



## **GARDINER PROJECT**

### **ANNUAL REPORT**

**to the Department of Primary Industry and Resource  
for the period 26/07/16 to 25/07/17 for  
EL23932, EL25009, EL27367 and EL29593**

**Combined Reporting Group No: GR442**

**Date:** September 2017

**Compiled by:** D Annison  
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**Project Name:** Gardiner

**Combined Report number:** GR442

**Tenement:** EL23932, EL25009, EL27367, EL29593

**Tenement operator:** Northern Star (Tanami) Pty Ltd

**Tenement holder:** Northern Star (Tanami) Pty Ltd (100%)

**Report type:** Annual

**Report title:** Annual Report to the Department of Primary Industry and Resources for the period 26/07/16 to 25/07/17

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**Author:** D. Annison, Senior Exploration Geologist, Northern Star Resources Ltd

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**List of assays:** Ag, Al, As, Au, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Fe, Ga, Ge, Hf, In, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, Re, S, Sb, Sc, Se, Sr, Ta, Te, Th, Ti, Tl, U, V, W, Y, Zn, Zr

**Distribution:** Department of Primary Industry and Resources (NT) (1)  
Northern Star Resources Limited (WA) (1)  
Central Land Council (NT) (1)

## **SUMMARY**

This report is the first annual report for Exploration Licences EL23932, EL25009, EL27367 and EL29593 which form the Gardiner Project located within the Granites-Tanami region of the Northern Territory. The tenements and associated project are reported under Group Report Number GR442.

This report covers exploration conducted on the project during the period 26th July 2016 to 25th July 2017.

Work completed in past 12 months:

- Reviewed historical surface geochemical and drilling data
- Re-processed historical airborne magnetic/radiometric data
- Flown regional airborne magnetic and radiometric survey
- Acquired RapidEye satellite aerial imagery
- Undertook a regional environmental survey
- Helicopter assisted field reconnaissance and rock chip sampling
- Kookaburra East and Supernova prospect targeting

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## **1. INTRODUCTION**

This report is the annual technical report for Exploration Licences EL23932, EL25009, EL27367 and EL29593 which form the Gardiner Project located within the Granites-Tanami region of the Northern Territory. The tenements and associated project are reported under Group Report Number GR442.

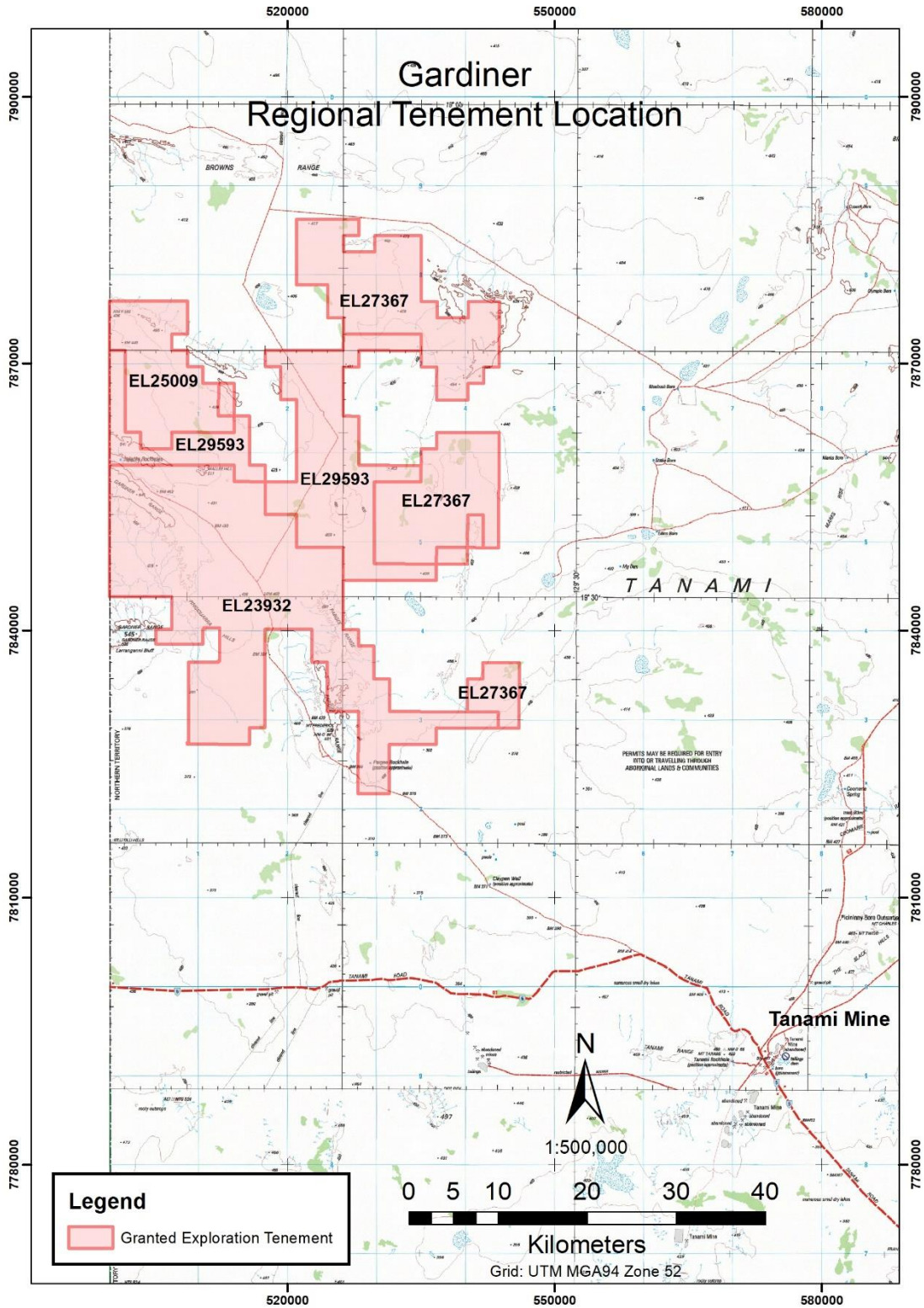
This report covers exploration conducted on the project during the period 26th July 2016 to 25th July 2017

The Gardiner Project is in the Granites-Tanami region approximately 600km north-west of Alice Springs, along the Western Australia (WA) and Northern Territory (NT) border (Figure 1). The project occupies land owned by the Purta, Mt Frederick 1 & 2 and Central Desert Land Trusts.

Access to the project from Alice Springs can be made via the Tanami Road for approximately 600km. The Tanami Road passes along the southern margin of the projects between the Tanami Mine and the WA/NT border. From the Tanami Road, cleared lines, old exploration tracks and the 'old' Tanami Track pass through the project area.

Alternatively, the project can be reached travelling 300km along the Tanami Road eastwards from Halls Creek in WA. The northern portion of the Gardiner-Tanami Project is most easily accessed from Halls Creek eastwards along the Duncan and Gordon Downs Road to the Ringer Soak community.

Figure 1 Regional Location Map



## 2. TENURE

Tenement EL29593 was originally part of a single tenement application EL24174. Following changes in the Mineral Titles Act in 2010, the original tenement application was found to exceed the maximum permissible area for an exploration licence and was split into three separate tenement applications (EL24174, EL29592, and EL29593).

Tenement EL29595 was originally part of the tenement application EL23932, which was split into three tenements (EL23932, EL29594, and EL29595) for the same reason.

The original tenement applications for EL23932 and EL24174 were applied for by Norm McCleary in 2003 and 2004 respectively. Ferrum Crescent Limited (then known as Washington Resources Limited) acquired a 100% interest in the tenements following their listing on the ASX on 14th November 2005.

Tenement EL25009 was applied for by Eclipse Minerals Pty Ltd, a subsidiary of Polaris Metals, on the 24th October 2005.

On 11th May 2006, Polaris Metals NL and Washington Resources Limited announced their intention to combine uranium assets, including the tenement applications, to form a new dedicated uranium company, Northern Uranium Ltd.

Tenement EL27367 was applied for by Northern Uranium between 2007 and 2009. Northern Uranium would later undergo a name change to Northern Minerals Ltd in late 2010.

Pursuant to a Tenement Sale Agreement and Mineral Rights Agreement both executed 29 August 2016 with completion effective from 10<sup>th</sup> January 2017, Northern Star (Tanami) Pty Limited became the 100% beneficial owner of the Titles. Transfer of Titles to Northern Star (Tanami) Pty Ltd were lodged and registered by the Department on 8 March 2017.

All the above tenements were granted following the signing of a Deed for Exploration between the Central Land Council, Traditional Owners and Northern Minerals on the 8 February 2012. Northern Star accepted and assumed all Northern Minerals' interest and obligations under the Deeds for Exploration and a Transferee's Deed of Covenant between the CLC and Northern Star was executed on 9<sup>th</sup> January 2017.

Joint group reporting was applied for the Gardiner-Tanami Project, incorporating EL23932, EL25009, EL26498, EL26541, EL27367, EL29592, EL29593 and EL29595, on 30 August 2013, and was approved by the Northern Territory Department of Mines and Energy (NT DME) on 6th September 2013 (Reporting Group GR 318-13). An Amendment to this group to withdraw EL26498, EL26541, EL29592 and EL29595 was lodged by Northern Star (Tanami) Pty Ltd and approved by DPIR on 23 February 2017 under a new Reporting Group GR442 with a reporting period of 26 July – 25 July and submission date of 25 September.

Tenement	Holder	Current Area (blocks)	Grant Date	Expiry Date
EL23932	Northern Star (Tanami) Pty Ltd 100%	190	21/08/2012	20/08/2018
EL25009	Northern Star (Tanami) Pty Ltd 100%	44	26/07/2012	25/07/2018
EL27367	Northern Star (Tanami) Pty Ltd 100%	127	21/08/2012	20/08/2018
EL29593	Northern Star (Tanami) Pty Ltd 100%	104	21/08/2012	20/08/2018

**Table 1 Tenement Schedule – Gardiner Project**

### 3. REGIONAL AND LOCAL GEOLOGY

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

Within the region, Archaean rocks of the Browns Range Metamorphics and Billabong Complex are theorised to underlie the later Proterozoic sequences. The overlying Palaeoproterozoic Tanami Group is dominated by volcanic and volcanoclastic 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, the Killi Killi Formation. Interbedded siltstone, greywacke and chert west of Tanami are included in the Twigg Formation.

The Pargee Sandstone and Mount Charles Formation have historically been identified as having been formed in short-lived, small extensional basins. A period of wider extension is believed to have followed, this was 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.

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. 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.

Neoproterozoic and younger sequences include the Redcliff Pound Group Neoproterozoic, Antrim Plateau Volcanics, Lucas Formation, Pedestal beds and Larranganni Beds.

The extensive flows of Neoproterozoic-Cambrian Antrim Plateau Volcanics consist primarily of tholeiitic basalt lava flows with minor sedimentary rocks. Flat lying sedimentary rocks of the Devonian Lucas Formation and Pedestal Beds and Cretaceous Larranganni Beds overlie Antrim Plateau Volcanics and older rocks.

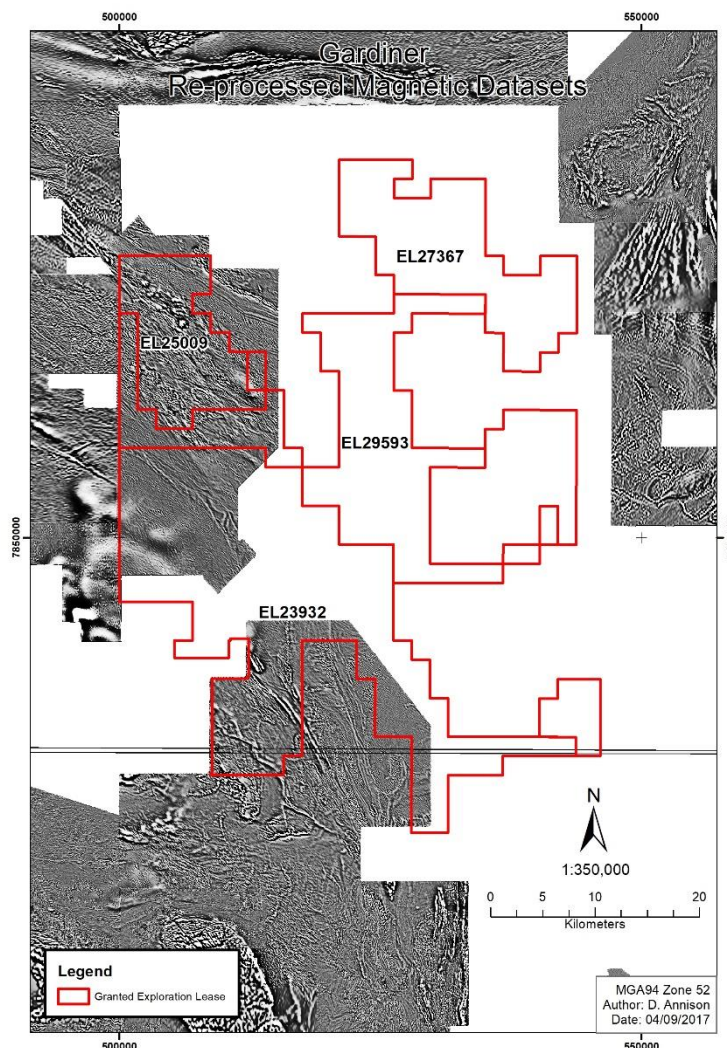
Large areas of the Tanami region are covered by Cainozoic deposits of laterite and calcrete, and more recent, unconsolidated fluvial and aeolian sand and gravel.

#### 4. WORK COMPLETED

Early in the reporting period NST finalised a review of surface geochemical and drilling datasets from the Gardiner Region. Minimal data was identified in internal and external searches. The data that was identified was of little value given its age and poor reliability.

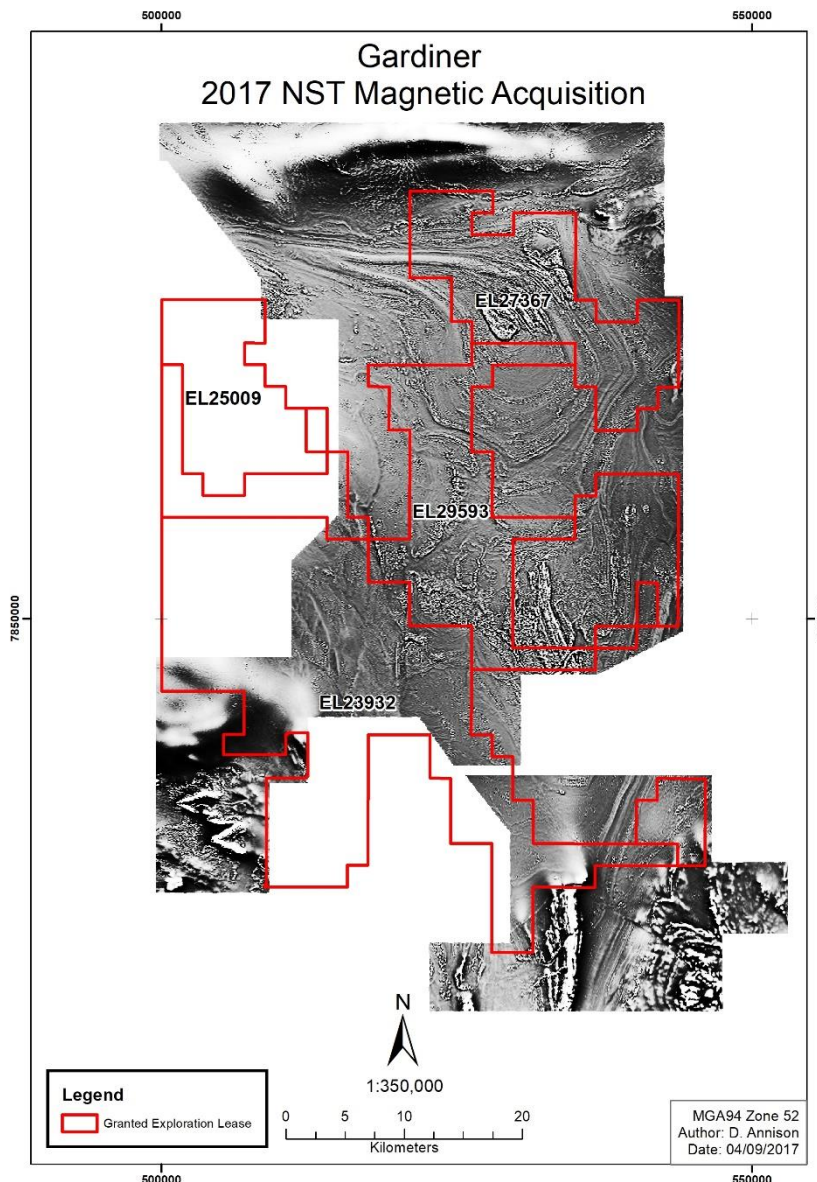
Following review of surface data, NST undertook a regional review of geophysical datasets with a focus on magnetic and radiometric surveys. Excluding publicly available government data, two legacy datasets were identified over the Gardiner tenements. One of these surveys was in NST possession, the other required petitioning of the Northern Territory Geological Survey (NTGS) to release the closed-file dataset. The data quality and integrity of these surveys was reviewed, the potential of these surveys to integrate with a new magnetic-radiometric survey was assessed. Figure 2 shows the re-processed magnetic data (raw 2<sup>nd</sup> Vertical Derivative) from these two surveys as well as other neighbouring datasets identified in the review process.

Figure 2 Re-processed Magnetic 2VD



The results of analysing the legacy datasets proved they would integrate effectively with a new magnetic-radiometric acquisition. Due to the extensive amount of transported cover and scale of the project area the decision was made to undertake a regional magnetic-radiometric survey in early 2017. The proposed survey was designed to fly approximately 80% of all NST tenure in the Northern Territory, a total of 77,940 line kilometres were proposed to cover an area ~4,500km<sup>2</sup>. Magspec Airborne Surveys were the chosen contractor for the survey which commenced May 28 and was finalised August 4. Survey commencement was delayed until late May due to inclement weather and mechanical issues. As the completion of this survey falls outside of the reporting period, and as such processing and data interpretation is ongoing, Figure 3 below shows the raw Total Magnetic Intensity first vertical derivative of the portion of the survey which covers the Gardiner region.

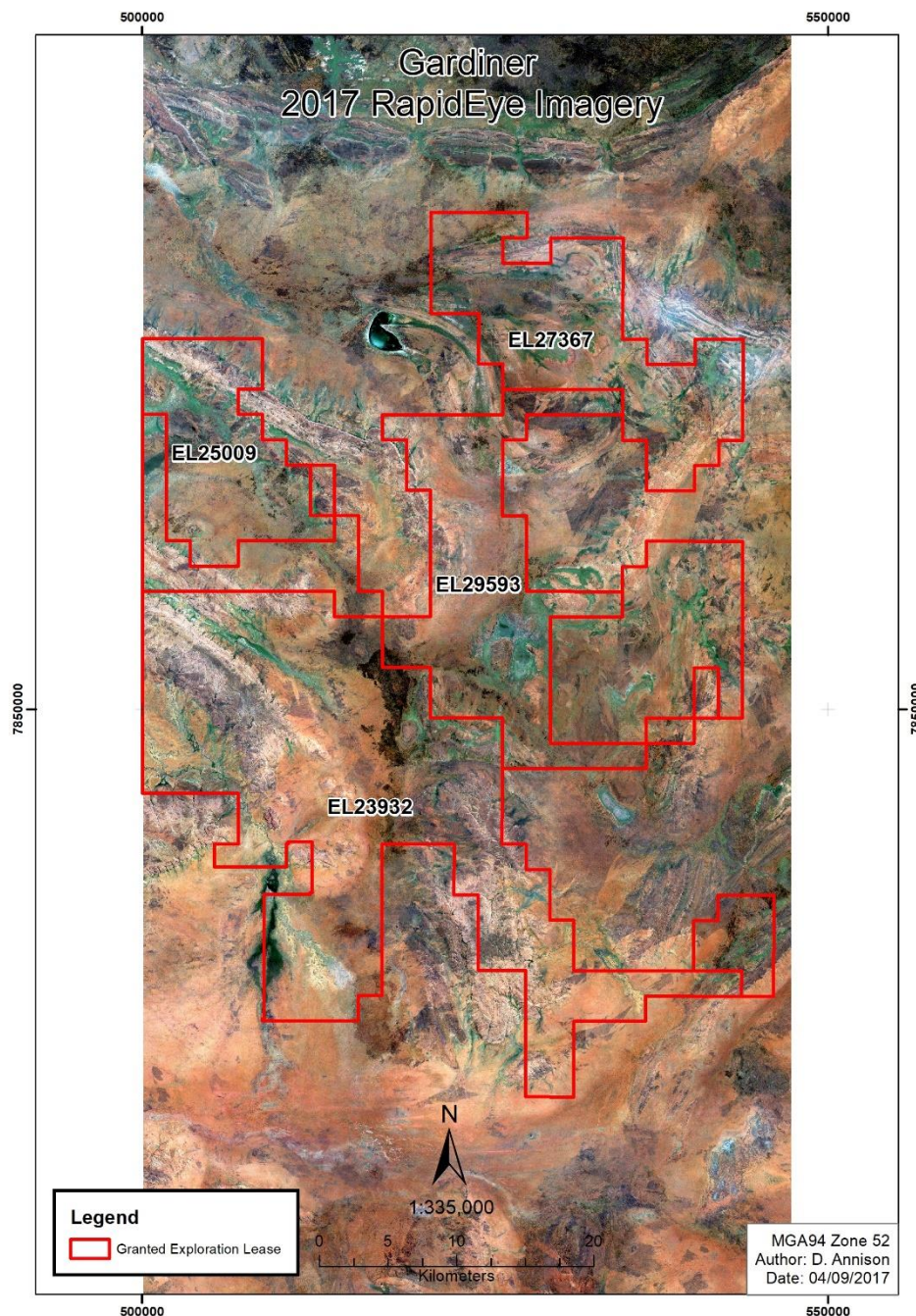
Figure 3 2017 NST Magnetic Acquisition (TMI 1VD)



Once data processing is complete NST will provide the NTGS with finalised datasets as per the Airborne Survey Agreement PE003.

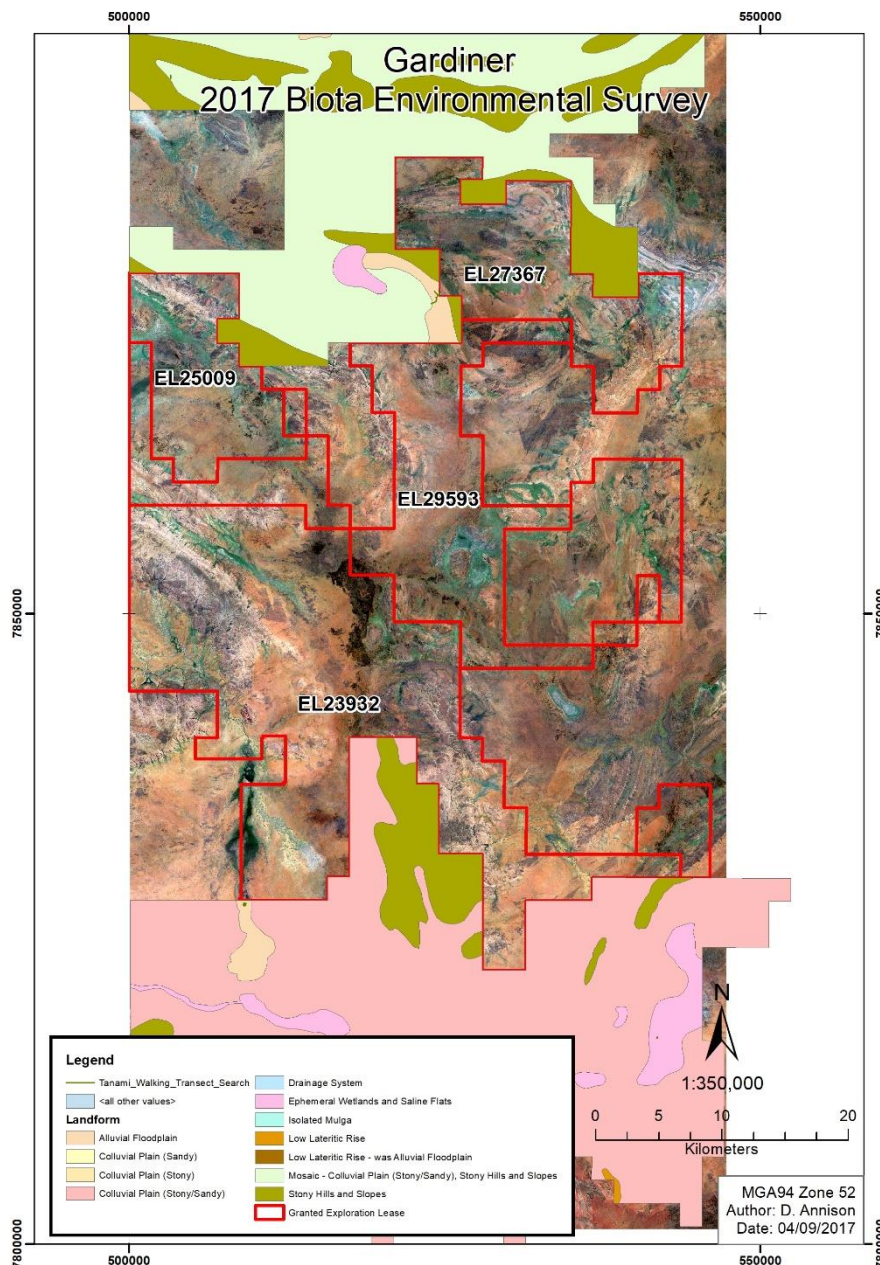
To better assist the geological interpretation of the recently acquired geophysical data and future field work, NST acquired 5m resolution RapidEye satellite imagery data over 4,372km<sup>2</sup>, which includes the Gardiner region. Figure 4 shows the RapidEye imagery in relation to the Gardiner tenements.

Figure 4 2017 RapidEye Satellite Imagery

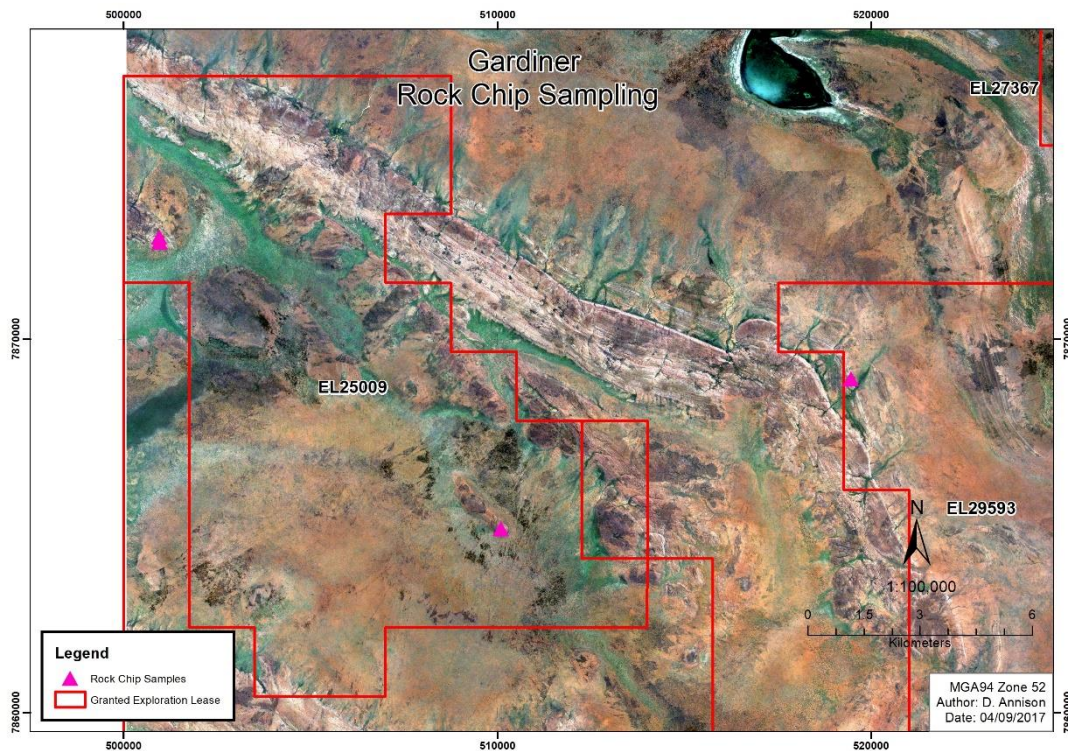


Biota Environmental were engaged to undertake a broad low-level survey across all NST NT tenure to better understand the significant flora/fauna present. This work was specifically undertaken to ascertain the management measures NST are required to implement in its future exploration activities. Although field transects were not undertaken over the Gardiner tenements, the landform type mapping and species cataloguing carried out in nearby areas is directly relevant to exploration activities carried out across this region. Figure 5 shows the landform type mapping conducted near the Gardiner tenements.

**Figure 5** Biota Environmental Landform Mapping



Helicopter assisted field reconnaissance was undertaken in June 2017 as a first pass high-level review of stratigraphy and areas of interest. A total of four rock chip samples were taken from tenements EL25009 and EL29593, all samples underwent ICPMS multi-element analysis but failed to return any anomalous results (See Figure 6). With the advent of recent geophysical data NST will undergo a detailed and extensive interpretation process which will involve ground truthing and/or field investigation of numerous areas.



Using previously available private and government geophysical datasets, NST has identified two main areas of interest in the Gardiner region, these have been denoted as Kookaburra East and Supernova. Both areas lie in the southern portion of Gardiner tenement EL23932. Work in this area is ongoing whilst approvals are being sought with the Central Land Council, NST will also submit a variation to its current Exploration MMP in early September for Air Core/RAB drilling at these prospects.

## **5. CONCLUSIONS AND RECOMMENDATIONS**

The Gardiner region is a relatively under-explored area due to its remoteness and difficult to access nature. Significant time and efforts should be made to establish access routes to the project area to help initiate on-ground activities to further advance the project.

The forthcoming reporting period will be the systematic analysis and interpretation of the recent aerial survey on both local and regional scales. This will build a geological framework and understanding of the area. Much of this work will be undertaken in the first half of the reporting period to allow planning for on-ground exploration activities in the field season of 2018.

An increase in low-impact geological mapping, ground checking and rock chip sampling will further compliment and build on the understanding of the area. If results from this initial work are encouraging, geochemical soils sampling programs may also be undertaken. Air Core/RAB drilling at the Kookaburra East and Supernova prospects will be undertaken pending CLC and DPIR approvals.

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