NUPOWER RESOURCES LTD
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AILERON PROJECT
EL 28475 Gilbeanie Bore

FINAL REPORT, SEPTEMBER 2012

Operator: NuPower Resources Ltd

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Map Sheets
1:100,000 Ti Tree 5553
1:250,000 Napperby SF53-09
GDA94, Zone 53

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SUMMARY

EL28475 was granted to NuPower Resources on 16/8/2011. It was acquired to test an airborne magnetic anomaly which was thought could be associated with rare earth or IOCG mineralization.

There are no known mineral deposits in the area. The nearest occurrences are of copper and tin at White Yard Hill 30km to the southwest and rare earths at Mt Finnis 40km to the west. The Nolans P-U-Th-REE deposit lies 30km to the southwest.

The region is underlain by rocks of the Arunta Region, a complex basement inlier in central Australia that has undergone a prolonged history of sedimentation, magmatism and tectonism extending from the Palaeoproterozoic to the Palaeozoic that is subdivided into three, largely fault bounded terranes with distinct geological histories; the Aileron, Warumpi and Irindina Provinces. The basement geology of the region comprises units of the Aileron Province consisting of greenschist to granulite facies metamorphic rocks with protolith ages in the range 1865-1710 Ma. It forms part of the North Australian Craton and is geologically continuous with the gold-bearing Tanami and Tennant Regions to the north.

Because of the high grade of metamorphism and the paucity of continuous outcrop across the Arunta Province, a reliable stratigraphy has not yet been constructed for the metasedimentary sequences and instead, the Early–Mid Proterozoic metamorphosed rocks have been subdivided into three Divisions, intruded by granites, on the basis of broad lithological correlations, in which Division 1 is regarded as the oldest and Division 3 as the youngest.

Division I rocks comprise mafic and felsic granulites and minor metapsammite and calcareous lithologies that are typified by granite facies metamorphic mineral assemblages. They are faulted against rocks of Division 2 or form enclaves surrounded by granite, orthogneiss or granitic gneiss. In the Gilbeanie Bore area they probably include the Tyson Creek Granulite, Weldon Metamorphics and Possum Creek Charnockite.

Division 2 comprises mostly metamorphosed pelitic, calcareous, or psammitic rocks and minor mafic-intermediate meta-igneous rocks. They range from low greenschist to low granulite facies and are usually faulted against Division 1 and overlain with an angular unconformity by Division 3. Units of Division 2 may be present here. Subdivided into 6 units they all appear to be lithological facies of one enormous flood of terrigenous detritus. Perhaps represented here by two lithologies of the Lander Rock Beds they comprise highly folded pelitic and impure metasediments ranging in grade from high amphibolite to low granulite facies that appear to have originated from a granitic terrain.

Division 3 consists of a basal conglomerate or arkose overlain by a mature quartzite followed by metamorphosed pelitic and calcareous rocks. Similar to Division 2 they grade from low greenschist to low granulite. This Division may be represented here by rocks of the Reynolds Range Group, a conformable sequence of quartzite, shale and carbonate.

Eleven intrusive granitic units, Mid Proterozoic in age, have been mapped in the Reynolds Ranges region, grouped into 7 older granitic gneisses and orthogneisses dated at 1500-1600m.y and three younger gneisses and unmetamorphosed porphyritic granite dated at 1350-1400m.y. Five of the older granitic rocks, the Anmatjira, Boothby, Yaningidjara, and Aloolya Orthogneisses and an un-named gneiss may be represented here. The Anmatjira and Aloolya Gneisses, and the un-named gneiss intrude Tyson Creek Granulite and Weldon Metamorphics in the Mt Weldon-Mt Finnis area west of the license where the Anmatjira Gneiss contains a small occurrence of rare earths near Mt Finnis. Boothby Gneiss outcrops in the headwaters of Woodforde River south of the area and is associated with the Nolan’s Bore rare earths deposit. Yaningidjara Gneiss underlies the Yaningidjara Hills west of the area. The Orthogneisses are granitic in composition, contain xenoliths of the surrounding metamorphic rocks, locally send dykes into the surrounding country rocks and are therefore interpreted as pre-syn tectonic granites.

The Arunta Block is traversed by a series of WNE-NW trending faults that locally widen into extensive zones of shearing and retrogression comprising muscovite-quartz schist with extensive quartz veins and epidote-bearing rocks. These may pass beneath EL28475.

The southern NT forms a ‘basin and range’ province in which Proterozoic and Palaeozoic rocks form prominent ranges separated by broad valleys in which at least twenty major Cainozoic sedimentary basins have developed. Of these the Ti Tree Basin completely covers the Gilbeanie Bore area. The stratigraphy of these basins is generally poorly known due to a lack of outcrop, strong weathering overprints, the paucity of drillholes and a lack of attention paid to the ‘cover’ overlying crystalline basement. Limited stratigraphic drilling by both the
BMR and the NTGS during the 1960’s and 1970’s provides much of the regional stratigraphic information of the Cainozoic Basins.

Due to lack of funds, no work has been done on the tenement and the decision was made to relinquish it entirely.

INTRODUCTION

NuPower originally became interested in the general area because of its Tertiary paleo-channel uranium potential and lesser hard rock uranium potential. Work has been done on the surrounding tenements, EL26374, EL24741 and EL28498 to explore for uranium.

EL28475 was taken out to explore a prominent circular magnetic feature which has had very little exploration in the past. It was thought that this could represent an alkalic intrusive complex with possible rare earth mineralization, or perhaps an IOCG occurrence.

LOCATION AND ACCESS

Gilbeanie Bore tenement EL28475 is located approximately 150 kilometres north northwest of Alice Springs within the Ti Tree (5553) 1:100,000 and Napperby (SF53-09) 1:250,000 map sheets (Figure 1). The tenement occurs within Pine Hill Station (NT Portion 725, PPL 1030) and straddles the Stuart Highway midway between the Ti-Tree Roadhouse and Aileron Roadhouses (approximately 30km from either).

The Amadeus Basin – Darwin gas pipeline passes through the tenement, whilst the Adelaide – Darwin Railway lies approximately 45km to the east.

Access to the tenement is via the Stuart Highway and from there via the network of station roads and tracks linking the water bores. It is also possible for light vehicles to access the tenement via the service road alongside the NT Gas pipeline, however a permit must be obtained from NT Gas before using this road.
Figure 1 – Gilbeanie Bore (EL28475) Tenement Location
CLIMATE AND VEGETATION

The region has a semi-arid continental climate, characterised by long hot summers when temperatures regularly exceed 40°C, and short mild winters. Average annual rainfall for the Gilbeanie Bore region taken from the Territory Grape Farm Bureau of Meteorology weather station is 305.4mm, most of which falls in the November to February period. Average minimum and maximum temperatures in summer are 21.7°C and 37.6°C while the corresponding winter average temperatures are 4.9°C and 22.3°C.

The Gilbeanie Bore tenement occurs in the Burt Plain (BRT) bioregion. Broad vegetation types within the Burt Plain bioregion include Eucalyptus low woodland with tussock grass understorey, Eucalyptus woodland with hummock grass understorey, Acacia woodland, hummock grassland and tussock grassland (Wilson et al. 1991 as cited by Baker et al., 2005).

TOPOGRAPHY AND DRAINAGE

Gilbeanie Bore EL28475 is situated to the north east of the NW-SE trending Ti-Tree Fault where the landscape over the Ti-Tree Basin consists of a flat, featureless sand-plain that slopes gently away from the ranges at elevations of around 575m to 605m ASL. The sand plain is mostly devoid of drainage.

Drainage in the area is dominated by the headwaters of Woodforde River draining north-eastwards from the Reynolds Range.

LOGISTICS

Alice Springs (pop. 27,000) is serviced daily by jet aircraft from several Australian capital cities (Sydney, Adelaide, Perth and Darwin) and less regularly from Brisbane, Cairns and Broome. Because of its location midway between Adelaide and Darwin the town is also well serviced by road transport and interstate bus services.

The Adelaide-Darwin transcontinental railway, passing through Alice Springs, is located approximately 45km east of EL28475. The Stuart Highway and the natural gas pipeline from the Amadeus Basin (west of Alice Springs) to Darwin both transect the western side of the licence.

Service station and accommodation facilities are at the Aileron Roadhouse or the small township of Ti-Tree where there is a medical centre, school and police station. The nearest station homesteads are Aileron adjacent to the Aileron Roadhouse and Pine Hill located just to the west of the area.

The nearest medical facilities are located at Ti-Tree and Alice Springs.

TENURE AND RELINQUISHMENT

Exploration Licence 28475 (Gilbeanie Bore), comprising 20 graticular blocks covering 63.5km² was granted on 16 August 2011 for a period of 6 years (Figure 2). No relinquishment has been done prior to this final report.
Figure 2 – Gilbeanie Bore (EL28475) Granted Area
NATIVE TITLE AND SACRED SITES

There is no Exploration Agreement in place between NuPower and the Central Land Council on behalf of the Traditional Owners. No exploration has been done and sacred sites have not been researched.
Gilbeanie Bore EL28475 is situated in the Aileron Province of the Arunta Region in the southern part of the Northern Territory (Figure 3).

Figure 3 - Geological Regions of the Northern Territory
Deformed and metamorphosed Palaeoproterozoic orogenic rocks older than 1800 million years outcrop as major tectonic units surrounded by younger rocks and essentially form the recognisable and inferred basement to the North Australian Craton. These Palaeoproterozoic rocks form the Pine Creek Orogen, Tanami Region, northern Arunta Province, and Tennant, Murphy and Arnhem Inliers. They include remnants of Achaean rocks, which have been dated at 2500 million years.

To the south, the rocks of the North Australian Craton pass into the Central Australian Mobile Belts of the Proterozoic Orogens of the Arunta Region and Musgrave Block, consisting of granulite and amphibolite facies, metamorphosed sediments and mafic volcanics intruded by granitoids. In the southern Arunta Province, episodic igneous activity took place between 1880-1050 million years and deformation included a series of major tectonic events, including retrogressive metamorphism in the Proterozoic and Palaeozoic.

A system of major WNW-ENE trending and north-northeast dipping thrust and reverse faults and shear zones affects the Arunta Region and southern margin of the Ti Tree Basin. The associated shear zones can be up to hundreds of meters in width and extend for several kilometres, and are thought to have formed during the 400-300 Ma Alice Springs Orogeny (Cartwright et al., 1999). A major fault, informally referred to as the Ti-Tree Fault, runs along the northern boundary of the Reynolds Range (and it’s continuation to the southeast) and forms part of this set of structures.

Cainozoic palaeodrainage systems are interpreted to be the remnants of the Mesozoic drainage system that once flowed into the Eromanga Basin in the southeast of the Northern Territory. Whilst the modern drainage flows north off the Reynolds Range, geological evidence strongly suggests that the Cainozoic palaeodrainage systems generally flowed towards the south and southeast. Evidence suggests a significant reactivation of structures created during Alice Springs Orogeny occurred during the early Tertiary and acted to deepen and create and rejuvenate the Cainozoic palaeodrainage systems. Southwards flowing palaeodrainage systems appear to have been dammed, diverted (generally to the east) and even reversed by this neotectonic event that also affected the MacDonnell Ranges to the south. This event is also interpreted to have been responsible for incision of meandering drainage systems through the MacDonnell (and other) Ranges. Similar drainage incision in response to early Tertiary neotectonism is also found in the Neoproterozoic Flinders Ranges (South Australia). In the Ti-Tree region, the creation of a minimum of 320m of structural relief (accommodation space) is indicated by the thickness of the preserved Cainozoic sedimentary package within the Ti-Tree Basin.

**LOCAL GEOLOGY**

**Pre-Cambrian-Proterozoic**

According to the web-site of the NTGS (December, 2004) basement rocks in the Aileron region comprise part of:

“... the Arunta Region, a complex basement inlier in central Australia that has undergone a prolonged history of sedimentation, magmatism and tectonism extending from the Palaeoproterozoic to the Palaeozoic. The Arunta Region can be subdivided into the three, largely fault bounded terranes with distinct geological histories: the Aileron, Warumpi and Irindina Provinces.

The Aileron Province comprises greenschist to granulite facies metamorphic rocks with protolith ages in the range 1865-1710 Ma. It forms part of the North Australian Craton and is geologically continuous with the gold-bearing Tanami and Tennant Regions to the north.

In contrast, the Warumpi Province comprises amphibolite to granulite facies rocks with protolith ages in the range 1690-1600 Ma, and is interpreted to be an exotic terrane that accreted to the southern margin of the North Australian Craton at 1640 Ma.

The Irindina Province in the Harts Range region comprises Neoproterozoic to Cambrian metasediments that formed in a major depocentre within the Centralian Superbasin and underwent high-grade metamorphism and deformation during Ordovician (480 - 450 Ma).”

Gilbeanie Bore (EL28475) is probably underlain by basement rocks of the Aileron Province.
Because of the high grade of metamorphism and the relative paucity of continuous outcrop across the Arunta Province, a reliable stratigraphy has not yet been constructed for the metasedimentary sequences. Instead, the Early–Mid Proterozoic metamorphosed rocks of the area have been subdivided by Stewart (1981) into three “Divisions”, intruded by granites, on the basis of “broad lithological correlations”, Division 1 being regarded as the oldest and Division 3 as the youngest. The rock units within each division may be chronostratigraphic correlatives but there is no evidence yet to support this.

Division 1 Palaeoproterozoic rocks comprise the Aileron Metamorphics consisting of pelitic, semi-pelitic, psammitic and calc-silicate gneisses and granulites, meta-gabbro, dolerite and mafic granulite. These rocks outcrop in the Anmatjira Ranges northwest of Gilbeanie Bore where they are intruded by Proterozoic granites, gneisses and orthogneisses, of the Arunta Block and are therefore inferred to underlie the area at depth beneath cover.

Proterozoic-Palaeozoic

North of Gilbeanie Bore the Arunta Inlier is stratigraphically unconformably overlain by outliers of Neoproterozoic and early Palaeozoic sediments of the Georgina Basin that may also underlie Gilbeanie Bore at depth. The stratigraphy of this basin comprises basal quartz sandstones, quartzites and conglomerates of the Grant Bluff Formation overlain by transitional marine/continental and glacial red and white sandstones and siltstones, quartzite, arkose, shale, conglomerate with basal tillites, boulder beds and ferruginous pebbly sandstones of the Central Mount Stuart Formation. These in turn are unconformably overlain by Cambrian and Ordovician sandstones, siltstones dolomite and chert of the Tomahawk Beds. The youngest rocks in the basin are of Devonian age and consist of cross-bedded sandstone, siltstone and conglomerate of the Dulcie Sandstone.

Cainozoic

Basement and Georgina Basin sediments in the Gilbeanie Bore area are covered by unconsolidated Cainozoic sediments derived by weathering of the surrounding basement terrains.

The southern NT forms a ‘basin and range’ province with Proterozoic and Palaeozoic forming prominent mountain ranges separated by broad valleys. Cainozoic sedimentary basins are widespread and well-developed within these intervening topographic depressions with at least twenty major basins outlined, (Senior et al., 1995).

The Gilbeanie Bore tenement is located in the southern part of the Ti-Tree Basin, which is known to be one of the best developed Cainozoic basins in the southern NT containing a sedimentary fill in excess of 300m thick, according to work carried out by NT Department of Water Resources/NRETA.

Quaternary sediments completely cover Gilbeanie Bore (Figure 4).
Figure 4. Gilbeanie Bore geology
PREVIOUS EXPLORATION

<table>
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<th>Open Report Number</th>
<th>File Dates</th>
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<th>Commodity</th>
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<td>U</td>
<td>EL752</td>
<td></td>
<td>Contains seismic traces, no raw data nor interpretation.</td>
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<td>CR2007-0325</td>
<td>July 2003 – March 2009</td>
<td>Tanami Exploration</td>
<td>Gold and Base metals</td>
<td>EL 9887</td>
<td>Recon work</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 – Gilbeanie Bore Historic Exploration

Individual open file reports are detailed further, below.

**CR1973-0026 (Ti Tree Area – Tenements AP3360 / EL3360)**
Author: Hughes, R. E, O’Sullivan, K.N., 1972.
Company: CRA Exploration Pty Ltd
Commodity: U
Dates: May-June 1972

EL3360 covered the entire tenement. A literature search was undertaken and the presence of anomalous analyses for uranium in local water bores was noted.

Fifty-eight water bores were then sampled and 46 gamma logs were run on all open bores. Many of the bores had been idle for several years and this may have affected the analytical results. Continuous ground radiometric traverses were also run. Sediments in the valley of the Kerosene Camp Creek and Woodforde River were sampled by 46 shallow auger drill holes. Additional work was recommended, however this was the final report and the tenement was relinquished in 1972.

**CR1973-0183 (Ti Tree Area – Tenement EL752)**
Company: CRA Exploration Pty Ltd
Commodity: U
Dates: May-June 1972

EL752 overlaps the northern ¾ of Gilbeanie Bore and extends further north.
Based on earlier work in the tenement area, six stratigraphic HQ diamond drill holes totalling 1277.79m were drilled at 5km intervals across EL752. The sediments intersected were not considered favourable for uranium deposition due to poor permeability, fine grain size and fair to good sorting. Report contains geological logs, downhole gamma logs and cross sections. None of the holes were within Gilbeanie Bore

CR1973-0269 (Ti Tree Area – Tenement EL752)
Author: Thomas Johnson, B. 1973
Company: CRA Exploration Pty Ltd
Commodity: U
Dates: February 1973

Seismic reflection survey. Report contains traces but no raw data, and no interpretation.

CR1984-0117 (Old Gilbeanie – Tenement EL4188)
Company: BHP Minerals Ltd
Commodity: U, Base Metals
Dates: June 1983 – June 1984

This tenement covered the western half of Gilbeanie Bore, Exploration was for base metals.

A combined aeromagnetic/radiometric survey was flown over the tenement in May 1983 and two gravity traverses were carried out. The resulting magnetic intensity contour map of the area revealed a “bull’s-eye” shaped anomaly, however, subsequent evaluation of the anomaly gave no significant values. One percussion hole, drilled 256m, passed through 94m of Tertiary sediments before intersecting crystalline basement. It was concluded that a unit within the Arunta Complex was the source of the anomaly and geochemical analyses of drill samples for base metals revealed no significant values.

CR2004-0386, EL 9887
Company: Tanami Exploration
Commodity: Gold, base metals
Dates: July 2003 – July 2004

Tanami Gold NL identified the potential for Palaeoproterozoic-hosted gold mineralisation and Neoproterozoic-hosted base metals mineralisation in the area of the Mt Solitary Joint Venture Project in Central Australia.

EL 9887 contains an aeromagnetic target interpreted to be magnetic aureole to an intrusive body. The target has been previously drilled by BHP in 1984, which intersected sulphides in weathered gneissic basement under 90+ metres of alluvial cover. Weakly elevated base metal assays were noted. 1 August 2006 Tanami geologists tried to locate drill spoil for possible geochemical or petrological appraisal of the target; however no trace of the drill hole was located.
EXPLORATION BY NUPOWER

No on-ground exploration has been done by NuPower. A circular magnetic anomaly was recognized from examination of available imagery (Figure 5). Comparisons were made between this and the anomaly at Mordor Pound, associated with an alkalic intrusive complex, and with anomalies close to Nolans (but not known to be associated with the rare earth mineralization). The main target envisaged was rare earth mineralization, however IOCG mineralization was also thought to be a possibility. The target had previously been tested by just one hole (BHP), which intersected only weakly magnetic gneiss. This was thought to be an inadequate test of such a large prospective target. Geophysics and drilling were proposed to be done, but were not carried out due to budget constraints.

![Figure 5. Gilbeanie Bore magnetic anomaly, BHP drill hole](image)

CONCLUSIONS AND RECOMMENDATIONS

This is one of a number of magnetic targets in the region north of Alice Springs which could perhaps be associated with mineralization, or could alternatively be due to disseminated magnetite in mafic metamorphics. Some of these targets, including this one, have not been thoroughly tested.
EXPENDITURE STATEMENT

GRANT DAVEY
BSc
6 June 2012
REFERENCES


APPENDICES
APPENDIX 1 – EXPENDITURE REPORT