



CAVE HILL PROJECT

ANNUAL REPORT

**to the Department of Mines and Energy
for the period 24/07/16 to 23/07/17 for
EL10355, EL10411, EL22229, EL22378, EL23342
AND EL9763**

Combined Reporting Group No: 160/10

Date: September 2017

**Compiled by: D Annison
Senior Exploration Geologist
Northern Star Resources Ltd**

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TITLE PAGE AND BIBLIOGRAPHIC DATA SHEET

Project Name: Cave Hill

Combined Report number: GR160/10

Tenement: EL10355, EL10411, EL22229, EL22378, EL23342, EL9763

Tenement operator: Northern Star (Tanami) Pty Ltd

Tenement holder: Northern Star (Tanami) Pty Ltd (25%); Tanami (NT) Pty Ltd (75%)

Report type: Annual

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24/07/16 to 23/07/17

Report period: 24/07/16 to 23/07/17

Author: A Mukherji, Principal – Land Management, Northern Star Resources Ltd

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1:250 000 map sheet: SF52-03 The Granites

1:100 000 map sheet: Frankenia 4857

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Geochemical Analysis, Target Identification

Prospects drilled: N/A

List of assays: N/A

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Department of Primary Industry and Resources	(NT)	(1)
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SUMMARY

This report describes exploration activities primarily for gold undertaken by Northern Star (Tanami) Pty Ltd over EL10355, EL10411, EL22229, EL22378, EL23342 and EL9763 as part of the Cave Hill Combined Reporting Group 160/10 between 24 July 2016 and 23 July 2017. The centre of the Project area is located approximately 650km northwest of Alice Springs along the Tanami Road.

The Cave Hill group of tenements form part of a larger Joint Venture agreement between Tanami Gold (NT) Pty Ltd and joint venture partner and manager Northern Star (Tanami) Pty Ltd, a wholly owned subsidiary of Northern Star Resources Limited.

Work completed in the past 12 months:

- Finalised review and targeting of legacy surface geochemical data
- Field collection of legacy drill chips for geological review
- Designed Mantis geochemical drilling program – (commenced outside of reporting period)
- Reviewed historical airborne magnetic/radiometric data
- Flown regional airborne magnetic and radiometric survey
- Undertook a regional environmental survey

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1. INTRODUCTION

This report describes exploration activities primarily for gold undertaken by Northern Star (Tanami) Pty Ltd ("**NST**"), a wholly owned subsidiary of Northern Star Resources Limited, over EL10355, EL10411, EL22229, EL22378, EL23342 and EL9763 as part of the Cave Hill Combined Reporting Group 160/10 between 24 July 2016 and 23 July 2017. The centre of the Project area is located approximately 650km northwest of Alice Springs along the Tanami Road.

The main access route to the Project area is via the Tanami Road then southwest at the Tanami Downs Station road. The tenements are difficult to access with significant cross country bush driving required. There is also a large area of wetlands that runs in a north-south direction through the Project area which also presents access problems. Other areas of dense vegetation and sand dunes also form natural barriers impeding access to vehicles.

2. TENURE

On 30 March 2010, the tenements comprising the Cave Hill Project were acquired by Tanami (NT) Pty Ltd (“**TNT**”), a wholly owned subsidiary of Tanami Gold NL, from Otter Gold NL (“**Otter**”). Otter is a wholly owned subsidiary of Newmont Asia Pacific.

In February 2015, a Heads of Agreement was executed between TNT and NST whereby NST agreed to progressively acquire a 60% joint venture interest in the tenements, of which the Cave Hill Group is a part, by sole funding all expenditure required to bring the Tanami Project back into commercial production which shall be achieved once the Central Tanami Project (“**CTP**”) processing plant has been refurbished and is operated for a 30-day period or has produced 5,000oz of gold. The CTP processing plant is located ~30km to the north of the Cave Hill Group.

As part of the consideration of the Heads of Agreement, NST acquired a registerable interest in the tenements of 25%.

Tenement	Holder	Current Area (blocks)	Grant Date	Expiry Date
EL10355	Tanami (NT) Pty Ltd 75%; Northern Star (Tanami) Pty Ltd 25%	4	04/06/2001	03/06/2017 **
EL10411	Tanami (NT) Pty Ltd 75%; Northern Star (Tanami) Pty Ltd 25%	7	04/06/2001	03/06/2017 **
EL22229	Tanami (NT) Pty Ltd 75%; Northern Star (Tanami) Pty Ltd 25%	8	08/06/2001	07/06/2017 **
EL22378	Tanami (NT) Pty Ltd 75%; Northern Star (Tanami) Pty Ltd 25%	6	08/06/2001	07/06/2017 **
EL23342	Tanami (NT) Pty Ltd 75%; Northern Star (Tanami) Pty Ltd 25%	8	25/05/2006	31/12/2017
EL9763	Tanami (NT) Pty Ltd 75%; Northern Star (Tanami) Pty Ltd 25%	7	24/07/2000	23/07/2017 **

Table 1 Tenement Details – Cave Hill Project

** Renewals have been lodged with the Department of Primary Industry and Resources and are currently pending final assessment.

3. REGIONAL AND LOCAL GEOLOGY

In the Tanami Region, one of the most important tectonic units is the North Australian Craton, the stratigraphic succession shows similarities with the Pine Creek and Halls Creek Orogens and 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.

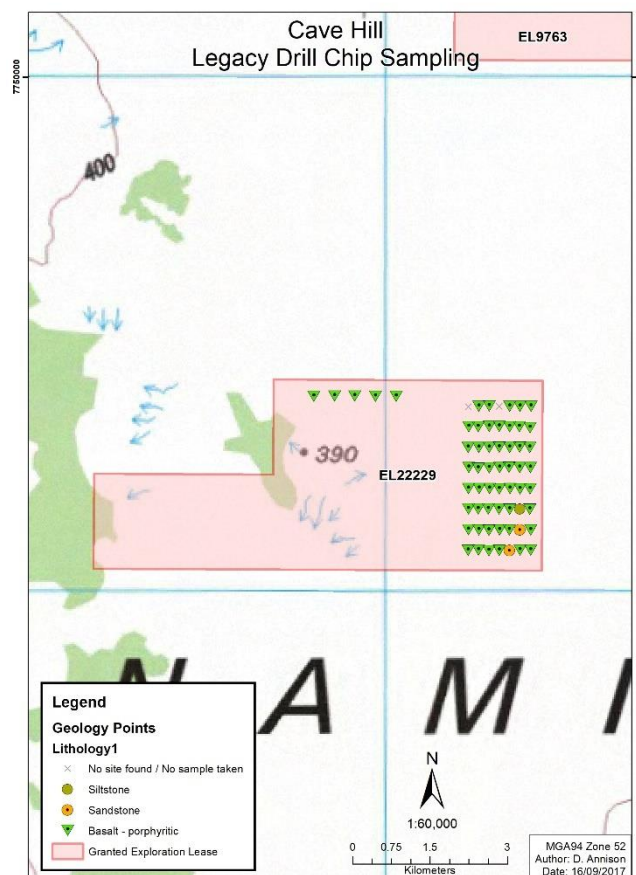
Large areas of the Tanami region are covered by Cainozoic deposits of laterite and calcrete, and more recent, unconsolidated fluvial and aeolian sand and gravel.

4. WORK COMPLETED

Early in the reporting period NST completed a review of legacy drilling and surface geochemical datasets, a decision to undertake further targeting assessment on surface geochemical data was made. The review of legacy drilling highlighted inconsistencies in geological logging and regolith data, to correct this the decision was made to collect any remnant drill chip samples still available in the field for review.

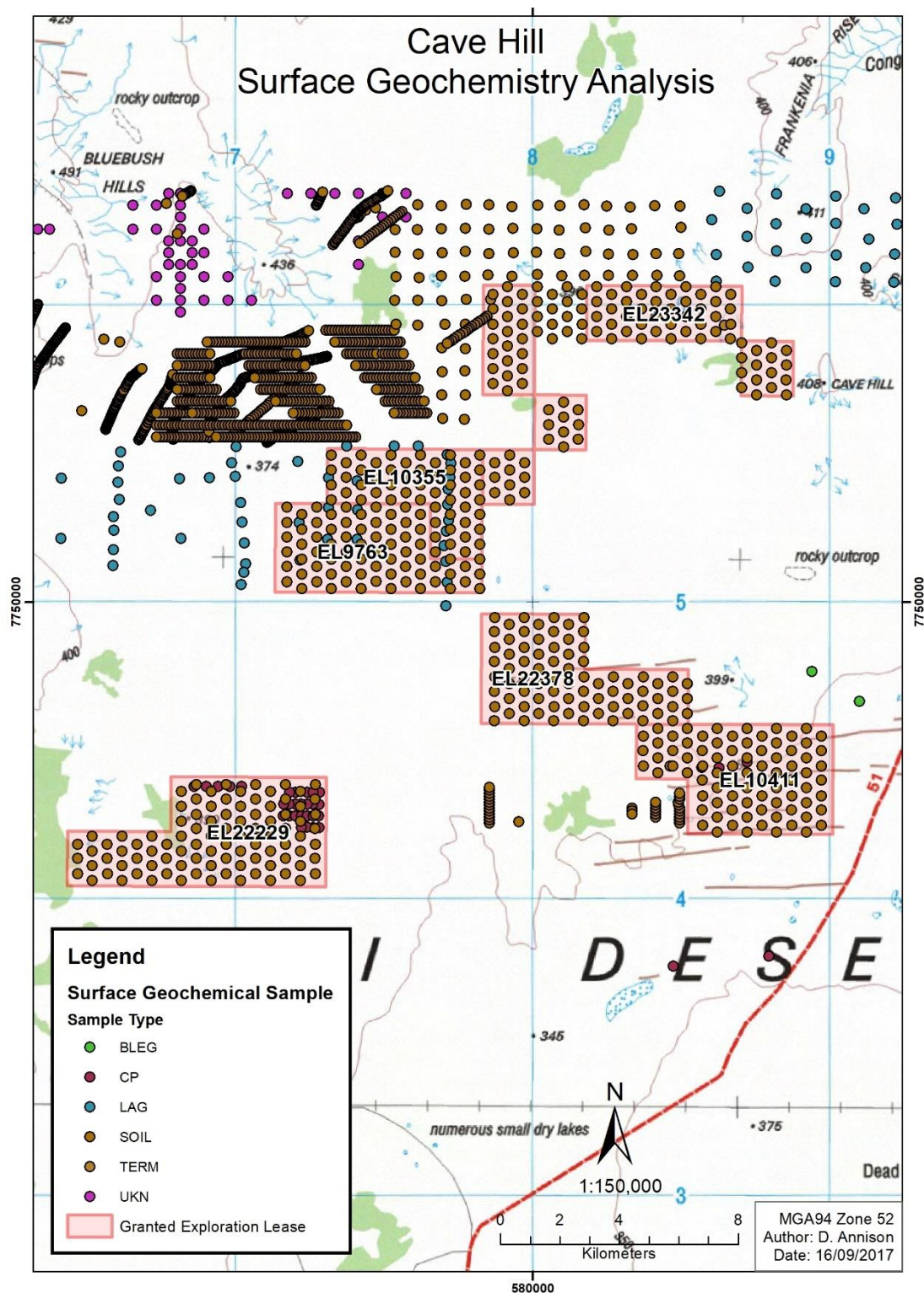
A total of 61 drill holes were found with remnant drill chips available at surface, these were collected and re-logged to ensure accuracy of existing data, all holes were situated on EL22229 (Figure 2). It was found that all drill holes intercepted Cambrian Antrim Plateau Basalts, so no samples were sent for laboratory analysis.

Figure 2 Remnant Drill Chip Sampling



Further analysis of legacy geochemical sampling was undertaken due to several unexplained anomalous samples identified in earlier review. Figure 3 shows the spatial distribution of samples that were analysed and their sample type.

Figure 3 Surface Geochemical Samples



Figures 4 and 5 illustrate Areas of Interest 1 to 4, these areas were field inspected to ascertain the regolith type upon which historical sampling was undertaken. Regolith types were found to vary significantly at each site, some of which were deemed unsuitable for soil sampling. As such, further investigation of these anomalies was to be undertaken.

Figure 4 Gridded Tungsten in Soils

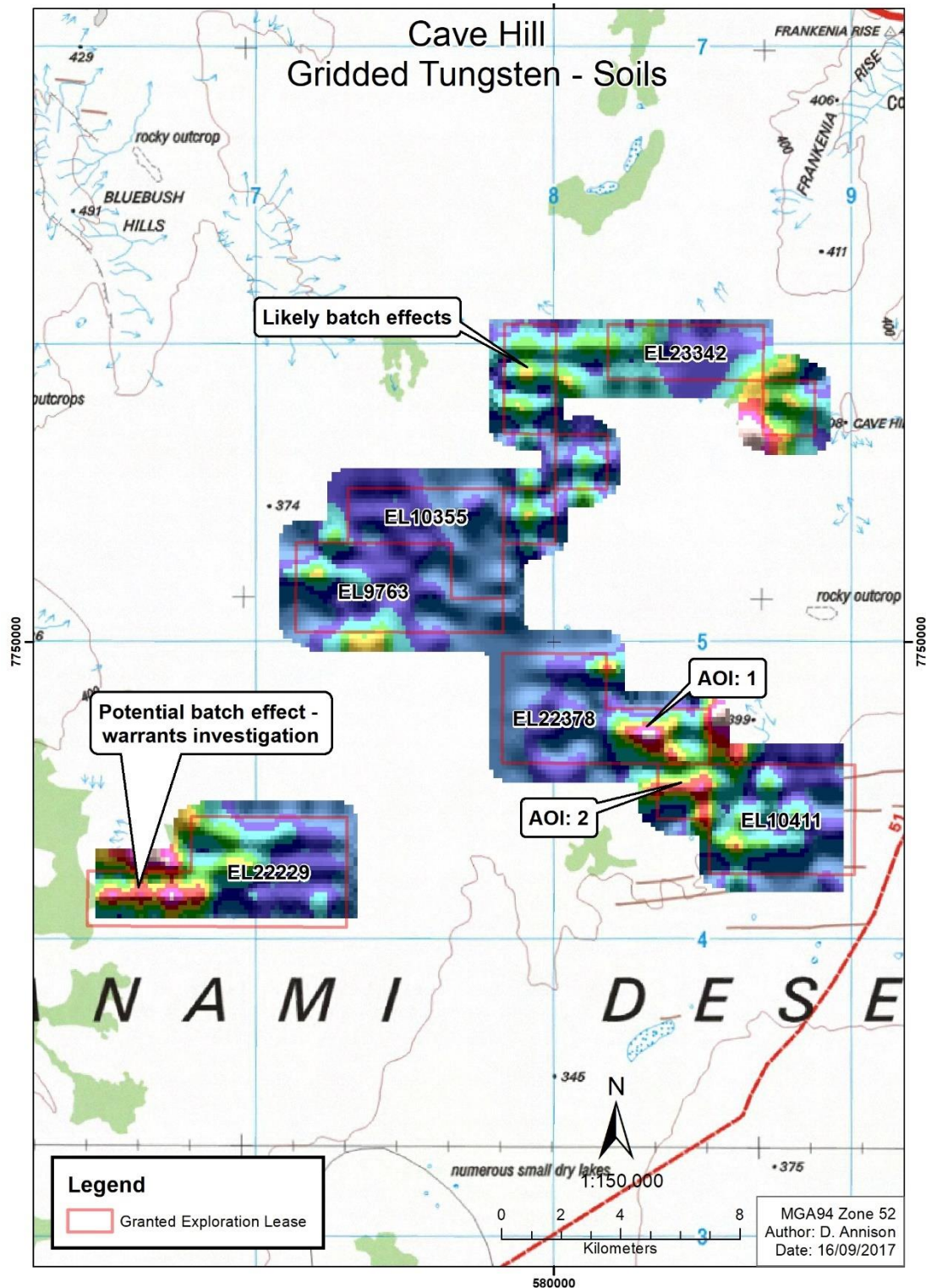
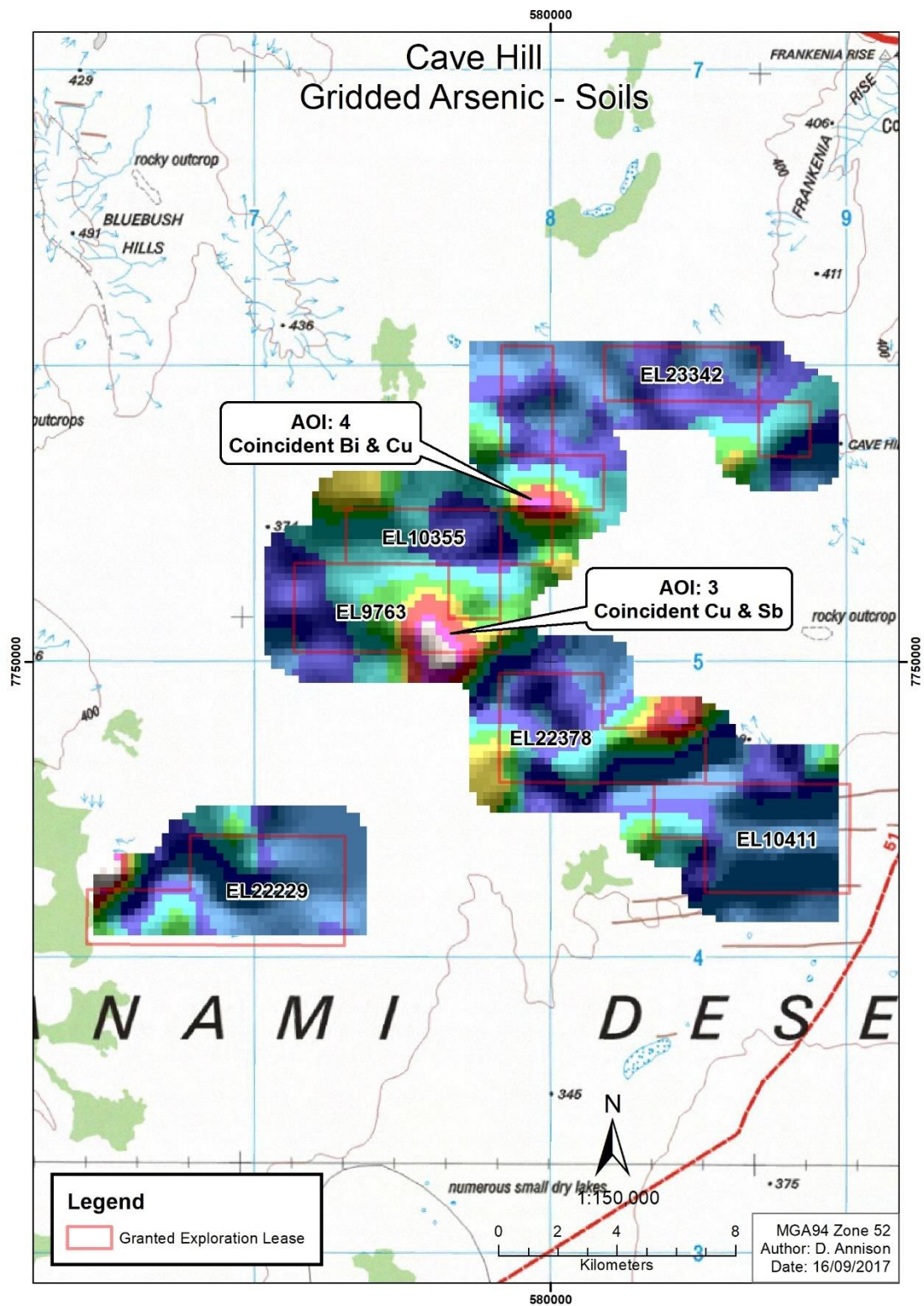
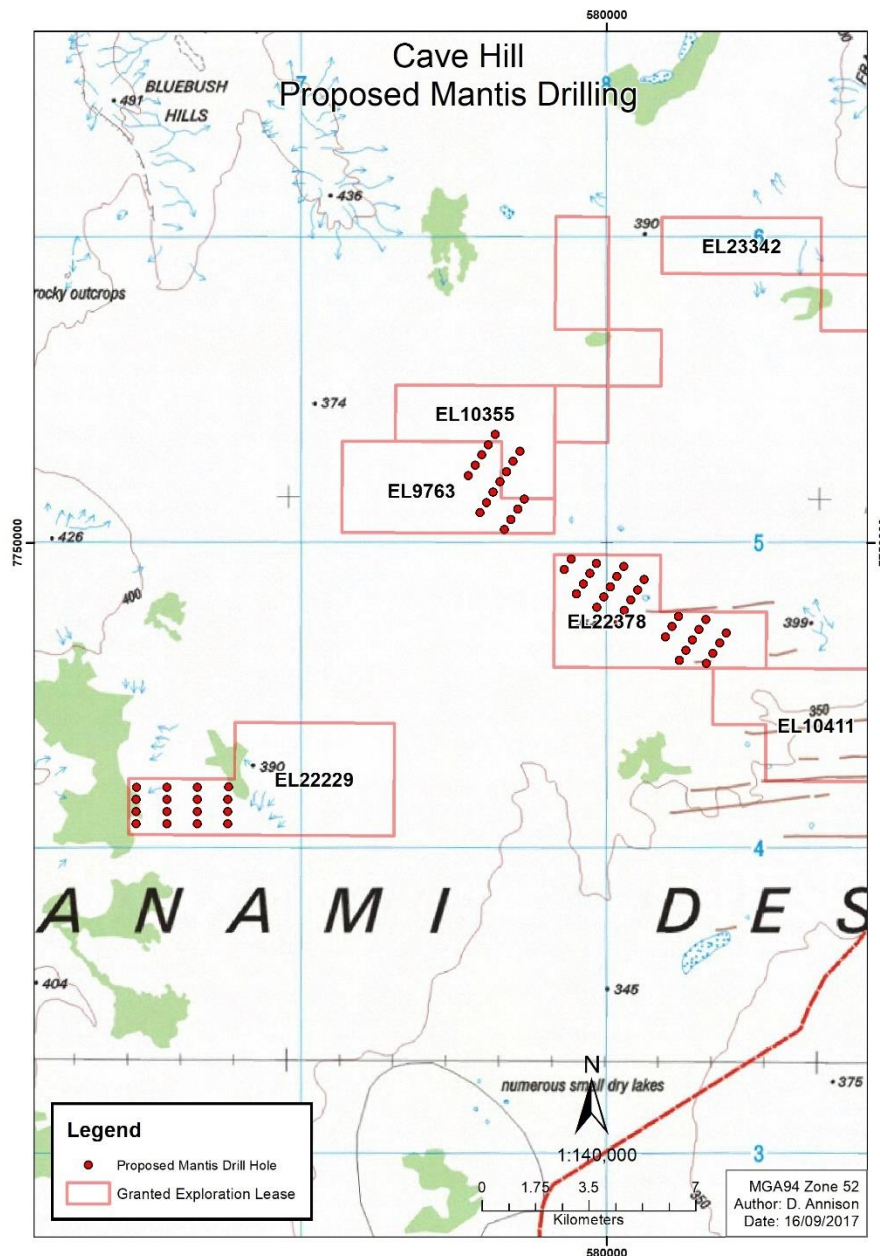


Figure 5 Gridded Arsenic in Soils



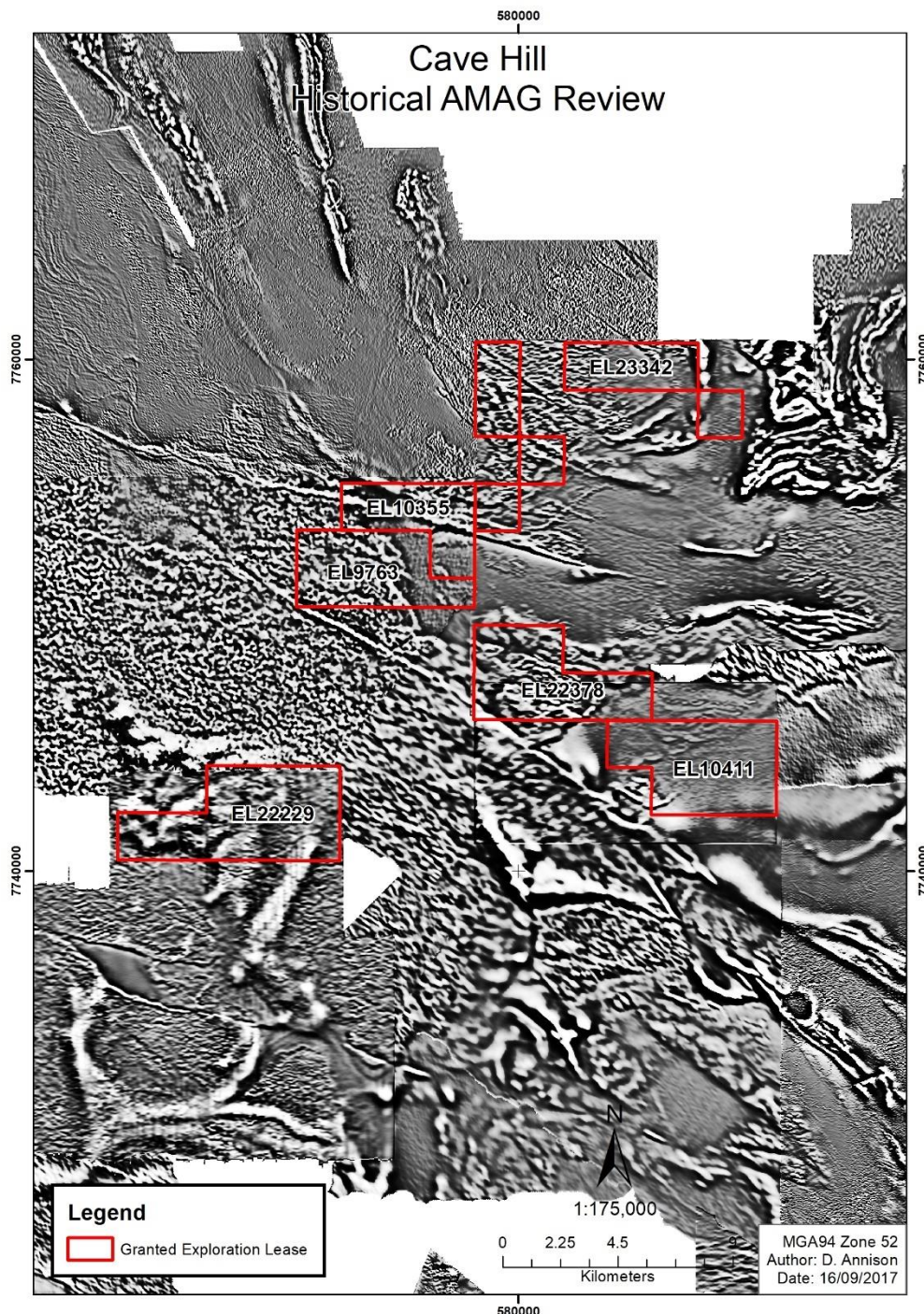
With MMP approval for the Tanami Regional Exploration Project completed in April 2017, a selective geochemical drilling program was designed. Mantis drilling was to be used in lieu of auger sampling to have the greatest likelihood of penetrating several meters of overlying sand and gravel. Working with several other Exploration companies in the Tanami Region, NST committed to utilising Wallis Drilling for the program, however it was not to commence until late-July. A total of 60 holes were planned by the end of the reporting period over EL22378, EL9763, EL10355 and EL22229 (Figure 6), covering 4 separate areas. At the date of this report submission, the program had been completed for 58 holes and a total of 1,959m.

Figure 6 Proposed Mantis Drilling



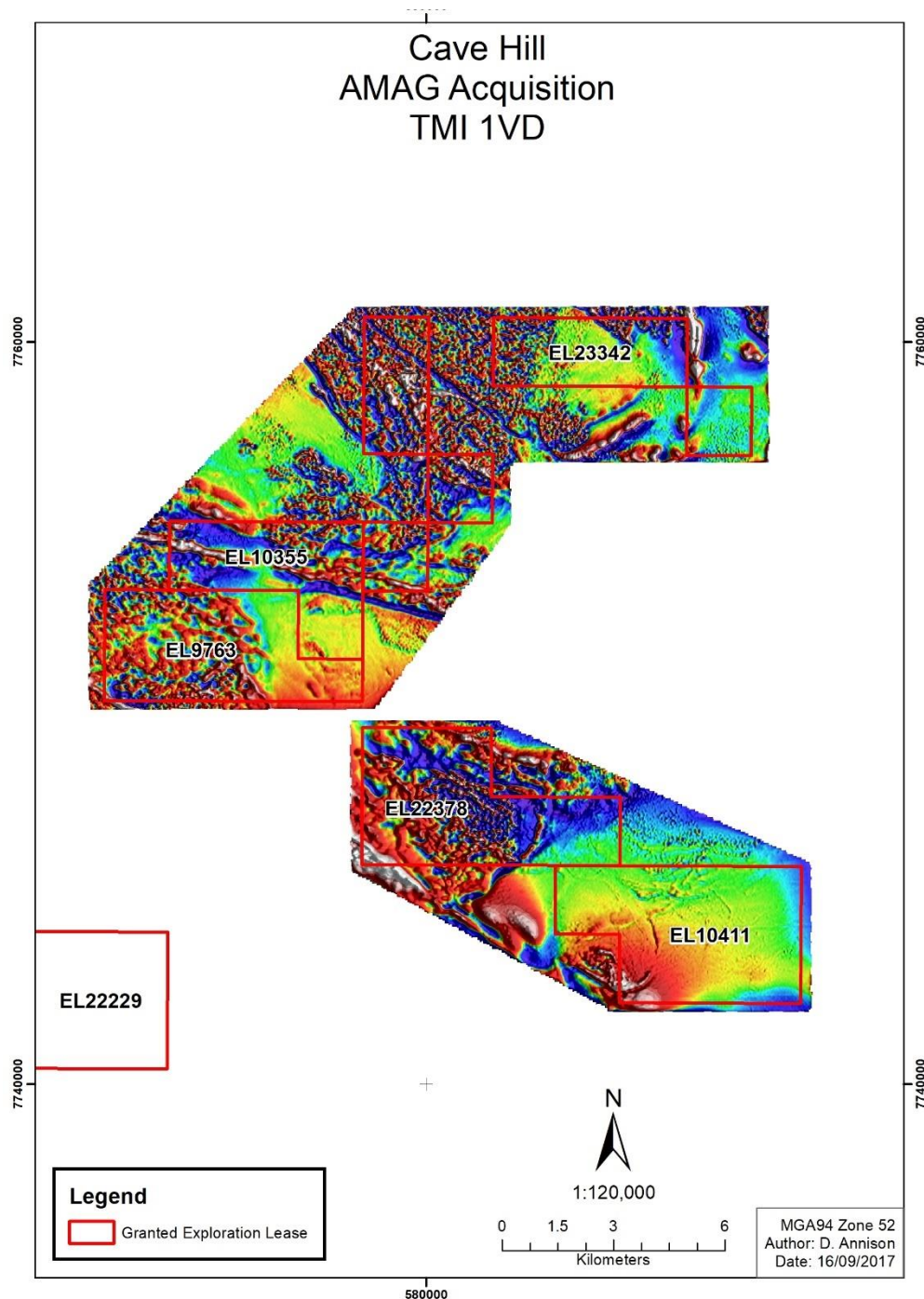
A review of historical airborne magnetic and radiometric data was undertaken to assess the quality and useability of those datasets. A lack of detailed, high-resolution geophysics led to the decision to survey the Cave Hill area as part of a larger regional airborne survey. Two separate grids were chosen to cover all Cave Hill leases excluding EL22229, due to a reasonable legacy dataset present over that area. Figure 7 shows the historical datasets reviewed.

Figure 7 Historical AMAG Review



As a result of the AMAG dataset review, several closed-file surveys were released by the NTGS following petitioning by NST. The regional airborne magnetic and radiometric survey was carried out between May 28 and August 4, a total of 77,940 line kilometres were flown over an area approximately 4,500km². AMAG data of the two survey grids covering the Cave Hill tenure are shown in Figure 8.

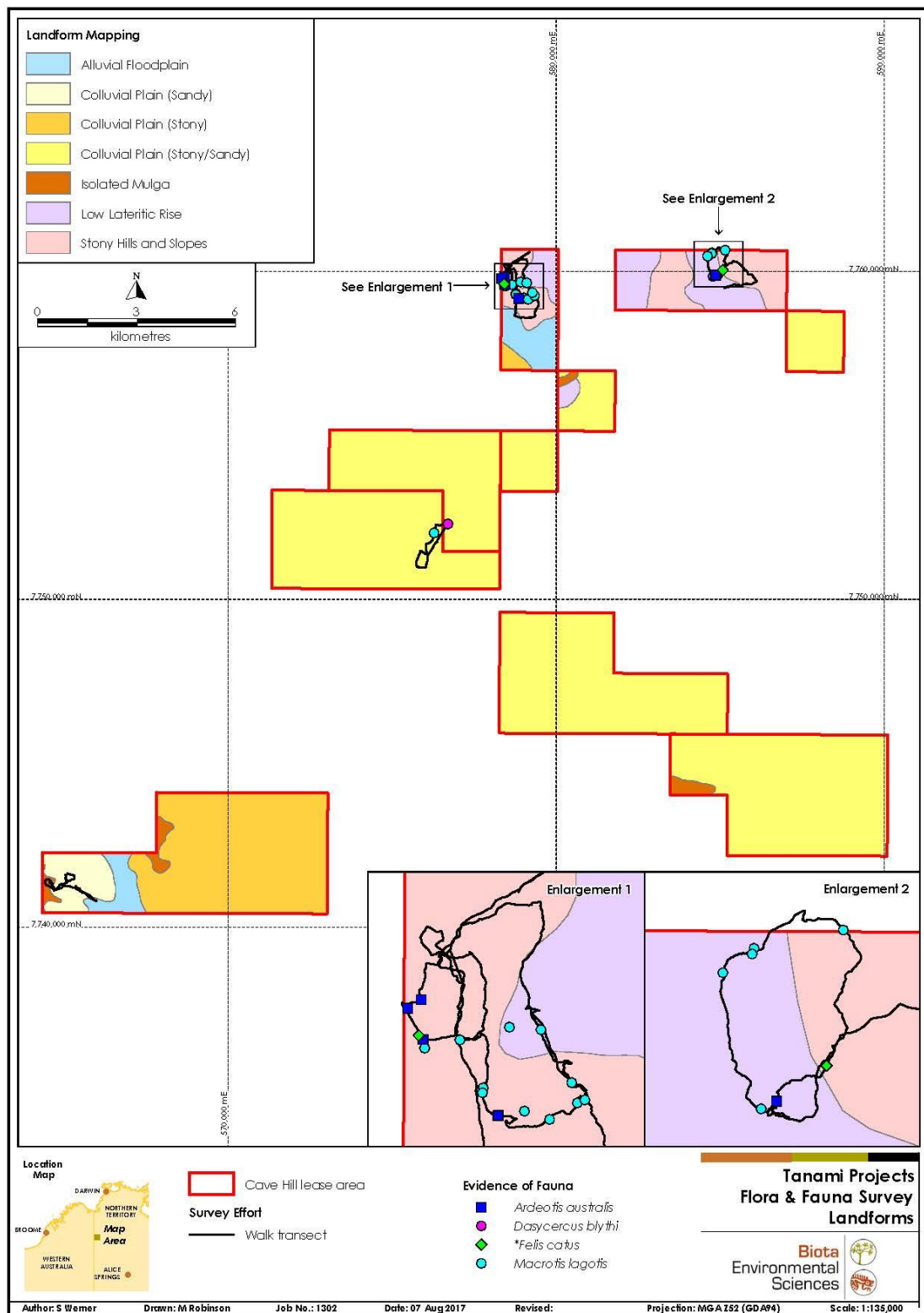
Figure 8 AMAG Acquisition - TMI 1VD



Receipt of the final survey data was outside of the reporting period, however the acquisition of the Cave Hill data was completed in early June, as such it has been included with this report.

To better inform future exploration programs and approvals, NST engaged the services of Biota Environmental to conduct a broad, low-level survey across all NST NT tenure. The survey was designed to provide a better understanding of any significant flora/fauna in the area. Ground survey at Cave Hill was centred over three tenements, EL23342, EL9763 and EL10355. In addition to surface transects, aerial surveying was also undertaken over all Cave Hill tenements, with helicopter assistance. Figure 9 shows landform type mapping conducted by Biota.

Figure 9 Landform Type Mapping - Biota 2017



5. CONCLUSIONS AND RECOMMENDATIONS

The Cave Hill region has shown through geochemical analysis and field reconnaissance to be host to critical Tanami Group Stratigraphy. Its proximity to the World-class Callie deposit (Newmont), and a similar structural architecture is promising to NST.

NST wish to advance the Cave Hill region through detailed analysis and interpretation of the recently acquired airborne magnetic and radiometric data. In addition, analysis of geochemical drilling in this area will continue, and potentially provide follow-up targets. The forthcoming reporting period will see the following work eventuate:

- Complete a detailed geological interpretation of recently acquired magnetic and radiometric data
- Complete a depth to basement (DTB) analysis of the recently acquired magnetic data to better assist with targeting (complement existing depth of cover surfaces)
- Trial the use of medium-resolution surface gravity for structural assessment
- Finalise geochemical drilling and assess results – potentially lead into a secondary targeting phase

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