MT MABEL PROJECT

EL29639 – MOUNT BRASSY

ANNUAL AND FINAL TECHNICAL REPORT

For the Period

22 April 2013 to 2 April 2015

Compiled by

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MAP REFERENCE: Alice Springs 250K - Sheet SG53-14
Target Commodities: Copper, Gold, Lead & Zinc

Report submitted 6 May 2015
All data provided is of GDA94 Datum, Zone 53.

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ABSTRACT:

Location: The EL is located within the Harts Range province of the eastern Arunta block in the Northern Territory, approximately 120km northeast of Alice Springs.

Geology: The project lies well within the Harts Range metamorphics of the Eastern Arunta Block, in a belt of metamorphosed sediments that are now biotite-sillimanite schists and gneisses. Several large scale pegmatite systems cross-cut the gneissic layering. These pegmatites have been historically worked for mica and possibly contain uraniferous Rare Earth Element (REE) minerals. Carbonate alteration, often associated with mineralisation and destruction of magnetism, is extensive. Adjacent to the west of the project is the Oonagalabi base metal deposit where a non JORC mineral resource of 25Mt@0.5%Cu and 1%Zn has been estimated.

Work Done: Work consisted of a complete review of historical work over the EL and generating targets for field follow-up.

Results: No field follow up work was completed prior to relinquishment of the EL in full due to financial constraints experienced by the company and the sector in general.

SUMMARY

The project area is located within the Harts Range province of the eastern Arunta block in the Northern Territory, approximately 100km northeast of Alice Springs.

It lies well within the Harts Range metamorphics of the Eastern Arunta Block, in a belt of metamorphosed sediments that are now biotite-sillimanite schists and gneisses. Several large scale pegmatite systems cross-cut the gneissic layering. These pegmatites have been historically worked for mica and possibly contain uraniferous Rare Earth Elements (REE) minerals.

Carbonate alteration, often associated with mineralisation and destruction of magnetism, is extensive.

A data review of all historic work was completed and a number of targets were identified for ground truthing which was never completed prior to relinquishment of the tenure.
1.0 INTRODUCTION

EL29639 lies within the Harts Range province of the eastern Arunta block in the Northern Territory, approximately 100km northeast of Alice Springs (Figure 1).

Mithril Resources was granted EL29639 on the 22nd April 2013 and covers 12 blocks for approximately 38sqkm.

Only minor exploration has been completed over the tenement area itself with most previous explorers focusing just to the west on the Oonagalabi mineral resource.

Location

The Project lies within the eastern Harts Ranges in the Northern Territory, approximately 100 km east-northeast of Alice Springs, on the Alice Springs 1:250,000 map sheet (Figure 1). Access is via the Plenty Highway, turning south onto station tracks (Riddoch Station) after crossing the Sandover River. The journey from Alice Springs is about four hours and is sealed for 150km, then becomes 4WD station tracks.

Figure 1: Location of EL29639 with mineral occurrences plotted on 250K topography.

Access is very limited within the prospect area with no reported tracks on the EL. Off-road driving or walking is required from the tracks, which access the Oonagalabi Cu-Zn deposit to the west of the lease. Relief in the lease is made up of a series of sharp ridges of granitic gneiss running east-west through the lease and constructing vehicular access would be extremely difficult.
2.0 TENURE

Tenure of the Mt Brassy Project is summarised in Table 1.

<table>
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<tr>
<th>Name</th>
<th>EL</th>
<th>Holder</th>
<th>Blocks</th>
<th>Area km²</th>
<th>Grant Date</th>
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<td>29639</td>
<td>Mithril Resources</td>
<td>12</td>
<td>37.90</td>
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</table>

TENEMENT STATUS

EL29639 was granted to Mithril on the 22nd April 2013 for a period of 6 years.

3.0 GEOLOGY

Various academic and government sources have developed a stratigraphic framework for the Proterozoic rocks of the Harts Range area based on classing the older units into Division 1 rocks and the younger units into Division 2 rocks. Both Division 1 (Strangways Metamorphic Complex, SMC) and Division 2 (Harts Range Group, HRG) have been further sub-divided into formations and informally into members. This broad, historical subdivision has been modified in many areas due to additional age dates becoming available from research.

Regional Geology

Structure

The Project area is situated in the SE portion of the Arunta Inlier, close to the boundary of the Proterozoic Aileron aged rocks and the Cambrian aged Riddock Amphibolite of the Harts Range Group. Of Proterozoic age, this inlier is a complex of high grade metamorphic sedimentary and igneous rocks, located at the southern margin of the North Australian Craton. The contact with the Central Australian Craton is overlain by the Neoproterozoic Amadeus Basin.

The Arunta Inlier merges with the Palaeoproterozoic Granites-Tanami Block to the NW and is bounded on all other sides by Palaeozoic Basins i.e. the Canning, Wiso, Georgina and Eromanga Basins.

The Arunta complex is transected by a series of regional and local scale east-west and northwest-southeast trending faults, which have been the loci of multiple phaser-south thrusting during the Proterozoic and later the Carboniferous Alice Springs Orogeny. This orogeny was responsible for retrograde metamorphism along the east-west structures, more widespread in the Harts Ranges than in the Central Province where it is intensely focussed on these structures. Metamorphic grades range from greenschist to granulite in the Northern Province and from amphibolite to granulite in the Central and Southern Provinces, with greenschist grades being associated with the retrogression in the south and central provinces.

Stratigraphy

Stratigraphy is largely overprinted by the structural thrusting and the division of the Inlier into structural provinces, but there are divisions of groups based on age dating and relationships. The older basement rocks have been considered to be the Strangways Metamorphic Complex, but age dating by AGSO suggests the Weldon and Aileron
Metamorphics in the Napperby area to the west may be older.

The Harts Range Group in the south eastern Arunta is essentially a pelitic and calcareous metasedimentary assemblage metamorphosed predominantly to amphibolite facies. The basal unit, the Entia Gneiss, has attained granulite facies but has been retrogressed to amphibolite facies and affected by the Palaeozoic Alice Springs Orogeny. PNC believed the Entia Gneiss was possibly older than the Strangways Metamorphics. The bulk of the Harts Range Group, the Irindina Gneiss and the younger Brady Gneiss, show little evidence of having exceeded amphibolite facies and are clearly younger than the Entia. The Bruna Gneiss, a felsic intrusive, or less likely a part-extrusive porphyroblastic rock, has been dated at 1750Ma but this date only puts a minimum age to the sequence. Studies at Adelaide University suggest the dominant metamorphism within the Harts Range Group is related to the Alice Springs Orogeny.

Post-orogenic platform cover sediments are sporadically distributed throughout the Arunta Inlier. At least three age groups were named but the Hatches Creek Group (1830–1800Ma) and the Reynolds Range group (1820-1780Ma) are now both considered SMC equivalents. The Simpson Gap Metasediments of the Iwupataka Metamorphic Complex (1660Ma) are truly covered.

The youngest sediments are the neo-proterozoic Amadeus Basin to the south and the Ngalia Basin in the centre (Fig. 4), which cover substantial portions of the Inlier and have little enough deformation to be significant oil and gas reservoirs.

Igneous Intrusives

The Arunta Inlier has a complex and virtually continuous history of igneous activity. There are at least six major recorded felsic igneous intrusive episodes. Of these the Ngadarunga Granite (1880Ma), the Napperby-Huckitta-Jervois Granites (1780-1760Ma) and the Yarangunyi Granite (1600-1570Ma) are the most extensive and geologically most important. Other recorded igneous events, of relatively small areal extent, are the Andrew Young’s Igneous Complex (1635Ma), Mordor Igneous Complex (1200Ma), Stuart (mafic) Dyke Swarm (1050Ma), Gum Tree Granite (990Ma), Mud Tank Carbonatite (730Ma) and the Harts Range Pegmatites (520,400Ma).

Project Geology

The Harts Range region has undergone repeated and substantial crustal reworking between Proterozoic and Palaeozoic times, and is now thought to represent an ancient and strongly altered/metamorphosed version of a continental collision zone. Much work was done in the 1990’s on the Harts Range region by Arnold and Fogly et al and Mawby (1996) of the University of Adelaide, with the assistance of PNC.

The two key findings by the Adelaide workers in the Harts Range region are as follows:

- Crust south of the Illogwa Shear Zone dates from between 1500-1250Ma compared to 450–300Ma in the Harts Range area, i.e. the Illogwa Schist Zone is a major crustal scale tectonic feature.
The Harts Range Group amphibolite facies metamorphism is Alice Springs Orogeny age and, unlike the Entia Dome sequence, there is no evidence for an earlier metamorphic event.

The key features of the Harts Range structural map, in order of interpreted age, are:

- The Entia Dome, a pre-1850Ma feature which forms basement to the Irindina Supracrustal sequence.

The emplacement of the younger granites (1780Ma) which form the exposed Inkamulla and Huckitta Domes. The position of the (inferred/buried) Mt. Muriel Dome is uncertain but is assumed to be post Entia as it has apparently indented the SW margin of the Entia Dome.

The Magneto-Telluric data from a team consisting of Adelaide University and NTGS geologists (Selway et al, 2007) suggests the Entia dome system is a deep-crustal feature that can be shown extending to the mantle. All the major structures, their conjugate structures and the shear zones show evidence of reactivation and retrogression to varying degrees.

A very important point noted was that the presence of mixed igneous mantle types, the deep seated subduction structures, significant amounts of fluid alteration and veining (particularly in mafic material), the presence of Cu in carbonates and shear zones in the area and magnetite in pegmatites in the project area all indicate that the Harts Range is highly likely to be prospective for IOCG deposits. The age and radioactivity of the granites in the region suggest that if present, these IOCG deposits are likely to be uraniferous.

In addition to the potential for IOCG deposits, the contact between the Cambrian aged Riddock amphibolite and the Proterozoic Aileron Province of the Arunta is prospective for Copper-cobalt mineralisation such as that discovered by Mithril in 2009 at the Basil Prospect southeast of EL29639 (Figure 2). At Basil, Mithril has outlined a JORC compliant resource of 26Mt @ 0.6%Cu and 0.06%Co.

4.0 PREVIOUS EXPLORATION

Exploration History

Earliest work in the region was poorly recorded mica mining from the depression era, with re-opening of the mica mines allegedly using POW labour during the war. Many of the Italians who had worked here during the war may have returned in the post-war era, as the anecdotal evidence from prospectors and station managers in the area suggests this situation. Base metals exploration for copper, with ancillary Au, Pb, Zn, Pt, Ni etc was conducted to the west of the EL by various workers with a focus on the nearby Oonagalbi base metal deposit. Only minor amounts of recorded sampling has been reported on EL29639 as outlined in Figure 2.
Figure 2: EL29639 with historic sampling plotted on 250K Geology. Note contact of green and pink geological units marks boundary of Cambrian aged Riddock amphibolite and Proterozoic Aileron Province.

A complete review of the historical work over the tenement can be found in Appendix 1.

5.0 WORK COMPLETED

5.1 2013-14

Work completed during the 2013-14 reporting period consisted of a complete review of all historic exploration to generate targets for ground follow-up.

5.2 2014-15

No work was completed during the reporting period due to financial constraints and the tenement was relinquished in full on the 2nd April 2015.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Ground truthing of targets generated during the desktop review in the first year is recommended. This work should focus on the contact between the Cambrian and Proterozoic aged rocktypes for Basil and Oonagalabi styles of mineralisation.
REFERENCES


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