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ABSTRACT

EL26588 is located 44 km NE Tennant Creek and 40km east of Three Ways immediately south of the Barkly Highway on the TENNANT CREEK 1: 250,000 and BARKLY 1:100,000 map sheets in the Northern Territory. The tenement occurs on the western margin of the Georgina Basin where flat-lying Cambrian sediments have been deposited. The basal part of this sequence, the Gum Ridge Formation, is considered prospective for phosphate mineralization overlying either carbonates or basalts of the Middle Cambrian. In 2010, field reconnaissance was carried out to determine the type and extent of outcrop and its pertinence to phosphate mineralization. Geochemical sampling was undertaken for multi-element assaying and this work involved the collection of 83 samples of which 47 were submitted. There were no significant soil phosphorus results with a highest value of 140 ppm in an area where geological mapping (Donnellan et al., 1998) indicates the presence of Quaternary sands overlying Gum Ridge Formation. Samples 1000 m either side of this sample contain 50 ppm P. High magnetic susceptibility readings recorded at this site suggest basalt of the Helen Springs Volcanics. Due to these unfavourable reconnaissance results, the tenement was surrendered on 15 November, 2012.
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1. INTRODUCTION

This report describes exploration activities on EL26588, Tennant Creek East prospect which is part of Minemakers Australia Pty Ltd (MAPL) Barkly Project. MAPL is a wholly owned subsidiary of Minemakers Limited which listed on the ASX on 10 October 2006. Exploration is aimed at the discovery of economic phosphate deposits proximal to the Alice Springs-Darwin railway and associated with shallow marginal sediments at the western edge of the Georgina Basin, similar to MAPL’s Wonarah deposits located approximately 200 km to the east-southeast.

2. LOCATION

EL 26588 is located 44 km northeast of Tennant Creek in the Northern Territory (Figure 1). The tenement lies on the 1:250,000 TENNANT CREEK SE53-11 and the 1:100,000 BARKLY 5859 map sheets. The centroid of the tenement is located close to 134°40’E and 19°25’S. The tenement covers generally flat to undulating pastoral land falling within NT Portion 1075 being Tennant Creek Perpetual Lease 1142 owned by KG, JS, GJ, & G Ford of Hughenden, Queensland.

3. TENURE

EL26588 covering 71 blocks (183.5 km²) was granted on 11 August 2008 to Minemakers Australia Pty Ltd for a period of six years. A partial surrender report detailing 20 blocks was submitted on 11 March 2011.
Figure 1: Location of EL26588.
4. GEOLOGY

The Tennant Creek East prospect is located on the eastern edge of the Palaeoproterozoic Tennant Creek Inlier and undeformed Middle Cambrian sedimentary rocks of the Gum Ridge Formation on the western edge of the Georgina Basin (Figure 2 and Figure 3). Geological mapping (Donnellan et al., 1999) indicates the oldest rocks lie to the north and are included in the Warramunga Formation of Palaeoproterozoic age (1859-1872 Ma). These rocks consist of tuffaceous turbiditic sedimentary rocks which have undergone polydeformation and low grade greenschist facies metamorphism.

Early Cambrian deposition is represented by the Helen Springs Volcanics that consist of amygdaloidal tholeiitic basalt and a basal sandstone unit. These rocks unconformably overlie folded Warramunga Formation. The contact with the overlying Gum Ridge Formation appears to be transitional. The Gum Ridge Formation was deposited in shallow shelf epicontinental seas subject to episodic peritidal influence. Lithologies consist predominantly of tabular chertified rocks, derived from the silicification of bedded impure calcareous mudstone or marl. Occasional trilobites, brachiopods and sponge spicules occur in this formation.

Figure 2: Stratigraphy & Phosphate Occurrences of the Georgina Basin (After Khan et al, 2007)
EL26588 is located on the BARKLY 1:100,000 map sheet. The NT Geological Survey has interpreted the underlying basement geology from gravity and aeromagnetic survey data. Stronger magnetic units that may contain volcanic units and low magnetic units are grouped within the Ooradidgee Formation a correlative of the Flynn Subgroup (Donnellan, 1995). Lithologies in this sequence consist of volcanic and volcaniclastic rocks comprising felsic lava ignimbrite, tuff and chert, sublithic and lithic arenite, wacke, siltstone, shale and mudstone. These rocks have been intruded by granite of the Tennant Creek Supersuite (1840-1850Ma). Donnellan et al. (1995) has interpreted the underlying Palaeoproterozoic rocks in the tenement area to be part of the Flynn Subgroup.

There is little or no outcrop within the tenement and lateritization is extensive. However, the Gum Ridge Formation has been mapped in the immediate region (Donnellan et al., 1998) and is known to underlie Quaternary surficial deposits from geological mapping and water bore drilling in the region.

5. WORK COMPLETED

Preliminary research involved identifying water bores in the immediate area and ascertaining whether these had been tested for phosphate in Khan et al. (2007) study. This study identified two strongly anomalous water bores (RN10258 & RN16928) within an area where geological mapping had identified key lithologies in the Helen Springs Volcanics and Gum Ridge Formation (Figure 4). Furthermore, there are extensive areas of alluvium and colluvium that possess elevated phosphate prospectivity. It was considered that any near-surface phosphorite would have a geochemical signature that may be identifiable by soil or maglag sampling.
Figure 4: Location of RN010258 and RN0116928 proximal to EL26588 (Source: Khan et al., 2007)

5.1 Geochemical survey

A geochemical survey was conducted over station tracks within the tenement during late January 2010 (Figure 5). A total of 82 geochemical samples were collected and these are summarised below:

35 maglag samples (94002-94018, 94137-94154)
3 rock samples (219905-219907)
44 soil samples (94242-94282, 219801-219803).

Soil samples were collected from a depth of about 15 cm. Sample weights were in the range 1200-1300 gm. Maglag samples were not always available at each site. Sample weights were in the range 15-30 gm. In addition, magnetic susceptibility and scintillometer readings were recorded at each sampling site using an SM-30 magnetic susceptibility meter and a RadEye PRD scintillometer.

The soil and rock samples were forwarded to ALS Chemex, Mt Isa. The soil samples were sieved to -80#, pulverised and digested in a multi-acid digest and assayed using ME-MS41, ICP-MS, ICP-AES techniques for the following 51 elements: Ag, Al, As, Au, B, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Fe, Ga, Ge, Hf, Hg, In, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, Re, S, Sb, Sc, Se, Sn, Sr, Ta, Te, Th, Ti, Ti, U, V, W, Y, Zn and Zr. The rock samples were pulversed and digested in a multi-acid digest and assayed using ME-MS41, ICP-MS, ICP-AES techniques for the same 51 elements listed above. The results are reported in Laboratory Reports MI10020779 (rocks) and MI1024320 (soils).

Due to a misunderstanding the maglag samples were not submitted until November 2010. Samples were submitted to Genalysis Laboratories Pty Ltd. For samples ≤ 25g there was no preparation and samples >25g were pulversised. An aqua regia digest was used and the following elements were assayed: ICP-OES for P (10ppm), Fe (100ppm), Mn (1ppm); ICP-MS for As (0.5ppm), Cd (0.01ppm), Ce (0.01ppm), La (0.01ppm), Pb (0.5ppm), U (0.01ppm) and Th (0.01ppm). Results are reported in Laboratory Report 1286_0_1015483.
Figure 5: Exploration Index Plan
5.2 Results

There were no significant soil phosphorus results. The highest value came from soil sample 94267 which assayed 140 ppm P and was located on a north-south track at 53K 470742E, 7851953S and 276mRL. Geological mapping (Donnellan et al., 1998) indicates the presence of Quaternary sands overlying Gum Ridge Formation despite samples 1000 m either side of this site containing only 50 ppm P. High magnetic susceptibility readings averaging 6.3x10^-7 cgs and scintillometer readings at 15 cps were recorded at this site. Rock sample 219907 located at 53K 454876E 7859075S 279 mRL assayed 100ppm P. This rock consists of nodular laterite developed over felsic volcanics.

6. CONCLUSIONS AND RECOMMENDATIONS

Since there were no significant surface sampling results, the tenement was surrendered on 15 November, 2012.

7. REFERENCES


