

The Anio Creek Anomaly

— Executive Overview

BACKGROUND

An airborne geophysical anomaly was first found near Anio Creek in the Cradle Mountain–Lake St Clair National Park in 1972. Subsequent overflights during nearby surveys in 1980 showed isolated magnetic and conductivity anomalies in the Anio Creek area. These anomalies could not be explained in terms of the known geology at the time and despite some further research, presented in the appended reports, the sources of the anomalies remain enigmatic.

Anio Creek is located at the northwest corner of the Cradle Mountain–Lake St Clair National Park. The area consists of a gently undulating ridge top at about 1000 m altitude bounded to the north by the long slope down to the Vale River, and to the south by the precipitous slope down to Devils Ravine. Vegetation on the ridge is a fire-influenced mosaic of buttongrass, scoparia-heath, tea tree scrub and deciduous beech, with patches of rain forest.

Mineral Resources Tasmania, with approval from the National Parks and Wildlife Service (NPWS) and working within the guidelines of the World Heritage Area Management Plan, carried out reconnaissance mapping of this area in 1988 as part of the regional Mt Read Volcanics mapping programme. This mapping did not explain the anomalies and it was concluded that more detailed geological and

geophysical research was required. A helicopter-borne aeromagnetic survey was flown in November 1993, to accurately locate the anomalies, and the area was geologically mapped in March 1994, again with the approval of NPWS. The field work was carried out in such a way as to ensure that there was no departure from minimal-impact bush-walking practices.

RESULTS

Results obtained from the 1993/94 survey are contained in the following reports which are appended to this document:—

1994/15 Geophysical anomalies at Anio Creek, *by R. G. Richardson*

1994/23 The petrography of some rocks from the Anio Creek area, *by R. S. Bottrill*

1994/24 A preliminary fluid inclusion study of a quartz-sulphide-chlorite vein at the Anio Creek prospect, northwest Tasmania, *by J. Taheri*.

1994/25 The geological setting and interpretation of the geophysical anomalies of the Anio Creek–Mt Remus area, *by K. D. Corbett and J. Pemberton*

SUMMARY OF FINDINGS

1. The strong magnetic anomalies appear to be caused by pipe-like features which lie at shallow depths (maximum 100 m to top).
2. The magnetic susceptibilities required to produce the anomalies are quite high, suggesting that pyrrhotite and/or magnetite may be involved.
3. Some association of the anomalies with Cambrian porphyry bodies, which are common in the area, is possible. However the known smaller bodies are not magnetic.
4. Mineral assemblages and fluid inclusions from rocks near the anomalies suggest a granitic source at depth. The regional gravity data also indicate that a shallow offshoot from the Dolcoath Granite could be present beneath Anio Creek.
5. There are mineralogical indications of possible interaction with mafic or ultramafic rocks at depth.
6. Geological samples from the area are sulphide-rich in places. Gold and copper are present in a breccia in Anio Creek, and there are small amounts of molybdenum, vanadium and cobalt at the Mt Remus prospect.
7. The sharply defined magnetic anomalies, and their geological setting within Precambrian rocks, are unusual features for Tasmanian geology.

CONCLUSIONS

When the above findings are considered the following conclusions may be drawn:—

- There is still insufficient information to give a definitive explanation of the anomaly source.
- Any discussion of the presence of economic concentrations of minerals in the anomaly-producing system remains purely speculative.
- The magnetic anomalies appear different in style to those known from western Tasmania. The relatively quiet nature of the magnetic field in the Anio Creek area, compared to much of western Tasmania, allows the two subtle anomalies studied to be readily discriminated from the effects of the surrounding rocks.
- A better understanding of these anomalies is still required due to their strong response and the unusual combination of mineral species in the area. The source of the anomalies may represent an example of a style of mineralisation not already known in the State.

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