ANNUAL AND FINAL REPORT OVER THE ARNOLD URANIUM PROJECT

DUNMARRA & McARTHUR MINERAL FIELD,
NORTHERN TERRITORY

Arnold Project
Exploration Licence: 26073

BY
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DISTRIBUTION
1. Northern Territory Department of Minerals & Energy
2. Diamantina Uranium Pty Limited
PROJECT NAME: ARNOLD

TENEMENTS: Exploration Licences 26073

MINERAL FIELD: Dunmarra & McArthur Mineral Field

LOCATION: Tanumbirini SE5302 1:250 000
Arnold River 5765 1:100 000
Nutwood 5766 1:100 000
Tanumbirini 5865 1:100 000
Cox 5866 1:100 000

COMMODITIES: Uranium and Diamonds
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1.0 ARNOLD PROJECT

1.1 Copyright Statement:

The owned information acquired by Diamantina Uranium includes all information under the previous work by Diamantina Uranium and work during reporting year sections. The rest of the information has been sourced from open reports and data through the Department of Mines and Energy. The Minister has authority to publish the copyrighted information accordingly.

2.0 INTRODUCTION

The Arnold project is located approximately 720km north-west of Darwin in Northern Territory. The project comprises one Exploration Licence (EL 26073) which covers a total area of 790 km$^2$. The area can be reached via the Stuart Highway from Darwin and east from the Carpentaria Highway.

This report describes the results of literature research and target generation based on re-interpretation of magnetic/radiometric data carried out during the third year of the Licence.

During July 2011 consulting geologists Kastellco Geological Consultancy ("KGC") conducted a review of existing historical exploration data within the Northern Territory Geological Survey Database. This was conducted for all the Project area to identify any high potential base metal and uranium exploration targets and resulted in the identification of several targets that warrant further work.

Exploration conducted by Kratos Uranium N. L. in the hinterland of EL 26073 indicates the potential of this area to host economic uranium deposits. Kratos noted that many anomalies identified by aeromagnetic surveys were attributed to the ‘black soil type’. The source of the radioactive nuclides was traced to spring water originating from depth and flowing through a leached oxidized zone at the base of the Corcoran Formation. Kratos concluded that radioactive spring water deposits in the region may be derived from a relatively concentrated parent uranium source at depth.

Historical prospects were reviewed to determine the effectiveness of the previous exploration and evaluate remaining potential within the Exploration Licence area.

Several low magnitude magnetic targets were identified based on the review and airborne geophysics; it was recommended the exploration licence area was to be relinquished upon very little to no mineral prospectivity as these anomalies were located within Quaternary lithologies which have been classified as transported material.

3.0 LOCATION AND ACCESS

The Arnold project is located approximately 720km north-west of Darwin in Northern Territory. The project comprises one Exploration Licence (EL 26073) which covers a total area of 790 km$^2$. The area can be reached via the Stuart Highway from Darwin and east from the Carpentaria Highway.

The project area consists of floodplains, headwaters and interfluves ranges of Tanumbirini, Eight Mile and Lagoon Creeks, which drain in northwards into the Gulf of Carpentaria.

Rainfall is seasonal, associated mostly with the summer monsoon. Temperatures range from the summer average of 35 degrees celsius to a winter average minimum of 12 degrees Celsius.
Access within the area is provided by a network of station tracks and stock control fence lines. Tanumbirini Station Homestead is only nearby permanent dwelling, located about 25 km in the south of the southern boundary of the tenement and has a packed dirt airstrip suitable for light aircraft.

4.0 TENEMENTS

The project is comprised of one granted exploration licence (EL) with the tenement details summarised in Table 1 and their locations are shown in Figures 1 and 2.

Table 1: Arnold Project - Tenement Summary

<table>
<thead>
<tr>
<th>Project</th>
<th>Tenement Number</th>
<th>Status</th>
<th>Current Area Blocks (sq km)</th>
<th>Current Holder</th>
<th>Granted Date</th>
<th>Expenditure Covenant ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arnold</td>
<td>EL26073</td>
<td>Granted</td>
<td>75 231 km²</td>
<td>Diamantina Uranium Pty Ltd</td>
<td>02/04/2008</td>
<td>$71,250</td>
</tr>
</tbody>
</table>

5.0 REGIONAL GEOLOGY MINERALISATION

The Project covers parts of the southern boundary of the Dunmarra Basin, which is a large intracratonic basin in north-eastern Northern Territory. The Dunmarra Basin contains thin, but widespread Jurassic to Cretaceous sediments of fluvial and marine origin comprising sandstones, carbonaceous shales and minor marls and limestones. Some of these sediments are derived from uranium-enriched provinces to the north (Pine Creek Orogen), the northeast (McArthur Basin) and possible south (Tennant Region).

The presence of uranium-enriched provinces alongside sandstone units deposited in continental and shallow marine environment suggests the Dunmarra Basin is potential for sandstone-hosted uranium that may include roll-front, tabular and tectonic/lithologic deposits. These types of deposits form when uranium is mobilised from uranium-rich rocks by oxidised groundwater and precipitated by reducing agents in sandstone such as carbonaceous material (detrital plant debris, marine algae), sulphides (pyrite, H2S), hydrocarbons (petroleum), and interbedded basic volcanics.

Sandstone-hosted uranium deposits have produced over 80% of the total uranium mined in the western USA, and currently account for about 15% of global production and 18% of global uranium resources (Dahlkamp, 1993; Lambet et al, 1996, 2001). The deposits are mostly low to medium grade (0.05-0.4% U3O8) and individual deposits can contain up to 50,000 t U3O8. Cumulative tonnages within a province or basin may be several hundred thousand tonnes.

Uranium occurrences in the Northern Territory can be grouped into four main styles of mineralisation: Proterozoic unconformity-related; vein-type; Westmorland-Murphy-type; and sandstone-hosted, which is Diamantia’s preferred target style.

Sandstone-hosted uranium deposits represent about 7% of Australia’s total resources of uranium, and in the Northern Territory, there are 20 known occurrences. Most are in the northern Ngalia Basin, although the largest deposit (Angela) is one of a few in the Amadeus Basin.

In South Australia, six uranium deposits are known, the largest being Beverly, Honeymoon, East Kalkaroo and Billaroo West-Gould-Dam, all amenable to ISL mining methods. Other deposits are
Manyingee, Oobagooma and Mulga Rock in Western Australia. At Mulga rock, uranium mineralisation is in peat layers interbedded with sand and clay within a buried palaeochannel (Lambert et al, 1996, 2001).

6.0 LOCAL GEOLOGY & MINERALISATION

The Proterozoic rocks which outcrop in the EL area belong to the thick McArthur Basin sequence, extending from Arnhem Land to the Queensland Border. Only the Upper Proterozoic Tawallah and Roper Groups are represented here. They are overlain, with strong angular unconformity, by the Lower Cambrian Bukalara Sandstone, which forms plateau and mesa cappings. A Cretaceous laterite, with associated bleached and mottled units, is developed as thin capping and abutments on plateau scraps. Thin residual soils in the areas of Proterozoic outcrop may also be of Cretaceous age.

Quarternary and Recent deposits include windblown sand, silt and gravel bordering the major creeks and black humic muds with occasional sinter deposits over the springs.

Rocks of the Tawallah Group are exposed in the board disjointed anticline in the north eastern part of the tenement area, in the headwater of 5 Mile and 8 Mile Creeks. The dominant lithology is quartz sandstone (the Masterton Formation), with interbedded acid volcanics (the Tanumiririni Volcanic Member) and closely associated volcanic, conglomerate, derived from acid volcanic by contemporaneous erosion. Within the core of the anticline, a variety of lithologies, including blocky
feldspathic sandstone and dolomitic siltstone, amy represent lower Tawallah Group units, the Rosie Creek sandstone and the Wollogorrag Formation, which are known also in the McArthur Basin.

The Upper Proterozoic Roper Group is a thick (approx 5,000 m) clastic sequence, consisting of alternating micaceous, mostly hematitic siltstone and shale with well sorted arenites. The arenites are clean sandstone with well developed sedimentary structures, cross bedding and ripple marks. They form prominent strike ridges trending generally northwest to northwest, while the politic units underlie the valley floors.

![Figure 2: Arnold Project – Geology Map](image)

**7.0 PREVIOUS EXPLORATION**

Exploration carried out by Kratos Uranium N. L. was outside the area of encompassed by EL 26073, e.g. anomaly 133L.B. was located 62 kilometres south-east of the approximate centre of EL 26073. Anomalies identified by aeromagnetic surveys were attributed to the ‘black soil type’. The source of the radioactive nuclides was traced to spring water originating from depth and flowing through a leached oxidized zone at the base of the Corcoran Formation. Kratos concluded that radioactive spring water deposits in the region may be derived from a relatively concentrated parent uranium source at depth.

In 1978, Western Mining completed a programme consisting of photogeology, soil sampling and
Geophysical surveys were concentrated on an area inferred to contain Mallapunyah Formation (on the eastern portion of the current tenement area). Two rock chip samples yield elevated zinc and cobalt contents (sample AA015136 - 420 ppm Co & 1505 ppm zinc, Sample AA015137 390 ppm Co & 1595 ppm Zn).

In 1985, CRA Exploration conducted diamond exploration within the central portion of EL26073. A single microdiamond was reported in two samples. Cassiterite grains were observed in concentrates from several samples. Two juxtaposed magnetic features were selected from data of an airborne magnetic and radiometric survey. Samples were taken over the interpreted source centres of profiled magnetic anomalies. A single microdiamond was detected in one of the loam samples. No significant mineralisation found.

From 1993 to 1995, Ashton Mining also conducted diamond exploration. The company collected 23 stream sediment samples. Examination proved negative for diamonds or kimberlitic indicator minerals. In 1997, Ashton Mining Limited, on behalf of the Australian Diamond Exploration Joint Venture, collected 129 gravel samples. 105 were negative and 4 returned a single microdiamond, with the remainder reporting chromites. Follow-up of the chromite bearing samples failed to verify the initial results. 49 loam samples in total were collected from 3 grids. 1 sample returned a single microdiamond, while a second (sample BAU04770) returned 10 microdiamonds. Resampling of the latter location failed to reproduce the original result. 1 x 50t bulk sample was collected and analysed. Results were negative. Other work included 3 small helimagnetic surveys (totalling 256 line km) were completed. No targets were identified and 131 line km of DIGITEM were also acquired. 2 small conductors were identified. 3 RAB holes drilled to test conductors returned negative results.

From 2003 until 2005, Astro Diamond Mines conducted diamond exploration as part of the Cox Project which covered approximately 8,676.9 square kilometres west of the Merlin diamond field. This report describes exploration work carried out over the partial surrender portion of EL 22296 during the period 5 February 2003 to 4 February 2005. Exploration included acquisition of geological, topographic and geophysical data, GIS compilations and data reviews, and compilation of open file data. The area was selected for exploration based on a regional diamond prospectivity review carried out by Astro Diamonds. Astro reviewed past exploration activity undertaken by Ashton and Rio Tinto in the relinquished area during the 1980’s. Astro concluded that the sample density collected for kimberlite indicator minerals was adequate. One sample in the surrendered area contained a microdiamond. No targets were generated from magnetic or Landsat data and the area was relinquished.

The western half of EL 22296 overlapped with the eastern portion of EL 26073. Previously published reports were reviewed with a focus on past diamond exploration conducted in the area. Of particular interest were reports that described the location of macro and microdiamond occurrences and the presence and nature of diamond indicator minerals. The first phase of exploration consisted of ground verification of previous diamond and indicator results across the Cox Project. The site investigations were focused on Cretaceous sediments within areas identified in the historical reports. Streams that had previously shown anomalous results were resampled and analysed for indicator minerals using microprobe analysis. Several samples were taken across the Cox Project, of which three (3) were sourced from streams within EL 22296. Results from these three (3) samples were not encouraging. Conclusions drawn from the data review indicated that this tenement would not be highly prospective for diamondiferous kimberlites. Microdiamonds found in the region have been interpreted as having originated from kimberlitic source rock(s) of considerable distance to the south of the tenement. Rock chip sampling did not alter this assessment. The lack of indicator minerals and locally sourced micro or macrodiamonds suggests that the potential for the area held under EL 22296 to host kimberlite rocks is low.
8.0 DIAMANTINA PTY LTD EXPLORATION 2011-2012

During January 2011 consulting geologists Kastellco Geological Consultancy (“KGC”) conducted a review of existing historical exploration data within the Northern Territory Geological Survey Database. This was conducted for all the Project areas to identify any high potential base metal and uranium exploration targets and resulted in the identification of several targets that warrant further work.

Work during this term included literature searches and data base compilation. Open file company reports were obtained from the Northern Territory Geological Survey and a review of past exploration data and geological concepts undertaken. Airphoto interpretation has identified geological and structural features for ground reconnaissance.

EL 26073 represents a greenfields exploration play for principally uranium deposits of varying genetic styles. The tenement is also considered to have potential to host diamond mineralisation. Past exploration has comprised heavy mineral sampling for kimberlitic indicator minerals and testing of magnetic and gravity anomalies for kimberlite pipes. Microdiamonds have been found in a portion of the area occupied by EL 26073; however Legend International Holdings (CR2008-0919) concluded they have originated from kimberlitic source rock(s) of considerable distance to the south of the tenement.

The targeting was undertaken at a high level to identify areas of interest that stand out in the regional re-interpreted geophysical data. Historical prospects were reviewed to determine the effectiveness of the previous exploration and evaluate remaining potential within the Exploration Licence area.

On a regional basis the Mt Hardy tenement is located in the highly prospective Dunmarra and McArthur Mineral Field. Through detail interpretation of airborne magnetic from the Northern Territory Geological Survey, the following magnetic anomalies were identified as shown in Table 2 and 3 shows the uranium anomalies. The location of the magnetic target anomalies targets is represented in Figure 3 and the radiometric target anomalies are represented in Figures 4.

Table 2: Magnetic Targets warranted for follow up exploration work over EL26073

<table>
<thead>
<tr>
<th>Tenure Number</th>
<th>Magnetic Anomalies</th>
<th>Strike Length of Anomaly</th>
<th>Width of Anomaly</th>
<th>Geological Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL26073 1</td>
<td></td>
<td>3.22 km Max</td>
<td>0.43 km Max</td>
<td>Quaternary Sediments</td>
</tr>
<tr>
<td>EL26073 2</td>
<td></td>
<td>3.06 km Max</td>
<td>0.41 km Max</td>
<td>Quaternary Sediments</td>
</tr>
<tr>
<td>EL26073 3</td>
<td></td>
<td>14.8 km Max</td>
<td>0.37 km Max</td>
<td>Quaternary Sediments</td>
</tr>
</tbody>
</table>

The project areas has been shown to contain a number of clusters and linear first and second order magnetic anomalies which have never been investigated in great detail (Figure 3).

Table 3: Uranium Anomalies warranted for follow up exploration work over EL26073

<table>
<thead>
<tr>
<th>Tenure Number</th>
<th>Radiometric Anomalies</th>
<th>Intensity of Anomaly</th>
<th>Strike Length of Anomaly</th>
<th>Width of Anomaly</th>
<th>Geological Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL26073 1</td>
<td></td>
<td>Strong</td>
<td>3.45 km Max</td>
<td>0.84 km Max</td>
<td>Quaternary Sediments</td>
</tr>
<tr>
<td>EL26073 2</td>
<td></td>
<td>Strong</td>
<td>2.26 km Max</td>
<td>1.07 km Max</td>
<td>Quaternary Sediments</td>
</tr>
<tr>
<td>EL26073 3</td>
<td></td>
<td>Strong</td>
<td>1.21 km Max</td>
<td>0.68 km Max</td>
<td>Quaternary Sediments</td>
</tr>
<tr>
<td>EL26073 4</td>
<td></td>
<td>Strong</td>
<td>2.94 km Max</td>
<td>0.91 km Max</td>
<td>Quaternary Sediments</td>
</tr>
</tbody>
</table>
Figure 3: Arnold Project Areas showing Magnetic Target Anomalies

Figure 4: Arnold Project Areas showing Uranium Channel Anomalies
9.0 CONCLUSIONS AND RECOMMENDATIONS

EL 26073 represents a green-fields exploration play for principally uranium and diamond deposits of varying genetic styles. Several radiometric targets were identified based on the review; it was recommended the exploration licence area was to be relinquished upon very little to no mineral prospectivity as these anomalies were located within Quaternary lithologies which have been classified as transported material.

10.0 REFERENCE


Starkey, L J., Central Electricity Generating Board Exploration (Australia), EL 4936 (Tanumbirini) & EL 4960 (Cat Creek) annual report to the Northern Territory Department of Mines & Energy for the first year of tenure ending 30th June 1987., Northern Territory Geological Survey, Open File Report CR1987-0174.


