

# **Plenty River Ground Magnetism Report**

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The Ground magnetism surveys acquired over 16 aeromagnetic targets from within the Plenty River diamond explorations tenements, indicates two general target types. These include:

- Target responses consisting of numerous small sources which model to a depth less than 20m with a magnetic susceptibility of 300 to 500 SI.
- Target responses consistent with a depth extensive larger source which have been modeled to depths between 20m and 70m with magnetic susceptibility ranges of 50 to 1330 SI.

Written by Mike Enright 16/11/05

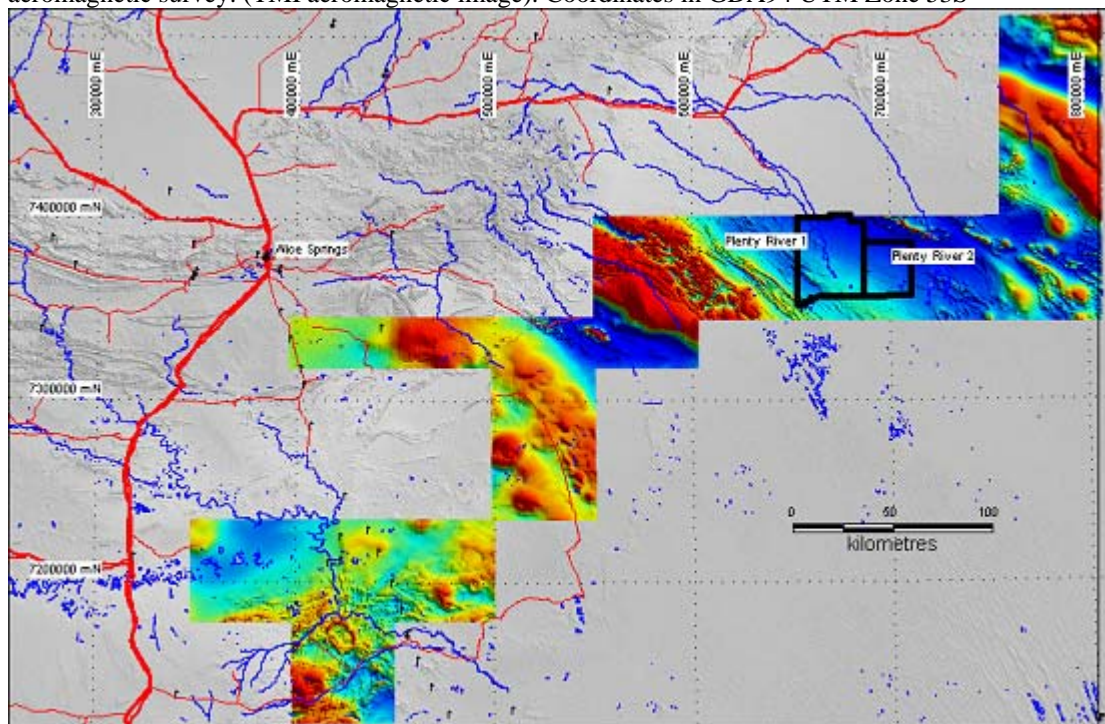
## **Introduction**

Ground magnetic surveys have been acquired over 16 aeromagnetic targets within the Plenty River tenements. The targets originate from the Eromanga airborne magnetics/radiometrics survey. The tenements (**Plenty River 1** N° 23792 and **Plenty River 2** N° 22872) are located 300km east of Alice Springs in the Northern Territory, which along with the extent of the Eromanga airborne survey is outlined in **Figure 1**.

The ground magnetic acquisition extended from the 5<sup>th</sup> until the 9<sup>th</sup> of November 2005. Travel to site and between targets was completed by helicopter. Each aeromagnetic target simultaneously had one loam sample collected. The sample consisted of three composite samples spaced 100m east-west. Sample results are pending.

From the original 18 selected aeromagnetic targets two targets have no work completed due to their location within the restricted access region traversing the Plenty River. The targets with no work completed are PR7 and PR15. The distribution of the targets is displayed in **Figure 2**.

**Figure 1:** Location map displaying Plenty River Tenements, Alice Springs and extent of the Eromanga aeromagnetic survey. (TMI aeromagnetic image). Coordinates in GDA94 UTM Zone 53S



For each target the ground magnetic acquisition has been completed by Mike Enright and consist of 4 or 5 north-south traverses of varying length. Magnetometers acquired continual data at three second intervals resulting in a station spacing of 3 to 4m. The magnetometers were real-time linked to the GPS except for targets PR1, PR12 and PR17. These three targets have been acquired with interpolation between 50m stations.

The data has been collected in Lat, Long with WGS84 datum. All data has been transformed to Eastings and Northings GDA94, AMG Zone53.

## **Equipment**

Helicopter (AS350BA Super D squirrel)  
2 x 858 Geometrics magnetometers, sensor and backpack  
1 x GPSmap 76 (real-time link to magnetometer)  
1 x Laptop (loaned from IT department)

## **Difficulties encountered**

During the acquisition one of the dump cables used in the real-time link to the GPS broke resulting in delays. The cable is the weak link in the system and new purpose built cables that go direct from the GPS to the magnetometer will be made up for future work.

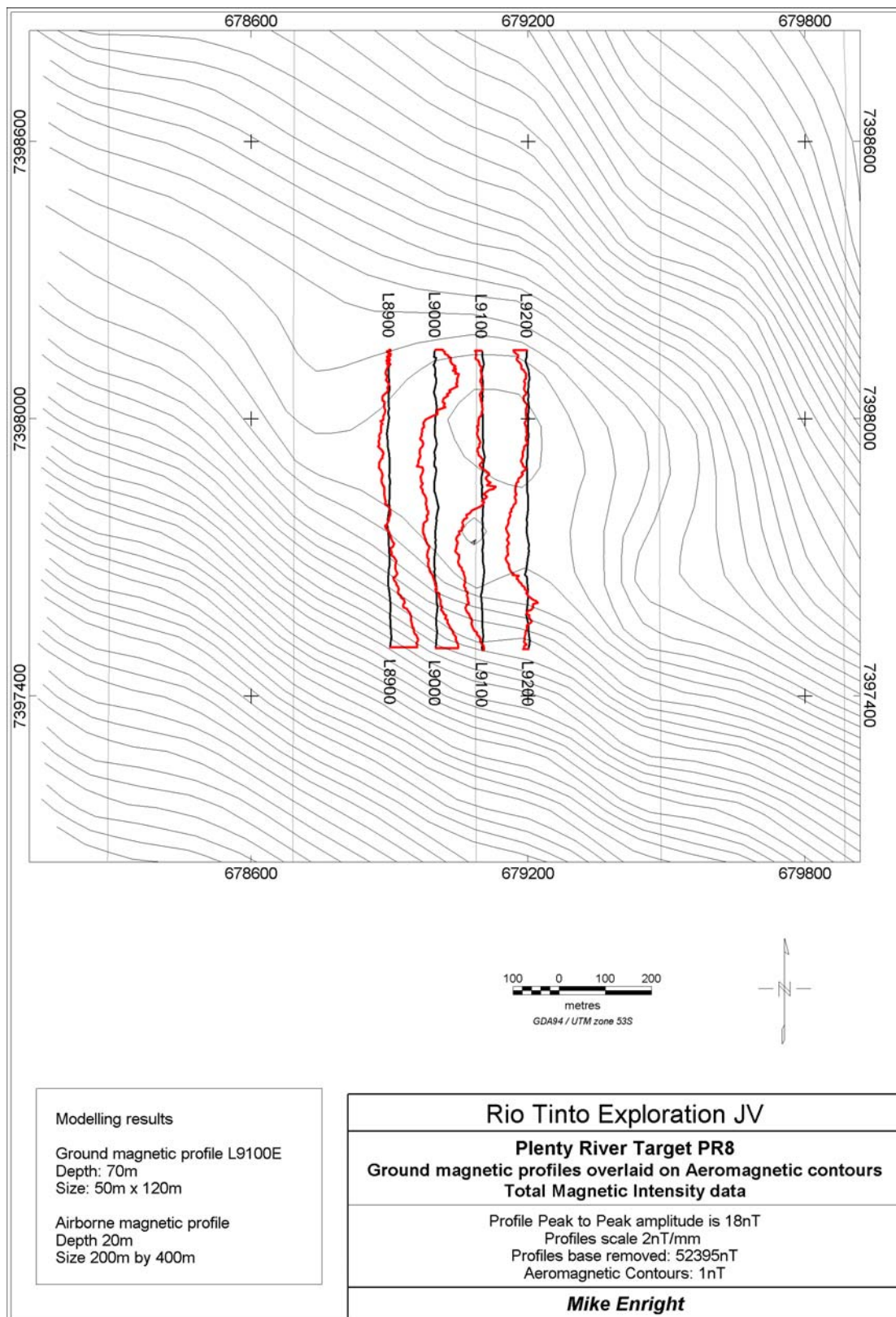
During acquisition one of the 858 magnetometers developed serious memory errors. The data for one target was lost and needed reacquiring and the unit will need to be tested before returning to the field.

Temperatures after midday were largely over 40° and with limited shade the acquisition rate slowed considerably and the number of kilometres walked reduced.

## **Results**

The ground magnetic grid has been displayed as line profiles overlaid on aeromagnetic contours. All data is Total Magnetic Intensity (TMI). The target completed is displayed on the following page.





## Summary Table

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All Modeling has been completed with GEOSOFT's MAGMOD with the models constrained to vertical bodies with depth extent. Due to the complex magnetic response from multiple source targets (which GEOSOFT cannot incorporate) the modelling has focussed on calculating depth to source of several individual responses separately and the results averaged. Often complete profiles are not modelled due to the interference from other source responses.

## Conclusions

Modeling of the ground magnetic profiles indicates a general trend of depth increase to target in the north, northwest direction.

The shallowest targets to the southeast tend towards the less interesting multiple, small source responses. Positive sample results would be expected for these targets if due to a kimberlite as depth to source is minimal.

The deeper targets are of increased interest due to their increased potential for depth extent.