

TCR 99-4339

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**MACMIN N.L.**

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**EL 3/92 THIRKELL HILL  
TASMANIA**

**FINAL REPORT AND  
ANNUAL REPORT TO 25 AUGUST 1999**

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**Date:** February, 1999  
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**99-4339**

ANNUAL/FINAL REPORT - EL 3/92  
THIRKELL HILL-MACMIN NL  
D HALL

## SUMMARY

In the past twelve months more core samples from drill holes CDH1 and CDH2 were assayed and a brief study made on the quartz veining found in the drill core.

During the 6 year tenure of EL 3/92 exploration has included soil sampling, pan concentrate drainage sampling, geological mapping, rock chip and float sampling, petrological work and drilling.

This report summarises work completed by MACMIN and joint venture partner Anglo Australian Resources N.L. and refers the reader to specific Annual Reports for detailed information on exploration.

A full review of the regional setting, geology, and previous tenement holder's exploration is found in the first Annual Report from 1/10/92 to 25/9/93.

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Simmons, 20 October 1998

## 1.0 INTRODUCTION

### 1.1 Licence Details

EL 3/92 was granted to Mac Mining on 17/10/92. It was under a joint venture with Anglo Australian Resources for several years and subsequently reverted 100% to Macmin (formerly Mac Mining). The licence was renewed until 25 September 2002. The location of EL 3/92 is shown on Figure 1.

The boundaries of the tenement are described as follows:

Commencing at the southwest corner at grid co-ordinates 384 000 metres E. 5 267 000 metres N. thence grid north to 5 278 000 metres N. grid east to 385 000 metres E. again grid north to 5 287 000 metres N. again grid east to 386 000 metres E. grid south to 5 286 000 metres N. again grid east to the Franklin-Lower Gordon Wild Rivers National Park boundary and by that boundary in a general south easterly direction to approximate grid co-ordinates 387 000 metres E. 5 284 400 metres N. again grid south to 5 282 000 metres N. again grid east to 388 000 metres E. again grid south to 5 274 000 metres N. again grid east to 389 000 metres E. again grid south to 5 272 000 metres N. grid west to 388 000 metres E. aforesaid again grid south to 5 267 000 metres N. aforesaid thence again grid west to the point of commencement.

### 1.2 Topography

The Thirkell Hill area occupies a depression or flat bottomed valley, possibly of glacial origin, between mountains of Owen Conglomerate to the west and Precambrian rocks to the east. Most of the E.L. is covered by heath or scrub and access is relatively easy compared to other parts of the Mt. Read Volcanics north of the Gordon River. The topography within the valley is subdued and this reduces the probability of rock outcropping. Drainages are overgrown, sluggish and are likely to contain large amounts of humic material. Humic acid inhibits the formation of gossans and geochemical anomalies both in soils and stream sediments.

### 1.3 Access

Access for heavy equipment/supplies can be by tracked or four wheel drive vehicle from the head of Birch Inlet on Macquarie Harbour or by helicopter from Strathgordon (40 kms east). An airstrip exists at Moores Valley, however, its present condition is unknown.

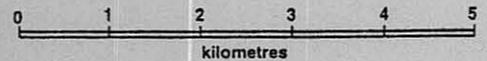
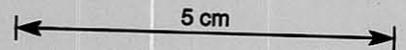
**LEGEND**

-  QUATERNARY / TERTIARY  
Alluvium, gravels etc.
-  MAINLY ORDOVICIAN  
Owen conglomerate - sandstones  
and conglomerates
-  CAMBRIAN MT READ VOLCANICS  
Felsic lavas, intrusive rocks, volcanoclastics,  
Includes overlying pyritic shales & siltstones
-  PRECAMBRIAN

-  Geological boundary
-  Fault
-  Track
-  World Heritage area boundary.
-  Boundary of E.L. 3/92

**PROSPECT AREAS**

- 1 Mt Lee
- 2 D'Aguiler South
- 3 D'Aguiler North
- 4 D'Aguiler East
- 5 Viking 3
- 6 Viking 4
- 7 Sprent River West
- 8 Sprent River East
- 9 Sprent River South
- 10 Conder River
- 11 Thirkell Hill
- 12 Conder River West
- 13 Hales River North
- 14 Hales River NE
- 15 Hales River East
- 16 Hales River West
- 17 Thirkell South
- 18 Viking 14
- 19 Viking 15
- 20 Conder River East



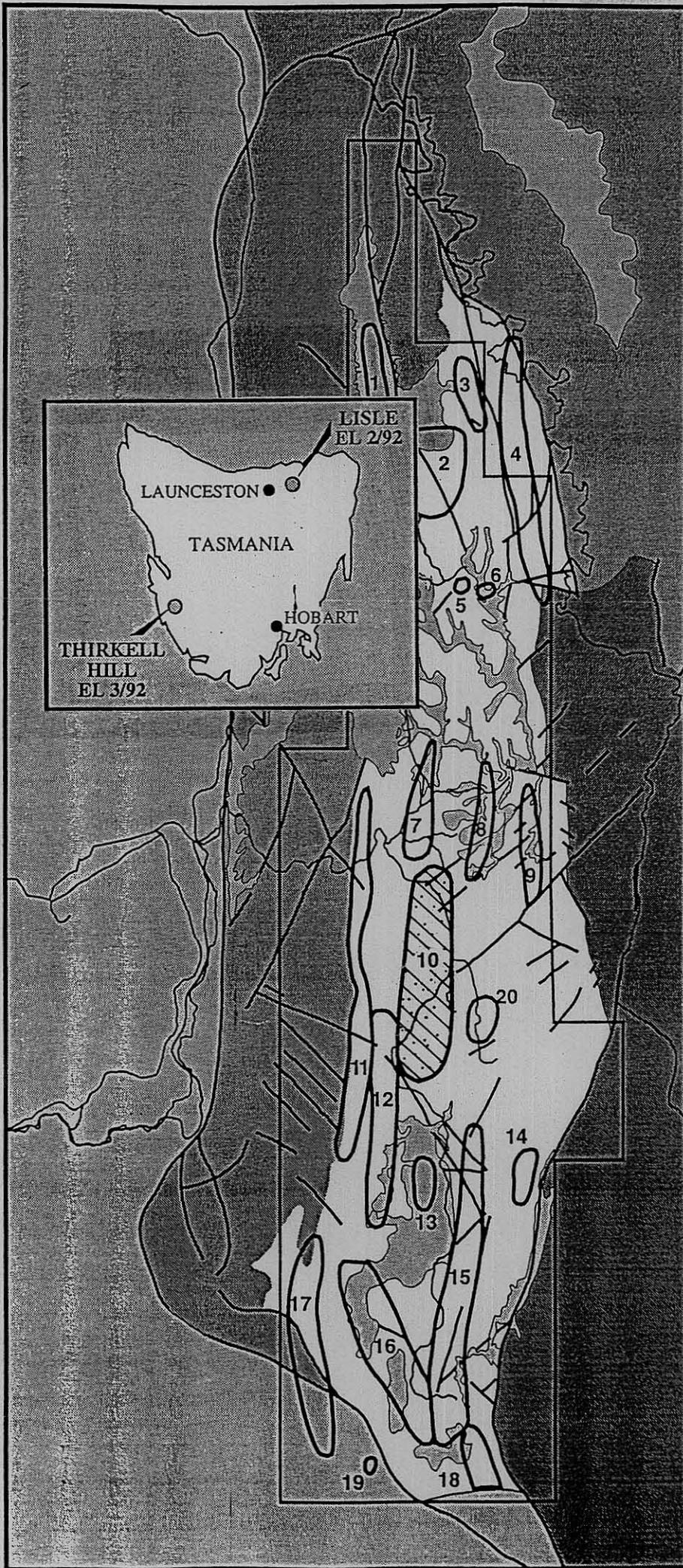
**MACMIN N.L.**

THIRKELL HILL

**GEOLOGY AND  
PROSPECT AREAS**

MAY 1993

Compiled: P.A.M. Drawn: NORTHPOINT



Bombardiers and 4 wheel Ag (Quad) bikes have been used extensively in the past for transport within the E.L. boundaries.

#### 1.4 Target Types

The Mt.Read Volcanics are host to five major massive sulphide deposits (Mt.Lyell, Rosebery, Hercules, Que River and Hellyer), one major gold deposit (Henty) and many smaller deposits.

The target models for the Thirkell Hill area are well defined:

- a) Polymetallic massive sulphides such as Rosebery/Hellyer with plus 20 Mt at 21% combined Pb+Zn, 160 g/t Ag and 3 g/t Au (Large et al, 1987).
- b) Copper/gold deposits such as Lyell with plus 100 Mt (in several deposits) at 1.3% Cu and 0.4 g/t Au (Large et al, 1987).
- c) Structurally controlled, high-grade gold deposits such as Henty with 500,000 plus tonnes at 30 to 50 g/t Au.

Significant base metal and gold mineralisation has been located to the south of Thirkell Hill in the Elliott Bay area.

## 2.0 REGIONAL GEOLOGY (from Annual report 1/10/92 to 25/9/93)

The following subsections have been quoted under the same headings from Green, 1990. All his figure references have been deleted.

### 2.1 Mt Read Volcanics

The Mt Read Volcanics (named after Mount Read, 2 km east of the Hercules mine), are dominantly calc-alkaline volcanic and intrusive rocks ranging in composition from subordinate basalt and andesite to predominant dacite and rhyolite. They form an arcuate belt wrapping around the western and northern margins of the Tyennan region from Elliott Bay to near Deloraine. The age of the volcanics is poorly constrained, but they may be restricted to the Middle and Late Cambrian. The oldest fossils in the volcanics are of late Middle Cambrian age at Que River (Undillan) and at Mount Lyell (Boomerangian) where they occur in units underlain by the bulk of the local volcanic sequences (Gee, Jago and Quilty, 1970; Jago et al., 1972, Corbett, in Corbett and Solomon, 1989; Jago and Brown, in Brown, 1989). Minor felsic and mafic volcanics and intrusives occur within Late Cambrian to Early Ordovician siliciclastic sequences of the Denison Group (Owen Conglomerate and correlatives) which blanket, commonly unconformably, much of the eastern and northern flanks of the Mt Read Volcanics (Corbett, in Corbett and Solomon, 1989). On the western margin the volcanics either interfinger with, or are faulted against, fossiliferous sedimentary rocks of the Dundas Group and correlatives. No felsic volcanic detritus has been reported from the Crimson Creek Formation or from the oldest units of the Dundas Group, so it appears that the Mt Read Volcanics may be synchronous with the Dundas Group.

In central western Tasmania, the Mt Read Volcanics are bisected by a major NNE trending fault zone, the Henty Fault, which separates the belt into two different metallogenic and lithological segments. Although movement on the fault was considerable in the Devonian (Berry, 1989), a concentration of tholeiitic dykes in the vicinity of the fault SE of Mount Read strongly suggest it was an active structure in the Cambrian (Corbett and Lees, 1987).

## 2.2 Areas South of Macquarie Harbour

In the D'Aguiar Range conglomerate, largely of Precambrian derivation with a minor volcanoclastic component, overlies Tyennan basement. Succeeding quartzphyric rhyolite, tuff and intrusive porphyry are unconformably overlain by polymict conglomerate, sandstone, tuff and shale beneath the Owen Conglomerate (I.D. Martin, unpublished data, 1974). Further south in the Elliott Bay area, the Lewis River Volcanics comprise quartz-feldspar prophyry lavas, pyroclastic breccias and tuffs with horizons of siltstone, volcanoclastic sandstone. Precambrian-derived conglomerate and black shale, which face west and are succeeded, apparently conformably, by Pleasant Creek Formation mudstone, felsic epiclastic breccia and sandstone, and sedimentary breccia. In the same area the Lewis River volcanics are unconformably overlain by volcanoclastic conglomerate, sandstone and pyritic black shale which are succeeded by the Owen Conglomerate (Large, Herrmann and Corbett, 1987). Pre-kinematic biotite granite plutons intrusive into the Lewis River Volcanics are probable of Cambrian age (Mcdougall and Leggo, 1965). Mineralisation has been discovered at a number of localities, the most significant of which is at Wart Hill where small pods of zinc-lead-silver-gold rich massive sulphides occur (Large, Herrmann and Corbett, 1987).

Correlation of the rocks of the Elliott Bay and D'Aguiar Range areas is problematical; they are most probably equivalent to the Tyndall Group (Corbett, in Corbett and Solomon, 1989).

A belt of calc-alkaline quartz-feldsparphyric felsic volcanics and andesitic lava and breccia, locally intruded by diorite, the Noddy Creek Volcanics, occurs south of Macquarie Harbour (White, 1975; McClenaghan and Corbett, in Corbett and Solomon, 1989).

## 2.3 Mt Read Volcanics – South to North Correlation

The correlation of Mt. Read Volcanics in the Elliott Bay - Thirkell Hill area to subdivisions within the northern Mt. Read Volcanics is uncertain and controversial. Whether such correlations are meaningful in terms of prospectivity for mineral deposits is also controversial.

Large in Large et al (1987) noted

correlation of the relatively simple sequence at Elliott Bay with the complex sequence in the Mt Darwin-Que River area is problematic and difficult to resolve with certainty. There seems little doubt that the Lewis River Volcanics represent a continuation of the Mt. Read Volcanic belt, since the rocks are petrologically similar and occupy the same geographic-stratigraphic position at the margin of the Tyennan Precambrian block and underlying the Owen Conglomerate.

In terms of correlation with the three main subdivisions of the northern part of the belt, Large and Wilson (1982) equated the Lewis River Volcanics with the central volcanic sequence, and the Waterloo Creek Group with the Tyndall Group. This was based on the fact that the centrally located Lewis River Volcanics are dominated by rhyolitic pyroclastics, lavas, subvolcanic intrusions, and granitoids broadly similar to those in the central volcanic sequence, whereas the Waterloo Creek Group consists of epiclastics and quartz porphyritic tuff unconformably overlying the central volcanic sequence in a manner similar to the Tyndall Group. However, the typical albite porphyritic rhyolites and dacites which dominate the central volcanic sequence in the Lyell-Murchison area do not appear to be present at Elliott Bay. Whether this is due to non development, burial by younger volcanics, or a facies change to quartz-feldspar porphyritic rocks is uncertain.

Corbett in Large et al (1987) favoured an alternative correlation and

equates the Lewis River Volcanics with the Tyndall Group exposed along the eastern margin of the belt in the vicinity of Mt. Murchison. Here, a basal conglomerate-sandstone-shale unit (Sticht Range Beds) sits unconformably on the Precambrian rocks (as is also the case near D'Aguiler Range) and passes up into sequence of quartz-feldspar porphyritic volcanics, intrusions, and volcanoclastic conglomerates. The sequence is intruded by the subvolcanic Murchison Granite of Cambrian age, which may be equivalent to the Low Rocky Point granite. Near its faulted western margin, the Murchison volcanic sequence passes gradationally into a unit of slate and

volcanogenic sandstone (the Farrell slates), a sequence resembling the Pleasant Creek Formation. The sub-Owen Conglomerate sequences in both areas are also similar, beginning with a basal volcanoclastic unit (generally thicker and more sandstone rich at Elliott Bay), followed by a siltstone-sandstone unit (only locally present in the Murchison-Lyell area), and capped by the typical siliceous conglomerate.

Large in Large et al 1987 comments further

If this correlation of the Lewis River Volcanics with the Tyndall Group is correct, it provides further evidence that massive sulfide mineralisation has occurred in the younger part of the Mount Read Volcanic belt, originally thought to be relatively unmineralised.

Corbett (1992) revised his opinion and equated the Elliott Bay volcanics to the Eastern Sequence in the Mt.Murchison area. In this area the Eastern Sequence comprises a belt of mainly quartz feldspar porphyritic volcanic, intrusive and volcanoclastic beds overlying the Sticht Range Beds to the east and north of Mt.Murchison. He also equated the Waterloo Creek Group with the Tyndall Group.

McPhee and Allen (1992) recently concluded that the Tyndall Group rocks may be prospective for massive sulphides. This conclusion impacts on the Thirkell area as there are numerous airborne EM and geochemical anomalies within Tyndall Group correlates. McPhee and Allen (1992) state:

sea floor hydrothermal systems responsible for the massive sulfide mineralisation in the Mount Read Volcanics operated in a variety of volcanic hosts and settings. In particular, the volcanoclastic facies associations that dominate the western volcano-sedimentary sequences and the Tyndall Group may be as prospective as the formations dominated by lavas (Central Volcanic Complex, Que-Hellyer Volcanics). In fact, such a volcanoclastic association hosts the Hercules and Rosebery massive sulfide deposits. These volcanoclastic associations also offer a means of eventually establishing correlations within the Mt.Read Volcanics that will constrain the relative ages of the known ore deposits. For example, correlation of the lower part of the Southwell Subgroup, the White Spur Formation, and the upper part of the Hercules-Rosebery volcanoclastic sequence would imply that the mineralisation at Hellyer is lower in the stratigraphic pile

than that at Hercules-Rosebery. Existing understanding suggests the reverse.

Whether the above correlations have any significance in terms of the prospectivity of EL 3/92 is entirely conjectural, however, we do know that massive sulphides of similar composition to Rosebery and significant gold both occur south of Thirkell Hill in the Elliott Bay area.

The southern sections of the Mt. Read Volcanics may be as prospective as the northern belt and are likely to yield significant deposits with sustained exploration.

### 3.0 EL 3/92 GEOLOGY

The geology is described in some detail by McGregor Dawson (1975) and Strickland (1978) The Department of Mines published (1992) the geology of the area at 1:25 000 as the A'Aguilar Range and Moores Valley - Wanderer River map sheets.

The Lower-Middle Cambrian rocks within EL 3/92 are known as the Lucas Volcanics and are equivalent of the Mt. Read Volcanics to the north and the Lewis River Volcanics to the south. Essentially the Lucas Volcanics consists of a sequence of fine to coarse-grained porphyritic quartz-feldspar rhyolitic lavas, pyroclastics, volcanoclastic sediments, and a high-level intrusive coarse-grained rhyolitic porphyry.

The Proterozoic rocks to the east are undifferentiated quartzites, quartz-mica and tourmaline-quartz schist, silicified dolomites, graphitic schists and chlorite schists. The faulted contact between the Precambrian and the Cambrian volcanics is suggested to be a steep reverse fault with negligible horizontal movement.

On the western fringe of the Cambrian volcanics is the Owen Conglomerate and to the south the volcanic sequence is obscured by Tertiary graben fill sediments.

The Tasmanian Department of Mines, on the D'Aguilar Range map sheet, describes the main mass of volcanics which extend along the entire western side of the EL as dominantly cream to pink felsic lava (quartz feldspar  $\pm$  biotite-phyric) with minor intercalated epiclastic rocks and lava breccias. To the east of these volcanics is an apparently intrusive unit described as coarse grained quartz-feldspar-biotite porphyry. This porphyry also extends the entire length of the EL but is much thicker at the northern end. It appears, in part, to have a distinctive magnetic character.

Underlying the above lava/intrusive is a sequence of siltstones, sandstone and shale that is partly siliclastic and partly volcanoclastic. Underlying that unit are poorly bedded to massive sandstones and granule-pebble conglomerate. Both these sedimentary units are considered to be correlates of the Sticht Range Beds.

Unconformably overlying the main volcanic sequence is the Waterloo Creek Group. This group consists of two members - a lower unit of mainly volcanoclastic conglomerate, siltstone and sandstone with some intercalated lavas and an upper unit of mainly pyritic black shale and siltstone that may grade upwards into micaceous siltstone and sandstone.

Little is known of the internal structure of the volcanics, although there appears to be a definite northerly structural trend. Intense shearing and cleavage has obliterated most bedding and facings.

#### 4.0 EXPLORATION CHARACTERISTICS OF MT READ DEPOSITS

We believe the exploration characteristics and exploration approach defined by Large et al (1987) are appropriate for EL 3/92. He states

The massive sulphide deposits occur locally within a narrow horizon of shales or volcanoclastics which forms part of a sequence of submarine volcanics and minor sediments.

The volcanics underlying the deposits are strongly altered with chlorite, sericite, pyrite, and crypto-crystalline quartz dominant, whereas volcanics overlying the deposits show little alteration.

Outcropping deposits exhibit stream-sediment lead, zinc, and gold anomalies. Discrete lead anomalies in soils are developed over sub-cropping ore zones and provide suitable drilling targets. Copper and zinc anomalies in soils tend to be dispersed and provide less reliable drilling targets.

Near-surface copper-bearing massive sulphides give rise to electro-magnetic and induced polarisation anomalies, whereas lead-zinc-rich massive sulphides (with minor copper) give a weak induced polarisation response and no electromagnetic response. However, recent work by Eadie et al. (1984) on the Que River and Hellyer deposits suggests that the lead-zinc ore is sufficiently conductive to give an electro-magnetic response using large loop transient electromagnetic systems.

## 5.0 EXPLORATION COMPLETED BY MACMIN AND JOINT VENTURE PARTNERS DURING TENURE OF EL 3/92

### 5.1 Soil Sampling

Initial soil sampling (in 1993) concentrated on the Condor group and anomalies in the central sector of the licence.

Two hundred and twenty nine (229) C-horizon soil samples were collected with a power auger and assayed for Pb, Zn, Cu, Fe, Ba, Au and As. Several significant base-metal anomalies were defined, in particular the Viking 22 – 9000N area. **Full details are presented in Annual Report to 25 September 1993 by P.A. McNeil.**

Power auger sampling continued in 1994 at Viking 11 and west of the old camp. Prior to completion of the C-horizon sampling the programme was changed to A-horizon sampling for Huminex analysis. The change in sample type was more time effective and allowed more samples to be collected; it was also hoped that gold would have greater dispersion in the A-horizon than in the C-horizon.

Huminex sampling covered the D'Aguilar South and Southern Porphyry Contact Prospects. A total of 892 samples were collected. **Full details are found in the Annual Report to 25<sup>th</sup> September 1994 by Grant MacDonald.**

A fence of C-horizon wacker samples were collected from the southern end of the Southern Porphyry Contact Huminex anomaly in 1994. **(Annual Report to 25<sup>th</sup> September 1995).**

A single line of hand augered C-horizon soil samples (21) were collected across the VLF-EM anomaly on the Viking 15 Prospect. Also in 1996, eighty three (83) Huminex and 96 C-horizon samples were collected from D'Aguilar South to fill in and extend the existing soil grid. **(Annual Report to 25<sup>th</sup> September 1996 by Russell Fulton).**

Three grid lines around Viking 11 and Southern Porphyry Contact were soil sampled to enable comparison between conventional soil analysis and the Huminex technique; only a weak correlation was apparent. **Details are presented in the Annual Report to 25<sup>th</sup> September 1996.**

## 5.2 Rock Chip and Float Sampling

Ferruginous pyroclastics and graphitic shales were sampled but no significant assay results were returned from the 6 samples collected in 1993.

In the 1994 program rock samples were collected from D'Aguilar South, Southern Porphyry Contact, Hales River East, Viking 11 and Viking 6-21 areas. **Further details are found in the Annual Report to 25<sup>th</sup> September 1994 by G. MacDonald.**

Six (6) altered sericite-hematite rock chip samples were collected from the Viking 19 Prospect in 1996. In the same year 38 rock chip samples were collected from D'Aguilar South, 3 of which had detectable gold. **(Details in the Annual Report to 25<sup>th</sup> September 1996 by Russell Fulton).**

## 5.3 Petrology

Eight (8) rocks collected in 1994 were thin sectioned and the descriptions are found in the Annual Report to 25 September 1995 by Grant MacDonald.

Eight (8) more rock samples were thin sectioned and showed the presence of several alteration styles. **Descriptions are presented in Annual Report to 25<sup>th</sup> September 1996.**

## 5.4 Pan Concentrate Gold Sampling

The 1993 pan concentrate sampling program concentrated on 31 km<sup>2</sup> of the central section of the tenement and collected 35 samples.

Details of the work and location of the anomalies are found in the Annual Report to 25<sup>th</sup> September 1993.

Further pan concentrate sampling in 1994 at the D'Aguilar South and Southern Porphyry Contact prospects showed visible gold and assayed up to 95.6 µg's gold.

## 5.5 Geological Mapping

The southern and northern anomalies on the Southern Porphyry Contact grid were mapped in 1994.

Further mapping was carried out at D'Aguilar South in 1996 and details are in the Annual Report to 25<sup>th</sup> September 1996 by Russell Fulton.

## 5.6 Drilling

A 6 hole diamond drilling program (292.5m) was completed in 1995 using a man portable rig. The holes SPCS 1-6 were drilled at 50° to 80°T along a fence, each to a depth of approximately 50m. Sulphide and quartz levels were low and only representative core samples were assayed with disappointing results. **Detailed logs, assays and cross-section are presented in the Annual Report to 25<sup>th</sup> September 1995 by Grant MacDonald.**

Two diamond holes were drilled into a soil anomaly and EM target on the Condor Prospect in 1998. Hole CDH1 reached 231.3m and CDH2, 139.3m both intersected a small weakly mineralised silicified breccia zone. **Detailed logs and assays are presented in the Annual Report to 25 September 1998 by Hugh Simmons and this report (Appendix 1).**

## 6.0 CONCLUSION

Results from exploration have been disappointing and the area is not considered to warrant further investigation.

## 7.0 BIBLIOGRAPHY

Fulton, R., (1996) Annual Report 1996, EL 3/92 Thirkell Hill

MacDonald, G., (1994) EL 3/92 Thirkell Hill, Tasmania Annual Report on Exploration Activity October 1993–September 1994.

MacDonald, G., (1995) EL 3/92 Thirkell Hill, Tasmania Annual Report on Exploration Activity October 1994–September 1995

McNeil, P.A., (1993) Annual Report 1.10.92–25.9.93 EL 3/92 Thirkell Hill, Tasmania.

Simmons, H. (1998) EL 3/92 Thirkell Hill, Tasmania Annual Report for Twelve Months ending 25 September 1998.

**EL 3/92 - THIRKELL HILL**

**ANNUAL AND FINAL REPORT**

**Appendix 1**

Laboratory Assay Sheets

(extra assays on core)

72 00. 1000

186020

7e 1-3

**A N A L A B S**



Our reference : BU015215  
Your reference : **E2920019**  
Project code : Drill Core  
Date received : 23/09/98  
Date reported : 01/10/98

**Analabs Pty. Ltd.**  
ACN 004 591 664  
14 Thirkell St, Burnie  
Tasmania 7320  
Telephone : (004) 31 6837  
Facsimile : (004) 31 8890

Hugh Simmons  
Geologist  
  
MACMIN N.L.  
P.O. Box 7996  
G.C.M.C.  
  
QLD 4217

*Thirkell Hill  
drill core*

Number of pages of results : 4  
Number of Samples : 54  
First Sample : 10013  
Last Sample : 10066

Invoice to:  
Hugh Simmons  
Geologist  
  
MACMIN N.L.  
P.O. Box 7996  
G.C.M.C.  
  
QLD 4217

Electronic Data Transmission :  
Modem //  
Facsimile //  
Disk Report //

Preliminary Reports :  
29/09/98 Report

Results to:  
Dennis O'Neill  
  
MACMIN N.L.  
P.O. Box 7996  
G.C.M.C.  
  
QLD 4217

Results to:

Remarks :

Authorised by .....  
On behalf of:

Richard Newman  
Laboratory Manager

The results in the following analytical report pertain to the samples provided to this laboratory for preparation and/or analysis as requested by the client.



Our reference : BU015215  
 Your reference : E2920019  
 Project code : Drill Core  
 Report date : 01/10/98  
 Report status : Final  
 Page : 1 of 4

Analabs Pty. Ltd.  
 ACN 004 591 664  
 14 Thirkell St, Burnie  
 Tasmania 7320  
 Telephone : (004) 31 6837  
 Facsimile : (004) 31 8890

### ANALYTICAL DATA

Sample	Au	Au(R)	Au(SS)			
10013	<0.01	--	--			
10014	<0.01	--	--			
10015	<0.01	--	--			
10016	<0.01	--	--			
10017	<0.01	--	--			
10018	<0.01	--	--			
10019	<0.01	--	--			
10020	<0.01	--	--			
10021	<0.01	--	<0.01			
10022	<0.01	--	--			
10023	<0.01	--	--			
10024	<0.01	--	--			
10025	<0.01	--	--			
10026	<0.01	--	--			
10027	<0.01	--	--			
10028	<0.01	--	--			
10029	<0.01	--	--			
10030	<0.01	--	--			
10031	<0.01	--	--			
10032	<0.01	--	--			
10033	<0.01	--	--			
10034	<0.01	--	--			
10035	<0.01	--	--			
10036	<0.01	--	--			
10037	<0.01	--	--			
10038	<0.01	<0.01	--			
10039	<0.01	--	--			
10040	<0.01	--	--			
10041	<0.01	--	--			
10042	<0.01	--	--			
10043	<0.01	--	--			
10044	<0.01	<0.01	--			
10045	<0.01	--	--			
10046	<0.01	--	<0.01			
10047	<0.01	--	--			
10048	<0.01	--	--			
10049	<0.01	--	--			
10050	<0.01	--	--			
10051	<0.01	--	--			
10052	<0.01	--	--			
10053	<0.01	--	--			
10054	<0.01	--	--			
10055	<0.01	--	--			
10056	<0.01	--	--			
10057	<0.01	--	--			
10058	<0.01	--	--			
10059	<0.01	--	--			
10060	<0.01	<0.01	--			
10061	<0.01	--	--			
10062	<0.01	--	--			
Method Units Detection Limit	P649 ppm 0.01	P649 ppm 0.01	P649 ppm 0.01			

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received





Our reference : BU015215  
 Your reference : E2920019  
 Project code : Drill Core  
 Report date : 01/10/98  
 Report status : Final  
 Page : 3 of 4

Analabs Pty. Ltd.  
 ACN 004 591 664  
 14 Thirkell St, Burnie  
 Tasmania 7320  
 Telephone : (004) 31 6837  
 Facsimile : (004) 31 8890

### ANALYTICAL DATA

Sample	Cu	Pb	Zn	Ag	Fe	
10013	43	466	409	<1	4.60	
10014	35	163	408	<1	3.85	
10015	32	170	405	<1	3.79	
10016	8	329	549	<1	4.02	
10017	7	68	395	<1	3.96	
10018	12	85	248	<1	3.87	
10019	24	419	512	<1	3.76	
10020	19	185	463	<1	3.99	
10021	7	73	385	<1	4.12	
10022	159	148	262	<1	3.66	
10023	15	99	386	<1	4.23	
10024	19	313	619	<1	3.97	
10025	12	243	517	<1	3.52	
10026	48	902	1240	1	3.77	
10027	42	789	754	<1	4.37	
10028	48	1042	763	1	4.39	
10029	21	520	617	<1	3.60	
10030	50	536	449	1	3.42	
10031	33	76	237	<1	2.86	
10032	30	89	211	<1	2.77	
10033	12	73	291	<1	3.43	
10034	29	742	505	1	3.78	
10035	27	701	707	1	3.71	
10036	39	401	709	<1	3.97	
10037	24	252	522	<1	4.34	
10038	43	767	663	<1	4.19	
10039	34	1046	687	<1	4.11	
10040	16	3319	536	5	3.67	
10041	34	641	845	<1	4.24	
10042	54	177	378	<1	3.68	
10043	8	36	319	<1	3.94	
10044	7	26	309	<1	3.57	
10045	32	296	147	<1	3.93	
10046	23	222	190	<1	3.92	
10047	17	123	246	<1	3.79	
10048	19	122	348	<1	3.77	
10049	17	1235	886	1	3.70	
10050	42	406	601	2	4.65	
10051	50	819	845	1	4.09	
10052	20	522	1232	<1	3.69	
10053	16	682	1043	1	3.93	
10054	17	398	890	<1	3.35	
10055	21	391	518	<1	3.75	
10056	15	<3	401	<1	2.29	
10057	10	12	518	<1	2.23	
10058	10	280	262	<1	2.83	
10059	4	254	330	<1	2.45	
10060	84	959	241	1	2.44	
10061	5	3	157	<1	2.53	
10062	3	<3	137	<1	2.22	
Method	A102	A102	A102	A102	A102	
Units	ppm	ppm	ppm	ppm	%	
Detection Limit	2	3	2	1	0.01	
Upper Method		A103				

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received





## ANALYSIS DESCRIPTION

Job number : BU015215 Order number : E2920019

-----  
Scheme code : S033 - Drillcore/Rock; Dry, Jaw crush, Fine pulv, Ring

-----  
Sample preparation. Drillcore, Rock samples; Dry,  
Jaw crush, Fine pulverise, Ringmill, <3.5kg

-----  
Scheme code : P649 - 50g Aqua Regia, Geochemical samples

-----  
Aqua Regia digest, (HCl, HNO<sub>3</sub>), Geochemical  
samples, 50g sample.

-----  
Scheme code : G102 - Triple acid digest, Geochemical samples

-----  
Triple acid digest, (HCl, HNO<sub>3</sub>, HClO<sub>4</sub>), Geochemical  
samples.

-----  
Scheme code : A102 - AAS analysis

-----  
AAS analysis of sample after G102 digest.

7e.1.3



Our reference : BU014946  
Your reference : E392002  
Project code : Soil Samples  
Date received : 29/07/98  
Date reported : 09/08/98

Analabs Pty. Ltd.  
ACN 004 591 664  
14 Thirkell St, Burnie  
Tasmania 7320  
Telephone : (004) 31 6837  
Facsimile : (004) 31 8890

Trevor Grigson / Hugh Simmons  
  
MACMIN N.L.  
P.O. Box 7996  
G.C.M.C.  
  
QLD 4217

*Thirkell Hill  
Soil line on  
drill section  
reverse*

Number of pages of results : 4  
Number of Samples : 71  
First Sample : 100001  
Last Sample : 100021B

Invoice to:  
Trevor Grigson  
  
MACMIN N.L.  
P.O. Box 7996  
G.C.M.C.  
  
QLD 4217

Electronic Data Transmission :  
Modem //  
Facsimile //  
Disk Report //

Results to:  
Dennis O'Neill  
  
MACMIN N.L.  
P.O. Box 7996  
G.C.M.C.  
  
QLD 4217

Results to:

Remarks :

Authorised by .....  
On behalf of:

Richard Newman  
Laboratory Manager

The results in the following analytical report pertain to the samples provided to this laboratory for preparation and/or analysis as requested by the client.



Our reference : BU014946  
 Your reference : E392002  
 Project code : Soil Samples  
 Report date : 09/08/98  
 Report status : Final  
 Page : 1 of 4

Analabs Pty. Ltd.  
 ACN 004 591 664  
 14 Thirkell St, Burnie  
 Tasmania 7320  
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 Facsimile : (004) 31 8890

### ANALYTICAL DATA

Sample	Au	Au(R)				
100001	<2	<10				
100002	<2	<2				
100003	<2	--				
100004	<2	--				
100005	<2	--				
100006	<2	<2				
100007	<2	--				
100008	<3	--				
100009	<2	<2				
100010	<2	--				
100011	10	8				
100012	20	--				
100013	34	34				
100014	<2	--				
100015	<2	--				
100016	<2	--				
100017	2	--				
100018	8	6				
100019	8	8				
100020	<2	--				
100021	<2	--				
100022	<2	--				
100023	<2	--				
100024	<2	--				
100025	<2	--				
100026	<2	--				
100027	<2	--				
100028	<2	--				
100029	<2	--				
100030	<2	--				
100031	<2	--				
100032	<2	<2				
100033	<2	--				
100034	<2	<2				
100035	<2	--				
100036	<2	--				
100037	<2	<2				
100038	<2	<3				
100039	4	3				
100040	<2	--				
100041	<2	--				
100042	<2	--				
100043	<2	--				
100044	<2	--				
100045	<2	--				
100046	<2	--				
100047	<2	--				
100048	<2	--				
100049	<2	--				
100050	<2	--				
Method Units Detection Limit	F614 ppb 2	F614 ppb 2				

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received



Our reference : BU014946  
 Your reference : E392002  
 Project code : Soil Samples  
 Report date : 09/08/98  
 Report status : Final  
 Page : 2 of 4

Analabs Pty. Ltd.  
 ACN 004 591 664  
 14 Thirkell St, Burnie  
 Tasmania 7320  
 Telephone : (004) 31 6837  
 Facsimile : (004) 31 8890

### ANALYTICAL DATA

Sample	Au	Au(R)			
100001B	<2	--			
100002B	<2	--			
100003B	<2	--			
100004B	<2	<5			
100005B	<2	--			
100006B	<2	--			
100007B	<2	<10			
100008B	<2	--			
100009B	<2	<2			
100010B	<2	--			
100011B	<2	--			
100012B	26	26			
100013B	12	10			
100014B	<2	--			
100015B	<2	--			
100016B	<2	--			
100017B	<2	--			
100018B	2	2			
100019B	<2	--			
100020B	<2	<2			
100021B	<2	<2			
Method Units Detection Limit	F614 ppb 2	F614 ppb 2			

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received



Our reference : BU014946  
 Your reference : E392002  
 Project code : Soil Samples  
 Report date : 09/08/98  
 Report status : Final  
 Page : 3 of 4

Analabs Pty. Ltd.  
 ACN 004 591 664  
 14 Thirkell St, Burnie  
 Tasmania 7320  
 Telephone : (004) 31 6837  
 Facsimile : (004) 31 8890

### ANALYTICAL DATA

Sample	Cu	Pb	Zn	Ag	Fe
100001	22	14	78	<1	0.18
100002	11	4	29	<1	0.49
100003	6	12	20	<1	0.57
100004	7	18	21	<1	0.21
100005	8	9	37	<1	0.20
100006	18	9	50	<1	0.40
100007	6	5	23	<1	0.42
100008	17	7	27	<1	0.19
100009	8	8	24	1	0.46
100010	16	4	19	<1	0.54
100011	7	8	15	<1	0.85
100012	10	11	14	<1	0.54
100013	10	6	17	<1	0.52
100014	5	3	14	<1	0.51
100015	2	3	74	<1	0.51
100016	12	<3	18	<1	0.29
100017	14	6	21	<1	0.49
100018	8	10	13	<1	0.43
100019	6	3	11	<1	0.65
100020	4	9	16	<1	0.41
100021	6	19	22	<1	0.69
100022	6	8	15	<1	0.62
100023	5	14	17	<1	0.58
100024	6	12	30	<1	0.49
100025	11	19	39	<1	0.78
100026	10	13	371	<1	0.49
100027	8	8	45	<1	0.75
100028	5	4	9	<1	0.60
100029	6	<3	18	<1	0.40
100030	6	8	48	<1	0.51
100031	5	3	47	<1	0.69
100032	6	12	10	<1	0.58
100033	8	7	26	<1	0.62
100034	7	7	10	<1	0.63
100035	6	9	44	<1	0.47
100036	6	4	32	<1	0.48
100037	6	8	15	<1	0.55
100038	8	10	17	<1	0.16
100039	7	4	17	<1	0.59
100040	8	6	44	<1	0.32
100041	7	4	15	<1	0.63
100042	6	6	23	<1	0.63
100043	6	15	9	<1	0.51
100044	2	4	31	<1	0.43
100045	5	8	14	<1	0.64
100046	4	11	51	<1	0.48
100047	4	11	16	<1	0.64
100048	5	13	39	<1	0.25
100049	5	10	25	<1	0.61
100050	5	8	15	<1	0.61
Method Units Detection Limit	A102 ppm 2	A102 ppm 3	A102 ppm 2	A102 ppm 1	A102 % 0.01

Notes: N.A. = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received



## ANALYSIS DESCRIPTION

Job number : BU014946 Order number : E392002

-----  
Scheme code : S001 - Pre-preparation  
-----

Sample preparation. Pre-preparation - sorting,  
boxing, weighing

-----  
Scheme code : S032 - RAB/Perc; Dry, Fine pulverise, Ringmill <3.5kg  
-----

Sample preparation. RAB, Percussion samples;  
Dry, Fine pulverise, Ringmill, <3.5kg

-----  
Scheme code : F614 - 50g fire assay, Lead collection, DIBK, AAS  
-----

Fire assay, Lead collection, Aqua Regia digest,  
DIBK extraction, AAS, 50g sample.

-----  
Scheme code : G102 - Triple acid digest, Geochemical samples  
-----

Triple acid digest, (HCl, HNO<sub>3</sub>, HClO<sub>4</sub>), Geochemical  
samples.

-----  
Scheme code : A102 - AAS analysis  
-----

AAS analysis of sample after G102 digest.

**EL 3/92 - THIRKELL HILL**

**ANNUAL AND FINAL REPORT**

**Appendix 2**

Memorandum

Quartz Veining in Diamond Drill Core from Condor Prospect,

Thirkell Hill by Hugh Simmons, 20 October 1998

Date: 20 October 1998  
To: Bob McNeil, Denis O'Neill  
From: Hugh Simmons

### Quartz veining in diamond drill core from Condor prospect, Thirkell Hill

The two diamond drill holes from the Condor prospect intersected rare zones of weak disseminated base metal mineralisation and two minor, apparently planar, silicified breccia zones containing quartz / alkali feldspar / chlorite / (carbonate) infill and weak galena / pyrite / chalcopyrite mineralisation. Several very narrow (<2 cm) sub-parallel quartz / chlorite / (carbonate) veins containing rare galena / pyrite / chalcopyrite mineralisation were also intersected.

Mineralisation is weak (particularly with respect to the project's aim of locating a massive sulphide target) and is obviously associated with the breccia infill and wallrock alteration. No evidence of massive sulphide lenses or strata-bound mineralisation was observed; in the vicinity of the breccia zones the host rock contained many microfractures (some of which were mineralised) and mineralisation was principally replacement of matrix chlorite adjacent to the microfractures. The breccia and associated mineralisation were intersected at a shallower depth in CDH2 than in CDH1, suggesting that the plane of the fracture zone may dip steeply West and plunge at a moderate angle to the NNW. The approximate NNW-SSE strike of the breccia / silicification is coincident with the lead - zinc anomaly identified by soil testing.

Exploration at Wart Hill (south of the Thirkell Hill tenement) has identified three distinct mineralising events in the area: (1) strata-bound massive sulphide (Pb-Zn-Ag), (2) fracture-controlled Pb-Zn( $\pm$ As), and (3) disseminated and vein-style Pb-Zn with possible associated strata-bound Au mineralisation and carbonate alteration (Gulson *et al.*, 1987). Lead isotope studies indicate that the lead in all styles had a common origin of emplacement during the Cambrian and that styles (1) and (3) are temporally closely associated with Cambrian rift-related volcanism whereas style (2) temporally relates to the Devonian emplacement of granitoids (Gulson *et al.*, 1987). Large *et al.* (1987) reported a lateral zonation or segregation between the Pb-Zn mineralisation and Cu-Au mineralisation near Wart Hill and interpreted this finding as indicating a difference in distance from the source of the mineralising fluids rather than indicating separate mineralising events. The veins intersected at Condor exhibit similar mineralisation and alteration selvages to those reported for the Devonian style (2) event.

#### References:

**Gulson, B.L., Large, R.R. and Porritt, P.M., 1987.** Base metal exploration of the Mount Read volcanics, western Tasmania: Pt.III. Application of lead isotopes at Elliott Bay. *Economic Geology* **82** (2) pp. 308 - 327.

**Large, R.R., Herrmann, W. and Corbett, K.D., 1987.** Base metal exploration of the Mount Read volcanics, western Tasmania: Pt.I. Geology and exploration, Elliott Bay. *Economic Geology* **82** (2) pp. 267 - 290.