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EL 635

WAROOKA

PROGRESS AND FINAL REPORTS TO LICENCE SURRENDER FOR THE PERIOD 27/5/1980 TO 26/12/1981

Submitted by
Jododex Australia Pty Ltd
1982

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Telephone: (08) 8463 3000
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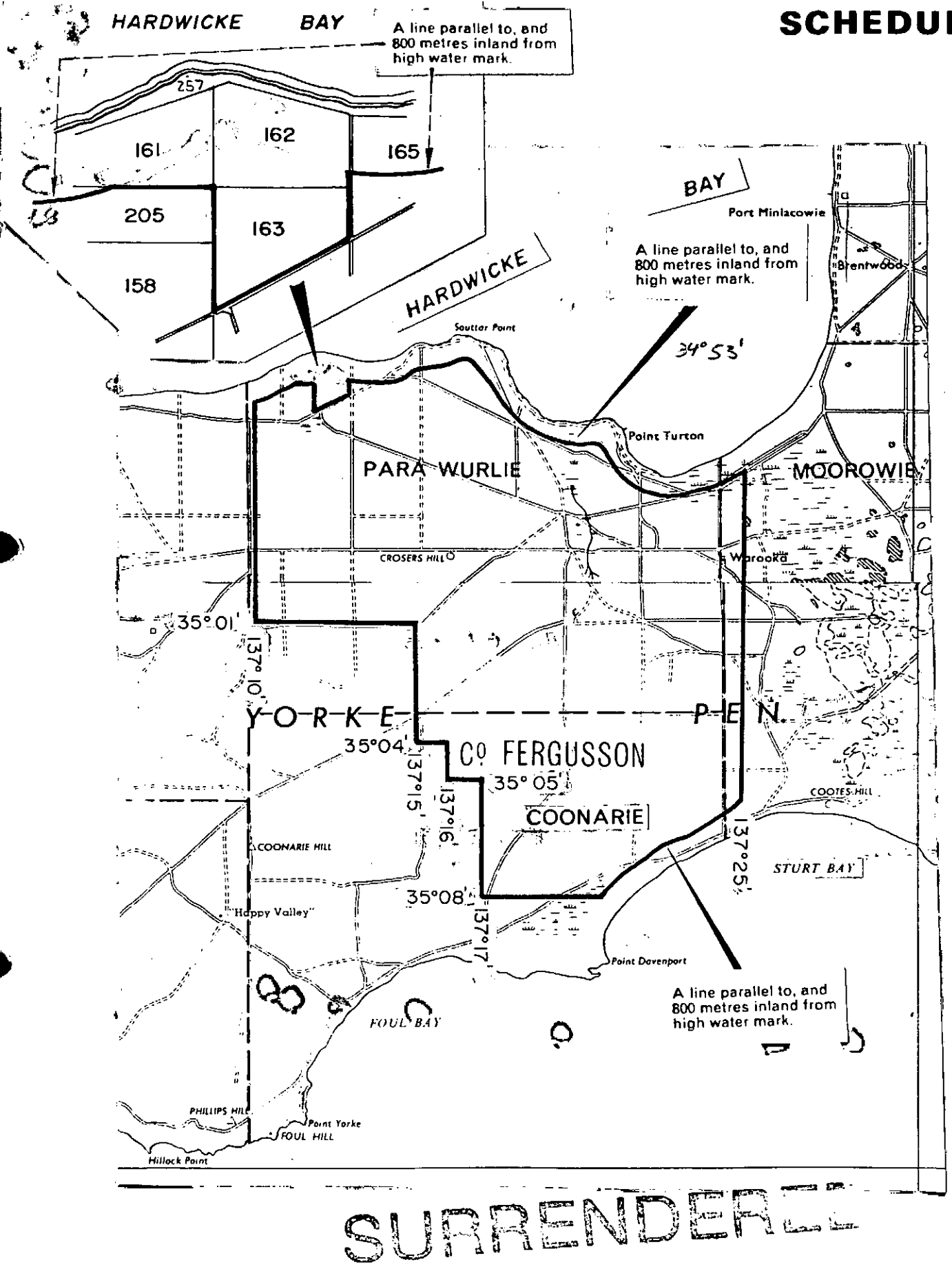
Government of South Australia
Primary Industries and Resources SA

SCHEDULE A



SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

APPLICANT: JODODEX AUSTRALIA PTY. LTD.

DM: 674 / 79 AREA: 377 square kilometres

1:250000 PLANS: MAITLAND KINGSCOTE

LOCALITY: WAROOKA AREA - YORKE PENINSULA

DATE GRANTED: 27-5-80 DATE EXPIRED: 26-5-~~81~~ 82

EL No: 635

Transparencies in Cylinder 3852/1 indicated by +T

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PLANS:	Bedrock Sampling - Location Of Shallow Drill Holes.	3852(II)15
REPORT:	To The S. A. Dept. Of Mines & Energy On Exploration During The Fifth Quarter Of Tenure To 26th August, 1981.	Pgs. 71-75
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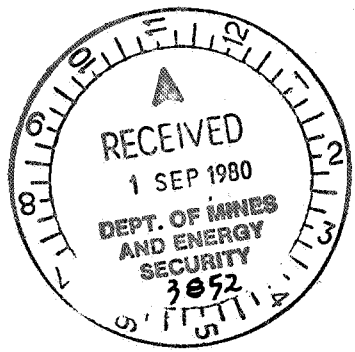
JODODEX AUSTRALIA PTY. LTD.

Exploration Licence No. 635

Report to the S.A. Department of Mines and Energy on exploration during the first quarter of tenure to 26th August, 1980.



August, 1980.

JODODEX AUSTRALIA PTY. LIMITED

032

E.L. 635

First quarterly report

to the S.A. Department of Mines and Energy

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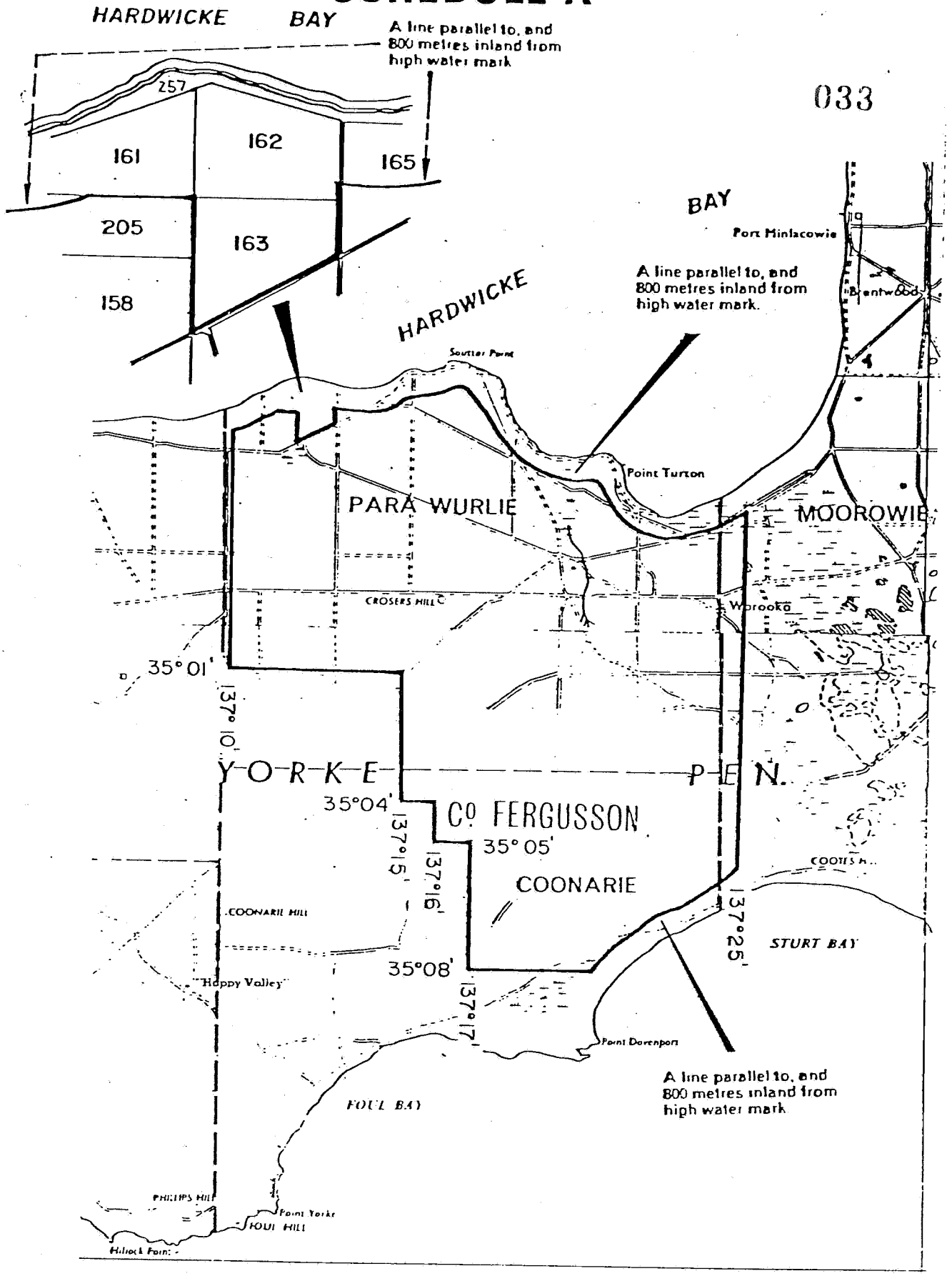
SCHEDULE A



EXPLORATION LICENCE No. 635

LOCALITY PLAN

FIG. 1

034

Report to the S.A. Department of Mines and Energy on exploration of E.L. 635 during the first quarter of tenure to 26th August, 1980

Exploration Licence 635 was granted to Jododex Australia Pty. Ltd. on 27th May, 1980, for a period of 1 year. The Licence area of 377 square kilometres is outlined in Figure 1.

During the first three months of exploration an airborne geophysical survey was carried out by Geoex Pty. Ltd. of Unley, S.A. The survey specifications are outlined below:

EQUIPMENT SPECIFICATIONS

Cessna A185E Aircraft
Geometrics G803 Magnetometer
McPhar SPECTRA 2 Spectrometer
McPhar 1024 Channel Analyser
24 Litre NaI (Tl) Detector
Bonzer Mark 10 Radar Altimeter
16mm Ground Tracking Camera
Digital Recording on 9 track 800 bpi
Industry Standard Magnetic Tape
Analogue Recording on Century 444
6 Channel Recorder

The nominal flight line separation was 250m, and the nominal tie-line bearing was 325° true north.

The observed mean sample interval in the flight direction was 43m, achieved with a nominal aircraft speed of 100 knots and a reading interval of 0.8 seconds. The mean sensor height was 60m, using a

.../2

towed bird configuration. The magnetometer accuracy is 1.0 nT and the resolution 1.0 nT.

Plans showing residual aeromagnetic total intensity contours, flight path plots and stacked profiles of total magnetic intensity are included as Figures 2, 3 and 4 of this report.

During the next quarter, interpretation of this magnetic survey will be undertaken and areas of interest outlined.

115000 N
112500 N
110000 N
107500 N
105000 N
102500 N
100000 N
97500 N
95000 N

705000 E
707500 E
710000 E
712500 E
715000 E
717500 E
720000 E

Airborne Geophysical Survey and Compilation by GEOEX PTY LTD

for

JØDØDEX AUSTRALIA PTY LTD

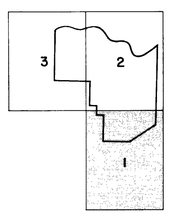
WARØØKA AREA SØUTH AUSTRALIA

CØNTØURS ØF RESIDUAL TØTAL MAGNETIC INTENSITY

SCALE 1:25000

0 500 1000 1500 2000 2500 METRES

SURVEY LOCATION



SHEET INDEX

The data presented is the residual magnetic intensity, after subtracting the International Geomagnetic Reference Field from the observed Total Magnetic Intensity. The data was corrected for diurnal drift using a base station monitor at WARØØKA Airfield, Latitude 34.967 S, Longitude 137.347 E, Altitude 45 Metres. The sensor height was 3 metres. The adopted value for this location was 60452 nT. Final detailed levelling of the data was performed using tie-line crossover analysis. A simple 3 point filter was applied to the data, which was then gridded and contoured using a 100m by 100m mesh cell.

SURVEY BOUNDARY

CONTOUR INTERVAL 5nT

PROJECT NUMBER 80343

SURVEYED APRIL 1980

EQUIPMENT SPECIFICATIONS
Cessna A185E Aircraft
Geometrics G803 Magnetometer
McPhar SPECTRA 2 Spectrometer
McPhar 1024 Channel Analyser
24 Litre NaI(Tl) Detector
Bonzer Mark 10 Radar Altimeter
16mm Ground Tracking Camera
Digital Recording on 9 track 800 bpi Industry Standard Magnetic Tape
Analogue Recording on Century 444 6 channel Recorder

The nominal flight line separation was 250 metres, and the nominal tie-line bearing was 325 degrees true. The observed mean sample interval in the flight direction was 43 metres, achieved with a nominal aircraft speed of 100 Knots, and a reading interval of 0.8 seconds. The mean sensor height was 60 metres, using a towed bird configuration. The magnetometer accuracy is 1.0 nT, and the resolution 1.0 nT.

3852(I)-1A

FIG 2 (Sheet 1)

137500 N

135000 N

132500 N

130000 N

127500 N

125000 N

122500 N

120000 N

117500 N

705000 E

707500 E

710000 E

712500 E

715000 E

717500 E

720000 E

Airborne Geophysical Survey and Compilation by

GEOEX PTY LTD

for

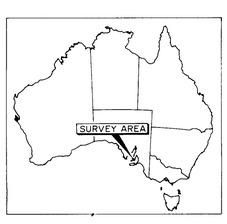
JØDØDEX AUSTRALIA PTY LTD

WARØØKA AREA SØUTH AUSTRALIA

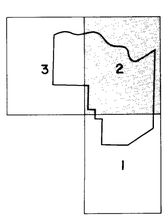
CONTØURS ØF RESIDUAL TØTAL MAGNETIC INTENSITY

SCALE 1:25000

0 500 1000 1500 2000 2500 METRES



SURVEY LOCATION



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SURVEY BOUNDARY

CONTOUR INTERVAL 5nT

PROJECT NUMBER 80343

SURVEYED APRIL 1980

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McPhar SPECTRA 2 Spectrometer
McPhar 1024 Channel Analyser
24 Litre NaI(Tl) Detector
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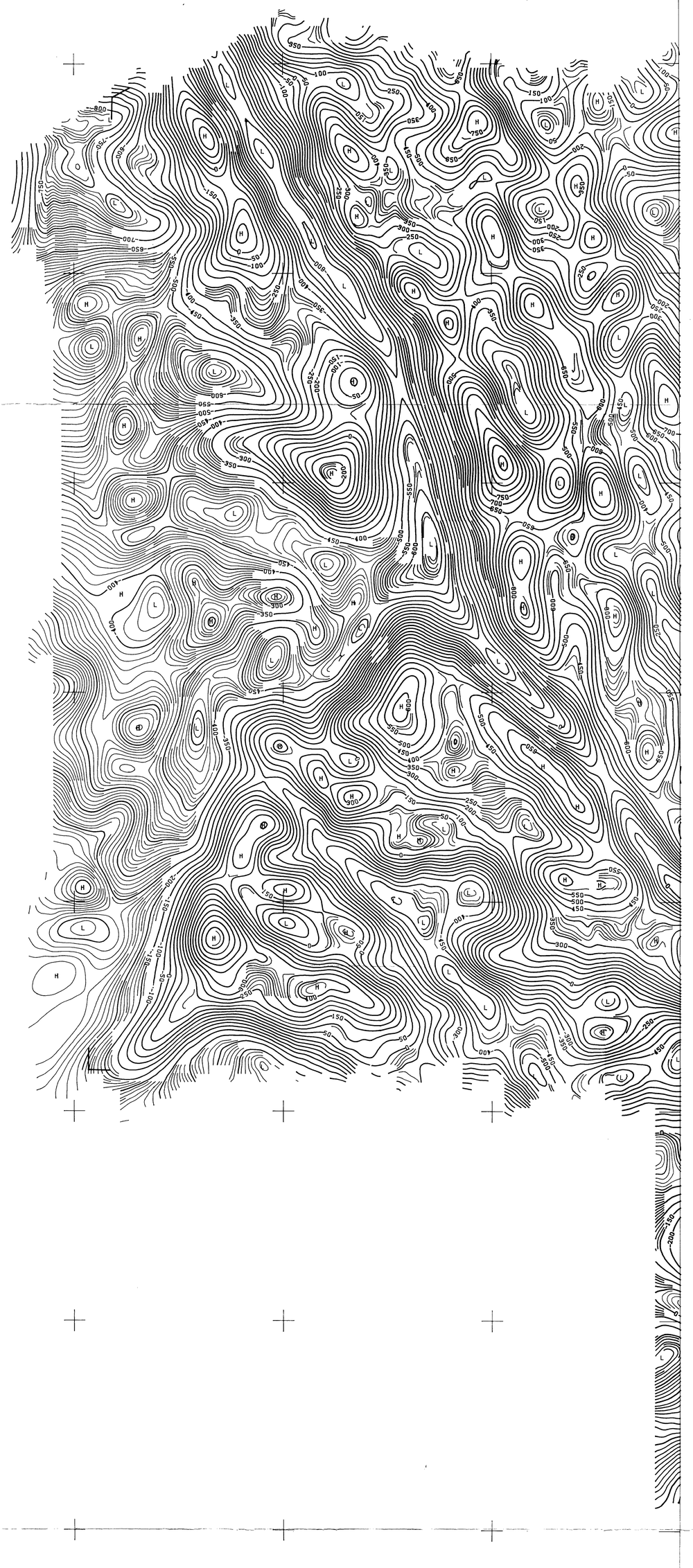
3852(1)-2

FIG. 2 (Sheet 2)

137500 N
135000 N
132500 N
130000 N
127500 N
125000 N
122500 N
120000 N
117500 N

687500 E
690000 E
692500 E
695000 E
697500 E
700000 E
702500 E



Airborne Geophysical Survey and Compilation by

GEOEX PTY LTD

for

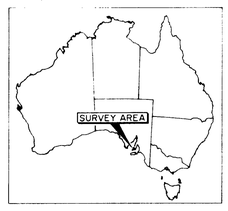
JØDØDEX AUSTRALIA PTY LTD

WARØØKA AREA SØUTH AUSTRALIA

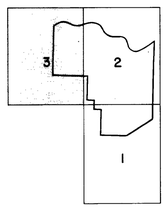
CØNTØURS ØF RESIDUAL TØTAL MAGNETIC INTENSITY

SCALE 1:25000

0 500 1000 1500 2000 2500 METRES



SURVEY LOCATION



SHEET INDEX

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Longitude137.347 E
Altitude 45 Metres
The sensor height was 3 metres.
The adopted value for this location was 60452 nT
Final detailed levelling of the data was performed using tie-line crossover analysis.
A simple 3 point filter was applied to the data, which was then gridded and contoured using a 100m by 100m mesh cell.

SURVEY BOUNDARY

CONTOUR INTERVAL 5nT

PROJECT NUMBER 80343

SURVEYED APRIL 1980

EQUIPMENT SPECIFICATIONS
Cessna A185E Aircraft
Geometrics G803 Magnetometer
McPhar SPECTRA 2 Spectrometer
McPhar 1024 Channel Analyser
24 Litre NaI(Tl) Detector
Bonzer Mark 10 Radar Altimeter
16mm Ground Tracking Camera
Digital Recording on 9 track 800 bpi Industry Standard Magnetic Tape
Analogue Recording on Century 444 6 channel Recorder

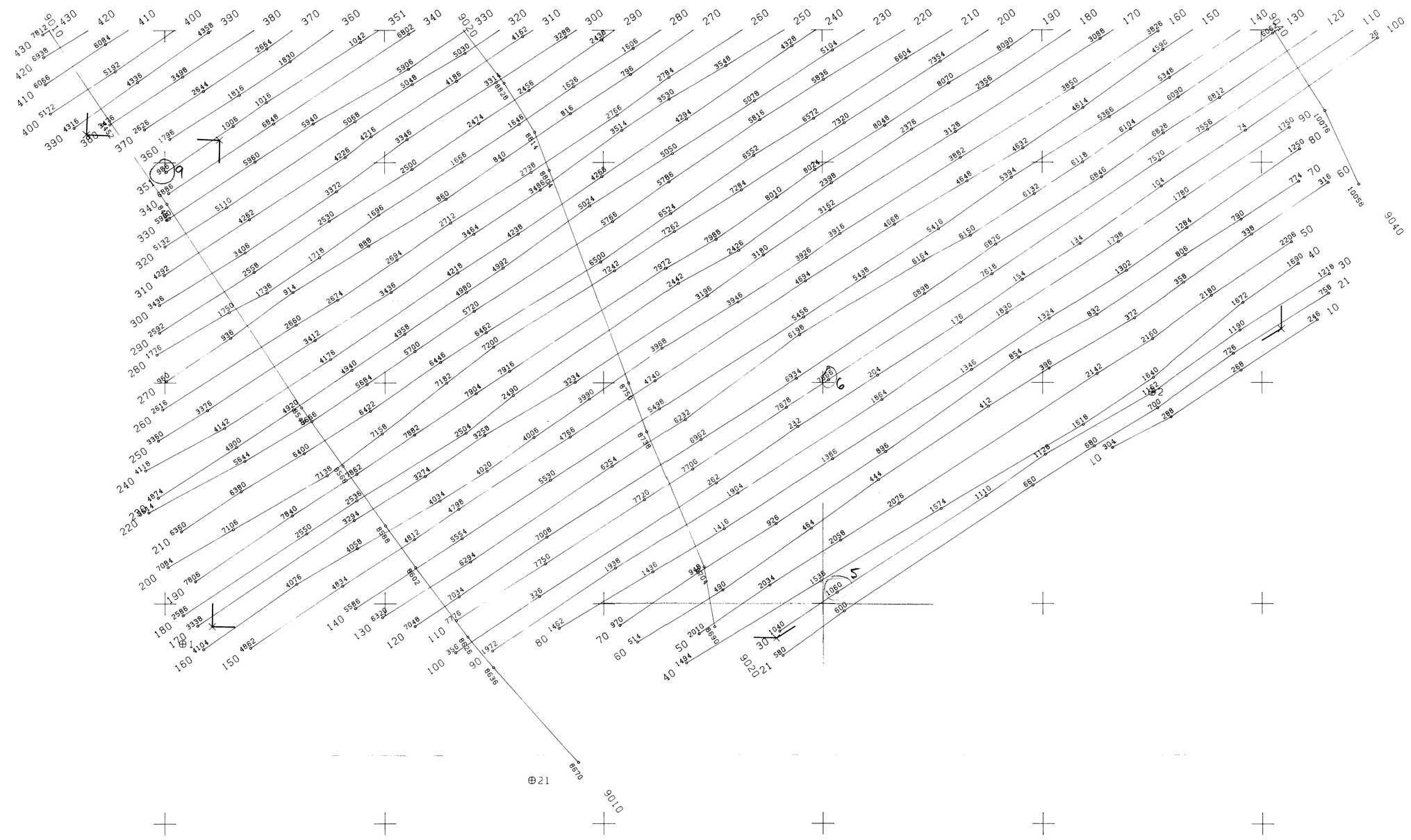
The nominal flight line separation was 250 metres, and the nominal tie-line bearing was 325 degrees true.
The observed mean sample interval in the flight direction was 43 metres, achieved with a nominal aircraft speed of 100 Knots, and a reading interval of 0.8 seconds. The mean sensor height was 60 metres, using a towed bird configuration. The magnetometer accuracy is 1.0 nT, and the resolution 1.0 nT.

3852(1)-3

FIG. 2 (Sheet 3)

705000 707500 710000 712500 715000 717500 720000

115000 112500 110000 107500 105000 102500 100000 97500 95000



Airborne Geophysical Survey and Compilation by GEOEX PTY LTD

for

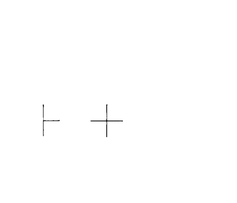
JODODEX AUSTRALIA PTY LTD

WAROOKA AREA SOUTH AUSTRALIA

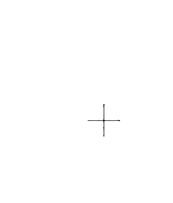
FLIGHT PATH PLOT

SCALE 1:25000

0 500 1000 1500 2000 2500 METRES



SURVEY LOCATION



SHEET INDEX

Navigation control was by reference to photomosaics and/or photo strips.
Flight path analysis was achieved by identification of 16mm. ground tracking photographs on the navigation control. The ground tracking camera was operated at a rate of one camera frame for two data samples, such that successive camera frames overlap.
An attempt was made to recover fiducials at intervals of 1.0 kilometre, and only recovered fiducials are shown on the map.
During processing the photomosaic was controlled using the Australian Metric Grid control points.

⊕ Registration point identified on photomosaic.
+ 2500 metre Australian Metric Grid.
SURVEY BOUNDARY

PROJECT NUMBER 80343 SURVEYED APRIL 1980

3582(I)-4

FIG. 3 (Sheet 1)

705000 707500 710000 712500 715000 717500 720000

137500 135000 132500 130000 127500 125000 122500 120000 117500

Airborne Geophysical Survey and Compilation by GEOEX PTY LTD

for

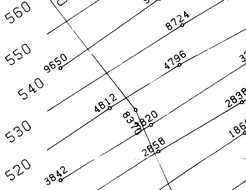
JØDØDEX AUSTRALIA PTY LTD

WARØØKA AREA SØUTH AUSTRALIA

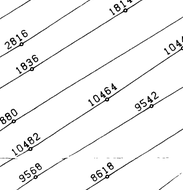
FLIGHT PATH PLØT

SCALE 1:25000

0 500 1000 1500 2000 2500 METRES



SURVEY LOCATION



SHEET INDEX

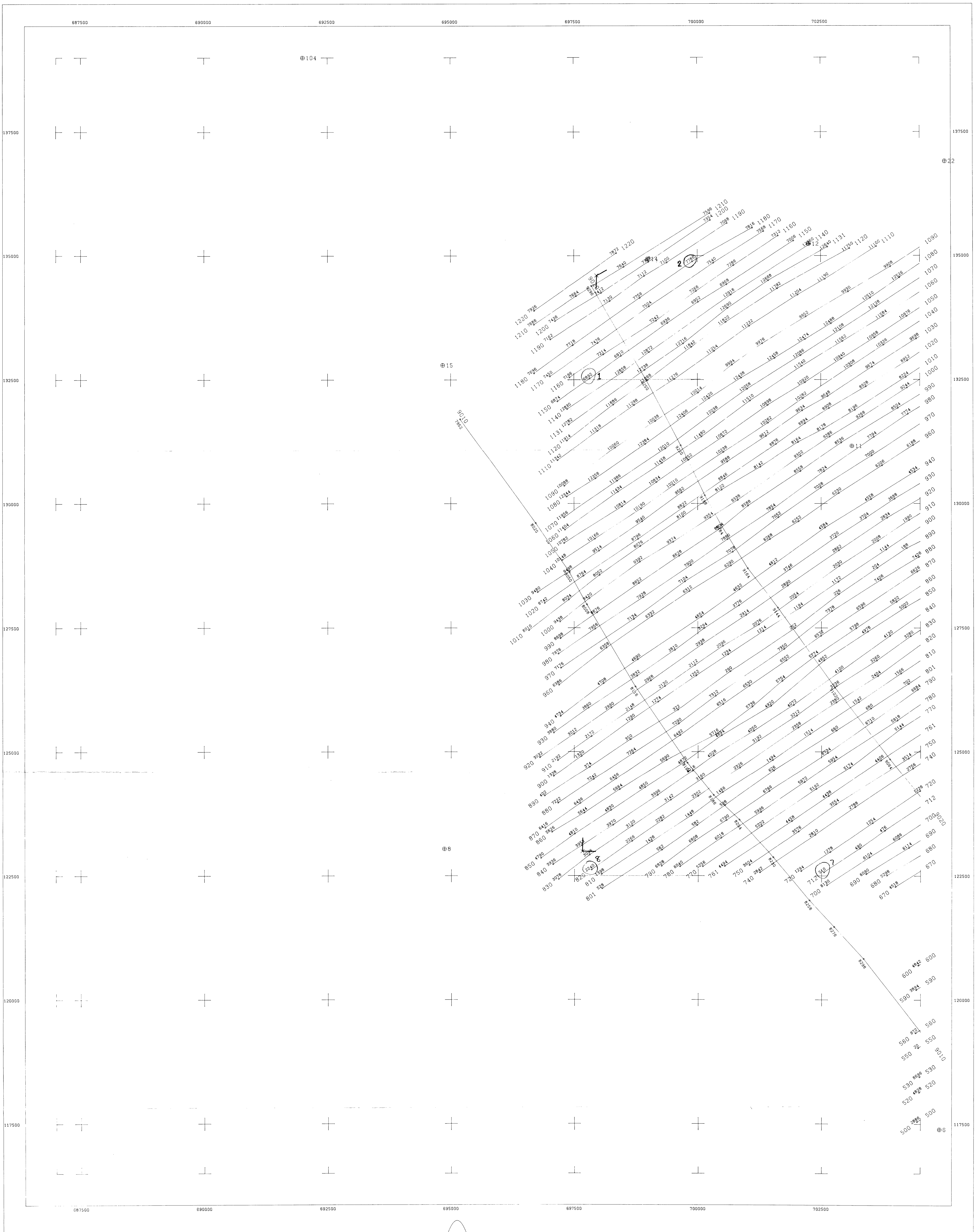
Navigation control was by reference to photomosaics and/or photo strips.
Flight path analysis was achieved by identification of 16mm. ground tracking photographs on the navigation control. The ground tracking camera was operated at a rate of one camera frame for two data samples, such that successive camera frames overlap.
An attempt was made to recover fiducials at intervals of 1.0 kilometre, and only recovered fiducials are shown on the map.
During processing the photomosaic was controlled using the Australian Metric Grid control points.

⊕ Registration point identified on photomosaic.
+ 2500 metre Australian Metric Grid.
SURVEY BOUNDARY

PROJECT NUMBER 80343 SURVEYED APRIL 1980

3852(1)-5

FIG. 3 (Sheet 2)



Airborne Geophysical Survey and Compilation by GEOEX PTY LTD

for

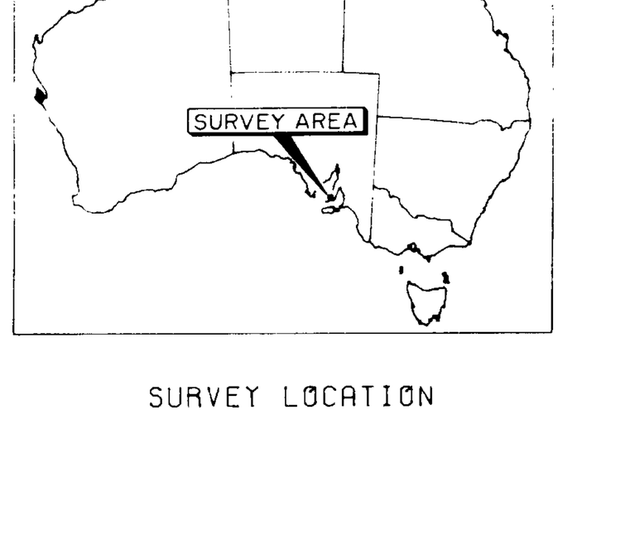
JODODEX AUSTRALIA PTY LTD

WAROOKA AREA SOUTH AUSTRALIA

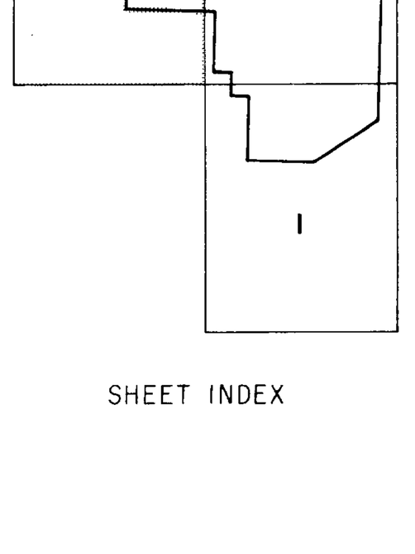
FLIGHT PATH PLOT

SCALE 1:25000

0 500 1000 1500 2000 2500 METRES



SURVEY LOCATION



SHEET INDEX

Navigation control was by reference to photomosaics and/or photo strips.
Flight path analysis was achieved by identification of 16mm. ground tracking photographs on the navigation control. The ground tracking camera was operated at a rate of one camera frame for two data samples, such that successive camera frames overlap.
An attempt was made to recover fiducials at intervals of 1.0 kilometre, and only recovered fiducials are shown on the map.
During processing the photomosaic was controlled using the Australian Metric Grid control points.

⊕ Registration point identified on photomosaic.

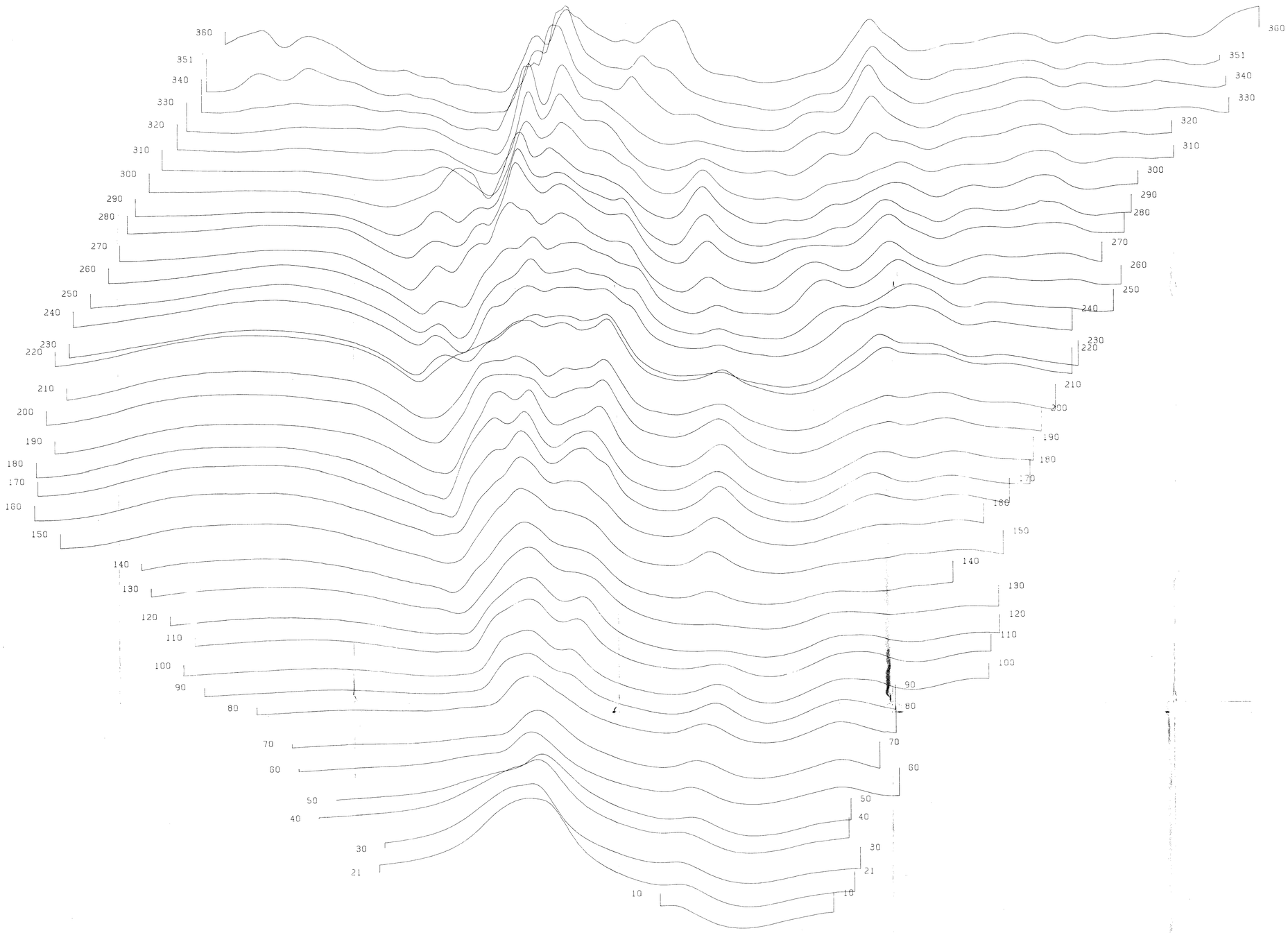
+ 2500 metre Australian Metric Grid.

SURVEY BOUNDARY

PROJECT NUMBER 80343 SURVEYED APRIL 1980

3852(I)-6

FIG. 3c (Sheet 3)



GEØEX PTY LTD

JØDØDEX AUSTRALIA PTY LTD

WARØØKA AREA
SØUTH AUSTRALIA

STACKED PROFILES OF TOTAL MAGNETIC INTENSITY

VERTICAL SCALE 200 GAMMA PER CM.
PROFILE BASE VALUE 61000
HORIZONTAL SCALE 1: 25000

3852(I)-7

LINES 10 TØ 360

SURVEYED APRIL 1980 3852(I)-7 PROJECT NUMBER 80348

FIG. 4 (Sheet 1)

GEOEX PTY LTD

JODODEX AUSTRALIA PTY LTD

WAROOKA AREA
SOUTH AUSTRALIA

STACKED PROFILES OF TOTAL MAGNETIC INTENSITY

VERTICAL SCALE 200 GAMMA PER CM.
PROFILE BASE VALUE 61000
HORIZONTAL SCALE 1: 25000

LINES 360 TO 750

SURVEYED APRIL 1980

3252(I)-8

PROJECT NUMBER 80343

FIG.4B(Sheet 2)

GEODEX PTY LTD

JODODEX AUSTRALIA PTY LTD

WARBOKA AREA
SOUTH AUSTRALIA

STACKED PROFILES OF TOTAL MAGNETIC INTENSITY

VERTICAL SCALE 200 GAMMA PER CM.
PROFILE BASE VALUE 61000
HORIZONTAL SCALE 1: 25000

LINES 740 TO 1090

SURVEYED APRIL 1982

3852(I)-9

PROJECT NUMBER 80343

FIG. 4 (Sheet 3)

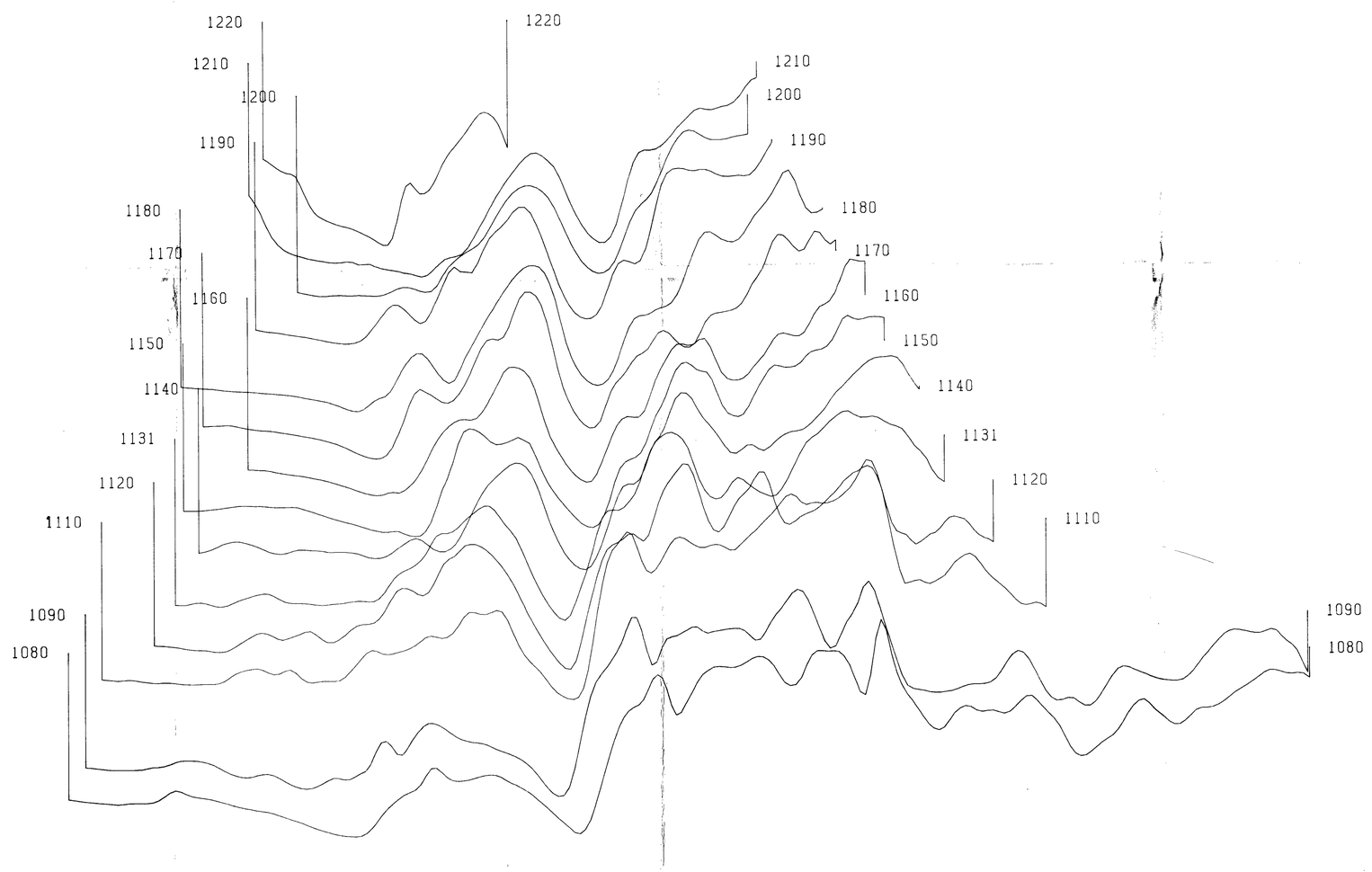
GEOEX PTY LTD

JODODEX AUSTRALIA PTY LTD

WAROOKA AREA
SOUTH AUSTRALIA

STACKED PROFILES OF TOTAL MAGNETIC INTENSITY

VERTICAL SCALE 200 GAMMA PER CM.
PROFILE BASE VALUE 61000
HORIZONTAL SCALE 1: 25000



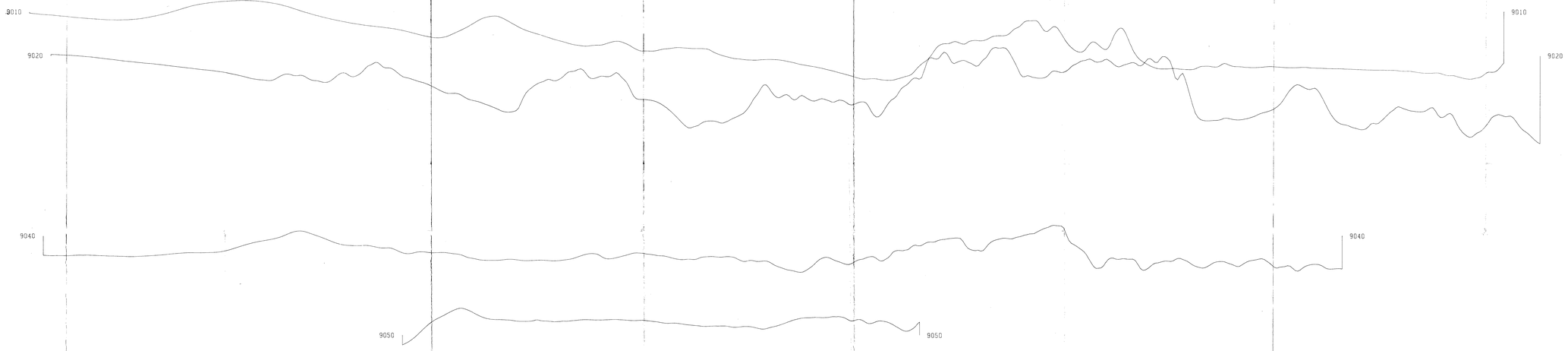
LINES 1080 TO 1220

SURVEYED APRIL 1980

3852(I)-10

PROJECT NUMBER 80343

FIG. 4b (Sheet 4)



GEØEX PTY LTD

JØDØDEX AUSTRALIA PTY LTD

WARØØKA AREA
SØUTH AUSTRALIA

STACKED PRØFILES ØF TØTAL MAGNETIC INTENSITY

VERTICAL SCALE 200 GAMMA PER CM.
PRØFILE BASE VALUE 61000
HØRIZØNTAL SCALE 1: 25000

LINES 9010 TØ 9050

SURVEYED APRIL 1980 3852(I)-11 PROJECT NUMBER 80343

FIG.4 (Sheet 5)

JODODEX AUSTRALIA PTY. LTD.

EXPLORATION LICENCE NO. 635

Report to the S.A. Department of Mines and Energy on exploration during the second quarter of tenure to 26th November, 1980

December, 1980

JODODEX AUSTRALIA PTY. LTD.

E.L. 635

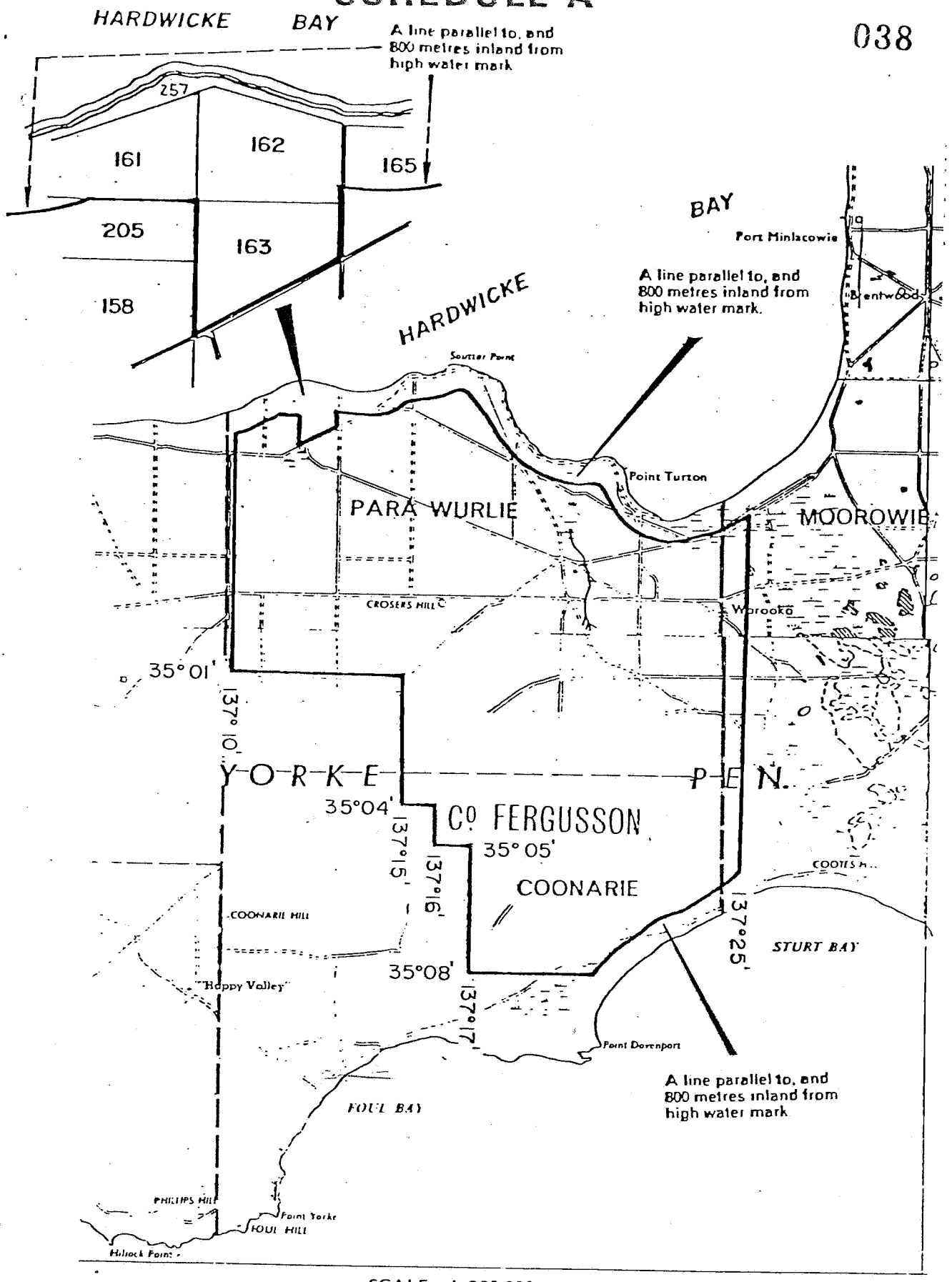
Second quarterly report to the S.A. Department of Mines and Energy

CONTENTS

ATTACHMENTS

SCHEDULE A

038



SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

EXPLORATION LICENCE No. 635

LOCALITY PLAN

FIG. 1

INTRODUCTION

Exploration Licence 635, covering 377 sq km in the south of Yorke Peninsula, was granted to Jododex on 27th May, 1980 for a period of one year (Fig. 1).

During the first quarter of tenure an airborne magnetic survey was carried out over the entire licence area. The area is totally devoid of outcrop and the survey was flown to provide a guide for the bedrock drilling that needs to be carried out to gain a basic understanding of the rock units present. The drilling programme was to have started during the second quarter but delays in receiving the survey results and the scarcity of drilling rigs have avoided this. Drilling is due to start in December, 1980.

The aeromagnetic data were processed by the contractor who produced three contour plans at 1:25,000 scale (submitted with first quarterly report). The survey data were also interpreted by Jododex and the findings were superimposed on a composite, at 1:50,000 scale, of the contour plans. This plan is enclosed as Figure 2.

The interpretation and the proposed test drilling are discussed in the following pages.

INTERPRETATION OF AIRBORNE MAGNETIC SURVEY AND DISCUSSION OF PROPOSED FOLLOW-UP DRILLING

The aeromagnetic contour map of the Warooka area was prepared using a simple smoothing filter. This appears to have smoothed out significant information. Anomalies that can easily be traced on the profiles for several kilometers were eliminated, as were some indications of small scale displacements. This can easily be seen in the northern section where the contour plan indicates a rather random distribution of magnetic bodies. The smoothing effect is only significant where the overlying sediment cover is thin, usually less than 50m, since increasing thickness provides a natural filter.

In an attempt to determine the position of these smaller features, the centres of the anomalies on the profiles were plotted on the contour plan, and these were connected. This has resulted in a plan that does not agree in detail with the contour plan even in areas with strong anomalism. It is apparent that small scale faulting and folding were removed by smoothing, however, the overall trends remained. The principal benefit of the plotting procedure lies in the outlining of the weaker elements and the location of some isolated magnetic features not apparent on the contour map.

Major boundaries, where depths to magnetic basement change, are indicated by the abrupt termination of trends or by their displacement. These boundaries, which are probably faults, have been used to subdivide the area into portions. It is apparent that the shallowest area, portion D, contains most of the magnetic trends. More deeply buried areas such as the extreme south did not warrant the plotting of trends since the contours are satisfactory. Because of the rather cluttered anomaly patterns, depth estimates were crude, using a length of straight slope or half width at half height. For symmetrical anomalies from dyke like bodies the latter technique is exact, as reference to the curves of S. Parker Gay indicates. Symmetrical anomalies will be produced by bodies dipping southwards at about 60^{o} at the strike encountered in this area. The half width method will yield too great a depth for more asymmetrical anomalies, as would be produced by a 60^{o} dip northwards. The length of straight slope method

yields a better estimate in this case. Of greater concern is the cluttering of anomalies, rendering dip estimates very suspect.

Within some areas, magnetic trends either disappear or are extremely weak. These areas are inferred to be 'granite'. The 'granites' do not appear to have strong aureoles with the exception of the one in portion B.

Portion A in the northwest of the licence area is relatively thickly covered in superficial material (>100m). The eastern part of portion A is similar to the eastern part of portion B to the south except that A is more deeply buried. The anomaly amplitude is significantly smaller in the west of A than in the west of B indicating that if the very magnetic material in B continues to the north into A, it is at great depth and overlain by rather weakly magnetic material.

Drill hole 36 is proposed to test the nature and thickness of the cover in the south of A. The results of this hole will be compared with those of hole 35 in portion B.

The basement in Portion B is generally shallow, under about 50m of cover. It is bounded to the east, north and south by apparently major faults. Holes 33 and 34 are proposed to examine magnetic and non magnetic material respectively. Hole 35 will test the northern end of a very magnetic band and the results will be compared with those of hole 36 to the north. Holes 17, 18, and 19 are to test a possible granite intrusion. Hole 17 is on a small feature, not discernible on the contour plan, that follows the general outline of the pattern. It may be due to a metamorphic effect. Hole 18 may also encounter metamorphosed material.

Three magnetic features that could possibly be more basic intrusions occur to the southeast of this 'granite'. Holes 5-9 are planned to test two of these features and the immediately surrounding area. The southern part of portion B, near the boundary fault, is more deeply buried. This area will be tested with holes 37 to 40 which will be drilled to investigate a probable alteration zone just north of the fault associated with a probable granite body in Portion C. Depth of cover could increase rapidly from about 40m at 37 to 100m at 38. Certainly the 'granite' in C is

unlikely to be intersected by hole 41 and all that can be expected is that the nature of the cover will be examined. This cover is not magnetic, compared with the small magnetic bodies in the bedrock cover of portion A.

Portion D is east of the major fault that forms the eastern boundary of A, B and C. Its eastern boundary is formed by another major northwest trending fault. The southern boundary, rather poorly defined, is taken to be a fault line that has been detected in a number of places. Basement within D is shallow, typically a few tens of meters below surface. This has resulted in many very subtle magnetic beds being detected. Several bands of very magnetic material occur. These may be the same unit repeated by folding but patterns suggestive of intrusions or disruptions occur where the noses should be. Holes 20, 21, 22, 23, 24, 25 and 42 to 49 may resolve this situation.

The northern part of area D contains a major body of material tentatively labelled 'granite' which should be intersected by holes 10 and 11. To the north of this 'granite', the contour pattern is contorted. It appears that significant magnetic variations occur almost at random, however, this is not the case. With care, discrete beds can be followed for considerable distances. The area will be tested with drill holes 12, 13, 14, 15 and 16.

It is noticeable that the magnetic response of the northern section of D is substantially different in character and intensity from that occurring immediately to the south.

Holes 1, 2, 3 and 4 are designed to examine a "bed" that apparently crosses the magnetic low separating portions B and D.

Portion E, to the southeast of D, is geologically similar to D. The material composing the southern end of D is faulted, resulting in an increase in cover from 50m at the northern end to in excess of 100m at the southern end. An exception is the westernmost corner where granite may occur. Depths here are of the order of a few tens of meters. In general, depths increase steadily to the south, a trend that continues into Portion F where depths greater than 200m can be anticipated.

Basement in Portion G is also more deeply covered than in D, ranging from 50m on the western side to in excess of 100m on the eastern side. On the far eastern side of G lies Portion H under several hundred meters of cover.

Exploration should be mainly confined to portion D where information can be obtained relatively easily. Drilling should be concentrated in D where stratigraphic control is easily obtained since many magnetic layers extend for many kilometers.

Reference

S. Parker Gay Jnr., 1967 - Standard curves for interpretation of magnetic anomalies over long tabular bodies. Mining Geophysics, V.11.

E.L. 635 - WAROOKA

Expenditure for three months to end of January, 1981

	$.
Salaries	
- geophysical	389
- geology & engineering	500
- drawing office	488
- geology & engineering drilling	125
Payroll Tax	18
Operating Expenses	
- general	201
- drawing office	49
- camps & cookery	7
Outside Services	
- sampling & assaying	22
Vehicle Running Expenses	39
Communications	75
Rent - Real Property	168
Rent - Personal Property	77
Stationery, Printing & Postage	2
Local Travel	134
Exploration Rights	90
Current Equipment Cost	49
Geophysical Survey Ground - Radiometric	3,000
	5,433
Administration	1,381
Expenditure for 3 months to January, 1981	6,814
Plus Expenditure Previously Reported	36,761
TOTAL EXPENDITURE	$43,575

137°10'
15'
20'
137°25'
34°55'
35°00'
35°05'
A
B
C
D
E
F
G
H
Boundary of E.L.635

REFERENCE

- Portion boundary (probably fault)
- Fault
- Inferred boundary
- Magnetic trend
- •41 Proposed test hole

JODODEX AUSTRALIA PTY. LTD.

E.L.635

AEROMAGNETIC INTERPRETATION

3852 (I) -12

SCALE 1:50,000	DRAWN: L.C.
DATE: December, 1980	CAT. Nº 541-1

FIG. 2

JODODEX AUSTRALIA PTY. LTD.

EXPLORATION LICENCE NO. 635

Report to the S.A. Department of Mines and Energy on exploration during the third quarter of tenure to 26th February 1981.

March, 1981

JODODEX AUSTRALIA PTY. LTD.

E.L. 635

Report to the S.A. Department of Mines and Energy on exploration during the third quarter of tenure to 26th February, 1981

CONTENTS

ATTACHMENTS

E.L. 635

Report to the S.A. Department of Mines and Energy on exploration during the third quarter of tenure to 26th February 1981.

Exploration Licence 635, covering 377 sq. km in the south of Yorke Peninsula, was granted to Jododex on 27th May, 1980 for a period of one year.

During the third quarter of tenure a bedrock sampling programme commenced. The programme is designed to provide limited lithological and geochemical information to aid in the interpretation of the magnetic survey (see second quarterly report). The drilling was undertaken by Northbridge Pty. Ltd. of Myrtle Bank, Adelaide, using a Schramm T64 rig.

The location of the drillholes is shown in Figure 1 and the drill hole statistics are listed in Table 1. The bedrock sampling programme will continue into the fourth quarter.

A contract has been let to Pitt Research of Sydney for a recontouring of the airborne magnetic data. The new contouring is hoped to better outline valid magnetic character which was obscured by the standard computer programme of Geoex. The final plan is expected to be completed during the next quarter.

TABLE 1 - E.L. 635 Bedrock sampling programme - February, 1981

Hole Number	Date drilled	Depth drilled(m) Rotary	Percussion	Total	Depth of Tertiary & Quaternary (m)	Location Section Number	Bedrock Lithology	Tentative Unit
W1	22 & 23	0-14 33-44	14-33	44	>44	on roadside adj. 10	hole abandoned due to loss of circulation	
W2	24	0-21	21-33	33	21	92	gneiss	EL
W3	25	0-21	21-30	31 1m HQ core	21	92	magnetite bearing gneiss	EL
W4	25	0-39	39-48	48	39	92	gneiss	EL
W5	26	0-17	17-36	36	17	91E	feldspar-biotite gneiss	EhO
W6	26	0-16	16-42	42	16	91E	feldspar-biotite gneiss	EhO
W7	26	0-6	6-18	18	6	91E	feldspar-magnetite gneiss	EhO
W8	27	0-7	7-34	34	12	on roadside adj. 52W	feldspar-biotite gneiss	EhO
W9	27	0-9	9-35	35	9	adj.52W	feldspar-biotite gneiss	EhO?
W10	27	0-3	3-24	24	9	adj.52W	biotite gneiss and schist	EhO?
		164	180	344				

137°10'

15'

20'

137°25'

H A R D W I C K E B A Y

Galway Bay

Point Souttar

34°55'

Corny Point

Brutus

Fish Point

Point Turton

Minlaton

Black Springs

W1

Yorketown

Warooka

W10

W9

W8

W7

W6

W5

W4

W3

W2

35°00'

Y O R K E P E N I N S U L A

Marion Bay

35°05'

Tea Tree Swamp

S T U R T B A Y

REFERENCE

•W2 Location and number of shallow drill hole

JODODEX AUSTRALIA PTY. LTD.

E.L.635

BEDROCK SAMPLING

Location of shallow drill holes

3852(I)-13

SCALE 1:50,000	DRAWN: L.C.
DATE: March, 1981	CAT. Nº 541-2

FIG. 1

TABLE 1 - E.L. 635 Bedrock sampling programme - May, 1981

Hole Number	Date drilled	Depth drilled(m) Rotary	Percussion	Total	Depth of Tertiary & Quaternary (m)	Location Section Number	Bedrock Lithology Field description	Unit	Depth of Sample (m)	Petrology and foliation
W1	22 & 23 Feb.	0-14 33-44	14-33	44	>44	on roadside adj. 10	Hole abandoned due to loss of circulation			
W2	24 Feb.	0-21	21-33	33	21	92	Gneiss	ELa	28-29	Hornblende(>5%) biotite (>5%) adamellite. Weakly foliated
W3	25 Feb.	0-21	21-30	31 1m HQ core	21	92	Magnetite bearing gneiss	ELa	30.0	Hornblende(>5%) biotite(1-5%) adamellite. Massive
W4	25 Feb.	0-39	39-48	48	39	92	Gneiss	ELg	47-48	Leucocratic granodiorite with secondary biotite. Massive to gneissic
W5	26 Feb.	0-17	17-36	36	17	91E	Feldspar-biotite gneiss	Eβ	35-36	Hornblende and plagioclase amphibolite with minor quartz, epidote & scapolite.
W6	26 Feb.	0-16	16-42	42	16	91E	Feldspar-biotite gneiss	ELg	35-36) 41-42)	Leucocratic granodiorite. Massive to gneissic
W7	26 Feb.	0-6	6-18	18	6	91E	Feldspar-magnetite gneiss	ELa	17-18	Hornblende(>5%) biotite(>5%) adamellite. Massive
W8	27 Feb.	0-7	7-34	34	12	on roadside adj. 52W	Feldspar-biotite gneiss	ELa	32-33	Hornblende (>5%) biotite(>5%) adamellite. Moderately foliated
W9	27 Feb.	0-9	9-35	35	9	adj. 52W	Feldspar-biotite gneiss	ELa	24-25) 34-35)	Hornblende(>5%) biotite(1-5%) adamellite. Weak to moderately foliated
W10	27 Feb.	0-3	3-24	24	9	adj. 52W	Biotite gneiss and schist	ELa	23-24	Hornblende(>5%) biotite(1-5%) adamellite. Weakly foliated
W11	28 Feb.	0-23	23-36	36	19	on roadside adj. 4	Gneiss	ELa	35-36	Hornblende(>5%) adamellite. Strongly foliated
W12	28 Feb.	0-6	6-30	30	6	254	Hornfels/amphibolite	Pβ	14-15	Amphibolite (hornblende and plagioclase, 3-5% magnetite) Finegrained granular
									25-26	Amphibolite. Coarse grained
W13	2 Mar.	0-10	10-24	24	10	254	Gneiss	ELa	23-24	Hornblende(>5%) biotite(1%) Weakly to moderately foliated
W14	2 Mar.	0-5	5-18	18	5	254	Gneiss	ELa	17-18	Hornblende(>5%) biotite(1-5%) adamellite. Strongly foliated
W15	3 Mar.	0-80	80-83	83	80?(P?)	82	Magnetite bearing micro-gneiss	Eh	80-81, 81-82	Microgneiss, quartz,plagio-clase, minor K spar. (possible metasediment)
		288	247	535						

3852.

050

Department of Mines and Energy - South Australia
Core Library, Conyngham St., Glenside, 5063. Ph: (08) 799574

SAMPLE RECEIPT SHEET

Sample Details:

Type of Sample: 1. Diamond ☐, Rotary ☑, Auger ☐, Cable Tool ☐,
Downhole Hammer ☑, Hand Dug ☐.
2. Whole core ☐, Split core ☐, Slabbed core ☐,
Cuttings ☑, Sludge ☐, Sidewall ☐.

Drillhole Number: 15 holes. W1, W2, W3 etc to W15

Depth of Hole: ..... metres. **Confidential:** Yes/No.

Number of Trays: ..... Date of Drilling Completion FEB/MAR 81.

Purpose of Drilling: Solid Fuels ☐, Iron Ore ☐, Engineering Investigation ☐, Petroleum ☐, Natural Gas ☐, Stratigraphic ☑, Uranium ☐, Metallics ☑, Non-Metallic Minerals ☐, Drainage ☐, Groundwater Investigation ☐.
Other Bedrock rock chip samples

Samples Received From: Company: JODOEX Individual: B Coles.
Phone: 2720289 Department/Section:
or 02·4393966

Location Information:

Descriptive locality (name of place): WAROOKA : SOUTHERN YORKE PENINSULA.
Hundred: Para Wurlie **Section:**
100,000 map sheet: ..... **50,000 map sheet:** , Coonarie, Turton
Mining Tenement No.: EL 635
And, if available, **Lat.:** ..... **Long.:** ..... OR **Eastings:** ..... **Northings:** ..... **Zone:**

Core Library Details:

Further work required on samples by Core Library staff .....

.....

.....

Current storage position of samples at the Depot .....

Additional Information

.....

.....

Signed ..... Sample Submittor

Date Samples Received / / ..... Core Library Supervisor

M.F. 96

137°10'

15'

20'

137°25'

H A R D W I C K E B A Y

Galway Bay

Point Souttar

34°55'

Corny Point

Brutus

Fish Point

Point Turton

Minlaton

Black Springs

W1

Yorketown

Warooka

W10

W9

W8

W7

W6

W5

W4

W3

35°00'

W2

Y O R K E P E N I N S U L A

W11

W15

W13

W12

W14

Marion Bay

35°05'

S T U R T B A Y

Tea Tree Swamp

REFERENCE

•W2 Location and number of shallow drill hole

JODODEX AUSTRALIA PTY. LTD.

E.L.635

BEDROCK SAMPLING

Location of shallow drill holes

SCALE 1:50,000	DRAWN. L.C.
DATE May, 1981	CAT. Nº 541-2

3852(II)-13 **FIG. 1**

JODODEX AUSTRALIA PTY. LTD.

EXPLORATION LICENCE NO. 635

Report to the S.A. Department of Mines and Energy on exploration during the fourth quarter of tenure to 26 May, 1981.

May, 1981

JODODEX AUSTRALIA PTY. LTD.

E.L. 635

Report to the S.A. Department of Mines and Energy on exploration during the fourth quarter of tenure to 26 May, 1981

CONTENTS

E.L. 635

Report to the S.A. Department of Mines and Energy on exploration during the fourth quarter of tenure to 26 May, 1981

Exploration Licence 635, covering 377 sq. km in the south of Yorke Peninsula, was granted to Jododex on 27 May, 1980 for a period of one year. It is expected that the Licence will be retained for a further twelve months.

During the fourth quarter of tenure a bedrock sampling programme, commenced in the previous quarter, continued and a further five holes were drilled. The location of the drillholes is shown in Figure 1 and drill hole statistics are listed in the Table. The programme has provided lithological and geochemical information on particular magnetic zones and horizons. Petrographic descriptions of samples from each hole are presented in Appendix 1 and spectrographic scan analyses of selected samples are presented in Appendix 2.

No discernible or objective petrographic evidence was found to distinguish between samples from Magnetic Zone B (W2, W3, W12, W13 and W14) and Magnetic Zone D. It is interpreted that a generally similar Lincoln Complex terrain underlies most of the area. The only possible metasediment intersected was a microgneiss described from hole W15, the most easterly hole drilled.

Strongly magnetic horizons were tested in holes W3, W5, W7 and W15. In each case magnetite grains gave rise to the anomalous magnetism.

The results of recontouring of the airborne magnetic data by Pitt Research of Sydney have been received. The information is being analysed and will be presented in the next exploration report.

APPENDIX 1

PETROGRAPHY

Pontifex & Associates Pty. Ltd.

TEL. 332 6744
A.H. 31 3816

26 KENSINGTON ROAD, ROSE PARK
SOUTH AUSTRALIA

P.O. BOX 91, NORWOOD
SOUTH AUSTRALIA 5067

055

MINERALOGICAL REPORT NO. 3248

8th April, 1981

TO:	Mr. F. Olgers, Jododex Australia Pty. Ltd., P.O. Box 509, CROWS NEST N.S.W. 2065
COPY TO :	Mr. B. Coles, Jododex Australia Pty. Ltd., 32 Mary Street, UNLEY S.A. 5061
YOUR REFERENCE:	Order No. 76
MATERIAL:	Percussion cuttings
IDENTIFICATION:	W 2 to W 15 series various depths
WORK REQUESTED:	Petrographic description
SAMPLES & SECTIONS:	Returned to you with this report

PONTIFEX & ASSOCIATES PTY. LTD.

COMMENTS

The percussion cuttings received were prepared as composite thin sections, generally with about 30 chips mounted in the one araldite block. In some samples, of relatively coarser (and fewer) chips, about 30 mm, two or three chips only were prepared as individual thin sections.

All section offcuts were stained with HF and sodium cobaltinitrite to highlight the distribution and abundance of K-spar (seen stained yellow).

There is sufficient similarity in the petrography of the great majority of chips in several groups of samples, for the whole batch (of 18 samples) to be petrographically subdivided (described and discussed) into four distinct groups (rather than numerous individual descriptions of individual samples which to a large extent would be unnecessarily repetitive).

These four petrographic groups are :-

1. massive to foliated hornblende and/or biotite adamellites
2. leucogranodiorites
3. gneisses (metasediments ?)
4. amphibolites

Note that in your covering notes, you state that the first three samples W2, 28-29; W3, 30.0 and W4, 47-48 belong to a different metamorphic terrain (Lincoln Complex) from that represented by all other samples.

..../

However there is no objective, petrographic evidence for separating those first three samples from the others in this batch. In mineralogy and texture the first two samples W2, 28-29; W3, 30.0 are adamellites, very similar to other adamellites in petrographic group 1. Sample W4, 47-48 is a leucogranodiorite which compares more closely to the leucogranodiorite W6, 35-36 than to the leucogranite sample W6, 41-42 (in the same hole).

**

COLLECTIVE DESCRIPTIONS OF THE FOUR GROUPS

GROUP 1 : massive to foliated hornblende and/or biotite adamellite

This is the largest group in the whole suite, including 10 samples. The rock types represented are massive to foliated, and although essentially adamellitic (quartz 25-35%, and 25 - 35% each of plagioclase and K-spar), the proportions of hornblende and biotite are variable (which in part reflects variation in the degree of foliation).

The following table summarises the essential mineralogy of samples forming this group 1, abbreviations are :-

h = <5% hornblende H = >5% hornblende
(b) = 1% biotite
b = 1 to 5% biotite
B = >5% biotite

m = massive
f = weakly foliated
ff = moderately foliated
fff = strongly foliated

		Subgroups within Group 1
W2, 28-29	: HB, f	essential hornblende, massive to weakly foliated
W3, 30.0	: Hb, m	
W7, 17-18	: HB, m	essential hornblende + biotite, massive
17-18	: B, m	essential biotite; massive to foliated
W8, 32-33	: hB, ff	
W9, 24-25	: Hb, f	essential hornblende, foliated
W9, 34-35	: Hb, ff	
W10,23-24	: Hb, f	
W11,35-36	: H fff	
W13,23-24	: H(b) f-ff	
W14,17-18	: Hb, fff	

..../

Group 1 continued

Sphene, apatite and magnetite are constant accessories, with sphene least abundant in the Hb samples from W9 and W10 (1 - 3%), and most abundant in the hornblende-rich samples from W11, 13 and 14 (3 - 5%). Magnetite shows a similar variation. The main accessory in W2, 28-29 may be partly metamict allanite rather than sphene.

Most of these group 1 rocks are granular with a grain size of 0.2 to 1.5 mm (or 0.2 to 2 mm in W10). Minor recrystallised patches locally have a grain size of 0.01 to 0.04 mm. Myrmekite is common in the relatively massive samples, but absent from the more foliated rocks from W11, 13 and 14.

Group 2 :

consists of leucocratic massive to gneissic granodiorites and includes W4, 47-48; W6, 35-36, 41-42. Secondary biotite in W4, 47-48 and W6, 35-36; and chlorite in W6, 35-36, 41-42; are common in veins or replacing primary biotite.

Most of the leucogranodiorites are granular with most grains under 1 mm in diameter, although rare grains of plagioclase in W4, 47-48 and in W6, 35-36 measure up to 2 mm. Consistent with the classification of granodiorite these rocks contain only accessory K-spar, which is mostly altered to checkerboard albite. Sample W6, 41-42 has brown clay pseudomorphs after an unknown mineral.

.../

GROUP 3 : consists of micro-gneisses (probably metasediments) and comprises only two samples - W15, 80-81 and W15, 81-82.

Sample W15, 80-81 consists mainly of quartz (25%) plagioclase (40%,), minor K-spar (5%), all with an average size of 0.2 mm. Muscovite (5 - 7%), biotite and epidote (each 7 - 10%), magnetite (5%), and sphene (3%) are scattered throughout.

The sample from W15, 81-82 is a coarse grained, plagioclase-biotite-quartz gneiss with partly chloritised biotite flakes to 5 mm across (35%), plagioclase anhedra (15%) about 1.5 mm, and recrystallised quartz grains (50%) to 3 mm. The rock has a folded layering, but the details and genesis of the folding are not certain as the section appears to be nearly parallel to the overall trend of the schistosity and layering.

GROUP 4 : the rocks are amphibolites and include W5, 35-36; W12, 14-15, 25-26.

Sample W12, 14-15 is fine grained and granular (most grains 0.1 - 0.3 mm) and almost entirely composed of hornblende and plagioclase, with <1% biotite and 3 - 5% magnetite.

The other samples are coarse grained (0.5 - 1.5 mm) and contain olive to reddish-brown biotite.

Sample W5, 35-36 also contains minor quartz, epidote and scapolite; and this sample includes a chip of biotite-hornblende leuco-granodiorite gneiss which has a weak foliation and a grain size of 0.1 - 0.6 mm. The composition of this chip is 2 - 3% hornblende, 2 - 3% biotite, 35 - 40% quartz and 55 - 60% plagioclase.

.../

Group 4 continued

A single chip of foliated amphibolite occurs in the sample W10, 23-24 which has otherwise been classified above in group 1 adamellites. This chip consists of well-oriented prisms of green hornblende (70%) to 1.5 mm long, which are partly retrogressed to chlorite. Minor plagioclase (25%) and accessory sphene are also present.

As a group, these amphibolites are considered to be meta-basic igneous rocks.

**

APPENDIX 2

GEOCHEMICAL ANALYSES

The Australian
Mineral Development
Laboratories

emington Street, Frewville,
South Australia 5063
Phone Adelaide 79 1662
Telex AA 82520

Please address all
correspondence to
P.O. Box 114 Eastwood
SA 5063
In reply quote:

amdel

NATA CERTIFICATE

3/299/0 - AC 4510/81

3 April 1981

The Manager
Jododex Australia Pty Ltd
PO Box 409
CROWS NEST NSW 2065

Attention: Mr F Olgers

REPORT AC 4510/81

YOUR REFERENCE;	Order No 75
IDENTIFICATION;	As listed
DATE RECEIVED;	18 March 1981
NOTE;	Sample WIZ 25-26 is listed but not received.

D.K. Rowley
Manager
Analytical Chemistry Division

for Norton Jackson
Managing Director

cc Jododex
32 Mary Street
UNLEY SA 5061

dam

Pilot Plant: Osman Place
Thebarton S.A.
Telephone 43 8053
Branch Laboratory: Perth

A10

SPECTROGRAPHIC ANALYSIS

Detection-Limit Concentrations of Elements
DC Arc Excitation

ELEMENT	ppm	ELEMENT	ppm
Ag	0.1	Mo	3
Al	100	Na	50
As	50	Nb	20
Au	3	Ni	5
B	3	P	100
Ba	200	Pb	1
Be	1	Rb	10
Bi	1	Sb	30
Ca	100	Sc	3
Cd	3	Si	100
Ce	300	Sn	1
Co	5	Sr	10
Cr	20	Ta	100
Cs	30	Te	20
Cu	1	Th	100
Fe	100	Ti	100
Ga	1	Tl	1
Ge	1	V	10
In	10	W	50
K	5	Y	10
La	50	Yb	1
Li	1	Zn	20
Mg	100	Zr	100
Mn	10		

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

REPORT AC 4510/81

QUALITATIVE SPECTROGRAPHIC ANALYSIS

Sample No.	Major	Minor	Heavy Trace	Trace	Faint Trace	Very Faint Trace
	100% 10%	1% 5000ppm	1000 500ppm	100 50ppm	10 5ppm	
		Na		Cu Sr	Y Ga	
W2 28-29	Si Al Fe	Ca Ti K		(Mn) Ba V Rb Cr Ni	Co Sc Li	Yb
		Mg		Zr	Pb	
		K		Mn	Sr	Li Ga Cu
W3 29-30	Si Al	Fe Na Ti Mg	Ba	Zr P La	V Nb Pb	Sc Co Yb
		Ca		Rb	Y	
		Ca		P Mn	Sr	Yb Ga
W4 47-48	Si Al	Fe K Ti Na Mg	Ba	Zr La	V Nb	Sc Li Co
				Rb	Y	Pb
		K		(Mn)	La Sc Pb	
W5 35-36	Si Al	Fe Ca Na Ti		Ba Zr V Sr	Ni Cr Co Nb	Yb
		Mg		Rb	Cu Y Li Ga	
		K		P Mn	Nb Ni Yb	
W6 41-42	Si Al	Fe Na Mg Ti		Ba Zr La Y	V Co Sc Ga	
		Ca		Rb	Li	

Elements not sought: U Re Hf Hg Platinoids B

Other elements not detected at limits quoted in attached sheet:

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

REPORT AC 4510/81

QUALITATIVE SPECTROGRAPHIC ANALYSIS

Sample No.	Major	Minor	Heavy Trace	Trace	Faint Trace	Very Faint Trace
	100%	10%	1% 5000ppm	1000 500ppm	100 50ppm	10 5ppm
			Ca Mg	Zr Sr	Y Pb	Yb
W7 17-18	Si Al	Fe Na	K Ti Ba	P Mn La	V Nb Li Co Sc	Ni Cu
				Rb	Ga	
			Ca Na	Zr Rb	Nb Li Ga	Cu
W8 33-34	Si Al	Fe K	Ti	Mn P Sr	V La Y Co	Yb Sc
			Mg		Pb	
			Ca Na	Zr	Sr Li	Yb
W9 34-35	Si Al	Fe K	Ti Ba	Mn P La	V Nb Co	Sc Pb
			Mg	Rb	Y Ga	Cu
			Ca	Zr	Ni Y Cu	Yb
W10 23-24	Si Al	Fe Na	Ti	Ba Mn Rb Sr	V La Cr Co	Sc
			K Mg	P	Li Ga	Pb
			Ca	Ba Zr Sr	V Li Yb	Cu
W11 35-36	Si Al	Fe K Na	Ti Mg	Mn Rb P La	Y Nb Ni	Sc Co
					Pb Ga	

Elements not sought: U Re Hf Hg Platinoids B

Other elements not detected at limits quoted in attached sheet:

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

REPORT AC 4510/81

QUALITATIVE SPECTROGRAPHIC ANALYSIS

067

Sample No.	Major	Minor	Heavy Trace	Trace	Faint Trace	Very Faint Trace
	100% 10%	1% 5000ppm	1000 500ppm	100 50ppm	10	5ppm
		Ca			Rb Ga	Ni
W12 14-15	Si Al	Fe Na	K Ti	Mn	Sr V Cr Zr Cu	Co
		Mg			Li Pb	Sc
		Ca	K	Rb Sr	Pb Sc	
W12 29-30	Si Al Fe	Na	Ti	Ba Mn Zr P La	Y V Nb Li Co	Cu
			Mg		Yb Ga	
		Ca		Rb Sr	Sc	Cu
W13 23-24	Si Al Fe	K	Ti Na Mg Ba	Mn Zr P La	V Nb Pb Co	Yb Mo
					Y Li Ga	
		Ca	K	P Sr	Pb Li	Cu
W14 17-18	Si Al Fe	Na	Ti Mg Ba	Mn Zr La	V Nb Co	Sc Yb
				Rb	Y Ga	
		Mg	K	Rb Sr	Li Cr Sc	Pb Cu
W15 80-81	Si Al Fe	Ca	Ti Na	Ba Mn Zr La	V Y Ni Co Ga	Yb
				P	Nb	

Elements not sought: U Re Hf Hg Platinoids B

* NOTE.- SAMPLE, "W12 25-26" LISTED NOT RECEIVED.

Other elements not detected at limits quoted in attached sheet:

TABLE 1 - E.L. 635 Bedrock sampling programme - May, 1981

Hole Number	Date drilled	Depth drilled(m) Rotary	Percussion	Total	Depth of Tertiary & Quaternary (m)	Location Section Number	Bedrock Lithology Field description	Unit	Depth of Sample (m)	Petrology and foliation
W1	22 & 23 Feb.	0-14 33-44	14-33	44	>44	on roadside adj. 10	Hole abandoned due to loss of circulation			
W2	24 Feb.	0-21	21-33	33	21	92	Gneiss	PLa	28-29	Hornblende(>5%) biotite (>5%) adamellite. Weakly foliated
W3	25 Feb.	0-21	21-30	31 1m HQ core	21	92	Magnetite bearing gneiss	PLa	30.0	Hornblende(>5%) biotite(1-5%) adamellite. Massive
W4	25 Feb.	0-39	39-48	48	39	92	Gneiss	PLg	47-48	Leucocratic granodiorite with secondary biotite. Massive to gneissic
W5	26 Feb.	0-17	17-36	36	17	91E	Feldspar-biotite gneiss	Pβ	35-36	Hornblende and plagioclase amphibolite with minor quartz, epidote & scapolite.
W6	26 Feb.	0-16	16-42	42	16	91E	Feldspar-biotite gneiss	PLg	35-36) 41-42)	Leucocratic granodiorite. Massive to gneissic
W7	26 Feb.	0-6	6-18	18	6	91E	Feldspar-magnetite gneiss	PLa	17-18	Hornblende(>5%) biotite(>5%) adamellite. Massive
W8	27 Feb.	0-7	7-34	34	12	on roadside adj. 52W	Feldspar-biotite gneiss	PLa	32-33	Hornblende (>5%) biotite(>5%) adamellite. Moderately foliated
W9	27 Feb.	0-9	9-35	35	9	adj. 52W	Feldspar-biotite gneiss	PLa	24-25) 34-35)	Hornblende(>5%) biotite(1-5%) adamellite. Weak to moderately foliated
W10	27 Feb.	0-3	3-24	24	9	adj. 52W	Biotite gneiss and schist	PLa	23-24	Hornblende(>5%) biotite(1-5%) adamellite. Weakly foliated
W11	28 Feb.	0-23	23-36	36	19	on roadside adj. 4	Gneiss	PLa	35-36	Hornblende(>5%) adamellite. Strongly foliated
W12	28 Feb.	0-6	6-30	30	6	254	Hornfels/amphibolite	Pβ	14-15	Amphibolite (hornblende and plagioclase, 3-5% magnetite) Finegrained granular
									25-26	Amphibolite. Coarse grained
W13	2 Mar.	0-10	10-24	24	10	254	Gneiss	PLa	23-24	Hornblende(>5%) biotite(1%) Weakly to moderately foliated
W14	2 Mar.	0-5	5-18	18	5	254	Gneiss	PLa	17-18	Hornblende(>5%) biotite(1-5%) adamellite. Strongly foliated
W15	3 Mar.	0-80	80-83	83	80?(P?)	82	Magnetite bearing micro-gneiss	Ph	80-81, 81-82	Microgneiss, quartz,plagio-clase, minor K spar. (possible metasediment)
		288	247	535						

137°10'

15'

20'

137°25'

H A R D W I C K E B A Y

Galway Bay

Point Souttar

34°55'

Corny Point

Brutus

Fish Point

Point Turton

Minlaton

Black Springs

WI

Yorketown

Warooka

W10

W9

W8

W7

W6

W5

W4

W3

35°00'

W2

Y O R K E P E N I N S U L A

W11

W15

W13

W12

W14

Marion Bay

35°05'

Tea Tree Swamp

S T U R T B A Y

REFERENCE

•W2 Location and number of shallow drill hole

JODODEX AUSTRALIA PTY. LTD.

E.L.635

BEDROCK SAMPLING

Location of shallow drill holes

SCALE 1:50,000	DRAWN: L.C.
DATE May, 1981	CAT Nº 541-2

3852 (II)-14

FIG. 1

TABLE 1 - E.L. 635 Bedrock sampling programme - May, 1981

Hole Number	Date drilled	Depth drilled(m) Rotary	Percussion	Total	Depth of Tertiary & Quaternary (m)	Location Section Number	Bedrock Lithology Field description	Unit	Depth of Sample (m)	Petrology and foliation
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W4	25 Feb.	0-39	39-48	48	39	92	Gneiss	PLg	47-48	Leucocratic granodiorite with secondary biotite. Massive to gneissic
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W15	3 Mar.	0-80	80-83	83	80?(P?)	82	Magnetite bearing micro-gneiss	Ph	80-81, 81-82	Microgneiss, quartz,plagio-clase, minor K spar. (possible metasediment)
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TABLE 1 - E.L. 635 Bedrock sampling programme - May, 1981

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		288	247	535						

137°10'

15'

20'

137°25'

H A R D W I C K E B A Y

Galway Bay

Point Souttar

34°55'

Corny Point

Brutus

Fish Point

Point Turton

Minlaton

Black Springs

WI

Yorketown

Warooka

W10

W9

W8

W7

W6

W5

W4

W3

W2

35°00'

Y O R K E P E N I N S U L A

W11

W15

W13

W12

W14

Marion Bay

35°05'

Tea Tree Swamp

S T U R T B A Y

REFERENCE

•W2 Location and number of shallow drill hole

JODODEX AUSTRALIA PTY. LTD.

E.L.635

BEDROCK SAMPLING

Location of shallow drill holes

3852(II)-15

SCALE 1:50,000	DRAWN: L.C.
DATE: May, 1981	CAT. Nº 541-2

FIG. 1

JODODEX AUSTRALIA PTY. LTD.

EXPLORATION LICENCE NO. 635

Report to the S.A. Department of Mines and Energy on exploration during the fifth quarter of tenure to 26 August, 1981.

August, 1981

JODODEX AUSTRALIA PTY. LTD.

E.L. 635

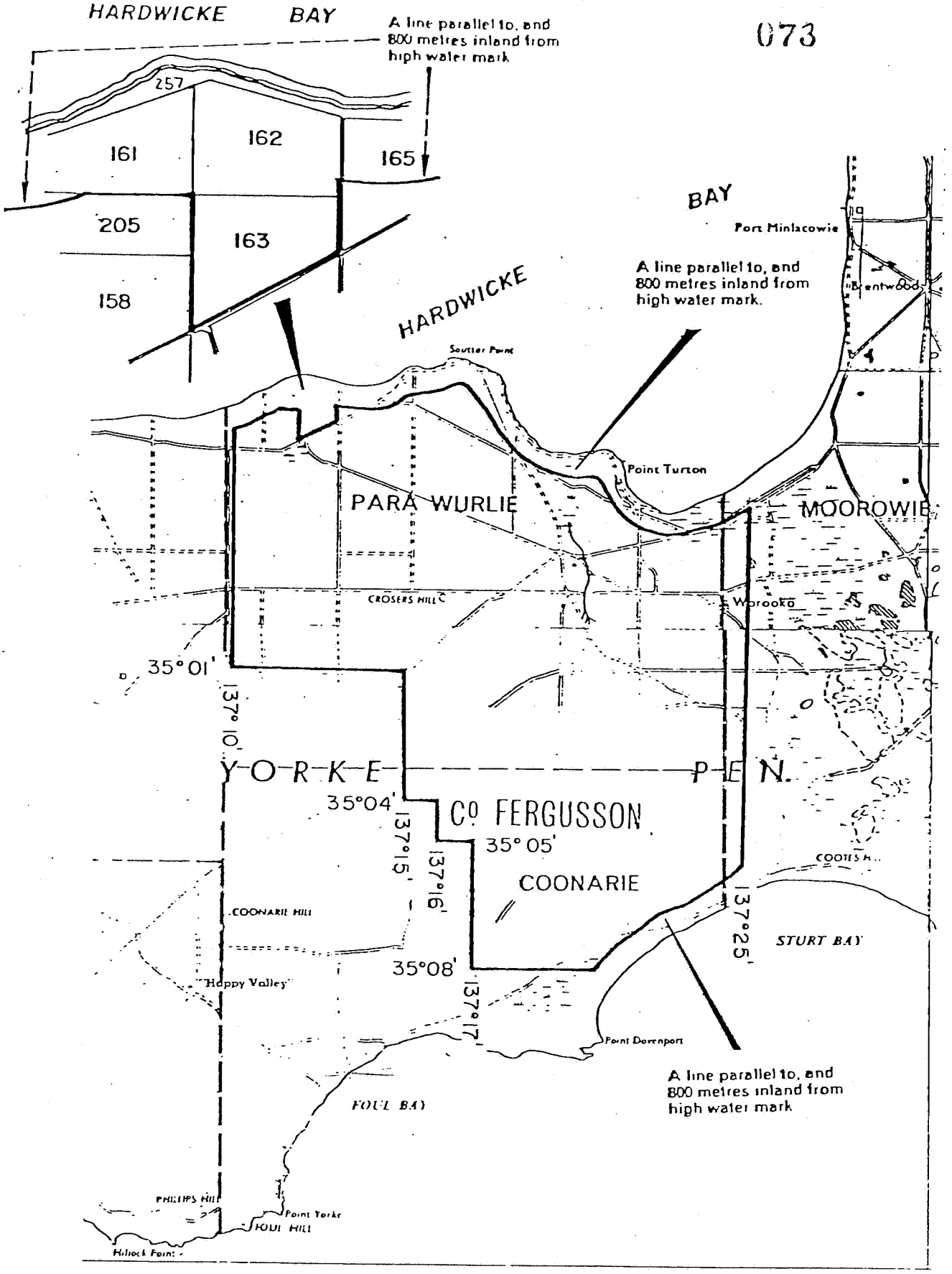
Report to the S.A. Department of Mines and Energy on exploration during the fifth quarter of tenure to 26 August, 1981

CONTENTS

ATTACHMENTS

SCHEDULE A

073



SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

EXPLORATION LICENCE No. 635

LOCALITY PLAN

FIG. 1

E.L. 635

Report to the S.A. Department of Mines and Energy on exploration during the fifth quarter of tenure to 26 August, 1981

Exploration Licence 635, covering 377 sq. km in the south of Yorke Peninsula, was granted to Jododex on 27 May, 1980 for a period of one year. The Licence was renewed for a further period of twelve months.

No field work was carried out during the fifth quarter of tenure.

During 1980, Geoex Pty. Ltd. flew and processed an aeromagnetic survey of E.L. 635. Contouring of the survey data was carried out using a simple filter which produced smooth slopes and a decided north-northwest grain. Upon closer inspection it was found that the smoothing had removed certain information as some significant features on the profiles were not evident on the contour plans or were seriously distorted. Consequently, a detailed check of the profiles was undertaken and a plan prepared showing trends (Fig. 2, Nov. 1980 Quarterly Report). Particularly for small or indistinct anomalies the tracing of magnetic units is very subjective. Since it was evident that the original total intensity contour map was inadequate, new total intensity contour plans were prepared by Pitt Research Pty. Ltd. of Crows Nest, N.S.W. (Figs. 2A, 2B, 3A, 3B).

These plans revealed significant differences from the earlier contour plans, such as:

(a) Many anomalies not represented on the old plan are present on the new plan;

(b) Anomaly positions were moved by up to 150m;

(c) Minor perturbations on the profiles can be detected on the latest set of contour plans and not on the earlier plan.

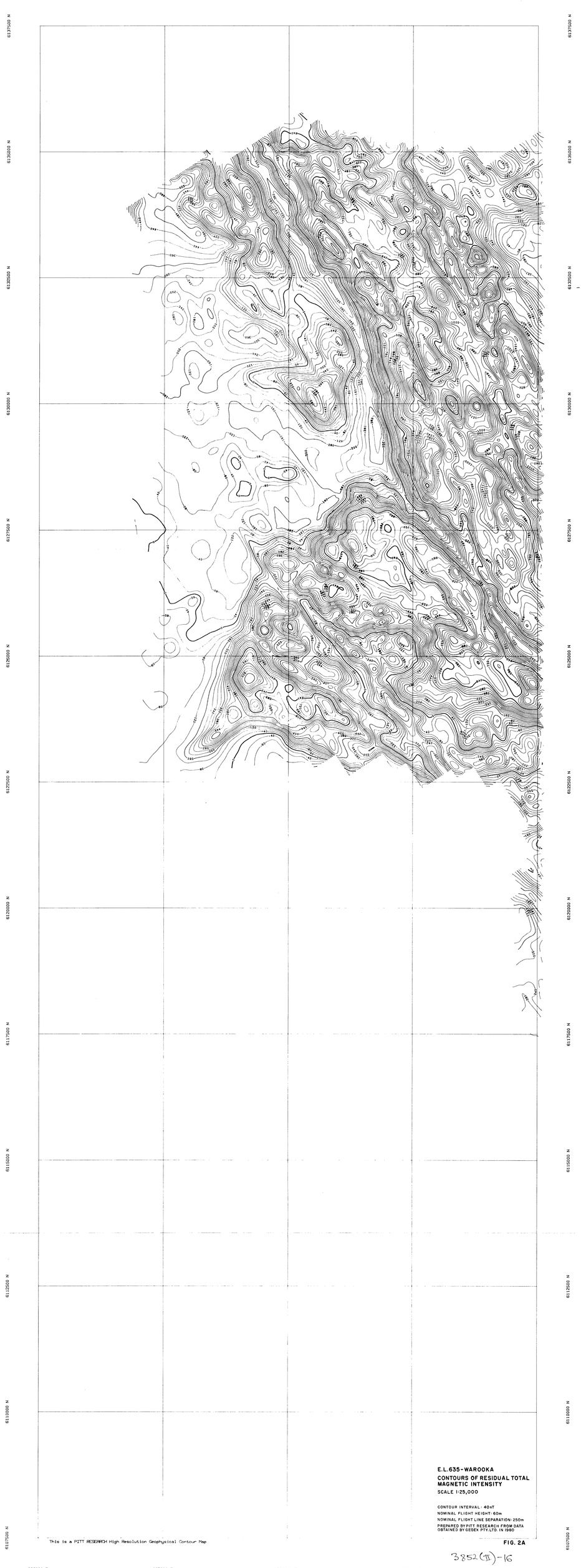
(d) Flight path recovery errors are more evident.

While the data were being recontoured some experiments were conducted to determine whether near surface features could be enhanced by the use of suitable filters. It was concluded that there was little significant improvement over what had been done already by recontouring and examining the profiles. Nevertheless, Pitt Research independently decided to select filters and complete the operation. A low pass filter and a high pass filter were run to produce two plans (Figs. 6 and 7). These are complementary filters, the two sets summing to the original. Finally two band pass filters were used to remove very high frequency and low frequency responses. These are presented as Figures 8 and 9.

Figure 6 is the most detailed and was compared with the trend map. It is evident that the correspondences are not exact. The filtering process may have distorted small anomalies and the contour spacing of 20 nT may have missed some features. The presence of poor ties between flight lines has created some anomalism. Likewise, in the exploration of the trend map, alternative interpretations are possible, particularly for the weak anomalies.

The filters used were in the form of a square array of coefficients operating on the mesh cells of the grid used in the construction of the unfiltered magnetic contour plan. Cell size was 100m. The lower right hand quadrant of the relevant filters are present on the plans. The complete filter is obtained by symmetry. Where two filters have been used in sequence, this is indicated by a multiplication sign.

In general, the trend map appears to be a better indicator of lithology than the filtered data. Discrepancies between Figure 6 and the trend map should be resolved on an individual basis since it is mainly a difference of interpretation. The total intensity magnetic contour maps, e.g. Figures 2A and 2B, are clearly a better representation of the observed magnetic field than the plan produced by Geoex Ltd.



E.L.635 - WAROOKA

CONTOURS OF RESIDUAL TOTAL MAGNETIC INTENSITY

SCALE 1:25,000

CONTOUR INTERVAL: 40nT
NOMINAL FLIGHT HEIGHT: 60m
NOMINAL FLIGHT LINE SEPARATION: 250m
PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEDEX PTY LTD. IN 1980

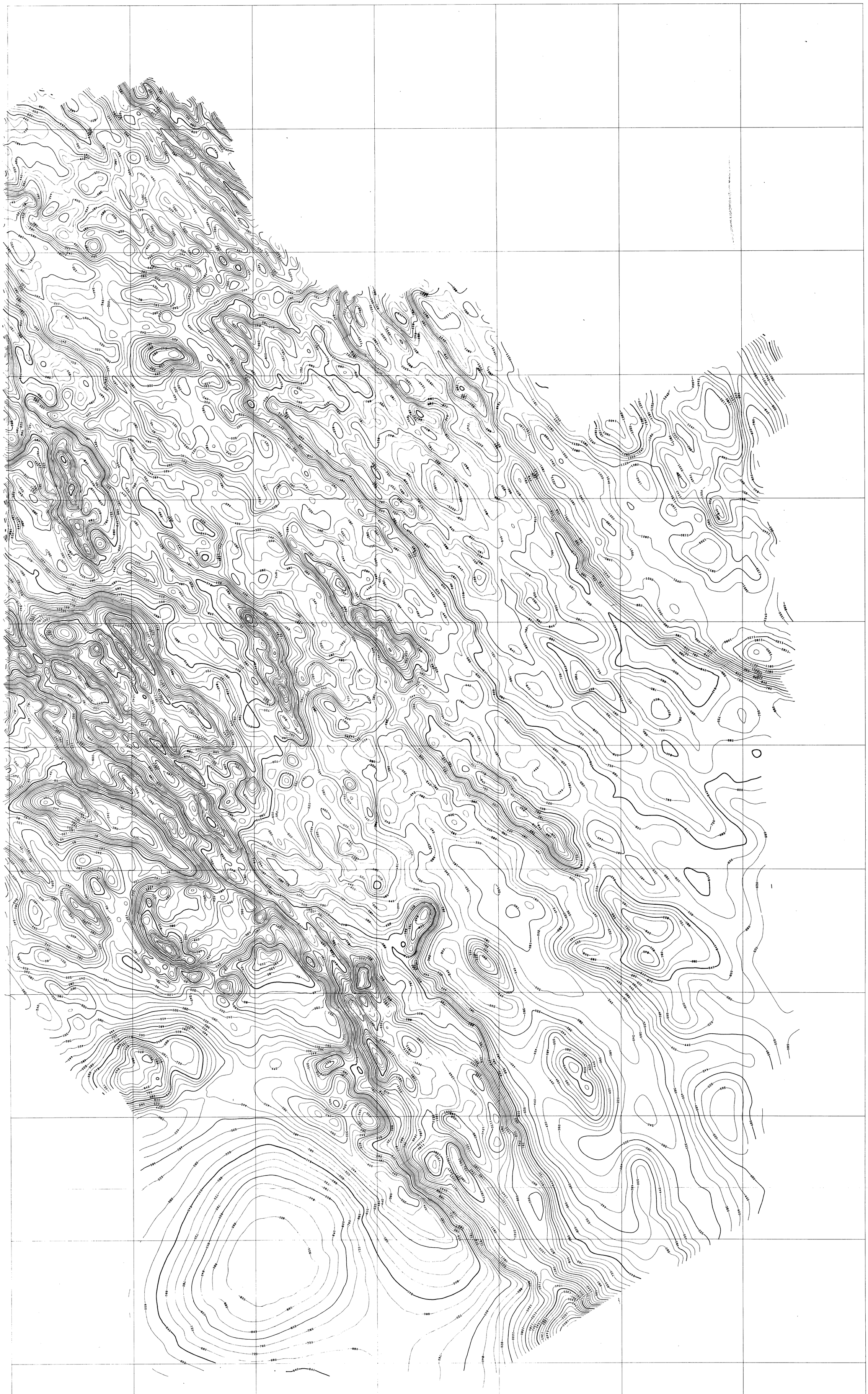
This is a PITT RESEARCH High Resolution Geophysical Contour Map

FIG. 2A

3852(II)-16

705000 E | 707500 E | 710000 E | 712500 E | 715000 E | 717500 E | 720000 E | 722500 E

6137500 N | 6135000 N | 6132500 N | 6130000 N | 6127500 N | 6125000 N | 6122500 N | 6120000 N | 6117500 N | 6115000 N | 6112500 N | 6110000 N | 6107500 N



E.L.635 - WAROOKA

CONTOURS OF RESIDUAL TOTAL MAGNETIC INTENSITY

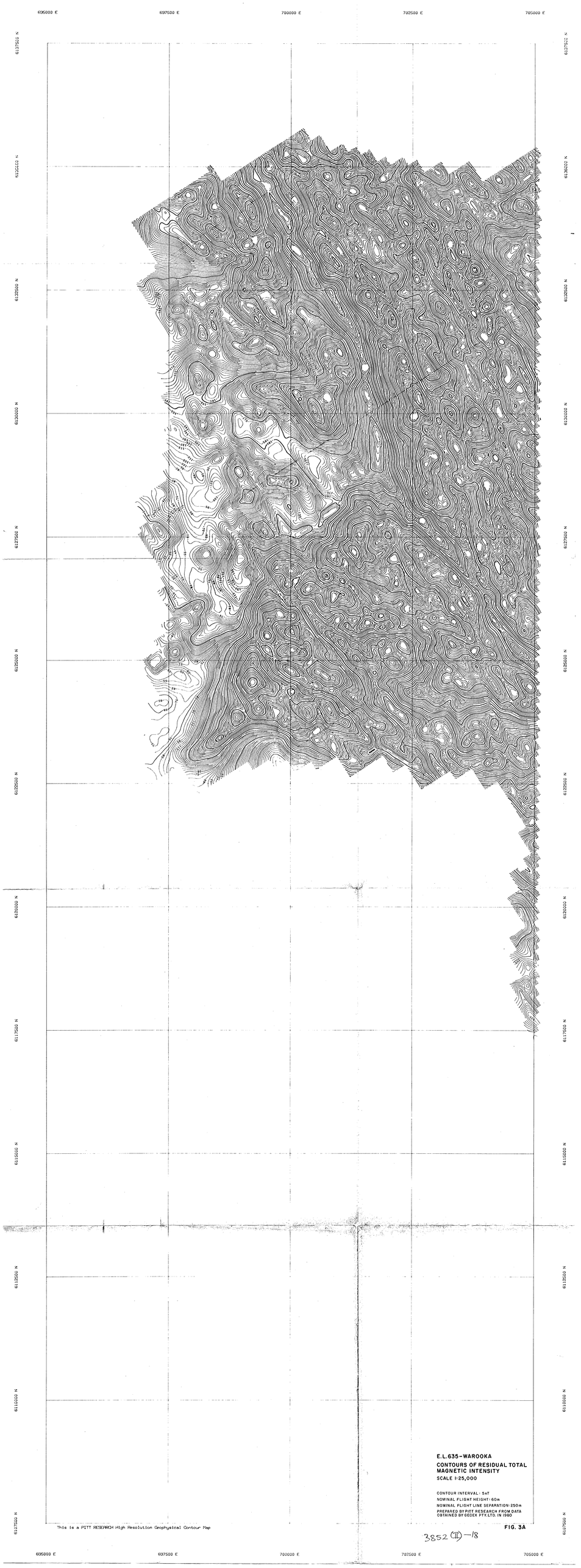
SCALE 1:25,000

CONTOUR INTERVAL: 40nT
NOMINAL FLIGHT HEIGHT: 60m
NOMINAL FLIGHT LINE SEPARATION: 250m
PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY.LTD. IN 1980

This is a PITT RESEARCH High Resolution Geophysical Contour Map

FIG. 2B

3852 (II) - 17



E.L.635-WAROOKA

CONTOURS OF RESIDUAL TOTAL MAGNETIC INTENSITY

SCALE 1:25,000

CONTOUR INTERVAL: 5nT
NOMINAL FLIGHT HEIGHT: 60m
NOMINAL FLIGHT LINE SEPARATION: 250m
PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY LTD. IN 1980

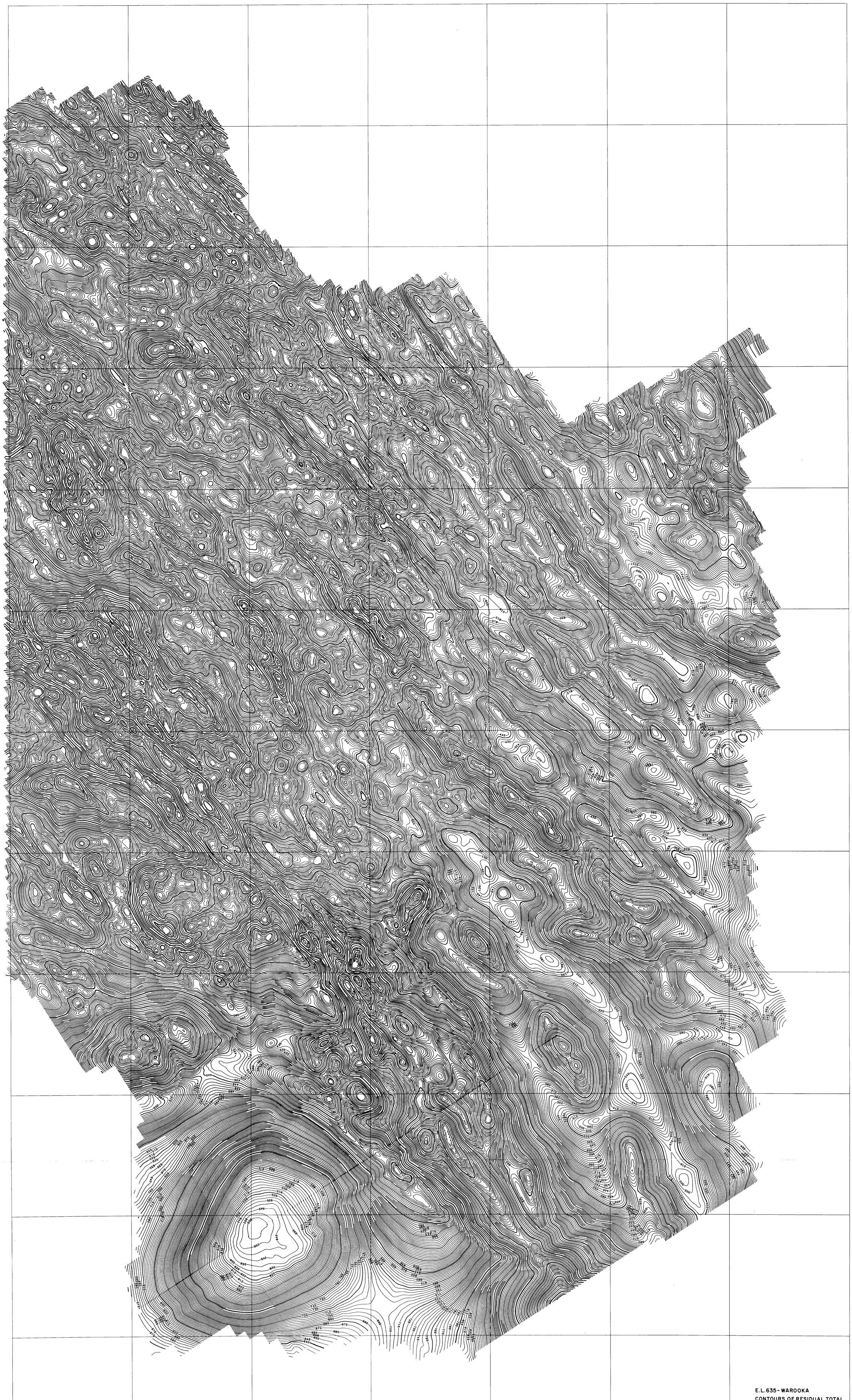
This is a PITT RESEARCH High Resolution Geophysical Contour Map

FIG. 3A

3852 (D)-18

705000 E | 707500 E | 710000 E | 712500 E | 715000 E | 717500 E | 720000 E | 722500 E

6137500 N | 6135000 N | 6132500 N | 6130000 N | 6127500 N | 6125000 N | 6122500 N | 6120000 N | 6117500 N | 6115000 N | 6112500 N | 6110000 N | 6107500 N



E.L.635 - WAROOKA

CONTOURS OF RESIDUAL TOTAL MAGNETIC INTENSITY

SCALE 1:25,000

CONTOUR INTERVAL: 5nT

NOMINAL FLIGHT HEIGHT: 60m

NOMINAL FLIGHT LINE SEPARATION: 250m

PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY. LTD. IN 1980

This is a PITT RESEARCH High Resolution Geophysical Contour Map

FIG. 3B

3852(II)-79

705000 E | 707500 E | 710000 E | 712500 E | 715000 E | 717500 E | 720000 E | 722500 E

700000 E

705000 E

710000 E

715000 E

720000 E

137 10

137 15

137 20

137 25

6135000 N

6130000 N

6125000 N

6120000 N

6115000 N

6110000 N

34 55

35 00

35 05

695000 E

E.L. 635 - WAROOKA

FLIGHT PATHS FOR RESIDUAL TOTAL MAGNETIC INTENSITY SURVEY

SCALE 1:50,000

3852(II)-20

FIG. 4

700000 E

705000 E

710000 E

715000 E

720000 E

137 10

137 15

137 20

137 25

6135000 N

34 55

6130000 N

35 00

6125000 N

35 05

695000 E

E.L.635 - WAROOKA

CONTOURS OF RESIDUAL TOTAL MAGNETIC INTENSITY

SCALE 1:50,000

CONTOUR INTERVAL: 20nT

NOMINAL FLIGHT HEIGHT: 60m

NOMINAL FLIGHT LINE SEPARATION: 250m

PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY. LTD. IN 1980

3852(II)-21

FIG. 5

700000 E
705000 E
710000 E
715000 E
720000 E
137 10
137 15
137 20
137 25
6135000 N
34 55
6130000 N
35 00
6125000 N
35 05
6120000 N

FILTER WEIGHTS

Low Pass Filter with Ramp between 9.0 and 11.0 sample intervals

.0240154302	.0273049611	.0226208647	.0161505998	.0094181042	.0057936340	.0009971078	-.0015605007
.0273049611	.0256208508	.0211997553	.0150352487	.0086429477	.0053542361	-.0001140693	-.0016108774
.0226208647	.0211997553	.0175221805	.0120084749	.0065583616	.0021198500	-.0006505765	-.0017154959
.0161505998	.0150352487	.0120084749	.0079090361	.0037936340	.0005730870	-.0012675086	-.0017622404
.0094181042	.0086429477	.0065583616	.0037936340	.0011266795	-.0007997315	-.0016878875	-.0016405864
.0057936340	.0053542361	.0021198500	.0005730870	-.0007997315	-.0016108774	-.0017314000	-.0013113023
.0009971078	-.0001140693	-.0006505765	-.0012675086	-.0016878875	-.0017314000	-.0013937413	-.0008395556
-.0015605007	-.0016108774	-.0017154959	-.0017622404	-.0016405864	-.0013113023	-.0008395556	-.0003713511

E.L.635-WAROOKA

CONTOURS OF FILTERED RESIDUAL TOTAL MAGNETIC INTENSITY (low pass filter)

SCALE 1:50,000

CONTOUR INTERVAL: 20nT

NOMINAL FLIGHT HEIGHT: 60m

NOMINAL FLIGHT LINE SEPARATION: 250m

PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY. LTD. IN 1980

5852 (III)-22

FIG. 6

700000 E
705000 E
710000 E
715000 E
720000 E
137 10
137 15
137 20
137 25
6135000 N
6130000 N
6125000 N
6120000 N
6115000 N
35 00
35 05

FILTER WEIGHTS

High Pass Filter with Ramp between 9.0 and 11.0 sample intervals

695000 E

.0684116058	-.0296986050	-.0245242124	-.0175761914	-.0099389220	-.0037254842	.0003581245	.0021893098
-.0296986050	-.0278955785	-.0229542912	-.0161442670	-.0090825948	-.0032179804	.0005914151	.0022449617
-.0245242124	-.0229542912	-.0186726554	-.0126005440	-.0067797709	-.0018764297	.0011841025	.0025605331
-.0175761914	-.0161442670	-.0126005440	-.0082718515	-.0037254842	-.0010676970	.0018656570	.0024121747
-.0099389220	-.0090825948	-.0067797709	-.0037254842	-.0007792590	.0013488765	.0023300359	.0022777817
-.0037254842	-.0032179804	-.0018764297	-.0010676970	.0013488765	.0022449617	.0023781048	.0019146166
.0003581245	.0005914151	.0011841025	.0018656570	.0023300359	.0023781048	.0020050881	.0013928487
.0021893098	.0022449617	.0025605331	.0024121747	.0022777817	.0019146166	.0013928487	.0008756161

E.L.635-WAROOKA

CONTOURS OF FILTERED RESIDUAL TOTAL MAGNETIC INTENSITY (high pass filter)

SCALE 1:50,000

CONTOUR INTERVAL: 20nT
NOMINAL FLIGHT HEIGHT: 60m
NOMINAL FLIGHT LINE SEPARATION: 250m
PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY. LTD. IN 1980

3852(II)-23

FIG. 7

700000 E
705000 E
710000 E
715000 E
720000 E
137 10
137 15
137 20
137 25
6135000 N
34 55
6130000 N
35 00
6125000 N
35 05
6120000 N

FILTER WEIGHTS

High Pass Filter with Ramp between 9.0 and 11.0 sample intervals

695000 E

.9684116038	-.0296988050	-.0245242124	-.0173761914	-.0099389220	-.0037254842	.0003581245	.0021893098
-.0296988050	-.0278935785	-.0229542912	-.0161442670	-.0090825948	-.0032179804	.0005914151	.0022449617
-.0245242124	-.0229542912	-.0186726754	-.0128005440	-.0067797209	-.0018764297	.0011841025	.0023605331
-.0173761914	-.0161442670	-.0128005440	-.0082718315	-.0037254842	-.0001676970	.0018656370	.0024121747
-.0099389220	-.0090825948	-.0067797209	-.0037254842	-.0007792590	.0013488765	.0023300359	.0022777817
-.0037254842	-.0032179804	-.0018764297	-.0001676970	.0013488765	.0022449617	.0023781048	.0019140166
.0003581245	.0005914151	.0011841025	.0018656370	.0023300359	.0023781048	.0020050881	.0013928487
.0021893098	.0022449617	.0023605331	.0024121747	.0022777817	.0019140166	.0013928487	.0008756161

FILTER WEIGHTS

Low Pass Filter with Ramp between 2.8 and 3.0 sample intervals

.3941062163	.1896724395	-.0246393031
.1896724395	.0696787484	-.0336825260
-.0246393031	-.0336825260	-.0158733968

E.L.635 - WAROOKA

CONTOURS OF FILTERED RESIDUAL TOTAL MAGNETIC INTENSITY (band pass filter)

SCALE 1:50,000

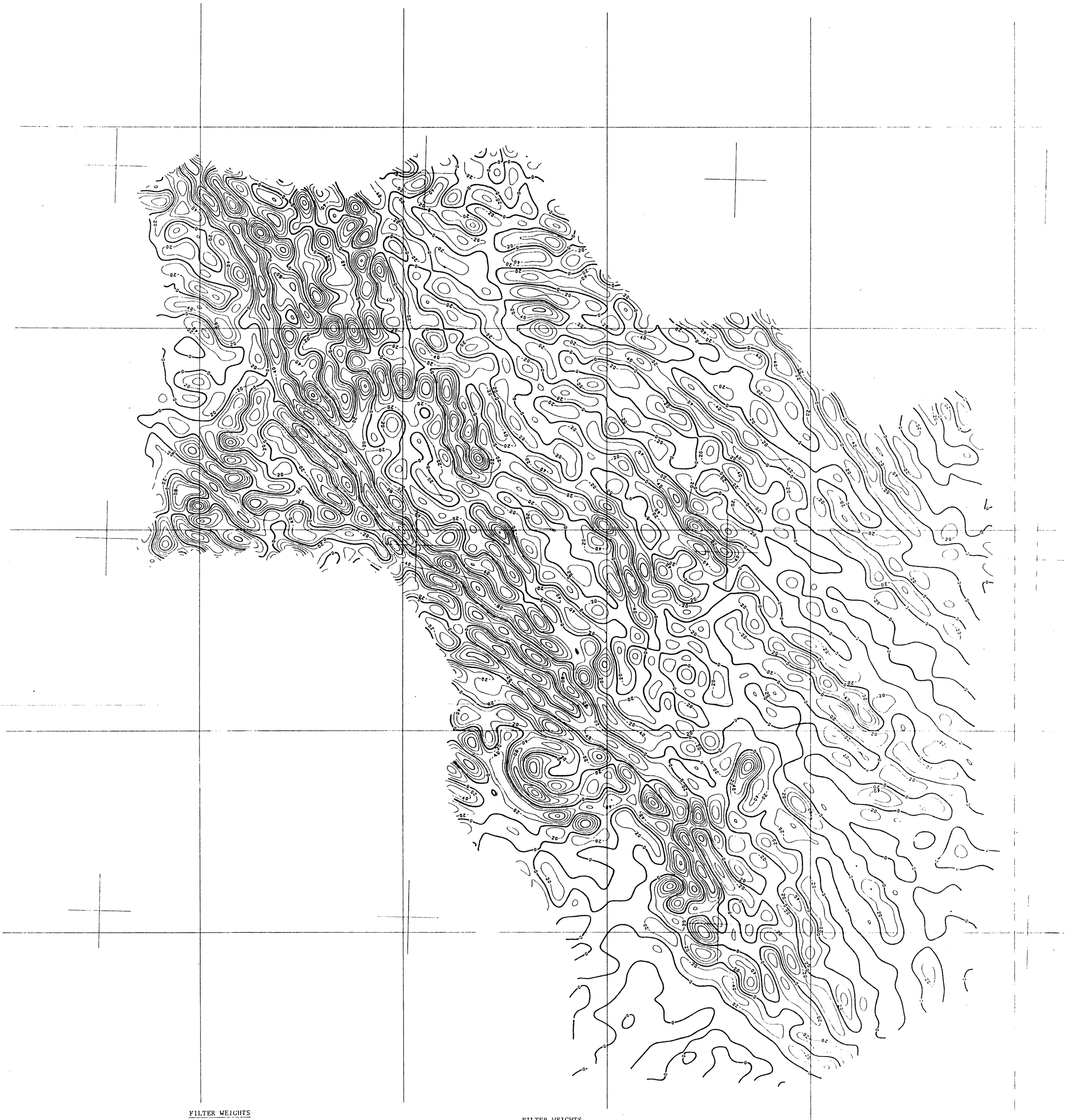
CONTOUR INTERVAL: 20nT
NOMINAL FLIGHT HEIGHT: 60m
NOMINAL FLIGHT LINE SEPARATION: 250m
PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY. LTD. IN 1980

3852(II)-24

FIG. 8

700000 E
137 10
705000 E
137 15
710000 E
715000 E
137 20
720000 E
137.25

6135000 N
34 55
6130000 N
6125000 N
35 00
6120000 N
6115000 N
35 05
6110000 N



695000 E

FILTER WEIGHTS

High Pass filter with Ramp between 9.0 and 11.0 sample intervals

.9684116038	-.0296988050	-.0245742124	-.0173761914	-.0099389220	-.0037254842	.0003581245	.0021893098
-.0296988050	-.0278935785	-.0229542912	-.0161442670	-.0090825948	-.0032179804	.0005914151	.0022449617
-.0245742124	-.0229542912	-.0186726854	-.0128005440	-.0067797209	-.0018764297	.0011841025	.0023605331
-.0173761914	-.0161442670	-.0128005440	-.0082718315	-.0037254842	-.0001676970	.0018656370	.0024121747
-.0099389220	-.0090825948	-.0067797209	-.0037254842	-.0007792590	.0013488765	.0023300359	.0022777817
-.0037254842	-.0032179804	-.0018764297	-.0001676970	.0013488765	.0022449617	.0023781048	.0019140166
.0003581245	.0005914151	.0011841025	.0018656370	.0023300359	.0023781048	.0020050881	.0013928487
.0021893098	.0022449617	.0023605331	.0024121747	.0022777817	.0019140166	.0013928487	.0008756161

×

FILTER WEIGHTS

Low Pass filter with Ramp between 6.0 and 7.0 sample intervals

.0631948085	.0563425246	.0350507523	.0129249210	-.0004854695
.0563425246	.0484155731	.0294327523	.0100091674	-.0013680602
.0350507523	.0294327523	.0162771479	.0034710528	-.0030378798
.0129249210	.0100091674	.0034710528	-.0020736578	-.0036390822
-.0004854695	-.0013680602	-.0030378798	-.0036390822	-.0024664094

E.L.635-WAROOKA

CONTOURS OF FILTERED RESIDUAL TOTAL MAGNETIC INTENSITY (band pass filter)

SCALE 1:50,000

CONTOUR INTERVAL: 20nT

NOMINAL FLIGHT HEIGHT: 60m

NOMINAL FLIGHT LINE SEPARATION: 250m

PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY. LTD. IN 1980

3852(II)-25

FIG. 9

JODODEX AUSTRALIA PTY. LTD. (INCORPORATED IN A.C.T.)
48 ALBANY STREET, CROWS NEST, N.S.W. TELEGRAPH AND CABLES "JODODEX" SYDNEY

PHONE: 439 3966
S.T.D. AREA CODE 02
TELEX: 21846

P.O. BOX 509,
CROWS NEST, N.S.W.,
AUSTRALIA 2065

076

BC:rkt
E - 20.

18 December, 1981.

The Director-General,
Department of Mines & Energy,
PO Box 151,
EASTWOOD, S.A., 5063.

Dear Sir,

E.L. 635 - Quarterly Report

No field work was carried out on E.L. 635 during the sixth quarter of tenure to 26th November, 1981.

During the period the results of the programme were assessed and the direction of future exploration discussed.

Unfortunately, the potential of the area has been downgraded to the point where no further work is justified and no budget was allocated for the area for 1982.

The Company, therefore, wishes to surrender the whole of E.L. 635. A relinquishment report will be prepared and fowarded in due course. A statement of expenditure is included with this letter.

Yours faithfully,

E.J. MALONE,
Managing Director.

encl.

EXPLORATION REPORT WAROOKA E.L. 635

SIX MONTHS TO 30TH NOVEMBER, 1981

	$
Service Fee Direct	4,598.32
Service Fee On Cost	940.48
Service Fee Overheads	3,695.00
Service Fee Vehicle	356.35
Communications	156.60
General Operating	151.70
Insurance	90.86
Rent - Property	668.67
Analytical Charges	502.25
Contract Drilling	582.23
EXPENDITURE FOR SIX MONTHS	11,742.46
Plus: Expenditure previously reported	63,343.90
TOTAL EXPENDITURE	$75,086.36

003

JODODEX AUSTRALIA PTY. LTD.

EXPLORATION LICENCE NO. 635

Final report to the S.A. Department of Mines and Energy.

January, 1982

JODODEX AUSTRALIA PTY. LTD.

E.L. 635 - FINAL REPORT

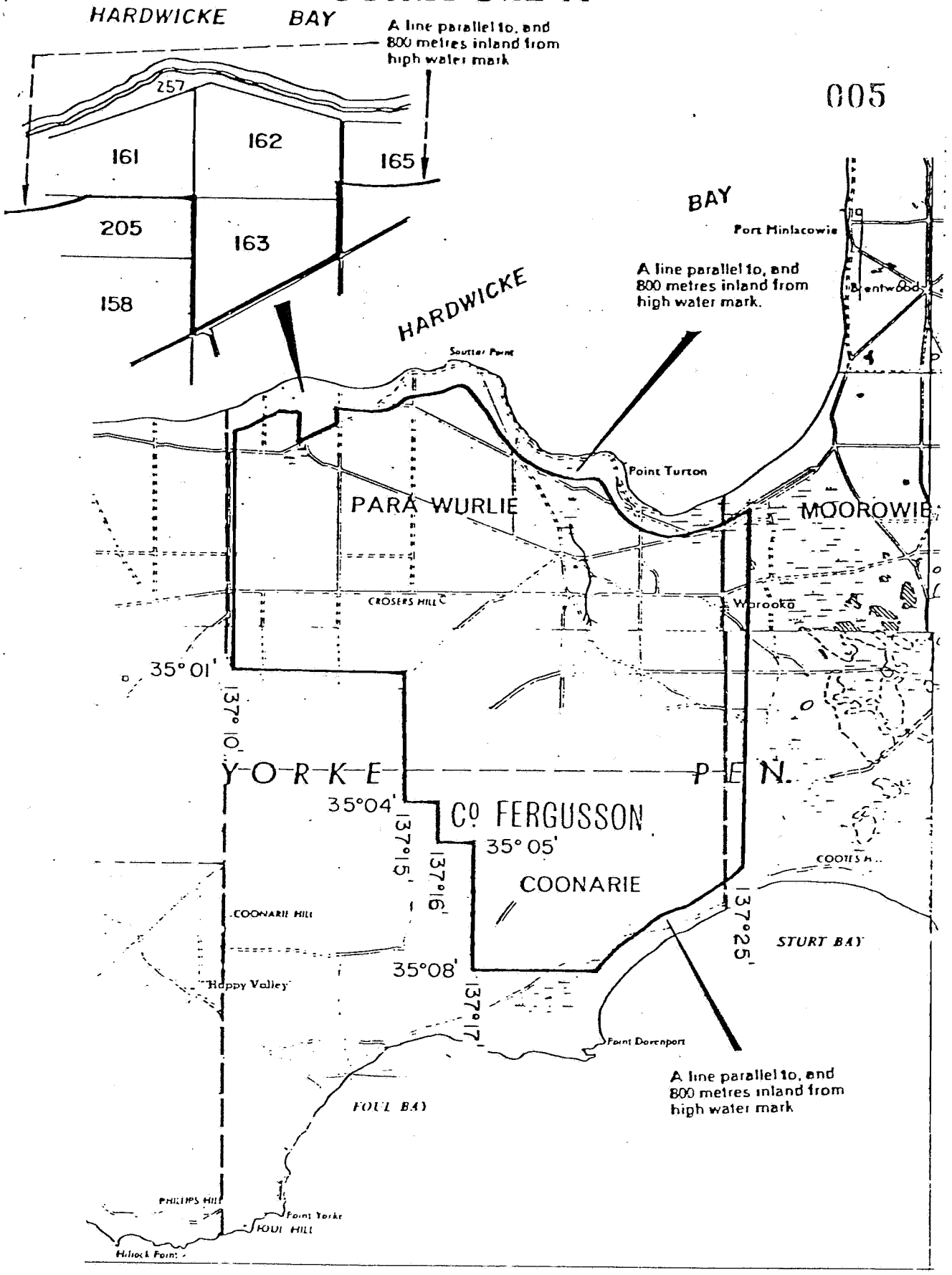
004

Report to the S.A. Department of Mines and Energy on exploration during the period 27 May, 1980 to 27 December, 1981.

CONTENTS

ATTACHMENTS

SCHEDULE A



SCALE 1:250,000

KILOMETRES 5 0 5 10 15 20 25 KILOMETRES

EXPLORATION LICENCE No. 635

LOCALITY PLAN

FIG. 1

Exploration Licence 635 covering 377 sq. km in the south of Yorke Peninsula, was granted to Jododex on 27 May, 1980 (Fig. 1). Relinquishment of the area was requested during December, 1981. This report details all work carried out by Jododex during the period of tenure.

AEROMAGNETIC SURVEY

Exploration of E.L. 635 commenced with an airborne magnetic survey by Geoex Pty. Ltd. The area is totally devoid of outcrop and the survey was flown to provide a guide for the bedrock drilling that was to be carried out to gain a basic understanding of the rock units present.

The aeromagnetic data were processed by the contractor and three contour plans at 1:25,000 scale were produced (submitted with first quarterly report). The survey data were also interpreted by Jododex and the findings were superimposed on a composite of the contour plans (Fig. 2).

The initial aeromagnetic contour map of the Warooka area was prepared using a simple smoothing filter and it appears that significant information was lost. Anomalies that can easily be traced on the profiles for several kilometers were eliminated by the filtering as were some indications of small scale displacements. This can easily be seen in the northern section where the contour plan indicates a rather random distribution of magnetic bodies. The smoothing effect is only significant where the overlying sediment cover is thin, usually less than 50m, since increasing thickness provides a natural filter.

In an attempt to determine the position of these smaller features, the centres of the anomalies on the profiles were plotted on the contour plan and these were connected. This resulted in a plan that does not agree in detail with the contour plan even in areas with strong anomalism. It is apparent that small scale faulting and folding were removed by the smoothing which left the overall trends. The principal benefit of the

plotting procedure lies in the outlining of the weaker elements and the location of some isolated magnetic features not apparent on the contour map.

Major boundaries, where depths to magnetic basement change, are indicated by the abrupt termination of trends or by their displacement. These boundaries, which are probably faults, have been used to subdivide the area into portions. It is apparent that the shallowest area, portion D, contains most of the magnetic trends. More deeply buried areas such as the extreme south did not warrant the plotting of trends since the contours are satisfactory. Because of the rather cluttered anomaly patterns, depth estimates were crude, using a length of straight slope or half width at half height. For symmetrical anomalies from dyke like bodies the latter technique is exact, as reference to the curves of S. Parker Gay* indicates. Symmetrical anomalies will be produced by bodies dipping southwards at about 60^{o} at the strike encountered in this area. The half width method will yield too great a depth for more asymmetrical anomalies, as would be produced by a 60^{o} dip northwards. The length of straight slope method yields a better estimate in this case. Of greater concern is the cluttering of anomalies, rendering dip estimates very suspect.

Within some areas, magnetic trends either disappear or are extremely weak. These areas are inferred to be 'granite'. The 'granites' do not appear to have strong aureoles with the exception of the one in portion B.

Portion A (Fig. 2) in the northwest of the licence area is relatively thickly covered in superficial material (>100m). The eastern part of portion A is similar to the eastern part of portion B to the south except that A is more deeply buried. The anomaly amplitude is significantly smaller in the west of A than in the west of B indicating that if the very magnetic material in B continues to the north into A, it is at great depth and overlain by rather weakly magnetic material.

* S. Parker Gay Jnr., 1967 - Standard curves for interpretation of magnetic anomalies over long tabular bodies.
Mining Geophysics, V.11

The basement in Portion B is generally shallow, under about 50m of cover. It is bounded to the east, north and south by apparently major faults.

Portion C could be underlain by granite. The cover is not magnetic, compared with the small magnetic bodies in the bedrock cover of portion A.

Portion D is east of the major fault that forms the eastern boundary of A, B and C. Its eastern boundary is formed by another major northwest trending fault. The southern boundary, rather poorly defined, is taken to be a fault line that has been detected in a number of places. Basement within D is shallow, typically a few tens of meters below surface. This has resulted in many very subtle magnetic beds being detected. Several bands of very magnetic material occur. These may be the same unit repeated by folding but patterns suggestive of intrusions or disruptions occur where the noses should be.

The northern part of area D contains a major body of material tentatively labelled 'granite'. To the north of this 'granite', the contour pattern is contorted. It appears that significant magnetic variations occur almost at random, however, this is not the case. With care, discrete beds can be followed for considerable distances. It is noticeable that the magnetic response of the northern section of D is substantially different in character and intensity from that occurring immediately to the south.

Portion E, to the southeast of D, is presumably geologically similar to D. The material composing the southern end of D is faulted, resulting in an increase in cover from 50m at the northern end to in excess of 100m at the southern end. An exception is the westernmost corner where granite may occur. Depths here are of the order of a few tens of metres. In general, depths increase steadily to the south, a trend that continues into Portion F where depths greater than 200m can be anticipated.

Basement in Portion G is also more deeply covered than in D, ranging from 50m on the western side to in excess of 100m on the eastern side.

On the far eastern side of G lies Portion H under several hundred metres of cover.

Since it was evident that the original total intensity contour map was inadequate, new total intensity contour plans were prepared by Pitt Research Pty. Ltd. of Crows Nest, N.S.W. (Figs. 3A, 3B, 4A, 4B). These plans revealed significant differences from the earlier contour plans, such as:

(a) Many anomalies not represented on the old plan are present on the new plan;

(b) Anomaly positions were moved by up to 150m;

(c) Minor perturbations on the profiles can be detected on the latest set of contour plans and not on the earlier plan.

(d) Flight path recovery errors are more evident.

While the data were being recontoured some experiments were conducted to determine whether near surface features could be enhanced by the use of suitable filters. It was concluded that there was little significant improvement over what had been done already by recontouring and examining the profiles. Nevertheless, Pitt Research independently decided to select filters and complete the operation. A low pass filter and a high pass filter were run to produce two plans (Figs. 7 and 8). These are complementary filters, the two sets summing to the original. Finally two band pass filters were used to remove very high frequency and low frequency responses. These are presented as Figures 9 and 10.

Figure 7 is the more detailed and was compared with the trend map. It is evident that the correspondences are not exact. The filtering process may have distorted small anomalies and the contour spacing of 20 nT may have missed some features. The presence of poor ties between flight lines has created some anomalism.

The filters used were in the form of a square array of coefficients operating on the mesh cells of the grid used in the construction of the unfiltered magnetic contour plan. Cell size was 100m. The lower right hand quadrant of the relevant filter is present on each plan. The complete filter is obtained by symmetry. Where two filters have been used in sequence, this is indicated by a multiplication sign.

In general, the trend map appears to be a better indicator of lithology than the filtered data. Discrepancies between Figure 7 and the trend map should be resolved on an individual basis since it is mainly a difference of interpretation. The total intensity magnetic contour maps, e.g. Figures 3A and 3B, are clearly a better representation of the observed magnetic field than the plan produced by Geoex Ltd.

BEDROCK SAMPLING

The aeromagnetic survey was followed by a limited bedrock sampling programme designed to provide lithological and geochemical information and to aid in the interpretation of the magnetic data. The drilling was undertaken by Northbridge Pty. Ltd. of Adelaide using a Schramm T64 rig. The location of the holes is shown in Figure 11 and the drill hole statistics are given in the Table. Petrographic descriptions of samples from each hole are presented in Appendix 1, spectrographic scan analyses of selected samples are presented in Appendix 2 and the results of analytical work carried out by North Broken Hill Limited on selected intervals are given in Appendix 3.

No discernible or objective petrographic evidence was found to distinguish between samples from Magnetic Zone B (W2, W3, W12, W13 and W14) and Magnetic Zone D. It is interpreted that a generally similar Lincoln Complex terrain underlies most of the area. The only possible metasediment intersected was a microgneiss described from hole W15, the most easterly hole drilled.

Strongly magnetic horizons were tested in holes W3, W5, W7 and W15. In each case magnetite grains gave rise to the anomalous magnetism.

CONCLUSION

Interpretation of the aeromagnetic data yielded zones of relatively shallow bedrock and zones of deeper bedrock. A number of magnetic and lesser magnetic horizons were identified and tested in a bedrock drilling programme. The geochemical and petrological data were not sufficiently encouraging to warrant the continuation of the base metal exploration programme.

TABLE - E.L. 635 Bedrock sampling programme - May, 1981

Hole Number	Date drilled	Depth drilled(m) Rotary	Percussion	Total	Depth of Tertiary & Quaternary (m)	Location Section Number	Bedrock Lithology Field description	Unit	Depth of Sample (m)	Petrology and foliation
W1	22 & 23 Feb.	0-14 33-44	14-33	44	>44	on roadside adj. 10	Hole abandoned due to loss of circulation			
W2	24 Feb.	0-21	21-33	33	21	92	Gneiss	ELa	28-29	Hornblende(>5%) biotite (>5%) adamellite. Weakly foliated
W3	25 Feb.	0-21	21-30	31 1m HQ core	21	92	Magnetite bearing gneiss	ELa	30.0	Hornblende(>5%) biotite(1-5%) adamellite. Massive
W4	25 Feb.	0-39	39-48	48	39	92	Gneiss	ELg	47-48	Leucocratic granodiorite with secondary biotite. Massive to gneissic
W5	26 Feb.	0-17	17-36	36	17	91E	Feldspar-biotite gneiss	Eβ	35-36	Hornblende and plagioclase amphibolite with minor quartz, epidote & scapolite.
W6	26 Feb.	0-16	16-42	42	16	91E	Feldspar-biotite gneiss	ELg	35-36) 41-42)	Leucocratic granodiorite. Massive to gneissic
W7	26 Feb.	0-6	6-18	18	6	91E	Feldspar-magnetite gneiss	ELa	17-18	Hornblende(>5%) biotite(>5%) adamellite. Massive
W8	27 Feb.	0-7	7-34	34	12	on roadside adj. 52W	Feldspar-biotite gneiss	ELa	32-33	Hornblende (>5%) biotite(>5%) adamellite. Moderately foliated
W9	27 Feb.	0-9	9-35	35	9	adj. 52W	Feldspar-biotite gneiss	ELa	24-25) 34-35)	Hornblende(>5%) biotite(1-5%) adamellite. Weak to moderately foliated
W10	27 Feb.	0-3	3-24	24	9	adj. 52W	Biotite gneiss and schist	ELa	23-24	Hornblende(>5%) biotite(1-5%) adamellite. Weakly foliated
W11	28 Feb.	0-23	23-36	36	19	on roadside adj. 4	Gneiss	ELa	35-36	Hornblende(>5%) adamellite. Strongly foliated
W12	28 Feb.	0-6	6-30	30	6	254	Hornfels/amphibolite	Eβ	14-15	Amphibolite (hornblende and plagioclase, 3-5% magnetite) Finegrained granular
									25-26	Amphibolite. Coarse grained
W13	2 Mar.	0-10	10-24	24	10	254	Gneiss	ELa	23-24	Hornblende(>5%) biotite(1%) Weakly to moderately foliated
W14	2 Mar.	0-5	5-18	18	5	254	Gneiss	ELa	17-18	Hornblende(>5%) biotite(1-5%) adamellite. Strongly foliated
W15	3 Mar.	0-80	80-83	83	80?(P?)	82	Magnetite bearing micro-gneiss	Eh	80-81, 81-82	Microgneiss, quartz,plagio-clase, minor K spar. (possible metasediment)
		288	247	535						

APPENDIX 1

Petrography by Pontifex and Associates

Pontifex & Associates Pty. Ltd.

015

TEL. 332 6744
A.H. 31 3816

26 KENSINGTON ROAD, ROSE PARK
SOUTH AUSTRALIA

P.O. BOX 91, NORWOOD
SOUTH AUSTRALIA 5067

MINERALOGICAL REPORT NO. 3248

8th April, 1981

TO:	Mr. F. Olgers, Jododex Australia Pty. Ltd., P.O. Box 509, CROWS NEST N.S.W. 2065
COPY TO :	Mr. B. Coles, Jododex Australia Pty. Ltd., 32 Mary Street, UNLEY S.A. 5061
YOUR REFERENCE:	Order No. 76
MATERIAL:	Percussion cuttings
IDENTIFICATION:	W 2 to W 15 series various depths
WORK REQUESTED:	Petrographic description
SAMPLES & SECTIONS:	Returned to you with this report

PONTIFEX & ASSOCIATES PTY. LTD.

COMMENTS

The percussion cuttings received were prepared as composite thin sections, generally with about 30 chips mounted in the one araldite block. In some samples, of relatively coarser (and fewer) chips, about 30 mm, two or three chips only were prepared as individual thin sections.

All section offcuts were stained with HF and sodium cobaltinitrite to highlight the distribution and abundance of K-spar (seen stained yellow).

There is sufficient similarity in the petrography of the great majority of chips in several groups of samples, for the whole batch (of 18 samples) to be petrographically subdivided (described and discussed) into four distinct groups (rather than numerous individual descriptions of individual samples which to a large extent would be unnecessarily repetitive).

These four petrographic groups are :-

1. massive to foliated hornblende and/or biotite adamellites
2. leucogranodiorites
3. gneisses (metasediments ?)
4. amphibolites

Note that in your covering notes, you state that the first three samples W2, 28-29; W3, 30.0 and W4, 47-48 belong to a different metamorphic terrain (Lincoln Complex) from that represented by all other samples.

..../

However there is no objective, petrographic evidence for separating those first three samples from the others in this batch. In mineralogy and texture the first two samples W2, 28-29; W3, 30.0 are adamellites, very similar to other adamellites in petrographic group 1. Sample W4, 47-48 is a leucogranodiorite which compares more closely to the leucogranodiorite W6, 35-36 than to the leucogranite sample W6, 41-42 (in the same hole).

**

COLLECTIVE DESCRIPTIONS OF THE FOUR GROUPS

GROUP 1 : massive to foliated hornblende and/or biotite adamellite

This is the largest group in the whole suite, including 10 samples. The rock types represented are massive to foliated, and although essentially adamellitic (quartz 25-35%, and 25 - 35% each of plagioclase and K-spar), the proportions of hornblende and biotite are variable (which in part reflects variation in the degree of foliation).

The following table summarises the essential mineralogy of samples forming this group 1, abbreviations are :-

h = <5% hornblende H = >5% hornblende
(b) = 1% biotite
b = 1 to 5% biotite
B = >5% biotite

m = massive
f = weakly foliated
ff = moderately foliated
fff = strongly foliated

		Subgroups within Group 1
W2, 28-29	: HB, f	essential hornblende, massive to weakly foliated
W3, 30.0	: Hb, m	
W7, 17-18	: HB, m	essential hornblende + biotite, massive
17-18	: B, m	essential biotite; massive to foliated
W8, 32-33	: hB, ff	
W9, 24-25	: Hb, f	essential hornblende, foliated
W9, 34-35	: Hb, ff	
W10,23-24	: Hb, f	
W11,35-36	: H fff	
W13,23-24	: H(b) f-ff	
W14,17-18	: Hb, fff	

..../

Group 1 continued

Sphene, apatite and magnetite are constant accessories, with sphene least abundant in the Hb samples from W9 and W10 (1 - 3%), and most abundant in the hornblende-rich samples from W11, 13 and 14 (3 - 5%). Magnetite shows a similar variation. The main accessory in W2, 28-29 may be partly metamict allanite rather than sphene.

Most of these group 1 rocks are granular with a grain size of 0.2 to 1.5 mm (or 0.2 to 2 mm in W10). Minor recrystallised patches locally have a grain size of 0.01 to 0.04 mm. Myrmekite is common in the relatively massive samples, but absent from the more foliated rocks from W11, 13 and 14.

Group 2 :

consists of leucocratic massive to gneissic granodiorites and includes W4, 47-48; W6, 35-36, 41-42. Secondary biotite in W4, 47-48 and W6, 35-36; and chlorite in W6, 35-36, 41-42; are common in veins or replacing primary biotite.

Most of the leucogranodiorites are granular with most grains under 1 mm in diameter, although rare grains of plagioclase in W4, 47-48 and in W6, 35-36 measure up to 2 mm. Consistent with the classification of granodiorite these rocks contain only accessory K-spar, which is mostly altered to checkerboard albite. Sample W6, 41-42 has brown clay pseudomorphs after an unknown mineral.

.../

GROUP 3 : consists of micro-gneisses (probably metasediments) and comprises only two samples - W15, 80-81 and W15, 81-82.

Sample W15, 80-81 consists mainly of quartz (25%) plagioclase (40%,), minor K-spar (5%), all with an average size of 0.2 mm. Muscovite (5 - 7%), biotite and epidote (each 7 - 10%), magnetite (5%), and sphene (3%) are scattered throughout.

The sample from W15, 81-82 is a coarse grained, plagioclase-biotite-quartz gneiss with partly chloritised biotite flakes to 5 mm across (35%), plagioclase anhedra (15%) about 1.5 mm, and recrystallised quartz grains (50%) to 3 mm. The rock has a folded layering, but the details and genesis of the folding are not certain as the section appears to be nearly parallel to the overall trend of the schistosity and layering.

GROUP 4 : the rocks are amphibolites and include W5, 35-36; W12, 14-15, 25-26.

Sample W12, 14-15 is fine grained and granular (most grains 0.1 - 0.3 mm) and almost entirely composed of hornblende and plagioclase, with <1% biotite and 3 - 5% magnetite.

The other samples are coarse grained (0.5 - 1.5 mm) and contain olive to reddish-brown biotite.

Sample W5, 35-36 also contains minor quartz, epidote and scapolite; and this sample includes a chip of biotite-hornblende leuco-granodiorite gneiss which has a weak foliation and a grain size of 0.1 - 0.6 mm. The composition of this chip is 2 - 3% hornblende, 2 - 3% biotite, 35 - 40% quartz and 55 - 60% plagioclase.

.../

Group 4 continued

A single chip of foliated amphibolite occurs in the sample W10, 23-24 which has otherwise been classified above in group 1 adamellites. This chip consists of well-oriented prisms of green hornblende (70%) to 1.5 mm long, which are partly retrogressed to chlorite. Minor plagioclase (25%) and accessory sphene are also present.

As a group, these amphibolites are considered to be meta-basic igneous rocks.

**

APPENDIX 2

Spectrographic Scan analyses of selected samples by AMDEL.

The Australian
Mineral Development
Laboratories

lemington Street, Frewville,
South Australia 5063
Phone Adelaide 79 1662
Telex AA 82520

Please address all
correspondence to
P.O. Box 114 Eastwood
SA 5063
In reply quote:

023

amdel

NATA CERTIFICATE

3/299/0 - AC 4510/81

3 April 1981

The Manager
Jododex Australia Pty Ltd
PO Box 409
CROWS NEST NSW 2065

Attention: Mr F Olgers

REPORT AC 4510/81

YOUR REFERENCE:	Order No 75
IDENTIFICATION;	As listed
DATE RECEIVED;	18 March 1981
NOTE:	Sample WIZ 25-26 is listed but not received.

D.K. Rowley
Manager
Analytical Chemistry Division

for Norton Jackson
Managing Director

cc Jododex
32 Mary Street
UNLEY SA 5061

dam

Pilot Plant: Osman Place
Thebarton S.A.
Telephone 43 8053
Branch Laboratory: Perth

A10

SPECTROGRAPHIC ANALYSIS

Detection-Limit Concentrations of Elements
DC Arc Excitation

ELEMENT	ppm	ELEMENT	ppm
Ag	0.1	Mo	3
Al	100	Na	50
As	50	Nb	20
Au	3	Ni	5
B	3	P	100
Ba	200	Pb	1
Be	1	Rb	10
Bi	1	Sb	30
Ca	100	Sc	3
Cd	3	Si	100
Ce	300	Sn	1
Co	5	Sr	10
Cr	20	Ta	100
Cs	30	Te	20
Cu	1	Th	100
Fe	100	Ti	100
Ga	1	Tl	1
Ge	1	V	10
In	10	W	50
K	5	Y	10
La	50	Yb	1
Li	1	Zn	20
Mg	100	Zr	100
Mn	10		

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

REPORT AC 4510/81

QUALITATIVE SPECTROGRAPHIC ANALYSIS

Sample No.	Major	Minor	Heavy Trace	Trace	Faint Trace	Very Faint Trace
	100%	10%	1% 5000ppm 1000	500ppm 100	50ppm 10	5ppm
		Na		Cu Sr	Y Ga	Sn
W2 28-29	Si Al Fe	Ca Ti K		Mn Ba V Rb Cr Ni	Co Sc Li	Yb
		Mg		Zr	Pb	
		K		Mn	Sr	Li Ga Cu
W3 29-30	Si Al	Fe Na Ti Mg	Ba	Zr P La	V Nb Pb	Sc Co Yb
		Ca		Rb	Y	
		Ca		P Mn	Sr	Yb Ga
W4 47-48	Si Al	Fe K Ti Na Mg	Ba	Zr La	V Nb	Sc Li Co
				Rb	Y	Pb
		K		Mn	La Sc Pb	
W5 35-36	Si Al	Fe Ca Na Ti		Ba Zr V Sr	Ni Cr Co Nb	Yb
		Mg		Rb	Cu Y Li Ga	
		K		P Mn	Nb Ni Yb	Pb
W6 41-42	Si Al	Fe Na Mg Ti		Ba Zr La Y	V Co Sc Ga	
		Ca		Rb	Li	

Elements not sought: U Re Hf Hg Platinoids B

Other elements not detected at limits quoted in attached sheet:

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

REPORT AC 4510/81

Page 2/3 026

QUALITATIVE SPECTROGRAPHIC ANALYSIS

Sample No.	Major	Minor	Heavy Trace	Trace	Faint Trace	Very Faint Trace
	100% 10%	1%	5000ppm 1000	500ppm 100	50ppm 10	5ppm
		Ca	Mg	Zr Sr	Y Pb	Yb
W7 17-18	Si Al	Fe Na	K Ti Ba	P Mn La	V Nb Li Co	Sc Ni Cu
				Rb	Ga	
		Ca	Na	Zr Rb	Nb Li	Ga Cu
W8 33-34	Si Al	Fe	K Ti	Mn P Sr	V La Y Co	Yb Sc
			Mg		Pb	
		Ca	Na	Zr	Sr Li	Yb
W9 34-35	Si Al	Fe	K Ti Ba	Mn P La	V Nb Co	Sc Pb
			Mg	Rb	Y Ga	Cu
			Ca	Zr	Ni Y	Cu Yb
W10 23-24	Si Al	Fe	Na Ti	Ba Mn Rb Sr V	La Cr Co	Sc
			K Mg	P	Li Ga	Pb
			Ca	Ba Zr Sr	V Li	Yb Cu
W11 35-36	Si Al	Fe	K Na Ti Mg	Mn Rb P La	Y Nb Ni	Sc Co
					Pb Ga	

Elements not sought: U Re Hf Hg Platinoids B

Other elements not detected at limits quoted in attached sheet:

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

027

REPORT AC 4510/81

Page 3/3

QUALITATIVE SPECTROGRAPHIC ANALYSIS

Sample No.	Major	Minor	Heavy Trace	Trace	Faint Trace	Very Faint Trace
	100%	10%	1% 5000ppm	1000 500ppm	100 50ppm	10 5ppm
		Ca			Rb Ga	Ni
W12 14-15	Si Al	Fe Na	K Ti	Mn	Sr V Cr Zr Cu	Co
		Mg			Li Pb	Sc
		Ca	K	Rb	Sr Pb	Sc
W12 29-30	Si Al	Fe Na	Ti	Ba Mn Zr P	La Y V Nb Li	Co Cu B
			Mg		Yb Ga	
		Ca		Rb	Sr Sc	Cu
W13 23-24	Si Al	Fe K	Ti Na Mg Ba	Mn Zr P	La V Nb Pb	Co Yb Mo B
					Y Ga Li	
		Ca	K	P	Sr Pb	Li Cu
W14 17-18	Si Al	Fe Na	Ti Mg Ba	Mn Zr	La V Nb	Co Sc Yb B
				Rb	Y Ga	
		Mg	K	Rb Sr	Li Cr	Sc Pb Cu
W15 80-81	Si Al	Fe Ca	Ti Na	Ba Mn Zr	La V Y Ni	Ga Co Yb B
				P	Nb	Sr

Elements not sought: U Re Hf Hg Platinoids B

* NOTE.- SAMPLE, "W12 25-26" LISTED NOT RECEIVED.

Other elements not detected at limits quoted in attached sheet:

APPENDIX 3

Analytical report by North Broken Hill Limited

NORTH BROKEN HILL LIMITED

ANALYTICAL REPORT SHEET
— UNIVERSAL —

EXPLORATION DIVISION

029

FIELD ENTRY

Date 11-12-81 Sampler / Driller W. Cowley

Area WARRAKA S.A. Machine

Grid Priority (urgency)

or location see Map No. or Air Photo No.

LABORATORY

Order No. 4310 Sheet No.

Project S.A. RECONNAISSANCE

Cost Code 571 Date Desp. 8-12-81

Notes

Co-ordinates/or From	Co-ordinates/or To	Interval / Depth	Geological description of sample	Tube No.	Sample No.	All results in parts per million unless otherwise indicated Cu	Pb	Zn	Al_2O_3 %
14m	15m	1m	W13	1	W13				15·65
15m	16m	"		2					16·10
				3	BLANK				—
7m	8m	1m	W12	4	W12				9·72
8m	9m	"		5					8·30
NECK	SAMPLE	—		6	15·5%				(15·25)

NORTH BROKEN HILL LIMITED

ANALYTICAL REPORT SHEET
— UNIVERSAL —

EXPLORATION DIVISION

·030·

FIELD ENTRY

Date 25·11·81 Sampler / Driller

Area Warooka Machine

Grid Priority (urgency)

For location see Map No. or Air Photo No.

LABORATORY

Order No. 4369 Sheet No.

Project S A Recon

Cost Code 521 Date Desp. 8·12·81

Notes

Co-ordinates/or From	Co-ordinates/or To	Interval / Depth	Geological description of sample	Tube No.	Sample No.	All results in parts per million unless otherwise indicated Cu	Pb	Zn	Ag	Ni	Co	Mo	Sn	W
	W1	42m - 44m				10	10	32	<1	18	8	<5	<20	<10
	W2	32 - 33				27	1	30	"	8	7	"	"	"
	W3	29 - 30				13	1	44	"	1	5	"	"	"
	W4	47 - 48				4	1	45	"	1	5	"	"	"
	W5	35 - 36				83	10	76	"	17	15	"	"	"
	W6	41 - 42				6	1	69	"	13	16	"	"	"
	W7	17 - 18				3	1	54	"	3	7	"	"	"
	W8	33 - 34				9	1	67	"	1	6	"	"	"
	W9	34 - 35				13	1	62	"	1	7	"	"	"
	W10	23 - 24				15	1	66	"	7	8	"	"	"
	W11	35 - 36				12	1	74	"	1	4	"	"	"
	W12	29 - 30				13	1	63	"	3	5	"	"	"
	W13	23 - 24				12	4	69	"	1	4	"	"	"
	W14	17 - 18				10	2	50	"	1	4	"	"	"
	W15	79 - 80				11	2	21	"	12	4	"	"	"
	"	80 - 81				10	1	25	"	12	5	"	"	"
	"	81 - 82				8	9	44	"	7	8	"	"	"
	"	82 - 83				3	1	77	"	10	9	"	"	"

137°10'
15'
20'
137°25'
34°55'
35°00'
35°05'
A
B
C
D
E
F
G
H
Boundary of E.L.635

REFERENCE

- Portion boundary (probably fault)
- Fault
- Inferred boundary
- Magnetic trend
- •41 Proposed test hole

JODODEX AUSTRALIA PTY. LTD.

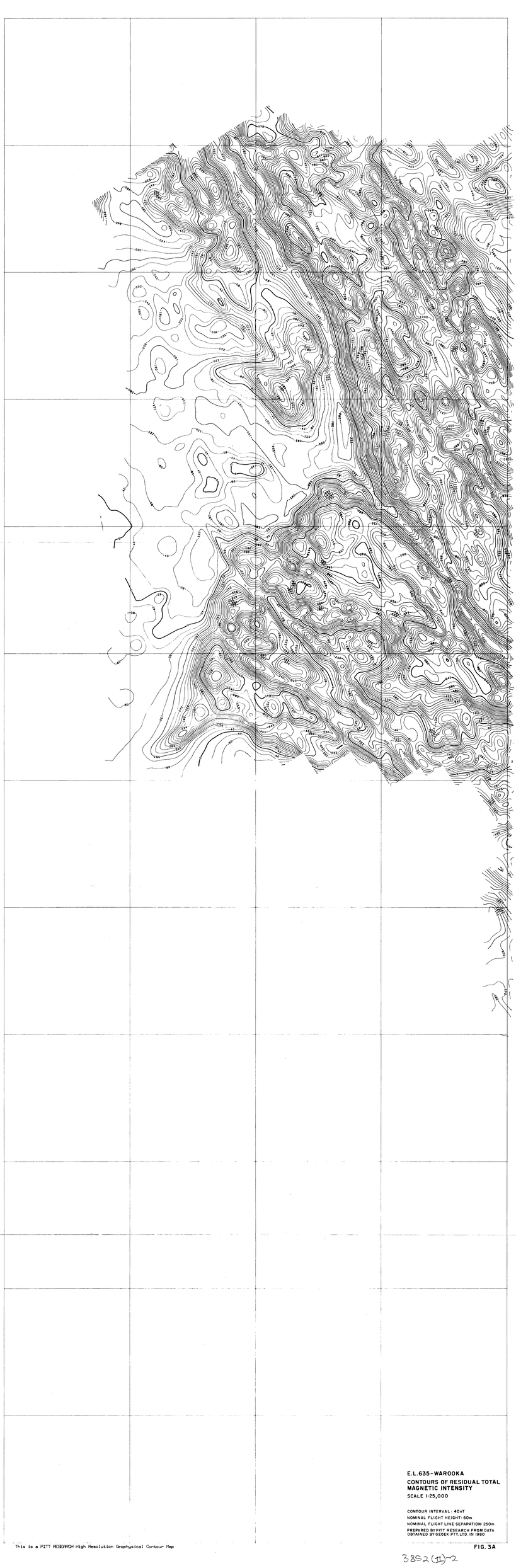
E.L.635

AEROMAGNETIC INTERPRETATION

3852-II-1

SCALE 1:50,000	DRAWN: L.C.
DATE: December, 1980	CAT. Nº 541-1

FIG. 2



E.L.635-WAROOKA

CONTOURS OF RESIDUAL TOTAL MAGNETIC INTENSITY

SCALE 1:25,000

CONTOUR INTERVAL: 40nT
NOMINAL FLIGHT HEIGHT: 60m
NOMINAL FLIGHT LINE SEPARATION: 250m
PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEDEX PTY. LTD. IN 1980.

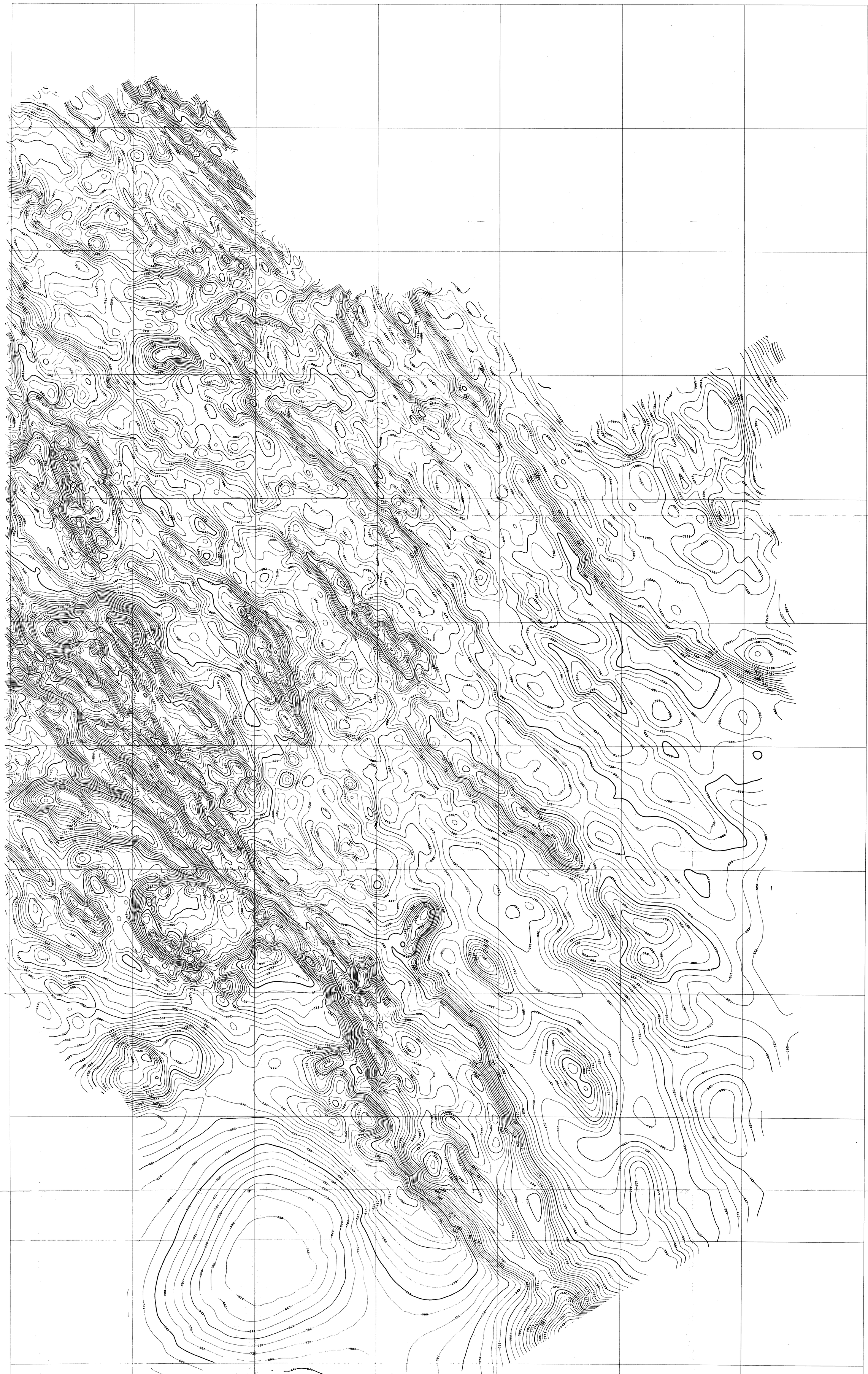
This is a PITT RESEARCH High Resolution Geophysical Contour Map

FIG. 3A

3852(II)-2

705000 E 707500 E 710000 E 712500 E 715000 E 717500 E 720000 E 722500 E

6137500 N
6135000 N
6132500 N
6130000 N
6127500 N
6125000 N
6122500 N
6120000 N
6117500 N
6115000 N
6112500 N
6110000 N
6107500 N



This is a PITT RESEARCH High Resolution Geophysical Contour Map

E.L.635 - WAROOKA

CONTOURS OF RESIDUAL TOTAL MAGNETIC INTENSITY

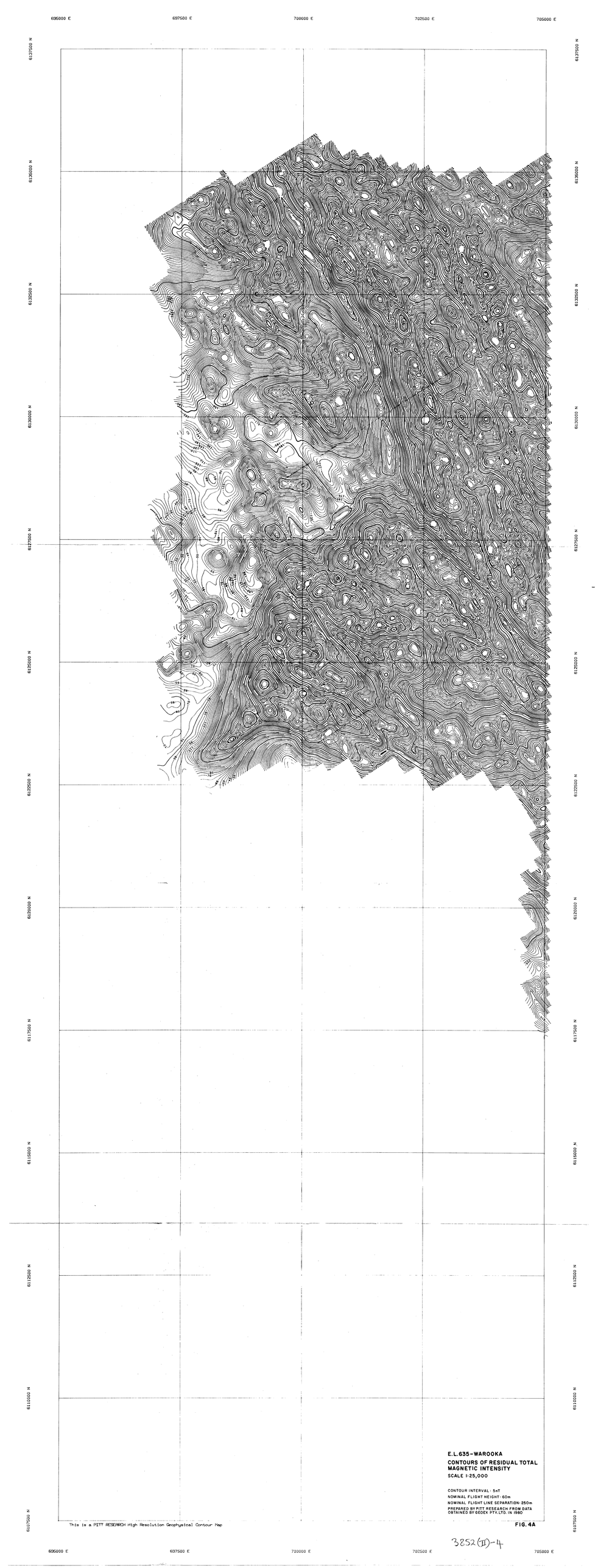
SCALE 1:25,000

CONTOUR INTERVAL: 40nT
NOMINAL FLIGHT HEIGHT: 60m
NOMINAL FLIGHT LINE SEPARATION: 250m
PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY. LTD. IN 1980

FIG. 3B

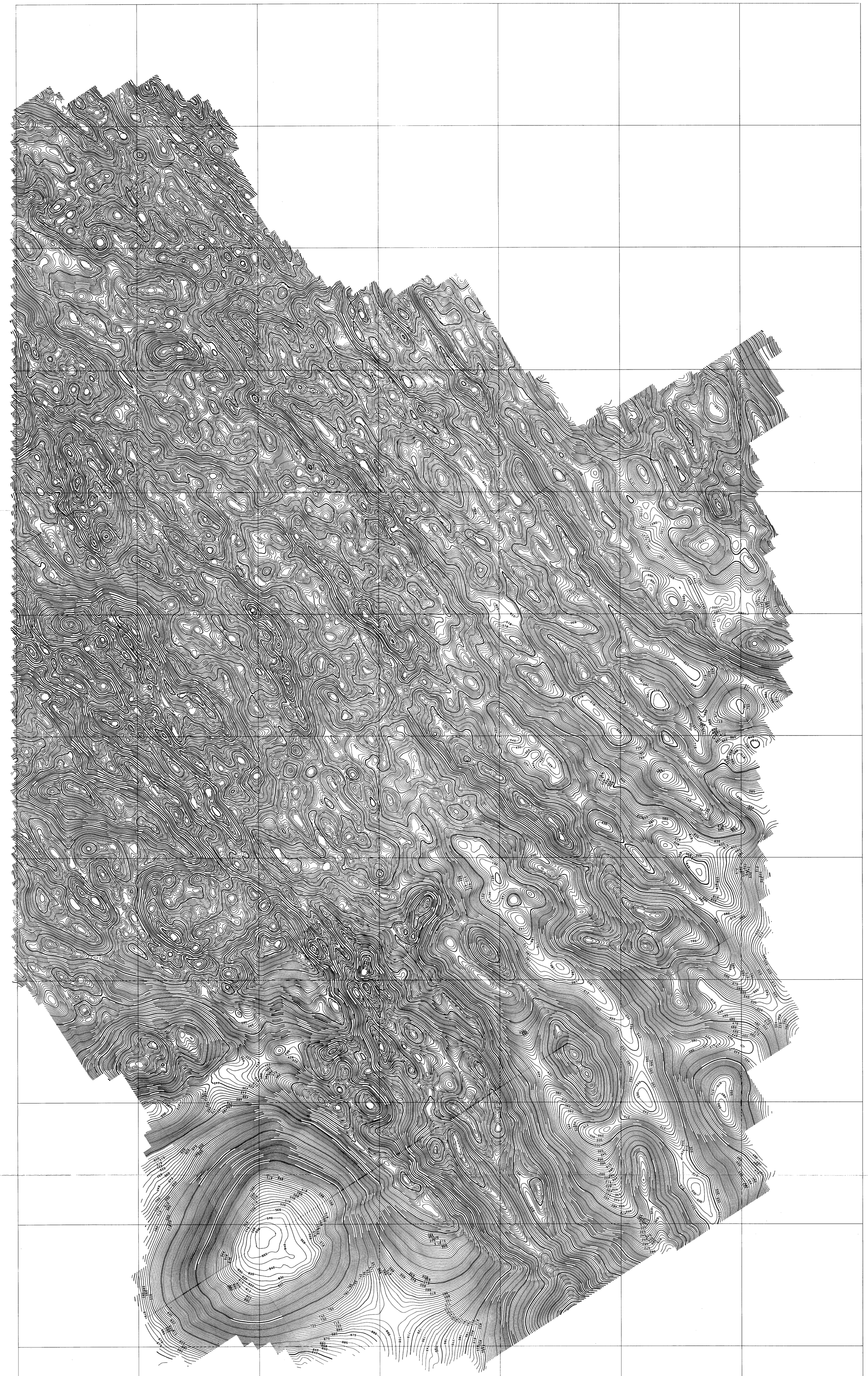
3852-II-3

705000 E 707500 E 710000 E 712500 E 715000 E 717500 E 720000 E 722500 E


696000 E
697500 E
700000 E
702500 E
705000 E
6137500 N
6135000 N
6132500 N
6130000 N
6127500 N
6125000 N
6122500 N
6120000 N
6117500 N
6115000 N
6112500 N
6110000 N
6107500 N
E.L.635-WAROOKA
CONTOURS OF RESIDUAL TOTAL MAGNETIC INTENSITY
SCALE 1:25,000
CONTOUR INTERVAL - 5nT
NOMINAL FLIGHT HEIGHT - 60m
NOMINAL FLIGHT LINE SEPARATION: 250m
PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEDEX PTY.LTD. IN 1980
This is a PITT RESEARCH High Resolution Geophysical Contour Map
FIG. 4A
3252(II)-4

705000 E | 707500 E | 710000 E | 712500 E | 715000 E | 717500 E | 720000 E | 722500 E

6135000 N | 6132500 N | 6130000 N | 6127500 N | 6125000 N | 6122500 N | 6120000 N | 6117500 N | 6115000 N | 6112500 N | 6110000 N | 6107500 N



E.L.635 - WAROOKA

CONTOURS OF RESIDUAL TOTAL MAGNETIC INTENSITY

SCALE 1:25,000

CONTOUR INTERVAL: 5nT

NOMINAL FLIGHT HEIGHT: 60m

NOMINAL FLIGHT LINE SEPARATION: 250m

PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY. LTD. IN 1980

This is a PITT RESEARCH High Resolution Geophysical Contour Map

FIG. 4B

3352(II)-5

705000 E | 707500 E | 710000 E | 712500 E | 715000 E | 717500 E | 720000 E | 722500 E

137°10'

15'

20'

137°25'

HARDWICKE BAY

Galway Bay

Point Souttar

34°55'

Corny Point

Brutus

Fish Point

Point Turton

Minlaton

Black Springs

W1

Yorketown

Warooka

W10

W9

W8

W7

W6

W5

W4

W3

35°00'

W2

YORKE PENINSULA

W11

W15

W13

W12

W14

Marion Bay

35°05'

Tea Tree Swamp

STURT BAY

REFERENCE

•W2 Location and number of shallow drill hole

JODODEX AUSTRALIA PTY. LTD.

E.L.635

BEDROCK SAMPLING

Location of shallow drill holes

SCALE 1:50,000	DRAWN: L.C.
DATE: May, 1981	CAT. Nº 541-2

3852(II)-6

FIG. 11

700000 E

705000 E

710000 E

715000 E

720000 E

137 10

137 15

137 20

137 25

6135000 N

34 55

6130000 N

6125000 N

35 00

6120000 N

6115000 N

35 05

6110000 N

695000 E

E.L. 635 - WAROOKA

FLIGHT PATHS FOR RESIDUAL TOTAL MAGNETIC INTENSITY SURVEY

SCALE 1:50,000

3852-II-7

FIG. 5

700000 E

705000 E

710000 E

715000 E

720000 E

137 10

137 15

137 20

137 25

6135000 N

34 55

6130000 N

6125000 N

35 00

6120000 N

6115000 N

35 05

695000 E

E.L.635 - WAROOKA

CONTOURS OF RESIDUAL TOTAL MAGNETIC INTENSITY

SCALE 1:50,000

CONTOUR INTERVAL: 20nT

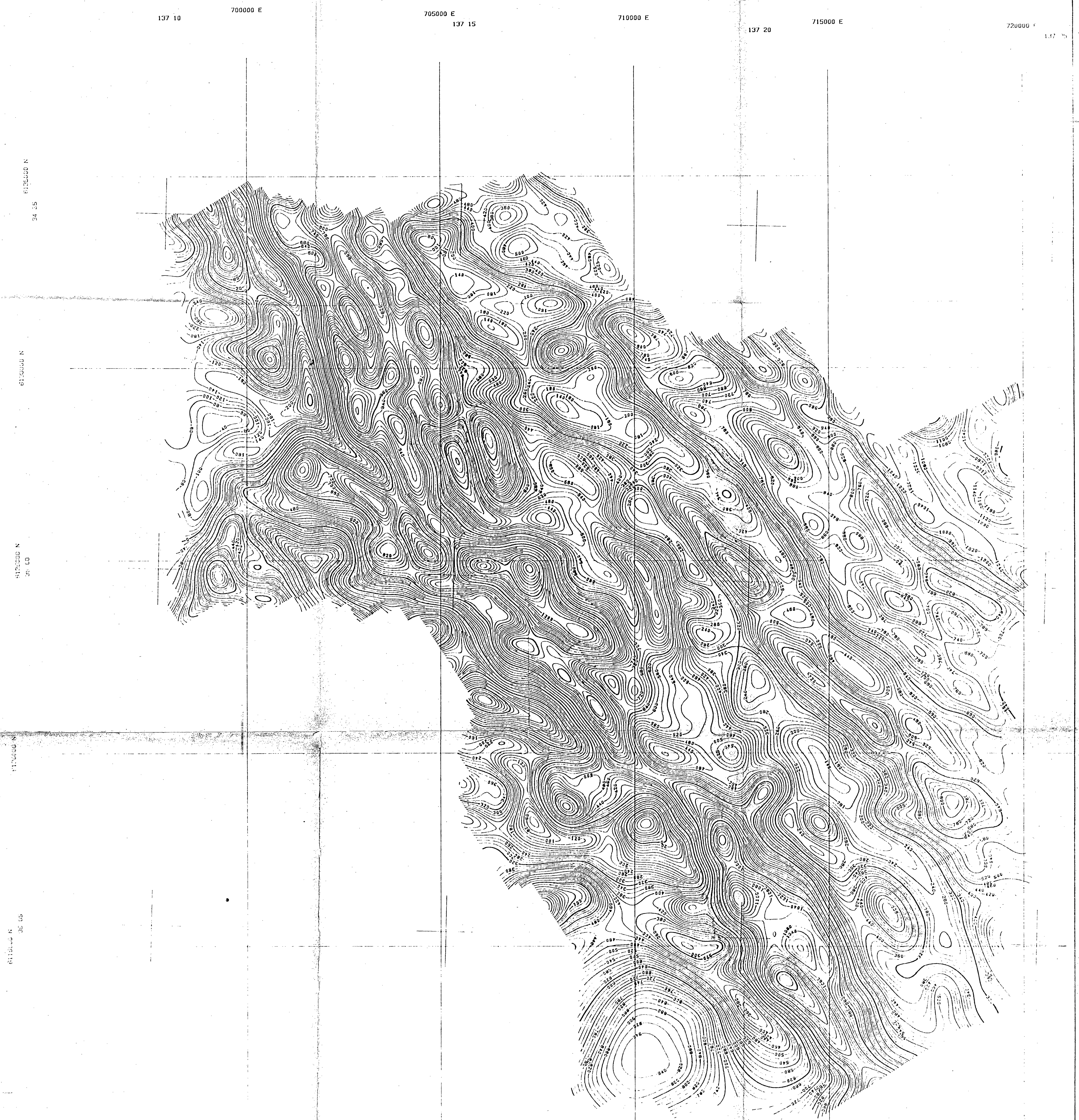
NOMINAL FLIGHT HEIGHT: 60m

NOMINAL FLIGHT LINE SEPARATION: 250m

PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY. LTD. IN 1980

3852(II)-8

FIG. 6



FILTER WEIGHTS

Low Pass Filter with Ramp between 9.0 and 11.0 sample intervals

695000 E

[illegible]	.0273049611	.0226208647	[illegible]	.0094181042	[illegible]	.0000971078	-.0015605007
[illegible]	[illegible]	.0211997553	[illegible]	.0086429477	.0035342361	-.0001140693	-.0016108774
[illegible]	[illegible]	.0173221806	[illegible]	.0065583616	.0021198500	-.0006505763	-.0017154939
[illegible]	[illegible]	.0120084749	[illegible]	.0037936340	[illegible]	-.0012675086	-.0017622404
[illegible]	[illegible]	.0065583616	[illegible]	[illegible]	-.0007997315	-.0016878875	-.0016405864
[illegible]	.0035342361	.0021198500	[illegible]	-.0007997315	-.0016108774	-.0017314000	-.0013113023
[illegible]	-.0001140693	-.0006505763	[illegible]	-.0016878875	-.0017314000	-.0013957413	-.0008395356
[illegible]	-.0016108774	-.0017154939	[illegible]	-.0016405864	-.0013113023	-.0008395356	-.0003713311

E.L. 635 - WAROOKA

CONTOURS OF FILTERED RESIDUAL TOTAL MAGNETIC INTENSITY (low pass filter)

SCALE 1:50,000

CONTOUR INTERVAL: 20nT

NOMINAL FLIGHT HEIGHT: 60m

NOMINAL FLIGHT LINE SEPARATION: 250m

PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY. LTD. IN 1980

3852(II)-9

FIG. 7

700000 E
705000 E
710000 E
715000 E
720000 E
137 10
137 15
137 20
137 25
8135000 N
8130000 N
8125000 N
35 00
35 05

FILTER WEIGHTS

High Pass Filter with Ramp between 9.0 and 11.0 sample intervals

[illegible]	-.0266[illegible]	-.0245242124	-.0123261914	-.0093380220	-.0037254842	.0005581245	.0021893098
[illegible]	-.0229[illegible]	-.0227[illegible]	-.0161442670	-.0090825948	-.0052170804	.0005014151	.0022440617
[illegible]	-.0229[illegible]	-.0[illegible]	-.[illegible]	-.0067797209	-.0018764297	.0011841025	.0023605531
[illegible]	-.0161442670	-.0[illegible]	-.[illegible]	-.0037254842	-.0016676970	.0018656370	.0024121747
[illegible]	-.0090825948	-.0067797209	-.[illegible]	-.0007797590	.0013488765	.0023300359	.0022777817
[illegible]	-.0052170804	-.[illegible]	-.[illegible]	.0013488765	.0022440617	.0023781048	.0019140166
[illegible]	.0005014151	.0011841025	[illegible]	.0023300359	.0023781048	.0020050861	.0013928467
[illegible]	.0022440617	.0023605531	.0024121747	.0022777817	.0019140166	.0013928467	.0006756161

E.L.635-WAROOKA

CONTOURS OF FILTERED RESIDUAL TOTAL MAGNETIC INTENSITY (high pass filter)

SCALE 1:50,000

CONTOUR INTERVAL: 20nT
NOMINAL FLIGHT HEIGHT: 60m
NOMINAL FLIGHT LINE SEPARATION: 250m

PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY. LTD. IN 1980

3852 (II)-10

FIG.8

700000 E
137 10
705000 E
137 15
710000 E
715000 E
137 20
720000 E
137 25
6135000 N
34 55
6130000 N
6125000 N
35 00
6120000 N
35 05
6115000 N

FILTER WEIGHTS

High Pass Filter with Ramp between 9.0 and 11.0 sample intervals

695000 E								
	.9684116038	-.0296988050	-.0245242124	-.0173761914	-.0093389220	-.0037254842	.0003581245	.0021893098
	-.0296988050	-.0278935785	-.0229542912	-.0161442670	-.0086825948	-.0032179804	.0005914151	.0022449617
	-.0245242124	-.0229542912	-.0186736754	-.0126005440	-.0067797209	-.0018764297	.0011841025	.0023605331
	-.0173761914	-.0161442670	-.0126005440	-.0082718515	-.0037254842	-.0001676970	.0018656370	.0024121747
	-.0093389220	-.0086825948	-.0067797209	-.0037254842	-.0007797590	.0013488765	.0023300359	.0022777817
	-.0037254842	-.0032179804	-.0018764297	-.0001676970	.0013488765	.0022449617	.0023781048	.0019140166
	.0003581245	.0005914151	.0011841025	.0018656370	.0023300359	.0023781048	.0020050881	.0013928487
	.0021893098	.0022449617	.0023605331	.0024121747	.0022777817	.0019140166	.0013928487	.0008756161

×

FILTER WEIGHTS

Low Pass Filter with Ramp between 2.8 and 3.0 sample intervals

.9641082163	.1896724391	-.0246393031
.1896724391	.0696782484	-.0336825260
-.0246393031	-.0336825260	-.0158744568

E.L.635 - WAROOKA

CONTOURS OF FILTERED RESIDUAL TOTAL MAGNETIC INTENSITY (band pass filter)

SCALE 1:50,000

CONTOUR INTERVAL: 20nT

NOMINAL FLIGHT HEIGHT: 60m

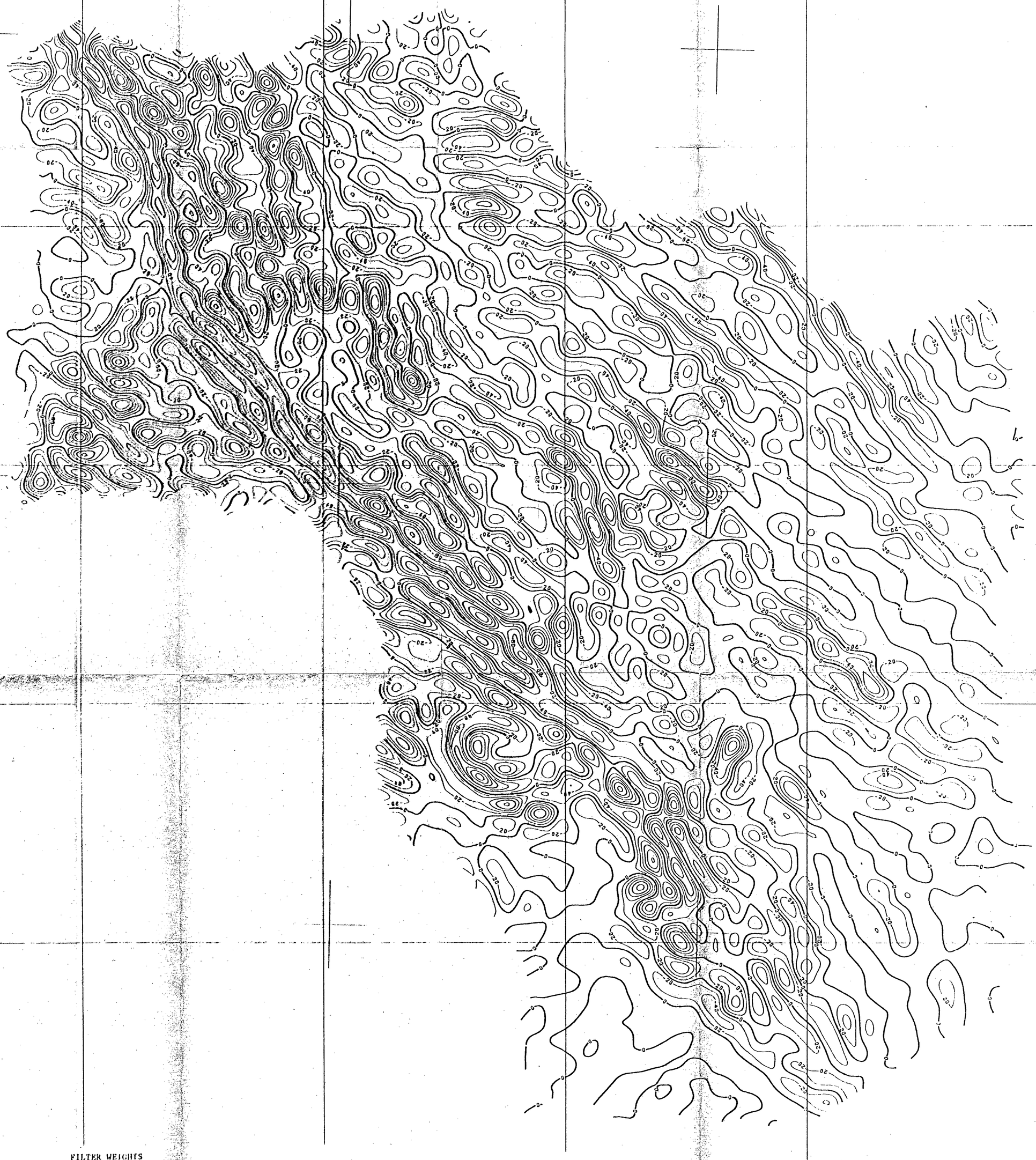
NOMINAL FLIGHT LINE SEPARATION: 250m

PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY. LTD IN 1980

3852(III)-11

FIG. 9

700000 E
137 10
705000 E
137 15
710000 E
715000 E
137 20
720000 E
137 25
6135000 N
34 55
6130000 N
6125000 N
35 00
6120000 N
6115000 N
35 05
6110000 N



FILTER WEIGHTS

High Pass Filter with Ramp between 9.0 and 11.0 sample intervals

695000 E

.3684115038	-.0296988050	-.0245242124	-.0173761914	-.0099389270	-.0032754842	.0005581245	.0021803708	
-.0296988050	-.0218935785	-.0229542912	-.0161442670	-.0080225048	-.0022172804	.0000114151	.0022440617	
-.0245242124	-.0229542912	-.0186786754	-.0128000440	-.0067797709	-.0018764297	.0011841025	.0023605551	
-.0173761914	-.0161442670	-.0128000440	-.0082718515	-.0037254842	-.0016676970	.0018666370	.0024121747	
-.0099389270	-.0080225048	-.0067797709	-.0037254842	-.0027727709	-.0013488765	.0025500550	.0027777817	
-.0032754842	-.0022172804	-.0018764297	-.0016676970	-.0013488765	-.0022446617	.0023781048	.0021946166	
.0005581245	.0000114151	.0011841025	.0018666370	.0025500550	.0023781048	.0020000883	.0013928487	
.0021803708	.0022446617	.0023605551	.0024121747	.0027777817	.0021946166	.0013928487	.0008716161	

×

FILTER WEIGHTS

Low Pass Filter with Ramp between 6.0 and 7.0 sample intervals

.0651944685	.0565475246	.0350507525	.0129249210	-.0004854695
.0565475246	.0488155731	.0294527525	.0100091674	-.0013680602
.0350507525	.0294527525	.0167771479	.0034710528	-.0030378798
.0129249210	.0100091674	.0034710528	-.0020736578	-.0036390822
-.0004854695	-.0013680602	-.0030378798	-.0036390822	-.0024664094

E.L.635-WAROOKA

CONTOURS OF FILTERED RESIDUAL TOTAL MAGNETIC INTENSITY (band pass filter)

SCALE 1:50,000

CONTOUR INTERVAL: 20nT

NOMINAL FLIGHT HEIGHT: 60m

NOMINAL FLIGHT LINE SEPARATION: 250m

PREPARED BY PITT RESEARCH FROM DATA OBTAINED BY GEOEX PTY. LTD. IN 1980

3852-II-12

FIG. 10