



Division of Mines and Mineral Resources — Report 1990/13

The Lisle aeromagnetic survey —a brief interpretation

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Abstract

A helicopter aeromagnetic survey was flown over the Lisle goldfield and surrounding areas in 1983 for Seltrust Mining Corporation. The data have been corrected to uniform terrain clearance and constant barometric altitude, and the resulting maps are dominated by known granitoids. Magnetic susceptibility measurements on core from a Mines Division drill hole show a value of at least 1.5×10^{-3} cgs.

INTRODUCTION

An aeromagnetic survey was flown by Geometrics International Corporation with a flight line spacing of 200 m and a nominal terrain clearance of 70 m (Storer, 1984). Magnetic data only were collected along north-south flight lines.

The area flown lies on both the Pipers River and Launceston Geological Atlas 1 mile maps but outcrop in much of the area is poor. Storer (1985) reported the results of 29 percussion drill holes, most of which terminated in granite or granodiorite, and the Mines Division has drilled one hole which entered granodiorite at shallow depth.

Examination of the aeromagnetic data showed that the terrain clearance varied from 64 m to 302 m, with an average of 121 metres. The data were corrected to a uniform terrain clearance of 150 m and a uniform barometric altitude of 1300 m using the method discussed in Richardson (1989a).

QUALITATIVE INTERPRETATION

Most of the features on the map (figs 1, 2) are related to granite/granodiorite distribution. There are clearly-defined areas of basalt in the west and south-east of the area (Areas 1 & 2 on Figures 1 & 2) but the noisy area in the north-east of the map sheet (Area 3 on Figures 1 & 2) appears to result from a combination of basalt and granitoid effects. The granitoid mass has a quite distinct margin at about 524000 mE, and also a WNW to ESE margin at its northern boundary.

The Lisle granite (Area 4 on Figures 1 & 2) stands out distinctly, as do the Bessell Reward, Golconda and Panama areas (5, 6 & 7 on Figures 1 & 2). Much of the granite is at shallow depth as shown by the high relief on the magnetic maps and the alteration on the geological maps.

QUANTITATIVE INTERPRETATION

Two profiles (A-B, C-D on fig. 2) were selected across the anomaly corresponding to the Lisle granite to allow

determination of consistent models. Data from the continuation to 1300 m barometric altitude were used to allow calculations to be performed with a planar datum. The initial models, which consisted of a magnetic granodiorite in non-magnetic surrounds, used a susceptibility of 0.4×10^{-3} cgs as used when modelling in the Mangana-Alberton area (Richardson, 1989b). During modelling it was found that a much higher susceptibility was required, and when some core was located the measured susceptibility (after partial correction for core diameter) was at least 1.5×10^{-3} cgs. It should be noted that the core contained visible sulphides. The final models used a susceptibility of 2×10^{-3} cgs.

Section A-B (fig. 3) shows two granodiorite highs at shallow depth separated by a zone of essentially non-magnetic material with granodiorite at a depth of about four kilometres. Section C-D (fig. 4) shows a single granodiorite high at shallow depth. Both sections show that the magnetic parts of the Lisle granite dip steeply on all margins. Both sections are not through true two-dimensional structures, resulting in some discrepancies between the sections.

CONCLUSIONS

With the information gained from the modelling it is possible to pick areas of shallow granodiorite. Figure 5 shows a number of such areas but any drilling should be preceded by both geological and magnetic ground checks. All core should be logged for magnetic susceptibility and should more data be required to better define drilling targets, a detailed gravity survey should be carried out. Altitude-corrected maps and a sorted located data tape are available from the Division of Mines and Mineral Resources.

REFERENCES

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- RICHARDSON, R. G. 1989a. The vertical continuation of aeromagnetic data. *Rep. Dep. Mines Tasm.* 1989/37.
- RICHARDSON, R. G. 1989b. The Mangana-Alberton aeromagnetic survey—a preliminary interpretation. *Rep. Dep. Mines Tasm.* 1989/19.

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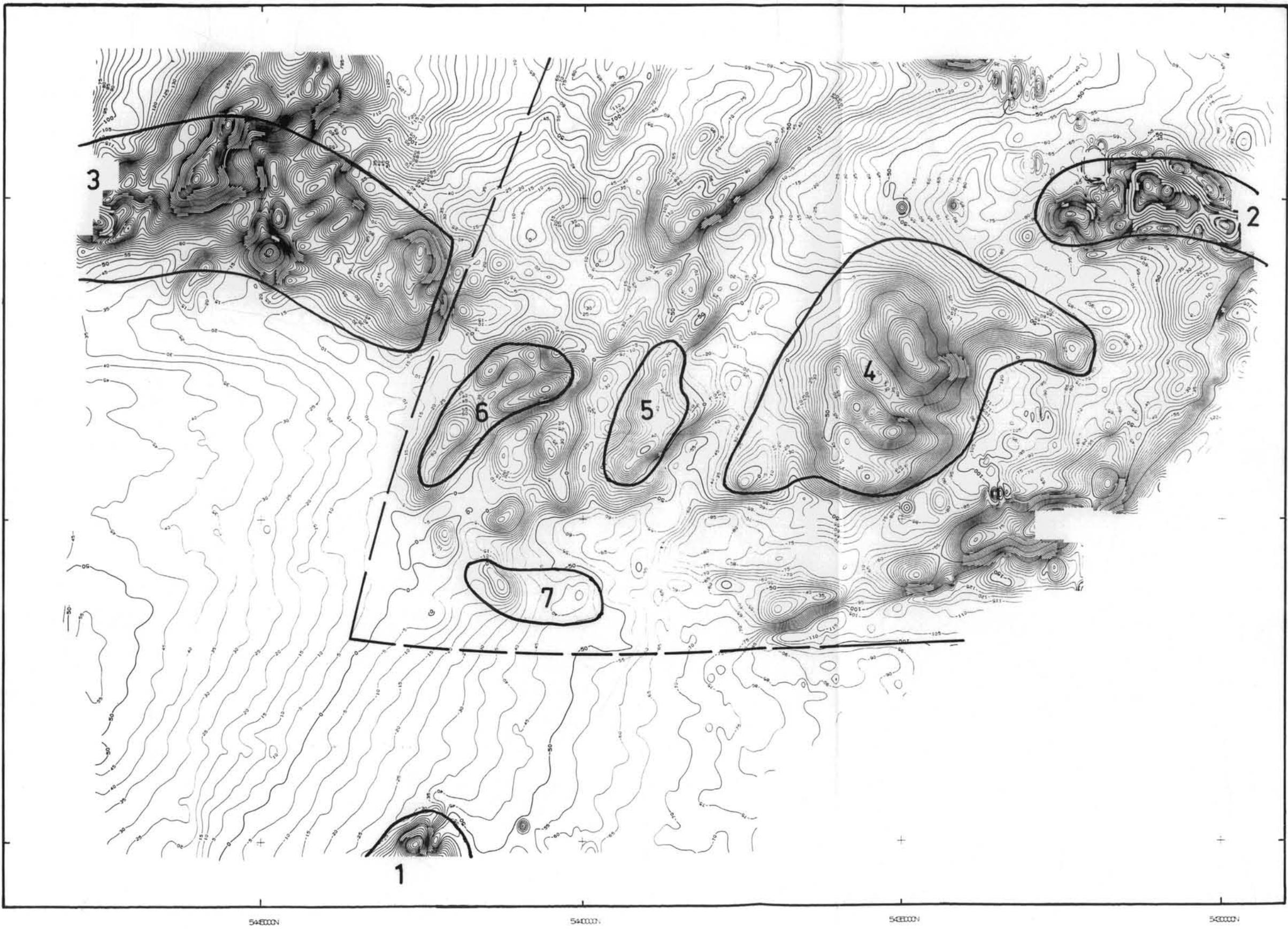


Figure 1. Residual magnetic intensity contours at 150 m terrain clearance.

5 cm

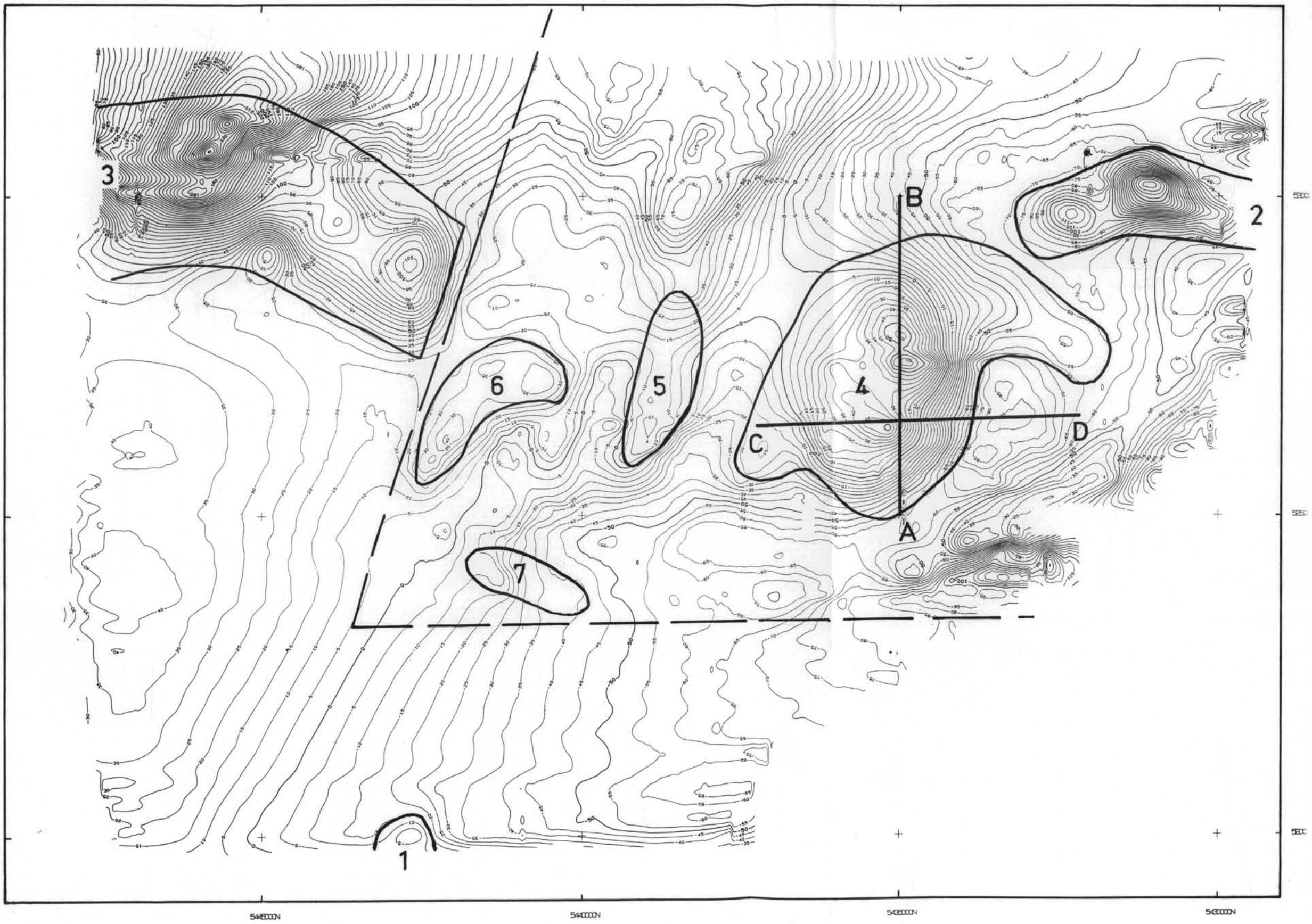
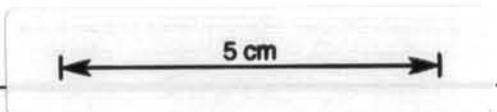


Figure 2. Residual magnetic intensity contours at 1300 m barometric altitude.



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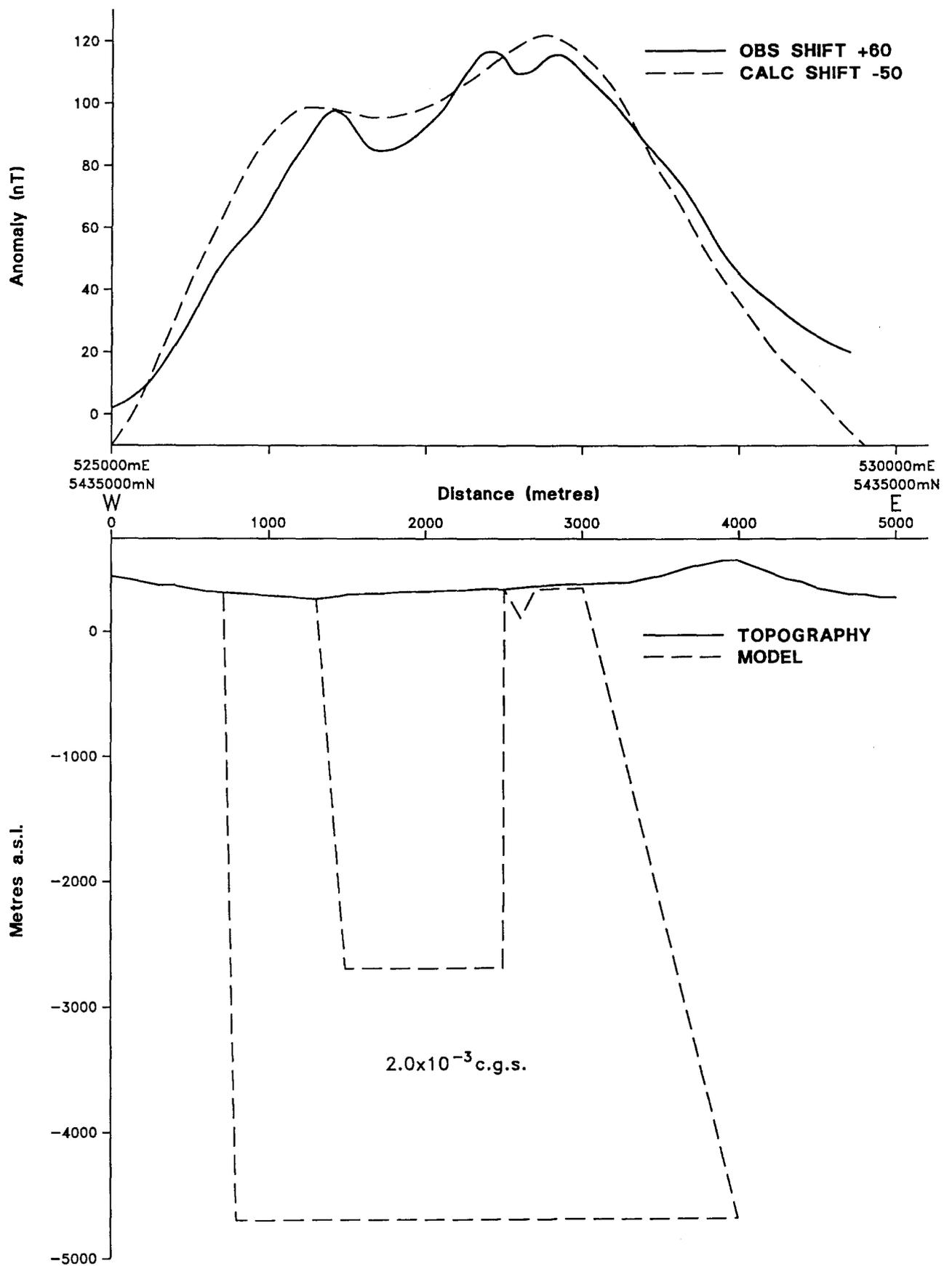


Figure 3. Section A-B.

5 cm

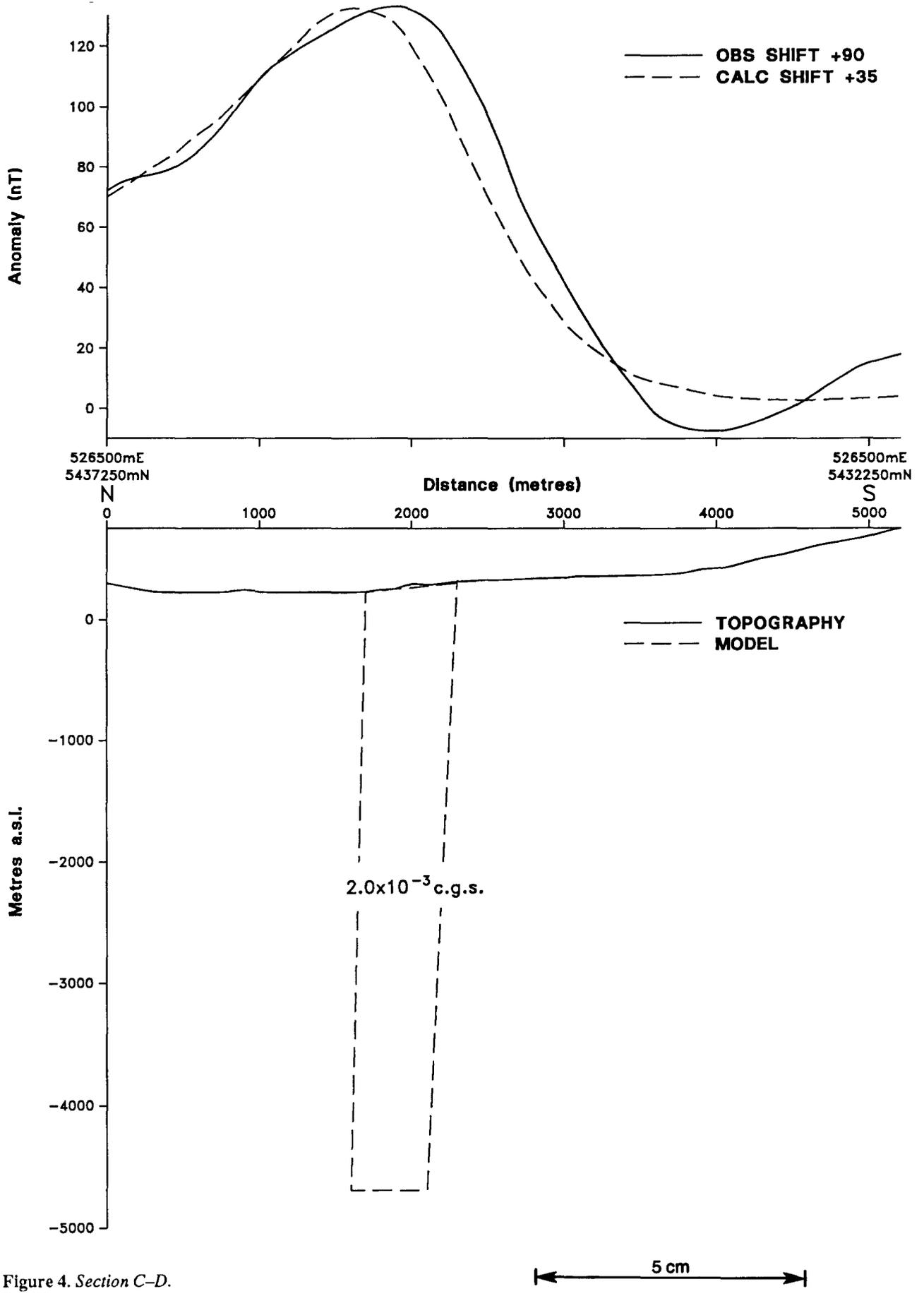


Figure 4. Section C-D.

5 cm

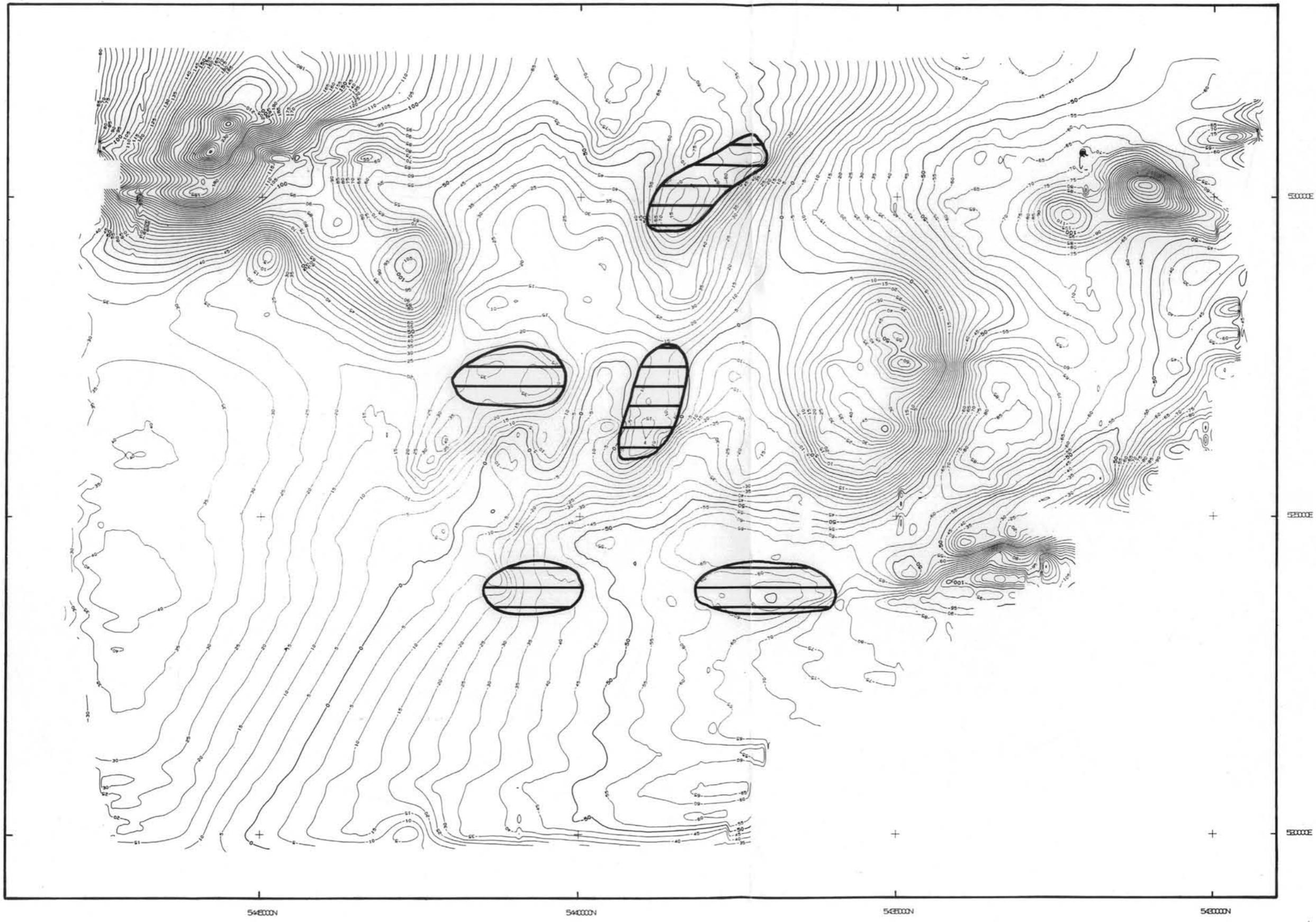


Figure 5. Areas of granodiorite warranting further investigation.

