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SUMMARY

Exploration Licence 31/85, Mt. Stewart, was taken up by Billiton Australia to explore particular aeromagnetic anomalies that may relate to tin-tungsten bearing skarns associated with the Meredith Granite.

Ground checking of magnetic anomalies has failed to produce evidence of major skarn development. Trenching of a small magnetite skarn at Anomaly 'A' produced elevated base metal values, but there is limited thickness and strike extent.

Anomaly 'B' is not skarn related. In the west of the licence area, a large aeromagnetic anomaly (E) is related to disseminated pyrrhotite and magnetite in metamorphosed sediments adjacent to the Meredith Granite.

Preliminary sampling of the Mt. Stewart Ultramafic Complex has produced only low levels of P.G.E's, but high Cr values. Further exploration is recommended.

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1.0 INTRODUCTION

E.L. 31/85 was granted to Billiton Australia on 23rd December 1985, and covers 89 km² southwest of Luina in NW Tasmania, (Fig. 1).

The aim of the exploration was to test particular aeromagnetic anomalies for tin-tungsten bearing skarn mineralization.

Topographically the area is typically 'West Coast' with deeply incised valleys, steep slopes, dense vegetation cover, and high rainfall.

A wide-spaced grid has been erected (500m line spacing) over the ultramafic. Six lines were put in, plus tie-lines, with the intention of using the grid, plus the tracks through the area, for delineating the approximate extent of any laterite development. All grid lines and tracks were surveyed by ground magnetometer.

2.0 GEOLOGY

The EL is situated on the northern side of the Devonian Meredith Granite Batholith. It is underlain by the late Precambrian Success Creek Group and Crimson Creek Formation, the Mt. Stewart Ultramafic Complex and Silurio-Devonian sediments (Fig. 2).

The Cleveland Tin Mine is located 3.5 km north of the granite contact, where the mineralization (pyrrhotite-pyrite-cassiterite +chalcopyrite) is regarded as replacement of dolomitic units in the Crimson Creek Formation. This is the major deposit in the area, but other smaller replacement deposits are present, usually tin and/or tungsten skarn mineralization, closer to the granite contact. Mt. Youngbuck is a scheelite bearing amphibole-magnetite-pyrrhotite skarn, drill tested by Aberfoyle.

The ultramafic intrusives have been exploited for Os-Ir mainly, but also explored for PGE, chromite, nickel and gold. The Mt. Stewart Ultramafic Complex is a Layered Dunite-Harzburgite succession, with the southern half being underlain by Meredith Granite, and the northern half in faulted contact with Success Creek Group sediments.

Ordovician-Silurian-Devonian sediments occupy an area south of Heazlewood and probably represent the disrupted northern part of the Gordon Limestone/Eldon Group correlates of the Huskinson Syncline.

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3.0 WORK COMPLETED

3.1 Aeromagnetic Anomaly 'A' (Fig. 4).

Two trenches were excavated by hand, on line 9200N across the skarn, and on 9400N across the ground magnetic peak.

Both trenches were sampled at 1m intervals along the floor. The samples were analysed by Analabs, Burnie; the elements and methods are as below:

Cu Pb Zn Ag Mn: Code 101: Perchlorin Acid/AAS
As : Code 114: Vapour Generation/AAS
W Sn : Code 401: XRF

3.2 Aeromagnetic Anomaly 'E'

This anomaly is situated in the east of the licence (Fig. 3) and is a broad arcuate high that appears to parallel the Meredith Granite contact.

A detailed review of previous exploration by Aberfoyle showed that significant ground checking had been carried out. Several small grids had been put in, and mapping, sampling and ground magnetics carried out. A single traverse along the Whyte River was done by

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Billiton, involving mapping, sampling and ground magnetics. This was an uncontrolled survey, as it was intended as a confirmation of Aberfoyle findings.

3.3 Mt. Stewart Ultramafic Complex

13 km of grid lines and tie-lines were erected over the complex (Fig. 6). Line spacing is 500m. The grid was designed to provide access to define the approximate limited of laterite development over the ultramafics. From exploration carried out on other ultramafics on the west coast, it appears that PGE's are associated with chromite in laterites.

Four panned concentrate samples and three rock samples were analysed for PGE's, Au and Cr, by Analytical Services (WA) Pty. Ltd.

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4.0 RESULTS

4.1 Aeromagnetic Anomaly 'A'

The skarn discovered on line 9200N at 10180E is only 2m wide, and of limited strike extent, based on ground magnetics. There appears to be a lag development of skarn rubble, as evidenced by the presence of ferruginous and manganiferous clays beneath skarn rubble. The trench locations are shown on Fig. 5.

Assay results from the 9200N trench indicate elevated base metal values (Appendix 1 and Fig. 5). Element maxima are: Cu 205ppm, Pb 1850ppm, Zn 1950ppm, Ag 3ppm, Sn 140ppm, W 160ppm, As 140ppm, Mn 4.4%.

It is apparent that the skarn is not hosting Sn/W mineralization. The base metal values are not unusual in the region, there being several small lead-silver-zinc fissure fill deposits near Heazlewood and the Mt. Stewart Mine; which are obviously related to the Devonian Meredith Granite.

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4.2 Aeromagnetic Anomaly 'E'

Exploration by Aberfoyle indicated that the area is underlain by a sequence of rocks lithologically similar to the Crimson Creek Formation. The sediments are a monotonous sequence of volcanolithic sandstones, coarse siltstones, laminated cherty siltstones, shales and rare tuffaceous sediments and cherts. They are probably derived from a basic-intermediate volcanic source.

The sequence is within the metamorphic aureole of the Meredith Granite, and has been metasomatised, and in places altered to hornfels. The magnetic response is due to disseminated magnetite and pyrrhotite. From the aeromagnetic contours (Fig. 3) the anomaly is several kilometres in length, is arcuate around the Meredith Granite, and crosses the boundary between the Crimson Creek correlates and the Precambrian Whyte Schists to the west.

4.3 Mt. Stewart Ultramafic Complex

Three stream sediment samples collected in 1986 were analysed by Comlabs for Au, Pt, Pd and Cr. All except Cr were below level of detection (Appendix 1), but Cr varied from 9.9% to 14.6%. The samples were processed to produce a Heavy Mineral Concentrate.

009

During reconnaissance traverses along tracks in the area, four panned concentrates and three rock samples were collected. All assays are in the ppb range only. The best results were from a panned concentrate, Sample No. 3070, Pt 30, Pd 1, Ru 21, Rh 45, Ir 13, Os 10. Best Au value was 10ppb in Sample No. 3067. Cr values were all high, up to 45%.

In the rock samples the PGE values are similar to the HMC, but the Cr is in the range 0.4% to 2.9%.

Grid mapping has not yet been carried out, and several samples collected during surveying of the grid remain to be analysed.

Given the layered nature of the ultramafic, the variable distribution of laterite, and the obvious high levels of Cr, the potential of the complex has not been exhaustively tested for the presence of Au and PGE's.

The ground magnetic profiles of the grid survey are presented as Figs. 7 and 8. As expected over ultramafics, the data is noisy and the amplitudes are high (plotted at 1000nT/cm). A near-surface discrete anomaly on 402500N, centred at 359250E, is interesting and is situated over laterite.

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It is apparent that ground magnetics cannot be used to differentiate between layers in the complex. However, a more comprehensive survey, together with sophisticated computer enhancement may produce meaningful results.

5.0 CONCLUSIONS & RECOMMENDATIONS

The magnetic anomalies have been satisfactorily investigated. There is no major tin-tungsten skarn development associated with the anomalies.

The ultramafic is still largely untested. The high Cr values from the panned concentrate samples are a positive feature. In other ultramafic bodies in the region (e.g. Wilson River), the PGE's appear to be associated with Cr. A substantial geochemical sampling programme is required to determine the prospectivity.

The grid should be mapped, both to define basic rock types, but particularly to define the extent of the laterite.

The alluvial potential should be investigated.

APPENDIX 1
Sample Record Sheets

SAMPLE RECORD

SAMPLE TYPE: ROCK CHIP

LOCATION / PROJECT: MT STEWART

SAMPLER: D. HALL

DATE: OCT '86

MAP / PHOTO REF: _____

ASSAY LAB: ANALABS

SAMPLE DESPATCH _____

ASSAY REPORT NO: 204.0.08.03939

MAR '87

ORDER NO: 11560

204.0.08.04358

SAMPLE STORAGE: DEVONPORT

ANOMALY 'B'

SAMPLE No.	LOCATION		INTER'L (m)	ANALYSES										DESCRIPTION	
	N	E		Cu	Pb	Zn	Ag	Ni	Bi	Sn	W	Mn	As		
3050	9100	10000		90	<5	53	<0.5	50	<10	<3	<10				Green grey fresh Mg Qtz amphibole ± epidote + amphibole. Mag. fr. magnetite.
3051	9100	10000		145	25	75	0.5	45	<10	<3	<10				Green grey fresh magnetite Mg Qtz amphibole fragmental rock Qtz/epid. v. fine!
3052	9100	10000		40	<5	60	<0.5	95	10	<3	<10				Dark rock fragmental Qtz amphib. sh. fr. magnetite + fr. Qtz lnd. fracture fill.
3053	9100	10000		45	<5	70	<0.5	55	<10	<3	<10				Dark l. mag. skarnified pebble comp. Qtz c.
ANOMALY 'A' TRENCH SAMPLES															
3054	9200N	10177	1m	125	1250	985	2.0			55		4.430	34		Yellow & blue grey clay. Mn veining
3055	"	10178		120	555	1150	3.0			65		1.930	48		Grey clay; Mn veins
3056	"	10179		205	1850	1950	3.0			90		2.600	120		Brown ferrug. manganese clay
3057	"	10180		185	155	910	<0.5			55		2450	120		Fe stained green clay
3058	"	10181		90	125	650	<0.5			85		1700	120		White/orange clay; green mica
3059	"	10182		60	90	215	<0.5			140		1015	110		Yellow/orange clay; withed granite?
3060	9210N	10200	Grab	170	180	1025	<0.5			1500		1005	820		White magnetite, oxidised shales
3061	9400N	10279	1m	<5	10	10	<0.5			10		50	15		Weathered granite
3062	"	10280		<5	<5	5	<0.5			8		25	3		" " + Fe staining
3063	"	10281		<5	<5	5	<0.5			<3		25	3		" " " "
3064	"	10282		<5	<5	10	<0.5			5		30	2		" " " "
3065	"	10283		<5	<5	5	<0.5			<3		25	2		" " + tourmaline
3066	9200N	Trench	Grab	50	160	910	1.0			140		1900	110		Micaceous skarn vein

REMARKS: _____

834014



SAMPLE RECORD

SAMPLE TYPE: _____ LOCATION / PROJECT: MT. STEWART SAMPLER: _____ DATE: 19/5/87 MAP / PHOTO REF: 014
 ASSAY LAB: ANALYTICAL SERVICES SAMPLE DESPATCH _____ ASSAY REPORT NO: 32850
 ORDER NO: 11561

SAMPLE STORAGE: _____

SAMPLE No.	LOCATION		INTERL (m)	ANALYSES										DESCRIPTION	
	E	N		%Cr	Au	Pt	Pd	Ru	Rh	Ir	Os	Cr			
3004	LOUGHMAN CK			12.0	<0.01	<5	<1								
3005	"	"		14.6	<0.01	<5	<1								
3006	"	"		9.9	<0.01	<5	<1								
				←----- P.P.L. -----→ %/t.p.m											
3067				10	2.5	1.0	6.0	1.5	2.0	2	3.2%				
3068				<2	3.5	1.0	13	2.0	6.5	4	34%				} Panned Gne.
3069				2	3.5	1.0	19	3.5	8.0	8	45%				
3070				<2	30	1.0	21	4.5	13	10	34%				} Rocks
3071				2	7.0	1.0	8.0	2.5	3.0	2	2.9%				
3072				<2	2.0	1.0	7.5	1.5	4.0	2	3800				
3073				<2	2.0	1.0	8.5	1.5	0.5	<2	1.7%				

REMARKS: _____

834015

REFERENCE NUMBER 32850

19 MAY , 1987

ORDER NUMBER 11501

015

SHELL Co OF AUSTRALIA LTD

P.O. Box 860
DEVONPORT TASMANIA 7310

Analysis of Mineral Samples

ANALYSED BY :
ANALYTICAL SERVICES (WA) PTY LTD
19 AUGUSTA ST
WILLETTON WA 6155
TELEPHONE 457 1498 457 2589
TELEX AA 84767

AUTHORISED BY : T.K.CHAN

834016

SAMPLE NUMBER	Au ppb	Pt ppb	Pd ppb	Ru ppb	Rh ppb	Ir ppb	Os ppb	Cr ppm
3067	10	2.5	1.0	8.0	1.5	2.0	2	3.2%
3068	< 2	3.5	1.0	13	2.0	6.5	4	34%
3069	2	3.5	1.0	19	3.5	8.0	8	45%
3070	< 2	30	1.0	21	4.5	13	10	34%
3071	2	7.0	1.0	8.0	2.5	3.0	2	2.9%
3072	< 2	2.0	1.0	7.5	1.5	4.0	2	3800
3073	< 2	2.0	1.0	9.5	1.5	0.5	< 2	1.7%

216

834017

017

Notes on Analysis of these Samples

A '*' Suffix after a result implies results are expressed in % for this sample

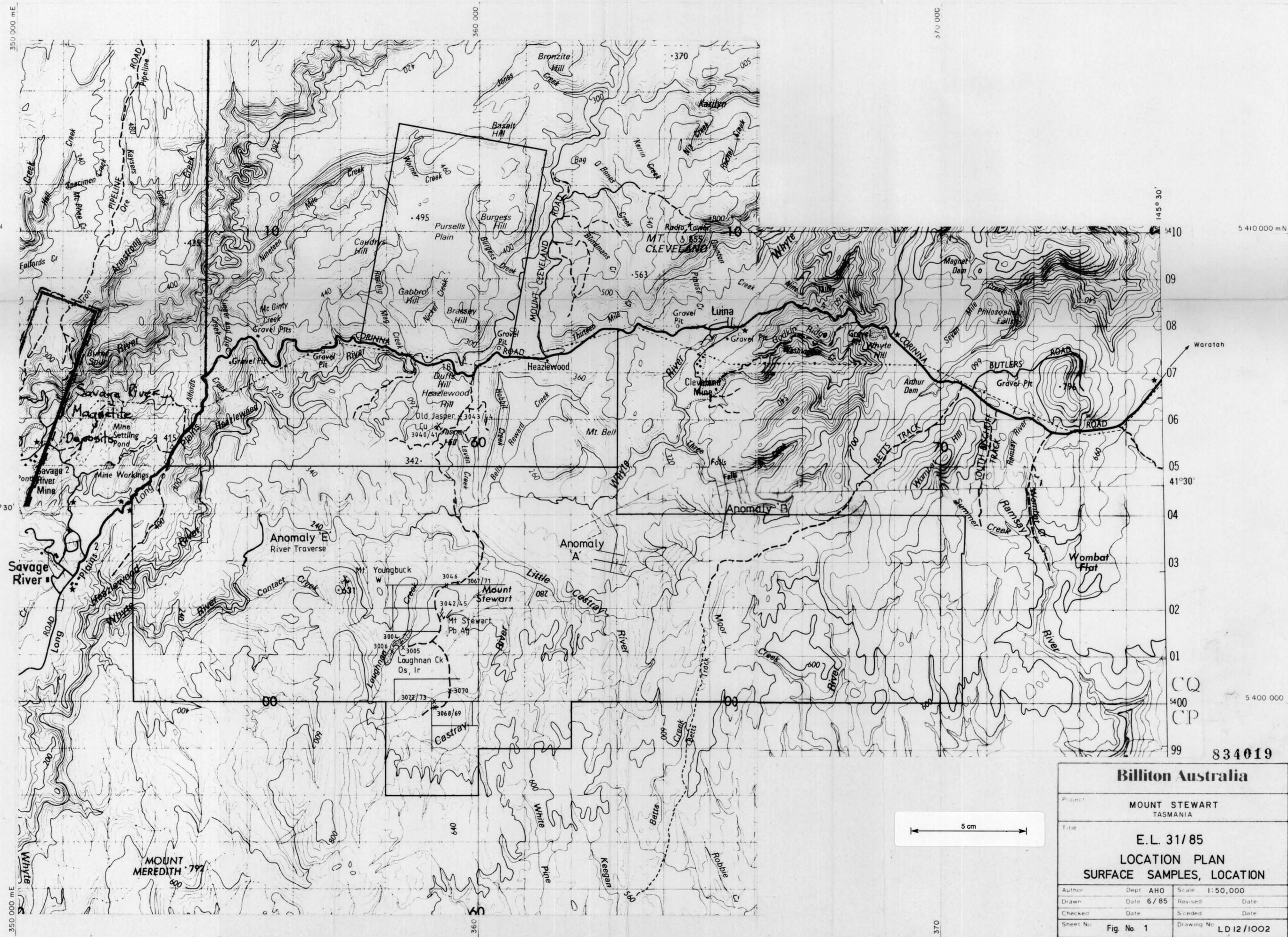
Au Pt Pd Ru Rh Ir Os
have been determined by Fire Assay of the sample (in NEW pots) using Nickel Sulphide as the collection media. The Platinoids have been recovered from the Nickel Sulphide and analysed by ICP-Mass Spectrometry.

Cr
has BEEN BROUGHT INTO SOLUTION BY FUSION WITH SODIUM PEROXIDE.
THIS FUSION PROCEDURE RESULTS IN TOTAL EXTRACTION OF THE ELEMENTS OF INTEREST.
THE DIGEST HAS BEEN ANALYSED BY INDUCTIVELY COUPLED PLASMA EMISSION SPECTROPHOTOMETRY.

SAMPLE STORAGE

Sample pulps and residues will be stored free of charge for ONE MONTH after reporting.
Samples are then Palletised, and a fee of \$0.80 per day per Pallet required is levied.

834018



Billiton Australia			
Project		MOUNT STEWART TASMANIA	
Title		E.L. 31/85 LOCATION PLAN SURFACE SAMPLES, LOCATION	
Author	Dept AHO	Scale	1:50,000
Drawn	Date 6/85	Revised	Date
Checked	Date	Scoded	Date
Sheet No.	Fig. No. 1	Drawing No.	LD 12/1002

87-2755

020

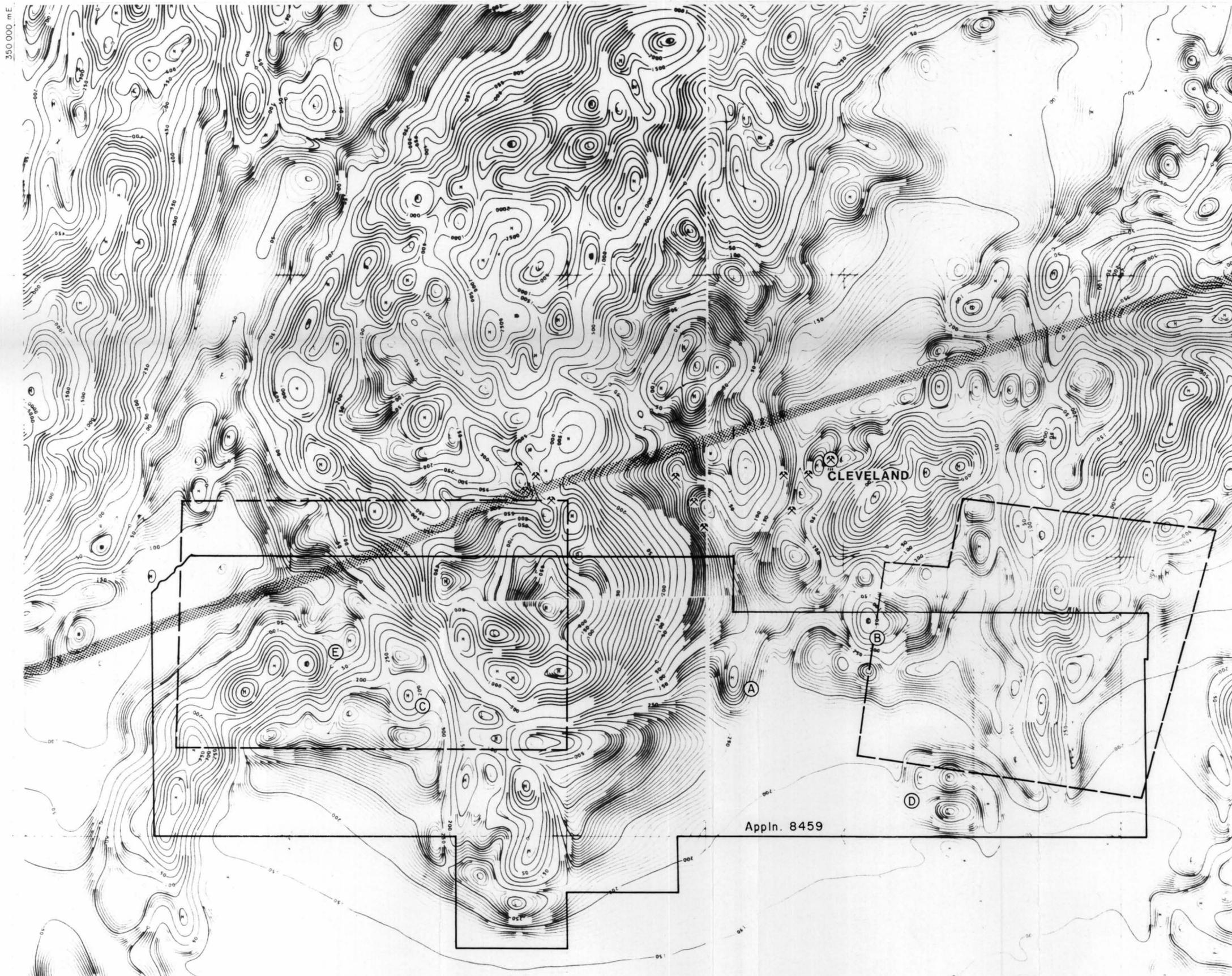
020

5 410 000 mN

5 410 000 mN

5 400 000

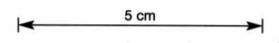
5 400 000



**Mt. Bischoff - Cleveland - Savage River
Aeromagnetic Trend**

- Dighem Coverage
- Flight line separation 500 m
- Flight line direction E-W
- Mean sensor height 135 m
- Base contour interval 5 nT
- Aeromagnetic anomalies discussed in text of application
- Major mine
- Workings, old mines

834021



Appln. 8459

87-2755

Billiton Australia

Project		MOUNT STEWART TASMANIA	
Title		AEROMAGNETIC CONTOURS (TASMANIAN MINES DEPT. SURVEY)	
Author	Dept. AHO	Scale	1:50,000
Drawn	Date 6/85	Revised	Date
Checked	Date	S. ced	Date
Sheet No.	FIG. 3	Drawing No.	MT 24 / 1088

350 000 mE

360 000

370

834022

5 cm

363000 E

87-2755

Billiton Australia

MT. STEWART: E.L. 31/85

ANOMALY 'A'
GEOLOGY

SAMPLE LOCATIONS

Author: D.B.H. Date: 3/87 Scale: 1:5000

Drawn: O.H. Trace: DPO. Rev: 001

Drawing No: LD 12 / 1002

Page No: 4

ACCESS TRACK
ORIGIN

mst

10000 E

10000 N

96000

Creek

Trench
3061-3065

96000

N 000 007

3026

sst

sst
Q. tour.

Mag Skarn

Old Trenches

3060

Trench
3054-3059
3066

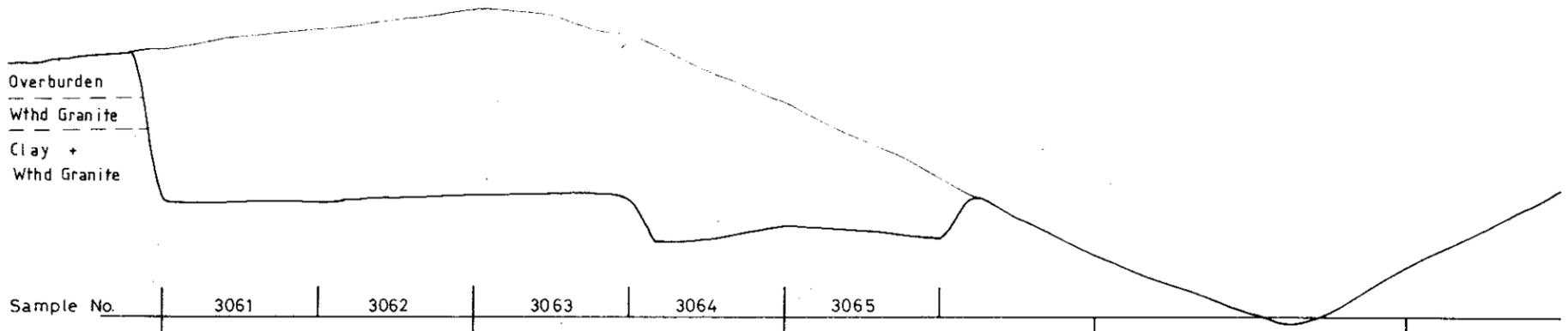
3027/28/29

9200 N

021

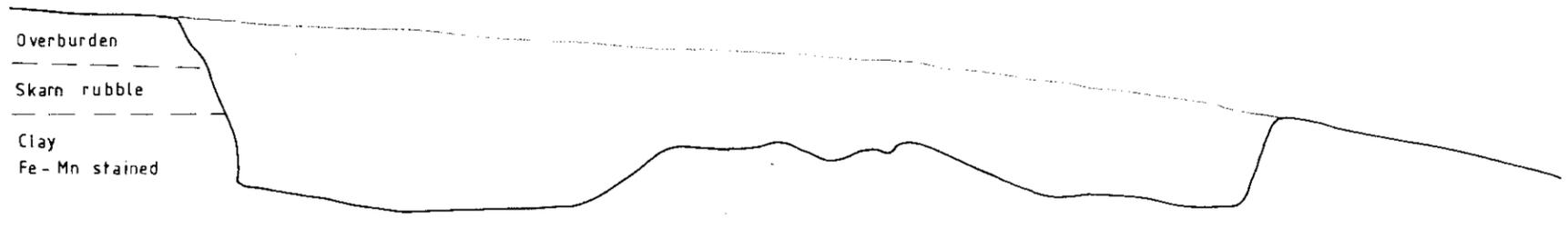
N000 707

820



Sample No.	3061	3062	3063	3064	3065
Results					
Cu	<5	<5	<5	<5	<5
Pb	10	<5	<5	<5	<5
Zn	10	5	5	10	5
Ag	<0.5	<0.5	<0.5	<0.5	<0.5
Mn	50	25	25	30	25
As	15	3	3	2	2
Sn	10	8	<3	5	<3
W	<10	10	<10	15	15

TRENCH 9400N/10280E



Sample No.	3054	3055	3056	3057	3058	3059
Results						
Cu	125	120	205	185	90	60
Pb	1250	555	1850	155	125	90
Zn	985	1150	1950	910	650	215
Ag	2.0	3.0	3.0	<0.5	<0.5	<0.5
Mn	4 430	1 930	2 600	2 450	1 700	1 015
As	34	48	120	140	120	110
Sn	55	65	90	55	85	140
W	30	<10	45	50	160	15

TRENCH 9200N/10180E

5 cm

834023

All values in ppm unless otherwise stated.

87-2755

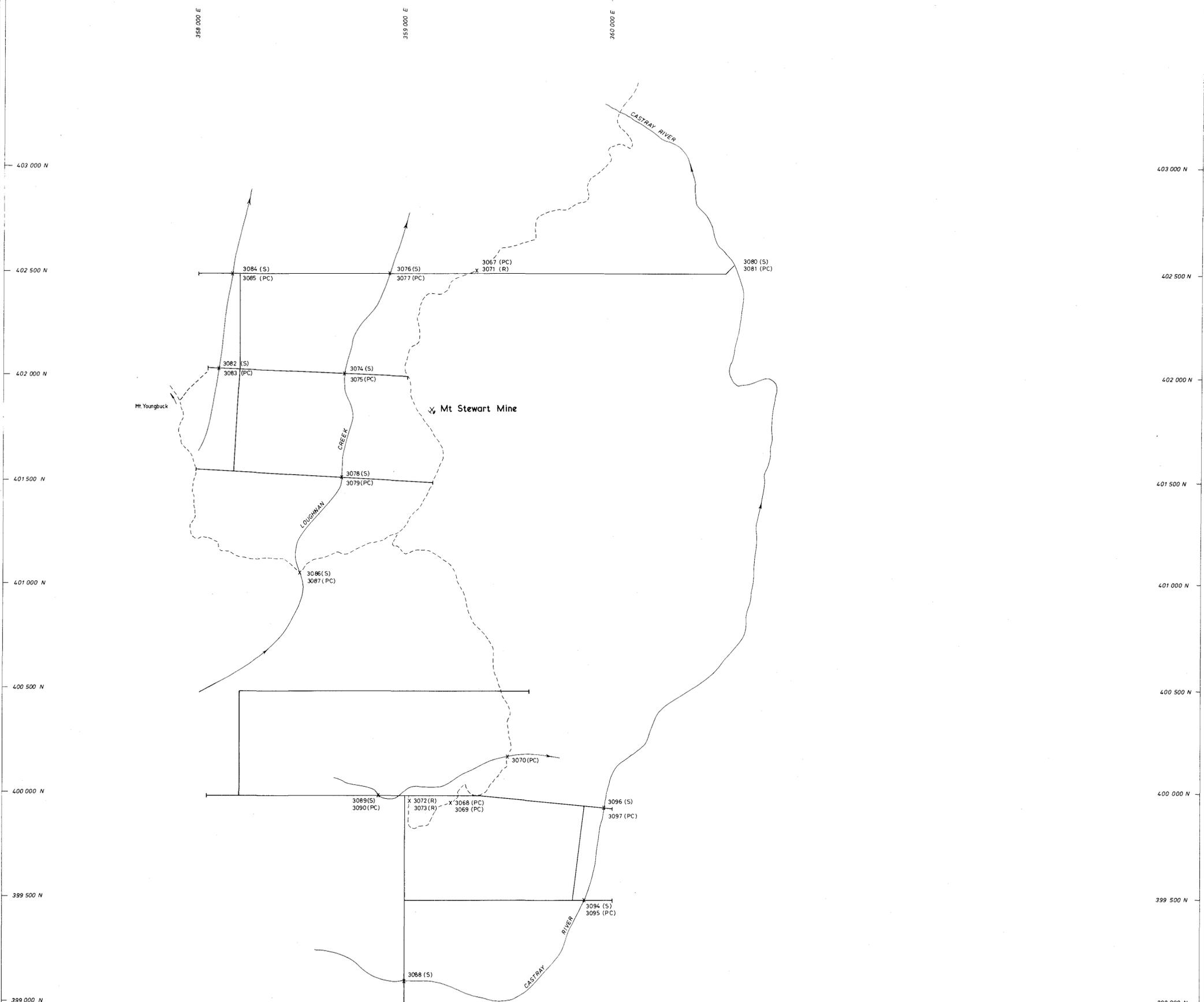
Billion Australia

Project MT. STEWART EL. 31/85

Title ANOMALY 'A'

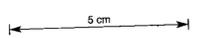
TRENCH PROFILES

Author	DBH	Date	4/87	Scale	1:40
Drawn	OH	Other	DP/ORT	Revised	
Drawing No.	L-611-001	Fig. No.	5		



- SAMPLES**
- x 3089 (PC) PANNED CONCENTRATE
 - x 3074 (S) STREAM SEDIMENT
 - x 3072 (R) ROCK SAMPLES

834024



87-2755

 The Metals Division of the Shell Company of Australia Limited			
Project MT. STEWART			
Title ULTRAMAFIC COMPLEX GRID PLAN SAMPLE LOCATIONS			
Author	D. B. H.	Dept.	TAS.
Scale	1:10000		
Drawn	O. H.	Date	8/87
Checked	Date	St'ced	Date
Sheet No.	FIG. No. C	Drawing No.	D/ LD12/002

750

87-2755

834025



SHELL COMPANY OF AUSTRALIA
METALS DIVISION
R.O.C.S. - PROTEM

MT STEWART, NW TAS
GROUND MAG TMI
CASTRAY RIVER
BASE 62500, 1000nT/C
SCALE 1 : 10000

FIG No :	LEGEND
DATE :	
AUTHOR :	
OFFICE :	
DRAWN :	

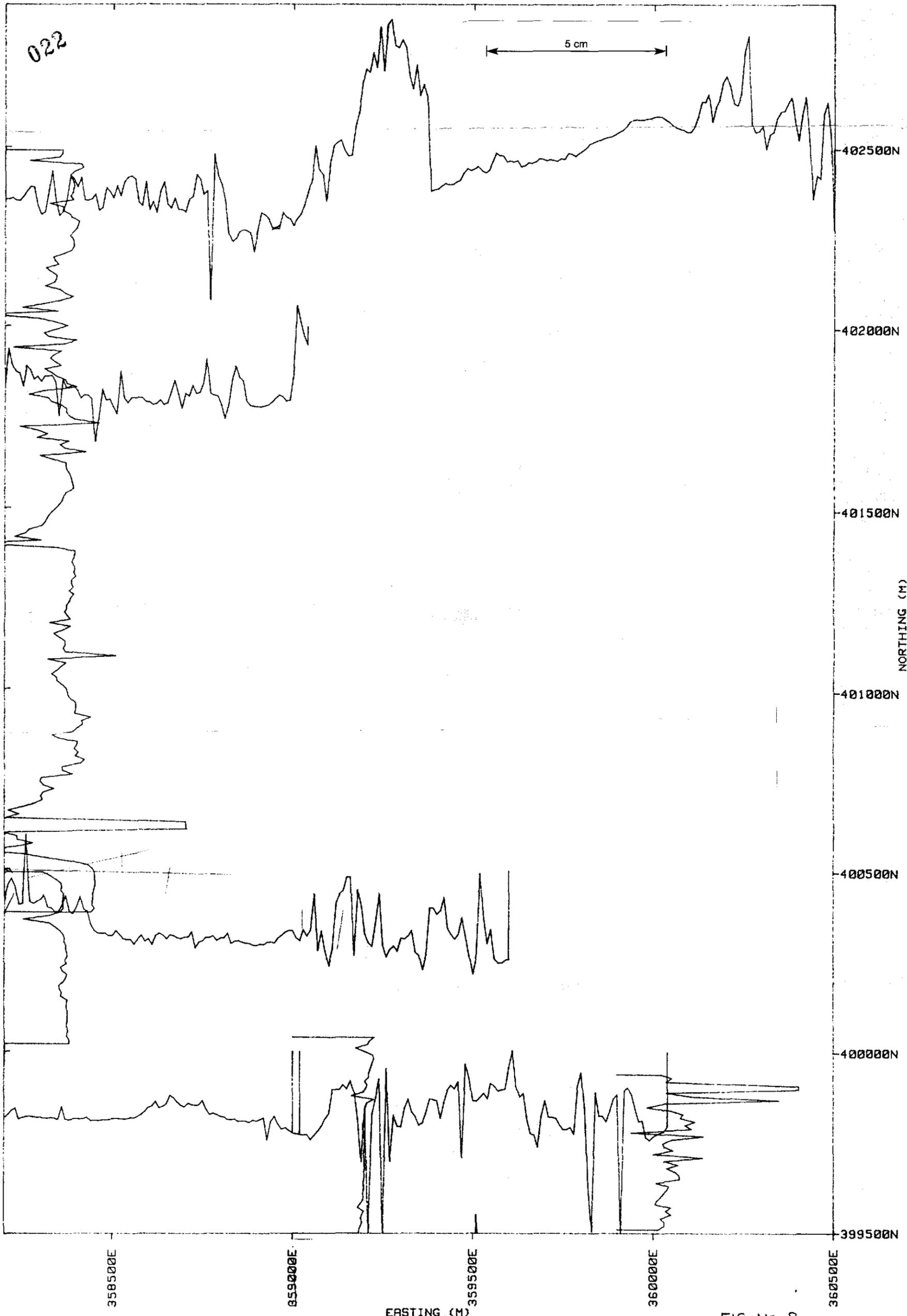


FIG. No. 8

87-2755

834026



SHELL COMPANY OF AUSTRALIA

025

METALS DIVISION

R.O.C.S. - PROTEM

MT STEWART, NW TAS
CASTRAY RIVER

GROUND MAG TMI
BASE 62500, 1000nT/C

SCALE 1 : 10000

FIG No :

LEGEND

DATE :

AUTHOR :

OFFICE :

DRAWN :

