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1. EXECUTIVE SUMMARY

EL27314 is part of the Auvex Georgina PL Georgina Basin Project, located in the southern Georgina Basin. The Project area is prospective for base metals, manganese and phosphate mineralization.

EL27314 was surrendered on the 30 January 2013.

During the reporting period exploration activities undertaken within EL27314 included interpretation of the available geological and geophysical data, the interpretation of satellite imagery, reconnaissance field visits, the development of exploration models, and a helicopter-borne VTEM geophysical survey.

The exploration model developed for base metal mineralization targeted north or northwest trending structures, positive magnetic anomalism (basement highs) +/- coincident gravity highs, anomalous geochemical trends (including manganese anomalism), and a disconformity between Cambrian Arrinthrunga Formation carbonate sediments and Cambro-Ordovician Tomahawk Formation clastic sediments. Application of this model to the Project area identified a prospective northwest trending linear zone, which extends through EL27314. This zone was evaluated by a 300km$^2$ VTEM system helicopter-borne time domain electromagnetic survey flown by Geotech Airborne PL in May 2012. The data was processed and reviewed by Southern Geoscience Consultants, with several northeast trending conductive units identified. Five of the twenty-three targets identified were considered high priority due to their geological placement and stronger representation in mid to late time EM response. Two of the priority targets were located within EL27314.

RC drilling of three of the priority VTEM targets (all outside of EL27314) did not intersect significant base metal mineralization. The conductors identified in the VTEM survey were found to represent weakly conductive regolith horizons associated with the current groundwater table, within a deeply weathered profile. The target disconformity is thought to be present at depths exceeding 300m vertical.

Phosphate mineralization is associated with outcropping or subcropping Cambrian Arthur Creek Formation. The Formation is present at considerable depths below surface within EL27314.

2. INTRODUCTION

Auvex Manganese Ltd operates seven Exploration Licences located in the southern portion of the Georgina Basin, in two Reporting Groups. Reporting Group GR156/11 of four Exploration Licenses includes EL27314. The Reporting Group GR156/11 tenements are held by Auvex Georgina Pty Ltd (a subsidiary of Auvex Manganese Ltd).

The Georgina Basin Project area is prospective for base metal, manganese and phosphate mineralization.

3. LOCATION AND ACCESS

The Project area is situated approximately 400 kilometres east north-east of Alice Springs, in the southern Georgina Basin (Figure 1). Access to the Project area is gained via a network of station tracks and fences extending from the Plenty Highway.

EL27314 was granted on the 15 January 2010. EL27314 is located north of Tarlton Downs homestead, north of the Plenty Highway.
Figure 1: Location, EL27314
The 330000km$^2$ Georgina Basin is an erosional remnant of a series of central Australian intracratonic basins of Neoproterozoic to Palaeozoic age (Dunster et al, 2007).

Over 1.5km of Neoproterozoic sedimentary rocks are preserved in downfaulted blocks and half-grabens on the southern margin of the Georgina Basin, while up to 2.2km of Cambrian to Devonian sediments are preserved within depocentres and synclines. In the Project area, the seismic basement consists of relatively undeformed mafic–intermediate intrusive bodies and younger non-magnetic granitoids of the Altjawarra Domain.

The complex evolutionary history of the Georgina Basin began during the Neoproterozoic breakup of the Rodinia supercontinent, when a northwest trending transcontinental rift system developed. In the southern Georgina Basin, Neoproterozoic siliciclastic rocks were deposited in small grabens and half-grabens, and on rift shoulders.

By 550Ma, a major dextral strike-slip zone developed between the northern and southern blocks in central Australia (the Petermann Orogeny). In the southern Georgina Basin, up to 360m of Early Cambrian sediments were deposited in a distal foreland-sag basin. After the Petermann Orogeny strike-slip faults locked, more stable conditions led to deposition on a carbonate platform (including the Arthur Creek, Arrinthrunga and Tomahawk Formations). A hiatus in deposition between the Arrinthrunga and Tomahawk Formations reflects localized relative uplift corresponding to the Cambro–Ordovician Delamerian Orogeny.

The Early Ordovician Larapinta Event exposed a basement core complex south of the Georgina Basin. Sedimentation in the southern Georgina Basin was dominated by marine siliciclastic deposition. Synsedimentary normal faulting occurred in what are now the Toko and Dulcie Synclines. The synclines dominate the broad-scale structure of the southern Georgina Basin. The fold axes of both structures are parallel to the adjacent basin margin. Gravity and magnetic modeling of basin thicknesses indicates the synclines are amplifications of preexisting basin depocentres.

Ordovician extension was terminated at 450Ma by the onset of convergent subduction at Australia’s eastern margin. During the Alice Springs Orogeny, which intermittently spans the Late Ordovician to Late Carboniferous, basement was thrust over Neoproterozoic–Ordovician rocks to form the present southern margin of the Georgina Basin. Most north- and northwest-trending structures within the Basin were reactivated in a reverse sense.

The eastern and southeastern margins of the Georgina Basin are obscured by Jurassic–Cretaceous sedimentary rocks of the Eromanga Basin. Unconsolidated Cenozoic alluvial and eolian sediments blanket much of the Basin.

Within EL27314, Cambrian and Ordovician sedimentary units of the Tomahawk Formation outcrop as low hills and mesas (Figure 2). Unconsolidated Cenozoic alluvial and eolian sediments blanket much of the outcrop.
Figure 2: Surface Geology, EL27314
4. **EXPLORATION ACTIVITIES 2010-2013**

During the reporting period exploration activities undertaken within EL27314 included interpretation of the available geological and geophysical data, the interpretation of satellite imagery, reconnaissance field visits, the development of exploration models and the definition of exploration targets. Details of the work programmes are included in previously submitted annual reports.

5.1 **Interpretation of Available Geological and Geophysical Data**

Explore Pty Ltd (principal Kim Francombe) collaborated with Southern Geoscience Consultants to retrieve, process and interpret existing open file aeromagnetic and radiometric data over the Project area.

The data indicated that manganese mineralization is controlled by northeast-southwest trending structures, possibly reflecting hydrothermal fluid migration along faults extending from a basement source.

5.2 **Interpretation of Satellite Imagery**

Remote Sensing and Geological Services (principal Taff Davies) completed an interpretation of Landsat Thematic Mapper imagery over the Project area. Seventy absorptive targets were identified as potential manganese mineralization locations, of which fourteen were located in EL27314. Some of the targets related to known manganese occurrences in association with northeast-southwest trending structures.

Point Repose Consulting Pty Ltd (principal Nat Cull) completed a review of the aeromagnetics, previous exploration data and remote sensing targets to generate priority targets for further reconnaissance exploration. The review identified an additional twenty-five targets, four of which were located in EL27314.

5.3 **Reconnaissance Field Visits**

Reconnaissance field inspections of known manganese outcrops and priority remote sensing targets within the Project area were undertaken (using a helicopter for access). The majority of the manganese mineralisation occurrences encountered consisted of replacement of thin, generally 5cm to 30cm thick, flat-lying horizons with a sandstone unit of the Tomahawk Formation. Although in some instances these occurrences were extensive, occurring over areas greater than 1,000 metres by 200 metres, they were not considered likely to represent a large mineralised system. Some of the targets showed evidence of hydrothermal brecciation and altered fluid pathways within carbonate units. A total of sixty rock chip samples (GB001-GB038, GB040-GB061) were collected; thirty-five of which were subsequently assayed for \( \text{Al}_2\text{O}_3 \), CaO, Cr\( _2\text{O}_3 \), Fe\( _2\text{O}_3 \), Fe, K\( _2\text{O} \), LOI, MgO, Mn, Na\( _2\text{O} \), P\( _2\text{O}_5 \), SiO\( _2 \), S, and TiO\( _2 \) by method XRF78S, SGS Laboratories. None of the samples collected were from EL27314.
5.4 Base Metal Target Definition

The previous exploration activities identified six priority manganese targets based on sample analyses and field observations. The targets are associated with northeast-southwest trending structures and a disconformity between Cambrian Arrinthrunga Formation carbonate sediments and Cambro-Ordovician Tomahawk Formation clastic sediments. None of the targets are within EL27314.

A review of the existing data was undertaken examining the potential for base metal mineralization within the Project area. An exploration model was developed to identify base metal mineralization targets, using known occurrences of base metals in the Georgina Basin as a guide. The model indicates base metal mineralization is associated with north or northwest trending structures, positive magnetic anomalous (basement highs) +/- coincident gravity highs, anomalous geochemical trends (including manganese anomalism), and Cambrian carbonate sediment hosts. Application of this model to the Project area identified one priority exploration target within a broad, northwest trending linear zone, which extends across EL27314.

5.5 Phosphate Target Definition

Historic data indicated phosphate mineralization is associated with outcropping or subcropping Arthur Creek Formation. The Formation is present at considerable depths below surface within EL27314.

5.6 VTEM Geophysical Survey

The base metal priority exploration target was evaluated by a 300km$^2$ VTEM system helicopter-borne time domain electromagnetic survey flown by Geotech Airborne PL in May 2012. The data was processed and reviewed by Southern Geoscience Consultants, with several northeast trending conductive units identified. The conductors were generally fairly wide (several hundreds of metres) and had strike lengths of up to several kilometres. The broad multi-peaked EM response profiles indicated the conductive units were flat, tabular and are either horizontal to near horizontal bodies, occurring at depths ranging from sub-cropping to greater than 200 metres vertical depth. The conductors were interpreted to reflect regolith/oxidation or perhaps lithological variations, although some of the conductors correspond with higher time constant values, which suggested weakly conductive mineralisation. No discrete responses indicative of highly conductive massive sulphide type conductors were identified in the VTEM data. The VTEM also highlighted thin northwest trending zones in the survey area, which were interpreted as possible fracture zones. These fractures potentially represented primary conduits for hydrothermal fluids.

A total of 23 conductive anomalies were identified in the VTEM data, five of which were considered high priority due to their geological placement and stronger representation in mid to late time EM response. Two of the priority anomalies, GB_VC_10 and 11, were located within EL27314 (Figure 3).
Figure 3: VTEM Targets
RC drilling of three of the priority VTEM targets (all outside of EL27314) did not intersect significant base metal mineralization. The conductors identified in the VTEM survey were found to represent weakly conductive regolith horizons associated with the current groundwater table, within a deeply weathered profile.

5. CONCLUSIONS AND RECOMMENDATIONS

A review of the available geological and geophysical data for the Project area culminated in the definition of exploration models and the identification of a base metal priority exploration target within the Project. VTEM geophysical surveying defined 23 conductive anomalies within the priority exploration target. RC drilling of three of the highest priority anomalies (outside EL27314) did not locate any significant base metal mineralization.

EL27314 was surrendered on the 30 January 2013.
6. REFERENCES


