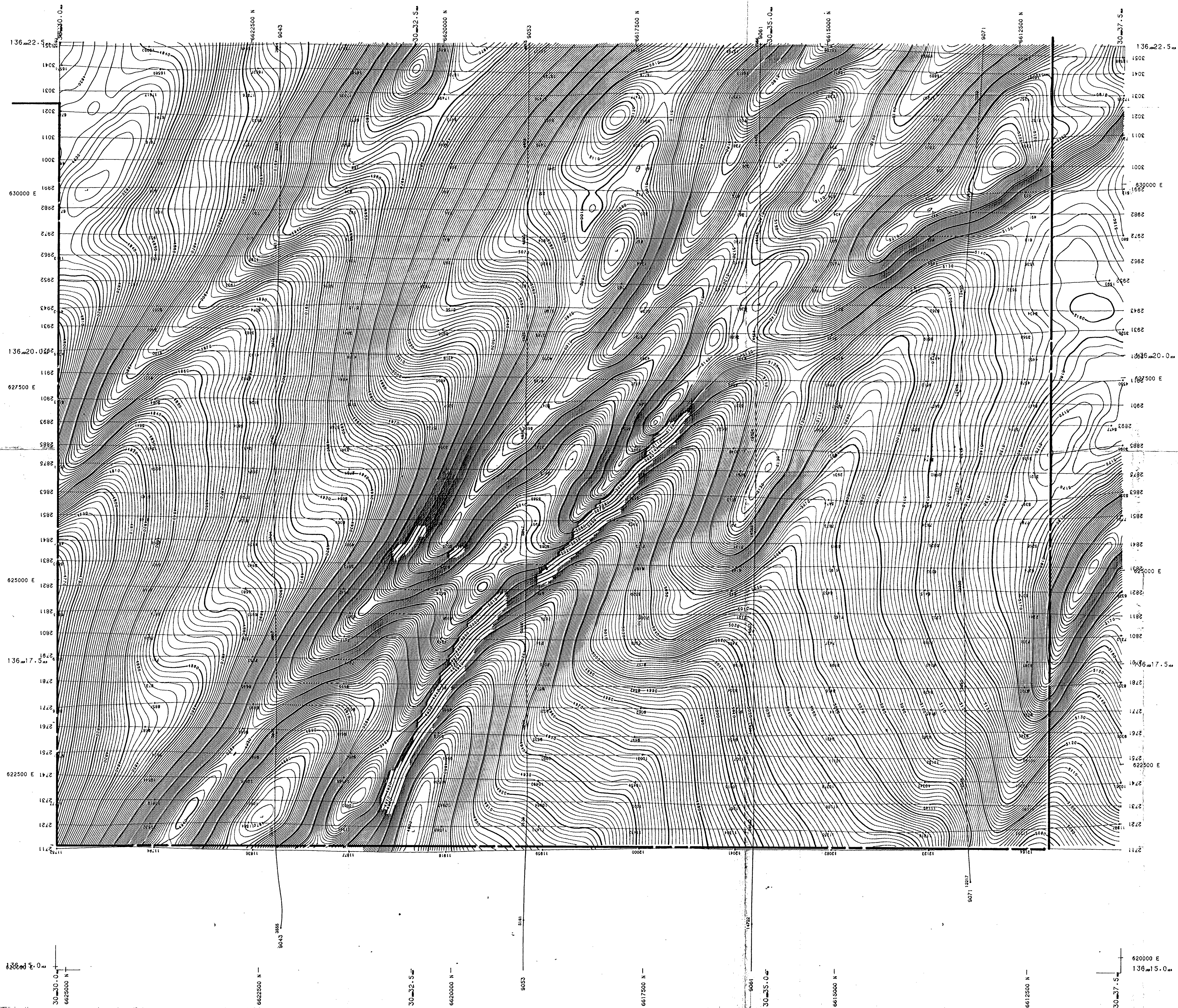
THE BROKEN HILL PROPRIETARY CO. LTD.		
EXPLORATION DEPT.		
EL 1224 HARCUS HILL S.A.		
TOTAL MAGNETIC INTENSITY CONTOURS		
DRAWN :	DATE : 16-8-85	CENTRE : Adelaide
TRACED :	PROJECT NO. :	DRAWING NO. :
CHECKED :	8-022-20	A1-790











PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

#### DETAILS OF SURVEY

FLOWN BY : AUSTREX INT. LTD.  
DATE : JULY 1984  
1:250,000 SHEET : KINGOONYA SH53-11  
TENEMENT : E.L. 1224  
PROJECTION IS TRANSVERSE MERCATOR. ANG ZONE : 53  
LINE SPACING : 300m  
SURVEY HEIGHT : 80m  
MAGNETOMETER : GEOMETRICS 6813  
COMPTON SCATTERING RATIO ALPHA : 0.30  
COMPTON SCATTERING RATIO BETA : 0.45  
COMPTON SCATTERING RATIO GAMMA : 0.83

#### DETAILS OF PROCESSING

PROCESSED BY BHP EXPLORATION : CAMBERWELL  
DIURNAL CORRECTION WAS DONE. BASE 57951 mT  
100% REMOVED  
REMOVED USING SPREADSHEET (LINE BY LINE)  
500m AT ADDED TO DATA  
DATA WAS GRIDDED AND CONTOURED USING PROGRAM GPCOR  
CONTOUR INTERVAL : 2mT  
MESH SIZE 60m X 60m  
SCAN 900m  
GRIDDING PARAMETERS : MINIMUM ANOMALY AMPLITUDE 10mT  
FILTER WAVE LENGTH 900m  
CORRELATION DISTANCE 1200m  
SMOOTHING USED : POLYNOMIAL SMOOTH  
SMOOTHING RADIUS 120m  
PIECEWISE SPLINE TECHNIQUE USED

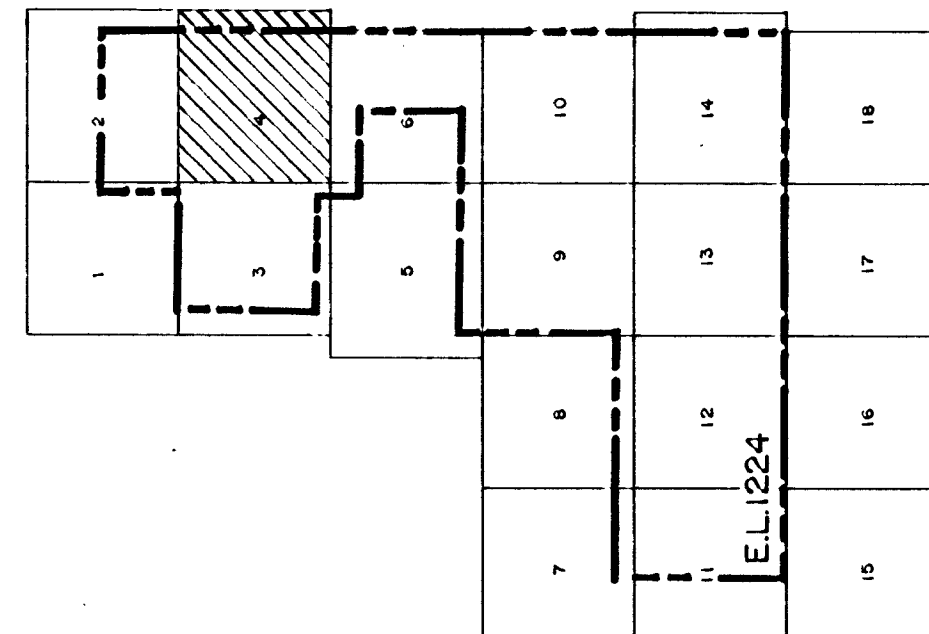
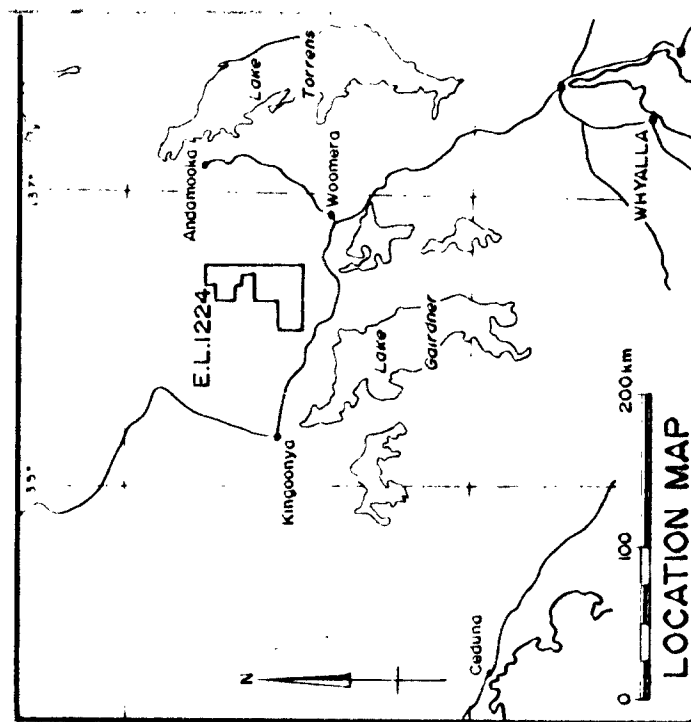
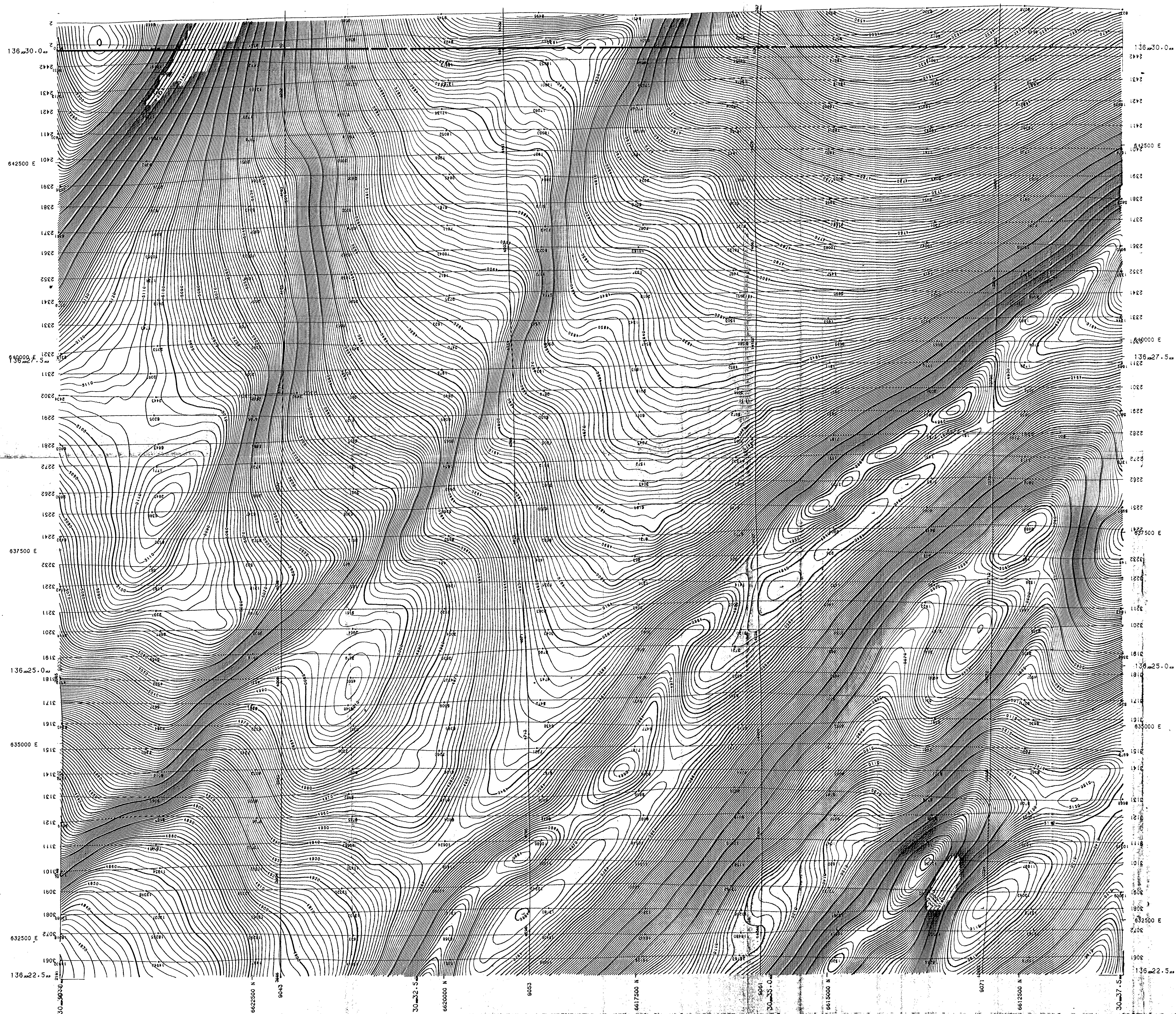
THE BROKEN HILL PROPRIETARY CO. LTD.  
EXPLORATION DEPT  
E.L.1224 HARCUS HILL S.A.  
TOTAL MAGNETIC INTENSITY CONTOURS

DRAWN :  
TRACED :  
CHECKED :  
DATE : 16-8-85  
PROJECT NO :  
CENTRE : Adelaide  
DRAWING NO :  
AI-792



5547-8





PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

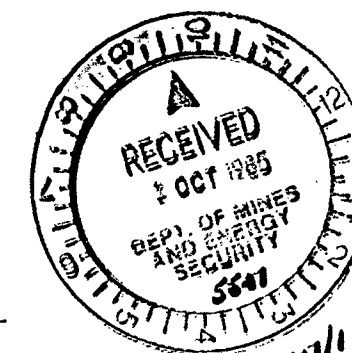
#### DETAILS OF PROCESSING

PROCESSED BY BHP EXPLORATION - CAMBERWELL  
DIURNAL CORRECTION WAS DONE. BASE 57951 m  
ITERATIVE LEAST SQUARES ADJUSTMENT (LINE BY LINE)  
5000 m ADDED TO DATA  
DATA WAS GRIDDED AND CONTOURED USING PROGRAM GPCRL  
CONTOUR INTERVAL 2m  
GRID SIZE 60m x 60m  
GRID COORDINATES  
MINIMUM AMPLITUDE 10mT  
FILTER WAVE LENGTH 900m  
CORRELATION DISTANCE 1200m  
SMOOTHING USED - POLYNOMIAL SMOOTH  
SMOOTHING RADIUS 120m  
PERCENTAGE OF LINE LENGTH USED

#### DETAILS OF SURVEY

FLYING BY: AUSTREX INT. LTD.  
DATE: JULY 1984  
1:250,000 SHEET - KINGDONIA SHS-11  
TENEMENT: E.L. 1224  
PROJECTION IS TRANSVERSE MERCATOR. ANG ZONE + S3  
LINE SPACING: 300m  
SURVEY HEIGHT: 80m  
MAGNETOMETER: GEOMETRICS 6813  
COMPTON SCATTERING RATIO ALPHA: 0.30  
COMPTON SCATTERING RATIO BETA: 0.45  
COMPTON SCATTERING RATIO GAMMA: 0.83

N



THE BROKEN HILL PROPRIETARY CO. LTD.  
EXPLORATION DEPT.

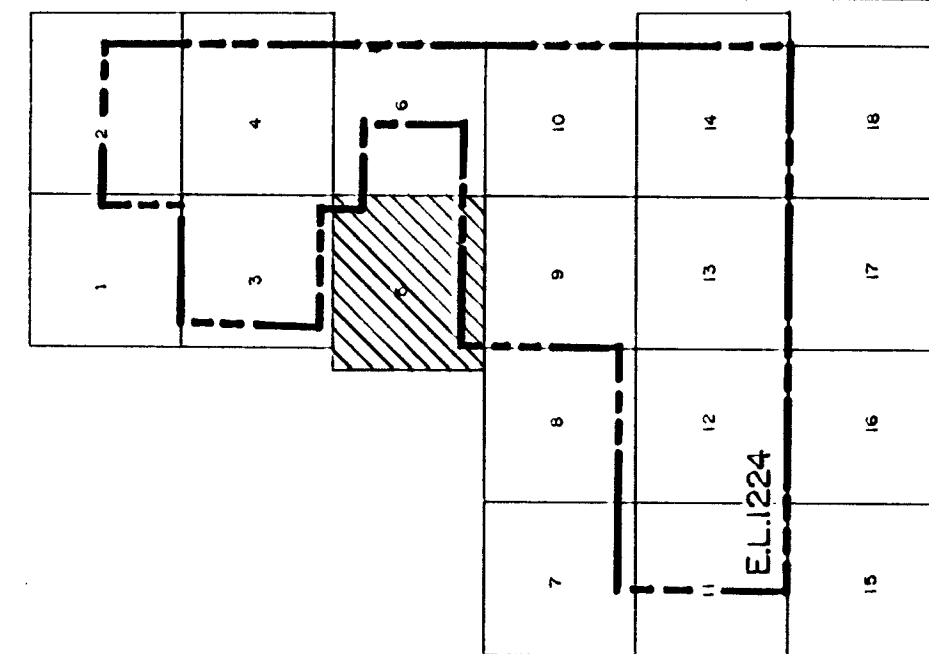
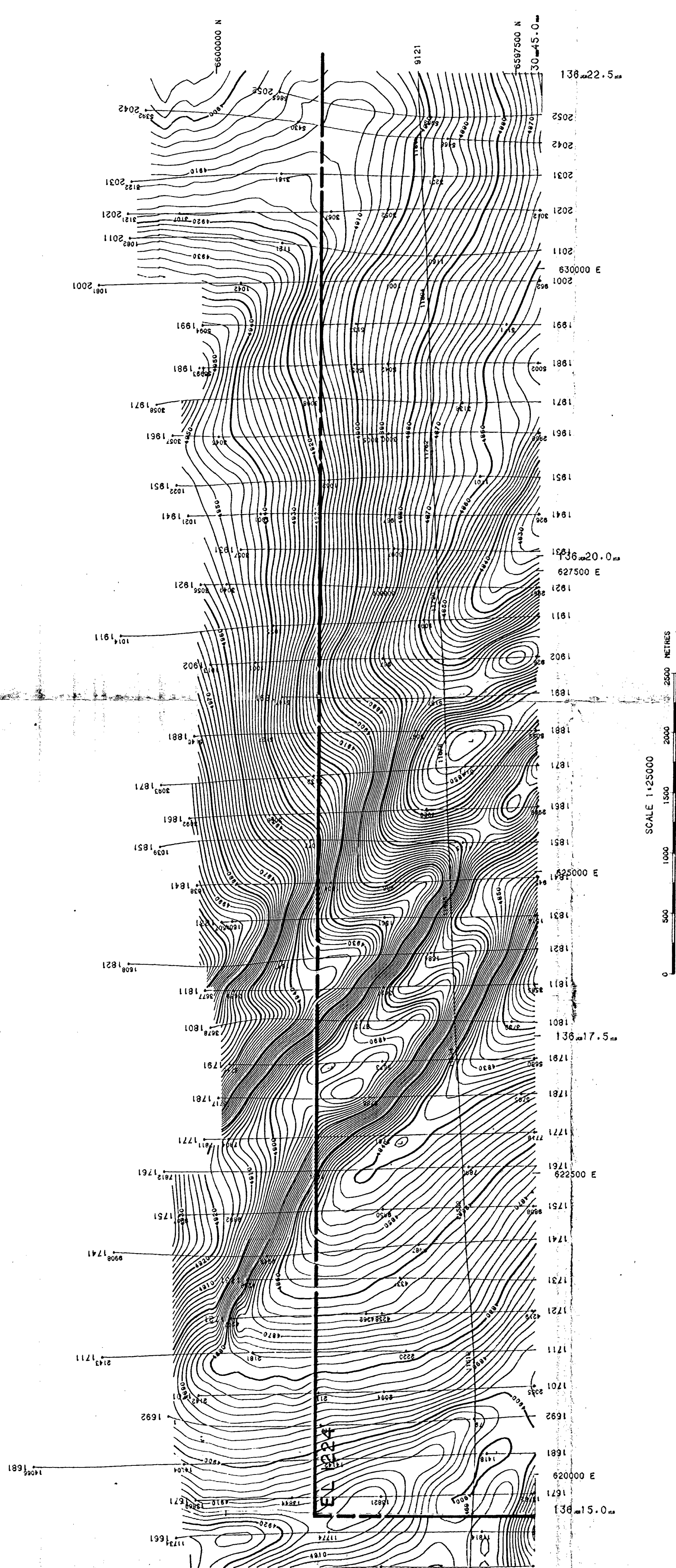
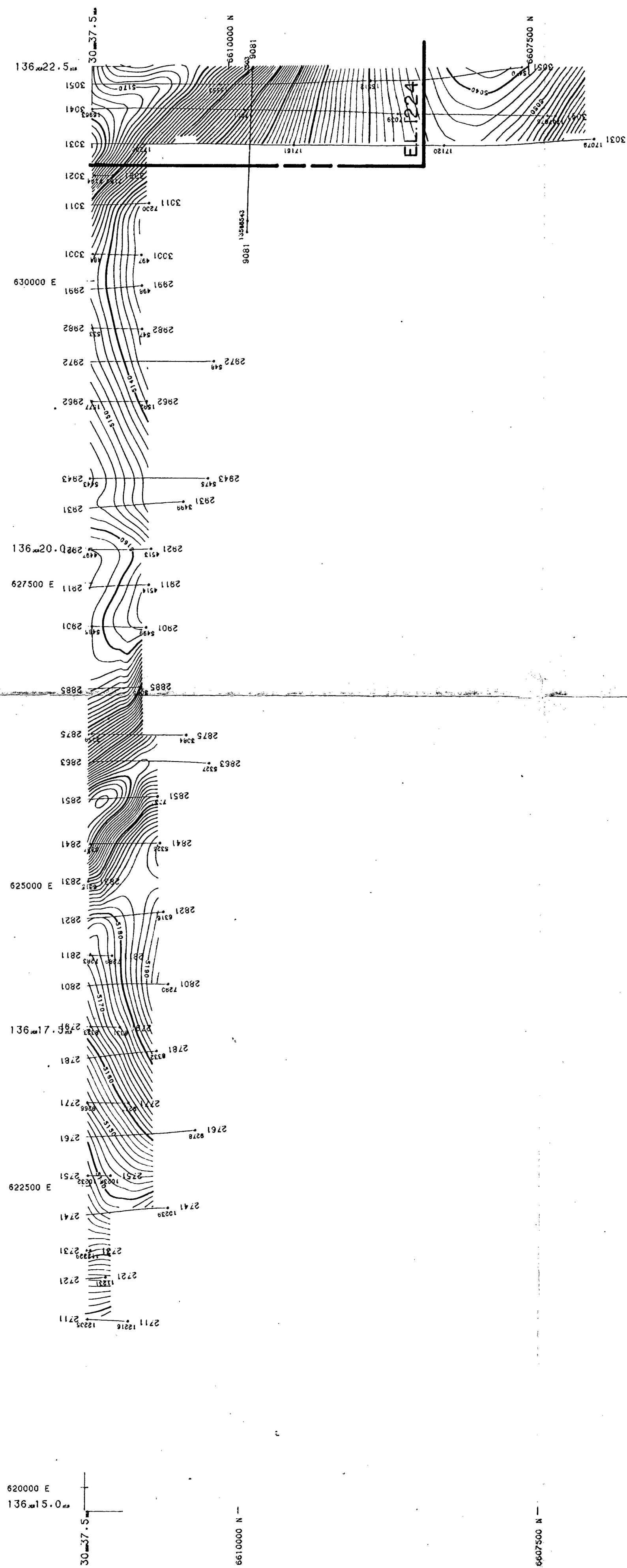
E.L. 1224 HARCUS HILL S.A.  
TOTAL MAGNETIC INTENSITY CONTOURS

4

DRAWN:	DATE: 16-8-85	CENTRE: Adelaide
TRACED:	PROJECT NO:	DRAWING NO:
CHECKED:	6-022-23	AI-793

5547-9





PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

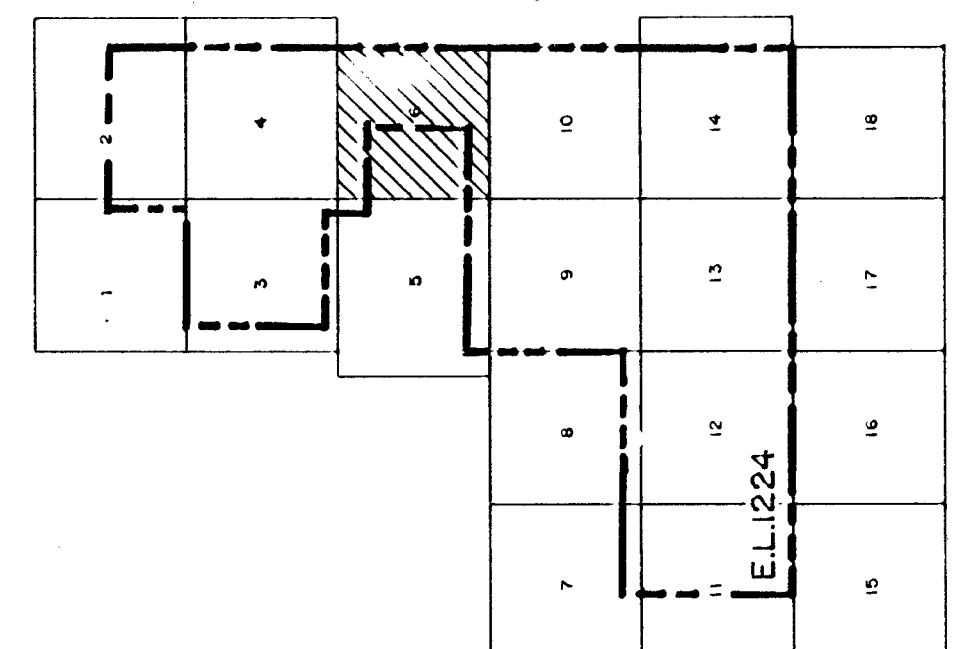
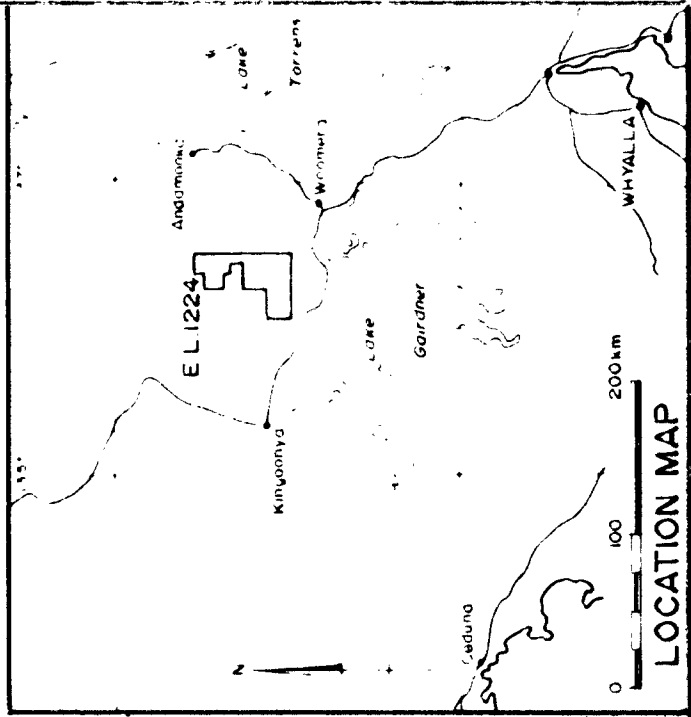
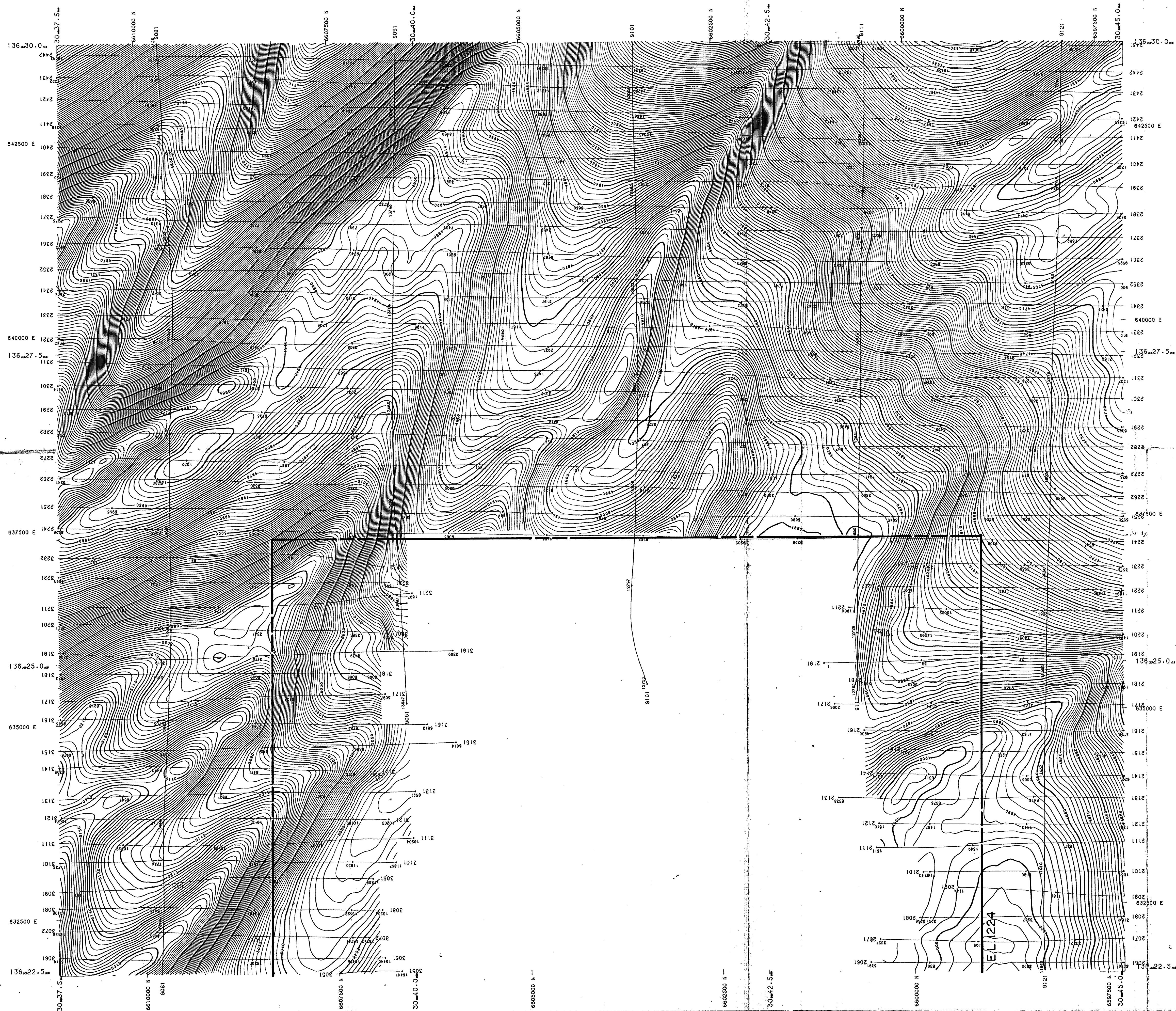
**DETAILS OF PROCESSING**  
 PROCESSED BY BHP EXPLORATION + CAMBERWELL  
 SURVEY CORRECTION WAS DONE BASE 57951 AT  
 CONVERSION WAS DONE BASE 57951 AT  
 ITERATIVE READING ERROR ADJUSTMENT (LINE BY LINE)  
 5000 AT ADDED TO DATA  
 DATA WAS GRIDDED AND CONTOURED USING PROGRAM GPCORL  
 CONTOUR INTERVAL 2m  
 GRID SIZE 6m X 6m  
 GRIDDING PARAMETERS  
 MINIMUM ANOMALY AMPLITUDE 10m  
 FILTER WAVE LENGTH 900m  
 CORRELATION LENGTH 1200m  
 SMOOTHING USED POLYNOMIAL SMOOTH  
 CORRELATION LENGTH 120m  
 PIECEWISE SPLINE TECHNIQUE USED

**DETAILS OF SURVEY**  
 FLOWN BY + AUSTREX INT. LTD.  
 DATE + JULY 1984  
 1:250,000 SHEET + KINGOONYA SH53-11  
 TENEMENT + E.L. 1224  
 PROJECTION IS TRANSVERSE MERCATOR. ANG. ZONE + 53  
 LINE SPACING + 300m  
 SURVEY HEIGHT + 80m  
 MAGNETOMETER + GEOMETRICS 6813  
 COMPTON SCATTERING RATIO ALPHA + 0.30  
 COMPTON SCATTERING RATIO BETA + 0.45  
 COMPTON SCATTERING RATIO GAMMA + 0.63

RECEIVED  
 2 OCT 1985  
 DEPT. OF MINES  
 AND ENERGY  
 SECURITY  
 5547

THE BROKEN HILL PROPRIETARY CO. LTD.  
 EXPLORATION DEPT.  
 EL. 1224 HARCUS HILL S.A.  
 TOTAL MAGNETIC INTENSITY CONTOURS  
 5  
 DRAWN +  
 TRACED +  
 CHECKED +  
 DATE + 16-8-85  
 PROJECT NO +  
 6-022-24  
 CENTRE + Adelaide  
 DRAWING NO +  
 A1-794  
 5547-10

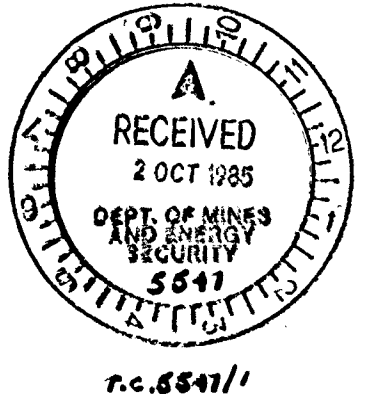




PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

**DETAILS OF PROCESSING**  
PROCESSED BY BHP EXPLORATION - CAMBERWELL  
JOURNAL CORRECTION WAS DONE - BASE 37951.01  
ITERATIVE READING ERROR ADJUSTMENT (LINE BY LINE)  
5000 m ADDED TO DATA  
DATA WAS GRIDDED AND CONTOURED USING PROGRAM GPCORL  
CONTOUR INTERVAL 2m  
GRID SIZE 50m X 50m  
GRIDDING PARAMETERS:  
MINIMUM ANOMALY AMPLITUDE 10mT  
CORRELATION LENGTH 500m  
SMOOTHING USED - POLYNOMIAL SMOOTH  
STANDARD DEVIATION 120m  
PIECEWISE SP-LINE TECHNIQUE USED

**DETAILS OF SURVEY**  
FLOWN BY - AUSTREX INT. LTD.  
DATE - JULY 1984  
1:250,000 SHEET - KINGOONYA SH53-11  
TENEMENT - E.L. 1224  
PROJECTION IS TRANSVERSE MERCATOR, ANG ZONE - 53  
LINE SPACING - 300m  
SURVEY HEIGHT - 80m  
MAGNETOMETER - GEOMETRICS 6813  
COMPTON SCATTERING RATIO ALPHA - 0.30  
COMPTON SCATTERING RATIO BETA - 0.45  
COMPTON SCATTERING RATIO GAMMA - 0.83



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPT.		
EL 1224 HARCUS HILL S.A. TOTAL MAGNETIC INTENSITY CONTOURS		
6		
DRAWN:	DATE: 16-8-85	CENTRE: Adelaide
TRACED:	PROJECT NO:	DRAWING NO:
CHECKED:	6-D22-25	AI - 795

5547-11



136 000.5 m  
607500 E

605000 E

136 000.5 m

602500 E

600000 E

136 002.5 m

597500 E

136 000.0 m

607500 N

605000 N

602500 N

600000 N

597500 N

597500 N

595000 N

592500 N

590000 N

587500 N

585000 N

582500 N

580000 N

577500 N

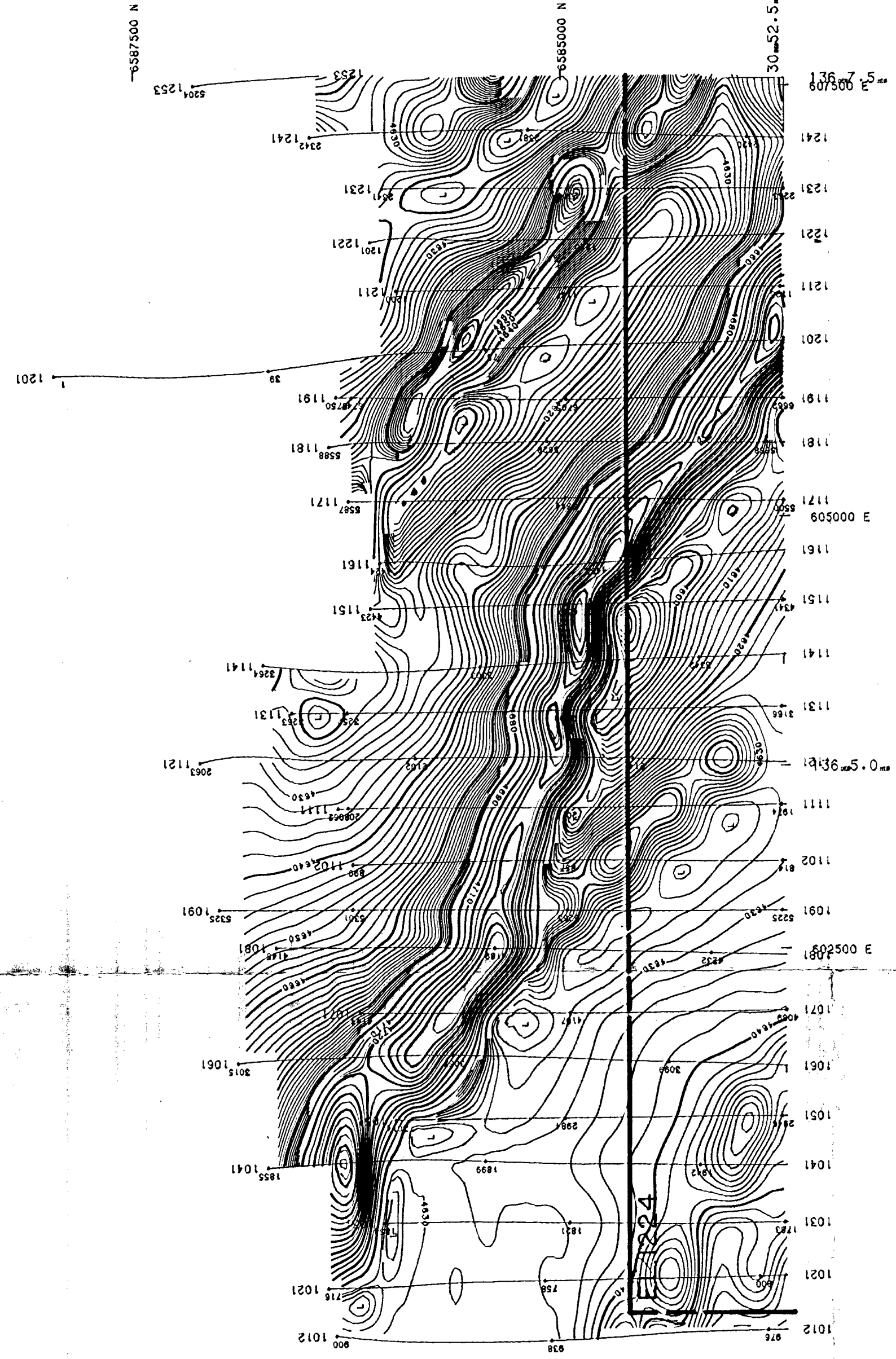
575000 N

572500 N

570000 N

136 000.0 m

607500 N



SCALE 1:25000  
0 500 1000 1500 2000 2500 METRES

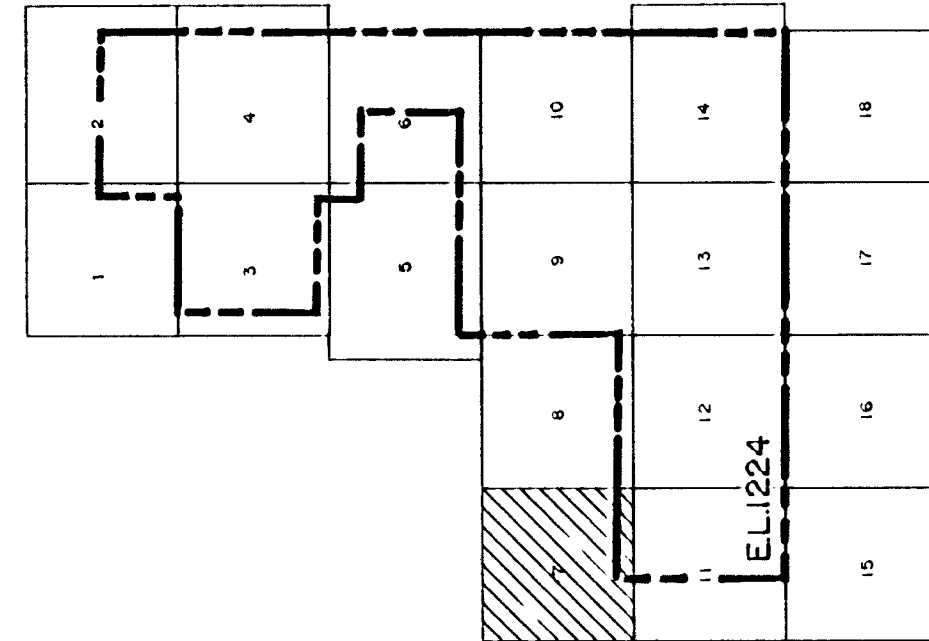
PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

#### DETAILS OF SURVEY

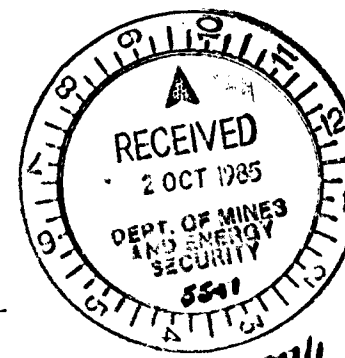
FLOWN BY : AUSTREX INT. LTD.  
DATE : JULY 1984  
1:250,000 SHEET : KINGOONYA SH53-11  
TENEMENT : E.L. 1224  
PROJECTION IS TRANSVERSE MERCATOR. ANG. ZONE : S3  
LINE SPACING : 300m  
SURVEY HEIGHT : 80m  
MAGNETOMETER : GEOMETRICS 6813  
COMPTON SCATTERING RATIO ALPHA : 0.30  
COMPTON SCATTERING RATIO BETA : 0.45  
COMPTON SCATTERING RATIO GAMMA : 0.83

#### DETAILS OF PROCESSING

PROCESSED BY BRP EXPLORATION : CAMBERWELL  
DIURNAL CORRECTION WAS DONE. BASE 57951 mT  
100% REMOVED  
21-01-84  
24-01-84  
24-01-84  
25-01-84  
DATA WAS GRIDDED AND CONTOURED USING PROGRAM GPCORL  
CONTOUR INTERVAL 2m  
NEAR SIZE 60m X 60m  
SCAN 900m  
GRIDDING PARAMETERS :  
MINIMUM ANOMALY AMPLITUDE 10mT  
FILTER WAVE LENGTH 900m  
CORRELATION DISTANCE 1200m  
SMOOTHING USED : POLYNOMIAL SMOOTH  
SHOOTING RADIUS 120m  
PIECEWISE SPLINE TECHNIQUE USED



N

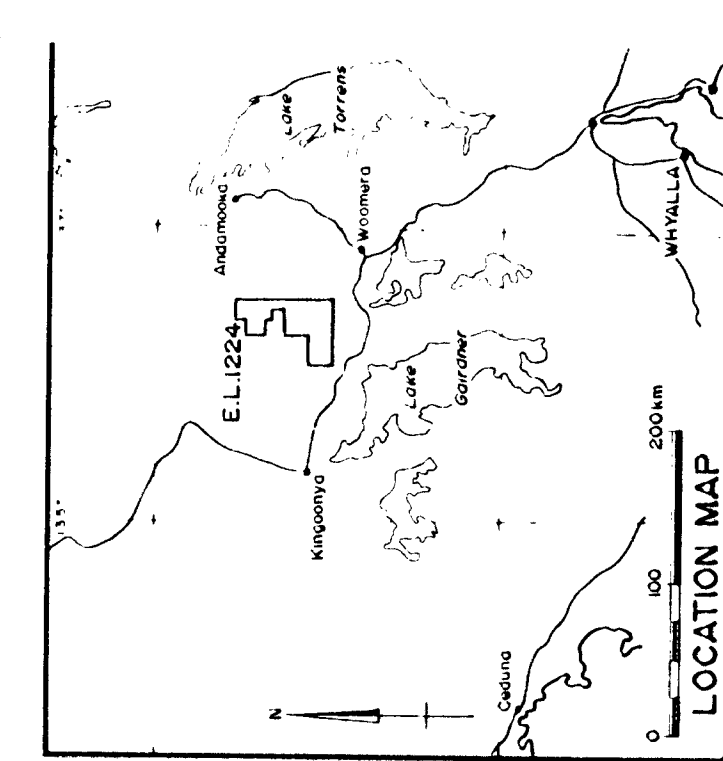
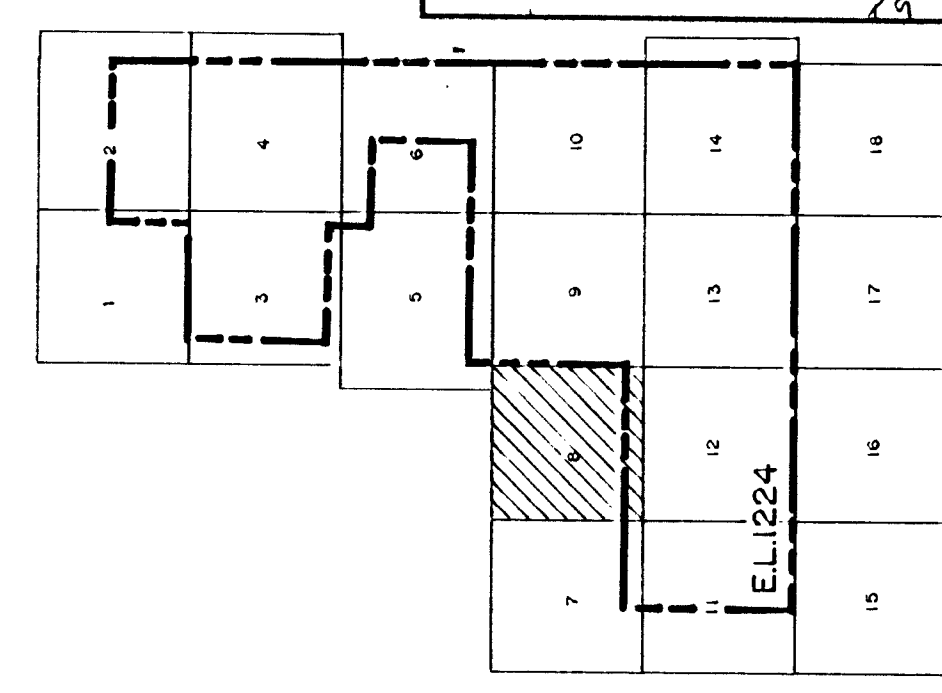
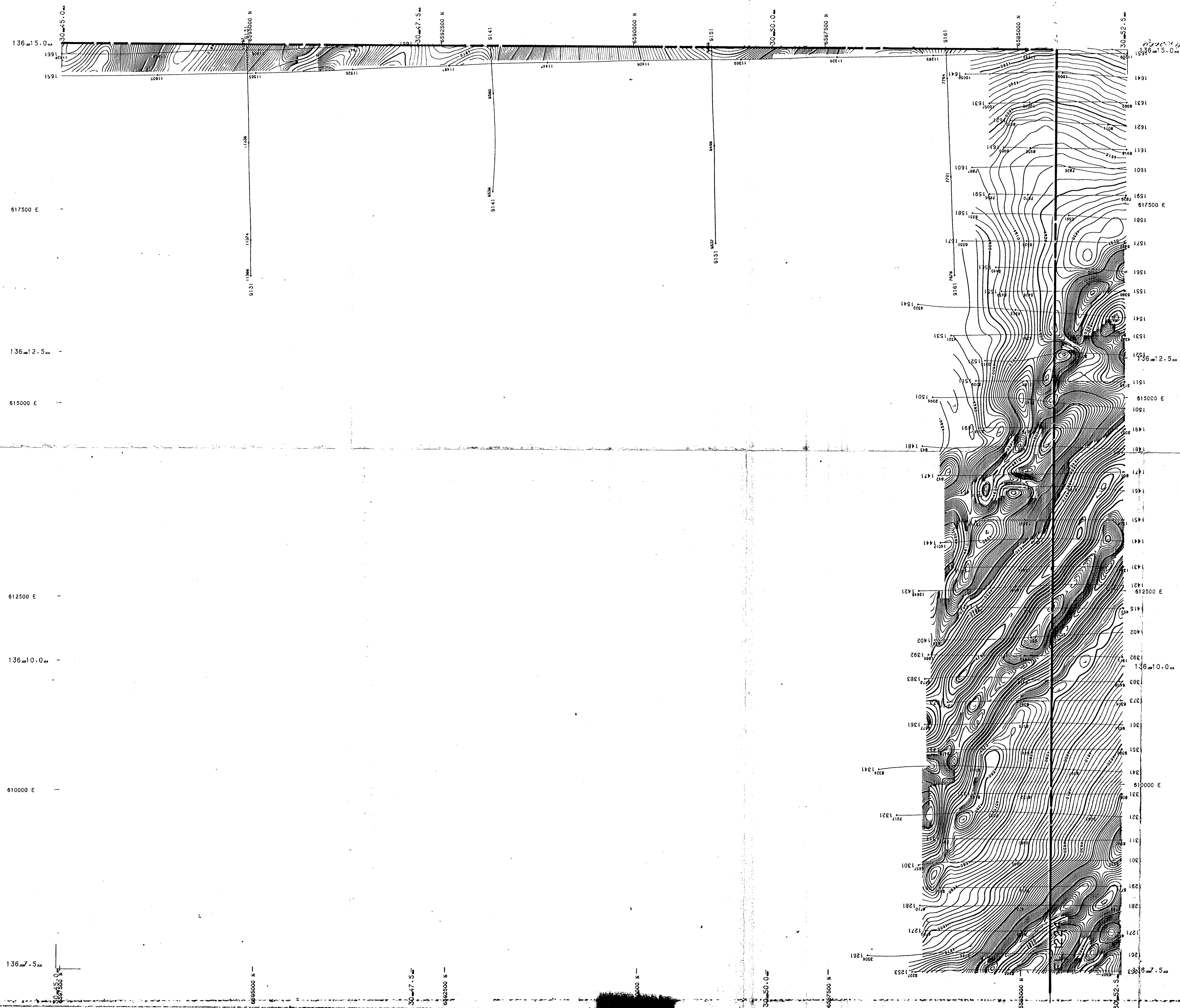


THE BROKEN HILL PROPRIETARY CO. LTD.  
EXPLORATION DEPT

EL 1224 HARCUS HILL S.A.  
TOTAL MAGNETIC INTENSITY CONTOURS  
7

DRAWN :  
PROJECT NO :  
CHECKED :  
DATE : 16-8-85  
CENTRE : Adelaide  
DRAWING NO :  
6-022-26  
AI-796

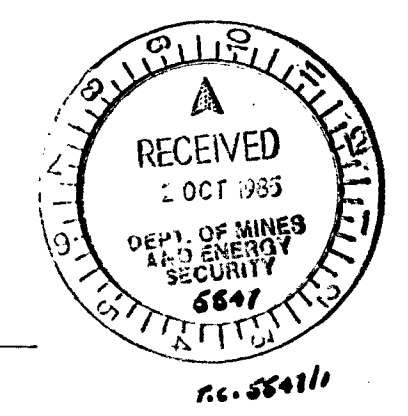
5547-12



PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

**DETAILS OF PROCESSING**  
PROCESSED BY BHP EXPLORATION + CAMBERWELL  
DIURNAL CORRECTION WAS DONE, BASE 574501 AT  
1000 REMOVED  
ITERATIVE HEADING ERROR ADJUSTMENT (LINE BY LINE)  
5000 AT ADDED TO DATA  
DATA WAS GRIDDED AND CONTOURED USING PROGRAM GPCORL  
SCALING INTERVAL 2m  
SCAL SIZE 800m  
GRIDGING PARAMETERS:  
MINIMUM ANOMALY AMPLITUDE 10m  
FILTER WAVE LENGTH 800m  
CORRELATION DISTANCE 1200m  
SMOOTHING USED, POLYNOMIAL SMOOTHING RADIUS 120m  
PIECEWISE SPLINE TECHNIQUE USED

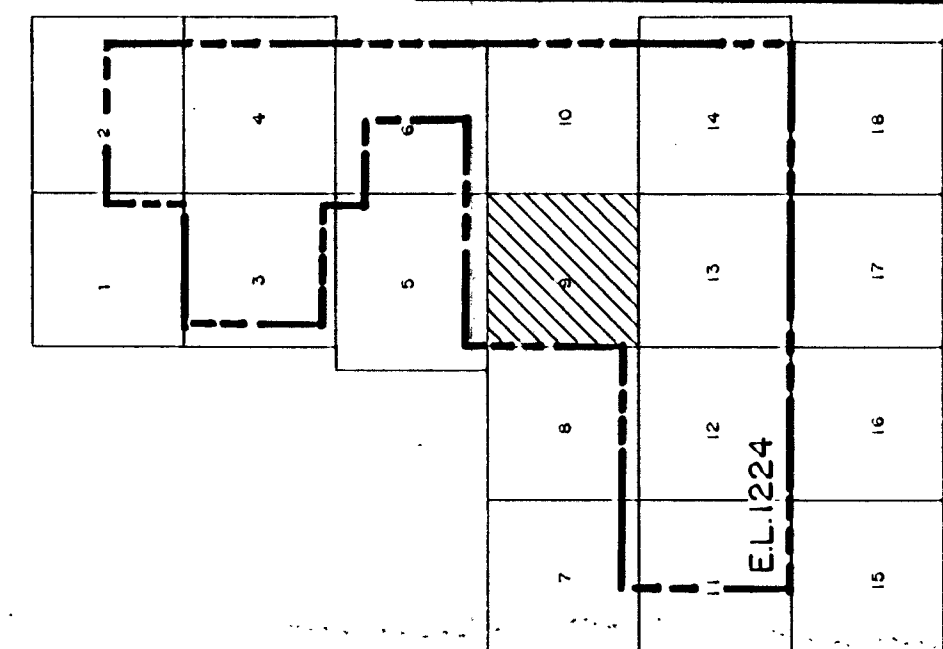
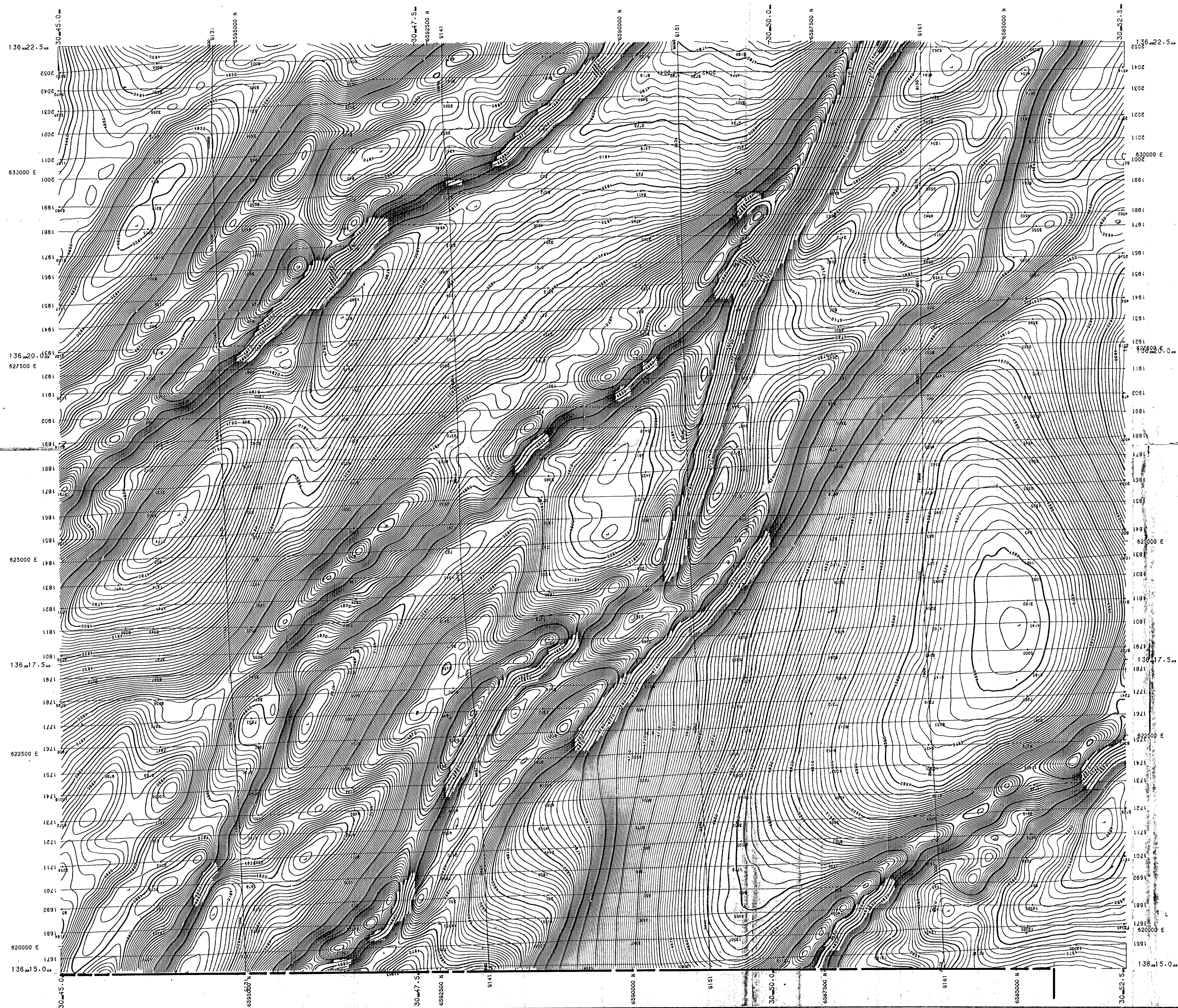
**DETAILS OF SURVEY**  
FLOW BY: AUSTREX INT. LTD.  
DATE: JULY 1984  
1:250,000 SHEET + KINGOONYA SH53-11  
TENEMENT: E.L. 1224  
PROJECTION IS TRANSVERSE MERCATOR, ANG ZONE: 53  
LINE SPACING: 300m  
SURVEY HEIGHT: 80m  
MAGNETOMETER: GEOMETRICS 6813  
COMPTON SCATTERING RATIO ALPHA: 0.30  
COMPTON SCATTERING RATIO BETA: 0.45  
COMPTON SCATTERING RATIO GAMMA: 0.83



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPT		
EL1224 MARCUS HILL S.A. TOTAL MAGNETIC INTENSITY CONTOURS		
8		
DRAWN: [REDACTED]	DATE: 16-8-85	CENTRE: Adelaide
CHECK: [REDACTED]	PROJECT NO: D22-27	DRAWING NO: A1-797

5547-13





PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

#### DETAILS OF SURVEY

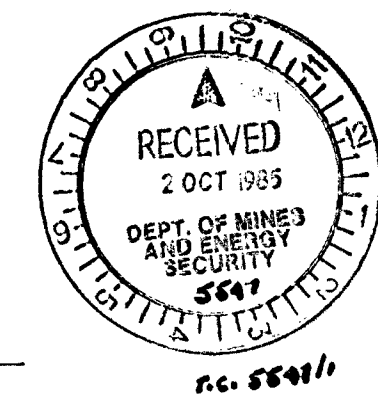
FLOWN BY : AUSTREX INT. LTD.  
DATE : JULY 1984  
1:250,000 SHEET : KINCOONYA SH53-11  
TENEMENT : E.L. 1224  
PROJECTION IS TRANSVERSE MERCATOR - ANG ZONE : 53  
LINE SPACING : 300m  
SURVEY HEIGHT : 80m  
MAGNETOMETER : GEOMETRICS 6813  
COMPTON SCATTERING RATIO ALPHA : 0.30  
COMPTON SCATTERING RATIO BETA : 0.45  
COMPTON SCATTERING RATIO GAMMA : 0.63

#### DETAILS OF PROCESSING

PROCESSED BY BHP EXPLORATION : CAMBERWELL  
DIURNAL CORRECTION WAS DONE. BASE 57451 nT  
LGRF REMOVED  
ITERATIVE HEADING ERROR ADJUSTMENT (LINE BY LINE)  
DATA WAS GRIDDED AND CONTOURED USING PROGRAM GPCORL  
CONTOUR INTERVAL : 2nT  
NEST SIZE 60m X 60m  
SCAN 800m  
GRIDDING PARAMETERS : MAXIMUM ANOMALY AMPLITUDE 10nT  
FILTERED ANOMALY 50nT  
CORRELATION DISTANCE 1200m  
SMOOTHING USED : POLYNOMIAL SMOOTH  
SMOOTHING RADIUS 120m  
PERCENTAGE SPLINE TECHNIQUE USED

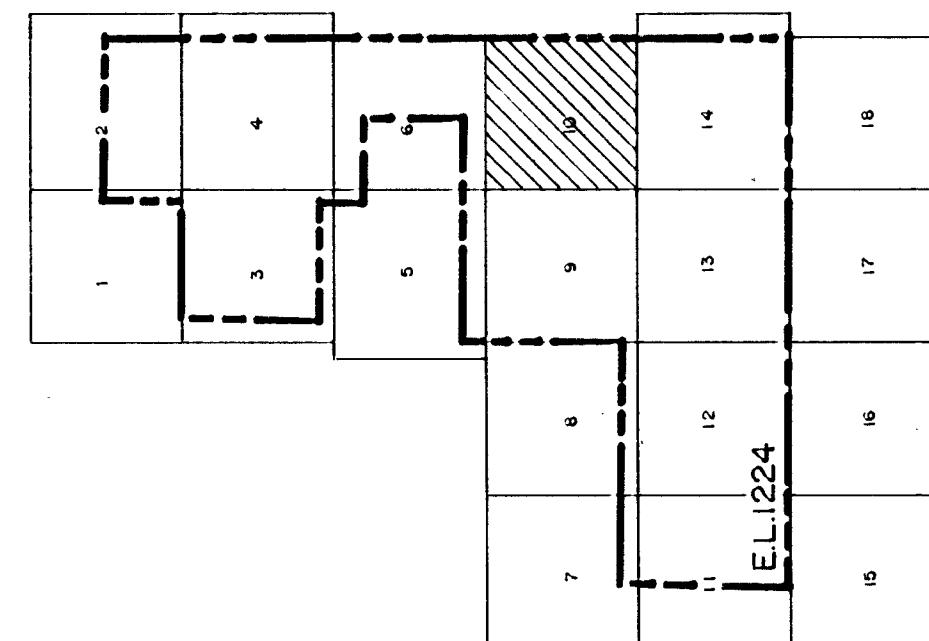
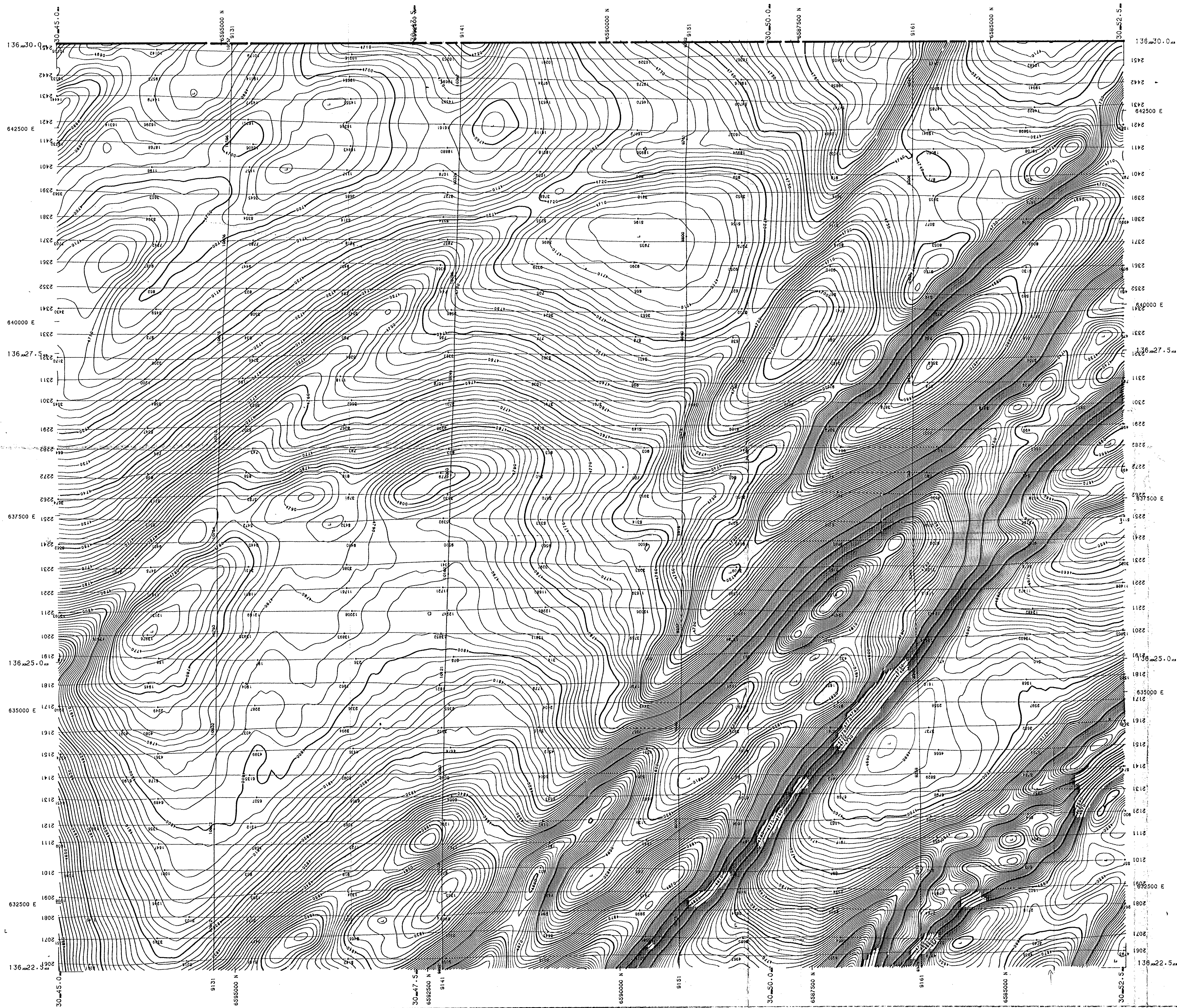
N

THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPT		
EL.1224 HARCUS HILL S.A. TOTAL MAGNETIC INTENSITY CONTOURS		
9		
DRAWN:	DATE: 16-8-85	CENTRF: Adelaide
TRACED:	PROJECT NO:	DRAWING NO:
CHECKED:	6-022-28	A1-798



5547-14





PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

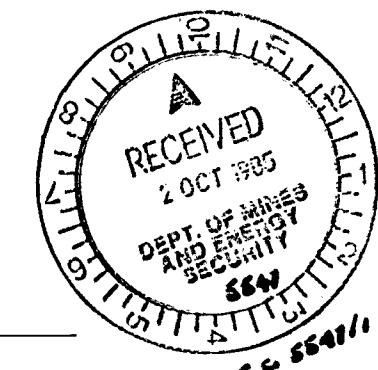
#### DETAILS OF SURVEY

FLOW BY : AUSTREX INT. LTD.  
DATE : JULY 1984  
1:250,000 SHEET : KINGOONYA SH53-11  
TENEMENT : E.L. 1224  
PROJECTION IS TRANSVERSE MERCATOR, ANG. ZONE : 53  
LINE SPACING : 300m  
SURVEY HEIGHT : 80m  
MAGNETOMETER : GEOMETRICS 6813  
COMPTON SCATTERING RATIO ALPHA : 0.30  
COMPTON SCATTERING RATIO BETA : 0.45  
COMPTON SCATTERING RATIO GAMMA : 0.83

#### DETAILS OF PROCESSING

PROCESSED BY BHP EXPLORATION : CAMBERWELL  
DIURNAL CORRECTION WAS DONE, BASE 57851 nT  
100% REMOVED  
DATA WAS GRIDDED AND CONTOURED USING PROGRAM GPCORL  
CONTOUR INTERVAL, 2nT  
MESH SIZE 60m X 60m  
SCALING PARAMETER : MINIMUM ANOMALY AMPLITUDE 10nT  
FILTER WAVE LENGTH 900m  
CORRELATION DISTANCE 1200m  
SMOOTHING USED : POLYNOMIAL SMOOTH  
PIECEWISE SPLINE TECHNIQUE USED

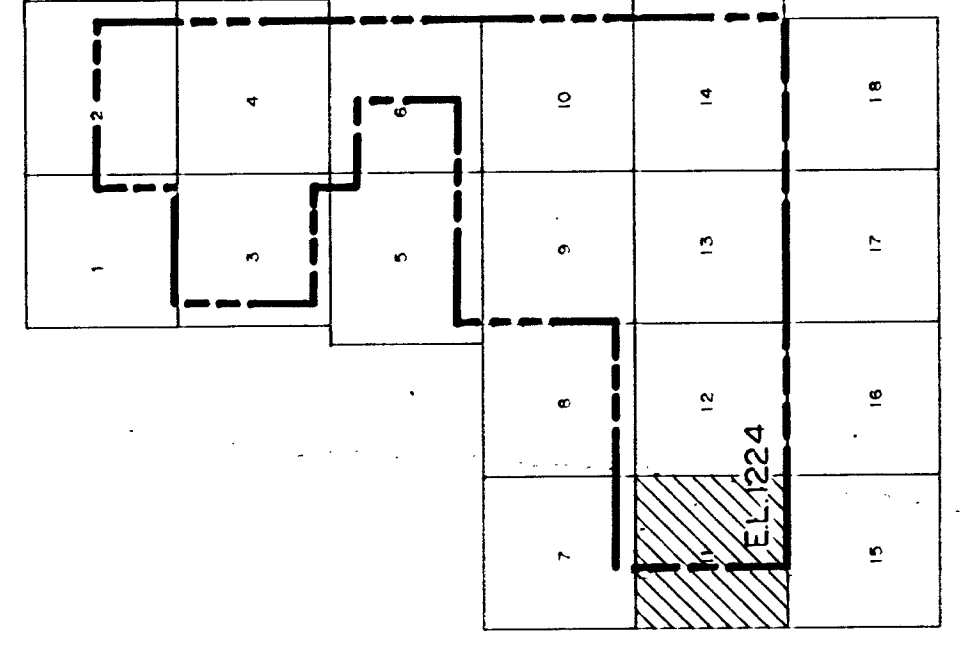
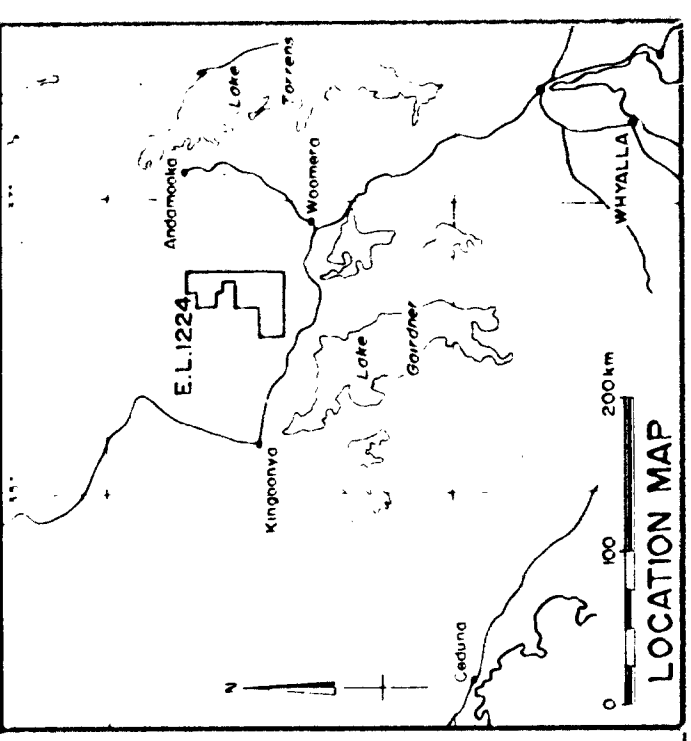
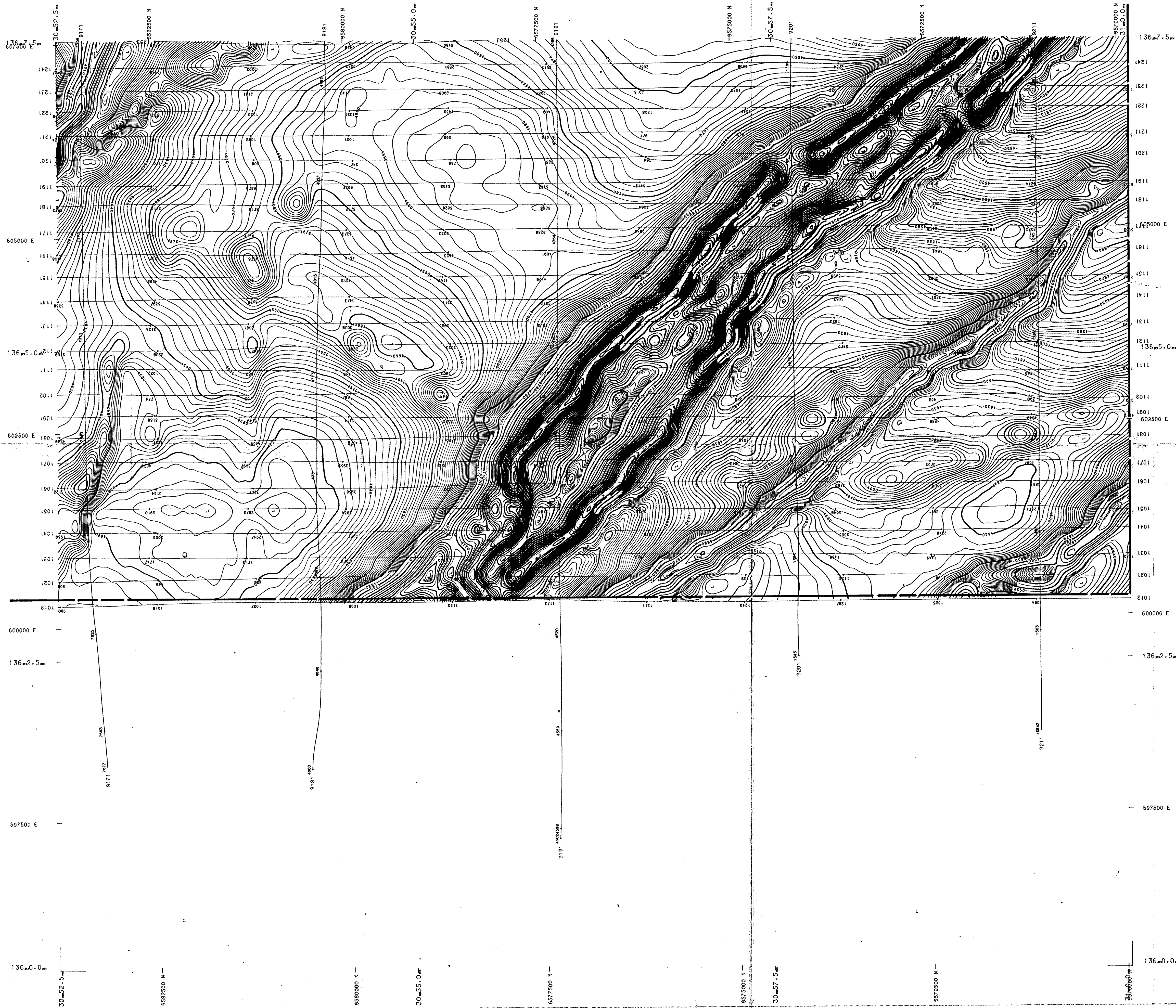
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THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPT.		
EL.1224 HARCUS HILL S.A. TOTAL MAGNETIC INTENSITY CONTOURS 10		
DRAWN:	DATE: 16-8-85	CENTRE: Adelaide
TRACED:	PROJECT NO:	DRAWING NO:
CHECKED:	6-022-10	A1-799

5547-15





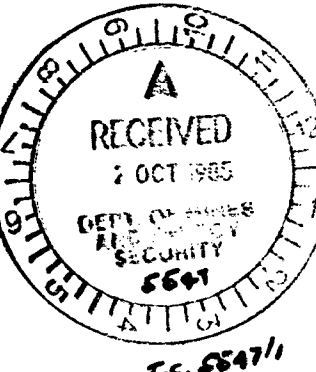
PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

DETAILS OF SURVEY

FLOWN BY : AUSTREX INT. LTD.  
DATE : JULY 1984  
1:250,000 SHEET : KINGOONYA SH53-11  
TENEMENT : E.L. 1224  
PROJECTION IS TRANSVERSE MERCATOR. ANG. ZONE : 53  
LINE SPACING : 300m  
SURVEY HEIGHT : 80m  
MAGNETOMETER : GEOMETRICS 6813  
COMPTON SCATTERING RATIO ALPHA : 0.30  
COMPTON SCATTERING RATIO BETA : 0.45  
COMPTON SCATTERING RATIO GAMMA : 0.83

DETAILS OF PROCESSING

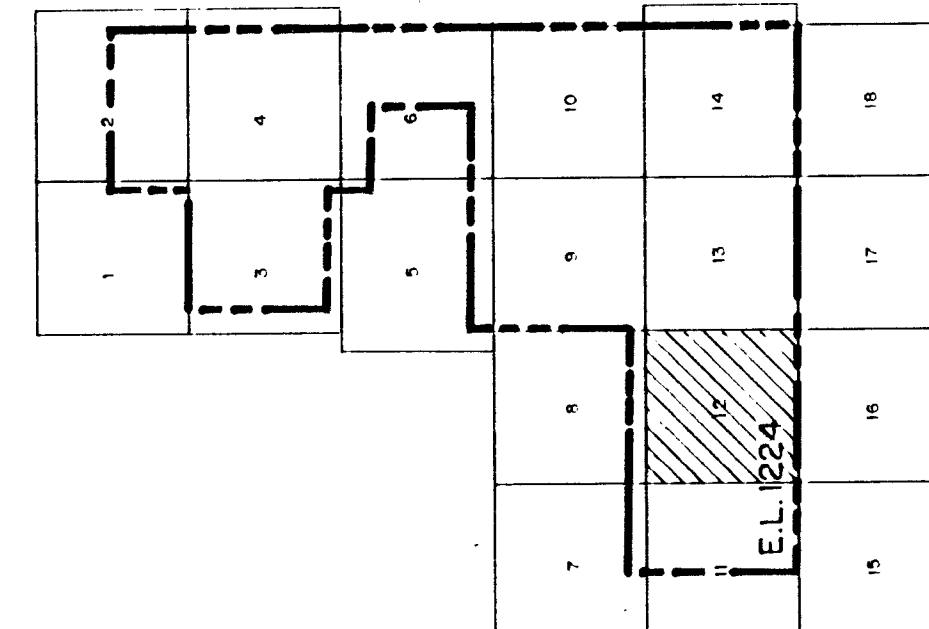
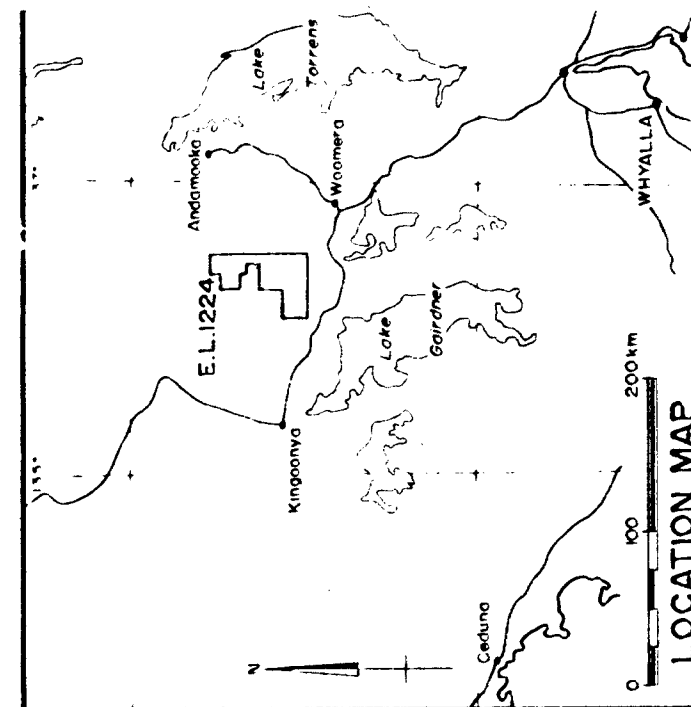
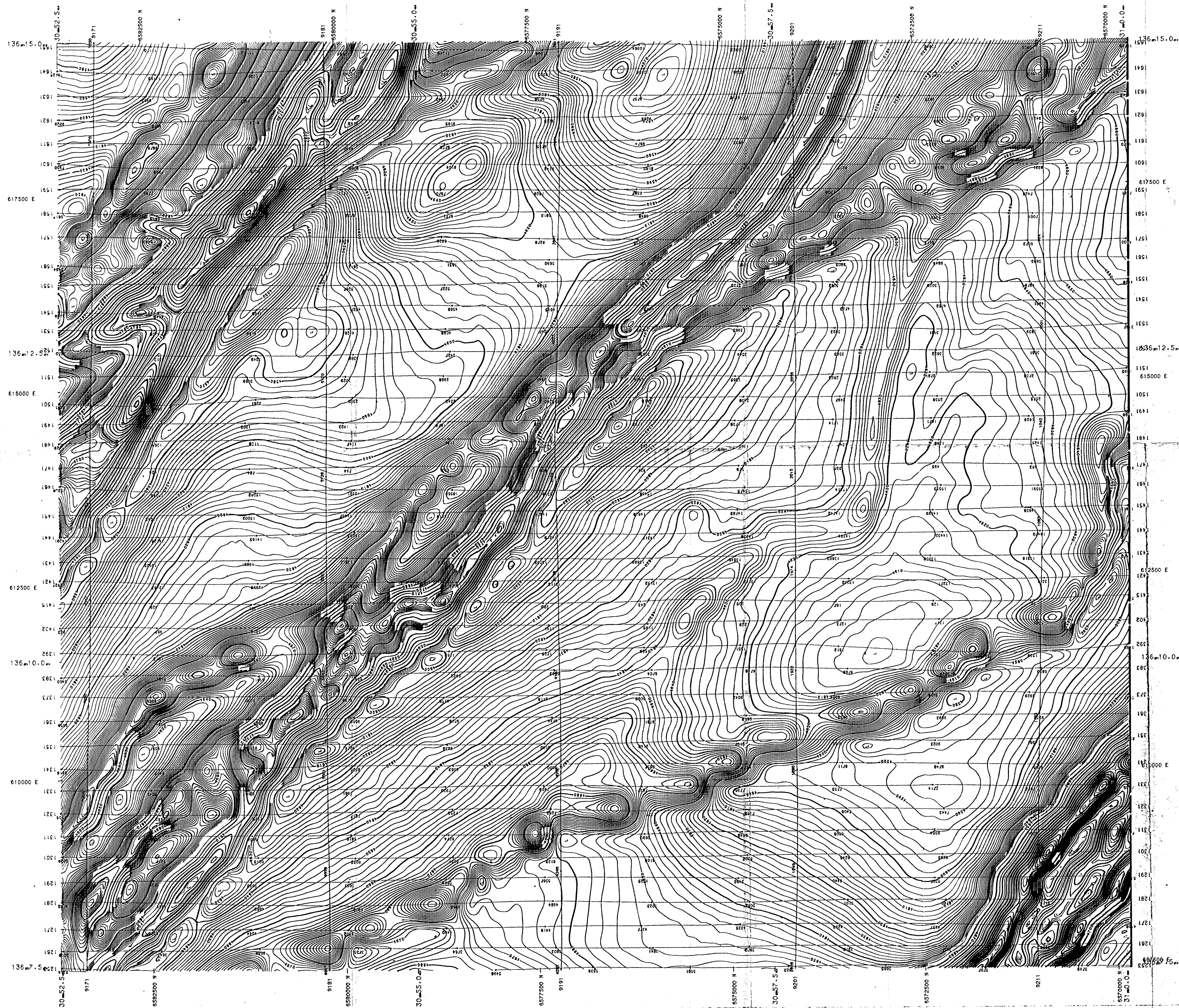
PROCESSED BY BHP EXPLORATION : CAMBERWELL  
DIGITAL CORRECTION WAS DONE. BASE 57851 mT  
198F REMOVED  
ITERATIVE HEADING ERROR ADJUSTMENT (LINE BY LINE)  
5000 mT ADDED TO DATA  
DATA WAS GRIDDED AND CONTOURED USING PROGRAM GPCRL  
CONTOUR INTERVAL 2mT  
SCAN 305, 60m X 80m  
GRIDDING PARAMETERS :  
MINIMUM ANGLE AMPLITUDE 10mT  
FILTER WAVE LENGTH 500m  
CORRELATION DISTANCE 1200m  
SMOOTHING USED 4th ORDER  
SHOULDER RADIUS 120m  
PIECEWISE SPLINE TECHNIQUE USED



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPT.		
EL 1224 HARCUS HILL S.A. TOTAL MAGNETIC INTENSITY CONTOURS II		
DRAWN:	DATE: 16-8-85	CENTRE: Adelaide
TRACED:	PROJECT NO:	DRAWING NO:
CHECKED:	6-022-30	AI-800

5547-16





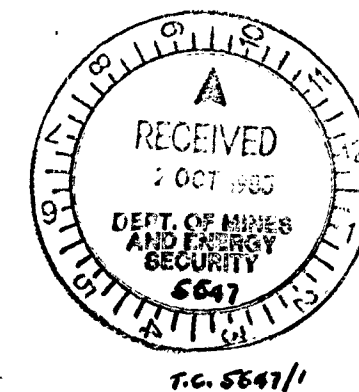
PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

#### DETAILS OF PROCESSING

PROCESSED BY BHP EXPLORATION + CAMBERWELL  
DIURNAL CORRECTION WAS DONE, BASE 57951 mT  
10RF REMOVED  
ITERATIVE HEADING ERROR ADJUSTMENT (LINE BY LINE)  
5000 mT ADDED TO DATA  
DATA WAS THEN RECONToured USING PROGRAM CPCSRL  
DRAWING INTERVAL 25  
MESH SIZE 500 X 500  
SCALING 900m  
GRIDDING PARAMETERS  
MINIMUM ANOMALY AMPLITUDE 10mT  
MAXIMUM ANOMALY AMPLITUDE 900m  
CORRELATION DISTANCE 1200m  
SMOOTHING USED - POLYNOMIAL SMOOTH  
SMOOTHING RADIUS 120m  
PIECEWISE SPLINE TECHNIQUE USED

#### DETAILS OF SURVEY

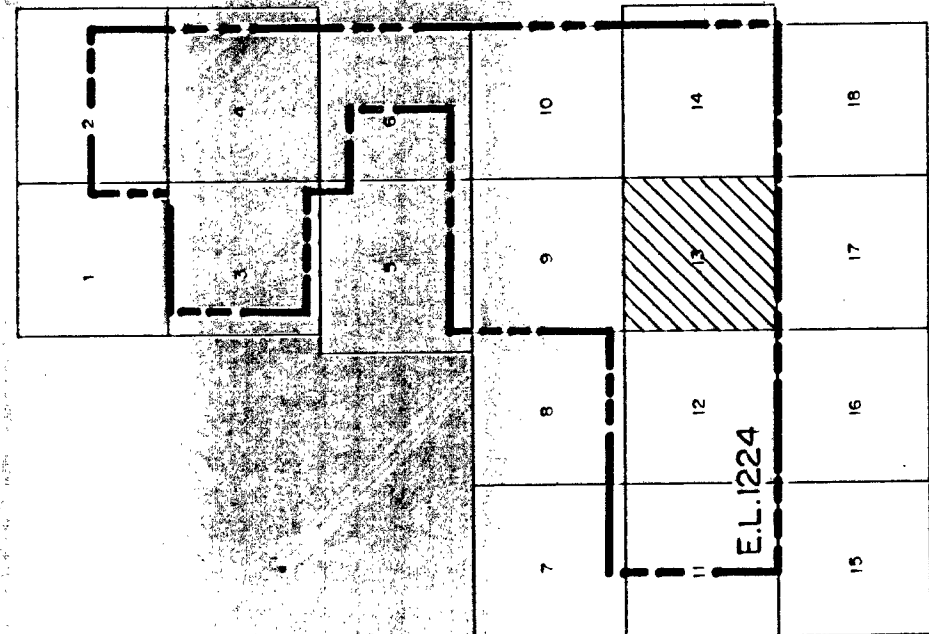
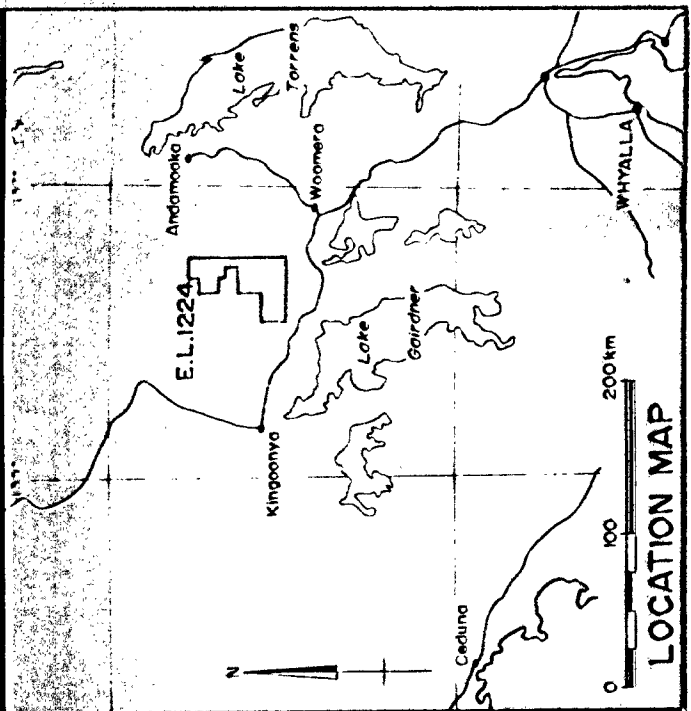
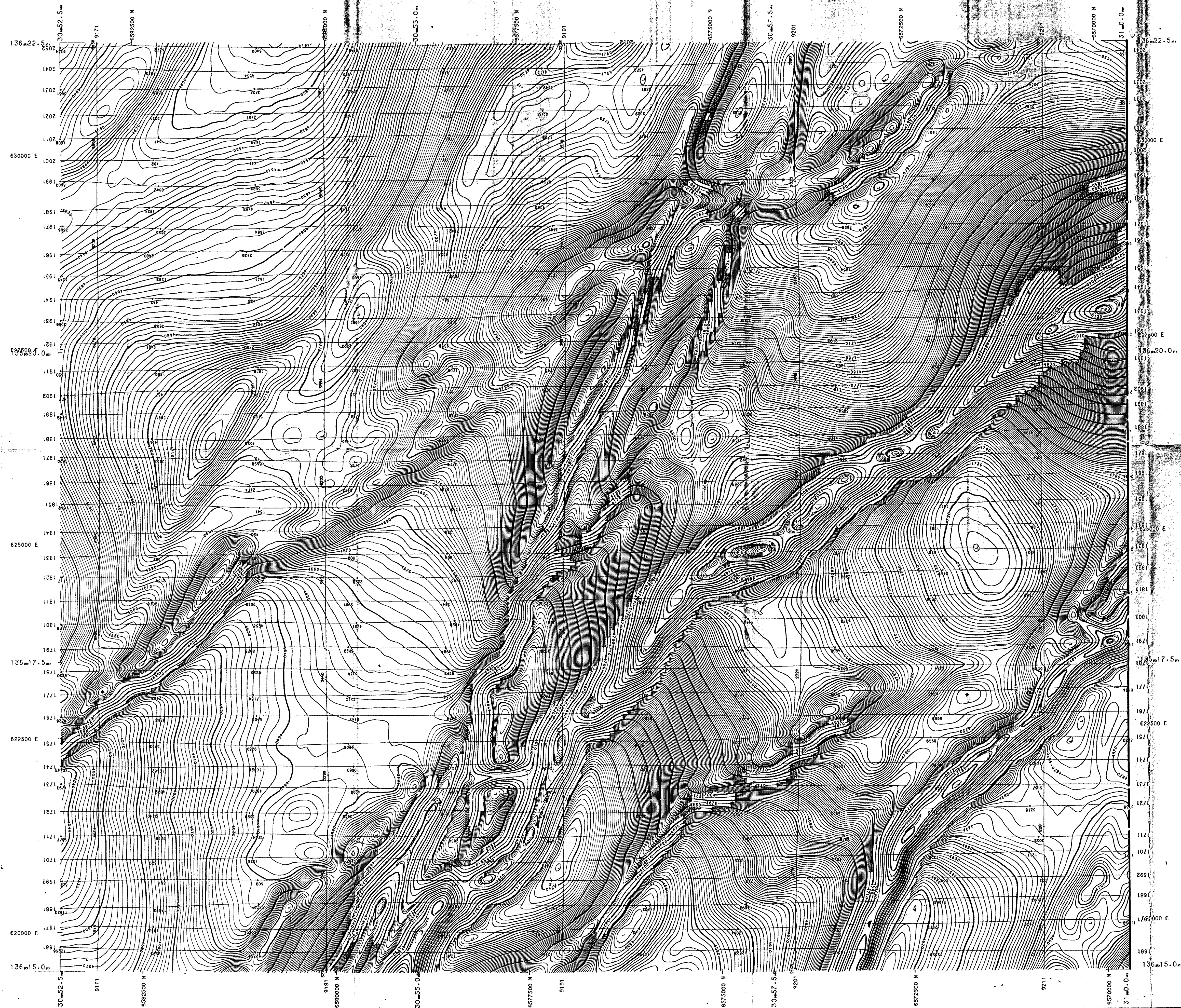
FLOWN BY + AUSTREX INT. LTD.  
DATE + JULY 1984  
1:250,000 SHEET + KINGOONVA SH53-11  
TENEMENT + E.L. 1224  
PROJECTION IS TRANSVERSE MERCATOR, ANG ZONE + 53  
LINE SPACING + 300m  
SURVEY HEIGHT + 80m  
MAGNETOMETER + GEOMETRICS 6813  
COMPTON SCATTERING RATIO ALPHA + 0.30  
COMPTON SCATTERING RATIO BETA + 0.45  
COMPTON SCATTERING RATIO GAMMA + 0.83



THE BROKEN HILL PROPRIETARY CO. LTD. EXPLORATION DEPT.		
EL 1224 HARCUS HILL S.A. TOTAL MAGNETIC INTENSITY CONTOURS 12		
DRAWN +	DATE + 16-8-85	CENTRE +
TRACED +	PROJECT NO +	DRAWING NO +
CHECKED +	6-D22-31	AI-801

5547-17





PATH DATA IS A COMBINATION OF DOPPLER AND VISUAL RECOVERY

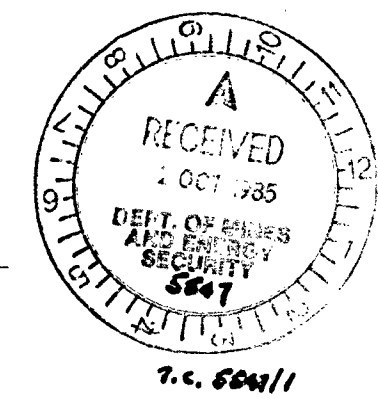
#### DETAILS OF PROCESSING

PROCESSED BY: BHP EXPLORATION : CAMBERWELL  
DIGITAL CORRECTION WAS DONE, BASE 57957 AT  
ITERATIVE HEADING ERROR ADJUSTMENT (LINE BY LINE)  
5000 AT ADDED TO DATA  
DATA WAS GRIDDED AND CONTOURED USING PROGRAM OPPORE  
CONTOUR INTERVAL 2m  
GRID SIZE 80m X 80m  
GRIDGING PARAMETERS :  
MINIMUM ANCHOR AMPLITUDE 10m  
CORRELATION DISTANCE 900m  
SMOOTHING USED - POLYNOMIAL SMOOTH  
PIECEWISE SPLINE TECHNIQUE USED

#### DETAILS OF SURVEY

FLOWN BY : AUSTREX INT. LTD.  
DATE : JULY 1984  
1:250,000 SHEET : KINGOONIA SHS3-11  
TENEMENT : E.L. 1224  
PROJECTION IS TRANSVERSE MERCATOR, ANG ZONE : 53  
LINE SPACING : 300m  
SURVEY HEIGHT : 80m  
MAGNETOMETER : GEOMETRICS 6813  
COMPTON SCATTERING RATIO ALPHA : 0.30  
COMPTON SCATTERING RATIO BETA : 0.45  
COMPTON SCATTERING RATIO GAMMA : 0.83

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THE BROKEN HILL PROPRIETARY CO. LTD.  
EXPLORATION DEPT

E.L. 1224 HARCUS HILL S.A.  
TOTAL MAGNETIC INTENSITY CONTOURS  
13

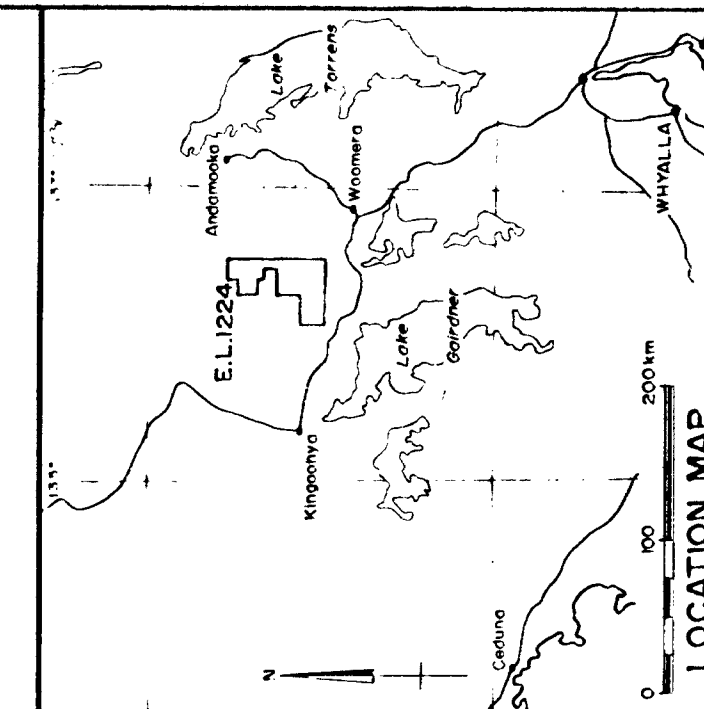
DRAWN:	DATE: 16-8-85	CENTRE: Adelaide
TRACED:	PROJECT NO:	DRAWING NO:
CHECKED:	6-D22-32	AI-802

5547-18









#### DETAILS OF SURVEY

DETAILED DETAILS OF PROCESSING

PROCESSED BY BHP EXPLORATION - CANBERWELL

JOURNAL CORRECTION WAS DONE. BASE 57951. nT	20-Oct-84
GRF REMOVED	21-Oct-84
ALTERNATIVE HEADING ERROR ADJUSTMENT (LINE BY LINE)	24-Oct-84
5000 nT ADDED TO DATA	24-Oct-84
DATA WAS GRIDDED AND CONTOURED USING PROGRAM OPGCR	25-Oct-84

MEAN SIZE 50 $\mu$  X 80 $\mu$   
SCAN 900 $\mu$   
SPREADING PARAMETERS  
MINIMUM ANOMALY AMPLITUDE 10nT  
FILTER WAVE LENGTH 900m  
CORRELATION DISTANCE 1200m  
SMOOTHING USED \*POLYNOMIAL SMOOTH  
SMOOTHING RADIUS 120m  
PIECEWISE SPLINE TECHNIQUE USED

FLOWN BY : AUSTIREX INT. LTD.  
DATE : JULY 1984  
11:250.000 SHEET : KINGOONYA SH53-11  
INEMENT : E.L. 1224

TENEMENT : E.L. 1224  
PROJECTION IS TRANSVERSE MERCATOR. AMG


LINE SPACING : 300 $\mu$ m  
SURVEY HEIGHT : 80 $\mu$ m  
MAGNETOMETER : GEOMETRICS 6813

COMPTON SCATTERING RATIO ALPHA : 0.30  
COMPTON SCATTERING RATIO BETA : 0.45  
COMPTON SCATTERING RATIO GAMMA : 0.83

THE BROKEN HILL PROPRIETARY CO. LTD.  
EXPLORATION DEPT

EL.1224 MARCUS HILL S.A.  
TOTAL MAGNETIC INTENSITY CONTOURS  
15

DRAWN:	DATE: 16-8-85	CENTRE: Adelaide
TRACED:	PROJECT NO:	DRAWING NO:
CHECKED:	6-D22-34	A1-804



T.C. 6547/1

5547-20







