

INTRODUCTION:

The Colebrook Hill Prospect is located south of Rosebery, Western Tasmania, in the E.L. 1/62, Mt. Black. Much geophysical exploration has been undertaken including magnetics and a range of electrical methods. The target in this area is tin-bearing pyrrhotite mineralisation within volcanic wackes and siltstone of the Cambrian Crimson Creek Formation.

Coincident magnetic, EM, EIP anomalies have been observed but there is considerable uncertainty as to the nature, distribution and depth range of the sources. Leaman Geophysics was asked to review and evaluate one such anomaly (labelled '2' in Figure 1). Anomaly '1' has been the subject of a separate evaluation (Richardson, 1982). The purposes of the evaluation in each case have been to improve definition of the anomaly and its source depth to aid drill location and establish if sources of sufficient size exist to justify drilling.

DATA AND TREATMENT:

Some of the total field magnetic data provided is reproduced in Figure 1. As requested, the evaluation has been restricted to anomaly '2' but in order to place this feature in true perspective all data between 5370900 and 5371200mN have been reviewed. Additional data from lines 950, 050 and 150 not shown in Figure 1 has also been examined (refer EZ plan AO-504-0288).

Profile plots (Figure 2) of the magnetic data shows it to be rather noisy with a major feature west of 374500. Anomalies '1' and '2' are labelled and seen to be rather spiky, generally width-limited and often patchy features. Most profiles show the anomalies as abnormal spikes in a general zone of magnetic disturbance. The bulges of anomaly evident on lines 000, 100mN may be due either to constructive interference of many, small shallow sources or superposition of such sources on a large deep source. This study has sought to resolve these alternatives.

In order to define the sources the following processing has been undertaken.

- i) spectral analysis to define likely source depth-width ranges and relative significance,
- ii) pole reduction analysis to appraise source distribution,
- iii) analytic signal analysis to define source boundaries,
- iv) horizontal and vertical gradient analysis to estimate source dip and location,
- v) filtering to decompose spikes and assess the apparent long wavelength aspects of the profiles, and
- vi) upward continuation as a means of filtering, confirmation of conclusions implied by ii, v, and for correlation with airborne data.

This treatment has been applied to all data along lines 5370900, 5371000, 5371100 and 5371200 since analysis is wasteful of data coverage and use of a large data sample is essential. Other