

**Meteoric Resources NL**

**ABN: 64 107 985 651**

**PO Box 963, West Perth, WA 6005**

**Phone: (08) 9485 2836; Fax: (08) 9485 2840**

**www.meteoric.com.au**



**METEORIC RESOURCES**

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**Partial Surrender Report for EL24363  
for the period  
13 October 2011 to 1 November 2013  
Warrego, Tennant Creek, Northern Territory**

**Project name:** Warrego

**Project holder:** Meteoric Resources NL

**Project operator:** Meteoric Resources NL

**Target commodity:** Gold, copper, bismuth

**Standard NT map sheets:** Tennant Creek (SE 53-14), Short Range (5659)

**Grant date:** 13/10/11

**Expiry date:** 12/10/17

**Author:** D Reddy, Meteoric Resources NL, PO Box 963, West Perth, WA 6005

**Email for further technical details:** rthomson@meteoric.com.au

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# **Partial Surrender Report for EL24363 for the period 13 October 2011 to 1 November 2013 Warrego, Tennant Creek, Northern Territory**

## **Abstract**

Exploration Licence 24363 is part of the Warrego project of Meteoric Resources NL, which is located near Tennant Creek in the Northern Territory and comprises EL24363, EL24255 and EL23764 targeting Tennant Creek-style Cu and Au ore bodies. EL24363 comprised 14 blocks covering an area of 34.9 km<sup>2</sup> and was granted on 13 October 2011.

Interpretation of previously acquired aeromagnetic data acquired by joint venture partner Sipa identified a number of magnetic anomalies that warrant further exploration.

A review of historical data led to 50% of the tenement being surrendered in the north on 1 November 2013 in order to focus on aeromagnetic anomalies in the south.

## **Location, title history, physiography and access**

Exploration Licence 24363 is part of the Warrego project of Meteoric Resources NL, which comprises EL24363, 24255 and 23764 targeting Tennant Creek-style Cu and Au ore bodies near Tennant Creek in the Northern Territory as shown in Figure 1. The Tennant Creek mineral field, hosts numerous high-grade copper-gold deposits with overall past production totalling 5 Moz of gold and more than 400 000 t of copper.

Since November 2009 the project was subject to a Joint Venture – Farm In agreement with Sipa Exploration NL and was called the Tennant Creek project. This agreement was withdrawn in April 2013 and the tenements are 100% owned by Meteoric Resources.

EL24363 comprises 14 blocks covering an area of 34.9 km<sup>2</sup>. A 50% partial surrender on 1 November 2013 led to 7 blocks being surrendered. This report details exploration carried out on the 7 surrendered blocks on EL24363 between 13 October 2011 and 1 November 2013.

The tenement is located northwest of the largest mine in the field, the Warrego mine, which had historical production of 1.3 Moz of gold and 92 000 t of copper at an average recovered grade of 8.5 g/t Au and 2% Cu and was characterised by high-grade gold zones averaging 20 g/t (Chisholm).

EL24363 falls within the Short Range (5659) 1:100 000-scale map sheet on the Tennant Creek (SE 53-14) 1:250 000 sheet.

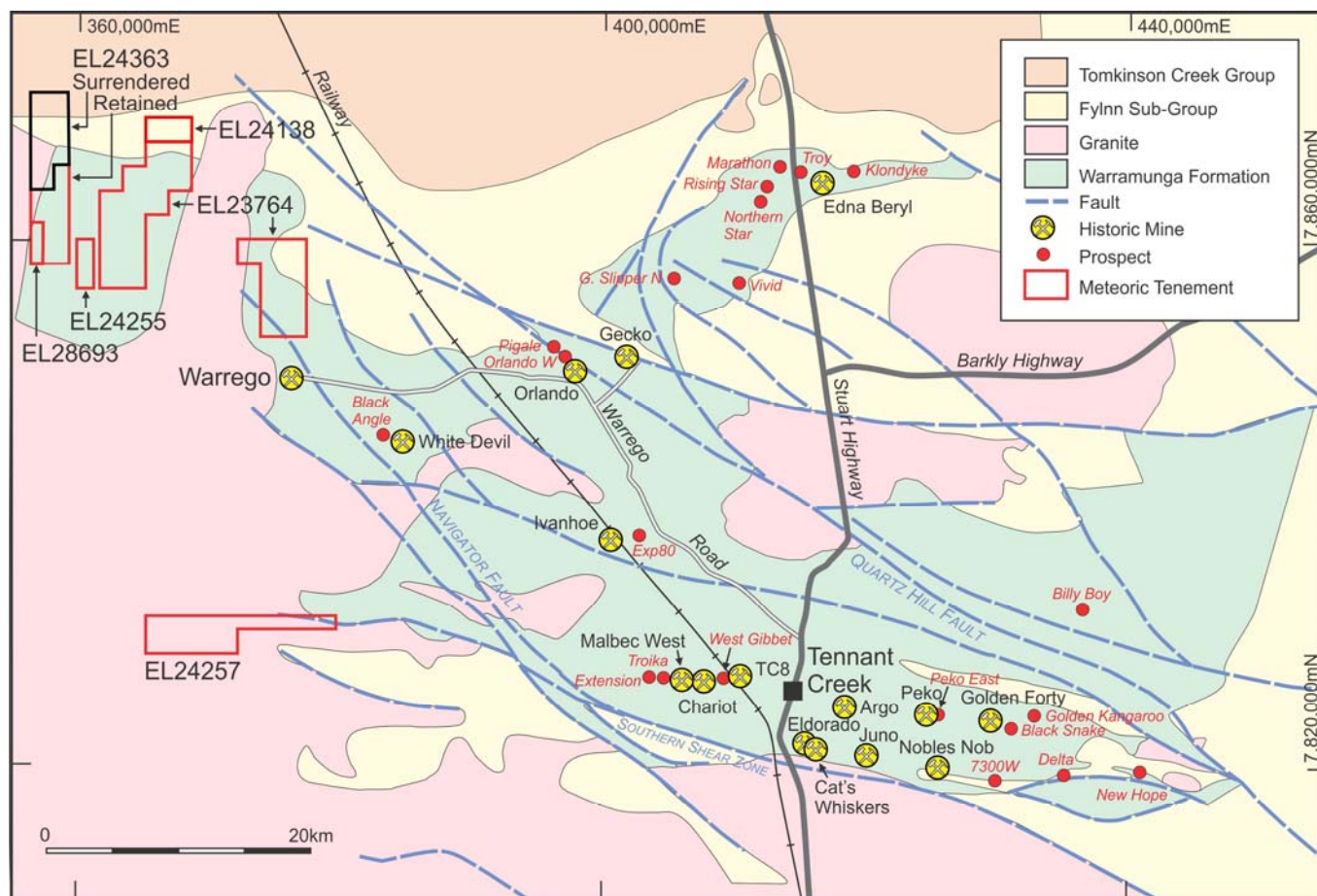
## **Geological setting, exploration history and exploration rationale**

### **Geological setting**

EL24363 is located in the Tennant Creek Inlier, an area of Proterozoic rocks consisting of three distinct geological provinces; the Davenport Province to the southeast, the central Tennant Creek Block and the Tompkinson Creek Province to the northwest. The Inlier is composed of a gneissic

basement overlain by Proterozoic sediments of the Warramunga Formation, Hatches Creek Group and the Tompkinson Creek Beds. The sequence of Proterozoic sediments was intruded by younger Proterozoic granitoids around 1858 to 1845 Ma during the Barramundi Orogeny. The Proterozoic rocks were subsequently overlain by Cambrian sediments of the Georgina Basin.

The Tennant Creek mineral field is located within the central block where the oldest rocks are the metasedimentary rocks of the Warramunga Formation, which host the ironstone–gold–copper–bismuth mineralisation, and which underlie most of the Warrego project area (Fig. 1).



**Figure 1. Regional geological setting of the Tennant Creek mineral field**

The Warramunga Formation comprises of a sequence of argillaceous sedimentary rocks that includes greywacke, siltstone, shale and units of hematite–magnetite shale. Cross-cutting and conformable quartz–feldspar porphyries occur within the sedimentary sequence.

The Warramunga Formation is intruded by granite and felsic porphyry dykes dated at 1850 Ma, coinciding with the dates of the Tennant Creek ironstones and mineralisation. The epigenetic ironstones are mostly restricted to the Warramunga Formation and are concentrated in several dominant structural trends. The ironstones generally range from a few tens of tonnes to tens of millions of tonnes, are discordant to bedding and occur within fold closures and shear and fault zones. The Tompkinson Creek and Flynn volcanosedimentary sequences overlie the Warramunga Formation. Deformation of the Warramunga Formation has been assigned to two main events to form WNW-trending upright folds and shearing. The shear zones are typically up to several hundred metres wide and trend W to WNW. The second event produced NNW- and NE-trending post-mineralisation regional faults.

The project covers an area of poor outcrop consisting of Cenozoic and Quaternary eolian and alluvial sand cover.

The Warrego project tenements are interpreted to cover the 11 km northern extension of favourable stratigraphy that hosts the Warrego mine. The Last Hope mine, where gold was first discovered in the Tennant Creek mineral field, is located near the project area.

The gold–copper–bismuth mineralisation in the Tennant Creek mineral field is predominantly hosted in magnetite–chlorite–hematite ironstones or sheared equivalents within the Warramunga Formation and is considered to be a high-grade variant of the iron oxide–copper–gold (IOCG) deposits found in Proterozoic terranes in Australia. Significantly, a second phase of ironstone alteration is interpreted to have occurred with the Au–Cu–Bi mineralisation, which overprints an earlier barren ironstone alteration event. The overprinted ironstones tend to possess high magnetic susceptibilities in excess 0.3–0.4 SI units.

There is evidence that the mineral deposits are structurally controlled and occur within more ferruginous horizons of the Warramunga Formation.

The ironstones and mineralisation are discordant to the folded Warramunga Formation rocks and tend to be located in structural flexures near fold axis hinge zones. The mineralisation occurs in small- to medium-sized lenses which are usually high grade, the mined deposits averaging 9 g/t Au and 2% Cu, with gold grades in some deposits up to 59 g/t Au (Juno). The Tennant Creek mineral field is no different to other IOCG provinces, with metal and oxide assemblages varying from one deposit to another, so that the proportion of magnetite and hematite in the ironstones can vary considerably. The sulphide content of the primary deposits rarely exceeds 10%. The gold-dominant ores are generally free milling with high recoveries normally being achieved. Oxidation extends up to 120 m below surface and within the ironstones results in a hematite–goethite–quartz–clay assemblage.

There is more recent evidence that copper–gold mineralisation is also associated with less magnetic, hematite-rich ironstones such as at the Nobles Nob and Chariot copper–gold deposits. At Chariot the deposit is coincident with a strong and shallow gravity response, which is separate from the Chariot magnetic response (Chisholm).

Locally, the geology comprises a central granite, the Warrego Granite, which divides the project into an eastern and western area. West of the Warrego Granite several magnetic targets have been identified, including Parakeet, Bustard, Chook and Chook North. A regional aeromagnetic image showing these features is shown in Figure 2.

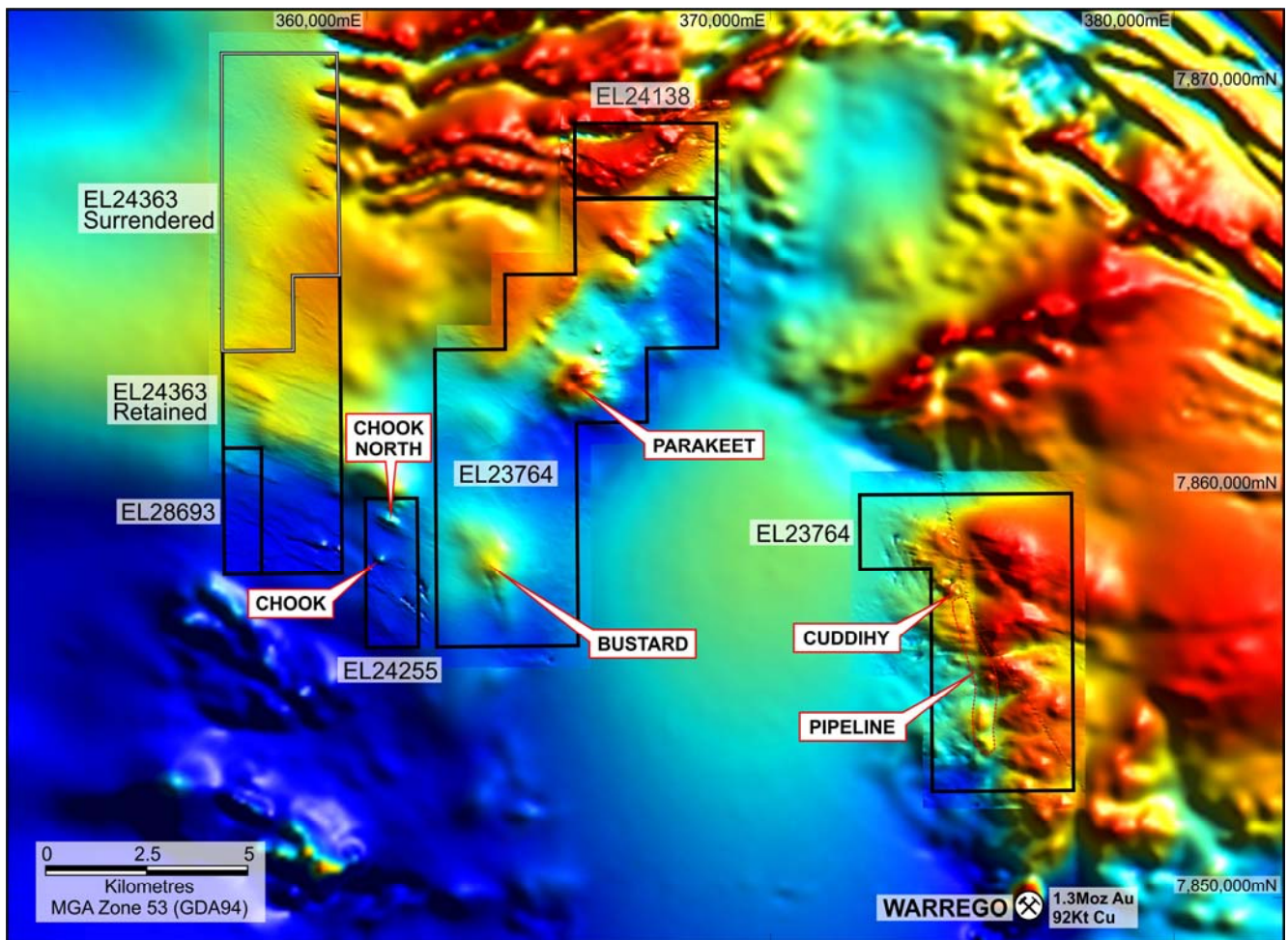
Parakeet is interpreted to lie on the NW extension of the Navigator Fault which trends close to the Warrego mine and the nearby Navigator prospects SE of the mine. East of the Warrego Granite, in an area of poor outcrop, several targets have been identified associated with a gravity ridge.

At Parakeet a series of subcropping ironstones with anomalous Cu–Au values have been identified over a 600 × 400 m area coinciding with a large pronounced coincident magnetic and gravity anomaly about 1 km in diameter.

## **Previous exploration**

Geopeko Limited explored the area during the 1970s and again in the 1980s using data from BMR aeromagnetic surveys and subsequently flying aeromagnetic and radiometric surveys. Several magnetic and geochemical anomalies were identified including Parakeet, Chook and Chook North.





**Figure 2. Warrego North aeromagnetic image**

Posgold Ltd (later Normandy) explored the area during the late 1980s to the mid-1990s. Work The area was explored for uranium by Uranerz in the 1970s and by CRA and the Central Electricity Generating Board in the 1980s, without success.

involved a detailed aeromagnetic survey (50 m line spacing) followed by geochemical sampling and vacuum drilling. Anomalies were followed up with ground magnetic surveys, gravity surveys in selected cases and by RAB and RC drilling. Records indicate that anomalous copper was intersected at Parakeet, including 3 m @ 1.1% Cu, 0.13 g/t Au from 105 m in hole PKRC-06 and 3 m @ 0.21% Cu, 0.27 g/t Au from 69 m in hole SRPK-02. Significant copper mineralisation was intersected in RAB and RC drilling adjacent to a magnetic anomaly at Chook southwest of Parakeet. One RC hole was drilled at Chook North with no significant results, but subsequent geochemical vacuum drilling at Chook North identified a copper anomaly with values up to 2102 ppm Cu. There is no record of the bottom of hole vacuum samples being analysed, nor is there any record of any follow up drilling on this target.

Giants Reef Mining Ltd held parts of the area from the late 1990s and completed detailed aeromagnetics and colour air photography.

## **Exploration targets and concepts**

Exploration within EL24363 (historical and recent exploration) is aimed at discovering typical Tennant Creek-style gold deposits or gold–copper deposits within small occurrences of surface

ironstone of the Warramunga Formation which strike east-southeast over a length of 4.5 km on the Golden Mile line of workings.

There are many examples of this type of deposit in the region, including Warrego, White Devil, Orlando, Gecko and North Star mines. These all take the form of ironstone (magnetite and/or hematite) masses with associated chloritic alteration and bodies of gold and/or copper mineralisation.

Sipa and Meteoric Resources recognised that while the use of magnetics have in the past been the primary exploration tool used by explorers its use in conjunction with the use of gravimetric surveying is becoming increasingly important in identifying new exploration targets. The companies have carried out extensive gravity and ground magnetic surveys over target areas.

Structural controls of mineralisation are considered to be important in the Tennant Creek area and in the Warrego area pronounced structural corridors interpreted from aeromagnetics trend N–S through the Warrego mine and NW–SE through the Gecko mine. These features together with others evident from the aeromagnetics identify a number of prospective corridors.

Previous exploration within the project area included shallow geochemical vacuum drilling which identified numerous copper–gold geochemical anomalies. Deeper drilling in these areas appears to be quite limited in extent, however, the reported occurrences of hematite and magnetite alteration provided encouragement for further exploration, particularly when combined with the results of Meteoric’s gravity and magnetic surveys.

## **2011–13 exploration**

### **Sipa exploration**

In 2011 Sipa carried out a high-resolution aeromagnetic survey over the Meteoric tenements at the Warrego project. Interpretation of the results followed on into the 2012–13 year.

On EL24363 the aeromagnetic survey was conducted at 50 m line spacing for 37.8 line km.

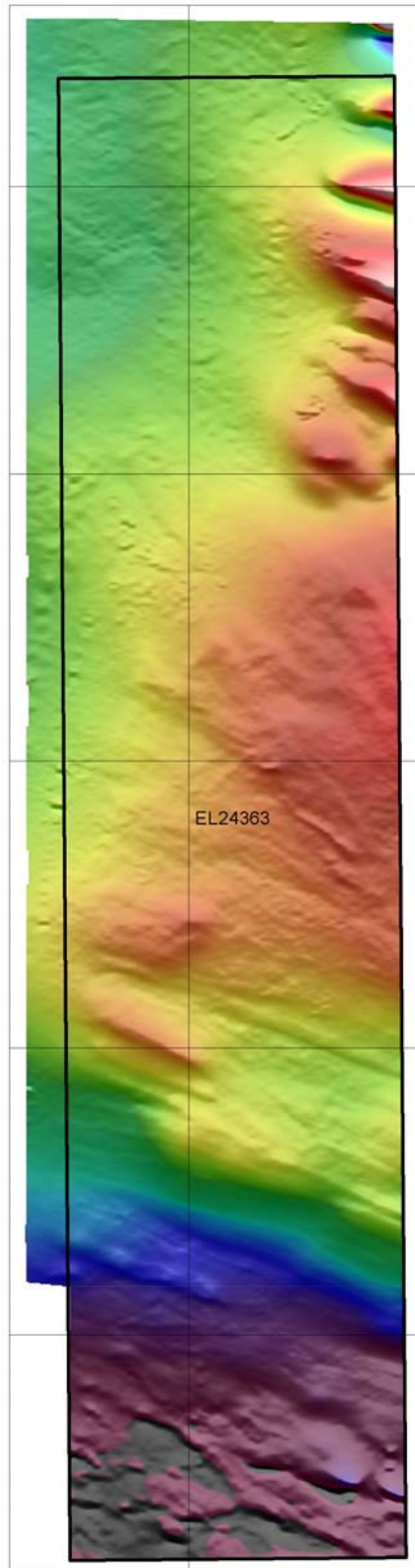
Importantly, the magnetic survey identified a number of magnetic anomalies as shown on Figure 3. Some of these anomalies may be stratigraphic, but a number also appear to relate to structures (Figs 2 and 3).

### **Meteoric exploration**

In previous years data from previous aeromagnetic surveys was used to identify areas of interest where Meteoric then conducted ground-based magnetic and gravity surveys to define drilling targets only on EL23764. Meteoric (and joint venture partner Image Resources) conducted soil sampling and vacuum drilling to identify drill targets. The airborne magnetics and gravity data were reprocessed along with a complete review of geochemical sampling carried out by previous explorers to generate exploration targets for drilling.

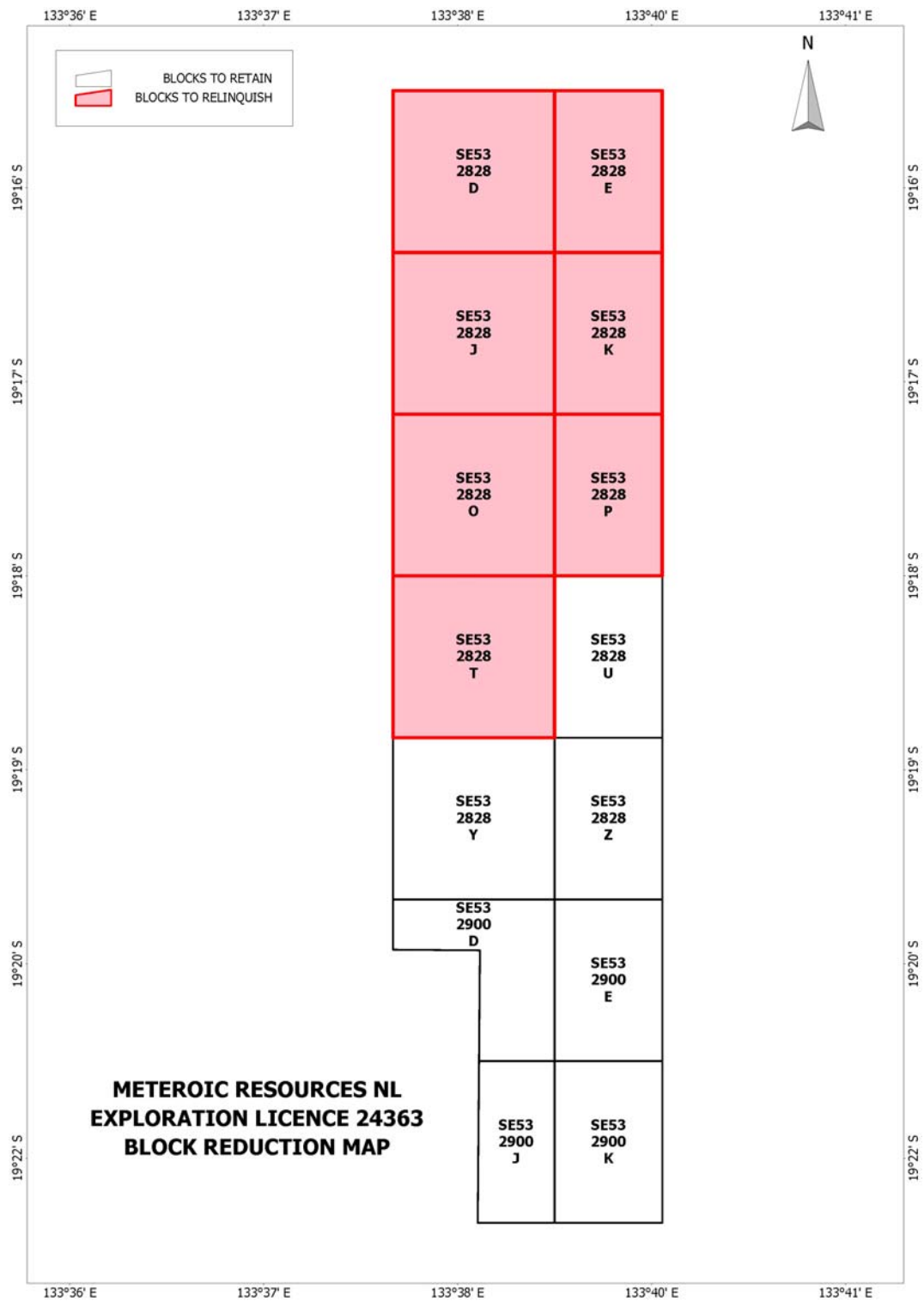
In the 2012–13 reporting year, since the joint venture agreement was withdrawn Meteoric Resources carried out extensive literature and data searches of historical exploration and previous aeromagnetic surveys in the Warrego project area. The data (geochemistry, rock sampling, vacuum drilling and drill sections) has been tabulated and used to produce a series of historical datasets and maps.

The review led to 50% of the tenement being surrendered in the north in order to focus on aeromagnetic anomalies in the south, as shown in Figures 4 and 5.

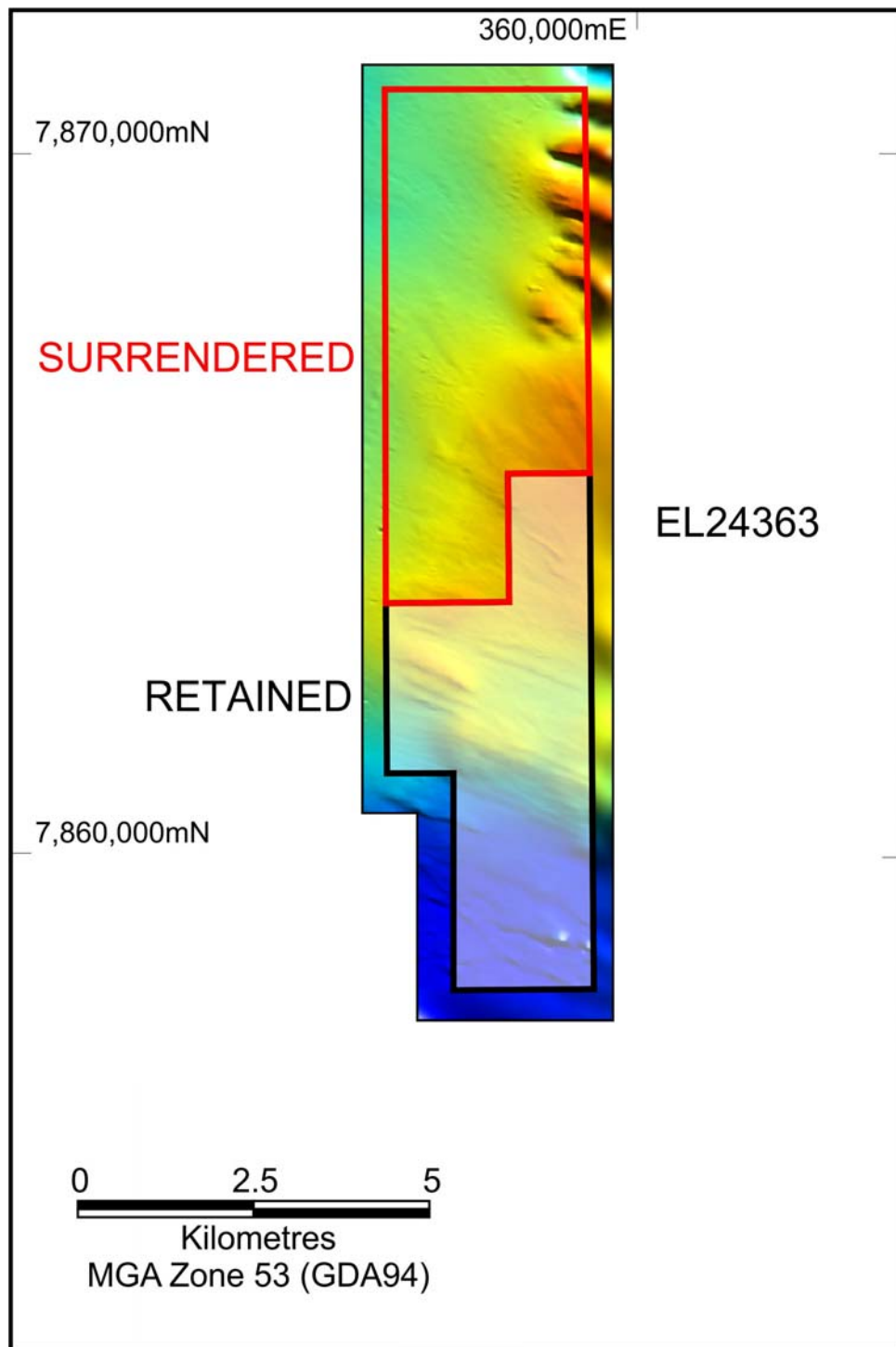


**Figure 3. EL24363 TMI image with NE shade**





**Figure 4. EL24363 50% relinquishment 2013**



**Figure 5. EL24363 50% relinquishment 2013 on TMI**

## **Conclusions**

Interpretation of the aeromagnetic data acquired by Sipa identified a number of magnetic anomalies that warrant further exploration. A review of historical data led to 50% of the tenement in the north being surrendered in order to focus on aeromagnetic anomalies in the south.