

**United Uranium Limited**  
**Partial Relinquishment Report on**  
**McArthur River Project EL25839**  
**For Period 21 September 2007 to 20 September 2010**

**Title Holder:** United Uranium Limited  
**Tenements:** Exploration Licence 25839  
**Project Name:** McArthur River Project  
**Report Type:** Partial Relinquishment Report  
**Mineral Field:** McArthur Mineral Field  
**Location:** Urapunga SD5310 1:250 000  
**Datum / Zone** GDA 94 / Zone 52  
**Commodities:** Uranium and Base Metals  
**Date of report:** 15 November 2010  
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**Distribution:**

- 1 Northern Territory Department of Minerals & Energy
- 2 United Uranium Limited

## ABSTRACT

- Location:** The McArthur River Project is located approximately 200 kilometres east north east of Katherine in the Northern Territory.
- Geology:** The project is located in the central portion of the McArthur Basin, which consists of platform cover sediments bounded by and unconformably overlying the Pine Creek, Arnhem and Murphy Inliers. The south eastern half of the tenement is dominated by the Roper Group and Collara Subgroups comprising largely thick interbedded fine grained glauconitic sandstones. Quaternary and recent alluvial sediments dominate the north western half of the tenement area.
- Work done:** Exploration activities on the relinquished portion of EL25839 consisted of a review of existing exploration data, high level targeting utilising reinterpreted regional geophysical data, compilation of public domain geological, geophysical and other digital data, reconnaissance sampling and scintillometer traverses of targets identified, flying of an airborne electromagnetic (VTEM) survey in conjunction with Geoscience Australia and first pass reconnaissance / prospecting (XRF/scintillometer survey) across targets generated from the VTEM survey.
- Results:** The work completed identified regional radiometric anomalies and a single broad conductive zone uranium target within the relinquished portion of EL25839, however the XRF/scintillometer survey failed to identify any significant anomalism, with the XRF survey delivering a single anomalous reading with elevated zinc (1480ppm), uranium (16ppm) and lead (115ppm), whilst the scintillometer readings ranged from 26 to 50 cps.
- Conclusion:** Exploration completed on the relinquished portion of EL25839 downgraded the prospectivity of the regional radiometric anomalies and the single broad conductive zone uranium target, therefore no further exploration activity is recommended.

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# 1 SUMMARY

This is a partial relinquishment report for tenement EL25839, United Uranium Limited's McArthur River Project. The report provides a summary of the exploration history of the surrendered portion of EL25839 for the period 21 September 2007 until relinquishment on 21 September 2010, plus a brief description of exploration by other operators prior to 21 September 2007. A brief description of the regional and local geology is also included in the report.

EL25839 is located approximately 200 kilometres east north east of the township of Katherine within the McArthur Mineral Field of the Northern Territory.

Exploration on the relinquished portion of tenement EL25839 consisted of a review of existing exploration data, high level targeting utilising reinterpreted regional geophysical data, compilation of public domain geological, geophysical and other digital data, reconnaissance sampling and scintillometer traverses of targets identified, flying of an airborne electromagnetic (VTEM) survey in conjunction with Geoscience Australia and first pass reconnaissance / prospecting (XRF/scintillometer survey) across targets generated from the VTEM survey. Results of the work completed downgraded the prospectivity of the regional radiometric anomalies and the single broad conductive zone uranium target within the relinquished portion of EL25839. The XRF survey delivered a single anomalous reading with elevated zinc (1480ppm), uranium (16ppm) and lead (115ppm), whilst the scintillometer readings ranged from 26 to 50 cps.

The project is located within the central portion of the McArthur Basin, which comprises 1700 to 1300Ma platform cover sediments bounded by and unconformably overlying the Pine Creek, Arnhem and Murphy Inliers. The south eastern half of the tenement is dominated by the Roper Group and Collara Subgroups comprising thick interbedded fine grained sandstones. Quaternary and alluvial sediments dominate the north western half of the tenement.

## 2 INTRODUCTION

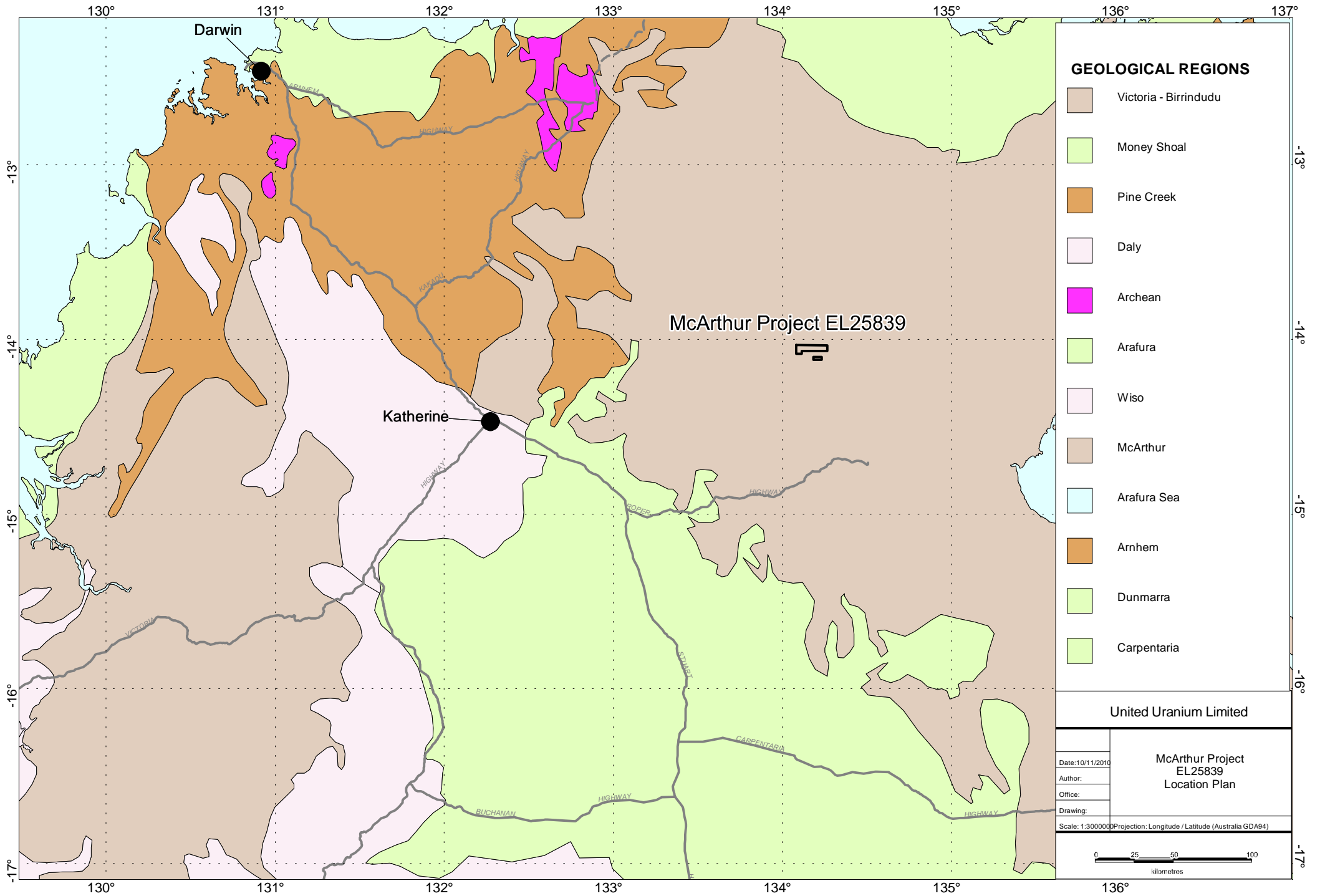
This report details exploration carried out on the relinquished portion of the McArthur River Project, EL25839, during the period 21/9/2007 to 21/9/2010. United Uranium Limited is the operator and holds an 80% interest in the tenement.

The project area is located approximately 200 kilometres east north east of Katherine in the Northern Territory (Figure 1). Access from Katherine is 50km south east on the Stuart Highway, then east on the Central Arnhem Road to the Mainoru Homestead, in the north west corner of the project area. Access within the tenement is on secondary roads and station tracks.

The tenement lies within the central portion of the McArthur Basin and is considered prospective for unconformity-related and vein hosted uranium deposits and base metal mineralisation. The South Alligator Uranium fields, located 180km to the west north west, are the closest uranium occurrences. The Bulman Zn-Pb deposits, a cluster of 10 deposits, are located from 10 – 50km north north east of the tenement.

A number of regionally extensive radiometric anomalies and two aeromagnetic anomalies have been defined within the project area from reprocessing of the Northern Territory Geological Survey (NTGS) airborne radiometric data.

The tenement was subject to partial relinquishment on 21 September 2010. This report details exploration activity completed on the relinquished portion of the tenement from grant on 21 September 2007 until relinquishment on 21 September 2010. It also provides a brief summary of the geology and previous exploration activity of the project area. Exploration activities included a review of existing exploration data, high level targeting utilising reinterpreted regional geophysical data, compilation of public domain geological, geophysical and other digital data, reconnaissance sampling and scintillometer traverses of targets identified, flying of an airborne electromagnetic (VTEM) survey in conjunction with Geoscience Australia and first pass reconnaissance / prospecting across targets generated from the VTEM survey.



### **3 TENURE**

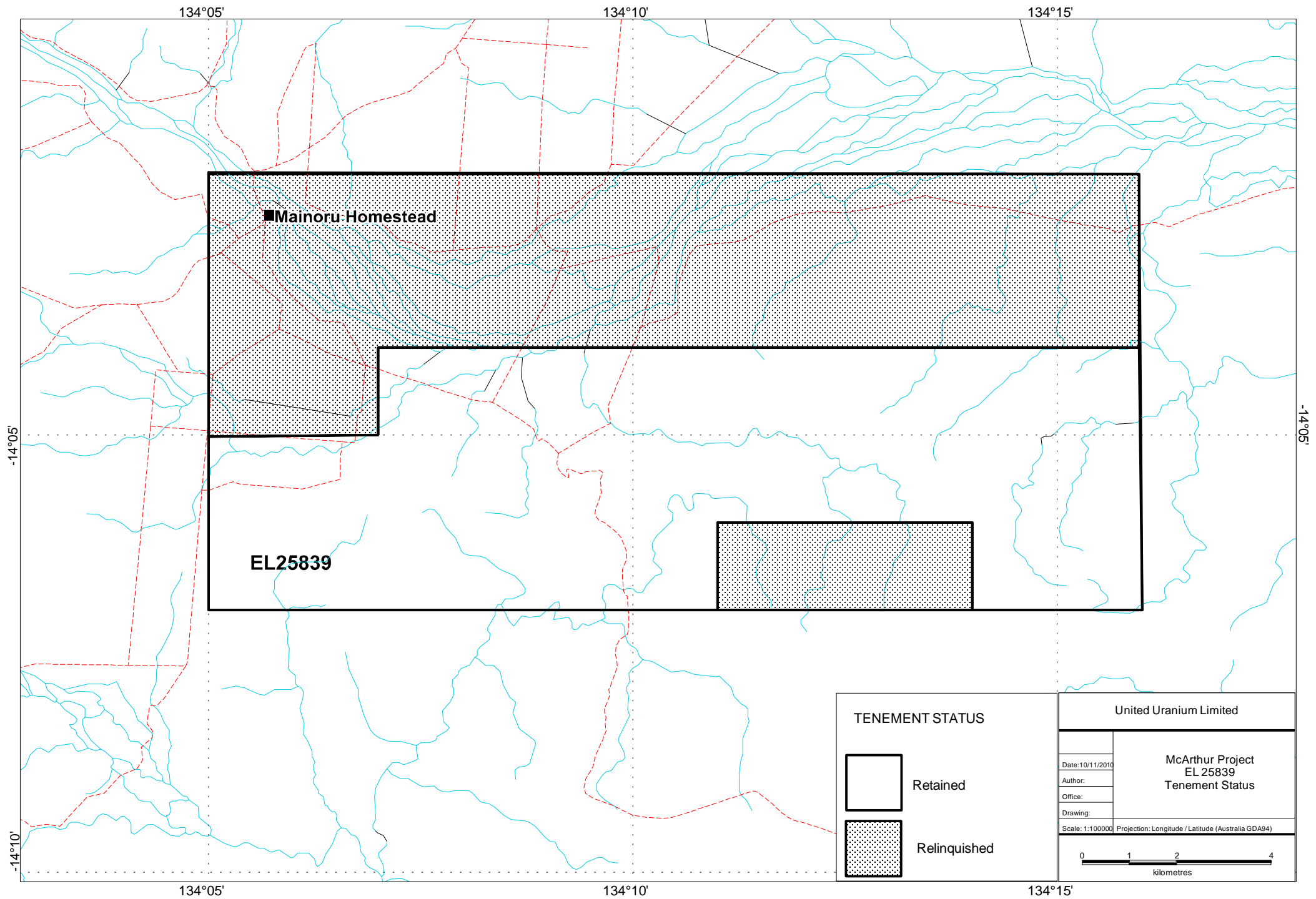
The McArthur River Project consists of a single granted exploration licence held in a joint venture between United Uranium Limited (80% interest and manager) and United Mining Resources Pty Ltd (20%). The project is located approximately 200 kilometres east north east of Katherine in the Northern Territory.

EL25839 was granted on 21 September 2007 and covered an area of 55 sub-blocks (approximately 182 sq km). The tenement was subject to partial relinquishment on 21 September 2010. Refer to Figure 2 for location of the relinquished portion of the tenement.

### **4 GEOLOGY**

The project is located in the central part of the McArthur Basin. The McArthur Basin is a large complex depositional basin covering an area of about 200,000km<sup>2</sup> extending from Arnhem Land in the north west and to the south west beyond the Queensland border. The Basin largely comprises 1700Ma to 1300Ma (Middle Proterozoic or Carpentarian) platform cover sediments which are the principal element of the North Australian Platform Cover (Plumb et al 1981). The Basin is bounded by and unconformably overlies the Early Proterozoic Pine Creek, Arnhem and Murphy Inliers.

Within the western part of the McArthur Basin the Lower Proterozoic sediments of the Katherine River Group form the oldest of the basin stratigraphies. Unconformably overlying the Katherine River Group are the middle Proterozoic lithologies of the McArthur River Group which comprises cherts, dolomites, sandstones and volcanics.





The tenement area is dominated by the Roper Group and Collara Subgroups comprising largely thick interbedded fine grained glauconitic sandstones. These are younger than the McArthur River Group, which is host to the world famous McArthur River base metals deposit. Minor amounts of laminated mudstones are also found within this group. The sediments cover the south eastern half of the tenement and dip gently to the south. The Jalboi Formation and Hodgson Sandstone Formation, comprising fine grained sandstones outcrop to the south east of the tenement area.

Several major north east trending structures cross cut the stratigraphy, some of these being suitable targets for follow up exploration.

Quaternary and recent alluvial sediments within the Mainoru drainage system dominate the north western half of the tenement area. Tertiary deposits of laterite and lateritic rubble generally overlie the much of the Proterozoic sedimentary units.

There are no gazetted uranium occurrences proximal to the tenement area. The South Alligator Uranium fields are located 180km to the west north west of the tenement.

The McArthur Basin as a whole has an excellent potential for discovery of large base metal deposits. The style of base metal mineralisation in the Basin is typically SEDEX, vein-type and palaeokarst related. Other types of mineralisation include vein-type and breccia pipe copper deposits at Redbank; smaller-sized iron ore deposits within McArthur sediments at Roper Bar; and manganese deposits.

Lead-zinc mineralization is widespread throughout the McArthur River region. The McArthur River (HYC) zinc-lead deposit, located 200km east of EL25839 is one of the largest in the world. Mineral resources as at 2006 (Xstrata Annual Report 2006) were 157 Mt @ 11.3% Zn, 4.9% Pb and 49 g/t Ag. It is an example of a sediment hosted (SEDEX) zinc-lead deposit, which are known from around the world. Sedex deposits are widely distributed in Northern Australia in the Mount Isa – McArthur River region, such as Mount Isa, Hilton, George Fisher, Lady Loretta, Dugald River, Century and McArthur River.

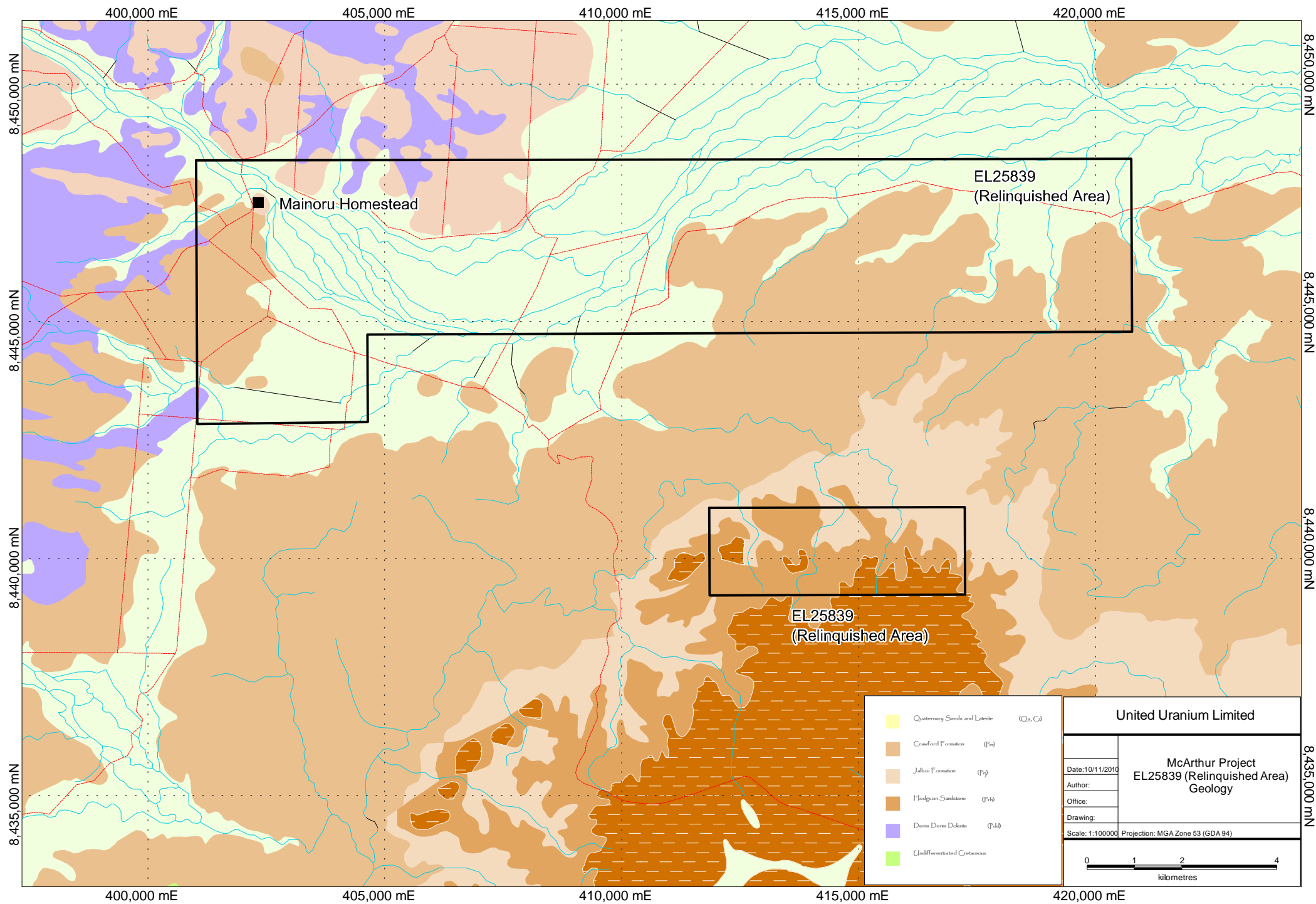
Deposit features include:

- Fine-grained galena and sphalerite, with pyrite and pyrrhotite
- Good geophysical targets (eg. EM, IP, gravity, conductivity).
- Generally there is either an iron-manganese or a silicate alteration halo.
- Syn-sedimentary and replacement ore textures.
- The major sulphides are pyrite, sphalerite and galena, with lesser chalcopyrite, arsenopyrite and marcasite.
- The mineralisation covers an area of 2 sq km and averages 55 m in thickness.

The project area lies proximal to the Bulman base metal deposits. Outcropping Zn-Pb-Ag mineralisation at the Bulman Deposit was discovered and briefly worked by prospectors in 1910. The deposit is hosted within gently dipping, laminated stromatolitic dolostone and chert of the Mesoproterozoic Dook Creek Formation which lies south of EL25839. The mineralisation at Bulman is found in ten separate deposits scattered over a 40km radius in close proximity to a dolerite intrusive. A combined resource of 1.2Mt @ 6.5% Pb and 0.93Mt @ 11%Zn was estimated for seven of these deposits.

The Swamp prospect, which is anomalous in lead and zinc, is the closest known mineral occurrence to the tenement area. The prospect, also known as “Anomaly 12 extended”, comprises a small open pit and is located 5km to the west of the tenement.

Reprocessing of the NTGS radiometric data draped over the DEM has highlighted a number of radiometric anomalies. The most prominent of these is coincident with the Crawford Formation (Roper Group) which extends in a south westerly direction for over 20km in the central part of the tenement area. The anomalous zone is apparent when looking at both the total count radiometric data and also the uranium data. These sediments are conceptually favourable sedimentary lithologies for sandstone hosted uranium deposits. It is probable that the apparent radiometric anomalies are associated with the lateritic cover overlying the sub cropping sandstone lithologies.



## 5 PREVIOUS EXPLORATION

All historical exploration undertaken within the tenement area has been reviewed. Based on the open file reporting from the Northern Territory Geological Survey, there were a limited number of historical tenements that either partially or fully covered EL25839.

Exploration carried out within the area covered by EL25839 has been carried out since 1970 largely for diamonds and with very limited reconnaissance sampling for base metals. The potential for the tenement area to host base metal mineralisation remains largely untested. Although some very early work has been undertaken over the targeted radiometric anomalies within the tenement area, the work failed to adequately explain these anomalies.

Previous exploration conducted both within EL25839 and proximal to the tenement area (*EL Number, Year, Report Number, Company*) follows;

**EL23499    2004            Exploration and Resource Development**  
(CR2004-023499)

The area held by Exploration and Resource Development Pty Ltd (ERD) covered the north eastern portion of EL25839 extending to the southeast. ERD were specifically targeting the area for diamonds. ERD completed open file reviews of the tenement area and concluded that sufficient work had been undertaken within the tenement area to downgrade the potential for base metals and diamonds. No field work was undertaken by ERD.

**EL23499    2004            Exploration and Resource Development Pty Ltd**  
(CR2004-0346)

The area held by Exploration and Resource Development Pty Ltd (ERD) covered the central portion of EL25839 and extended to the south. ERD completed open file reviews of the area and concluded that sufficient work had been undertaken within the tenement area to downgrade the potential for base metals and diamonds. No field work was undertaken by ERD.

**EL 3351      1983      Ashton Mining Limited**

*(CR1983-085)*

Ashton Mining Limited conducted exploration for diamonds over EL3351 which covers the eastern half of EL25839. Ashton undertook stream sediment sampling to assess the area for diamond indicator minerals. Due to extremely difficult access, a helicopter was utilised to undertake the program. There were no significant results.

**EL 4486      1990      Stockdale Prospecting Limited**

*(CR1985-0149)*

EL4486 covered the same area now held by United Uranium as EL25839. Stockdale undertook reconnaissance stream sampling for diamond and kimberlitic indicator minerals at a density of 1:200km<sup>2</sup>. Sample results were all negative and the ground was subsequently relinquished.

**EL 6287, 6289      1994      Stockdale Prospecting Limited**

*(CR1990-0060)*

EL6287 covered the north western half of EL25839 and EL6289 covered the south eastern half of EL25839. Stockdale undertook reconnaissance and infill stream and loam sampling for diamond and kimberlitic indicator minerals at a density of 1:5.8km<sup>2</sup> over 15,714km<sup>2</sup>. There were no significant results.

**EL 8938      1995      CRA Exploration**

*(CR1996-0241)*

CRA undertook exploration for ilmenite and kimberlitic diatremes in the Urapunga Project area in the Western McArthur River Basin in 1996. The area included the western third of the EL25839. Landsat TM data, aeromagnetic and radiometric data was purchased and reprocessed for the region of which 25 aeromagnetic targets were selected for follow up work.

Heliborne aeromagnetics was conducted over 12 of these anomalies. Loam samples collected from a number of these anomalies all returned negative results. The potential for ilmenite and diamonds in the region was downgraded following the exploration program.

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**AP 2332                      1971                      *Australian Aquitaine Petroleum***  
**(CR1971-0074)**

In 1970, Australian Aquitaine Petroleum together with Canadian Aero Service Ltd undertook an airborne radiometric survey on half mile line spacing's over an area which included the north western half of the tenement now held by United Uranium. The open file report is an operational report and does not provide any conclusions or results from the survey.

**AP 3133                      1971                      *Stockdale Prospecting***  
**(CR1971-0112)**

Exploration by Stockdale was primarily for diamonds and kimberlitic indicator minerals. Reconnaissance sampling and stream sediment sampling was carried out.

In addition, an airborne spectrometer traverse was undertaken over part of the tenement area now held by United Uranium with the target being for uranium. The instrument employed was a TV-3A Radiation Spectrometer with readings being taken at 100m above ground level. Results showed that the radiometric anomalies were related to either monazite in the drainage channels or laterites on top of the Proterozoic sediments.

## 6 EXPLORATION ACTIVITIES

Exploration activity completed on the relinquished portion of EL25839 from grant on 21 September 2007 until relinquishment on 21 September 2010 consisted of a review of existing exploration data, high level targeting utilising reinterpreted regional geophysical data, compilation of public domain geological, geophysical and other digital data, reconnaissance sampling and scintillometer traverses of targets identified, flying of an airborne electromagnetic (VTEM) survey in conjunction with Geoscience Australia and first pass reconnaissance / prospecting across targets generated from the VTEM survey.

The high level targeting utilising reinterpreted regional geophysical data identified a number of regionally extensive radiometric anomalies and two aeromagnetic anomalies that warranted follow up exploration.

In August 2008 a reconnaissance rock chip sampling program was completed in the north west of the tenement, with 5 rock chip samples and scintillometer (total count) readings (30002R – 30006R) collected at each sample point within the relinquished area over second tier radiometric anomalies. Weakly elevated uranium assays were returned from the some of the rock chip samples, with a maximum assay of 4.3ppm uranium (30006R), however base metal results were all low order.

A VTEM survey consisting of east west flight lines on 250m spacing for a total of 981 flight line kilometres was undertaken in conjunction with Geoscience Australia. The flying of the survey was initially completed in late 2008, however data issues resulted in the survey being re flown in April 2009.

United Uranium appointed geophysical consultants Mapitt Geosolutions to process and interpret the airborne electromagnetic survey data with the aim of defining targets for further exploration. This work identified a broad conductive zone uranium target (T3) in the central north of the project area, the majority of which is within the relinquished portion of the EL25839.

In October 2009 a reconnaissance / prospecting program, consisting of two broadly north west – south east trending traverses approximately 2.0 kilometres apart, with scintillometer and XRF readings collected every 50m

along the traverses (61 points; MCT2.59 2.81, MCT2.83, MCT2.93 – 2.100, MCT300 – 328), was completed across the relinquished portion of the T3 target. Scintillometer and XRF readings were also collected from three isolated sample locations within the relinquished portion of EL25839, MCT2.58, MCT330 and MCT331). XRF data consisted of readings for Mo, Zr, Sr, U, Rb, Th, Pb, Se, As, Hg, Zn, W, Cu, Ni, Co, Fe, Mn, Ba, Cs, Te, Sb, Sn, Cd, Ag and Pd.

The T3 target is located adjacent to the Mainoru River flats. The observed geology consisted of an area of flat wash made up of unconsolidated sand and silt, with the north eastern traverse passing through low ridges of outcropping fine grained sandstone.

Scintillometer readings ranged from 26 to 50 cps, with the higher readings occurring on the north eastern traverse in the areas of outcropping sandstone. The XRF survey delivered a single anomalous reading in the same area (MCT328), with elevated zinc (1480ppm), uranium (16ppm) and lead (115ppm). There were no significant scintillometer or XRF readings on the south western traverse.

XRF and scintillometer data points with scintillometer cps readings for the relinquished portion of EL25839 are presented in Figure 4.

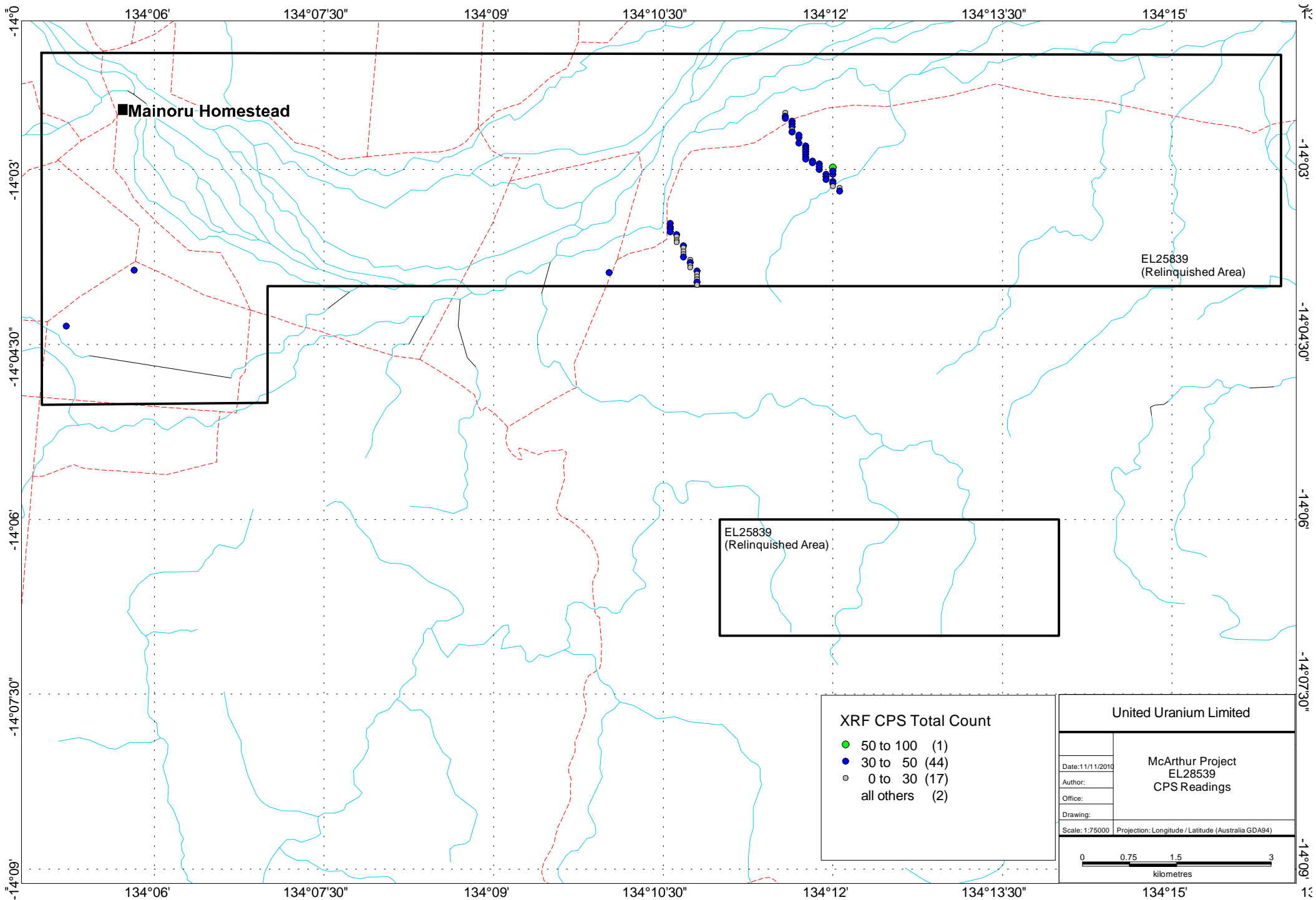
The digital data from the airborne electromagnetic survey has been provided to the Northern Territory Department of Minerals and Energy.

## **7 CONCLUSION**

Exploration completed by United Uranium has downgraded the prospectivity of the regional radiometric anomalies and the single broad conductive zone uranium target identified within the relinquished portion of EL25839.

No further exploration activity is recommended for the relinquished portion of EL25839.





## 8 REFERENCES

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Stockdale Exploration Limited., Exploration Licences 6286-6301. Roper River Area. Northern Territory, Common Report to 31<sup>st</sup> January 1990. Open File Report CR1990-060.

Stockdale Exploration Limited., Prospecting Authorities 2612 & 3133, Final Report for the Period 22.12.70 – 21.12.71 Arnhem Land Northern Territory, Open File Report CR1971-0112.

# ***APPENDIX 1***

## **ROCK CHIP SAMPLES AND SCINTILLOMETER SURVEY**

### **DIGITAL DATA FILE**

**(August 2008)**

**MAC\_August 2008\_Surface Geochem Relinquished Area.xlsx**

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## ***APPENDIX 2***

**SCINTILLOMETER AND XRF SURVEY**

**DIGITAL DATA FILE**

**(October 2009)**

**MAC\_Gamma\_XRF\_2009 Relinquished Area.xlsx**