ABSTRACT

ML27244 forms part of the Wonarah Project, located approximately 240 km east-south east of Tennant Creek. This report details work completed during the first year of tenure which comprised crushing and analysis of material which had been mined from the Arruwurra trial pit the previous year. A total of 199 samples were taken from the trial pit and a stockpile and analysed for a multi-element suite by XRF by Amdel Laboratories, Mt Isa. The total expenditure for the reporting period was $2,263,417.43.
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1 INTRODUCTION

This report describes exploration activities during the first year of tenure for ML27244, (Wonarah Mineral Lease) which is part of Min emakers Australia Pty Ltd (MAPL) Wonarah Project. The tenement was applied for to provide the necessary infrastructure for the Wonarah mining operation and to cover the bulk of the then-defined resource and was previously part of SEL26452.

A feasibility study on the Wonarah Project was completed in May 2010 by AMC Pty Ltd and has already been forwarded on DVD. The entire resource is now within ML27244, although it was still within SEL26452 at the time of calculation. JORC compliant figures are as follows:

<table>
<thead>
<tr>
<th>CUT-OFF</th>
<th>INDICATED</th>
<th>INFERRED</th>
<th>TOTAL</th>
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<tbody>
<tr>
<td>15% P₂O₅</td>
<td>197Mt @ 21.6% P₂O₅</td>
<td>207Mt @ 20% P₂O₅</td>
<td>404Mt @ 21% P₂O₅</td>
</tr>
<tr>
<td>10% P₂O₅</td>
<td>289Mt @ 18.5% P₂O₅</td>
<td>331Mt @ 17% P₂O₅</td>
<td>620Mt @ 18% P₂O₅</td>
</tr>
<tr>
<td>0% P₂O₅</td>
<td>536Mt @ 12.8% P₂O₅</td>
<td>722 Mt @ 11% P₂O₅</td>
<td>1,258Mt @ 12% P₂O₅</td>
</tr>
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MAPL is a wholly owned subsidiary of Mine makers Limited which listed on the ASX on 10 October 2006. Exploration by MAPL is aimed at the discovery of economic phosphate deposits proximal to favorable infrastructure, particularly the Alice Springs-Darwin railway. Such deposits are known to occur in shallow marginal marine sediments at the western edge of the Georgina Basin.

2 LOCATION

ML27244 is located 240km east-southeast of Tennant Creek and the nearest town is Camooweal in western Queensland, approximately 180km to the east (Figure 1). The tenement is on the 1:250,000 Alroy, Frew River, Ranken and Avo  n Downs and the 1:100,000 Wonarah, Joildung, Ranken and Barry Caves map sheets.

Access to the project is via the Barkly Highway, the main paved freight link between Queensland and the Northern Territory, which runs along the northern boundary of ML27244. Access within the tenement is via a network of dozed tracks suitable for 4WD only.

The topography relief is very gentle and the area is semi-desert with generally sparse tree and shrub cover.

3 TENURE

ML27244 covers 10,800 hectares and was ML27244 was applied for on 23 March 2009 and granted on 18 February 2010 to MAPL for a period of 20 years, expiring on 17 February 2035. The tenement is located on NT Freehold Land (NT Portions 0374 7-03756) owned by the Arruwurra Aboriginal Corporation.
Figure 1: Location of ML27244
4 GEOLOGY

Minemakers Australia is seeking to develop a large sedimentary phosphate deposit within the Georgina Basin. The Georgina Basin is an extensive late Proterozoic to early Palaeozoic basin that extends from northwestern Queensland through much of the eastern Northern Territory area and which hosts several large sedimentary phosphate deposits. A map representing the regional geological setting is presented in Figure 2.

Sedimentary phosphate deposits are restricted in their occurrence globally. The model for phosphate deposition requires upwelling, cold phosphate-saturated water depositing phosphate onto the continental shelf where the required narrow pH range is locally present. Co-deposition with carbonate occurs at slightly higher pH values. Carbonate deposition becomes dominant at higher pH. Post-depositional reworking and replacement of carbonate facies by phosphatic mineralisation is probably an important factor in upgrading phosphorite grades to economic levels.
The Wonarah phosphate project is situated in the central western Georgina Basin, a large late Proterozoic to early Palaeozoic basin that extends from northwestern Queensland through much of the eastern Northern Territory.

Basement rocks in this part of the Georgina Basin are comprised of granites of unknown age. They are possibly correlates of the Palaeo-proterozoic rocks of the Tennant Creek region. Mesoproterozoic sediments and volcanics are overlain by the Early Cambrian Helen Springs Volcanics (formerly Peaker Piker Volcanics). A northeast-southwest trending basement high runs through the Wonarah project area.
Overlying Middle Cambrian sediments are divided into two basin-wide sequences. Sequence One deposited clastics, carbonates, organic shales and minor phosphorites during gradual transgression which was abruptly terminated by rapid regression. In the Wonarah region, basement highs are flanked by onlapping dolomitic rocks equivalent to the Thorntonia Limestone. An erosional unconformity is represented by the development of a karst surface.

Sequence Two deposited shallow clastics, carbonates, grainstones, peritidal phosphorites and phosphatic limestones in a transgressive tract system. At Wonarah dolostone, mudstone and phosphate of the lower Middle Cambrian Upper Gum Ridge Formation overlie Sequence One rocks and basement highs. This formation contains major phosphate mineralisation and is equivalent to the Beetle Creek Formation on the eastern Margin of the basin which hosts Phosphate Hill and Lady Annie-D-Tree phosphate deposits. The overlying Wonarah Beds are Middle Cambrian mudstone, siltstone and dolostones. Silcrete, ferricrete and calcretic regolith are extensively developed and large areas are covered by stabilised aeolian sand.

4.1 Project Geology
4.1.1 Main Zone

Basement in the Main Zone area is alkali feldspar granite of possible Palaeo-proterozoic age. These are overlain by the Helen Springs Volcanics. The top of the basalt is extremely weathered and a ferruginous and manganiferous duricrust is developed locally. Where less weathered, the basalt is vesicular, amygdaloidal and irregularly porphyritic. Dolomitic rocks of the Thorntonia Limestone equivalent are present above the basalt at the southeastern extremity of the Main Zone. To the east and the south the carbonate rocks are developed extensively.

The overlying phosphate-bearing Upper Gum Ridge Formation is divided into five main units: a basal, indurated high grade phosphorite; muddy to sandy, clay-rich transitional sediments; a chert breccia phosphorites; a mudstone phosphorite; and a convolute mudstone.

The basal Transitional Phosphorite is a laterally discontinuous high grade indurated phosphorite up to 3m thick developed throughout the eastern and southern part of the Main Zone.

The Transition Sediments (TUN) are laterally continuous, 4-6m thick and comprised of clay-rich mudstone and siltstone with minor phosphorite, dolomite, sandstone and basal epiclastic.

The Chert Breccia Phosphorite forms a distinctive, laterally continuous horizon, 1-10 m thick, and comprised of yellow, grey or pink, variably friable or indurated, low to high grade phosphorite with abundant dark grey chert. Chert averages 50-60%.

The Mudstone Phosphorite is the main phosphate-bearing unit at Wonarah and is comprised of 1-10m of yellow and pink mudstone phosphorite with trace to minor dark grey chert. The mineralogy is dominated by (carbonate)-fluorapatite–$\text{Ca}_5(\text{PO}_4,\text{CO}_3)_3F$. The MPH is variably friable or indurated with the indurated phosphorite typically being high to very high grade (30-40% $\text{P}_2\text{O}_5$).

The Convolute Mudstone is a 1-10m thick unit of white, light grey and yellow clay-rich variably convolute mudstone with minor siltstone and fine sandstone interbeds. It generally contains minor (<10%) $\text{P}_2\text{O}_5$. 
The Wonarah Beds overlie the Convolute Mudstone and are comprised of mudstone and siltstone with min or chert, the Hangingwall Mudstone. The Wonarah Beds thicken towards the east and south away from the basement high that defines the western fringe of the Main Zone. Dolomitic units, the Hangingwall Dolostone, are present east and south of the Main Zone.

Regolith is extensively developed throughout the Main Zone with silcrete and ferricrete present in most holes. Low silcrete ridges are prominent features. Colluvial and alluvial deposits are common and extensive stabilised aeolian deposits cover much of the regolith.

The phosphatic units thin and peter out towards the basement high which trends in a northeast-southwest direction towards Arruwurra. To the east and south the phosphatic units, although still present with grade and thickness, are too deep to be of economic interest at this time.

A stratigraphic column and schematic section are presented in Figure 3 and Figure 4, respectively.
4.1.2 Arruwurra

At Arruwurra, the economic phosphate mineralisation occupies a broad northeast-southwest trending shelf sloping gently to the southwest. The shelf drops away sharply at the western end and along the southeastern edge. Mineralisation outcrops in the northeast before petering out against the basement high to the north.

Basement at Arruwurra is similar to the Main Zone and comprised of alkali feldspar granite of possible Palaeo-proterozoic age. This is overlain by the Helen Springs Volcanics which are similar in character to Main Zone. Thorntonia Limestone equivalent dolomites and dolostones overlay the basalt along the southeastern and southern margin of the deposit. An abrupt change in lithology and depth to basalt basement indicates a probable fault which has thrown the deposit side upwards. A karst surface is present on the dolomite.

The Upper Gum Ridge Formation at Arruwurra is somewhat attenuated in comparison to the Main Zone. The stratigraphic equivalent of the high grade Transitional Phosphorite is called the Basal Phosphorite at Arruwurra and is the main unit of economic importance. It is a strongly indurated, very high grade brown phosphorite mudstone which averaged approximately 2m in thickness and is developed throughout the north-eastern part of Arruwurra. The overlying Transitional Sediments are thinner than in the Main Zone and are comprised of 1-3m of mudstone, siltstone and phosphorite. The Chert Breccia Phosphorite is absent at Arruwurra and the overlying Arruwurra Phosphorite (APH) is the stratigraphic equivalent of the Mudstone Phosphorite. The Arruwurra Phosphorite is grey to yellow and is more chert-rich than the Mudstone Phosphorite at the Main Zone. The unit varies in thickness from 1 to 6m and is thickest along a north-east trending axis through the centre of the deposit. The Arruwurra Phosphorite is overlain by and, near surface, interdigitates with a limestone carbonatite unit in the northeastern part of the deposit area. Outcropping high grade phosphorites occur in this area.

The Convolute Mudstone is not logged at Arruwurra. The Hangingwall Mudstone unit is similar to the Main Zone except in the far east of Arruwurra where dolomitic and calcareous units, the Hangingwall Dolomite, are present.
Stabilised aeolian sand covers much of the area and is underlain by ferricrete, silcrete, and, above the carbonate unit in the northeast, calcrete and black soil.

5 WORK COMPLETED

5.1 Trial Crushing Program

In May 2010, a program was conducted to crush the remaining BPH material that had been stockpiled at Arruwurra as a result of the Trial Mining Program completed in December 2009 (Figure 5). The samples were taken from ore that was mined from the trial open pit and then had been stockpiled in the Loadout area, and a second stockpile on top of the waste storage. Both stockpiles were crushed and loaded into containers on the loadout area and samples submitted to Amdel Laboratories, Mt Isa for analysis. A summary review is attached as Appendix 1.

![Figure 5: Exploration Index Plan](image)

6 DISCUSSION

Planned future work on this tenement is the development of full scale mining once funding of the Wonarah Project is attained. This may include pre-feasibility for mining, beneficiation and pipeline construction.
7 REFERENCES

