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# M.I.M. EXPLORATION PTY. LTD. TECHNICAL REPORT

No. 1917

TITLE:

SUBSTITUTE EXPLORATION LICENCE No. 7389 "GRANITE MARGIN" N.T.

FIRST ANNUAL REPORT: YEAR ENDED 23 APRIL1992

ISSUING DEPARTMENT:

EXPLORATION

AUTHOR:

IAN BRUCE

INVESTIGATIONS

CONDUCTED BY: DARWIN BASED M.I.M EXPLORATION STAFF

SUBMITTED BY:

P.G. SIMPSON

DATE:

MAY 1992

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#### FIRST ANNUAL REPORT for SEL7389 N.T.

#### 1. INTRODUCTION AND SUMMARY

Substitute Exploration Licence No. 7389 "Granite Margin" was granted on 24th. April, 1991 to Carpentaria Gold Pty. Ltd. for four years to consolidate title to three contiguous Exploration Licences which had been previously granted to the company.

Processing and interpretation in early 1991 of the data from an aeromagnetic survey indicated that the complex magnetic aureole around the southern contact of the Mount Bundey granite is transected and possibly controlled by a number of north-south lineaments.

These lineaments appear to be the loci for dolerite intrusions and quartz veining and a possible zone of magnetic depletion of the magnetic aureole.

The "Lunchtime" bullseye magnetic anomaly, which is located along one of the lineaments was soil sampled and traversed with ground magnetics in 1990. Follow up in 1991 included a 92 hole/ 334m Aircore drilling programme.

The sample results of the Aircore drilling gave only scattered, moderate Au and base metal anomalies.

The potential for significant mineralisation in the area appears to be at depths of 200-400m, given the southward plunge of the fold axes and the results of modelling of the magnetics.

#### 2. LOCATION AND ACCESS

SEL7389 is located south of Mount Bundey in the Mary River locality, approximately 90km southeast of Darwin in the Northern Territory (Figure 1).

The Licence is located within the Mary River and the McKinlay River 1: 100 000 sheets (5272, 5271) and in the Darwin and Pine Creek 1: 250 000 sheets (SD52-4, SD52-8).

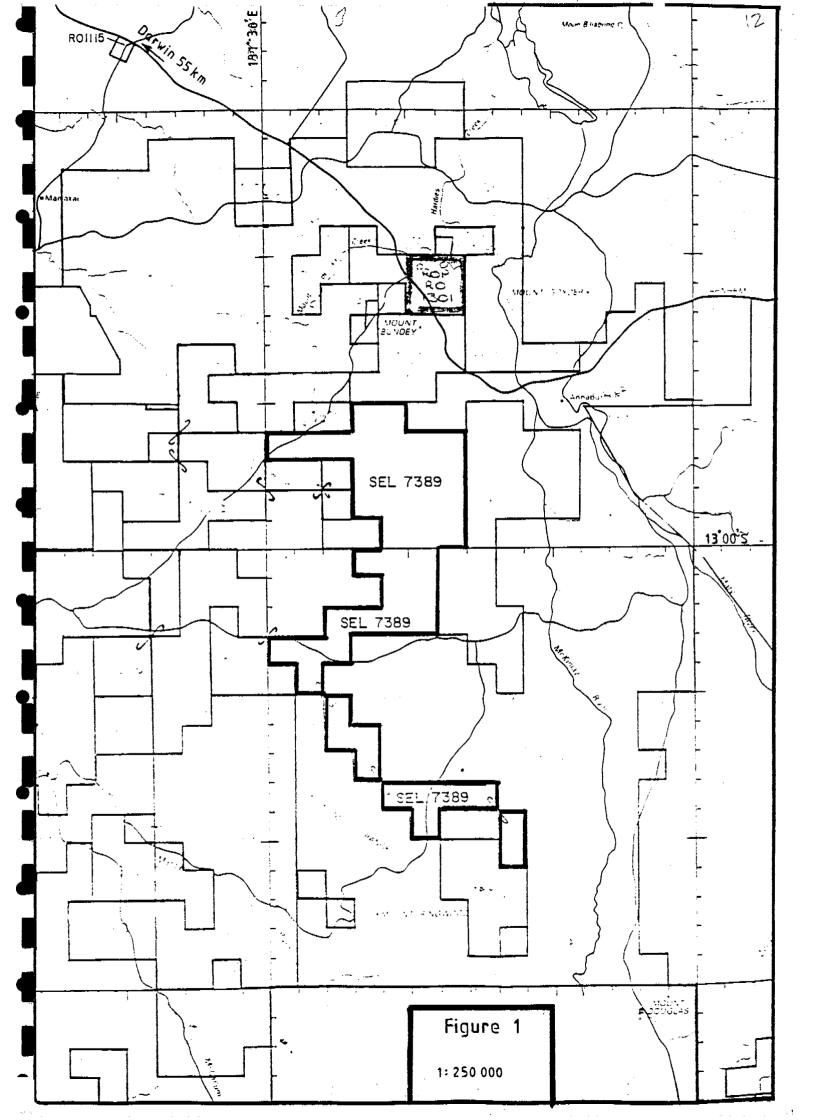
The relevant 1:50 000 sheets are Mount Bundey (5272-111) and Mount Ringwood (5271-1V).

Access from Darwin is gained via the Stuart and Arnhem Highways to a turnoff about 1km before the Mary River bridge, thence southwest via station tracks for about 4km to the eastern boundary of the Licence.

Alternative access is via the Deepwater Road, which meets the Arnhem Highway about 2km east of the Mount Bundey Creek crossing. A station track turns off the Deepwater Road about 10 km from the Arnhem Highway and this track can be followed for two km to the northwestern corner of the Licence.

The Licence is located on Old Mount Bundey Pastoral Lease No. 931 and the Mt.Ringwood Pastoral Lease No. 718. The southeastern blocks are located on McKinlay River Pastoral Lease No. 932.

The unsealed access tracks may be boggy and impassable during the wet season, November to April.



#### 3. TENURE

Substitute Exploration Licence No. 7389, consisting of 44 blocks was applied for by Carpentaria Gold Pty. Ltd. on 12th February, 1991. The purpose of the SEL application was to consolidate title to Exploration Licence Nos. 5346, 7083 and 7166, which had already been granted to Carpentaria Gold (Table 1).

SEL7389 was granted on 24th April, 1991, for a term of four years.

Carpentaria Gold Pty. Ltd. is a wholly owned subsidiary company of MIM Holdings Limited (MIM). Since June, 1991, exploration of tenements held by MIM has been conducted by MIM Exploration Pty. Ltd.

A relinquishment of 22 of the 44 original blocks was effected on the 24th. April, 1992 (Figure 2).

TABLE 1
TENEMENTS REPLACED by SEL7389

Tenement	Name	Date of Grant
EL5346	Woodleigh	23.10.87
EL7083	Koolant	12.12.90
EL7166	Gumtree	26.11.90

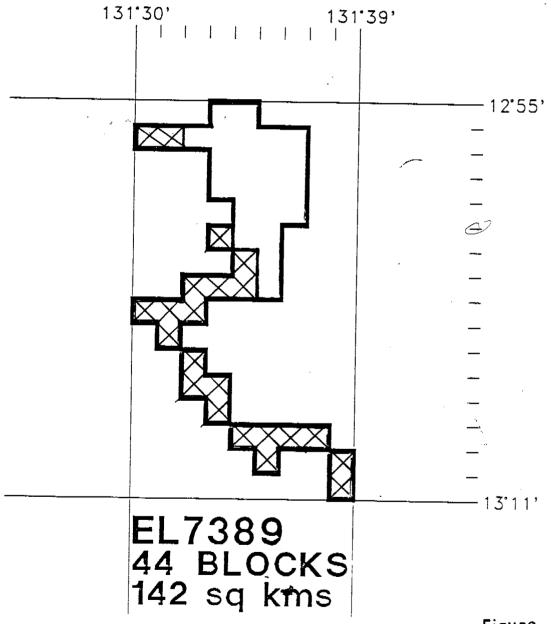


Figure 2
MIM EXPLORATION PTY/LTD.

#### 4. REGIONAL GEOLOGY

The regional geology of the Darwin 1:250 000 sheet area is described by Pietsch and Stuart-Smith (1987) and the regional geology of the area of the Claims is represented on the BMR - NTGS 1:100 000 map of The Geology of the Mary River - Point Stuart Region (1983).

Metasedimentary rocks of the early Proterozoic South Alligator Group (Koolpin Formation to Mt.Bonnie Formation) and the Finniss River Group (Burrell Creek Formation) are tightly folded about a number of southerly plunging fold axes. The Mount Bundey granite intrudes the northern part of the Licence area and dykes or sills of dolerite intrude the metasedimentary sequence, generally striking parallel to the fold axes.

A weak, near vertical slatey to phyllitic cleavage is developed in the lutites. Chiastolite crystals may be developed in shales within the contact aureole of the granite.

Regional magnetic data show that the mount Bundey granite was intruded at the intersection of 130/310° and 040/220° magnetic lineaments (Figure 3). The magnetic anomaly of the granite appears sinistrally displaced by the 130/310° lineament, which is part of a set of two dolerite dykes (Pietsch and Stuart-Smith, 1987).

#### 5. PREVIOUS WORK

In the mid 1970's Geopeko explored the southern contact of the Mount Bundey Granite for uranium, base metals and gold, under EL142. Programmes of airborne and ground magnetics and radiometrics, soil sampling and drilling identified the Quest 29,30,42 and 44 base metal and gold prospects, which were placed under a number of mineral claims and leases. These tenements were subject to a joint venture agreement between Geopeko and Carpentaria Gold since 1989, but have recently been sold to a third party.

A consortium led by Pan D'or Mining NL explored parts of the area under EL1653 in the late 1970's. Pan D'or identified other gold prospects adjacent to Quest 29 and 30, which are now held by Mssrs. Roberts and Parkinson.

Newmont Australia explored the eastern part of the area for gold from April 1987 to 1990, under EL5008. An intensive programme of BCL and soil sampling, mapping and rock chipping identified several prospects of gossanous, veined and brecciated Koolpin Formation, but the results of limited drilling were disappointing.

Parts of SEL7389 had been previously held by Carpentaria Gold under EL5346 "Woodleigh", but progressively relinquished during 1988-89 after disappointing BCL results. New exploration models focussing on intrusive contacts led to renewed interest in the area from late 1989, and these areas were reapplied for as EL7166 "Gumtree".

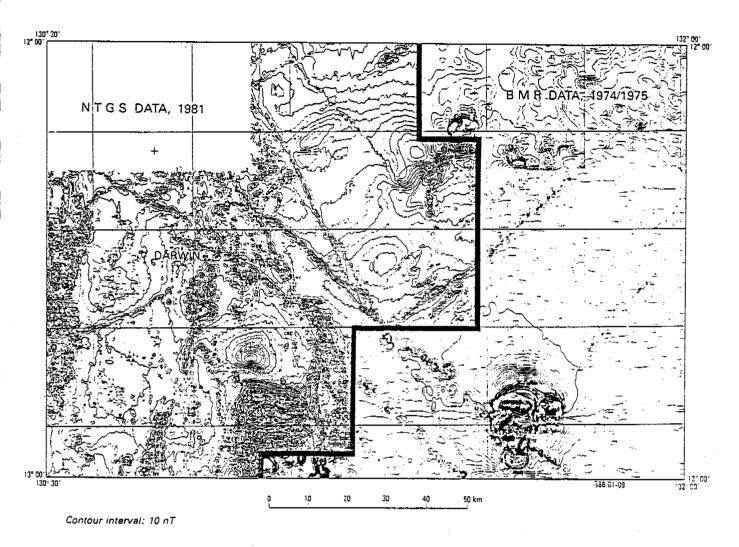


Figure 3 Total magnetic intensity contours of DARWIN.

(after Pietsch & Stuart-Smith, 1987)

#### CARPENTARIA GOLD PTY. LTD. WORK PROGRAMME

#### 6. AIRBORNE MAGNETICS SURVEY

#### 6.1 IMAGE PROCESSING

A 10km x 10km block of detailed aeromagnetics was flown by Aerodata in August 1990, over the northern part of SEL7389. A plan of contoured total magnetic intensity was presented in the 1991 Annual Reports for former EL No's. 5346, 7083 and 7166, and is reproduced herein with the present SEL boundary marked (Drawing No. 33207).

Image processing of the magnetics and radiometrics was undertaken by Geoimage Pty. Ltd. of Brisbane in September, 1990. Twenty-four separate images were produced of greyscale and rainbow magnetics, with various shade directions and incorporating vertical derivatives. A copy of the Geoimage report is included here as Appendix 1, and colour copies of four of the images are included as Drawing No's. 33121, 33124, 33125 and 33127.

An interpretative plan of the magnetics was prepared by MIM staff geophysicist Mike Shalley in early 1991, presented here as Drawing No. 33166.

Interpretation of the magnetic imagery was done by Mike Shalley in collaboration with Darwin-based geologists. A memorandum which summarises the interpretation is included here as Appendix 2.

The dominant feature is the crescent-shaped zone of complex, moderate to high magnetic intensity which curves around the southern margin of the granite.

There is no clear zone of low (dipolar) response to the south as would be expected, given the relatively low magnetic inclination of the area, about -40°. A dipolar response should not be expected where the source has a shallow dip to the south, which has been confirmed by quantitative interpretation of several of the anomalies (see later) and which agrees with the postulated southerly plunge of the intrusive.

The Quest gold and base metal prospects are located within the crescent-shaped zone of intense magnetics and generally on the flanks of magnetic highs. Outcropping dolerite is often associated with the mineralisation.

While the dolerites may contribute to the magnetic anomalies they are probably not the only source, as magnetic susceptibilities expected of dolerite are lower than those modelled for the anomalies by this interpretation.

Several smaller anomalies were identified south of the main crescent-shaped zone, including Anomaly A, "Lunchtime" and Anomaly F, "Beehive". A zone of magnetic depletion in the southern rim of the main anomaly was also noted - Anomaly G.

Several linear, low to moderate amplitude anomalies (approx. 100nT) trend north-south, approximately parallel to geological strike. At first it was thought that these may reflect particularly magnetic stratigraphic units, such as the Mt. Bonnie Formation. Flexures and offsets suggest small scale faulting, and tight arcuate trends resemble fold closures.

Three of these 350-360° linear anomalies at AMG coordinates 778 000E, 784 000E and 785 000E, by their position and orientation appear to bound the Mt. Bundey magnetic anomaly (see Drawings 33166, 33207 and 33121-127). By inference, these structures may have controlled the intrusion of the granite.

The presence of dolerite dykes parallel to the structures at 778 600E, 8566400N and 784 200E, 8561 700N lends support to this argument.

#### 6.2 QUANTITATIVE INTERPRETATION

Quantitative interpretation was carried out on three lines - AA1, BC and DE (Drawing No. 33166), using the Toolkit Plus interpretation package.

The models are of course only a simplification, and interpretation of dip is subject to uncertainties since remnant magnetisation of the host rocks is unknown and has been assumed to be zero.

Anomaly A (Lunchtime) is interpreted as being 205m deep and dipping west. The lack of a dipolar low to the south could be due to either a shallow, southward plunge or by some connection with the next anomaly to the south at 783000E, 8560500N (Drawing No. 33207).

Anomalies B,C and D,E in the main magnetic aureole are interpreted to be 60-80m deep and dipping shallowly to the southeast and southwest, respectively.

#### 7. LUNCHTIME PROSPECT

#### 7.1 GEOLOGY and GROUND MAGNETICS

Exploration of Aeromagnetic Anomaly A in 1990 located a 350m +10ppb Au-in-soil anomaly oriented parallel to strike, open to the south and possibly to the north. Peak result was 40.3ppb Au (Witham, 1991(2)).

The anomaly is hosted by lateritised Koolpin Formation on the moderately steeply dipping, west limb of an anticline. A strike-parallel dolerite dyke is located 50m west of and downslope of the soil anomaly.

The position of the magnetic anomaly was delineated further by a ground magnetic survey in late 1990. A Geometrics G856 proton magnetometer was used with a 3m staff. Readings were taken every 10m on east-west lines at 50m line spacings. The data was processed on Magpac software and the profiles generated on Lotus 1-2-3.

Ground magnetic traverses located the axis of the 100-150nT magnetic anomaly approximately coincidental with the outcropping dolerite. A plan of contoured ground magnetics was provided by Witham, 1991(2), and the eight magnetic profiles are included as Appendix 4 herein.

#### 7.2 AIRCORE DRILLING

A 92 hole/334m aircore drilling programme was undertaken at Lunchtime in October,1991 to test the Au-in-soil anomalism below the lateritic duricrust and to define the true extent of the dolerite.

The drillholes were collared at 10m intervals along lines 8562300N, 8562450N, 8562500N and 8562600N and drilled to saprolite at an average depth of 3.6m. The off-the-face and reverse circulation construction of the BQ bit and rods prevent excessive downhole contamination so that it was feasible to sample only the lowermost 1m of the drillhole. The drilling contractor was R.W.Tracey of Childers, Queensland.

Plans of drillcollars, geology and Au, As, Cu, Pb and Zn assay results are enclosed.

The depth to the magnetic anomaly is estimated at 200m (Appendix 2) and the depth to the top of the Koolpin Formation could be 400 to 900m, if one assumes a 10-20° plunge of the anticlinal axis from the Quest 29 area (Drawing No. 33047).

Given that the mineralisation may be reasonably deep it was assumed that the surface expression would be quite subtle and low detection analytical methods were used for Au analyses.

#### 7.3 GEOCHEMICAL RESULTS

Log probability plots were constructed to determine population thresholds for Au, Cu, Pb, Zn and As. The upper threshold and peak analytical results for each of the elements are as follows:

	<u>Upper Threshold</u>	<u>Peak Value</u>
Au ppb Cu ppm Pb ppm	39 200 112	180 330 460
Zn ppm	190	1150
As ppm	181	460

Aircore drilling defined a 300m Au anomaly at about 783010E, trending 355° and open to the north and south. The line spacing was too broad and irregular to define the width of the anomaly.

Comparison with the Au-in-soil results reported in Witham, 1991(2) reveals a 20m to 50m westward or downslope dispersion of the soil results relative to the Aircore results.

There is a reasonable spatial correlation between Au and As, a weaker Au-Zn correlation and little correlation between Au and the other metals. The base metal results and to a lesser extent As show some downslope dispersion from the main Au anomaly.

Anomalous values for the base metals tend to be scattered and do not form coherent clusters, except for a small grouping at 8562400N, 782920 to 782960E, which coincides with an inlier or raft of chert and siltstone within the dolerite intrusion. This cluster has associated Au and As anomalies at 782950E.

Correlation coefficients were calculated for various pairs of elements to test the apparent scattered distribution of anomalies. The Au-As correlation is confirmed but the Au-Zn correlation is shown to be false. There is at best a weak Cu-Zn correlation, and the other base metal pairs show no correlation.

Element Pair	Correlation Coefficient
Au-As	0.6249
Au-Pb	0.1211
Au-Cu	0.1519
Au-Zn	-0.0360
Cu-Zn	0.2429
Cu-Pb	0.1309
Cu-As	0.1606
Pb-Zn	-0.2003
Pb-As	0.3761
Zn-As	-0.1747

#### 8. BEEHIVE

A local, 25-50nT magnetic high and adjacent magnetic low (Anomalies F,G of Drawing 33166) are located on the western flank of an anticline at the contact between Gerowie Tuff and Koolpin Formation.

Ground magnetic traverses in 1990 of Anomaly F (Appendix 5) revealed a broad, regular high with some noise on the western side, over outcrop of Gerowie Tuff.

Anomaly G is interpreted as a zone of magnetic depletion in the complex magnetic aureole of the Mt. Bundey Granite, and hence potentially significant.

The contoured and processed magnetics and geology (Drawing Nos. 33047, 33125, 33207) indicate that a north-south trending magnetic lineament at 782400E intersects the magnetic aureole coincidental with Anomaly G.

The 782400E lineament "hosts" a number of dolerite sills or dykes and quartz veins, as well as the Lunchtime magnetic Anomaly A.

The Anomaly G depletion zone is considered to be quite prospective and will be targetted for follow up.

#### 9. CONCLUSIONS

The greatest potential for significant gold or base metal mineralisation in SEL7389 is considered to be along a north-south lineament which appears to have acted as a locus for magnetisation at Anomaly A "Lunchtime" and for demagnetisation at Anomaly G. Dolerite intrusion and quartz veins are also developed along this lineament, which may be a deep seated structure associated with the emplacement of the Mount Bundey Granite.

Interpretation of airborne magnetics in 1991 indicated a source depth of 200m for the Lunchtime magnetic anomaly.

Aircore drilling at "Lunchtime" confirmed the presence of a 300m gold-arsenic anomaly, open in both directions, with associated scattered, weak base metal anomalies. The Aircore drill pattern needs to be filled in and extended along strike, and followed up by percussion/diamond drilling. The deeper drilling would need to be guided by improved ground magnetics and IP.

The zone of possible demagnetisation at Anomaly G should also be followed up with Aircore drilling, ground magnetics and IP.

#### **REFERENCES**

Pietsch B.A.

and Stuart-Smith P.G., 1987: DARWIN SD52-4 1:250,000

Geological Map Series Explanatory Notes

NTGS Publication, 1987

Witham, W.J.A., 1991(1):

Termination Report on Part A of

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Exploration Licence No.5346

Carpentaria Gold Pty.Ltd. Technical Report No. 179

to the N.T. Department of Mines

Witham, W.J.A., 1991(2):

Exploration Licence No.7083

"Koolant" N.T.

First and Final Report

Carpentaria Gold Pty.Ltd. Technical Report No. 177

to the N.T. Department of Mines

Witham, W.J.A., 1991(3):

Exploration Licence No.7166

"Gumtree" N.T.

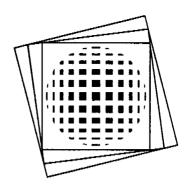
First and Final Report

Carpentaria Gold Pty. Ltd. Technical report No. 178

to the N.T. Department of Mines

# APPENDIX 1

GEOIMAGE
Processing of Airborne Magnetics
Granite Margin, Northern Territory



# GEOIMAGE SPECIALISTS IN IMAGE PROCESSING AND REMOTE SENSING APPLICATIONS

#### PROCESSING OF

#### AIRBORNE MAGNETICS

GRANITE MARGIN, NORTHERN TERRITORY

for

CARPENTARIA EXPLORATION COMPANY PTY. LTD.

R.N. WALKER SEPTEMBER, 1990

#### INTRODUCTION

Under instructions from Carpentaria Exploration Company, an airborne geophysical survey identified as the Granite Margin Area to the south-east of Tom's Gully was image processed. The data was obtained as a located data tape from Aerodata who also supplied a 20 metre grid of the magnetics.

The data was examined by William Witham on the ER Mapper and Disimp systems.

#### PROCESSING

The magnetics grid had the following characteristics

BLHC 776 000 E, 8 560 360 N

Sample, lines 520, 525 Pixel sizes 20, 20

Vertical derivative (VD) and vertical derivative with automatic gain control (VDG) files were produced from the flight line data and then gridded with the same characteristics, using a minimum curvature algorithm. (See Appendix 2)

The magnetics data was used to derive the greyscale shade images at various sun azimuth angles, whereas the VD image was used to derive the shade illumination component of the colour shade images.

The radiometrics data was corrected with the following parameters before gridding with the same characteristics as above.

#### Stripping Coefficients

Alpha	0.495
Beta	0.457
Gamma	1.110
Delta	0.174

#### Height Corrections

Total Count	0.006600
Potassium	0.007500
Uranium	0.005600
Thorium	0.005600

Appendix 1 contains output from runs converting the real grid files to byte files.

All real grid files were backed up as ER Mapper files on optical disc.

#### LIST OF SLIDES

- 1 Greyscale magnetics.
- 2 Greyscale vertical derivative.
- 3 Greyscale vertical derivative with automatic gain.
- 4 Rainbow pseudocoloured magnetics with vertical shade.
- 5 Rainbow pseudocoloured magnetics with the vertical derivative introduced as the intensity in a HSI transform.
- Rainbow pseudocoloured magnetics with the vertical derivative with automatic gain introduced as the intensity in a HSI transform.
- 7 Greyscale 00 azimuth 26 altitude shade image on the magnetics.
- 8 Rainbow pseudocoloured magnetics with a 00 azimuth 26 altitude shade on the vertical derivative.
- 9 Greyscale 45 azimuth 26 altitude shade image on the magnetics.
- 10 Rainbow pseudocoloured magnetics with a 45 az 26 altitude shade on the vertical derivative.
- 11 Greyscale 90 azimuth 26 altitude shade image on the magnetics.
- 12 Rainbow pseudocoloured magnetics with a 90 azimuth 26 altitude shade on the vertical derivative.
- 13 Greyscale 135 azimuth 26 altitude shade image on the magnetics.
- 14 Rainbow pseudocoloured magnetics with a 135 azimuth 26 altitude shade on the vertical derivative.
- 3-channel radiometrics. Potassium-red, thorium-green and uranium-blue.
- 16 Composite radiometrics-magnetics image. Potassium-red, thorium-green and uranium-blue. Shade is the vertical derivative.

# APPENDIX 1 - REAL TO BYTE CONVERSION RUNS

# Magnetics

BYTE VALUE	REAL VALUES
1	46722.78
16	46763.74
32	46794.16
48	46818.69
64	46839.28
80	46870.46
96	46901.80
112	46922.27
128	46944.75
144	46967.66
160	46987.39
176	47006.89
192	47068.38
208	47175.37
224	47255.02
240	47327.35
256	47797.03

# Vertical Derivative

•	
BYTE VALUE	REAL VALUES
1	-32.02
16	-15.50
32	-9.47
48	<del>-</del> 5.09
64	-2.74
80	-1.62
96	-0.92
112	-0.48
128	-0.19
144	0.05
160	0.41
176	1.13
192	2.41
208	4.65
224	9.07
240	16.06
256	197.28

# APPENDIX 1 - REAL TO BYTE CONVERSION RUNS (ctd)

# Vertical Derivative with Automatic Gain Control

BYTE VALUE 1 16 32	REAL VALUES -2.39 -1.94
48	-1.69 -1.47
64	-1.27
80	<del>-</del> 1.07
96	-0.86
112	-0.63
128	-0.32
144	0.10
160	0.58
176	1.02
192	1.37
208	1.67
224	1.91
240	2.10
256	2.96

# Radiometrics (TC, K, U, Th)

BYTE VALUE	REAL VALUES	}		
1	1531.43	3.71	21.08	46.42
16	1796.29	22.87	30.49	55.92
32	1943.43	31.61	36.10	63.19
48	2153.06	39.61	41.15	69.79
64	2417.46	48.79	46.73	77.08
80	2660.13	59.20	52.51	85.09
96	2913.67	71.48	58.52	93.36
112	3182.60	86.08	64.60	102.71
128	3447.91	103.56	71.04	112.17
144	3696.02	123.36	78.18	122.40
160	3982.16	146.88	86.57	135.97
176	5018.50	191.08	102.21	172.35
192	7513.14	282.91	129.04	250.30
208	8116.65	330.64	146.68	272.73
224	8487.90	363.14	158.57	287.57
240	8794.09	386.23	167.34	298.52
256	10521.64	496.43	230.39	359.24

#### APPENDIX 2 - VERTICAL DERIVATIVES

 $\mathbb{Z}_{J}$ 

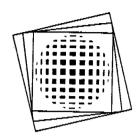
Vertical derivatives are used to improve the resolution of small scale anomalies caused by near surface magnetic sources, and to suppress the longer wavelength anomalies resulting from deeper sources. Derivatives can be calculated using a one dimensional operator and this is usually done on the original flight line data prior to gridding, or using a two dimensional operator on the grid file.

One dimensional operators tend to suppress local anomaly trends which parallel or near-parallel the flight line direction. This however can also be an advantage of the one-dimensional operator in that on poorly levelled data it will suppress or even remove artefacts caused by poor levelling.

In image products produced from vertical derivative grids, the usual distribution of data is such that the major anomalies will be very obvious however the weaker trends in the less magnetic units will tend to fall around a greyscale value of 127 and be difficult to see. This can be overcome using the technique of "Automatic Gain Control" (AGC) as suggested by S. Rajagoplan (Conference Volume, 5th ASEG Conference, 1987). In this technique, the vertical derivative is calculated along the flight line and the relative amplitude of each data point is adjusted by dividing by the gain in a window around the data point. The gain is defined as the inverse of the root mean square of the original data values in the window.

The result of the vertical derivative with AGC is to emphasise small anomalies in low gradient areas while suppressing high amplitude anomalies in high gradient areas.

Geoimage routinely carries out vertical derivative and vertical derivative with AGC operations on the original flight line data prior to gridding.



# GEOIMAGE SPECIALISTS IN IMAGE PROCESSING AND REMOTE SENSING APPLICATIONS

March 3, 1991

Mr M. Shalley Carpentaria Exploration Company GPO Box 1042 Brisbane 4001

Dear Mike,

Please find attached 2 copies of a set of 35 mm slides of the Granite Margin radiometrics. The numbering on the slides has been continued on from the slides in our September 1990 report. The enhancements are as follows-

Slide 17 Greyscale total count
Slide 18 Rainbow pseudocoloured total count.
Slide 19 Greyscale potassium
Slide 20 Rainbow pseudocoloured potassium
Slide 21 Greyscale uranium
Slide 22 Rainbow pseudocoloured uranium.
Slide 23 Greyscale thorium
Slide 24 Rainbow pseudocoloured thorium.

Yours sincerely

/Scb R.N.Walker

# APPENDIX 2

MEMORANDUM from M.J.Shalley Mount Bundey Granite Margin Airborne Geophysical Survey

# **MEMORANDUM**

From : M.J. SHALLEY

To : I. BRUCE '

Attn : P.G. SIMPSON

Date : February 14, 1991.

Ref : MJS:SF:TECH.

Subject: MOUNT BUNDEY GRANITE MARGIN AIRBORNE GEOPHYSICAL

SURVEY

#### SUMMARY

This report follows the release of my draft report (February 4, 1991) and the subsequent discussions with Peter Simpson and Ian Bruce, Darwin Office.

Mineralization in the Mount Bundey Granite Margin area is generally confined to a crescent shaped zone of magnetic activity immediately to the south of the granite. Gold is likely to be the most important metal but lead and zinc also occur. Most of the gold mineralization occurs on the flanks of local magnetic highs and is often associated with dolerite. The dolerite may contribute to local magnetic anomalies but is probably not the only source.

A marked magnetic low, producing a bifurcation in the southern edge of the crescent shaped zone, is worth follow-up. It may be associated with magnetite/pyrrhotite depletion, hopefully caused by ore bearing fluids.

Anomaly A (the Lunchtime Anomaly) lies to the south of the main complex. A gold geochemical high to 41 p.p.b. is associated with the magnetic high.

#### RECOMMENDATIONS

- Collect magnetic susceptibility data from drill cuttings, outcrop and drill core as it becomes available. This should be aimed at identifying all sources of magnetic anomaly.
- 2. Collect a few oriented samples of magnetic rock types for magnetic remanence tests. Drill core is the best source of samples since weathering and lightning strikes can cause confusion with surface samples. Remanence tests cost about \$50 per sample so sampling should be judicious.
- 3. Initiate ground follow-up (geological mapping and geochemical sampling) of the magnetic low Anomaly G.

- 4. Check the Lunchtime Au geochemical anomaly with shallow drilling before deciding on a geophysical programme.
- 5. Obtain 35 mm colour slides of radiometric channels (K,U,Th). These have been ordered from Geoimage.

#### 1. INTRODUCTION

The Mount Bundey Granite Margin airborne geophysical survey was flown and compiled by Aerodata from July to September 1990. Survey specifications are set out in Appendix 1. The important aspects of the specifications are:

Flight line spacing	200 m
Flight line direction	East-West
Mean Terrain Clearance	70 m
Navigation	Syledis

The Syledis navigation and flight path recovery system provides location accuracy to ±5 m or better.

# 2. <u>DATA SUPPLIED FOR INTERPRETATION</u>

The data supplied by Darwin Office for interpretation includes :

Total field magnetic contours  1 nT contour interval	) Scales 1:10 000 ) 1:25 000
Flight path map	1:25 000
Stacked magnetic profiles	1:25 000
First vertical derivative stacked profiles	1:25 000
Geological sketch map	1:25 000

Image Processing Report by R.N. Walker (GEOIMAGE)

The image processing report contained sixteen 35 mm slides of total field magnetics with a selection of shade filters generally based on first vertical derivative data. Two slides contained composite radiometric data (potassium - red, uranium - blue, thorium - green). There were no slides of individual radiometric bands, but these have since been ordered from Geoimage (K,U,Th).

Notes on ground magnetic responses have been supplied by lan Bruce.

#### 3. GEOLOGY

The geological map is very sketchy. It provides broad outlines of sedimentary units and intrusives from oldest to youngest as follows:

South Alligator Group

Koolpin Formation, Gerowie Tuff and Mount

Bonnie Formation

Finniss River Group

Burrell Creek Formation

Zamu Dolomite

a massive quartz dolerite

Mount Bundey Granite

The sediments strike approximately north-south. The distribution of sediments indicates the existence of an anticline with Koolpin Formation contained in the core. The very limited dip information shows the west limb dipping west (45° to 80°??). The exposed apparent thicknesses of Gerowie Tuff suggest that the east limb dips more steeply than the west limb.

The Zamu Dolerite occurs as irregularly distributed small patches of outcrop, generally ovoid in shape and up to 300 m long and 100 m wide. The outcrop shape suggests dykes but the irregular pattern of distribution does not really support that idea. The concentration of outcrops south of the Bundey Granite suggests a relationship between the two intrusives but does not give much clue to the subsurface distribution of dolerite.

Current drilling of the Quest 29 gold target shows that the dolerite in that area is a sill which strikes N-S and dips at 10-20° to the east. The outcrop coincides reasonably well with a local magnetic high.

The Mount Bundey Granite outcrops in the northern part of the area and appears to be intrusive into the sediments. The geological map falls short of the northern boundary of the magnetic map by about 1.2 km and covers only the southern margin of the granite. Ian Bruce reports that the Mount Bundey Granite/Mount Goyder Syenite complex has a N-S elliptical outcrop which may be due, in part, to a southerly plunge of the intrusive body. The Quest 29 and Quest 30 mineralized zones, dipping westerly and easterly respectively, may be concentric ring fractures developed around the southern flank of the intrusion (cooling/collapse tensional fractures).

Note that the Mount Goyder Syenite does not occur within the mapped area.

#### 4. MINERALIZATION

Three prospects are noted on the map. They are:

Quest 29, gold
Quest 30 East, lead
and The Bob Smith Reef (Ag-Zn-Pb)

Other prospects noted on a sketch map (Fig.1) supplied by lan Bruce are:

BHS, gold Saddle Anomaly, gold Quest 29, lead Quest 30 West, gold Lunchtime Anomaly Beehive Anomaly

Quest 29 (gold) is a significant gold prospect with an estimated resource of 115 000 t grading 6 g. It is situated on the eastern flank of a magnetic high (confirmed by ground magnetics). The Saddle gold anomaly, which lies about 900 m to the north-west is situated on a similar magnetic structure. The Quest 29 lead target lies on the western flank of a separate magnetic anomaly.

The Bob Smith Reef and BHS gold anomaly lie on the western and eastern flanks respectively of the same magnetic high.

Quest 30 West is a gold-in-soil anomaly with some mineralized quartz veining. The anomaly, with an associated parallel dolerite outcrop, lies on the north-western flank of a strong and shallow sourced magnetic high.

Quest 30 East (lead ) lies near the peak of a broad, deep sourced magnetic high.

The Beehive anomaly is a local magnetic high at the southern end of a broader magnetic complex. Ground follow-up so far has not indicated any associated mineralization.

The Lunchtime anomaly is an isolated bullseye magnetic high south of the granite margin. Soil samples from the area show elevated gold values with a peak of 41 p.p.b. contained in a 200 m strike length zone of >20 p.p.b.

Ground magnetics suggests that the anomaly is sourced within Koolpin Formation. However, the source may not be outcropping so its nature is the subject of speculation at this stage.

#### 5. MAGNETIC DATA

#### 5.1. Qualitative Interpretation

The magnetic contour map and processed images projected from 35 mm colour slides were used to pick out the main features and to relate them to the geological map. A transparent overlay was prepared to assist with correlation (Plate 1).

#### 5.1-1. Dominant Feature

The dominant feature of the magnetic map is a crescent shaped area of moderate to high magnetic intensity which lies around the southern margin of the granite. It varies considerably in character, indicating a complex arrangement of magnetic sources within the zone.

A notable characteristic of the magnetic pattern is that there is no zone of low response to the south. Given the comparatively low magnetic inclination for the area (about -40°), we should expect to see a broad and well developed magnetic low to the south of the highs, except where the source has a relatively shallow dip to the south. Quantitative interpretation (next para.) confirms shallow dips to the south-east and south-west. This agrees with lan Bruce's model of a south plunging intrusive.

All of the known mineralization, with the exception of the Lunchtime anomaly, lies within this crescent shaped magnetic zone. Mineralization generally lies on the flanks of magnetic highs and is often associated with outcropping dolerite. The dolerite probably contributes to local magnetic anomalies but may not be the only source (see below). Also, the relationship of the dolerite to the mineralization is not clear. It may be that the dolerite is intruding the fractures (tensional) which provided the plumbing for the mineralizing fluids. Some magnetic property measurements (susceptibility and remanence) on the dolerite would be helpful. Core samples will be available after the next drilling programme (probably in April).

In the absence of concrete geological evidence, the source(s) of this complex magnetic high is a matter for speculation. Three possibilities are worth consideration:

- (1) banded iron formations within the sediments
- (2) dolerite
- (3) skarn developed from the intrusive granite.

Quantitative interpretation (see next para.) indicates magnetic susceptibilities in the range 0.01 to 0.02 cgs. Note, however, that no account has been taken of remanent magnetization, for which we have no information. The susceptibilities noted above are higher than those expected for a dolerite. They are quite consistent with either banded iron or skarn.

#### 5.1-2. Smaller Anomalies

There are several bullseye anomalies to the south of the main feature. One of these, Anomaly A (or the Lunchtime Anomaly), has been subjected to quantitative interpretation. It probably forms part of a more extensive unit continuing to the south, where the anomaly develops again. Correlation with geology shows that the zone is associated with the axis of the anticline which contains Koolpin Formation.

Geochemical soil sampling has revealed an anomaly of up to 41 p.p.b. contained within a zone of >20 p.p.b. having a strike length of 200 m. Cherty siltstones are noted in the same area. A parallel dolerite dyke outcrops to the west. Ground magnetics confirms that the magnetic anomaly is contained within Koolpin Formation. Some quantitative interpretation of the ground magnetics is warranted, since my interpretation of the airborne anomaly gives a depth to source of about 200 m. The ground survey will give a better definition.

If Anomaly A proves to contain significant mineralization, then its southern extension should also be examined closely. Nearby isolated anomalies such as "F" should also be checked.

There are several linear, generally north-south trending anomalies within the sediments. They vary in amplitude from very low to moderate (about 100 nT). As best as can be judged from the existing geological map, the anomalies closely parallel the trend of the sediments and they are therefore believed to be caused by stratigraphic units containing either pyrrhotite or magnetite or a bit of both (e.g. the Mount Bonnie Formation trend). Flexures and offsets in some cases suggest small scale faulting. Another interesting feature of these is the fact that in a few cases we see rather tight arcuate trends which look like fold closures (Plate 1). If they are fold closures they suggest tight folding which, Ian Bruce assures me, is consistent with regional geology.

A south-west to north-east trending magnetic anomaly (labelled DY-DY on the overlay) is almost certainly caused by a magnetic dyke. There is no geological expression shown on the existing map.

There is weak and generally irregular magnetic expression within the granites - a typical granite response.

Trend lines picked out from the image processing are generally south-west to northeast. A few other directions are also represented.

A significant feature within the magnetic complex is a local low causing a bifurcation of the crescent shaped zone of activity near its southern edge (Anomaly G). Bearing in mind that gold may occur in association with magnetic lows, this deserves some ground follow-up.

#### 5.2. Quantitative Interpretation

Quantitative interpretation was carried out on three lines which were picked off the contour map. They are AA¹ across Anomaly A, BC across Anomalies B and C, and DE across anomalies D and E.

A cautionary note must apply to all quantitative interpretation. The models available in most interpretation packages (including Toolkit Plus used here) are simplifications of what occurs in nature. This is particularly so for the complex anomalies addressed here. Interpretations of dip are always subject to error caused by remanent

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magnetization unless this is known and accounted for in the modelling. Such errors can be very large. In this case, since we do not know the strength or direction of remanence, it has been assumed to be zero. Finally, there is generally some trade-off between thickness of source and its magnetic susceptibility. This is particularly so if thickness is less than depth to top, in which case only the product of thickness and magnetic susceptibility is well defined.

Results of quantitative interpretation are listed below.

#### Anomaly A (Lunchtime Anomaly)

Depth	205 m
Thickness	200 m
Magnetic Susceptibility	0.012 cgs
Dip	50° to West

The lack of a magnetic low to the south of this anomaly can be explained in two ways:

- 1) The source has some degree of connection with that from the next anomaly to the south.
- 2) The source plunges at a shallow angle to the south.

#### Anomaly B

Depth	64 m
Thickness	230 m
Magnetic Susceptibility	0.018 cgs
Dip	20° to S.E.

#### Anomaly C

Depth	184 m
Thickness	400 m
Magnetic Susceptibility	0.019 cgs
Dip	20° to S.E.

You will note the quite distinct difference in depth for these two adjacent anomalies.

The modelling indicates that the sources are separate and that C is not simply a complication of the dip or plunge of B.

#### Anomaly D

Depth	81 m
Thickness	150 m
Magnetic Susceptibility	0.011 cgs
Dip	35° to S.W.

Anomaly E

Depth
Thickness
Magnetic Susceptibility
Dip

64 m 150 m 0.02 cgs 30° to S.W.  $A_{N}$ 

#### 6. RADIOMETRICS

The radiometric data available at present are only in the form of composite processed colour slides (potassium, uranium and thorium). Processed slides of individual channels have been ordered from Geoimage.

The granite, as expected, has the brightest signature, indicating elevated values in all three elements. The only exception to this is an area in the north-east corner, where a dark signature indicates depressed values. Since this falls outside the mapped area, the reason for the change of signature is not known.

Two patches of blue-green signature, indicating elevated uranium and thorium, occur to the west of the granite. They may be related to drain patterns but this cannot be checked from available mapping.

Four small zones of pinkish signature (potassium and uranium) occur to the south of the granite, generally within Koolpin Formation. There is no geological explanation for the signature.

### 7. IMPLICATIONS FOR MINERALIZATION AND EXPLORATION

Most of the known mineralization is associated with the crescent shaped zone of magnetic activity. Mineralization generally lies on the flanks of local magnetic highs and gold in particular is often associated with dolerite intrusives (sills or dykes). I do not see any definable character for anomalies associated with mineralization so further exploration should continue along the lines already established. However, to improve our understanding of the magnetic response we should collect magnetic property data (susceptibility and remanence) from drill core or cuttings and outcrop where possible.

The magnetic low which bifurcates the southern edge of the crescent shaped zone may have some significance for mineralization. It could be a zone of alteration causing magnetite/pyrrhotite depletion with, hopefully, associated mineralization. Further exploration of this zone should involve surface mapping aimed at defining alteration, if it exists. Some geochemical sampling should also be done. Ian Bruce suggests that there may be associated sulphidization or silicification.

If this is so, and if there is any geochemical support, a geophysical programme might be appropriate. I would recommend either IP or CSAMT, both of which are moderately expensive. Before deciding positively on a geophysical programme, I would want to see some support from either geology, geochemistry or both.

Anomaly A, the Lunchtime Anomaly, does have geological and geochemical support, albeit fairly weak (geochem. to 41 p.p.b. Au). I expect shallow drilling should be the next move, followed by IP or CSAMT if there is encouragement. I would like to see the results of the ground magnetics for this area. It may have some relevance in deciding future programmes.

#### **RECOMMENDATIONS**

- Collect magnetic susceptibility data from drill cuttings, outcrop and drill core as it becomes available. This should be aimed at identifying all sources of magnetic anomaly.
- 2. Collect a few oriented samples of magnetic rock types for magnetic remanence tests. Drill core is the best source of samples since weathering and lightning strikes can cause confusion with surface samples. Remanence tests cost about \$50 per sample so sampling should be judicious.
- 3. Initiate ground follow-up (geological mapping and geochemical sampling) of the magnetic low Anomaly G.
- 4. Check the Lunchtime Au geochemical anomaly with shallow drilling before deciding on a geophysical programme.
- 5. Obtain 35 mm colour slides of radiometric channels (K,U,Th). These have been ordered from Geoimage.

M.J. Shalley

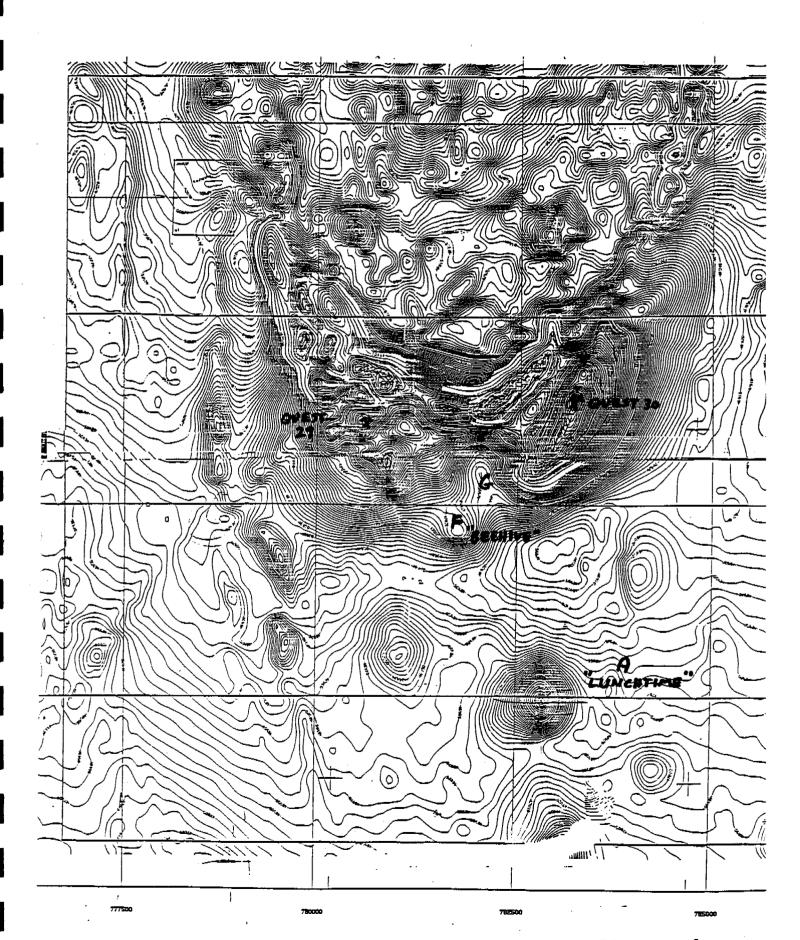


FIGURE 1

### SURVEY SPECIFICATIONS

#### **AIRCRAFT**

VH-ADH CESSNA 206G STATIONAIR II

#### MAGNETOMETER

SCINTREX VIW 2321-A2 SPLIT BEAM CESIUM VAPOUR

RESOLUTION

0.01 nanoTesia

CYCLE RATE

0.20 second

SAMPLE INTERVAL

13 metres (average)

#### SPECTROMETER

256 CHANNEL GEDMETRICS EXPLORANIUM GRB00

VOLUME

33.56 litres

CYCLE RATE

1.00 seconds

SAMPLE INTERVAL

65 metres (average)

#### DATA ACQUISITION

8 CHANNEL WATANABE MC 6700 CHART RECORDER AERODATA DIGITAL ACQUISITION SYSTEM HEWLETT PACKARD 300 SERIES COMPUTER

### FLIGHT LINE SPACING

TRAVERSE LINES

200 metres

TIE LINES

2000 metres

#### FLIGHT LINE DIRECTION

TRAVERSE LINES

090-270 degrees

TIE LINES

000-180 degrees

#### SURVEY HEIGHT

70 metres - mean terrain clearance

#### NAVIGATION

Syledis U.H.F. positioning system

#### FLIGHT PATH RECOVERY

Syledis U.H.F. positioned

### APPENDIX 3

LUNCHTIME Aircore Drilling
Assay Results



# CLASSIC LABORATORIES LTD

Incorporated in WA; a wholly owned subsidiary of Amdel Ltd

Postal Address: P.O. Box 58, Berrimah, Northern Territory 0828 Marjorie Street., P.O. Box 58, Berrimah, Northern Territory 0828 Telephone: (089) 32 2637 Facsimile: (089) 32 3531

MIM Exploration Pty Ltd P.O. Box 21 BERRIMAH

NT

0828

ANALYSIS REPORT

Your Reference : QP 95801

Our Reference : 1DN1456

Samples Received : 11/10/91

Results Reported: 17/10/91

Number of Samples: 93

Report Pages : 1 to 2

This report relates specifically to the samples tested in so far as the samples supplied are truly representative of the sample source.

If you have any enquiries please contact the undersigned quoting our reference as above.

Report Codes:

N.A. -Not Analysed

L.N.R. -Listed But Not Received

I.S. -Insufficient Sample

Giarrite Margin Lunchtime

Discore

Approved Signature:

for

ALAN CIPLYS

Manager - Darwin

CLASSIC LABORATORIES LTD

\*\*\* RELIABLE ANALYSES AND SERVICE \*\*\*



### CLASSIC LABORATORIES LTD

Job: 1DN1456 O/N: QP 95801 1

SAMPLE	Au	AuDp1	As	Cu	Pb	Zn
QP 95801	<0.01		<50	11	18	3
QP 95802	<0.01		<50	58	52	7
QP 95803	<0.01		<50	56	29	10
QP 95804	<0.01		<50	17	140	30
QP 95805	<0.01		<50	64	175	13
QP 95806	<0.01	<0.01	<50	67	13	23
QP 95807	<0.01		100	150	59	150
QP 95808	<0.01		<50	84	20	96
QP 95809	<0.01		<50	110	16	130
QP 95810	0.09		170	220	56	320
QP 95811	0.05		460	155	62	270
QP 95812	<0.01		60	89	22	110
QP 95813	<0.01	<0.01	<50	72	35	58
QP 95814	<0.01		60	56	31	22
QP 95815	<0.01		230	145	54	62
QP 95816	<0.01		140	140	60	105
QP 95817	<0.01		180	135	53	44
QP 95818	<0.01		100	89	49	73
QP 95819	<0.01		150	87	87	53
QP 95820	<0.01		100	82	82	54
QP 95821	<0.01	<0.01	190	105	220	91
QP 95822	<0.01		160	83	71	42
QP 95823	<0.01		< 50	120	72.	14
QP 95824	<0.01		<50	67	17	340
QP 95825	<0.01		< 50	51	20	260
QP 95826	<0.01		<50	78	16	1150
QP 95827	<0.01		<50	105	37	22
QP 95828	<0.01		<50	59	13	89
QP 95829	<0.01	<0.01	<50	64	11	67
QP 95830	<0.01		<50	210	38	490
QP 95831	<0.01		<50	250	16	250
QP 95832	<0.01		<50	84	15	220
QP 95833	<0.01		<50	24	44	130
QP 95834	<0.01		60	56	15	135
QP 95835	<0.01		80	84	84	47
QP 95836 QP 95837	<0.01 <0.01		140 60	110 125	65 63	82 71
QP 95837 QP 95838	<0.01		130	120	78	25
QP 95839	<0.01		210	99	73	91
QP 95840	<0.01		<50	30	63	42
QP 95841	<0.01		<50	140	75	105
QP 95842	<0.01		<50 <50	62	64	44
QP 95843	<0.01		250	67	89	88
QP 95844	<0.01		120	87	39	80
QP 95845	<0.01		140	59	96	42
QP 95846	<0.01		160	87	110	26
QP 95847	<0.01		150	85	100	38
QP 95848	<0.01		220	160	460	78
QP 95849	<0.01	<0.01	190	98	52	130
QP 95850	<0.01		70	46	72	25
mar						<b></b>
UNITS	ppm	ppm	ppm	mqq	ppm	ppm
DET.LIM SCHEME	0.01	0.01	50	2 AAS2	4 7792	2 AAS2
ocheme	FA1	FA1	AAS2	MMOZ	AAS2	AADZ



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Job: 1DN1456 O/N: QP 95801

SAMPLE	Au	AuDp1	As	Cu	Pb	Zn
QP 95851	<0.01		170	220	115	85
QP 95852	0.01		110	81	105	15
QP 95853	<0.01		<50	51	120	36
QP 95854	<0.01		160	37	110	16
QP 95855	<0.01		80	81	65	37
QP 95856	<0.01		180	180	120	21
QP 95857	<0.01		120	58	51	13
QP 95858	<0.01		<50	82	52	18
QP 95859	<0.01		120	59	35	60
QP 95860	<0.01		100	87	45	61
QP 95861	0.03		290	83	120	61
QP 95862	<0.01		190	135	77	330
QP 95863	<0.01		<50	185	58	130
QP 95864	<0.01	<0.01	<50	210	35	105
QP 95865	<0.01		<50	130	22	160
QP 95866	<0.01		100	150	26	82
QP 95867	<0.01		130	51	42	105
QP 95868	0.05		190	330	90	42
QP 95869	<0.01		120	310	13	180
QP 95870	<0.01		130	200	290	44
QP 95871	<0.01		<50	155	39	380
QP 95872	<0.01	<0.01	<50	69	11	87
QP 95873	<0.01		80	125	39	175
QP 95874	<0.01		<50	125	31	175
QP 95875	<0.01		70	260	54	185
QP 95876	<0.01		<50	67	12	160
QP 95877	<0.01		<50	81	5	250
QP 95878	<0.01		<50	115	22	41
QP 95879	<0.01	<0.01	<50	170	30	550
QP 95880	<0.01	<0.01	110	125	33	210
QP 95881	<0.01		80	61	8	58
QP 95882	<0.01		<50	57	14	62
QP 95883	<0.01		<50	195	36	830
QP 95884	<0.01		<50	86	30	400
QP 95885	<0.01		<50	56	52	540
QP 95886	<0.01		90	79	27	60
QP 95887	<0.01		90	88	140	32
QP 95888	<0.01	<0.01	100	68	45	34
QP 95889	<0.01		330	100	94	18
QP 95890	<0.01		130	60	40	23
QP 95891	<0.01		<50	115	38	48
QP 95892	0.04		200	175	130	340
QP 95893	0.09		440	51	62	76

UNITS	ppm	ppm	ppm	mqq	ppm	ppm
DET.LIM	0.01	0.01	<sup>-</sup> 50	2	4	2
SCHEME	FA1	FA1	AAS2	AAS2	AAS2	AAS2



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Job: 2DN0481 O/N: QP 95801

Sample	Au	AuDpl
95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 95803 979995 979995 979995 979995 979995 979995 979995 979995 979995 979995 979995 979995 979995 979995 979995 9799995 979999999999	<pre>&lt;0.001 0.005 0.0015 0.0015 0.0015 0.0017 0.0019 0.0019 0.0019 0.0019 0.0019 0.0010 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.001</pre>	0.001 0.083 0.083 0.006 0.006
DET.LIM SCHEME	0.001 FA3	0.001 FA3



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Job: 2DN0481 O/N: QP 95801

S	AMPLE	Au	AuDp1
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	95857 95858 95859 95860 95861 95862 95863	<0.001 <0.001 0.006 0.015 0.069 0.018 0.005	0.001
	95864 95865 95866 95867 95868 95869	0.003 0.011 0.001 <0.001 0.005 0.073 0.003	
QP QP QP QP QP QP	95870 95871 95872 95873 95874 95875	0.014 0.007 0.005 0.003 <0.001 0.017	0.014    
QP QP QP QP QP QP	95876 95877 95878 95879 95880 95881 95882	0.002 0.007 0.009 0.002 <0.001 0.001	0.008
QP QP QP QP QP QP	95883 95884 95885 95886 95887 95888	<0.001 <0.001 <0.001 0.014 0.003 <0.001	and Add day did day day day day day day
OP OP OP OP	95889 95890 95891 95892 95893	<0.001 0.006 0.010 0.062 0.18	

UNITS	ppm	ppm
DET.LIM	0.001	0.001
SCHEME	FA3	FA3

# Carpentaria Exploration Company Pty. Ltd.

SAMPLER'S INI	ITIALS: .	SAMPLE LEDGER 9-10-91 10 -91 10 -91 10 -91 10	
SAMPLE NO.	SAMPLE TYPE	GRANITE MINGON" - LUNCHIME -> DIS-	STORI REF.
9195501	Aiccore	formil 7-3 com 3-6 and with him have a commenced	<u></u>
02		67. 0-1 < h.	4-
03		13 0-1 of ble int = 50 contraints 1-2 Gram ret - 1 and 35	3
0.4		LG 0-1 = - gyill 1-2 cheens who and 24 organism	<u> </u>
05		15 6-1 Gran Per ayw 1-7 light groon sil silting /2 2)	2
06	•	assumble 2-3d. Un 3-4 dipon 700 litta Stephill LT 0-1 Red a aren semisilicens sittier 1-2 cleare	14
67		H all alth 2-3 clear to bk all state hand and I all the ellest	13
<b>0</b> 8		2-3 Light promin advisible in more that 3-4 dilhol (of)	4
09			1 1
/0		1100-1 Ferr own schort, 1-7 Tem gyw acht, 2-3 Ferr wht ayw ocht 3-4, Hard Gers ayw (dolent), 7.35  211 6-1' Ferr chtocket 1-2 Form gyw 2-3 Form whtayw 3-1 6-3 2012 2012 2012	155
/1		LIZO-1 BK mir Cht van Perc 1-7 Silve eaus cht . 7-3 Silver	14
12		212 7-1 Sil be choo tight by the 1-7 Frent sist (11) 4	14
/3		LIY 0-1 the anis ocithe 1-2 for cht eats 7-2	] <del>'}</del>
. 14 15		(15 0-1 For light ay/wht cht 1-2 Fer will which 2-3	7
16		LIGO-1 Venu terr grayracke 1-7 For silinfied t	14
17		(17 0-1 Ferr min attack endeht 1-2. Whitered ayw	4
18		Z-4 wht red aim & su cht Z18 0-1 Formald aim , 1-7 Sil chi dim with TED 72 Term aim 3-4 Sil who and aim	1
. /9		LIG J-1 Fear cht sil aval	1
2P9582 0		1200-1 wt apriceme alliceme alle	13
	DD =	diamond drillcore  WHITE - REGION  Percussion/rotary cuttings  VELLOW - RRICE	

PD percussion/rotary cuttings rotary airblast cuttings other drilling samples (specify)

other (specify)

soil sample

SS R P. stream sediment sample rock chip sample petrological sample

NOTE: PLEASE DESCRIBE SAMPLE LOCATION FULLY & CONCISELY

YELLOW - BRISBANE PINK - RETAIN

# Carpentaria Exploration Company Pty. Ltd.

WW MG HAR

·SAMPLER'S IN	TIALS:	DATE 9-10-91	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
SAMPLE NO.	SAMPLE TYPE	GRANITE MUREAN PROSTET 135 100015000	STORE REF.
Q195821	HIRCOR	271-0-1 - Siliceons red and Wade cht	2
22		L22 0-1 Siliceon red-black dd	3
73		C23 O-1 rid romange at 1-2 red day able at 3-4 Black	1/4
• 24	•	CZ4 0-1 Fe 511 s/s, 1-2 gy orange clas, 2-3 who gran	4
25		clay (dolerste)	4
26		pellits of clay, 2-3 = 9ft a room clay, 3-4, soft green what clay.	4
27		clear to bk cht, 2-3 light green gyn, 3-4 Ferr gyn & grad da	4
28		28 and Ferr ayward day 1-2 Red clay, 2-3, ight green clay, 3-4 Tight graday (dol? or gyn)	4
29		clay, 3-4 how your clay and mor physicales	4
30	-	2- 150 0-1 ist-cht sist 1-2 Ferr GN 2-3 Tight brown clay 34 hight from clay and ferr gyn,	1.p.
31		3-4 light green arm,	4
32:	1. Sp. 1.	3-4 what challeng a clay 2-3 hand brown clay	4
33		green day, 34 light inour sed day, 2-3 light	4
34		aren day, and holling pellos, 2-4 light	4
35		135 0-1 Fer sol stat, 1-2 For gyw and gtz 2-3 Ferr	4
<i>3</i> 6		L36 0-1 ilicens grey chets 1-1.7 ditto	1:
<i>3</i> 7		(37 04 Em Sil by x st. 1-2 silver in 1 silver	2
38		-38 0-1 -1 green-gray but 1-218 31 jm stet.	2
39		L39 0-1 >1 red cht	1
40		140 6-1 Dk red 31 chart 1-2: 1 red che 1 2-3	4
SAMPLE TYPE: D	D = 0	diamond drillcore 1 light gree /with 1	(2-D

SAMPLE TYPE: CODE:

DD = diamond drillcore PD = percussion/rotary

percussion/rotary cuttings rotary airblast cuttings other drilling samples (specify) WHITE - REGIONAL BASE YELLOW - BRISBANE PINK - RETAIN

S = soil sample SS = stream sediment sample R = rock chip sample P = petrological sample

other (specify)

NOTE: PLEASE DESCRIBE SAMPLE LOCATION FULLY & CONCISELY

### Carpentaria Exploration Company Pty. Ltd. SAMPLELEDGER

	•	SAMPLE LEDGER	Tark Kir
SAMPLER'S IN	ITIALS: .	WW/MG DATE: 9-10-91/	7
SAMPLE No.	SAMPLE TYPE	GRANITE MARKUN NT / LUNCHTME ANDMAN	STO
DP95841	AIFRE	clay and aux 3-4 Rod 10,000 = 14th 1/11 about	12
<u> </u>		1/42 0-1 Silved chart hard 1-7 dd d 4 -	1
43		For oin, 3-4-1 and and Quest Questions L+3 0-1 Fer sk- 7-2 which a local or 2-25	5
44		2-3 dilto, 3-Leight for sily	L;_
45	·	50 who ayou 50 fe sikel , 7-4	11
46		CHE 0-1- Fer DK SKY 1-7 BIK SK+ + man 4, 7-3	7
4-7		hemaine inchiquaywacke 7-41isht green inch all alvi 22000	1
48		2-3 Violy green arywards 2-1 light green Silicens Cill	4
49	·	149 0-4 Terri CINC/CT 1-7 CII and Mk gyw 2-3 cHrose Com ayw 3-4 CII was a new a reyworks	4
50		aren ayn, 3-4 light grow and close avisis. I	4
<i>S</i> 1		CSIO-1 Ferr Silterand egyn 1-7 dilto 7-3 light aroun aini 3-4 SII aren ann e For sist.	4
<b>5</b> 2		25207-Sil fe-r Zilktone 151-2.511 Con- sist 2-3 Con light area ability to Z-4 Ditto	4
√3	Non!	1530-1 CINE ZLAON R31808, Com Cit 1-2 W1-red	7:
54		2-3 HV 1-1 50 Gra Corn 50, 3-4 Blis whit alkington dat	4
<i>\</i> \( \langle 5	2000	LSS D-1 1 No 2450 SZOBNE D-1 G all 1-7: F- bit skit80	Zı
ζ6		LSD 0-1 Fer SIC+ 1-2 Dayn SD For alst 2-4 dittas	4
57		L570-7 Fix akt 7-7 12 cilston a haht may 1, 2-3	<u></u>
<u> </u>		-580-1 Ferr skt 12 Fer Ivillanum gyw est 2380	<u> </u>
<i>(</i> 9	1	59 0+1 Cidial arean allely 1-2 21 de cht 2.5 Fear	ナル
60		160 0-1 with deticht + For met 1-2 Black to clear s.1	<u></u>
MPLE TYPE: D	7	elet, 2-3 Nitta, 24 Cloris, to bleile cht	4

SAMPLE TYPE: CODE:

diamond drillcore percussion/rotary cuttings rotary airblast cuttings other drilling samples (specify) PD RAB =

WHITE - REGIONAL BASE YELLOW - BRISBANE PINK - RETAIN

soil sample

stream sediment sample rock chip sample petrological sample other (specify) cify)

NOTE: PLEASE DESCRIBE SAMPLE LOCATION FULLY & CONCISELY SAMPLER'S INITIALS: WIN IME DATE: THURS - 91

SAMPLER S IN		DATE: $\Omega = 1 \Omega = 1 \Omega$	-1.6
SAMPLE NO.	SAMPLE TYPE	Commence Margine Drosmer // John - 10	STORE REF.
QP95861	1.1.1.1.10 <sup>©</sup>	Cal 1-1 For obserbly 1-3 close out 75 s close out	3
(_2		162. Orthogram - normal desired person la - la 3-1/2 on	<i>i</i>
<i>6</i> 3		162 0-1 Jan = 161 1-7 F Armany and 7-3 your a chall	4
(,4		164 O-11 K-12 light am and 1-2 hout on to orange	۷
65	:	The on the distance of house and society will and	4
66	,	2-4 Onkin much there is not (1) and ?)	4
67		LATO-1 11 hard ont distill kill chall	1
ر 8		1.3 M+1/20 deanist sket 3-6-our de boirs et du - 4-	4
69		169 0-1 Fam red sil sist 1-7 light onen to inte our 7-3	C.f-
70		1-70 0-1 Form eld a clock 1-2 80 relaction strong	4
<b>41</b>		cht 7-3 mal and sight, 3-4-8, with promote sight and	4
7/2		172 0-1- salt at class 1-2 sed relatingelete 7-2 1	4
73		2-3 rol apa - bill-this - ( bill 2-4 - ) - and - bill	4
74		L74 O-1 Recorded DK Stat (carb) 1-2 ppt class and Com-	
75		75 0-1 For lot state oft) 1-7 For- 201 81 det 7-51	-
76	-	Chierto dan 3-4 jungi o am libra.	4-
77		L77 0-1 Bed an cht 182 port day 2-3 historia	Lja
78	•	1-78 0-1 GI Else it 1-2 R CHELLINGS MAY MAY TO 2-3 and e agreen secondaring soll holder promised to the content of	4
79		679 0-1 - 18506 7200 003 21 01 - 12-72/000 - 1 12-1 13-2	: 
QP9580		(S) 0-1 Ton - 1001, 500 0-2 6 1000 0 23	<u>L</u>

SAMPLE TYPE: CODE:

DD = diamond drillcore

PD = percussion/rotary cuttings
RAB = rotary airblast cuttings
other drilling samples (specify)

WHITE - REGIONAL BASE YELLOW - BRIBBANE PINK - RETAIN

1- A

S = soil sample
SS = stream sediment sample
R = rock chip sample
P = petrological sample
other (specify)

10 E.

NOTE: PLEASE DESCRIBE SAMPLE LOCATION FULLY & CONCISELY

# Carpentaria Exploration Company Pty. Ltd.

SAMPLE LEDGER THURS DATE: 10-10-91 SAMPLER'S INITIALS: ... 62300N SAMPLE LOCATION/DETAILS SAMPLE No. STORE TYPE MARCIN DECITION OF CITY LUNCHPHE ANDWAY REF. ALRONA 300N & 70E year - redulary 2-3 Red  $\sqrt{2}$ *©*3 84 **7**5 8 8 89 90 91-0-1 91 5134 mard 3 92 promy <1 93 fer sil sist 4 5 6 7 8 9 0

SAMPLE TYPE: CODE:

DD = diamond drillcore
PD = percussion/rorary c

PD = percussion/rotary cuttings RAB = rotary airblast cuttings other drilling samples (specify)

S = soil sample

SS = stream sediment sample
R = rock chip sample
P = petrological sample

other (specify)

NOTE: PLEASE DESCRIBE SAMPLE LOCATION FULLY & CONCISELY

WHITE - REGIONAL BASE

YELLOW - BRISBANE

PINK - RETAIN

### APPENDIX 4

#### LUNCHTIME ANOMALY

### Ground Magnetic Survey Profiles

Line 62400mN

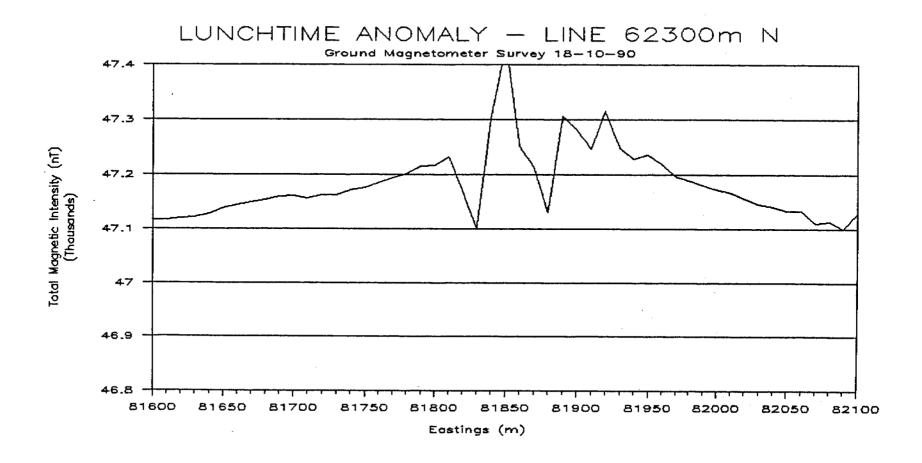
Line 62450mN

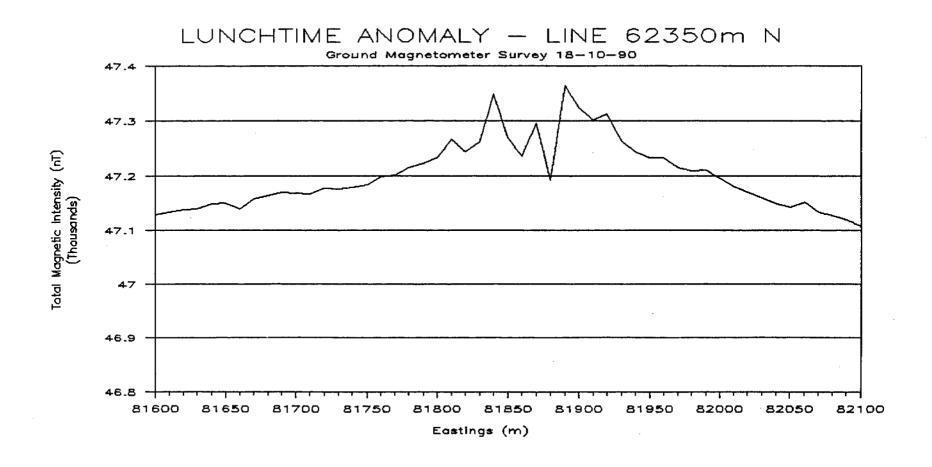
Line 62500mN

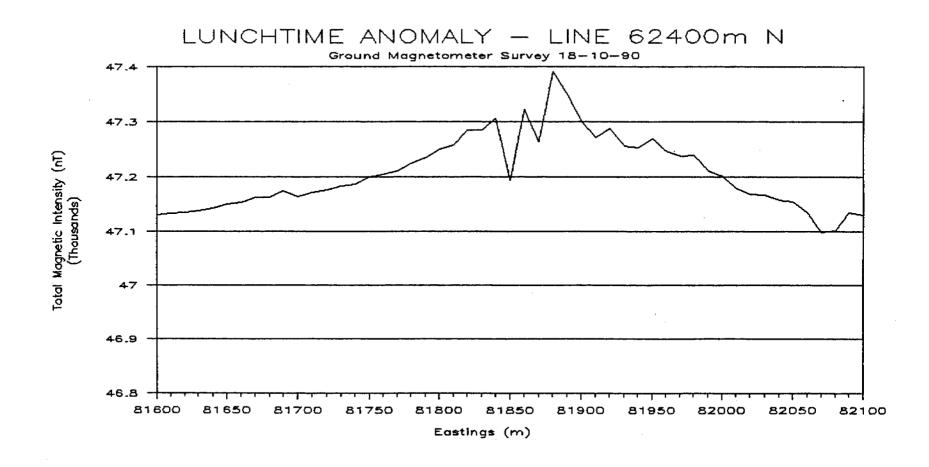
Line 62550mN

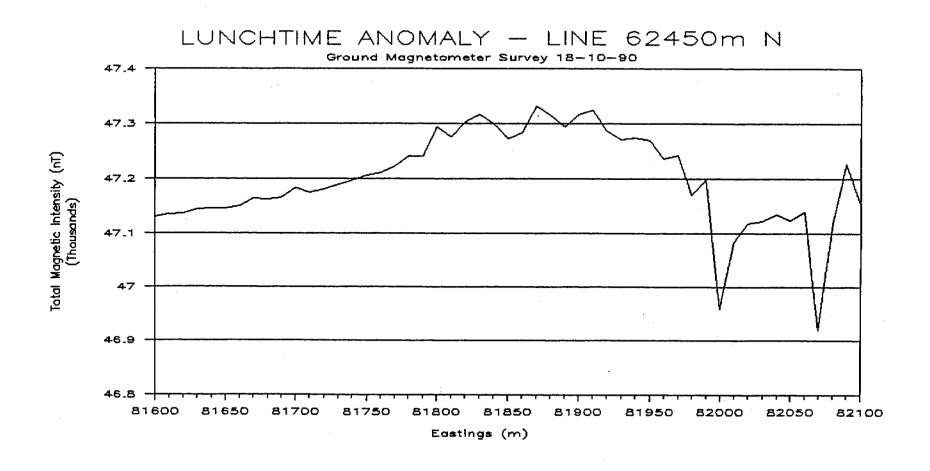
Line 62600mN

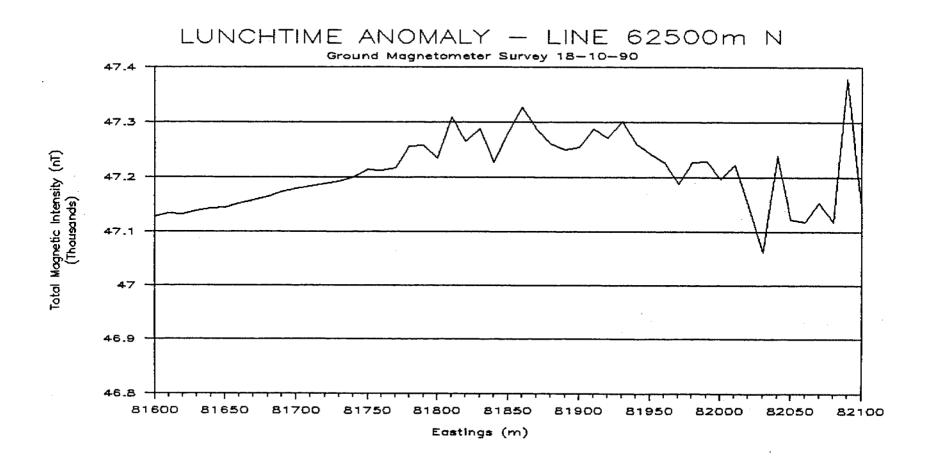
Line 62700mN

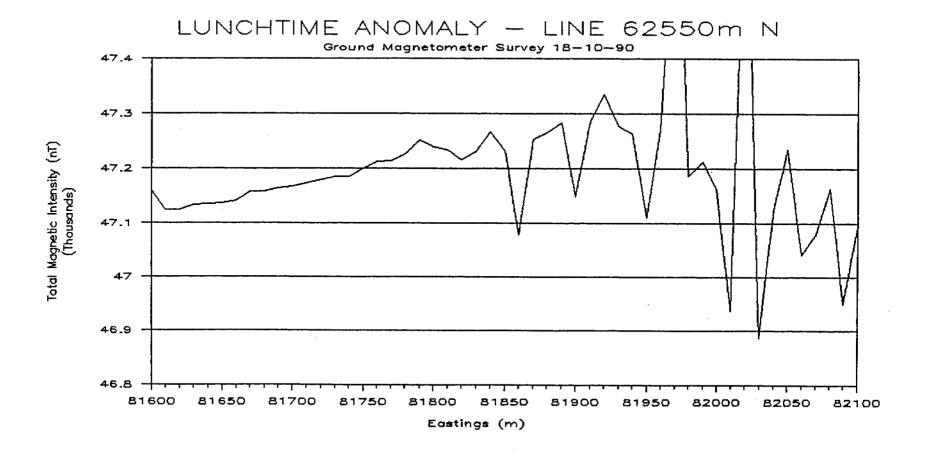


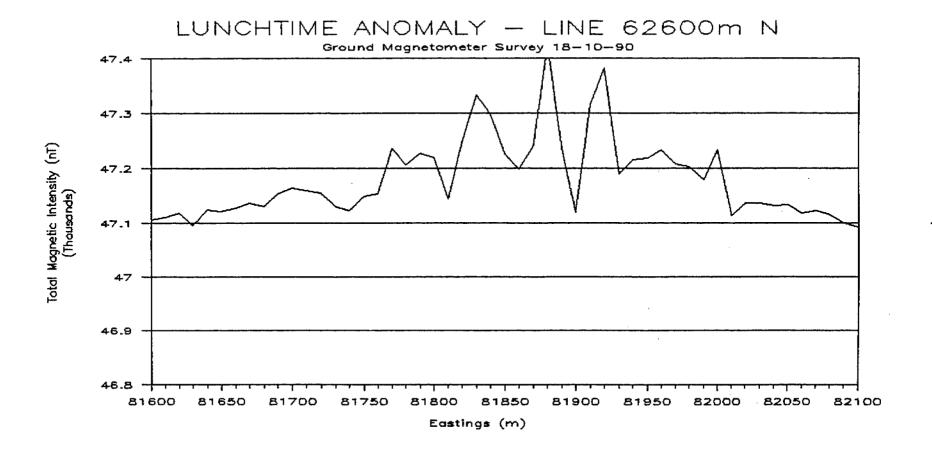


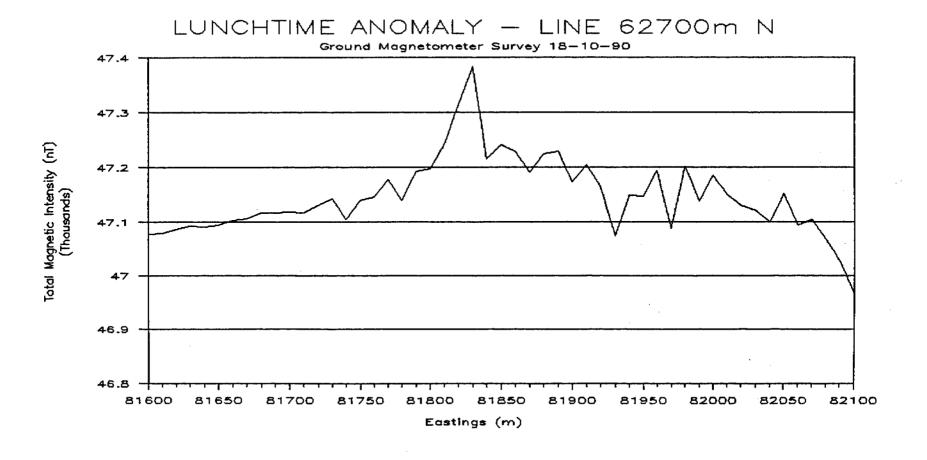












### APPENDIX 5

#### **BEEHIVE ANOMALY**

### **Groound Magnetic Profiles**

Line 64500m N

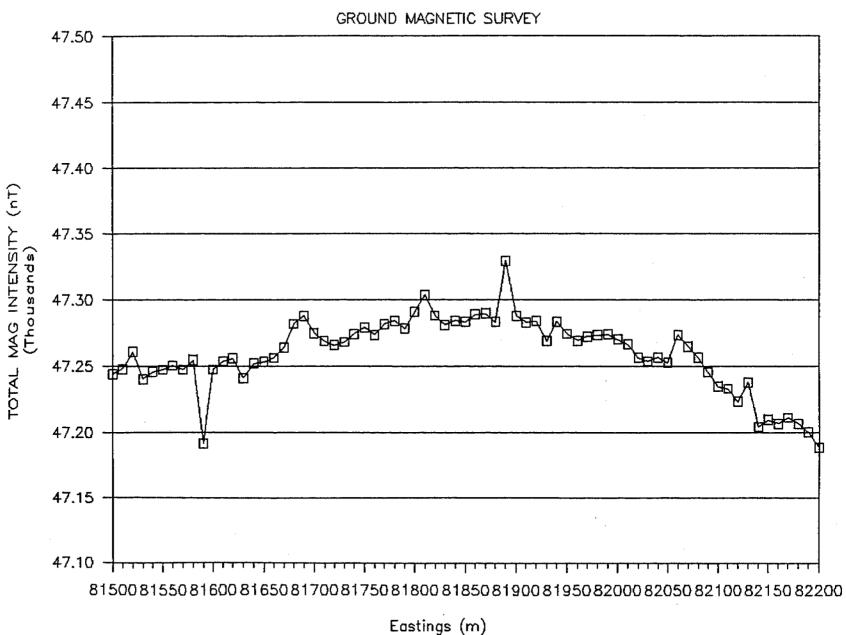
Line 64550m N

Line 64600m N

Line 64650m N

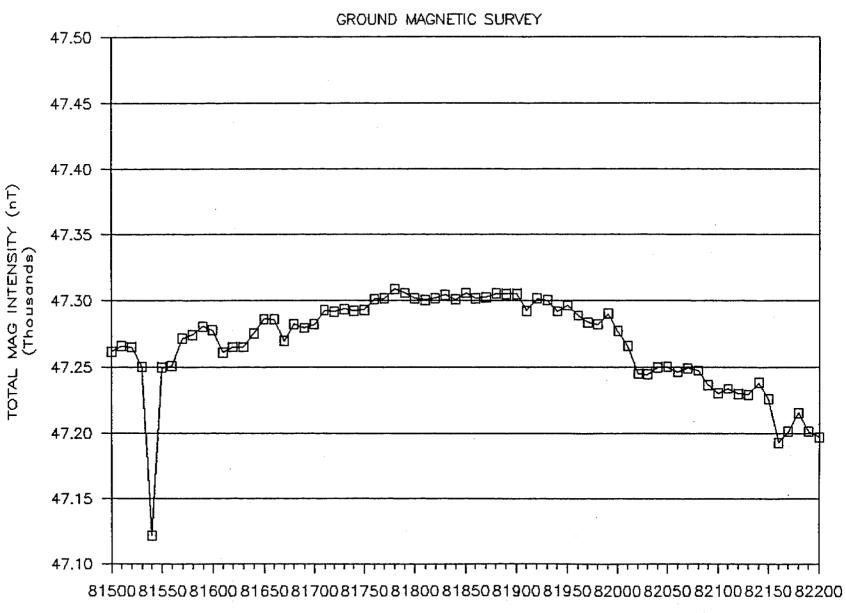
Line 64700m N

# BEEHIVE LINE 64500m N



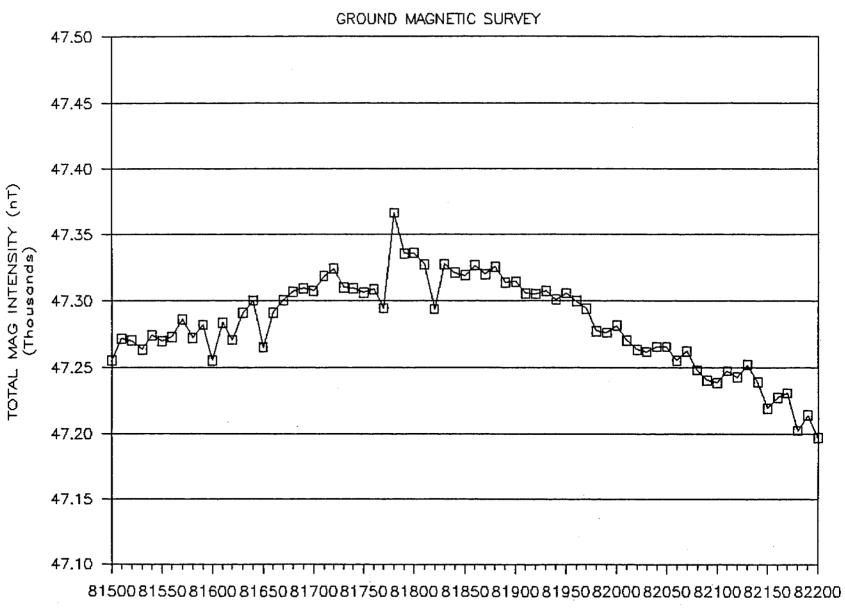
reading

# BEEHIVE LINE 64550m N



Eastings (m) □ reading

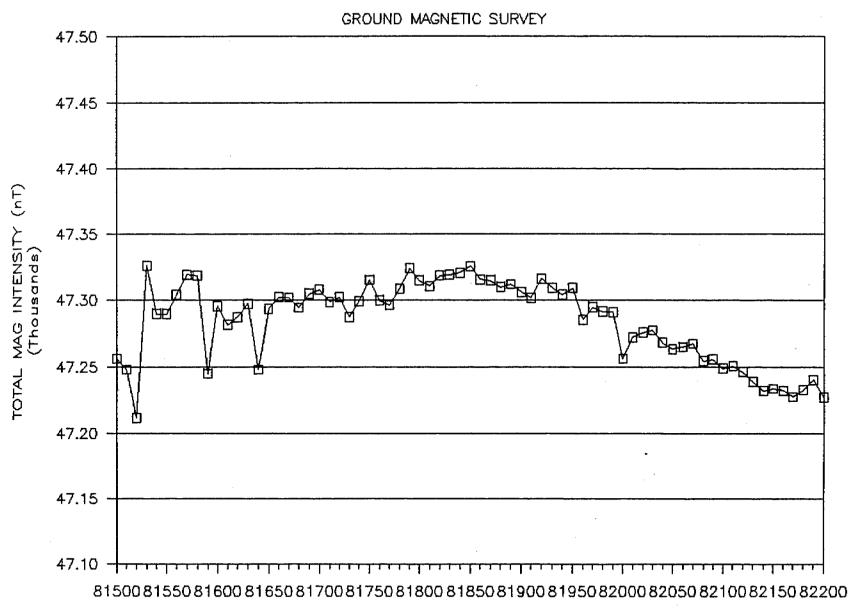
# BEEHIVE LINE 64600m N



Eastings (m)
□ reading

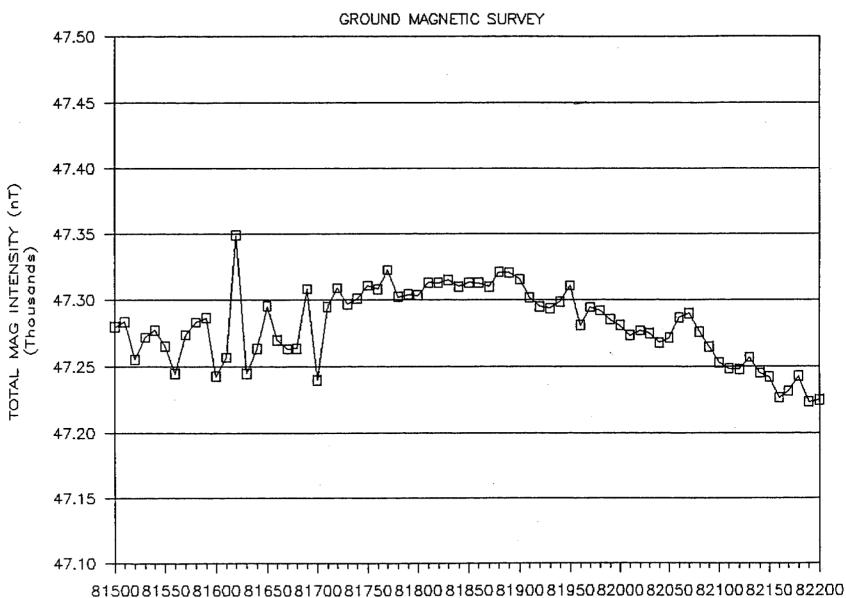


# BEEHIVE LINE 64650m N



Eastings (m) □ reading

## BEEHIVE LINE 64700 m N



Eastings (m)
□ reading

26.5.92 NORTHERN TERRITORY GEOLOGICAL SURVEY GEOSYSTEM DATA SHEET REPORT NO: CR TECHNICAL REPORT No. 1917 Substitute Exploration Licence No. 73:69 GRANITE MARGIN" N.T. FIRST ANNUAL REPORT: Year Ended 23rd april 1992. AUTHOR(S): /AN BRUCE M.I.M. EXPLORATION PTY. LTD. PUBLISHER PLACE OF PUB'N DARWIN DATE OF PUB'N 1992 REPORT TYPE:.....UNPUBLISHED.....PAGES OF TEXT\_\_\_20 CORE: LS LS DRILL CORE?\_\_\_\_\_ NONE ICENCE NO(S): SEL 73f9 LICENCEE(S): CARPENTARIA GOLD PTY. LTD. OINT VENTURE(S):\_\_\_\_\_\_\_\_ PERATOR(S): M.I.M. EXPLORATION PTT, LTD. 1: 1 000 000: 250 000: DARWIN SD 52-4, PINE CREEK SD 52-A 100 000: MARY RIVER 5272 M. KINLAY RIVER 5271 ROSPECT NAME(S): LUNCHTIME; ANOMALY G

And the state of the second se

Substitute Exploration Licence No. 7389 "Granite Margin" was granted on 24th. April, 1991 to Carpentaria Gold Pty. Ltd. for four years to consolidate title to three contiguous Exploration Licences which had been previously granted to the company.					
Processing and interpretation in early 1991 of the data from an aeromagnetic survey indicated that the complex magnetic aureole around the southern contact of the Mount Bundey granite is transected and possibly controlled by a number of north-south lineaments.					
These lineaments appear to be the loci for dolerite intrusions and quartz veining and a possible zone of magnetic depletion of the magnetic aureole.					
The "Lunchtime" bullseye magnetic anomaly, which is located along one of the lineaments was soil sampled and traversed with ground magnetics in 1990. Follow up in 1991 included a 92 hole/ 334m Aircore drilling programme.	a				
The sample results of the Aircore drilling gave only scattered, moderate Au and base metal anomalies.					
The potential for significant mineralisation in the area appears to be at depths of 200-400m, given the southward plunge of the fold axes and the results of modelling of the magnetics.					
	<u> </u>				
	· · · · · · · · · · · · · · · · · · ·				
TEXT LOCATION:					
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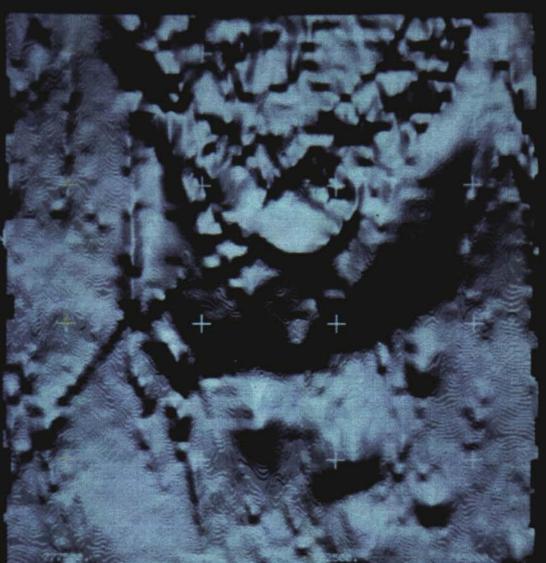
1557500

GRANITE MARGIN

8565000

SHADE ON MAGNETICS 80 AZ 26 ALT

6562500



7 7000

856758

9565000

2562500.

### **DRAWINGS**



