PARTIAL RELINQUISHMENT REPORT EL24453

Bigrlyi Surrounds

NGALIA REGIONAL PROJECT

6 February, 2006 to 8 January, 2016

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1:250K Map Sheet: Mount Doreen SF52-12
1:100K Map Sheets: Vaughan 5053, Doreen 5153

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SUMMARY

Exploration Licence EL24453 (Bigrlyi Surrounds) is part of the 100% owned Energy Metals Ltd (EME) Ngalia Regional Project situated approximately 360km northwest of Alice Springs and surrounding the Bigrlyi Uranium Project (Kerr & Liu, 2015).

EL24453 was granted on 6 February 2006. A partial reduction (reducing the EL by 85 blocks or 43% of the original area) was approved on 8 January 2016. This report covers exploration activities that occurred on the surrendered area during Energy Metals period of tenure.

The tenement covers areas of granitic and metamorphic basement of the Aileron Province in the north and east. Areas of Vaughan Springs Quartzite (basal Naglia Basin) crop out along the prominent Treuer Range in the western part of the tenement, and in plateau country to the south. Mt Eclipse Sandstone and underlying formations, often under sand cover in the south, occupies the remainder of the tenement.

Exploration activities on the relinquished blocks were limited by a number of Aboriginal sites of heritage significance within which ground disturbing works including drilling were either not permitted or restricted.

Exploration work on the relinquished blocks over Energy Metals’ period of tenure included ground reconnaissance surveys, several heritage surveys, an aerial geophysical radiometric and magnetic survey with interpretation (2007), a ground radiometric survey (2008), and a project review (2015). The ground radiometric survey was designed to test for radiometric anomalies along the inferred northeast extension of the Waite Creek thrust fault system in basement terrain. However, radiometric anomalies were found to be associated with a dominance of Th relative to U, with low assessed potential for the presence of a uranium mineralised system. Following further assessment in 2015, parts of the tenement were considered to be non-prospective for uranium and were relinquished.
INTRODUCTION

The Ngalia Regional project comprises ten 100% owned exploration licences located in the Ngalia Basin, between 180 and 350 km northwest of Alice Springs in the Northern Territory (Figures 1 & 2). Seven of these tenements are contiguous and surround the Bigrlyi uranium deposit (ELR 46-55) as well as a number of other uranium deposits and occurrences including the Malawiri prospect (EME 52%, ELR41) and part of the Walbiri deposit (EME 42%, ELR45).

EL24453 (initially 196 graticular blocks located southwest of the Bigrlyi resource area) was granted on 6 February 2006 for a term of six years and was subsequently renewed for two periods of two years. An application for surrender of 85 blocks was approved by the DME on 8 January 2016. This report covers the partial relinquishment.

![Map of Australia showing project location](image)

*Figure 1. Location of the Bigrlyi/Ngalia Regional Projects (NT).*
Geology and Physiography

Most of the tenement area borders the northern margin of the Ngalia Basin with prominent outcrop of Vaughan Springs Quartzite and Mt Eclipse Sandstone, the latter in particular associated with the Patmungala Syncline in the east of the tenement and the Davis Dome, west of Davis Gap (Figure 3).

Prominent geomorphological features within the tenement include the Treuer Range, west of Davis Gap, which comprises Vaughan Springs Quartzite, and the Naburula Hills, east of Davis Gap, which comprises mainly Mt Eclipse Sandstone. The southern part of the tenement in the vicinity of Rankins Reward comprises hills and plateau country composed of Vaughan Springs Quartzite and underlying granite. In the south much of the area comprises Mt Eclipse Sandstone covered by sand plain and is drained by a number of creeks that have formed alluvial outflow plains. There are minor areas of granitic basement outcrop in the north and east (Southwark Granite Suite). The Mt Eclipse Sandstone is the primary target for uranium mineralisation in the Ngalia Basin.

The relinquished areas (Figure 3) consist dominantly of granitic and metamorphic basement, Vaughan Springs Quartzite hill country and areas of oxidised Mt Eclipse Sandstone assessed as having low uranium potential (Figure 6).
Figure 3. Surrendered areas (85 blocks – area shown in red) in relation to topographic features, prospects and the retained area (in green).
Previous Work

Rio Tinto Exploration identified magnetic and radiometric anomalies in basement terrain of the Aileron Province in the northeast part of the tenement area (Davies & McCoy, 1998). Magnetic anomaly AS2 within Patmungala beds was drill tested (hole DD97AS002 – see Figures 4 for location) revealing the source of the anomaly as intervals of banded iron formation with no significant base metal or U anomalism identified in the hole. Rio Tinto further evaluated a number of aerial radiometric anomalies and concluded that several granite-associated anomalies were of significance (Figure 4).

Figure 4. Annie Springs U-channel radiometric map (Davies & McCoy, 1998) showing location of drill-hole DD97AS002 and the location of significant U-related radiometric features (red and orange colours). EL24453 relinquished area boundary shown in red.

In 1978, Afmeco drilled DAV-1, a deep stratigraphic hole into the Mt Eclipse Sandstone of the Davis Dome anticline (French et al., 1978), located on relinquished ground south of Bigrlyi (Figure 5). Uranium mineralisation over 0.4m width was encountered at a depth of 899.3m. The Mt Eclipse Sandstone units that lie stratigraphically above the mineralisation in this area are generally oxidised or partially oxidised and unmineralised.
WORK COMPLETED From 6\textsuperscript{th} February 2006 to 8\textsuperscript{th} January 2016

Geophysical Survey

An airborne geophysical survey, providing radiometric, magnetic and topographic data, was conducted over Energy Metals' Ngalia Regional tenements in September 2007 by GPX Airborne (Saul, 2008). A total of 14,932 line kilometres was flown. The data were processed by Southern Geoscience Consultants (SGC), who meshed the new data with previous company survey data. SGC were subsequently contracted to interpret the imagery in terms of structural and radiometric features. Figure 5 shows the SGC interpretation of processed magnetic imagery with the prominent Yuendumu thrust fault system identified, and Figure 6 shows that interpretation overlain on geological outcrop.

Radiometric imagery is shown in Figures 7 and 8. Features of note include the strong combined U+Th+K response of the Southwark Granite Suite terrain to the northeast and west; the generally weak response of the Vaughan Springs quartzite and Mt Eclipse Sandstone; the association of drainage-related regolith features with potassium (likely illite-rich clays) and minor thorium-related anomalies in west, which are probably associated with ferruginous regolith (see Figures 6, 7 & 8). A number of uranium-specific anomalies previously identified by Davies & McCoy (1998) in granite terrain west of the Crystal Creek prospect on Energy Metals' tenement EL30004 (Figure 8) and this area has been retained.

Drilling Programs

Energy Metals did not conduct any drilling programs or other sampling programs on the relinquished ground during the period of tenure.
Figure 5. Colour-shaded TMI-RTP magnetic imagery with tilt derivative filter (TDR) applied. Structural interpretation provided by SGC including thrust faults (direction of overthrust indicated), major and minor faults (black lines), fold axes (yellow), fracture zones (S-pattern lines) and bedding or lineament trend directions (dot-dash lines). Tenement boundaries shown as in Figure 3. Yuendumu Thrust Fault system identified; Rio Tinto drill-hole DD97AS002 and Afinco drill-hole DAV-1 located.
Figure 6. Outcropping geological units from Mt Doreen 250K map-sheet shown in relation to SGC structural interpretation (see Figure 5). Red/dark pink = granite; brown/light purple = metamorphic basement; pink = Vaughan Springs Quartzite; red-brown = Treuer Member; dark purple = Djugamara Formation; blue = Kerridy Sandstone; dark orange = Mt Doreen Formation; grey = Mt Eclipse Sandstone; light orange = Cenozoic deposits weathered from granite terrains. Tenement boundaries shown as in Figure 3.
Figure 7. Uranium channel radiometric response map with overlaid structural interpretation. Note the strong response (pink colours) of the granite terrain to the east and north; and regolith features in red/orange colours.
Figure 8. Ternary RGB radiometric map with overlaid structural interpretation. R(red) = potassium; G(green) = thorium; B(blue) = uranium. Note the strong U+Th+K response of the granite terrain to the northeast; weak response of the Vaughan Springs Quartzite (dark); association of drainage-related regolith features with potassium (red-brown colours), minor thorium-related anomalies in the east (green) probably associated with ferruginous regolith and a number of discrete uranium anomalies in blue. Crystal Creek location shown.
Figure 9. Surrendered areas (85 blocks – area shown in red) in relation to Aboriginal heritage areas (in blue) and the retained area (in green).
Heritage Clearances

CLC heritage notifications were lodged for drilling activities in the first year of EL24453 and at later times when additional work programs were planned. The clearance programs involved the Traditional Owners who identified a significant number of cultural sites, many of them located within the Naburula Hills and in plateau country west of Rankins Reward; several large sensitive zones were outlined as shown in Figure 9. In some areas of these zones, ground disturbing activities are not permitted and accordingly these sites have adversely impacted exploration activities, including potential drilling programs.

Ground Radiometric Survey

Exploration work by EME on the surrendered ground was primarily aimed at targeting surficial radiometric anomalies within the prospective Mt Eclipse Sandstone. However in 2008, a ground radiometric survey was designed to test for radiometric anomalies along the inferred northeast extension of the Waite Creek thrust fault system bordering basement granitic terrain in the west of the tenement (Burn, 2009). The prospect, called the “Thrust Prospect”, partly overlapped the adjacent licence EL24533. Results of the survey are shown as a gridded image in Figure 10. Although a number of radiometric anomalies were identified, these were found to be associated with a dominance of Th relative to U, mainly within the granitic terrain, which down-graded the potential of the area for hosting a uranium mineralised system.

Figure 10. Gridded radiometric image of total counts over the Thrust Prospect.
Project Review

During 2015, the project was reviewed to identify areas of low uranium prospectivity with a view to surrender of non-prospective ground before the next anniversary date. The following ground was recommended for relinquishment:

- Northern and eastern areas of granitic and metamorphic basement excluding areas adjacent to the Crystal Creek or Rankins Reward prospects.
- Areas of Vaughan Springs Quartzite outcrop.
- Areas of oxidised Mt Eclipse Sandstone lacking a U-related radiometric response and located higher in the stratigraphy than the Bigrlyi mineralisation.

An application to surrender the ground shown in Figure 3 was made in December 2015 and approved by the DME on 8th January 2016.

Digital Data

All digital data covering EME’s exploration activities on the relinquished ground has previously been reported to the NT DME.

CONCLUSIONS

Due to assessed low prospectivity for uranium mineralisation, parts of the tenement were recommended for partial surrender with 111 blocks to be retained (see Figure 3); the partial surrender application was approved on 8th January 2016.

REFERENCES


