Annual and Final Report On
EL 28496
for The Period
30 March 2014 to 5 May 2015
Northern Territory
(Gold and Base Metals Project)

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Exploration Licence (EL) 28496 is located approximately 90 km south of Darwin and about 15 km north of Adelaide River in central part of Pine Creek Orogen. It was granted to a syndicate of Abrar Hussain Malik and Zia U. Bajwah on 30 March 2012, and will expire on 29 March 2018. It comprises 6 blocks that covers approximately 13.6 km². Due to low mineral potential of the project area, EL 28496 was surrendered outrightly on 29 March 2015.

Geological setting of the project area is dominated by the Burrell Creek Formation whereas subordinate lithologies of the South Alligator River Group such as the Gerowie Tuff and Mt Bonnie Formations are also present in the north-western part of the project area. The Burrell Creek Formation mainly comprises grewacke, silts stone, slate and phyllite, whereas the Gerowie Tuff is mainly cherty tuff, silt-greywacke and siltstone. The Mt Bonnie Formation is represented by siltstone, mudstone, greywacke and chert horizons. The meta-sediments are tightly folded about axes, plunging towards south. However, much of the Palaeoproterozoic stratigraphic is under the Quaternary sediments and regolith cover which could be 10 - 40 meter deep.

During the term of the Licence, an appraisal of geological and geophysical data was under taken in order to assess mineral potential of the project area. A structural interpretation with the help of geophysical data was also conducted, which provided important subsurface information. In addition, a number of field trips were undertaken for ground-truthing. These rocks are folded into anticlinal structures which generally plunge southward. These anticlinal structures are host to gold mineralisation (e.g Zapopan and Howley anticlines) in the PCO. Almost whole of the project area is concealed under recent sedimentary cover and only drilling exercise can retrieve geochemical samples for assaying. However, surrounding geological setting and geochemical interpretation does not support the presence of gold or base metals mineralisation within the project area. As a result of that EL 28496 was surrendered on 5 May 2015.
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1.0 INTRODUCTION

EL 28496 is situated in the central part of the Pine Creek Orogen (PCO), which has been considered prospective for gold, base metals and uranium mineralisation. This tenement is explored for gold and base metals mineralisation, and in this communication exploration activities undertaken during the term of the Licence are documented.

2.0 LOCATION AND ACCESS

EL 28496 is located about 90 km south of Darwin (Figure 1) and approximately 15 km north of Adelaide River. Stuart Highway and Darwin to Adelaide Railway line transect the project area (Figure 1). Access within the tenement is possible by the station tracks, which could be difficult in the wet season. The tenement falls on the Pine Creek 1:250,000 sheets and on the Batchelor 1:100,000 sheet. The area underlain by EL 28496 is generally low-lying, open, black soil plains, with little rock exposures.

3.0 TENEMENT STATUS AND CLIMATE

EL 28496 was granted to syndicate of Abrar Hussain Malik and Zia U. Bajwah on 30 March 2012, and was expected to expire on 29 March 2018. It comprises 6 blocks that covers approximately 13.6 km² and falls on Pine Creek (1: 250,000) and Batchelor (1: 100, 000) sheets. However, due to low mineral potential of the tenement, it was surrendered on 5 May 2015. Underlying cadaster belongs to Adelaide River Grazing Company, AN Harrower, BR Taylor and JL Hills.

The project area has semi-arid, tropical climate with April to September warm dry season followed by wet season from October to March. The average rain fall is about 1200 mm and most of which falls during wet season. Temperatures are highest in October to November with the mean maximum 35° – 37° C, whereas mean minimum is 22 ° - 24° C. The coolest months are June and July when the mean maximum is 30° – 32° C, with the mean minimum of 12° - 14° C.
Figure 1: Tenement Location Map of EL 28496
4.0 GEOLOGICAL SETTING

EL 28496 is located within the Pine Creek Orogen (PCO), a tightly folded sequence of Palaeoproterozoic rocks, 10 km to 14 km in thickness, laid down on a rifted granitic Archaean basement during the interval ~2.2-1.87Ga (Ahmad et al. 1993). The sequence is dominated by pelitic and psammitic (continental shelf shallow marine) sediments with minor inter-layered tuff units. Pre-orogenic mafic sills of the Zamu Dolerite intruded the sequence prior to regional metamorphism and deformation.

During the Top End Orogeny (~1.87-1.85Ga) the sequence was tightly folded and pervasively altered with metamorphic grade averaging greenschist facies to phyllite. The Cullen intrusive event introduced a suite of fractionated calc-alkaline granitic batholiths into the sequence in the period ~1.85-1.78Ga (Bajwah 1994). These high temperature, I-type intrusives induced strong contact metamorphic aureoles ranging up to (garnet) amphibolite facies, and created more extensive biotite and andalusite hornfels facies.

Geological setting of the project area is shown in Figure 2. Here, the Burrell Creek Formation dominates the tenement area. Subordinate lithologies of the South Alligator River Group such as the Gerowie Tuff and the Mt Bonnie Formations area are also present in the north-western part of the project area. The Burrell Creek Formation mainly comprises grewacke, siltstone, slate and phyllite. The Gerowie Tuff is composed of cherty tuff and silt-greywacke and siltstone, whereas Mt Bonnie Formation’s main lithologies are siltstone, mudstone, greywacke and chert horizons. The meta-sediments are tightly folded about axes, plunging towards south (Figure 2). A number of gold, uranium and base metal deposits are hosted by these formations in the PCO. Gold mineralisation is found in saddle reefs in anticlinal closures, fissure veins in N-S shear zones, bedding parallel veins, and stock-works. Gold is also associated with minor sulphides in quartz veins. A major base metal deposits (Woodcutter) is located about 22 km north of EL 28496. It produced a total of 4.65Mt ore at 12.28% Zn, 5.65% Pb and 87 g/t Ag. In addition, two more base metal deposits such as Iron Blow and Mt Bonnie are confined to the Mt Bonnie Formation, which have produced significant quantities of base metals and gold in the past, and still have a combined resource of about 1Mt of ore which can increase substantially with further exploration.
Figure 2: Geological Setting of the Project Area
However, much of the Palaeoproterozoic stratigraphic is under the recent sediments and regolith cover which could be 10 - 40 meter deep.

5.0 PREVIOUS EXPLORATION HISTORY

A brief exploration history in and around the project area is given below. It is mainly derived from previous exploration reports stored in the NTGS repository along with Governmental geological and geophysical surveying programs.

Perhaps the earliest geological investigation of the area was conducted by the Aerial, Geological and Geophysical Survey of Northern Australia (AGGSNA) between 1935 – 1939. BMR (now Geoscience Australia) conducted geological mapping program in 1950’s and produced the first 1: 250 000 geological map of Pine Creek sheet covering the project area. Between 1971 – 1980, region including the project area was mapped in-detail with the production of Batchelor (1: 100 000) geological map.

Part of the project area was explored by Pancontinental Mining Pty Ltd under expired EL 1577. It included geological mapping, rock chip sampling, costeaming, auger and diamond drilling. Locally, high values of gold were encountered at Sundance prospect which was later mined. Uranium and base metal concentrations were also encountered (Pancontinental Mining Limited, 1981).

A syndicate of Jimberlana Minerals / Euralba Mining / WR Grace Australia / Pan D'Or Mining explored part of EL 28496 from 1982 – 1986 under ceased EL 1656 (Hancock,1987). Geological mapping, geochemical sampling were undertaken to search for gold and base metals mineralisation. However, the exploration was not very successful due to lack of geophysical survey.

From 1987 – 1991, part of the project area was explored by Eupene Exploration Enterprises under EL 5105 (ceased). It involved geological mapping, geochemical sampling, costeaming and drilling. Significant anomalous values were obtained from the main quartz reef at Area 3, Mt
Woods. One sample from southern end of Mt Woods showed significant gold mineralisation, assaying 13.93 ppm Au (Smith, 1990).

Some base metals anomalies were identified from Glen Luckie and Predictor Hill area while part of the area was explored under expired EL 6422 (Butler, 1991). Eighty stream sediments (-40 mesh) were taken from EL 6422 which outlined 4 anomalous areas outside the current project area. Forty rock chip samples were also collected during the same program. Elevated Cu (312ppm maximum), Pb (531ppm maximum) and weakly anomalous Zn (168ppm maximum) were obtained from the Tortilla Flats, Heaton Hill and Predictor Hill anomalies. At Glen Luckie 4 anomalous Zn (2050 ppm maximum), As (540 ppm maximum), Cu (280 ppm maximum) and Pb (100 ppm maximum) were obtained. All gold values were low.

6.0 EXPLORATION ACTIVITIES DURING TERM OF THE LICENCE

During the period under review, an appraisal of geological and geophysical data was undertaken in order to assess mineral potential of the project area. A structural interpretation with the help of geophysical data was also conducted, which provided important subsurface information. In addition, a number of field trips were undertaken for ground-truthing. Figure 3 shows exploration index map of EL 28496.

Reconnaissance ground-truthing of the project area shows that much of EL 28496 is covered by recent sedimentary cover which hampers access to bed rock geology. To date, geological mapping undertaken indicates that in the north-western part of the tenement Gerowie Tuff and Mt Bonnie Formation are present, which probably are overlain by the Burrell Creek Formation. These rocks are folded into anticlinal structures that generally plunge southward (Figure 2 and 3). These anticlinal structures are generally host to gold mineralisation (e.g Zapopan and Howley anticlines) in the PCO. All the rock formations present in the project area are prospective for gold and base metals mineralisation. In addition, geological setting may also be fertile for the uranium mineralisation, particularly due to its close proximity to the Rum Jungle Uranium Mineral Field. The Burrell Creek Formation is exposed along Stuart Highway cuttings within the project area. It generally occurs as massive light reddish-brown greywacke which has been subjected to extensive brecciation and fracturing as a result of deformation (Figure 4). It is mainly composed of quartz, feldspar fragments set in fine-grained matrix.
Figure 3: Exploration Index Map of EL 28496
Figure 4: Grewacke of the Burrell Creek formation exposed along Stuart Highway cutting (729200mE, 8546250mN) Fracturing and brecciation may be seen in the outcrop
The Burrell Creek is generally covered by alluvial/colluvial recent sedimentary cover (Figure 4), which appears to be mainly derived from overlying rocks.

Figure 2 shows that nose of the anticlinal fold terminates just inside the tenement area. However, TMI image (Figure 5) of the project area shows that it extends well into the southern part of EL 28496, where it is covered by recent sedimentary cover. The western limb of the anticline appears to be magnetic which could also be host to gold mineralisation as noted elsewhere in the PCO.

The Licence was also searched for drilling data. However, no data were found and search will continue to examine the historical annual exploration report. Some of the geochemistry done outside the project area is not prospective.

Part of the project area is covered by AEM survey undertaken by Geoscience Australia undertaken during 2008-2009 (Craig, 2011). Line 1002101 covers the project area and surrounding region. Interpretation of AEM section shows a moderate conductor in the southern part of EL 28496, which is coinciding with the fold structure. This conductor may be due to the presence of carbonaceous and pyritic sediments within the Mt Bonnie and Gerowie Tuff (South Alligator Group). However, there is no Palaeoproterozoic, fractionated I-type granite which could be responsible for gold, base metals and uranium mineralisation in the adjacent sediments.

7.0 CONCLUSIONS AND RECOMMENDATIONS

A technical review of geological, structural and geophysical data indicates that EL 28496 has little potential for any economic mineralisation. As much of the project area is concealed under recent sedimentary cover, and requires drilling to retrieve geochemical samples for assaying. However, due to depressed economic environment what exploration industry is facing, it is difficult to commit funds for such a project which has low economic potential. Due to these factors, EL 28496 was surrendered on 5 May 2015.
Figure 5: TMI Image of the Project Area
8.0 REFERENCES


