SUPLEJACK PROJECT

ANNUAL AND FINAL SURRENDER REPORT for the period

29th December 2009 to 27th March 2015

Exploration License EL27368

OPERATED BY

NORTHERN MINERALS LIMITED

ANNUAL AND FINAL SURRENDER REPORT

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<th>NUMBER</th>
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<td>SUPLEJACK PROJECT – FINAL SURRENDER REPORT Exploration License EL27368</td>
<td>09-May-2015</td>
<td>Kurt Warburton, Nicole Heesh</td>
<td>2015-05</td>
<td>Heavy rare earths, uranium, gold</td>
<td>4758 “Pargee, 4858&quot;Tanami”</td>
<td>SE5215 “Tanami”</td>
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Abstract:

Tenement EL27638 formed part of the Suplejack project in the Gardiner Tanami region, and was granted on the 29/12/2009.

The project is located along the northern edge of the Palaeo-Proterozoic Coomarie Dome, formed by the intrusion of granitic units circa 1815 Ma. The surrounding units include the deformed Palaeo-Proterozoic Tanami and Macfarlane Peak Groups. Each of these units has been eroded and covered by the Mesoproterozoic Birrindudu Basin (Gardiner Sandstone, Talbot Well Formation and Coomarie Sandstone). Much of the surface geology is covered with Tertiary duricrusts, mainly calcrete, and unconsolidated Quaternary sediments.

Northern Minerals (NM) acquired the tenement in late 2009 with the intention of exploring for gold and unconformity related uranium. The company focus began to shift towards rare earth exploration in 2009/2010, which were subsequently concentrated when drill results from the Browns Range project in 2011 presented heavy rare earth (HRE) mineralisation. The Suplejack Project shares a number of geological features with Browns Range. It is located along the northern edge of the Coomarie Dome, formed by a granitic intrusion of similar age to the Browns Range granite, near the Gardiner Sandstone unconformity. Xenotime has been identified outside the project at the nearby Boulder Ridge prospect.

During tenure the company conducted historical data reviews, conceptual targeting exercises, a hyperspectral survey and reprocessing and interpretation of historical geophysical images. No on-ground exploration was completed while Northern Minerals operated the tenements.

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Declaration

To the best of our knowledge, this document conforms to the format outline for an annual report, as shown by the Northern Territory Geological Survey- Minerals and Energy Division website.
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1. INTRODUCTION

EL27368 was granted to Northern Uranium on the 29th December 2009. Approval for this tenement to be added to the combined reporting group for the Suplejack project (GR-074/09) was approved by the Department of Mines and Energy on the 27 June 2011.

There have been two partial relinquishments for EL27368 at the end of the second and fourth years. The first on the 26th of February 2012 required fifty per cent equating to 47 blocks to be relinquished. The second relinquishment required a further fifty per cent or 23 blocks to be surrendered on the 26th of February 2014, leaving 23 blocks.

2. LOCATION & ACCESS

The project area is located approximately 600km northwest of Alice Springs within the Suplejack pastoral lease. The tenements are approximately 40 km north of Tanami, 468 km west of Tennant Creek and 260 km south west from Kalkarindji. The Tanami 1:250,000 map sheet (SE5215) covers the tenement area. There are two 1:100,000 map sheets which cover the tenement; Pargee (4758) and Tanami (4858).

![Figure 1: Location of EL27368](image-url)
Access to the project from Alice Springs is northwest via the Tanami road for approximately 600km to the Tanami Gold Mine, then north-northeast for approximately 90km along the Lajamanu road to Suplejack Station homestead. Access from Suplejack Station homestead is via a limited number of station tracks heading westwards.
3. TENURE
Tenement EL27368 contains 23 blocks and covers an area of 70 km².

The current tenement schedule is outlined in Table 1.

Table 1: Tenement Schedule (March 2015)

<table>
<thead>
<tr>
<th>Tenement</th>
<th>Tenement No.</th>
<th>Area (Blocks)</th>
<th>Surrender Date</th>
<th>Grant Date</th>
<th>Expiry Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suplejack Project</td>
<td>EL27368</td>
<td>23</td>
<td>27/3/2015</td>
<td>29/12/2009</td>
<td>28/12/2015</td>
</tr>
</tbody>
</table>

Figure 2: Surrendered Areas
4. REGIONAL GEOLOGY

The Tanami Region, one of the most important tectonic units in the North Australian Craton, has a stratigraphic succession which shows similarities with the Pine Creek and Halls Creek Orogens, other Paleoproterozoic successions in northern Australia.

Within the region, the MacFarlane Peak Group, interpreted to be the basal unit of the Paleoproterozoic sequence, is dominated by volcanic and volcaniclastic rocks, along with clastic and calc-silicate sediments. These are overlain by siltstone, carbonaceous shale, calc silicates and BIF of the Dead Bullock Formation. This in turn is overlain by a thick sequence of turbidites, known as the Killi Killi Formation. Interbedded siltstone, greywacke and chert west of Tanami are included in the Twigg Formation. The latter three units are grouped together in the Tanami Group.

The Pargee Sandstone and the Mount Charles Formation occur in small extensional basins. A period of wider extension follows, accompanied by felsic volcanism in the Mount Winnecke Group and Nanny Goat Volcanics.

Five main granitic suites are recognised in the Tanami Region, the most important being the Coomarie and Frederick Suites. The youngest granites in the area belong to The Granites Suite. Archaean rocks identified from drilling comprise of the Browns Range Metamorphics and the Billabong Complex.

Deposition in the Birrindudu Basin began with sandstone transgressing over the metamorphic and crystalline basement probably at about 1.7 Ga. This was accompanied by regionally extensive north-trending growth faults and volcanism, possibly indicating rifting. The Birrindudu and Tolmer Groups represent the exposed basal section of this basin and may be as much as 6,000m thick locally. Apart from minor felsic volcanic rocks (tentatively assigned to undifferentiated Birrindudu Group) and carbonate rocks and shale in the upper Tolmer Group, these units are dominated by coarse clastic sedimentary rocks.

The eastern margin of the project is covered by Cambrian flood basalts (Antrim Plateau Volcanics), which overlie Mesoproterozoic Gardiner Sandstones of the Birrindudu Basin.

Several ESE, SE and N-trending structures have been identified within the project area, which represent subsidiary structures to the major regional ESE-trending structures, such as the Trans-Tanami Fault and the Bluebush Fault.

A large portion of the area is covered by ferricrete as well as surficial deposits including alluvium, lateritic lag and windblown sand. The Gardiner Formation outcrops are frequently capped by a silcrete layer of variable thickness.

Surface outcropping of the Birrindudu Group (Gardiner Sandstone and Talbot Well Formation) covers the northern edge of the project area. These units trend in a general NE-SW orientation where they wrap around the northwest margin of the Palaeo-Proterozoic Coomarie Dome. The Birrindudu Group sediments are overlain by Tertiary calcrete deposits and surficial Quaternary
sediments. The southern portion of the project is covered by alluvial deposits developed over granodiorite of the Coomarie Dome.

Figure 3 below shows the outcrop geology of the project area taken from the NTGS 1:250,000 scale geological mapping of the area.
Figure 3: NTGS Geology 1:250K
5. EXPLORATION COMPLETED

5.1. 2014

No work was completed on this tenement in 2014.

5.2. 2013

No work was completed on this tenement in 2013.

5.3. 2012

Hyperspectral Survey (Hymap)

During 2012, Northern Minerals conducted a hyperspectral survey covering the entire tenement area of EL27368 using the Hymap scanner operated by Hyvista Corporation. The HyMap provides 128 bands across the reflective solar wavelength region of 0.45 – 2.5 nm with contiguous spectral coverage (except in the atmospheric water vapour bands) and bandwidths between 15 – 20 nm.
### 5.4. 2011

**Geophysical Data Review and Targeting Exercise:**

Northern engaged a consulting geophysicist from Fathom Geophysics to reprocess and interpret the data from various airborne magnetic and radiometric surveys completed between 2007 and 2008. This was considered necessary for the following reasons:

- The geophysical surveys conducted over Northern Mineral’s contiguous land holdings in Western Australia and the Northern Territory hadn’t been merged into a single grid.
- No comprehensive magnetic interpretation has been previously completed over the entire area covered by the surveys.
- To assist in selecting conceptual gold and uranium targets for future work.

The data from the detailed surveys conducted by AREVA / Northern Minerals was merged with regional government datasets onto a single grid to provide regional context to the surveys. From the merged grids a coarse, regional interpretation was completed over the entire area for an overview of regional basement geology and to identify major structures. A second, more detailed interpretation was then completed over the detailed surveys flown in 2007 and 2008.

The targeting exercise involved identifying potential gold and uranium targets based on the characteristics of known mineralisation in the Tanami area, and from models of possible deposit types in the area.

The gold targeting methodology involved locating areas of interest with large scale structures to provide the main pathway for mineralising fluids, secondary, cross-cutting structures, lithological complexity, and an iron rich lithology that could act as a chemical trap through sulfidation. Each area was ranked according to these criteria.

For uranium the targeting methodology involved locating areas of interest with a porous host rock, a nearby potential uranium source (such as granites or from within Killi Killi Beds), structures to act as fluid pathways, and any evidence of uranium from the radiometric data.

Several conceptual targets identified for gold and uranium require further investigation, including ground checks. However, due to limited resources these

### 5.5. 2009/2010

No work undertaken on the tenement due to financial constraints experienced at the time.

### 6. CONCLUSION

EL27368 was initially acquired for the purposes of unconformity-style uranium and gold exploration. However, since 2010 with the ongoing success at the Browns Range project in Western Australia, the company’s focus has shifted to exploring for and defining heavy rare earth (HRE) mineralisation. Due to limited resources available, a rationalisation of Northern Minerals tenement holdings was
necessary and those that no longer meet its primary exploration criteria or are considered less prospective for HRE mineralization are being surrendered.

7. REFERENCES

Tanami, NTGS 1:250,000 Geological Series Explanatory Notes, Sheet SE/52-15