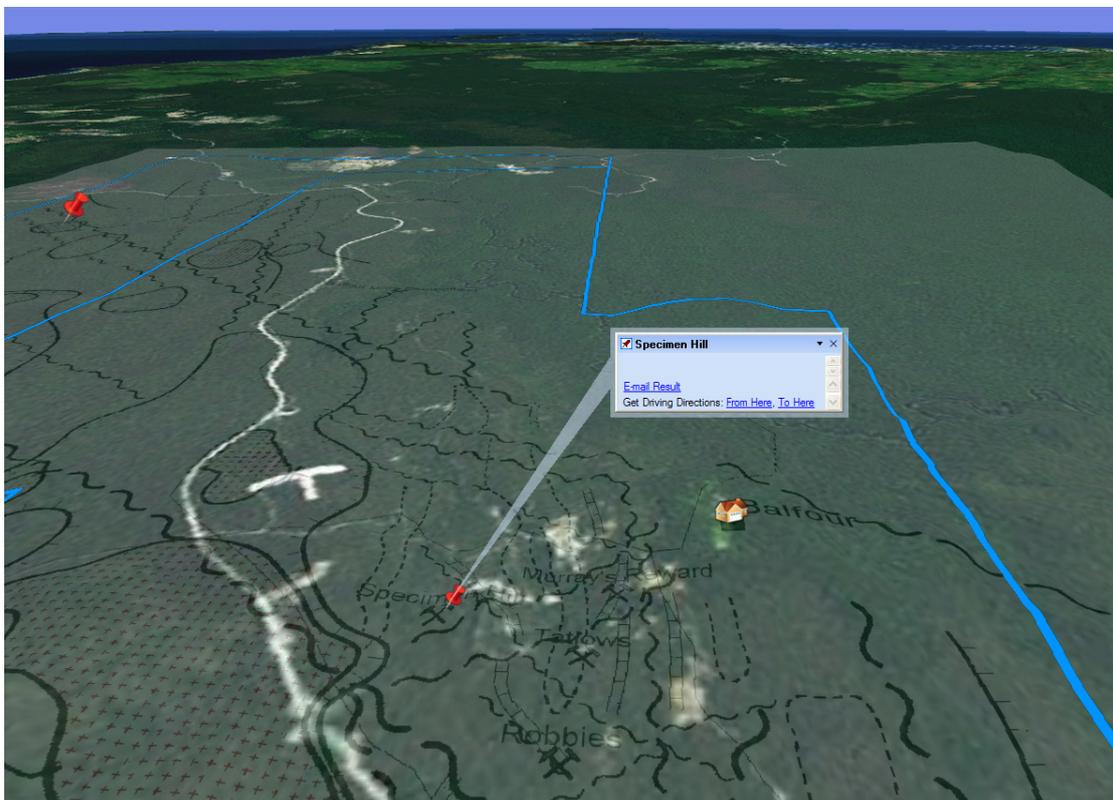


Balfour Project

Tasmania

Specimen Hill Magnetic Data Modelling



Prepared for Pleiades Resources Pty Ltd
by
Andrew Bisset

June 2009

Table of Contents

Table of Contents	i
List of Figures	ii
List of Tables	ii
1. Summary	1
2. Modelling Results	5
3. Comments	13

List of Figures

Figure 1: Regional magnetic image (TMI RTP) of the Balfour region with inset showing the Specimen Hill magnetic unit	2
Figure 2: Colour magnetic image (TMI) with a first vertical derivative added back as intensity.....	3
Figure 3: Residual gravity image with interpretation showing location of Specimen Hill prospect (inset).....	4
Figure 4: Plan view of TMI image (RTP) with magnetic models and body numbers...5	
Figure 5: Plan view of models with TMI image as background. Flight lines are shown.	6
Figure 6: Plan view of TMI image (RTP) overlain with models and lines indicating cross-section locations	6
Figure 7: Example cross-section showing features of each graph.....	7
Figure 8: Cross sections along three flight lines showing models as they intersect the lines. Magnetic susceptibility values are shown along with a default density.....	9
Figure 9: Three dimensional perspective view of model and magnetic data.....	10
Figure 10: 3D view of model looking eastwards	11
Figure 11: 3D view of model and TMI looking westwards.....	11
Figure 12: 3D view of model looking northwards. Note the difference in depth between the first two tabular bodies and those further to the north.....	12
Figure 13: Area south of Specimen Hill with elevated magnetism (left) and gravity (right)	13

List of Tables

Table 1: Arthur-Pieman geophysical survey specifications.....	1
Table 2: Summary of magnetic models and depth to top of source.....	5

1. SUMMARY

Magnetic data from the Specimen Hill locality was modelled in 2D across several flight lines to provide an estimate of depth to source for the main magnetic unit that runs through the region.

Magnetic data for modelling was sourced from the Arthur-Pieman survey flown in 1996. Details of this survey are presented in Table 1. Data from this survey had no altitude data and consequently an assumption has been made for a constant sensor altitude of 90 metres above ground level as per the flight record specifications. This is a critical assumption as it affects depth estimates for any subsequent modelling.

Table 1: Arthur-Pieman geophysical survey specifications

Survey Name	Arthur-Pieman
Date Acquired:	April 1996
Flight Line Spacing:	200 m
Flight Line Direction:	East-West
Magnetic Sensor Height:	90 metres AGL

Summary of findings from the modelling are;

- A north-east trending structure immediately south of Specimen Hill appears to separate shallower and less magnetic bodies to the north from deeper and more magnetic bodies to the south
- The more magnetic body south of this structure is also coincident with an increase in the gravitational field which may indicate a relationship between the two

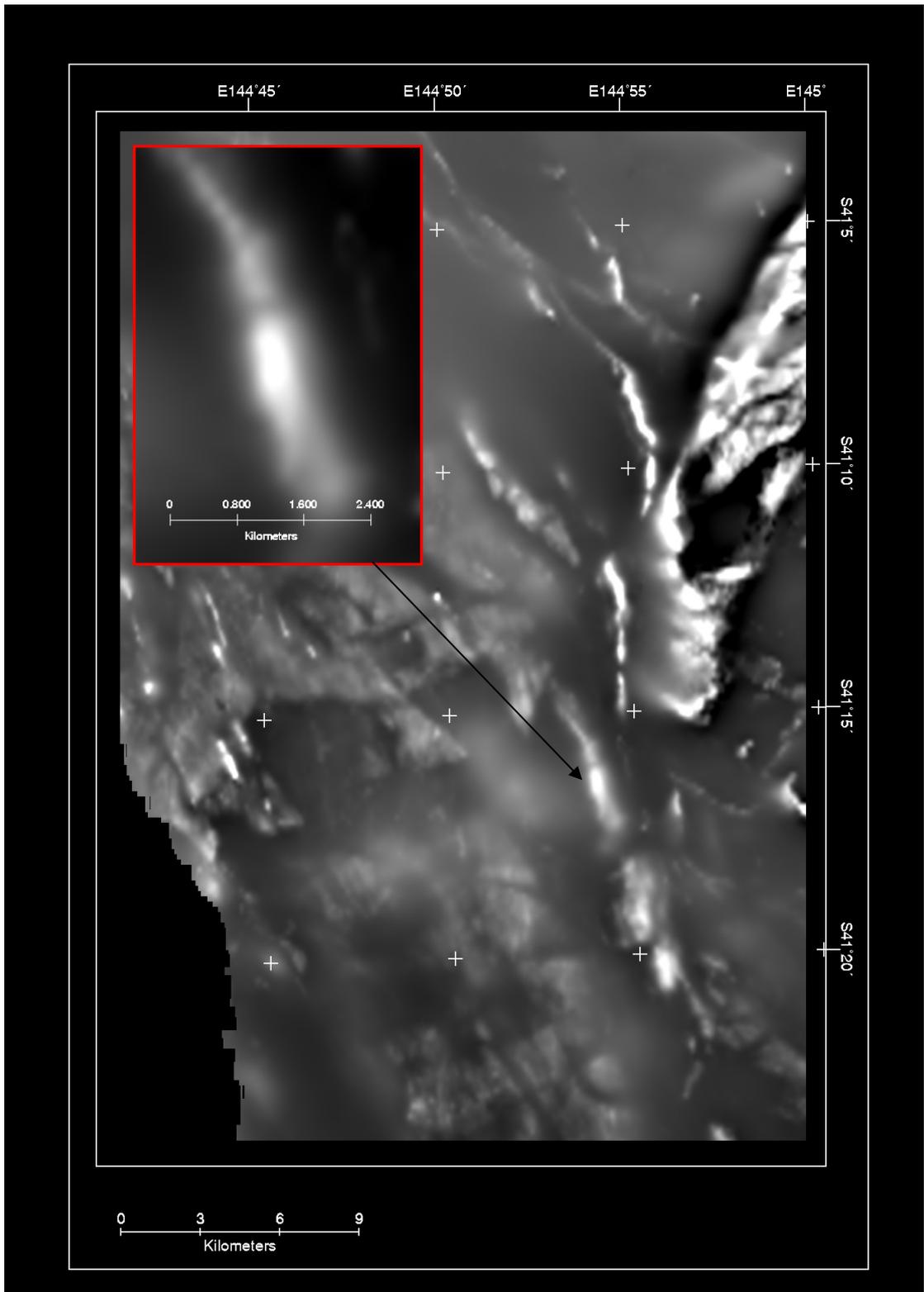


Figure 1: Regional magnetic image (TMI RTP) of the Balfour region with inset showing the Specimen Hill magnetic unit

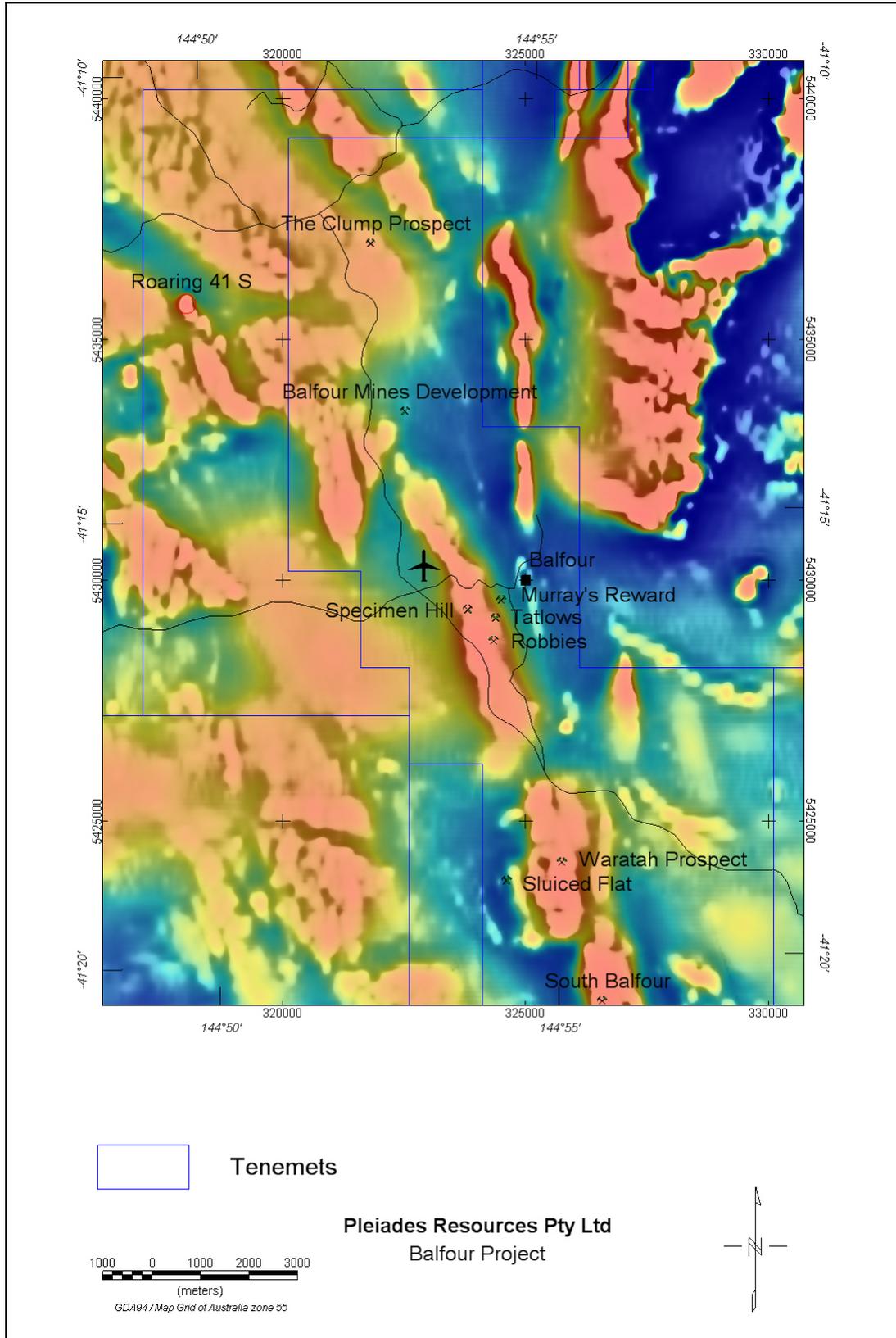
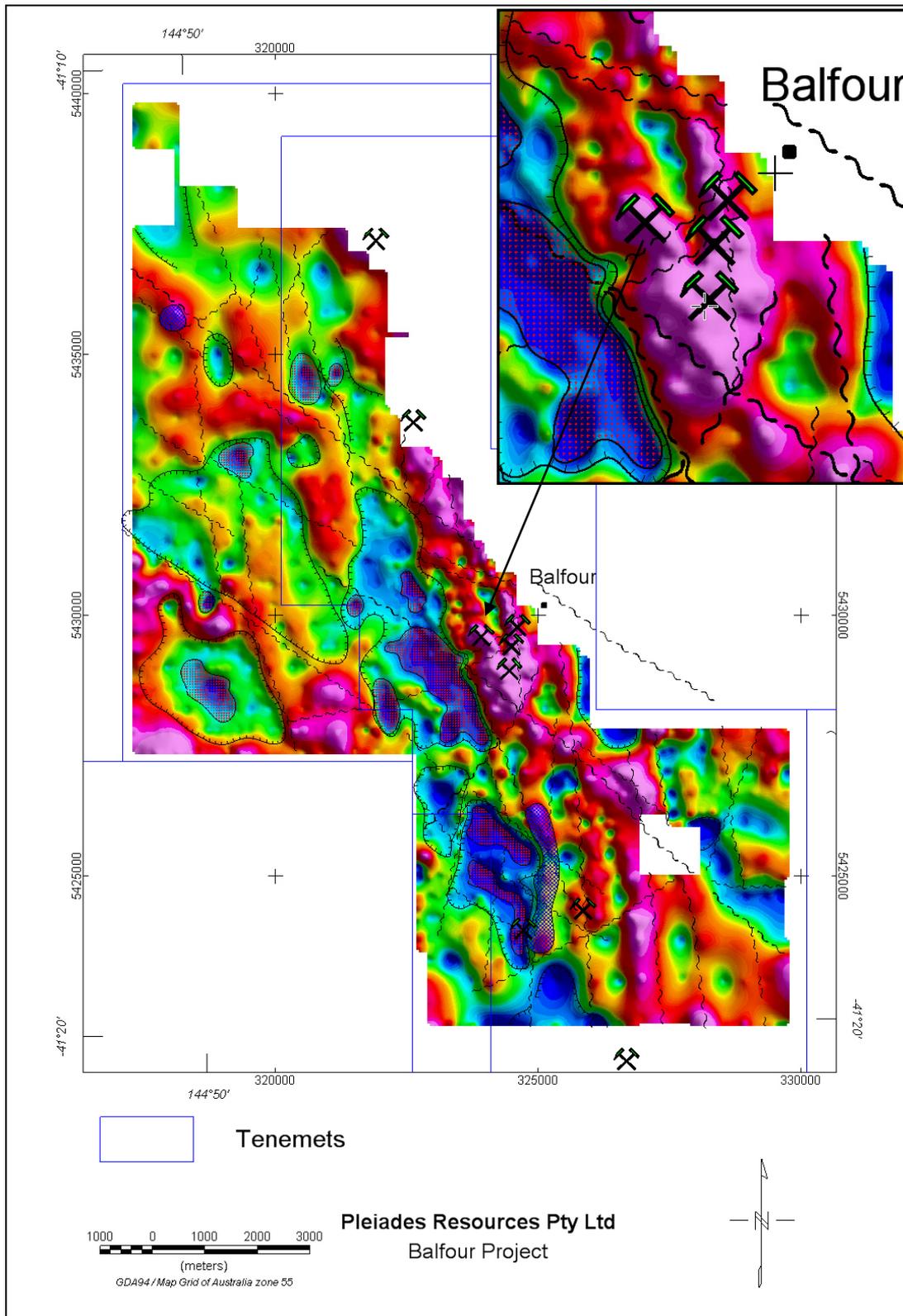


Figure 2: Colour magnetic image (TMI) with a first vertical derivative added back as intensity



2. MODELLING RESULTS

To obtain indicative depth estimates to the magnetic source, three lines were modelled using basic tabular bodies. There is a noticeable change in depth to magnetic source and of magnetic susceptibility between those bodies north of the Specimen Hill fault and those south of it.

Results of this modelling are presented in Table 2 and Figure 4 to Figure 8. All depths are from surface in metres. Susceptibility values are given in SI units. Note that no modelling of gravity data was undertaken

Table 2: Summary of magnetic models and depth to top of source

Name	Depth (below surface)	Susceptibility (SI $\times 10^{-5}$)
Body 1	340	40,000
Body 2	340	13,000
Body 3	280	17,000
Body 4	130	8000
Body 5	80	1300

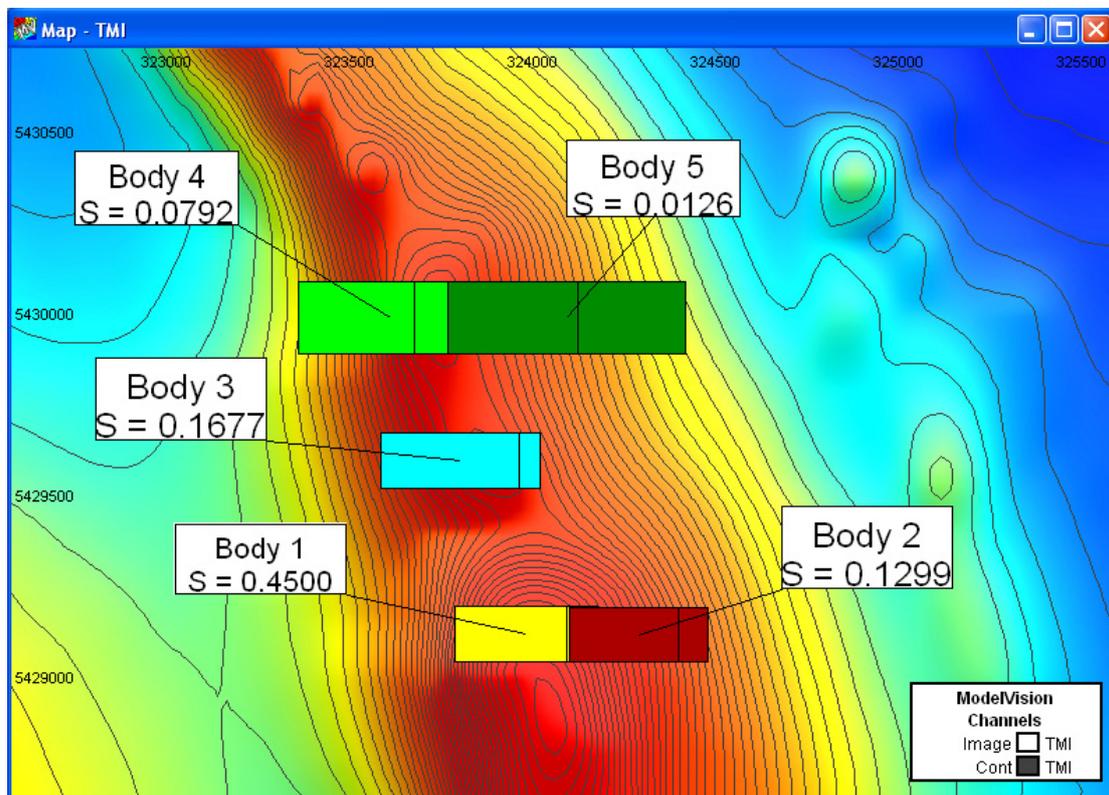


Figure 4: Plan view of TMI image (RTP) with magnetic models and body numbers

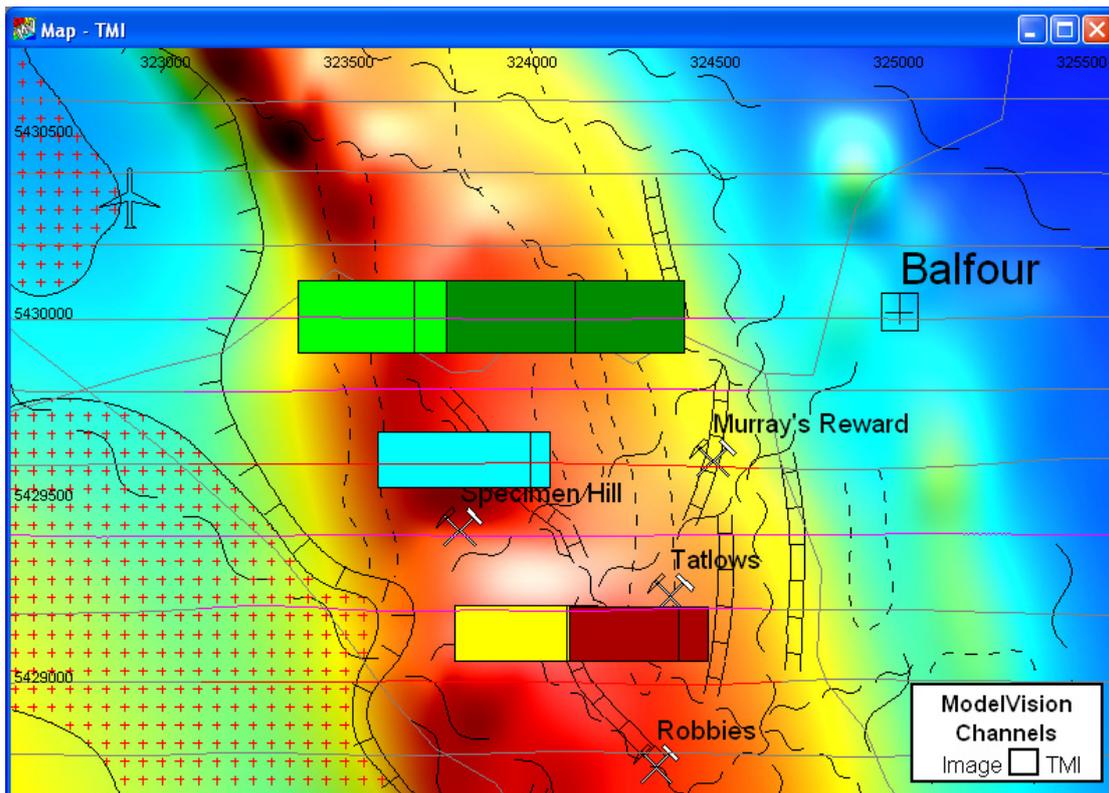


Figure 5: Plan view of models with TMI image as background. Flight lines are shown.

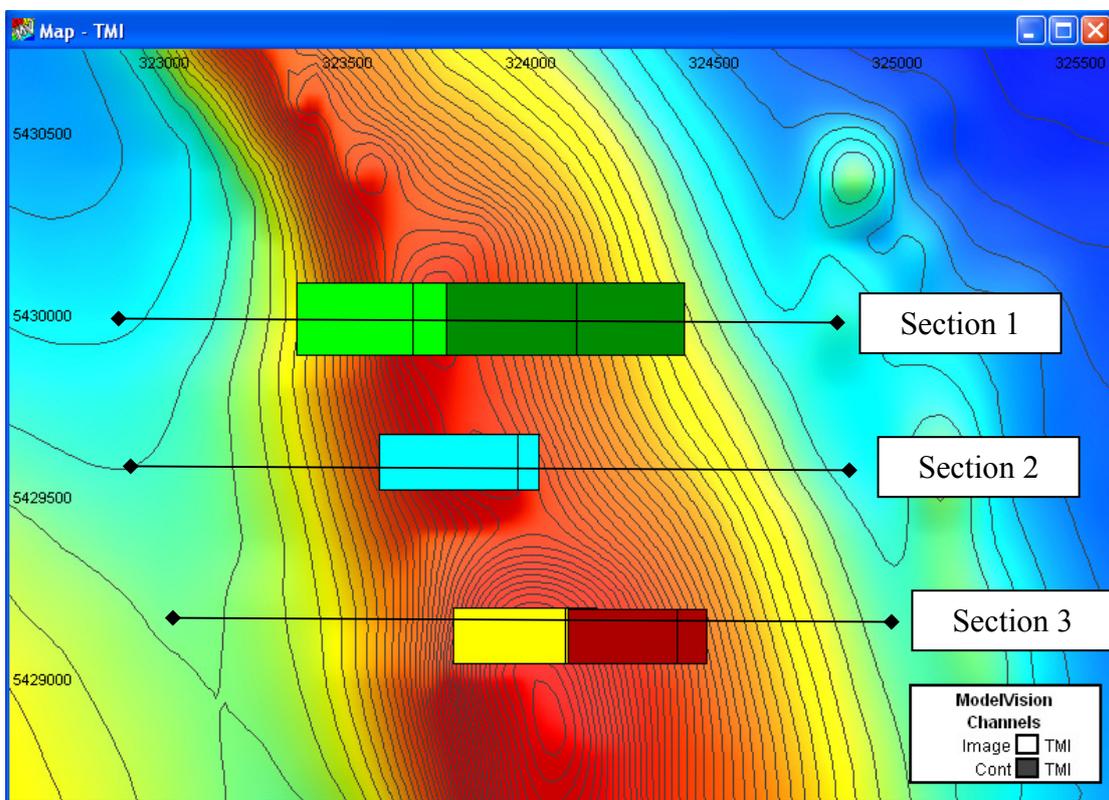


Figure 6: Plan view of TMI image (RTP) overlain with models and lines indicating cross-section locations

The following images are of cross-sections along three selected flight lines of the magnetic airborne survey (Figure 6). Each cross-section shows;

- a regional magnetic field (pink line),
- the airborne survey profile (black line),
- the magnetic profile generated from the models (red line),
- the models themselves as they intersect the flight path.

Terrain variations within the localised area were considered minimal in comparison to depth of models. Due to a lack of any flight altitude information it was impossible to accurately generate models to include the surface terrain. An assumption of a constant 90 meter flying altitude was made in all modelling.

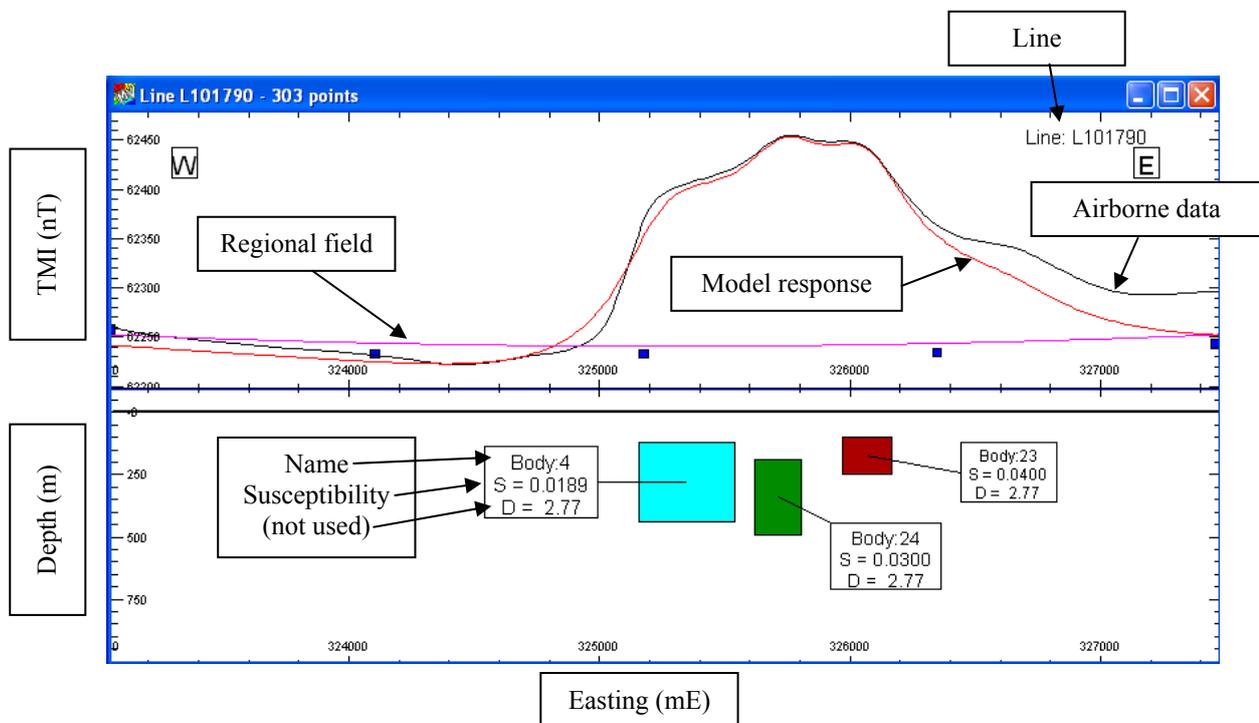
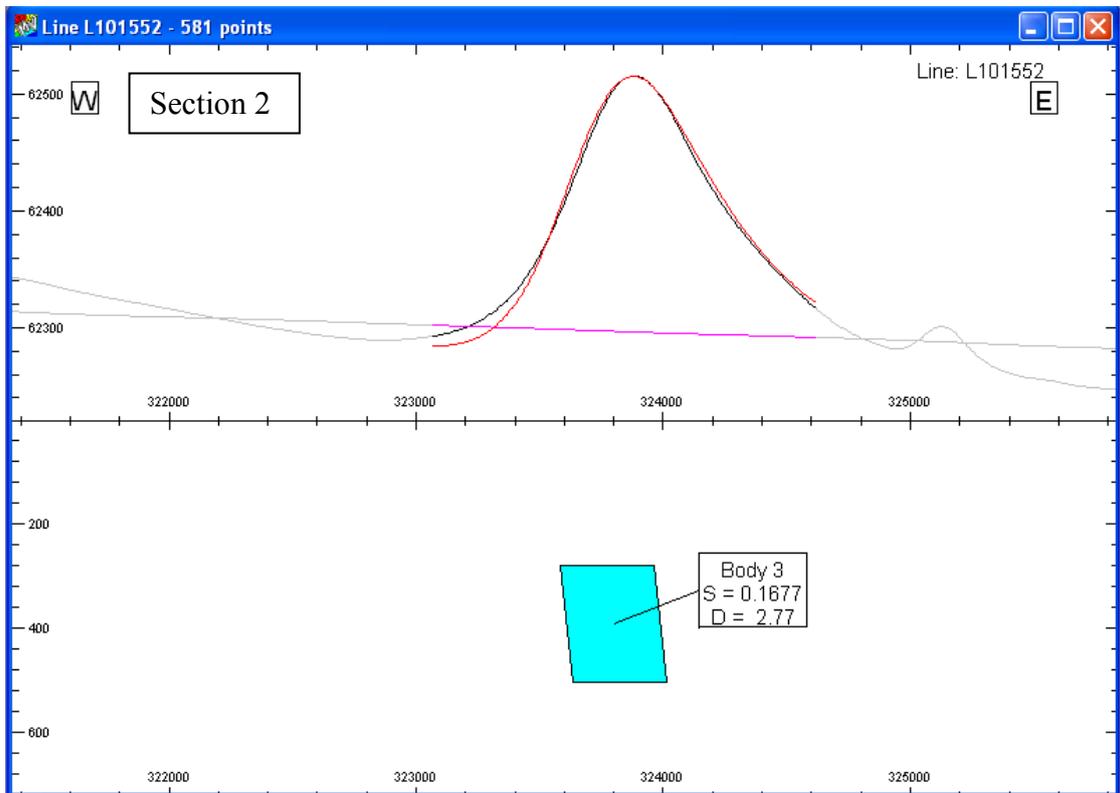
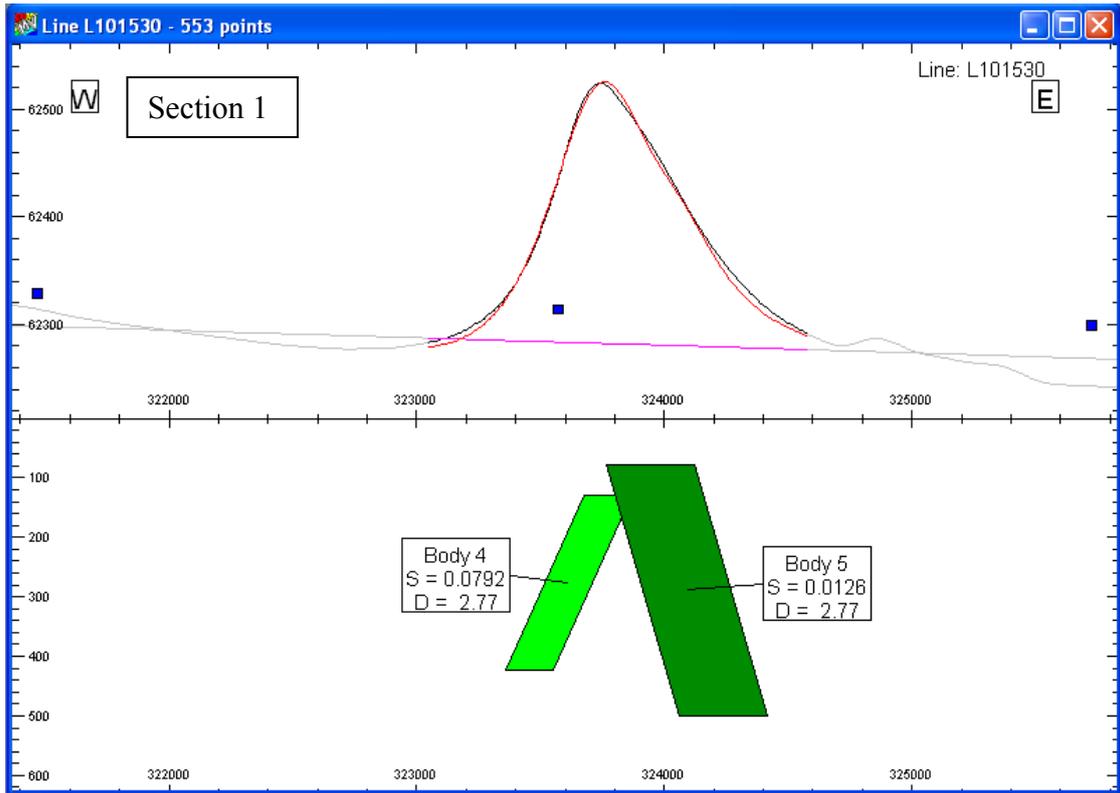


Figure 7: Example cross-section showing features of each graph



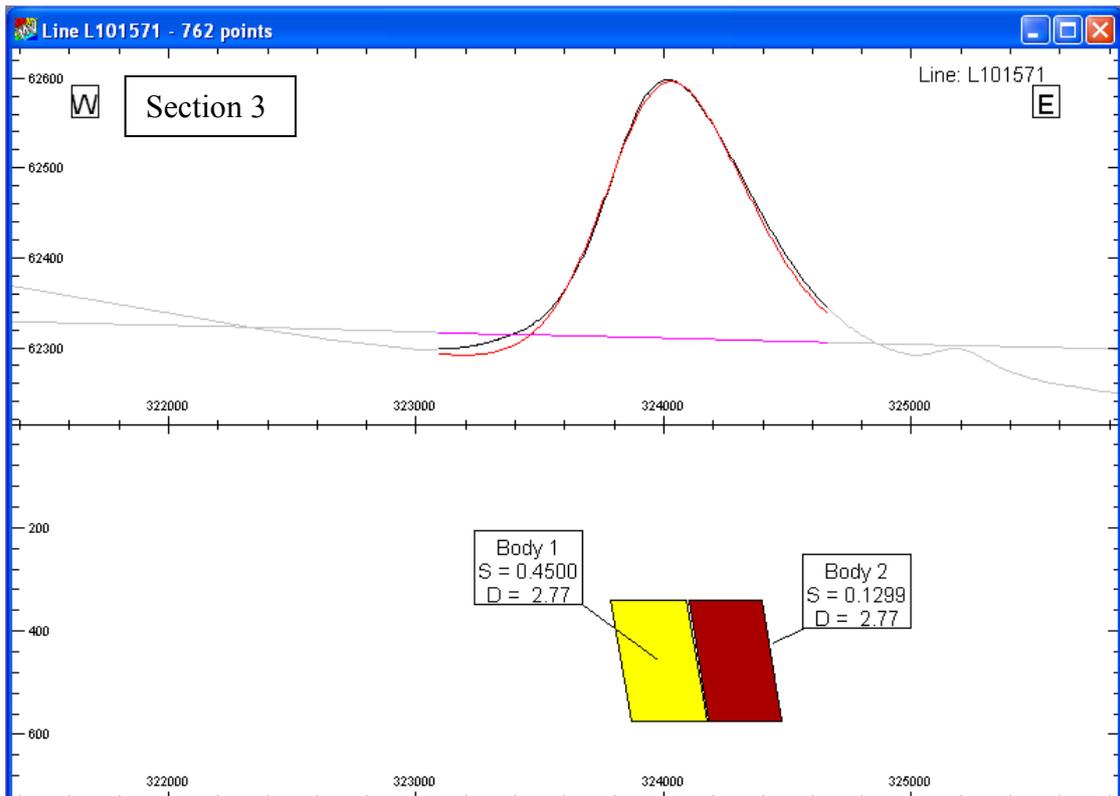


Figure 8: Cross sections along three flight lines showing models as they intersect the lines. Magnetic susceptibility values are shown along with a default density.

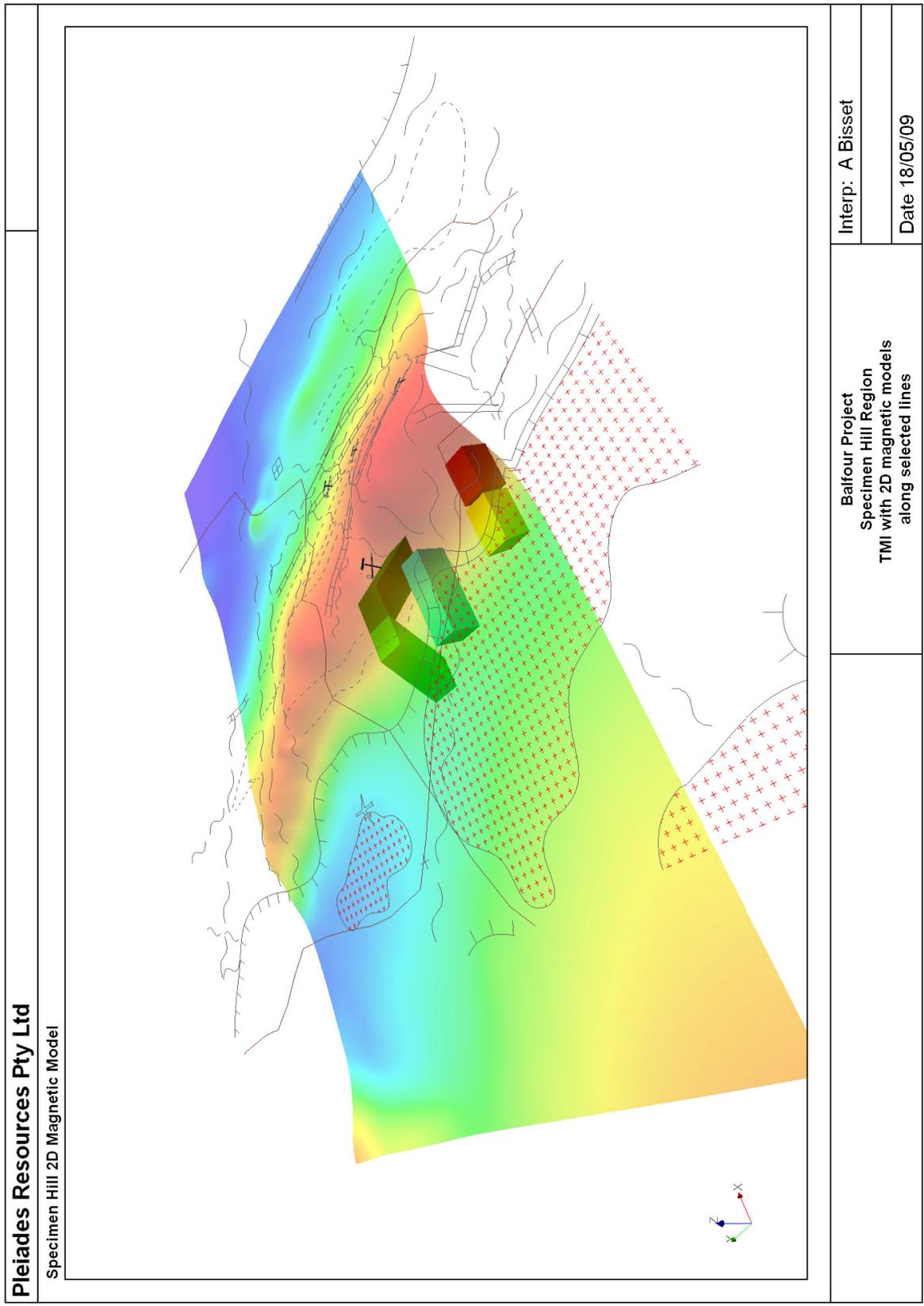


Figure 9: Three dimensional perspective view of model and magnetic data

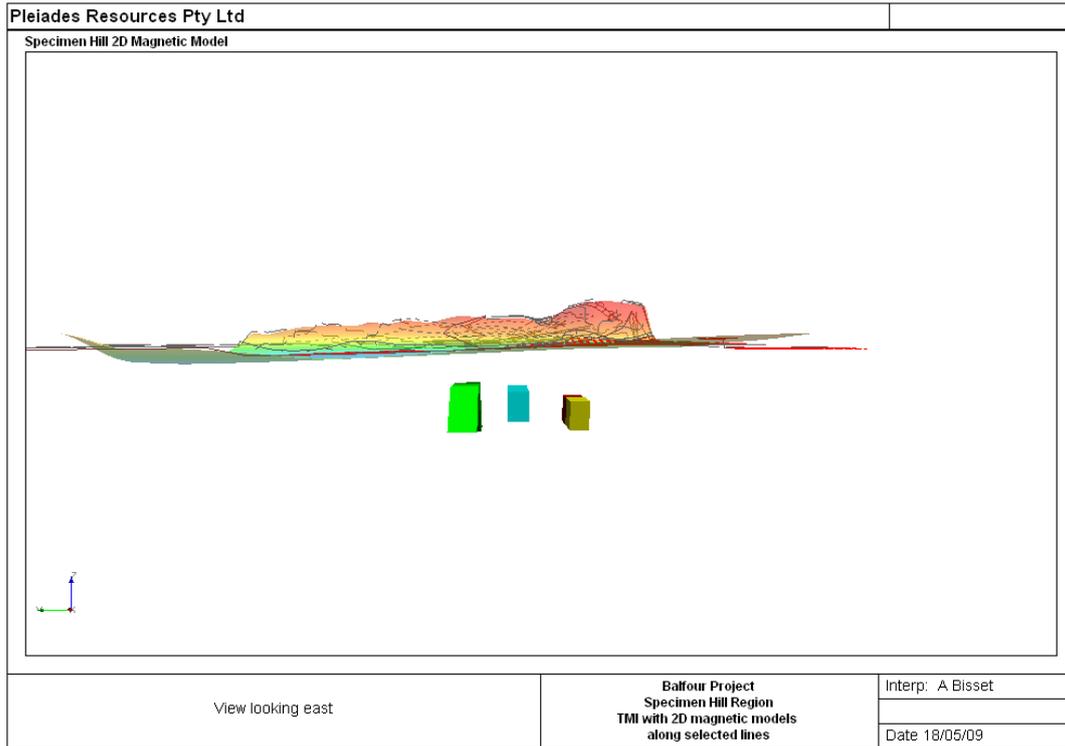


Figure 10: 3D view of model looking eastwards

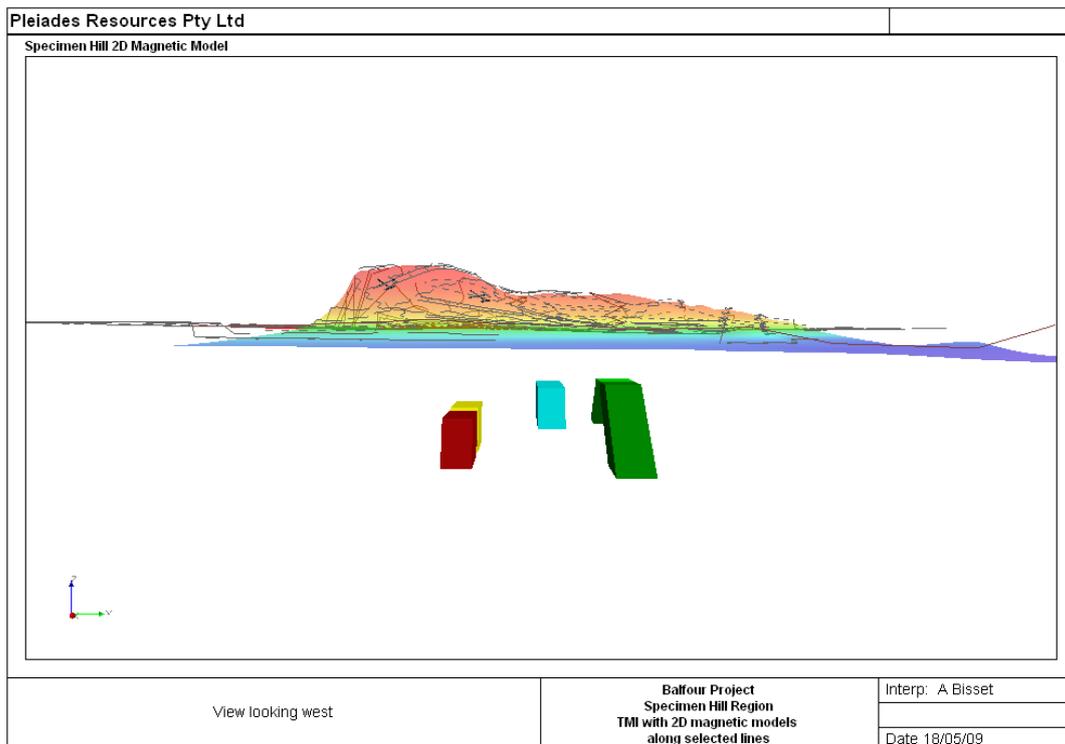


Figure 11: 3D view of model and TMI looking westwards

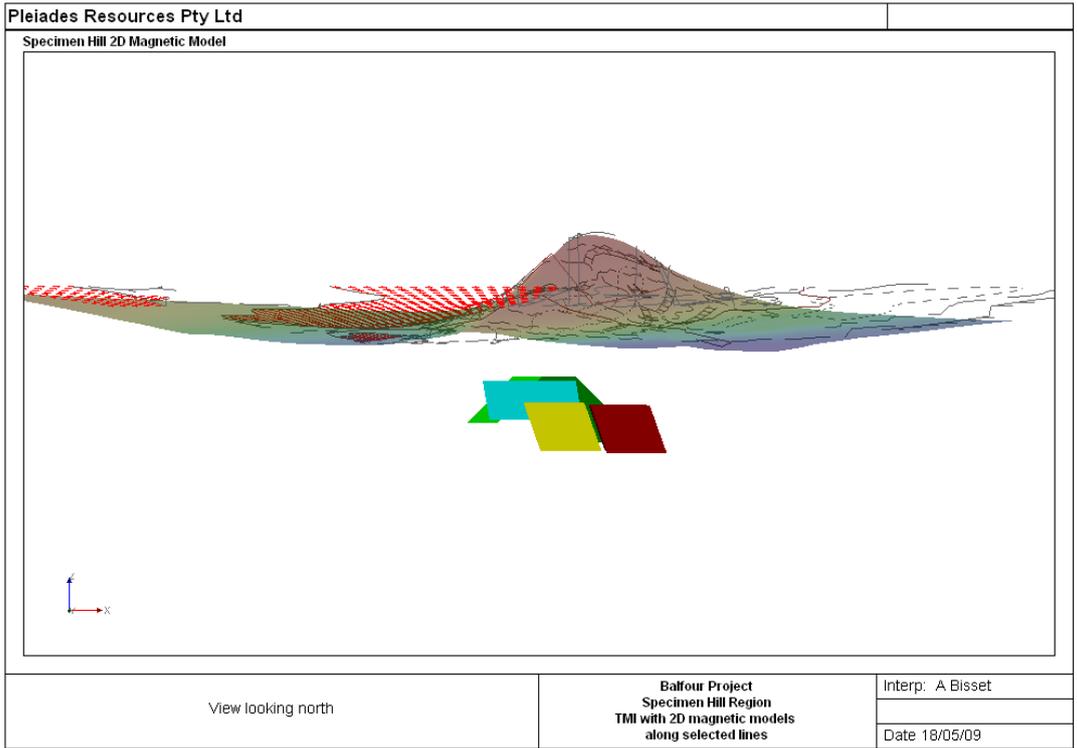


Figure 12: 3D view of model looking northwards. Note the difference in depth between the first two tabular bodies and those further to the north.

3. COMMENTS

Although not a comprehensive model, there is some indication of an empirical relationship between the more magnetic body south the Specimen Hill fault and the increased gravity values. This relationship should be investigated more thoroughly by joint modelling of magnetic and gravity data.

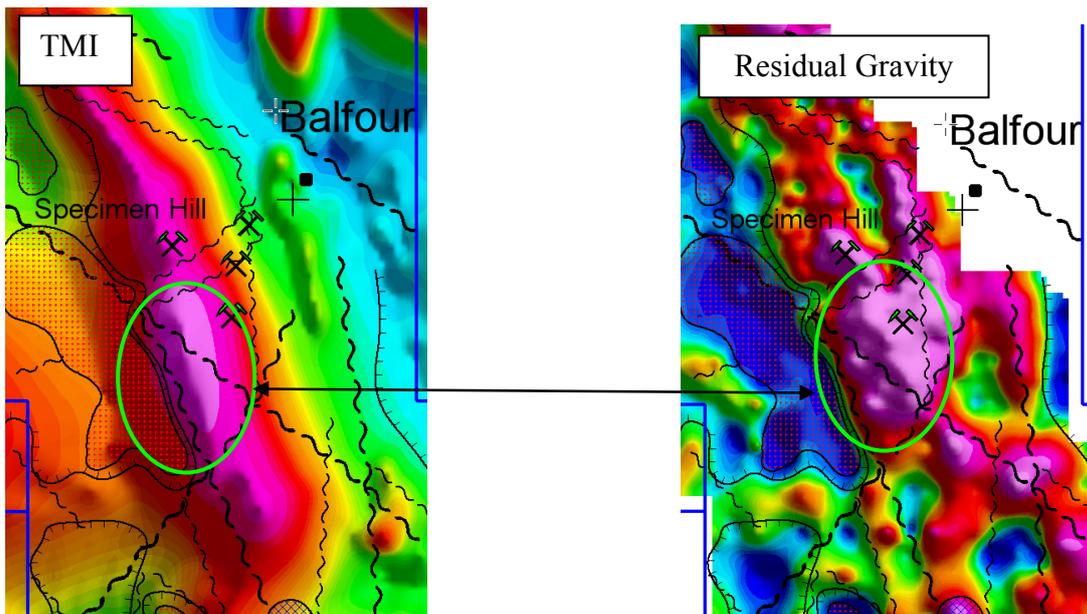
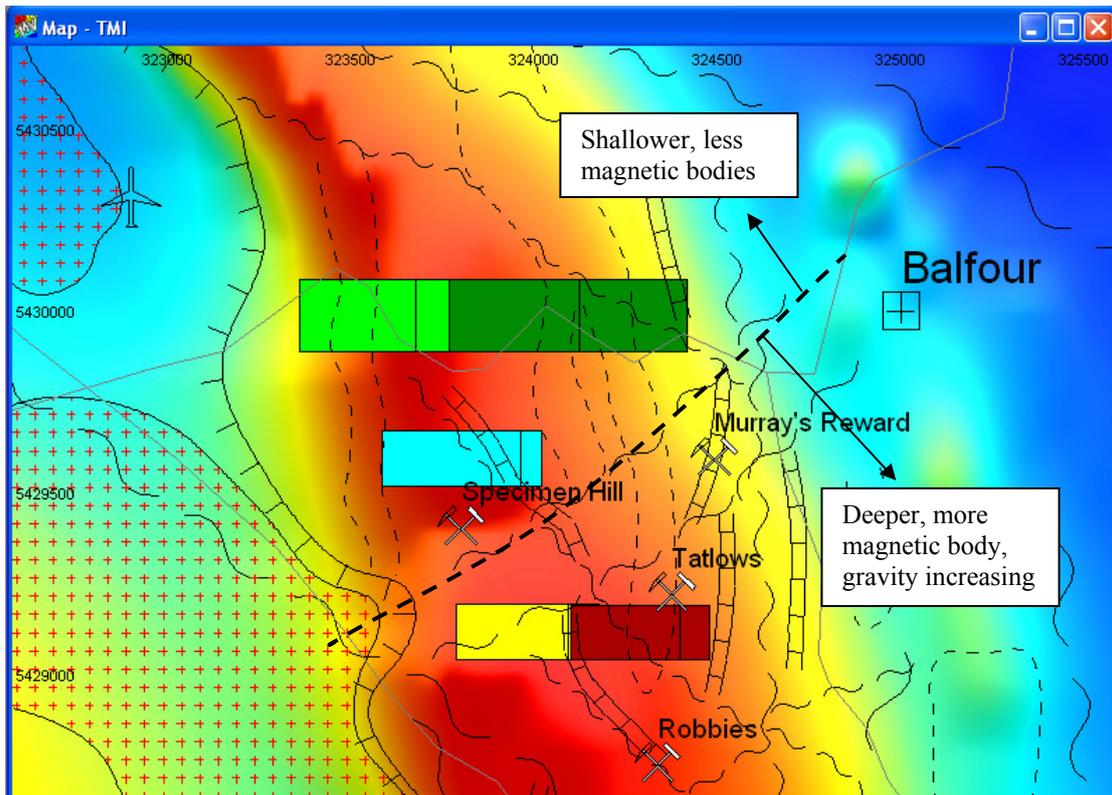


Figure 13: Area south of Specimen Hill with elevated magnetism (left) and gravity (right)