



**EL25076**  
**Partial Relinquishment Report**  
**Chilling Project**  
**18 September 2006 – 17 September 2012**

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**Submitter of Report: Crossland Uranium Mines Ltd**

**NT 1:100,000 Map Sheets: Daly River 5070 & Reynolds River 5071**

**NT 1:250,000 Map Sheet: Pine Creek SD52-08**

**Map Datum: GDA 94 MGA Zone 52**

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## SUMMARY

This report details exploration work conducted between 18 September 2006 and 17 September 2012 on a relinquished portion of EL 25076. EL 25076 (Allia) was granted for a six year term on 18 September 2006 (expiring 17 September 2012). The original title covered an area of 189 sub-blocks (630 km<sup>2</sup>). A Waiver of Reduction was granted on 17 September 2009 allowing all sub-blocks to be retained. In September 2011 the title was reduced to 149 blocks (497 km<sup>2</sup>). In September 2012 Crossland applied for renewal and reduced the license to the current 111 blocks (370 km<sup>2</sup>).

During the tenure, exploration activities related to the relinquished portions consisted of:

- Literature research of previous exploration, geological and geophysical surveys over the EL and surrounding district
- Data compilation
- Acquisition and reinterpretation of NTGS airborne geophysical data sets
- Processing and interpretation of results
- Geological Reconnaissance
- An airborne radiometric and magnetics survey
- GA sponsored Airborne EM

# 1 INTRODUCTION

The Chilling region was initially selected because of the presence of a 'Primary Hub', which was identified using confidential technology supplied by Paradigm Geoscience, (now Global Geoscience Limited). The aim of the technology is to identify targets for mineral exploration with the same signatures as major mineral deposits. The method offers a means to identify important mineral resources without the need to acquire title to broader areas, with the resultant demanding access and land use challenges. Because of the restricted areas selected, more intensive exploration than would be normal in greenfields exploration can be focused on the limited area by even junior mineral explorers such as the holders. The Hubs have responded to the selection process in a similar fashion to major mineral deposits. It is to be expected that in most cases the target deposits do not outcrop, or they would already have been discovered, so it will be necessary to penetrate the overburden to make discoveries. The selection technique does not permit identification of target commodities, and these must be determined by consideration of regional metallogenic factors and field reconnaissance.

EL 25076 was acquired with the intention of exploring for unconformity related uranium deposits (URD). The EL covers an extensive arcuate unconformity between the Palaeoproterozoic metamorphic basement and the gently dipping Mesoproterozoic platform sedimentary cover rocks and provide an excellent target zone. The length of unconformity covered by the tenement is about 55 kms long and is up to 10 kms wide. As well as URDs the area also has the potential to host iron-oxide breccia-related deposits. Additionally this group of leases has excellent potential for hosting base metals and gold deposits.

## 2.1 Tenure

EL 25076 (Allia) was granted for a six year term on 18 September 2006 (expiring 17 September 2012). The title originally covered an area of 189 sub-blocks (630 km<sup>2</sup>). A Waiver of Reduction was granted on 17 September 2009 allowing all sub-blocks to be retained. In September 2011 the license was reduced to 149 blocks (496.61 km<sup>2</sup>). In September 2012, Crossland applied for renewal and reduced the license to the current 111 blocks (370 km<sup>2</sup>).

## 2.2 Location and General Description

The license extends from approximately 20 kilometers(kms) northeast to about 45 kms south of the Daly River Crossing (see Fig 1). Access is gained from Darwin via paved road by taking the Stuart Highway to Adelaide River and then following the Dorat Road and later the Daly River Road to the crossing. From there two routes utilizing 4WD dirt tracks allow direct access to different parts of the EL.

The property falls within NT Portions 1666, 2682 and 3434 (Branir P/L i.e. Tipperary Station ACN 061 718 876), NT Portion 3435 owned by the Indigenous Land Corporation and NT Parcel 2700 which is now under the control of parks and Wildlife NT. The area is subject to

two Land Claims under the Aboriginal Land Rights Act (NT), LC No. 177, Fish River Region and LC No. 235, Daly River Region II. The EL is also subject to two Native Title

Claims as follows: FC\_No. NTD6028/01, Fish River and FC No NTD8/07, Tipperary (KAMU).

## 2 GEOLOGY

The EL is covered by two geological map sheets:

- NTGS 1:100,000 Daly River Sheet, published along with explanatory notes in 1987 (Dundas et al, 1987).
- NTGS 1:100,000 Reynolds River Sheet, published along with explanatory notes in 1989 (Pietsch, 1989).

See Figure 2 for the regional geology framework. The dominant geological feature is the Giant's Reef Fault which trends NNE, running along and occasionally cutting across the tenement's western boundary. The oldest rocks present are the Hermit Creek Metamorphics, which occur as a few scattered outcrops on the westernmost part. The next oldest is the Finnis River Group, which is represented by the Burrell Creek Formation and the overlying Chilling Sandstone. The Finnis River group forms an arc shaped swath which covers the southwest corner and much of the western margin of the tenement. Two major structures present in the southwest corner are the Muldiva Anticline (Burrell Creek Formation) and the Chilling Syncline (Chilling Sandstone), which form a sub-parallel trending anticline-syncline pair.

Three intrusive units, the Murra-Kamangee Granodiorite, the Allia Creek Granite and the Jamine Granite are present. The Murra-Kamangee Granodiorite is represented as a few scattered outcrops on the western side near outcropping Hermit Creek Metamorphics. The largest and most significant intrusive, the Allia Creek Granite is located in the south central part where it intrudes into the crook of the arcing swath of the Finnis River Group. Exposures of the Jamine Granite occur on the western side of the property, to the northeast of the exposures of Murra-Kamangee Granodiorite.

The most widespread units are the Depot Creek and Stray Creek Sandstone of the Tolmer Group. These rocks cover well over 60% of the tenement. The youngest rocks are the Antrim Plateau Volcanics, which are present along the southern boundary, near the contact between the Finnis River and Tolmer Groups.

The relinquished blocks consist principally of Tolmer Group sediments with some lower proterozoic Burrell Creek Formation.

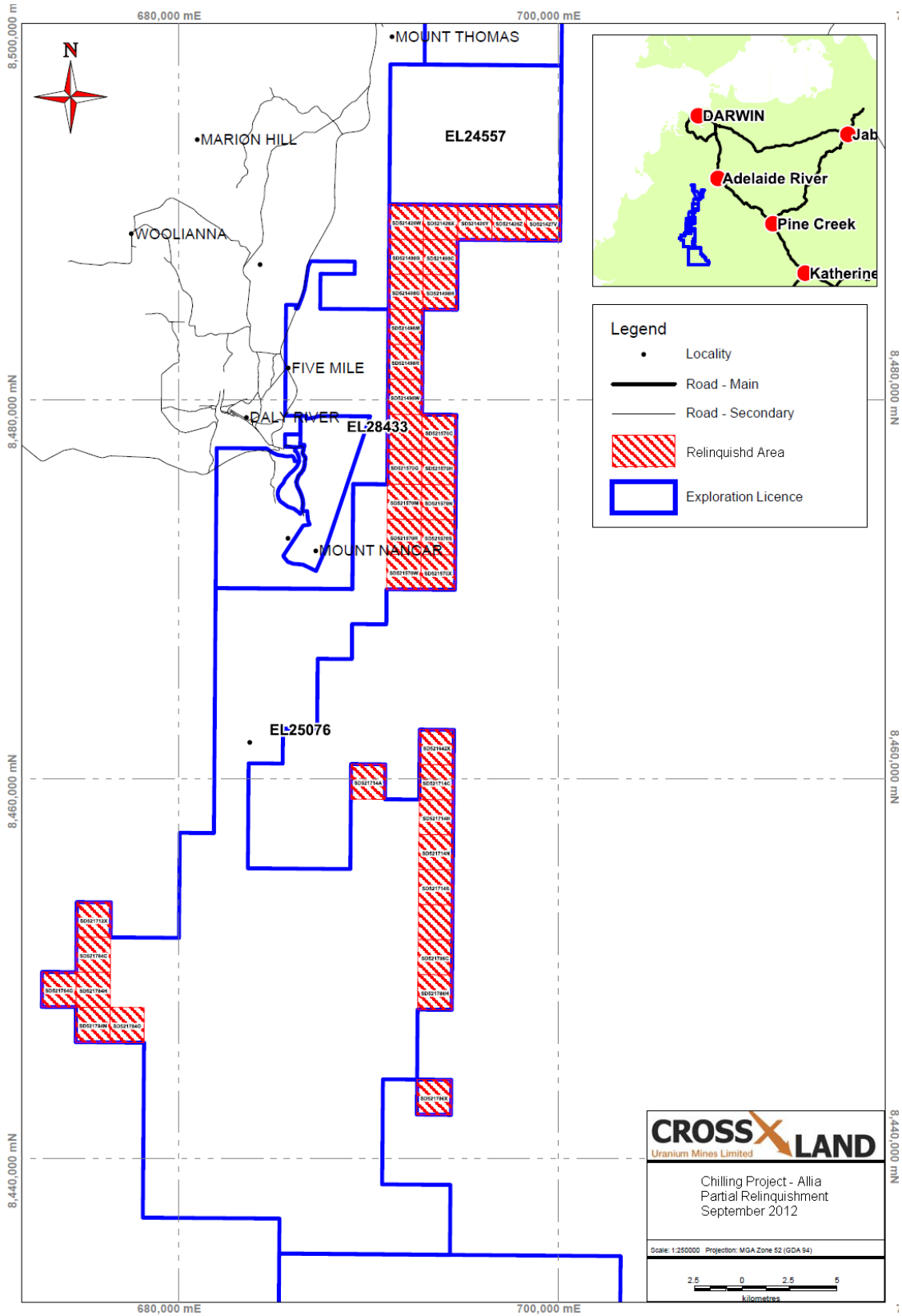


Figure 1. Location Map

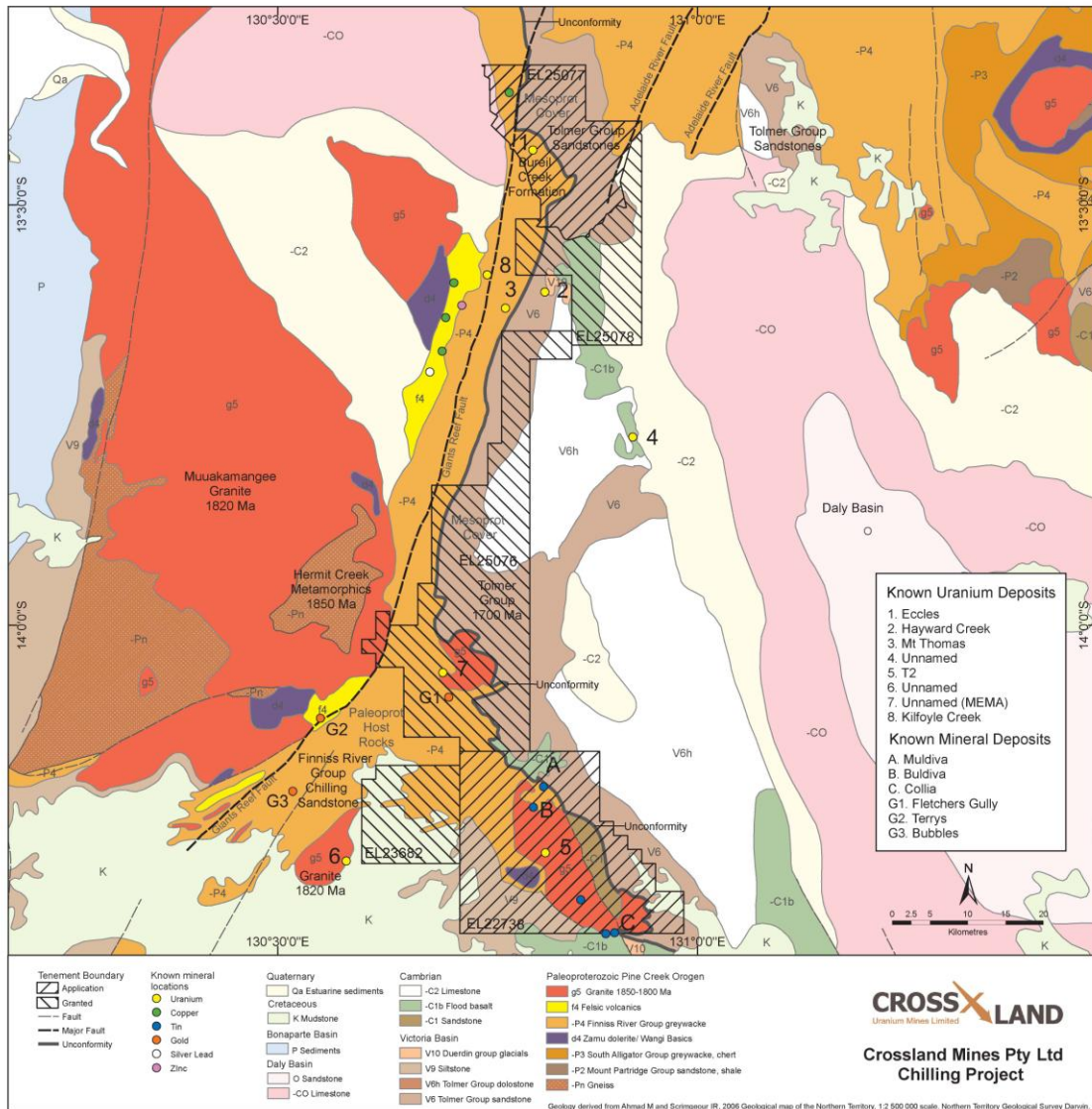


Figure 2. Regional Geology Map.

## 3 EXPLORATION

### 3.1 Exploration Rationale

The geological setting of the Chilling Project suggests that a wide variety of deposit styles could be present. The greater region has produced both gold and tin, the latter intimately related to granites e.g. the Soldiers Creek granite and to associated pegmatite swarms, which invade the lower Proterozoic Burrell Creek formation. The best known example of gold mineralisation is the historical Fletcher's Gully Mine located on the licence, where incomplete records indicate that 70 kg or 2250 oz gold were produced. Tin, as alluvial concentrations and lode deposits is known from Buldiva, Muldiva and Collia in ELs 25076 and 22738. Base metals deposits have been prospected / mined in a structurally prepared meta-sediment-volcanic environment assigned to the basal Burrell Creek formation at Daly River and also in carbonate rocks of the Daly Basin. The district also has basic intrusives which could have a potential to host nickel-copper or platinoid mineralisation.

Examples of uranium mineralisation with a spatial relationship to the unconformity occur at March Fly in EL 24557 and at Eccles in EL 25077, both part of the Chilling project. Both occurrences are hosted by the lower proterozoic Burrell Creek Formation and associated with pegmatitic and/or tourmaline-rich quartz veining.

Within EL 25076 the only known uranium occurrence is a structurally controlled radiometric anomaly present at the MEMA Prospect. This anomaly is shear-hosted and occurs within the Allia Creek granite, located in the extreme southern section of the licence.

### 3.2 Exploration Conducted by Crossland

During the period that Crossland has held EL 25076 exploration undertaken on the tenement falls into two categories office based studies and field work. Office studies include:

From 2006 to the time of relinquishment, exploration activities related to the subject blocks consisted of:

- Literature research of previous exploration, geological and geophysical surveys over the EL and surrounding district
- Data compilation
- Acquisition and reinterpretation of NTGS airborne geophysical data sets
- Processing and interpretation of results
- Geological Reconnaissance
- An airborne radiometric and magnetics survey
- Airborne EM



### **3.3.1 Results of Literature Research**

A search of the Northern Territory Geological Survey's "STRIKE" (Spatial Territory Resource Information Kit for Exploration) data base reveals that 9 historical APs (Application to Prospect) and 79 historical ELs overlap geographically with the four current ELs of the Chilling Project. Naturally a large number of companies and individuals have explored for a variety of commodities including gold, base metals, barite, cobalt, chromium, diamonds, fluorite, limestone, nickel, PGE's, silver, tin, tantalum and uranium. The "STRIKE" database indicates that there are 234 open file annual reports describing exploration undertaken by lease holders on these historical tenements.

Companies involved in historical exploration in the region from the late 1960s onwards include Kewanee Australia Pty Ltd, Le Nickel Exploration Pty. Ltd., and Sutton's Motors. The latter entered into a joint venture with Mobile Energy Minerals Australia to explore for gold, tin and uranium. In the 1980s both Ashton Mining Ltd and Stockdale Prospecting Ltd. sampled the region for diamonds. Carpentaria Exploration Company conducted regional work for gold resulting in the discovery of several localised high grade but uneconomic occurrences.

From the late 1980s to the early 1990s both Renisons Goldfields Consolidated Ltd and Northern Gold NL explored within the district including parts of the project area for gold. Total Mining Australia Pty Ltd in joint venture with PNC Exploration (Australia) Ltd conducted a program of uranium exploration along the Tolmer Sandstone trend from the mid to late 1980s.

### **3.3.2 Reprocessing of NTGS Airborne Geophysical Datasets**

Geophysical data covering the title was acquired by NT Geological Survey in 1984. This was flown on 500 m line spacing at 100 m ground clearance. See Figure 3.

## **3.4 Field Work**

### **3.4.1 Tenure Year 1**

Initial reconnaissance by 4WD vehicle was undertaken to identify access and complete first past radiometric prospecting. Geological observations were noted at various points within the EL. Some parts of the relinquished blocks may have been included in this activity.

### **3.4.2 Tenure Year 2**

An airborne magnetics and radiometric surveys was flown late in the year. Details of the survey are recorded below.

#### **3.4.2.1 Airborne Geophysics**

Crossland Uranium Mines contracted GPX Aeroscience Pty Ltd (GPX) of Perth WA to conduct the surveys. The survey was carried out between November 9 2007 and December 4 2007 with the crew operating out of the town of Batchelor.

The surveys were flown using a Cessna 210 fixed wing aircraft. Equipment used to conduct the survey included a Billingsley Ultra Miniature TFM 100G2 fluxgate magnetometer, a Pico Envirotec G-Mag with Scintrex CS-3 Cesium vapour sensor base magnetometer, a Pico Envirotec GRS-410 gamma ray spectrometer and a Rockwell Collins ALT-50A radar altimeter.

The survey was originally planned to be on 100 m line spacing but because the survey was started late in the season after rains had commenced the line spacing was increased to 200 m with tie lines spaced at 1000 m intervals running north – south. The survey was conducted at a height of 60 m.

Additional information on the survey including general survey information, survey equipment specifications, equipment calibrations and data acquisition checks, in field data verification and data processing can be found in GPX's logistic report which has been included herein as Appendix 1.

During the course of the airborne geophysical survey a Rockwell Collins ALT-50A radar altimeter was used to collect altitude data. The digital terrain model was generated by subtracting the data collected by the radar altimeter from the GPS heights. See Figures 3-6 for results of survey.

#### **3.4.2.2 Ground Based Geophysical**

Following processing of the airborne radiometric data, 21 anomalies were identified as a priority for follow-up ground assessment. The latter exercise was undertaken by helicopter in April 2008 with each anomaly being identified on the ground by traversing with a spectrometer. The geological environment was also described.

### **3.4.3 Tenure Year 3**

No activities were carried out within the relinquished blocks.

### **3.4.4 Tenure Year 4**

A GA instigated regional TEMPEST survey was carried out over the region. This survey would have covered the relinquished blocks. Results of the survey were made public by GA in 2011

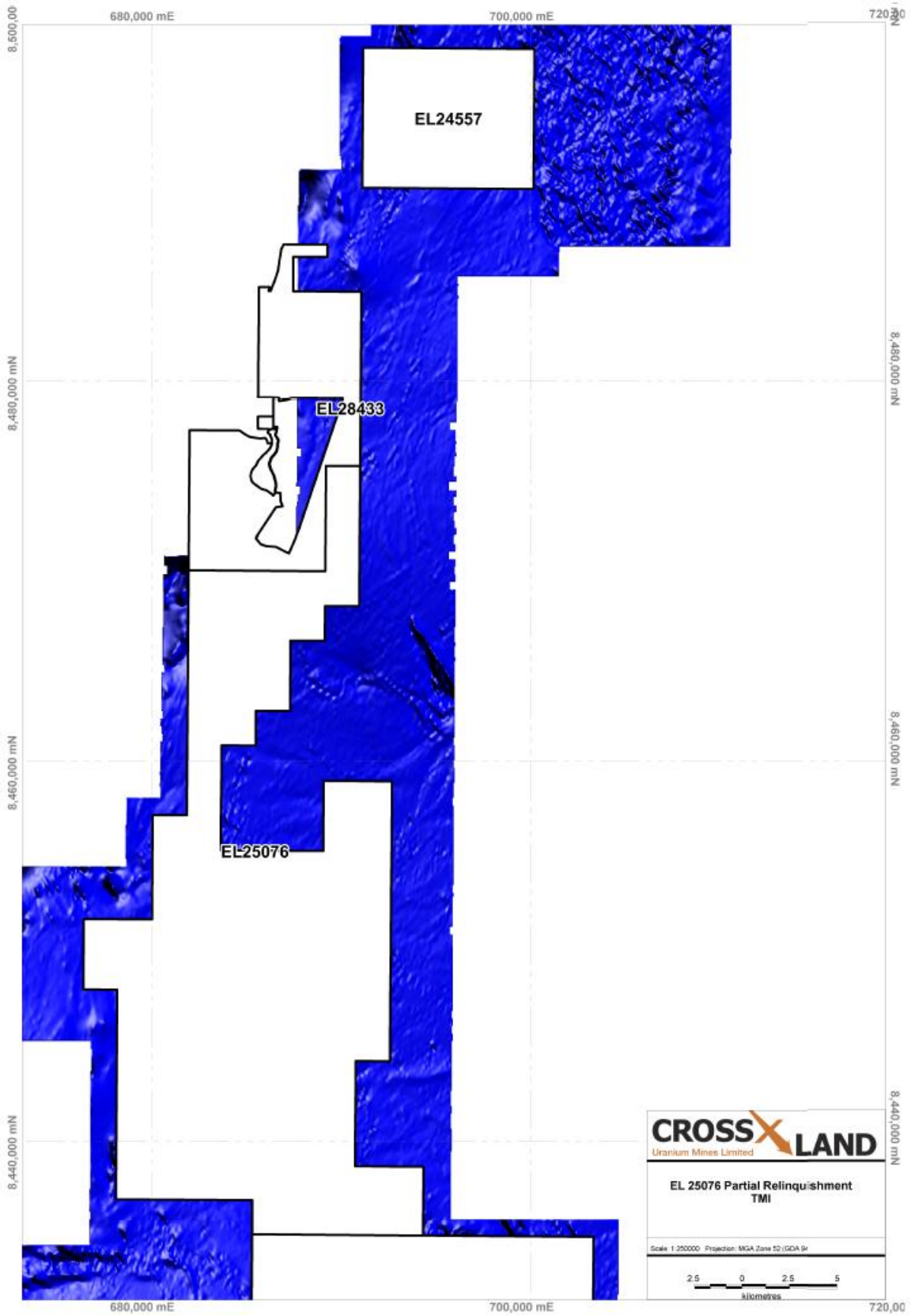


Figure 3. Airborne Total Magnetic Intensity

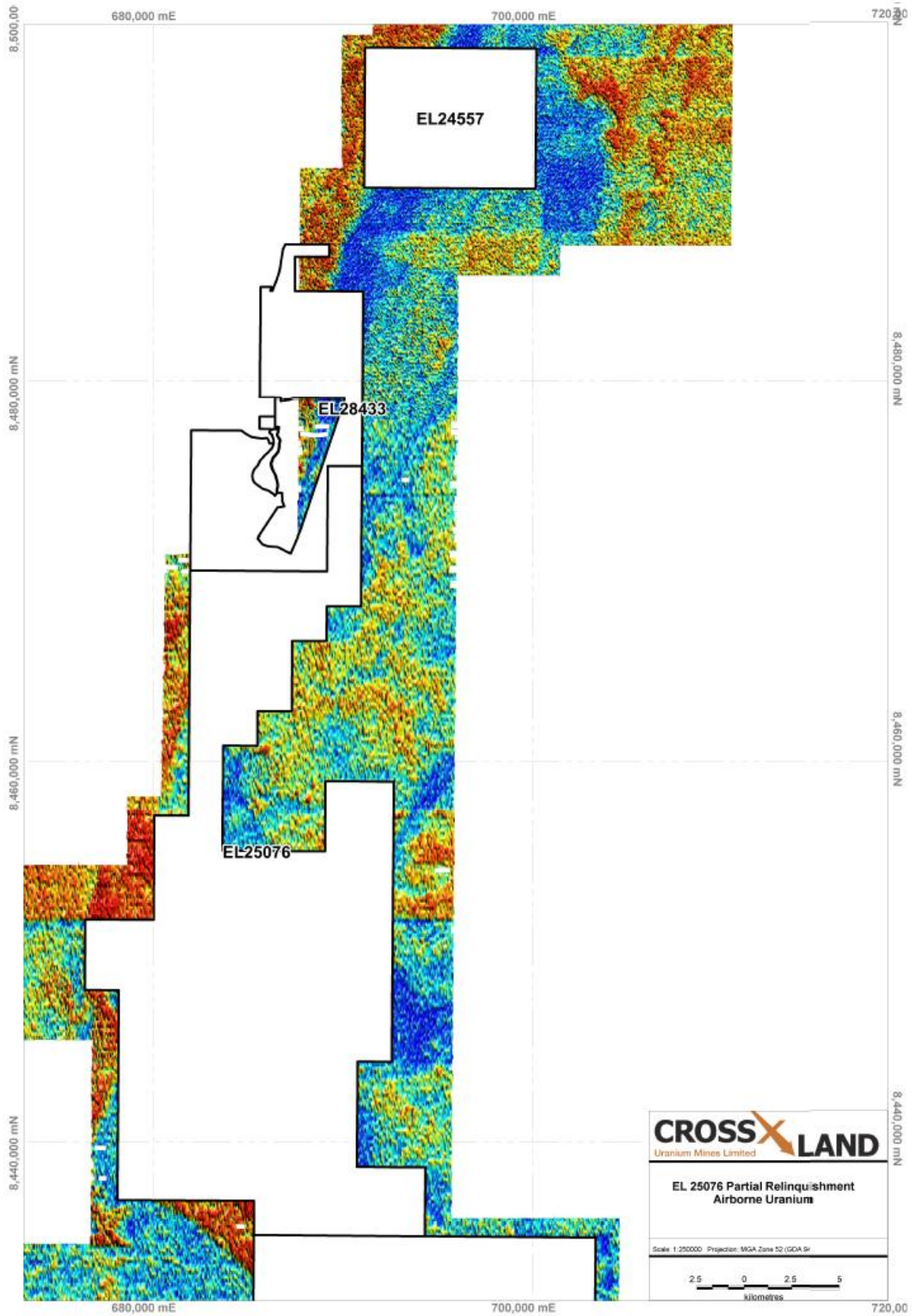


Figure 4. Airborne Uranium

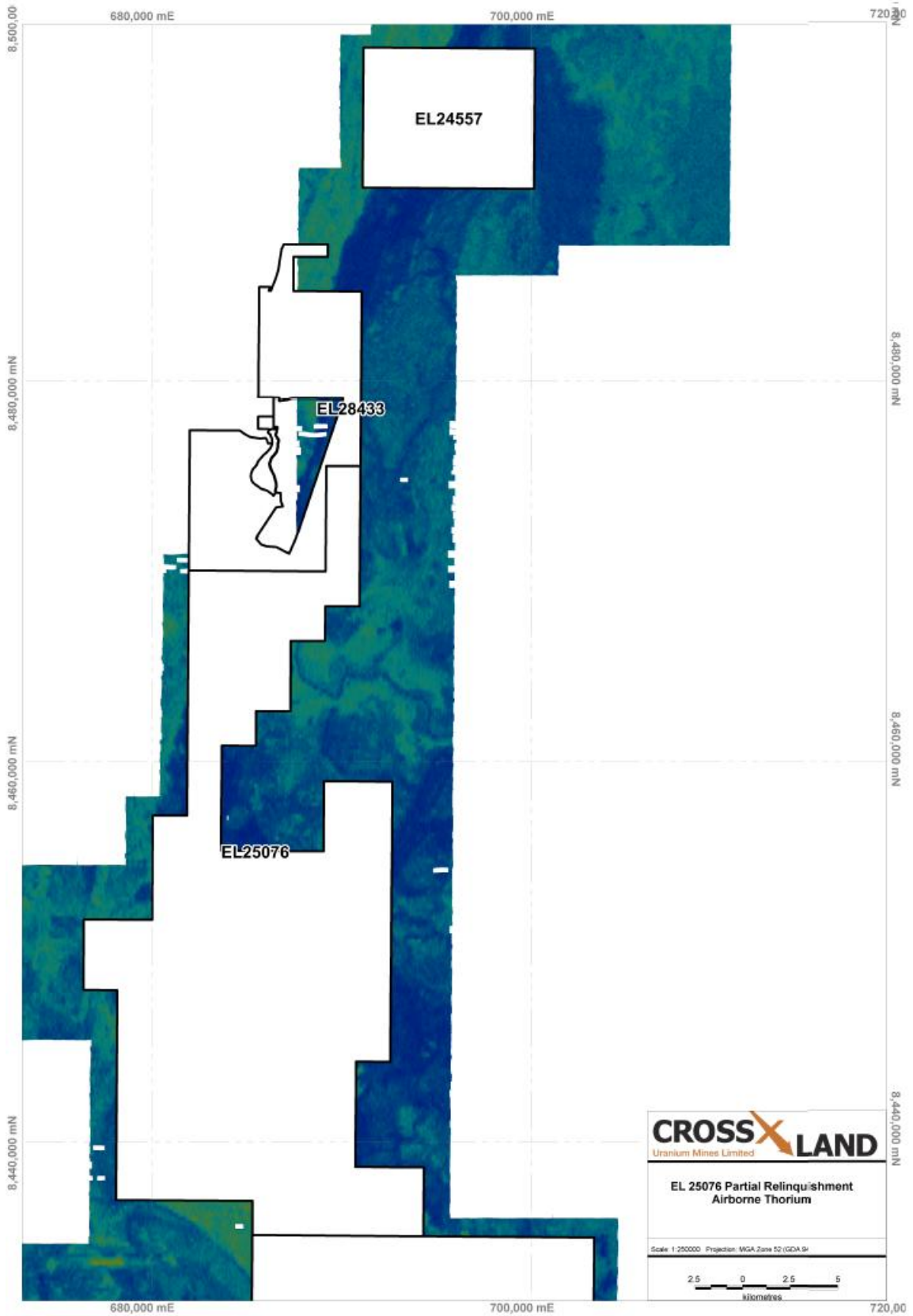


Figure 5. Airborne Thorium



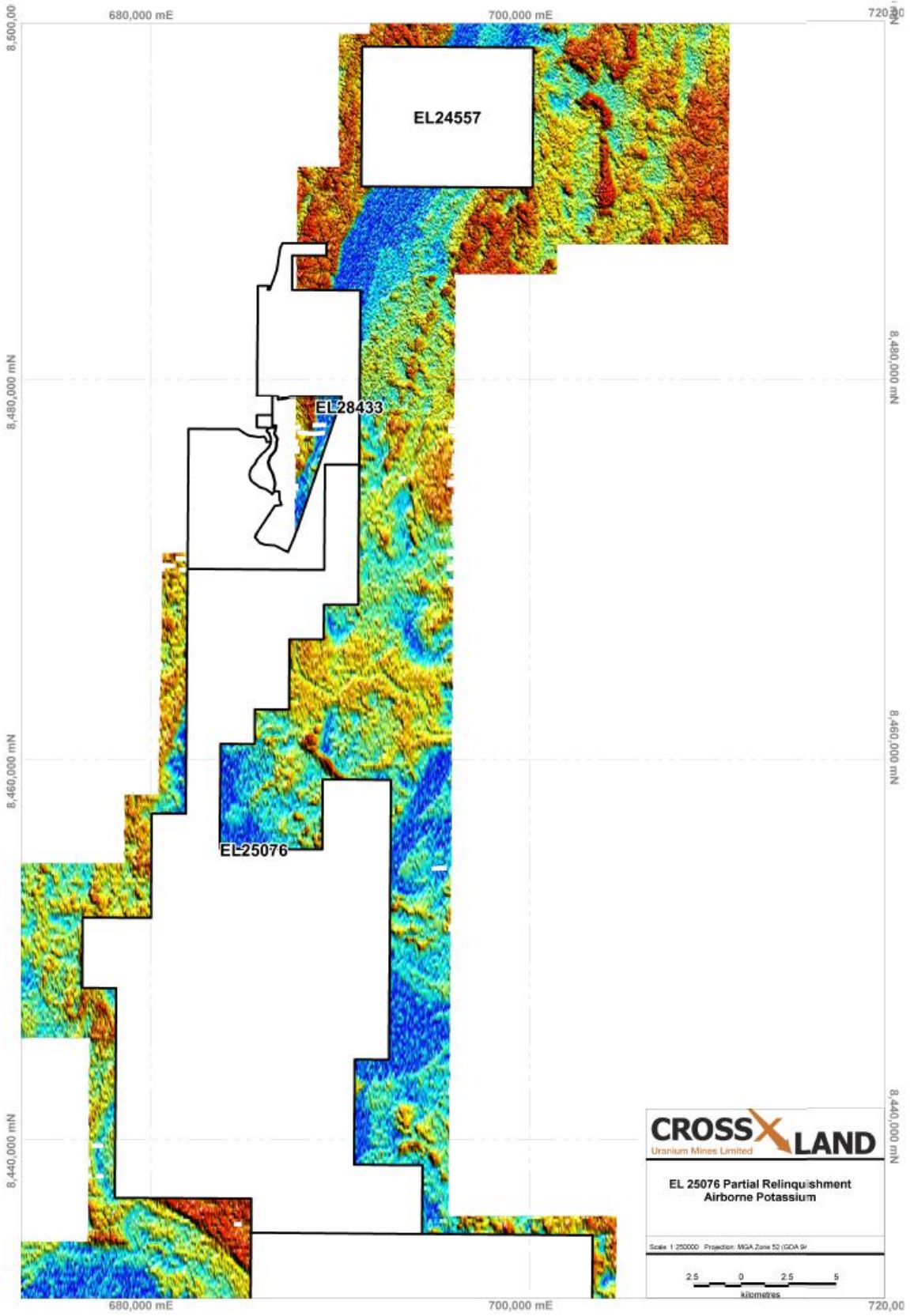


Figure 6. Airborne Potassium

### **3.4.5 Tenure Year 5**

No work was carried out within the relinquished blocks.

## **4 CONCLUSIONS**

Majority of the field work completed has taken place on the retained parts of the licence. Activities completed within the relinquished ground initially included some ground reconnaissance and assessment of NTGS airborne geophysical data. Following acquisition of further licences in the region, Crossland undertook an airborne radiometric and magnetic survey to further define the regional radiometrics. A government funded TEMPEST EM survey was flown in 2009.

Based on interpretation and assessment, Crossland has relinquished the ground in lieu of other more promising prospects.

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