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EL8/2002 AND EL10/2002 BALFOUR-TEMMA AREA

ANNUAL REPORT TO 20.12.2003

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Abstract

During the first year of tenure of EL8/2002 and EL10/2002, geological and topographic data were sourced from Mineral Resources Tasmania (MRT) and Lands Information System Tasmania (LIST), and data from the detailed helicopter electromagnetic survey carried out by MRT in 2002 as part of the Western Tasmanian Regional Minerals Program (WTRMP) were processed. Targets for ground investigation were identified.

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Introduction

This report presents the work carried out in EL8/2002 and EL10/2002 in the Balfour – Temma area during the first year of tenure to 20.12.2003. Figure 1 shows the location of the tenements.

Review of previous work

Balfour Area

The historical mining area of Balfour is outside the area of these ELs, but the style of mineralization there is a possible exploration target within them.

Work at Balfour by ACI Limited from 1968 until 1974 included extensive IP surveys and drilling as part of their exploration program for copper. Eight prospects were tested by drilling, and a resource of 0.5MT at 0.8% Cu was defined at Murray's Reward. Drilling at the Clump was compromised by poor core recoveries. Also, disseminated Pb-Zn mineralization was found within a quartzite in the Clump area (Westbrook, 1999).

Subsequently, CRA Exploration carried out EM and IP surveys, costean and auger sampling and drilling from 1995 to 1997. They found copper to be depleted above known copper occurrences and that conventional stream sediment sampling techniques were ineffective due to leaching, quartz lag cover and weakly incised drainage patterns. Similar conclusions were reached by Pacific-Nevada Mining Pty Ltd in 1999, who also undertook a helicopter EM survey over the northern end of the Balfour Copper trend and failed to find any responses coincident with the known mineralization (Westbrook, 1999).

The ACI and CRAE drilling intersected maximum mineralised widths of 20 and 17m respectively with grades exceeding 1%Cu.

Temma Area

In the Temma area, strong magnetic responses have been investigated for both copper and gold associated with magnetite at the Nelson River (see Figure 10), Strickland, Little Eel and Possum Creek prospects by Pickands Mather and Pacific-Nevada. There is historic copper production at Strickland, copper anomalism was confirmed at Nelson River and Little Eel Creek, and gold at Strickland and Possum Creek (Turner, 1999 and 2000).

Balfour Helicopter Electromagnetic and Magnetic Survey

In early 2002, a detailed helicopter electromagnetic survey was carried out over the Balfour and Temma areas and to the south by MRT as part of the Western Tasmanian Regional Minerals Program (WTRMP) which also included geological mapping at 1:25000 scale. The resultant data were released in mid 2002 (Mineral Resources Tasmania, 2002), and the survey specifications are reproduced below.

Survey completed:	April 2002				
Traverse line spacing:	200 metres				
Traverse line direction:	090 / 270 degrees				
Tie line spacing:	2000 metres approx				
Tie line direction:	000 / 180 degrees				
Survey height:	EM towed Bird at 30m agl				
Electromagnetic System	Hummingbird 5 frequency EM system				
Resolution:	1ppm				
Recording Interval:	0.1 sec (approx. 3.5 metres sampling)				
Data acquisition:	Geo Instruments Model G2002 system Geotech Hummingbird system				
Channel	1	2	3	4	5
Freq (Hz)	7000	6600	980	880	34000
Orientation	CX	CP	CX	CP	CP
Coil Sep (m)	6.25	6.25	6.03	6.03	4.79
Aircraft:	AeroSpatale Squirrel helicopter AS350BA				
Magnetometer					
Type:	Geometrics G822A Caesium vapour				
Resolution:	0.001 nT				
Recording interval:	0.1 sec (approx. 3.5 metres sampling)				
Installation:	Magnetometer sensor mounted in HEM bird.				
Navigation					
Flight path navigation:	Real time satellite Differential GPS system				
Navigation equipment:	Fugro OMNISTAR GPS receivers				
Flight path record:	WGS84 Easting/ Northing coordinates				
Radar altimeter:	Collins Alt50				
GPS base station locations:	Fugro OMNISTAR(Real Time DGPS)				

Exploration completed during the reporting period

Topographic, hydrological and geographical data were sourced from Land Information System Tasmania (LIST) for the general area (Figure 2).

Digital geological mapping for the Temma, Balfour and Dempster 1:25000 map sheets was obtained from Mineral Resources Tasmania (MRT) (Figure 3) as were mineral occurrence locations (Figure 4).

The digital magnetic and electromagnetic data for the Balfour helicopter electromagnetic survey were recompiled for various themes. Figure 5 shows total magnetic intensity (TMI) and Figure 6 shows the first vertical derivative calculated from TMI. Figure 7 shows the apparent conductivity calculated from the 880Hz coplanar coil configuration.

Dr James Reid from the University of Tasmania reviewed the electromagnetic and magnetic data as profiles on a line by line basis for the whole survey, and selected the conductor responses shown in Figure 8 as being of possible interest as exploration targets.

Figure 9 shows the location of targets which will be considered for ground checking during the next year.

Discussion of results

The WTRMP detailed helicopter electromagnetic and magnetic survey utilized a line spacing of 200m over a large area within which systematic mineral exploration has concentrated mainly on relatively small areas of historical mining and prospecting. Some strike limited conductors have been defined in under-explored areas, and their sources remain to be investigated as indicators of economic mineralization. In the Temma area, some of these conductors are proximal to magnetic responses, suggesting a possible iron – copper – gold association as has been noted at some historical prospects in that area.

Balfour area

At Balfour, there is no HEM conductivity response directly associated with the known mineralisation, and Reid comments that “Numerous north-south trending linear bedrock conductors, with strike extents of 1-2 km, have been identified around the historic mining centre of Balfour. The strike extent of these conductors suggests that they are most likely to be carbonaceous units of the Balfour Shale, which are known to contain up to 40% graphite (Veska, 1993).” Although mineralized systems of this size and grade may not respond to airborne EM, higher sulphide concentrations may, and at The Clump (321600mE 5436900mN), a magnetic response appears to be coincident with the mineralization and a bedrock conductor.

Although the greatest concentration of conductive responses occurs on the Balfour trend, a similar area (Target B1) occurs about 3km to the SE of the mine in EL10/2002 where conductive trends extend over a strike length of 1km or more. A portion of one of these trends is coincident with a magnetic response, possibly indicating that the conductive source here is related to pyrrhotite rather than graphite, and therefore more likely to be associated with mineralization as at The Clump.

Conductive but non-magnetic trends also occur about 10km north of Balfour, and the area may warrant investigation, but as a lower priority (Target B2).

Temma Area

Near Temma in the northwest part of the area, copper and gold mineralization is associated with magnetite at the Strickland prospect, and drilling has confirmed anomalism at the Little Eel and Possum Creek prospects which are also associated with magnetic responses. In the general area, linear, NNW trending magnetic responses with strike lengths up to 4km are evident on the airborne survey data, particularly the first vertical derivative, and most of the high amplitude occurrences of these are targets for similar styles of mineralization. A moderate bedrock conductivity response coincident with the magnetic response is present on one flight line at Possum Creek. Elsewhere, weakly

elevated conductivities are coincident with some of the magnetic responses. Occasional stronger responses have been noted peripheral to the magnetic responses, rather than coincident. For the style of mineralization, this is not unusual.

The NNW trending magnetic responses are all regarded as prospective for Cu-Au mineralization although the maximum amplitudes of the responses are 600 to 1000nT, much less than those over deposits of this type near Mt Isa and Tennant Creek where responses of several thousands of nT are common.

Ten possible targets which include three existing prospects, have been identified.

SW Area

Conductive responses occur sub-parallel and close to the coast in the southwest of the area shown. These have no associated magnetic responses and could be bounded by a structure to their immediate east where there is a change in the slope of the topography. As such, they could represent stratiform sulphides emplaced adjacent to a fault in a setting similar to McArthur River i.e. sedimentary hosted stratiform deposits.

Five targets of this type have been identified.

Central Area

There are instances of interesting, short strike length conductive responses in the south central part of the project area. These are designated as C1, C3 and C3 on Figure 9. Reid points out these prominent bedrock conductors within a resistive, quartzite unit about 6km SW of Balfour (C1 and C2), the latter of which is associated with a magnetic response. These conductive responses are among the best of the survey, and their source is unknown. The area is mapped as Lagoon River Quartzite which is noted as having rare conglomerate and shale, but this unit is otherwise devoid of conductors.

A similar target occurs at C3 to the south.

Conclusions

An assessment of the available geophysical data over the project area has identified several targets of interest.

- Two copper targets NE of the Balfour trend of mineralization
- Ten targets for copper –gold mineralization associated with magnetite near Temma. These include three existing prospects with anomalous levels of those elements.
- Five conductive targets without magnetic associations south of Temma. These could represent stratiform base metal mineralization.
- Three conductive targets in the south central part of the area.

Given that most of the area is poorly explored, access is difficult and the effectiveness of geochemistry has been questioned by previous work at Balfour, ground inspection of the targets defined by the airborne data should be the first step in assessing their exploration potential.

Environment

No ground activities were carried out during the year.

Expenditure

Geology	\$10,050
Geophysics	\$7,621
Other	\$5,998
Admin (10%)	<u>\$2,367</u>
	<u>\$26,036</u>

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Keywords

Balfour, Temma, copper, gold, airborne electromagnetic surveys, airborne magnetic surveys.

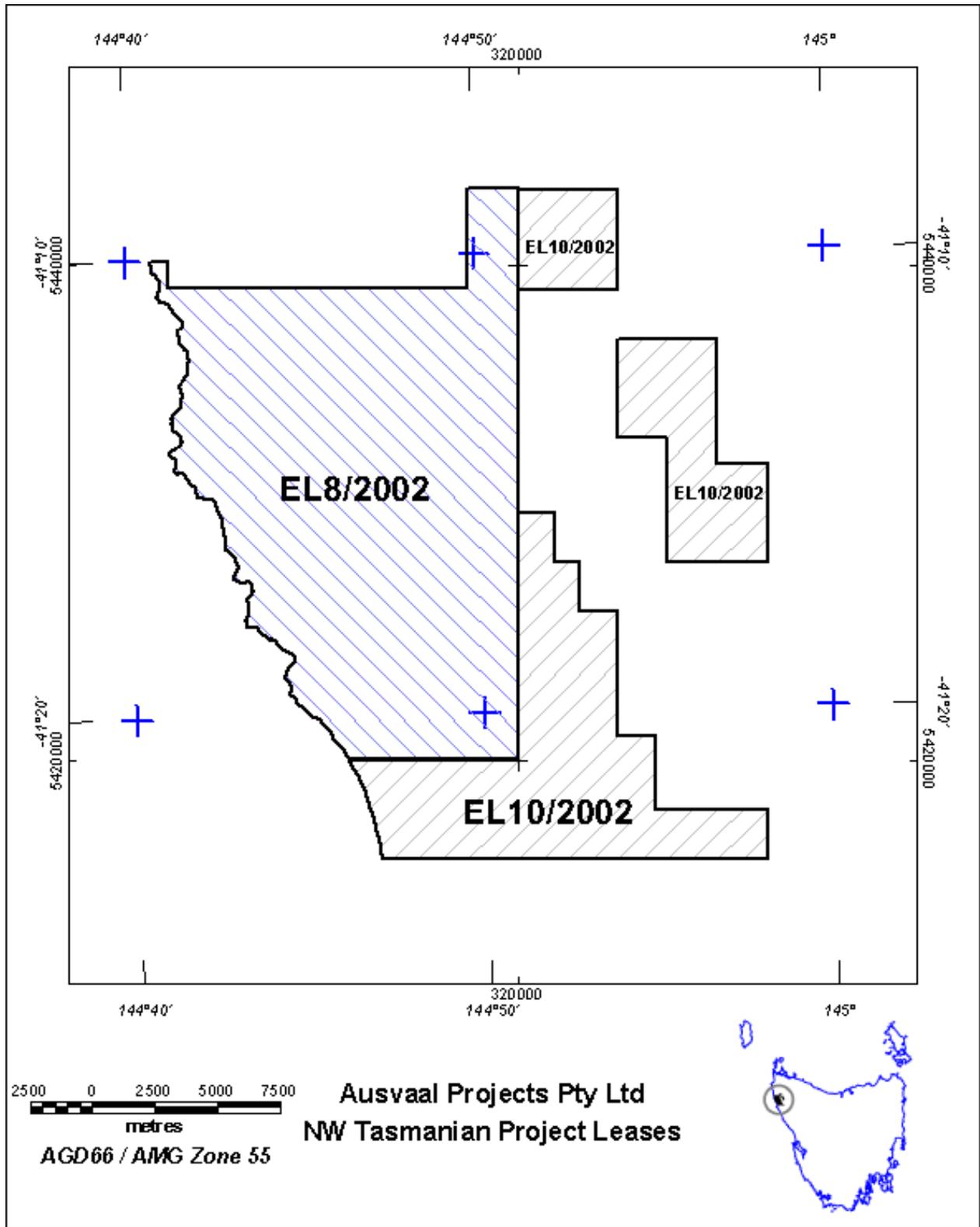


Figure 1 Location map

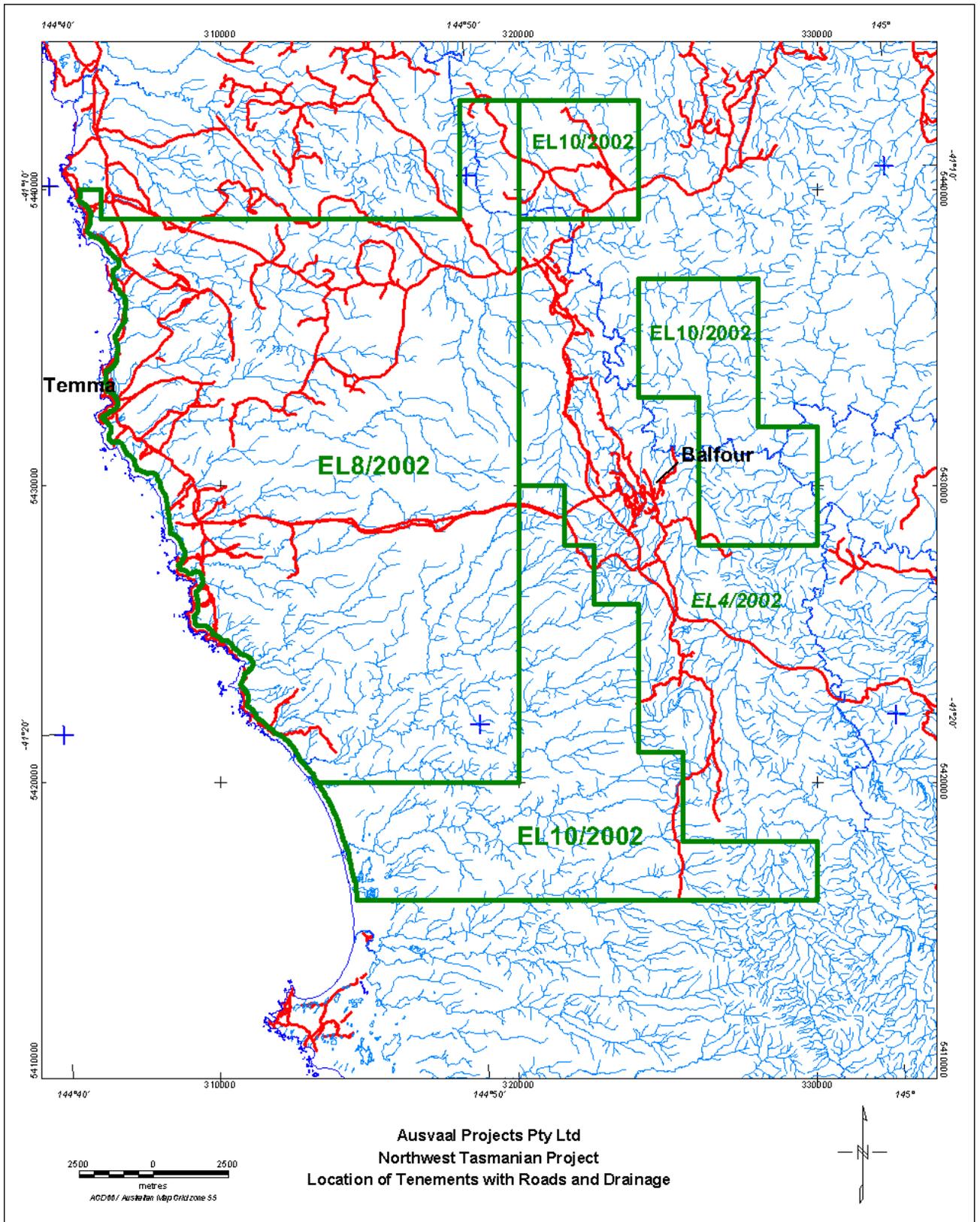


Figure 2 Location of tenements showing road and track network and drainage

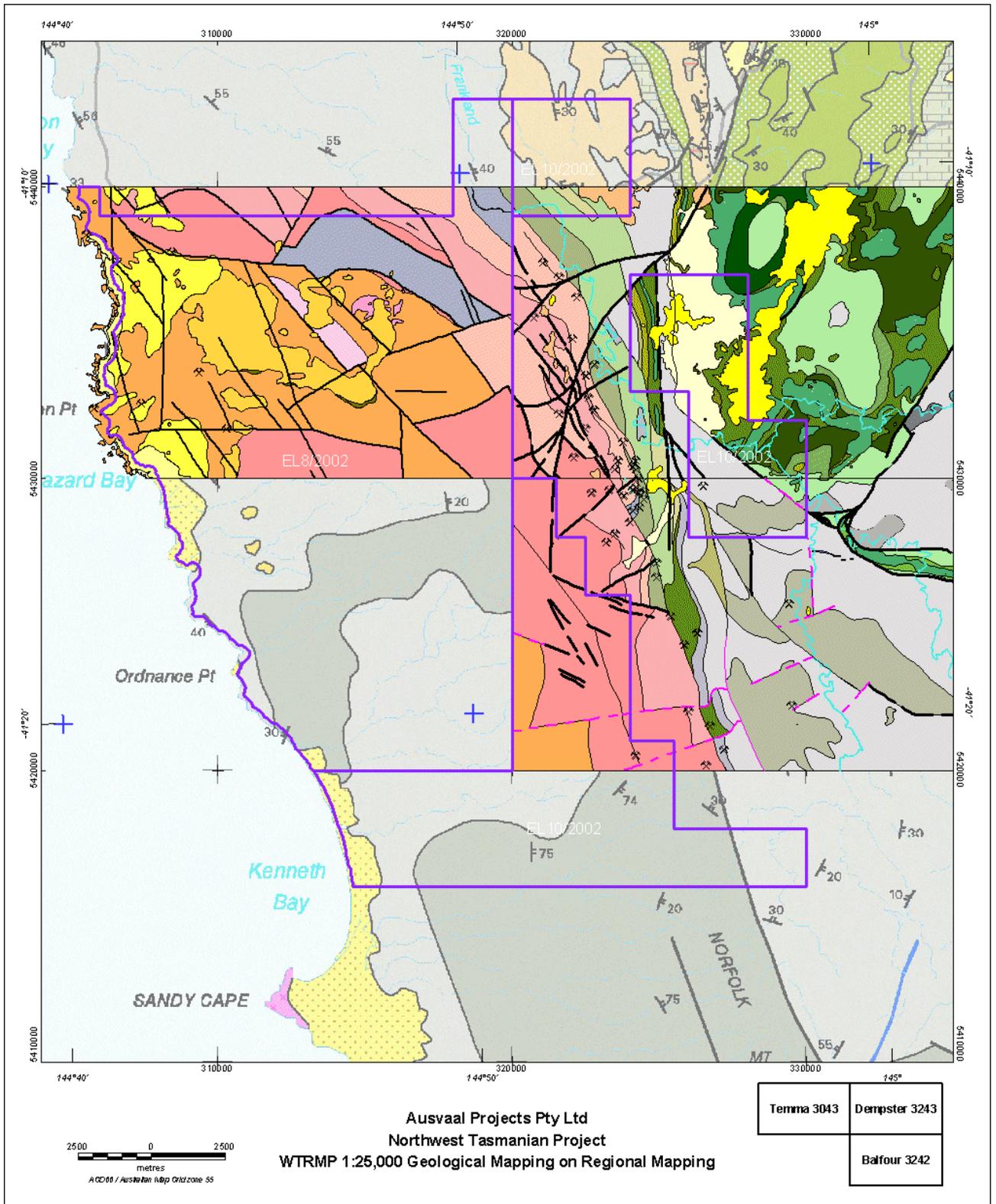


Figure 3 1:25,000 geology sheets overlain on regional geology

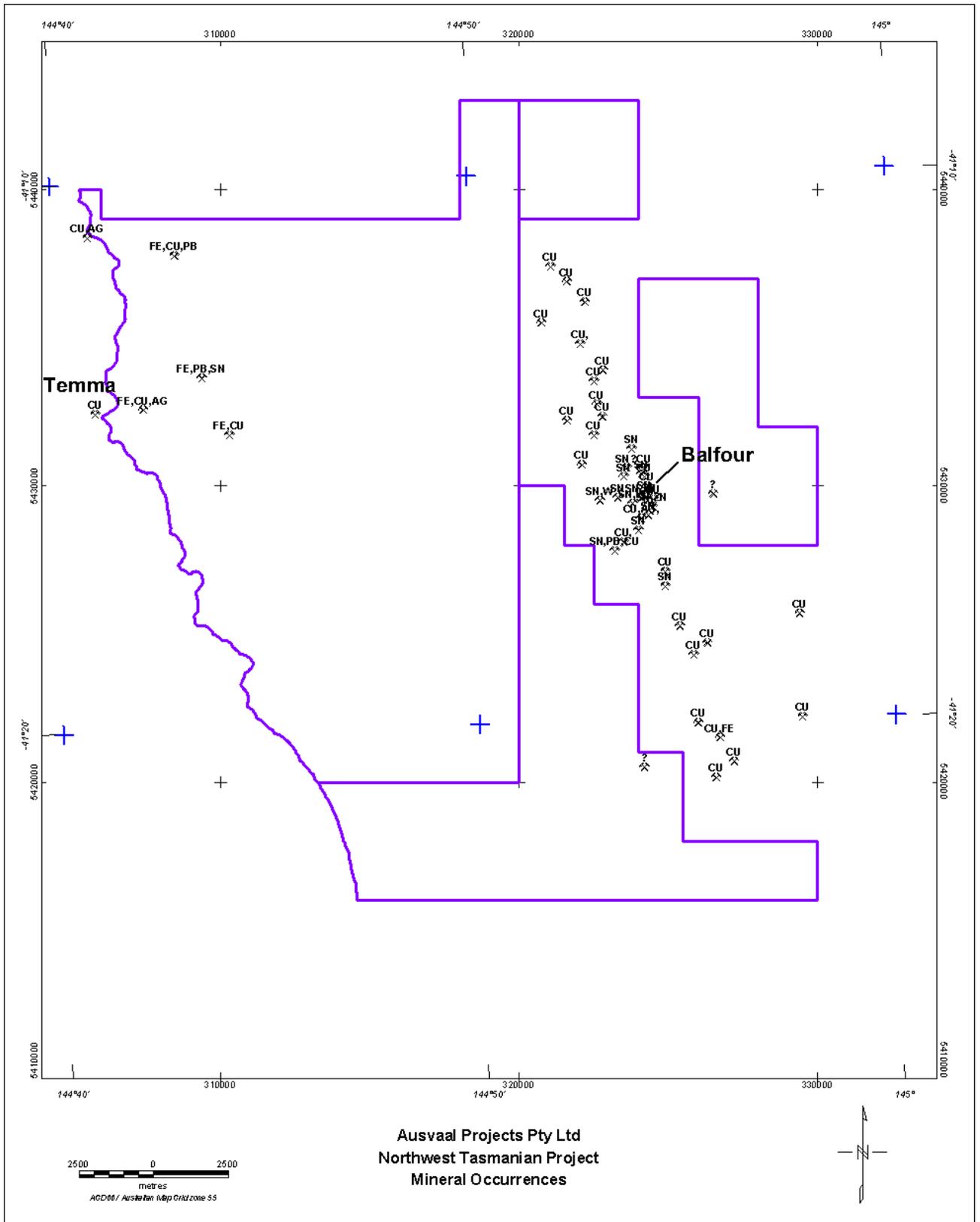


Figure 4 Mineral occurrences

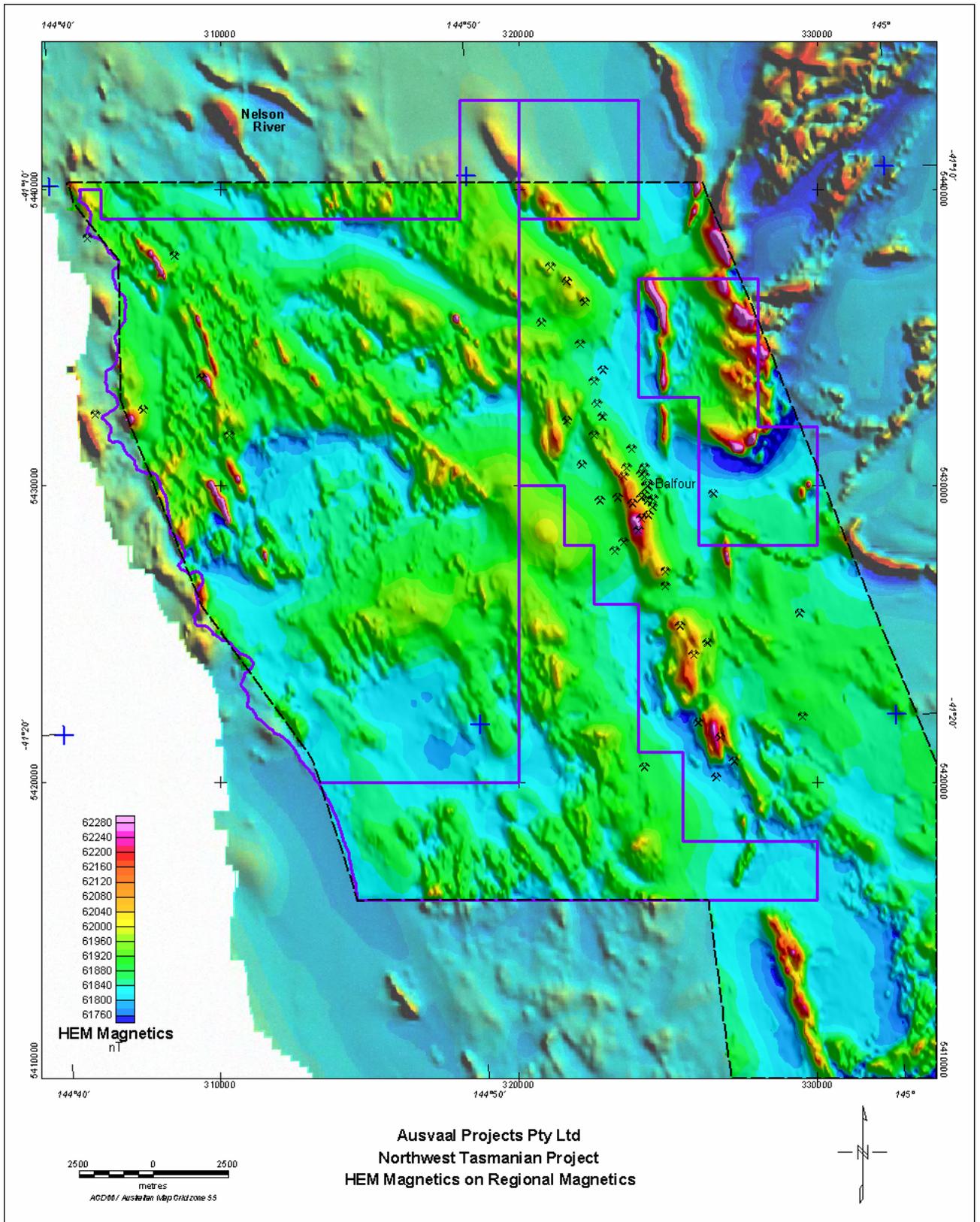


Figure 5 HEM magnetics (total magnetic intensity) on regional magnetics

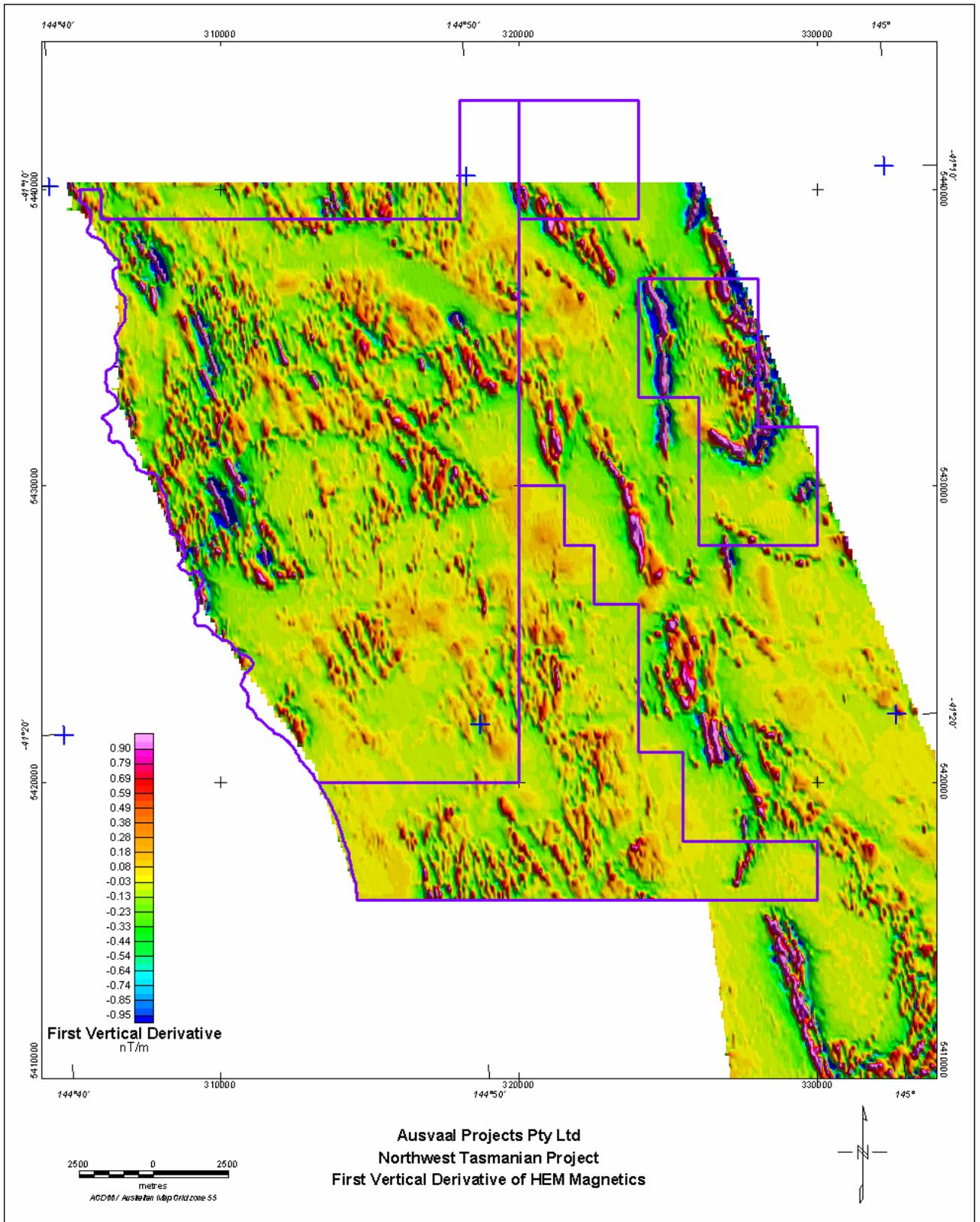


Figure 6 First vertical derivative of total magnetic intensity (reduced to pole)

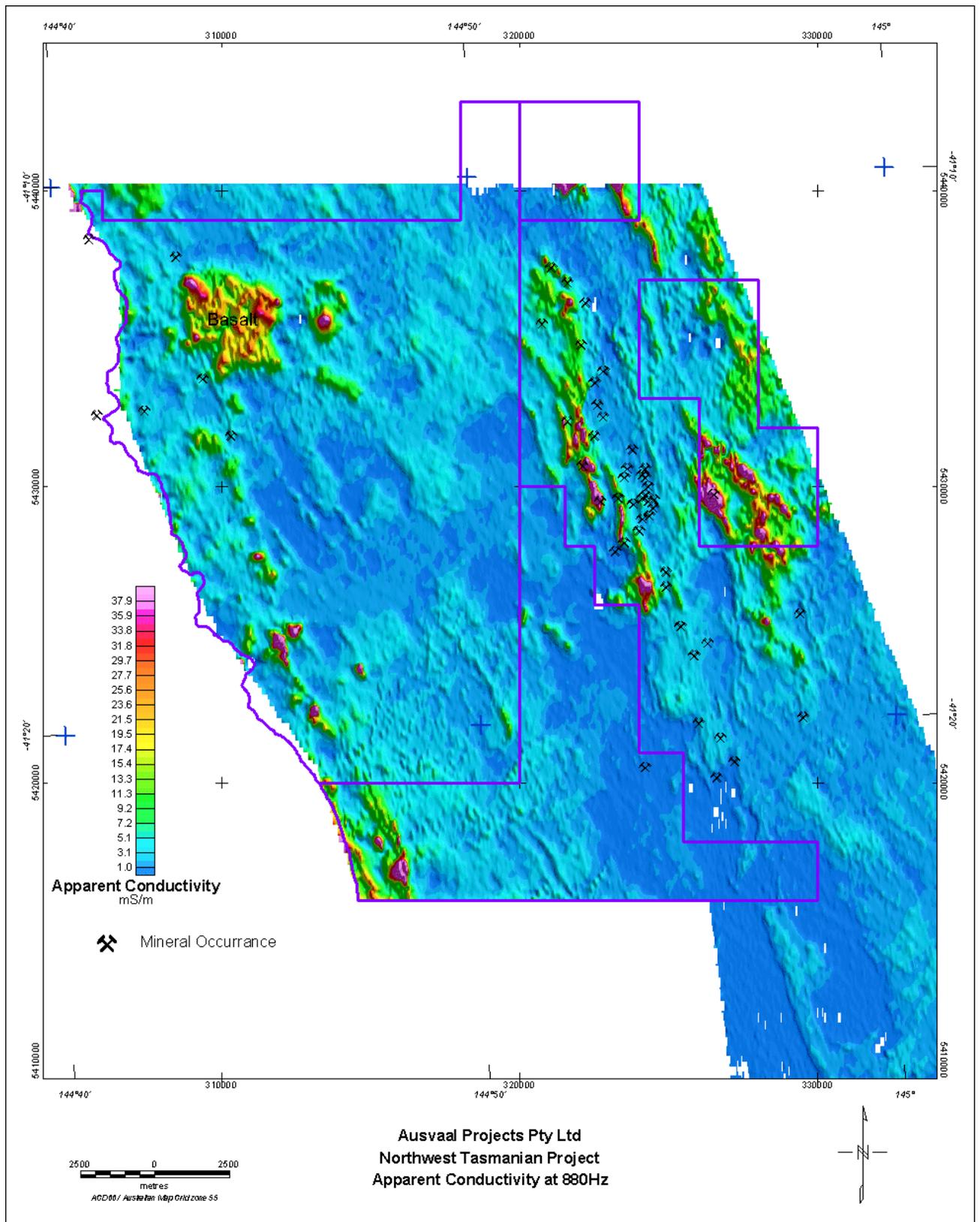


Figure 7 Apparent conductivity at 880Hz from helicopter EM survey

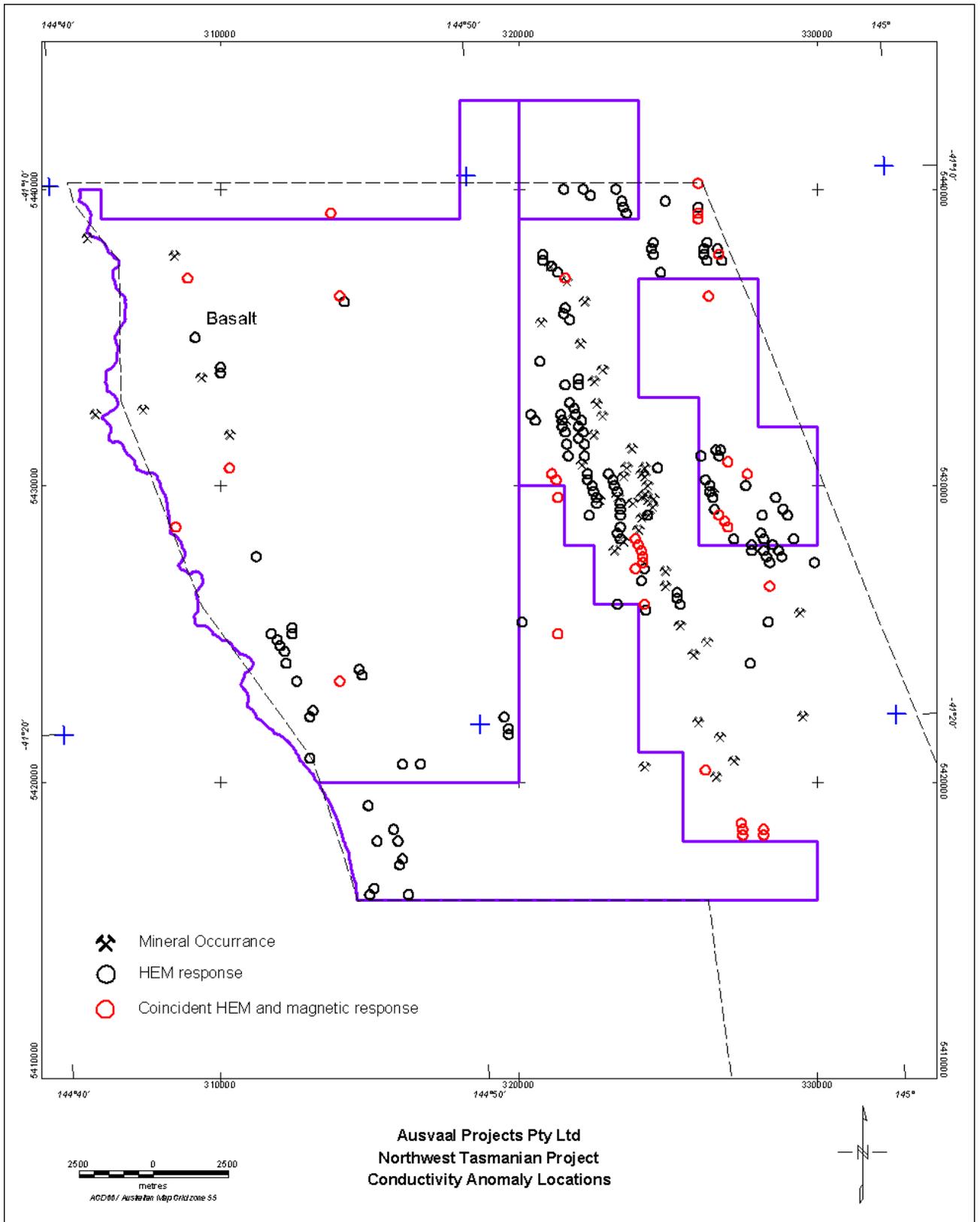


Figure 8 Conductivity anomaly locations

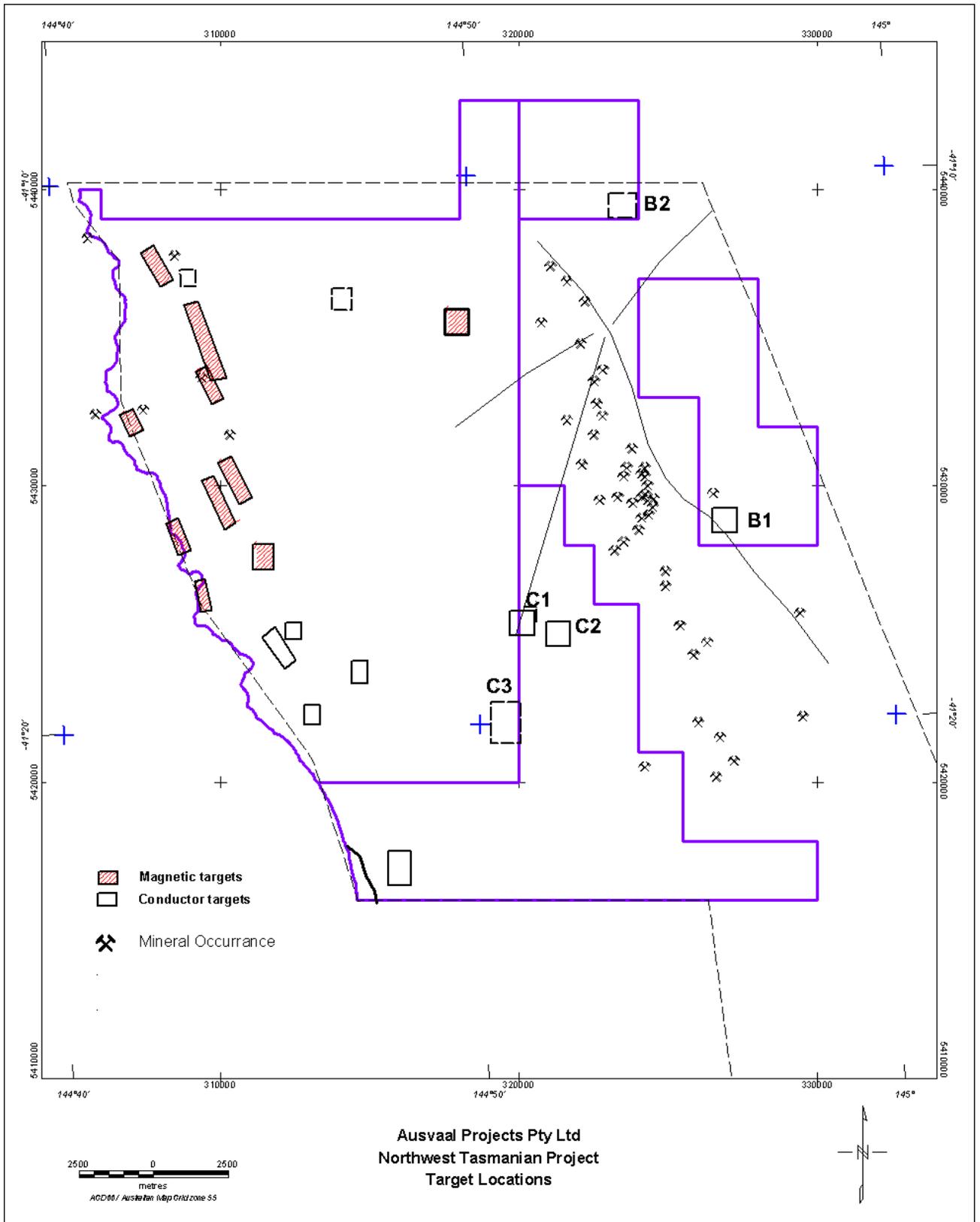


Figure 9 Target locations