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SUMMARY

1. Exploration Licence 31/87 at the northern extremity of Sorell Peninsula in western Tasmania, is underlain by Precambrian quartzites with interbedded phyllites and shales. The area is structurally complex.
2. Some of the quartzites contain more than 98% SiO₂. Comalco Ltd. explored the area in the early 1970's, established reserves of several million tonnes of silicon-grade orthoquartzite and has a current mining lease (16M/75) covering 4 km within EL31/87. No mining has occurred.
3. Subsequent to Comalco's work, a small body of granite was discovered on the west coast of the tenement, associated with localised contact metamorphism.
4. Recent geophysical studies have demonstrated the granite is part of a much larger, largely offshore, granite pluton, now termed the Grandfathers Granite.
5. The Grandfathers Granite has petrological affinities to, and seems to be contiguous with, the tin and silver-lead mineralising Heemskirk Granite to the north.
6. The geophysical studies also suggest the Precambrian rocks are part of a thin thrust sheet overlying Cambrian sediments. A strong previously unexplained, magnetic anomaly near Cape Sorell, within EL31/87, may represent a mafic part of the Cambrian succession or a metals-enriched zone along the thrust sheet.
7. The tin-tungsten and silver-lead potential of the peninsula is untested. The granite may also have mobilised base metals and gold from Cambrian source rocks.
8. A mapping and geophysical exploration programme is outlined to help explore for blind tin-tungsten and base metal and gold mineralisation, within suitable Precambrian hosts or along the thrust surface itself.

1. INTRODUCTION

1.1 Tenement Details

Exploration Licence 31/87 (Figure 1) was granted to New Holland Mining NL on 15 January, 1988. The Company is sole owner and manager.

The EL is entirely within the 'South West Tasmania' Australian Heritage Commission Act registered entry.

The area excludes	● Crown Reserves	0.2km ²
	● Commonwealth of Australia	0.7km ²
	● Consolidated Mining Lease 16M/75	4.0km ²
The area comprises	● Private property	0.4km ²
	● South West Conservation Area	46.6km ²

Consolidated Mining Lease 16M/75, covering 4km², is held by Comalco Ltd. for silica on the northern part of the tenement (Figure 2).

Exploration licences in Tasmania are granted for up to ten years, but must be renewed annually. There is a compulsory reduction of at least half the original area in the first five years.

1.2 Exploration Aims

Comalco Ltd. evaluated the economic potential of the high-grade Precambrian quartzites on Sorell Peninsula in the mid-1970's. The area was not considered prospective for base metals or gold.

Subsequent developments have considerably enhanced the economic potential of EL31/87. These include:

1. The discovery by Mines Department regional geologists (Baillie *et al*, 1977) of a small granite outcrop and nearby contact metamorphic zone on the west coast of the tenement.
2. The acquisition since the early 1980's of regional gravity and aeromagnetic coverage as part of the Department of Mines Mt. Read Volcanic Project.
3. The regional and locally detailed geophysical interpretations of Leaman (especially 1988 (a-c)) which
 - reaffirmed earlier concepts of Precambrian thrust sheets overlying Cambrian sequences, and suggested an early Cambrian age of thrusting.

- suggested the Precambrian on Sorell Peninsula was very thin - perhaps only a few hundred metres.
- showed that the isolated granite outcrops on the peninsula were only a small part of a much larger, mainly offshore, pluton - now termed the Grandfathers' Granite.

Leaman (1988b) also showed that the Grandfathers Granite may be contiguous with the mineralised Heemskirk Granite to the north, with its classically zoned tin and silver-lead deposits at Zeehan.

EL31/87 clearly has untested prospectivity for disseminated, vein or replacement-skarn tin-tungsten mineralisation in receptive hosts within the metamorphic aureole of the Grandfathers Granite. If the thrusting predates granite intrusion, the thrust surface itself may be a favourable focus for mineralisation. Moreover, potential exists for heat and fluids from the granite to mobilise base metals and gold from suitable Cambrian sources up into the thrust surface or favourable hosts. The strong magnetic anomaly on the peninsula within EL31/87 is a possible target for testing this concept.

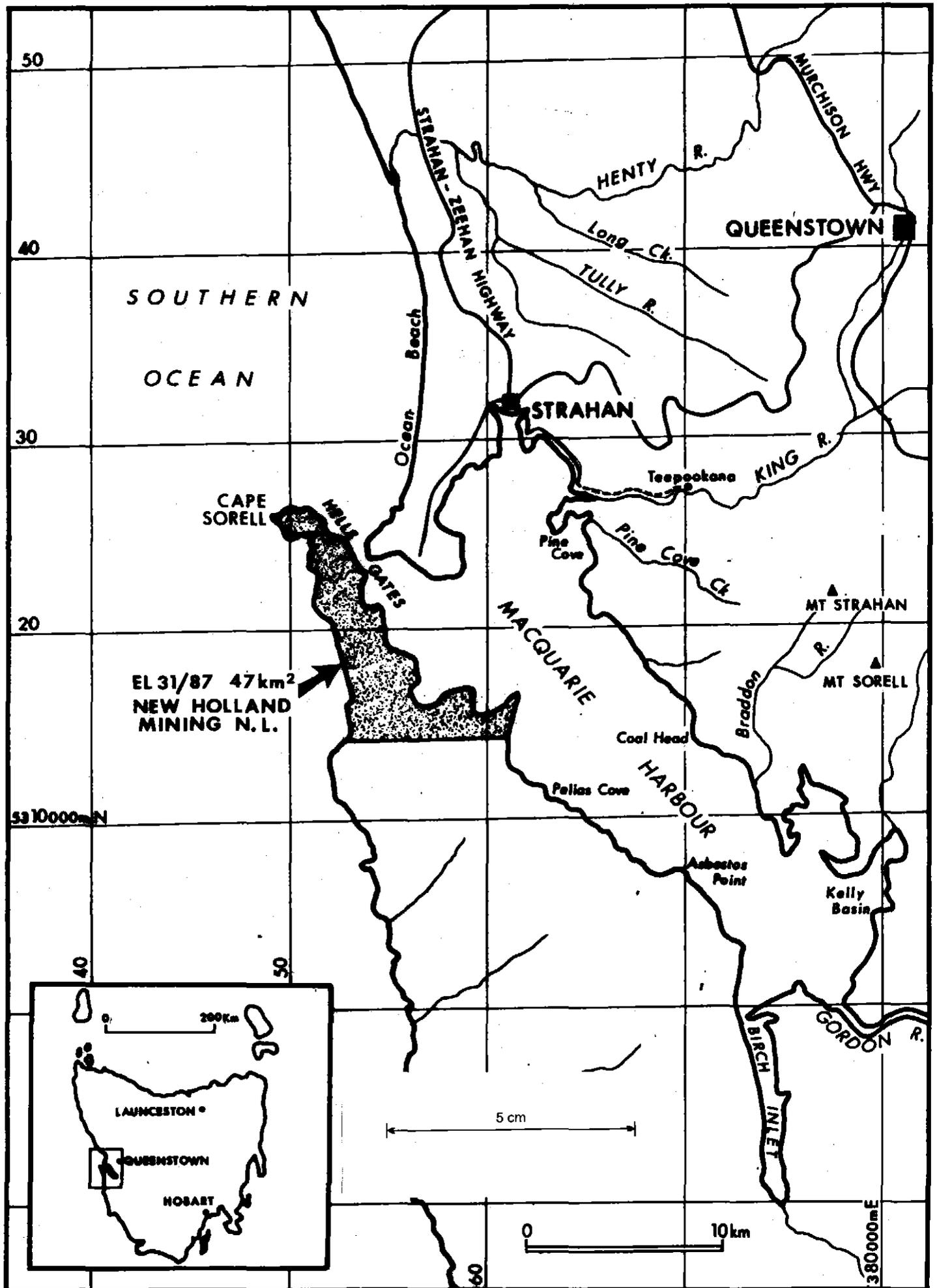


Figure 1. Location map, EL31/87, western Tasmania.

2. WORK COMPLETED IN YEAR 1

2.1 Summary

New Holland's Year 1 assessment of EL31/87 has been confined to a detailed review of existing data and preparation of a prospectivity report (Cromer, 1988) to aid further work.

2.2 Review of Previous Exploration

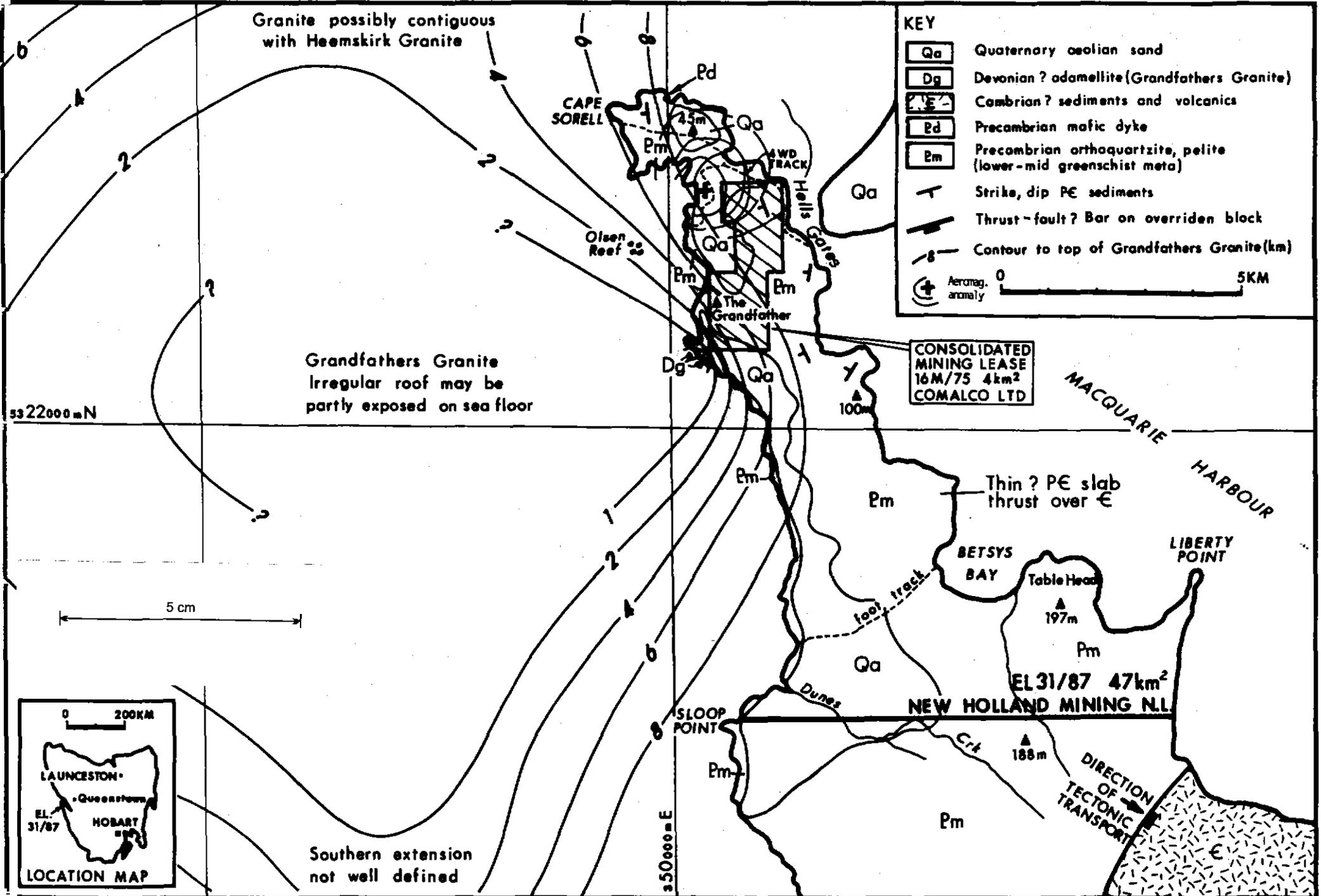
The central west of Tasmania has seen several decades of modern exploration, mainly by large companies such as Mt. Lyell Mining and Railway Co. Ltd., E.Z. Co. Ltd., Lyell-E.Z., BHP Pty. Co. Ltd., Rio Tinto Aust., Exploration, Comalco Ltd. and Pickands Mather and Co. Sorell Peninsula was included in several EL's held by these companies.

In the early 1970's, Comalco Ltd. explored the area for high-grade quartzite. Early reports indicated a huge resource (1000mt) in the Precambrian (Pickin, 1971). Later, (Pickin, 1975), Comalco delineated several high-grade orthoquartzite prospects covering several square kilometres on Cape Sorell. Reserves were estimated at 2.7mt (more than 99% SiO₂) of orthoquartzite suitable for silicon metal production, and a similar tonnage of 98% SiO₂ suitable for ferrosilicon production. The Company recommended further drilling, produced a technical report on mining and on-site smelting of 100,000 tonnes per year (Anon, 1975), and secured the area with Mining Lease 16M/75 covering four square kilometres (Figure 2). No mining has taken place but the lease is still current. Comalco was apparently unaware of the occurrences of Devonian adamellite on the coast west of their lease.

2.3 Tenement Geology

Precambrian. The northern part of Sorell Peninsula is composed dominantly of Precambrian rocks (Figure 2) with minor Devonian granite and superficial Quaternary cover.

The peninsula extends south from Cape Sorell to Birch Inlet and is divided by north-northwest-trending faults into two regions of Precambrian rocks and two of probable Cambrian rocks. The latter comprise the Mainwaring Group. Crawford and Sandiford (1984) recognised the structures as probable thrust faults, the Cambrian rocks (including amphibolites, andesites, felsic volcanics and volcanoclastics) as correlates of early Dundas Trough rocks further north. Leaman (1986) suggested the Precambrian blocks on Sorell Peninsula were 1-5km thick on geophysical grounds, and that they represented part of disrupted thrust sheets tectonically emplaced from the northwest and concealing Cambrian sequences.



Generalised Geology, EL31/87. Gravity data from Leaman (1988b), magnetic data from Corbett et al (1982).

McClenaghan (1988) described several phases of deformation in the Cambrian and Precambrian blocks, and two styles of faulting. He suggested that some faulting may be Cambrian, but that the thrusting was possibly Devonian or younger. Findlay and McClenaghan (1987) proposed a two-hole drilling programme south of EL31/87 to test for overthrusting.

More recently, Leaman (1988a) has argued that the Precambrian rocks are much thinner than previously thought - perhaps a few hundred metres - overlying Early Cambrian sequences. He suggests (pers. comm.) the thrusting is early Cambrian in origin, and modified in the Devonian. The thrust surface is estimated to dip at a low angle (perhaps 10°) to the northwest. This recent work has implications for prospectivity on the peninsula.

An as-yet unexplained positive magnetic anomaly occurs on the northern tip of the peninsula, within EL31/87 (Figure 2). In view of Leaman's (ibid) thrust model, the anomaly may represent a magnetic body in the Cambrian at relatively shallow depth beneath the Precambrian overthrust, or a magnetic body on the thrust surface itself. The style of the anomaly is similar to that at Renison Bell to the north.

The Precambrian rocks in the tenement (Corbett and Brown, 1975, 1976, Baillie et al, 1977, Baillie and Corbett, 1985) are a structurally complex series of lower-middle greenschist facies orthoquartzite, micaceous quartzites, phyllites, shales and minor conglomerates. The succession reflects a shallow-water, tectonically stable depositional environment in the late Proterozoic. The metamorphism, main cleavages and folding may be related to the Penguin Orogeny (c 630-750 Ma; Turner, 1988).

The Precambrian rocks are lithologically and structurally similar to other Precambrian inliers in Tasmania and in particular to parts of the Rocky Cape Group.

A small dyke of cleaved amphibolite has intruded orthoquartzites at the northern tip of the peninsula. Nearby, south of Split Rock, dolerite boulders are common (Baillie and Corbett, 1985, p 44). These occurrences are similar to many small mafic intrusions through the Tasmanian Precambrian. Most were probably intruded during the Penguin Orogeny.

Devonian Granite Baillie et al (1977) was the first to recognise small, isolated outcrops of adamellite on the coast six kilometres south of Cape Sorell. The intrusive is presumably Devonian in age since it is structurally undeformed and is petrologically similar to the radiometrically dated (340-357 Ma) Heemskirk Granite forty kilometres north.

Some of the pelitic Precambrian rocks on the coast 1.5-2km north of the adamellite have been thermally metamorphosed.

3. DISCUSSION

New Holland Year 1 review has revealed that the Sorell Peninsula has economic potential for tin-tungsten and base metal and gold mineralisation.

A possible source for the tin and tungsten is the recently recognised Grandfathers Granite, a largely buried, offshore, pluton-sized body. The pluton also may have acted as a heat and fluid source to mobilise base metals and gold from suitable Cambrian source rocks which are thought to underlie the peninsula at shallow depth beneath an overthrust Precambrian sheet.

The thrust surface itself, receptive host rocks in the Precambrian, or both, may have acted as foci for mineralisation.

This recently enhanced prospectivity of the peninsula is completely untested.

4. PROPOSED FUTURE EXPLORATION

To adequately test tenement prospectivity, exploration in Year 2 will aim at:

- (a) establishing the detailed sub-surface shape of the Grandfathers Granite. This will involve gravity (nominal 1km² spacing, onshore and offshore; see Figure 2) and about 100 line kilometres of aeromagnetics. The geophysics will also refine the thickness of the Precambrian rocks and better define of the magnetic anomaly at the northern end of the peninsula.
- (b) establishing the detailed stratigraphy and structure of the Precambrian rocks to investigate possible host rock lithologies for mineralisation.

This approach will hopefully lead to target definition for exploratory drilling in Year 3.

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