LUCY CREEK PROJECT
EL 24724 JOHANSSEN RANGE

PARTIAL RELINQUISHMENT REPORT FOR PERIOD ENDING 15TH JANUARY 2009

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Map
1:100,000 Jinka 6052
1:100,000 Jervois Range 6152
1:250,000 Hukitta SF53-11
GDA94 Zone 53

Distribution
Department of Regional Development, Primary Industry, Fisheries & Resources
NuPower Resources Ltd Darwin office
NuPower Resources Ltd Sydney office
SUMMARY

The Lucy Creek Project comprises three tenements, EL24716 Lucy Creek, EL24724, Johanssen Range and EL10215 Jervois. These licenses were applied for and granted to Arafura Resources NL in December 2005. Two licenses, Lucy Creek and Johanssen Range, were transferred to NuPower Resources Ltd during the demerger by Arafura of certain uranium assets into the new company. Arafura retained Jervois but transferred the rights to uranium to NuPower.

Arafura’s interest in these tenements, prior to the demerger, included the potential for orthomagmatic Fe-Ti-V, Ni-Cu and Pt-Pd-Au and other types of mineralisation associated with mafic intrusions of the Arunta block, tungsten, molybdenum, other base metal and gold mineralisation in the Bonya Schist and equivalent rocks of the Arunta, Mary Kathleen style or iron-oxide copper gold related mineralisation in the Arunta Block, various styles of uranium mineralisation including sandstone and unconformity related styles in the Georgina Basin, sediment-hosted MVT, base metal or phosphate mineralisation in the Georgina Basin and a range of other commodities associated with intrusives such as carbonatites, kimberlites and pegmatites.

The uranium interest was based on the 2004 NTGS airborne radiometric data that contains a large uranium anomaly in the western Jervois Range, mostly within EL24716 but extending into the adjacent EL10215. Previous exploration here by CRA for unconformity U-Cu-P mineralisation in the mid 1990’s tested the lateral undercover extensions of the Mount Baldwin/Arthur Creek Formations and while uranium results were disappointing they intersected significant intervals of phosphate mineralisation.

Less significant radiometric anomalies in the Johanssen Range license include a prominent short wavelength high amplitude uranium-thorium anomaly associated with the Eurowie Sandstone Member of the Arrinthrunga Formation in Arrinthrunga Creek, several small uranium-thorium anomalies associated with the unconformity between the Mt Baldwin Formation and Arthur Creek Formations in a similar stratigraphic position to the radiometric anomaly at Lucy Creek and small isolated anomalies elsewhere in the Arrinthrunga Formation.

The geology of Johanssen Range comprises mostly cover sediments of the Georgina Basin where they outcrop in the Johanssen Range, overlying basement rocks Arunta Block Bonya Schist preserved in the south.

The Early Proterozoic Bonya Schist is the oldest formation here confined to the southern parts of the area where it overlies the Mascotte Gneiss Complex. The Schist comprises mostly muscovite and two-micas schists derived from mostly pelitic, psammopelitic and calcareous metasedimentary rocks, metamorphosed to upper greenschist to lower amphibolite facies.

Various Proterozoic granites intrude the Bonya Schist, including foliated, locally porphyritic, muscovite granite on the southern side of the Johanssen Range. The Schist is also intruded by several different phases of Samarkand Pegmatite.

The earliest sediments of the Georgina Basin represented here are thin to thickly bedded, fine to coarse grained, quartz arenite of the Grants Bluff Formation in the eastern flanks of the Johanssen Range. This is overlain by micaceous, very thin to very thickly bedded, siltstone, laminated mudstone and medium grained quartz arenite of the Elkera Formation. Mild tectonism followed the Elkera Formation so that it is overlain disconformably by the Mount Baldwin Formation comprising thin to very thickly bedded, cross bedded, fine-medium grained, quartz arenite forming prominent ridges in the range.

Red Heart Dolostone disconformably overlies Mount Baldwin Formation and consists of basal sandstone grading upwards through silty shale to a white dolostone-silty dolostone unit. This is overlain by a silty sandstone to siltstone unit that is topped by a limestone and dolostone unit. This formation, containing phosphorite, outcrops along the base of the eastern flank of the Jervois Range, and is locally indurated by Tertiary laterite and silcrete, but may be absent along the
northern flank of the Johanssen Range where Arthur Creek Formation appears to rest directly on Mount Baldwin Formation.

Arthur Creek Formation overlies Red Heart Dolostone (and Mount Baldwin Formation where Red Heart Dolostone is absent). It contains a lower sequence of fossiliferous, organic-rich, laminated, pyritic, calcareous siltstone the upper part of which contains very thick limestone beds, overlain by calcareous quartz arenite to quartzose limestone. Arrinhrunga Formation conformably overlies Arthur Creek Formation in the northwestern part of the license area containing a thick well bedded sequence of dolostone and limestone with minor siliclastic rocks. One of the lithofacies of the Arrinhrunga Formation, the Eurowie Sandstone Membre, is the youngest formation of the Georgina Basin preserved here. The Arthur Creek and Arrinhrunga Formations underlie most of the central and northern parts of the project area but are covered extensively with Quaternary alluvium from Arthur Creek and its tributaries.

Copper and tungsten have been prospected and mined at Green Hoard, Damascus, Wells, Ashmara, Xanten, City of Medina, Jericho, Tashkent, Bonya, White Violet, Ultra Violet, Samarkand, Petra, Kings Legend, Johanssen's Pillar and other unnamed occurrences from the Bonya Schist and associated units, in the Bonya Hills region, south of Johanssen Range.

In Year 1 Arafura Resources completed an RC drilling program at Lucy Creek, in EL24716 and the adjacent EL10215 in November 2006 to test for uranium mineralisation associated with a prominent airborne radiometric anomaly in the Red Heart Dolostone. There was no work on Johanssen Range due to the demerger process.

In Year 2 following the demerger of uranium assets from Arafura to NuPower, NuPower completed preliminary metallurgical testwork of two composite samples to determine the suitability of this material to heap leach recovery of uranium from a low grade resource. There was no work on Johanssen Range due to delays with the metallurgical work and the lack of suitable geologists.

In Year 3 reconnaissance identified low grade phosphorite mineralisation in Arthur Creek Formation on Johanssen Range but did not locate Red Heart Dolostone for sampling. Attempts to access a prominent radiometric anomaly in a remote area were unsuccessful. There was no reconnaissance in the areas relinquished. Bore waters were sampled but there were none from the areas relinquished.

Sixteen blocks were relinquished on 15th January 2009, reducing the license area to 80 blocks covering 253.68 square kilometres. These included areas of Arrinhrunga Formation and Bonya Schist that were considered not prospective for uranium or phosphate.
INTRODUCTION

The NuPower Resources Ltd Lucy Creek Project comprises three tenements;

EL24716 Lucy Creek (100% NuPower)
EL24724 Johanssen Range (100% NuPower)
EL10215 Jervois (Arafura Resources Ltd, uranium interest to NuPower)

This partial relinquishment report is concerned with EL24724 Johanssen Range, (Figure 1).

BACKGROUND

Previous exploration has identified a range of mineral commodities throughout the Jervois region. Base metals, hosted by the Palaeoproterozoic Bonya Schist, were mined at the Green Parrot, Reward, Attutra, Sykes, Cox, and Bellbird mines in the Jervois Mining District, southeast of the tenement. Further occurrences of base metals and tungsten hosted by the Bonya Schist and associated units, also occur in the Bonya Hills region, south of the tenement. Ti-V-rich magnetite occurrences, some with anomalous Cu-Pt-Pd-Au are known from the Attutra Metagabbro to the east.

Originally Arafura's initial interest in these tenements, prior to the demerger of the uranium assets to NuPower, stemmed from the potential for;

- Orthomagmatic Fe-Ti-V, Ni-Cu and Pt-Pd-Au and other types of mineralisation associated with mafic intrusions in the Arunta Region.
- Tungsten, molybdenum, other base metal and Au mineralisation in the Bonya Schist and equivalent rocks of Arunta Region.
- Various styles of uranium mineralisation including sandstone and unconformity related styles in the Georgina Basin.
- Mary Kathleen style or iron-oxide copper gold related mineralisation in the Arunta Region.
- Sediment-hosted MVT, base metal or phosphate mineralisation in the Georgina Basin.
- A range of other commodities associated with intrusives such as carbonatites, kimberlites and pegmatites.

The 2004 NTGS airborne radiometric data contains a large uranium anomaly in the western Jervois Range, mostly within EL24716 but extending into the adjacent EL 10215 held by Arafura Resources Ltd, (Figure 1). Here previous exploration by Arafura has focused on testing the radiometric anomaly with an extensive percussion drilling program for uranium and by earlier workers on the lateral undercover extensions of the Mount Baldwin/Arthur Creek Formations for uranium and phosphate (Menzies and Palmer, 1994) while outcrop in the immediate vicinity of the airborne uranium anomalies has received limited attention.
Figure 1 - Uranium Channel Radiometric Anomalies, Lucy Creek Project (NTGS Survey 2004)
Figure 2 - Location and Access to Lucy Creek Project
Less significant radiometric anomalies in EL 24724 Johanssen Range include;

- A short wavelength high amplitude uranium-thorium anomaly in the tenement associated with the Eurowie Sandstone Member of the Arrinthrunga Formation comprising thinly bedded, red-brown, shallow marine quartz arenite with rare siltstones in Arrinthrunga Creek.
- Several small uranium-thorium anomalies associated with the unconformity between medium-coarse grained thin-thickly bedded quartz arenite of the Mt Baldwin Formation and overlying calcareous siltstone with limestone interbeds of the Arthur Formation in a similar stratigraphic position to the radiometric anomaly at Lucy Creek.
- Small isolated anomalies elsewhere in the Arrinthrunga Formation.

LOCATION AND ACCESS

Exploration License 24724 is located approximately 280 kilometres east north-east of Alice Springs (Figure 2) in the Jervois region covering parts of Arapunya, Jinka, Jervois and Lucy Creek pastoral stations. Access is via the well formed but mostly unsealed Plenty Highway that turns off westwards from the Stuart Highway 68 kilometres north of Alice Springs. This highway, that can be closed to all traffic or have weight provisions applied following heavy rain, passes to the south of the tenements approximately 300km from the Stuart highway. Well formed dirt roads from the Plenty Highway to Jinka, Jervois and Lucy Creek Stations and the Baikal Community provide good access to the area. Further vehicular access across the low country is then via station tracks servicing bores and fence lines. Access into the hill country of the Johanssen Range is difficult however through lack of any roads or tracks.

The nearest active unsealed airstrips are located near the Jinka, Jervois and Lucy Creek homesteads and near the MolyHill Mine and Baikal. An infrequently used airstrip is also located at the abandoned Jervois mine site.

TOPOGRAPHY AND DRAINAGE

The tenement is located in the headwaters of Arthur Creek that drains the area to the northeast, and Arrinthrunga Creek, a headwater tributary of Arthur Creek, (Figure 2). Elevations here are around 400m ASL. Johanssen Range, trending ENE through the southern part of the tenement rises to over 500m ASL, as a series of parallel strike ridges. South of Johanssen Range in the northern extent of the Bonya Hills, elevations rise to over 450m ASL in a highly dissected and irregular schist terrain.

CLIMATE

The climate is mainly dry all year round with hot summers and cool to cold winters. Average annual rainfall, based in records from the nearest Bureau of Meteorology weather station at Jervois, is 290mm of which about two-thirds falls in the December to March period. Average minimum and maximum temperatures in summer are 22°C and 38°C degrees while corresponding winter average minimum and maximum temperatures are 5°C and 22°C. Frosts are common some winters.
TENURE

Exploration license EL24724 Johanssen Range was applied for by Arafura Resources NL on 11\textsuperscript{th} May 2005, (Figure 3). The title was granted 2\textsuperscript{nd} December 2005 for a period of six years. It comprised 96 blocks covering an area of 304.40 square kilometres.

Following a request to the Department regarding the statutory reduction of area at the end of Year 2 on 31\textsuperscript{st} October 2007 NuPower was granted the waiver on 31\textsuperscript{st} January 2008 to retain all 96 blocks until 01/12/08.

The following request to waive partial relinquishment at the end of Year 3 on 30\textsuperscript{th} October 2008 was deferred on 9\textsuperscript{th} December 2008 and the request to relinquish 16 blocks on 11\textsuperscript{th} December 2008 was accepted on 15\textsuperscript{th} January 2009, reducing the license area to 80 blocks covering 253.68 square kilometres, (Figure 4).

The exploration license covers parts of the following perpetual pastoral leases (PPL), (Figure 5):

- Lucy Creek Station, NT Portion 686, PPL 1007
- Jervois Station, NT Portion 366, PPL 962
- Jinka Station, NT Portion 482, PPL 1119
- Arapunya Station, NT Portion 481, PPL 1118
Figure 3 - Exploration License Application ELA24724, Johanssen Range
Figure 4 - Lucy Creek Project, Johanssen Range EL24274, Retained Area
Figure 5 – Lucy Creek Project, EL24724 Johanssen Range, Pastoral Stations
NATIVE TITLE
There are no registered native title claims over the land subject to this license.

In the absence of instructions to the Central land Council from potential native title claimants in the area, the exploration license is not subject to a Native Title Exploration Agreement between NuPower Resources Ltd and the CLC nor a pre-existing Exploration Agreement between Arafura Resources Ltd and the CLC to which NuPower may have access.

In the absence of any Exploration Agreements, Native Title issues are addressed in accordance with Item 18 of the Schedule 2 Conditions which attach to the grant documents of the licenses. This requires that NuPower convene a meeting with registered native title claimants before commencing exploration activities other than reconnaissance. As there are no registered native title claimants at present there is no compulsion to convene such a meeting.

The entire area is subject to an ILUA application in the name of NT Oil EP 127 and 128 ILUA, Tribunal No. D12007/002, registered on 15th April 2008.

ABORIGINAL SACRED SITES
There are no recorded sacred sites on Johanssen Range.
GEOLOGICAL SETTING
The regional and local geological discussion in this report largely comes from the extensive experience gained by K. Hussey in the Arunta Region while employed by the Northern Territory Geological Survey (NTGS) and during their collaborative programs with Geoscience Australia (GA).


REGIONAL GEOLOGY
The Arunta Region contains more than 200,000 square kilometres of metamorphic rocks in the southern parts of the NT and has been recently subdivided into three distinct geological regions by the NTGS, the Aileron, Warumpi and Irindina Provinces (Figure 6). The Aileron Province largely consists of Palaeoproterozoic (1865-1500 Ma) sedimentary and igneous rocks that have undergone greenschist to granulite facies metamorphism. The majority of the preserved metasedimentary and igneous rock units in this region were deposited or emplaced prior to the 1740-1690 Ma Strangways Orogeny (e.g. Scrimgeour 2003, Hussey et al., 2005, Claoué-Long et al., in prep a, b). This event appears to have affected the entire Aileron Province to some degree, as opposed to the 1590-1570 Ma Chewings Event that appears to be localised within the central and southern(?) parts of Aileron Province (e.g. Hand and Buick, 2001, Fraser, 2004). The 1810-1800 Ma Stafford and 1790-1770 Ma Yambah Events also appear to be present throughout the Aileron Province, with extensive bimodal igneous activity, associated sedimentation and localised Low Pressure-High Temperature metamorphism.

Most of the eastern parts of the Aileron Province, including the Jervois district, have been metamorphosed at upper greenschist or lower amphibolite facies conditions in the Strangways Orogeny, with an apparent abundance of 1810-1700 Ma igneous activity and deformation. Regions of the Aileron Province have also been subject to younger (1640-1500 Ma) periods of magmatism.

Current views on the depositional and tectonic setting of the Aileron Province are based on recent geochemical, isotopic and igneous studies and the contained mineral systems. These favour a rifted continental crust or evolving backarc setting in the early parts of the depositional history [e.g. Hussey et al., 2005, Hoatson et al., 2005 Matthew Cobb (PhD student, Curtin University) pers. comm., 2005], with a prolonged tectonothermal convergent event in the Strangways Orogeny. Hussey et al. (2005) and Hoatson et al. (2005) argue for contiguous sedimentation and bimodal igneous activity during Stafford Event. This Event is thought to be responsible for the development of localised(?) deep-marine basins in the Arunta Region, as opposed to contemporaneous subaerial to shallow-water volcanism and sedimentation in the adjacent Davenport Province.

The Aileron Province contains contemporary equivalents of the gold-bearing Granites-Tanami and Tennant Creek Regions and regional aeromagnetic data indicate lateral continuity between these Regions. The Aileron Province is therefore regarded as part of the North Australian Craton, however, localised facies variations and differences in sedimentary environments are evident (e.g. Hussey et al., 2005).

The Warumpi Province in the south and southeast of the Arunta Region contains a younger package of metasedimentary and volcanic rock types with protoliths in the range 1690-1600 Ma (Scrimgeour et al., 2003). The Province was variably metamorphosed in the 1640 Ma Leibig Orogeny, 1570 Ma Chewings and the 1150 Ma Teapot Events.
Figure 6 - Geological Regions of the Northern Territory (Ahmad and Scrimgeour, 2004) with location of the Lucy Creek Project
Unmetamorphosed Neoproterozoic to Palaeozoic marine and terrestrial sedimentary rocks of the Georgina, Ngalia and Amadeus Basins surround and unconformably overly the Arunta Region. Contemporaneous Neoproterozoic to Cambrian strata of the Harts Range Group (Buick et al., 2001, Maidment et al., 2004, Buick et al., 2005) are also caught up within the eastern parts of the Arunta Region in the newly defined Irindina Province (Scrimgeour, 2003). This revision and reinterpretation of the Arunta Region has significant geological implications and has come about largely as a result of several extensive chronological, metamorphic and metallogenic studies in the eastern Arunta Region (eg Miller et al., 1998, Mawby et al., 1998, 1999, Hand et al., 1999a, b, Buick et al., 2001, Scrimgeour and Raith, 2001, Hussey 2003, Maidment et al., 2004, Buick et al., 2005, Claoué-Long and Hoatson, 2005, Close et al., 2005, Hussey et al., 2005).

Geochronological and metamorphic studies have shown that the rocks of the Harts Range Group in the Irindina Province are variably metamorphosed to transitional granulite facies in the (480-450 Ma) Ordovician Larapinta Event. This high-grade event is followed by lower-grade Devonian to Carboniferous deformation and granite and pegmatite intrusion. Interestingly, the high-grade Larapinta Event appears to have had little influence on the thermal history of the surrounding rocks of the Aileron Province, and apart from rare exceptions appears to be largely restricted to the Irindina Province (Maidment 2004, Close et al., 2005, Hussey et al., 2005, Claoué-Long and Hoatson, 2005).

Many of the fault bounded contacts between the various units within the Arunta and surrounding regions are attributed to the (390-300 Ma) Devonian-Carboniferous Alice Springs Orogeny. Most of the fault movements within the Georgina Basin also appear to be related to the Ordovician Larapinta Event and Devonian-Carboniferous Alice Springs Orogeny.

LOCAL GEOLOGY
Reference is made to Freeman (1986), Freeman et al. (1989), Zhao and Bennet (1995), Maidment (2004), Hoatson et al. (2005), Claoué-Long and Hoatson (2005), Dunster et al. (2006) for details on the geology and geochronology of the region, in the absence of more detailed recent publications, that provide an insight into the local geology and nomenclature. K. Hussey was part of an NTGS team working on revisions to the Jervois Range 1:100 000 and HUCKITTA 1:250 000 map sheets and has provided previous mapping experience and unpublished data for this section.
Figure 7 - Geology Johanssen Range (1:250,000 Huckitta SF53-11)
The geology of the license comprises mostly Late Proterozoic-Late Cambrian cover sediments of the Georgina Basin that outcrop in the Johanssen Range, overlying basement rocks of the Arunta Block Bonya Schist preserved in the south, (Figure 7).

Previously, the Arunta Province (domain/inlier/block) was divided into three major subdivisions based on coarse structural and stratigraphic considerations (Stewart et al., 1984, Shaw et al., 1984). The three structural provinces were divided into the Northern, Central and Southern Domains, separated by major east-west tectonic zones. In the eastern parts of HUCKITTA near the license areas, the Delny-Mount Sainthill Fault Zone was used to separate the Northern from the Central Tectonic Domain (Freeman 1986). The Delny-Mount Sainthill Fault Zone is now used in part to separate the Aileron Province in the north from the Irindina Province in the south. The rocks of the Harts Range Group in the south have been metamorphosed to transitional granulite facies in the Ordovician Larapinta Event (Hand et al., 1999a, b, Buick et al., 2001, 2005, Maidment 2004) while the contemporaneous units in the Georgina Basin that unconformably overlie greenschist to amphibolite facies rock units of the Aileron Province immediately north of this fault zone are essentially unmetamorphosed. Claoué-Long and Hoatson (2005) found localised thermal affects coeval with the Larapinta Event in the Attura Metagabbro region.

The Early Proterozoic Bonya Schist (-pCo) is the oldest formation here confined to the southern part of Johanssen Range where it overlies the Mascotte Gneiss Complex. It is a polydeformed composite unit that is consisting mostly of muscovite and two-micas schists derived from pelitic, psammopelitic and calcareous metasedimentary rocks, with subordinate psammitic and quartzite units, and felsic and mafic igneous rocks, metamorphosed to upper greenschist to lower amphibolite facies. The formation is subdivided into 5 informal units and one formal unit, the Kings Legend Amphibolite, present immediately south of Johanssen Range. Rare preserved sedimentary structures in the psammitic and quartzite units in the Bonya Hills indicate that at least parts of the Schist were deposited in high-energy shallow-water environments.

Recent unpublished NTGS mapping (by K. Hussey and Max Frater) has found that some of the mafic and felsic igneous units within the Bonya Schist, as it is currently mapped (Freeman 1986 and Freeman et al., 1989), are clearly discordant intrusive units. Other igneous bodies are extrusive units. Various Proterozoic granites intrude it, one of which is represented here on the southern side of the Johanssen Range consisting of foliated, locally porphyritic, muscovite granite with local magnetite or tourmaline aggregates. The Schist is also intruded by several different phases of Samarkand Pegmatite of medium to very coarse grained plagioclase and minor K feldspar and quartz with accessory muscovite, tourmaline, apatite and sphene. These rocks clearly intrude the Bonya Schist as plutons or as high level sills/laccoliths and field and petrological evidence indicates that most if not all have been deformed and metamorphosed, probably in the Strangways Event.

The Bonya Schist has a variable magnetic character depending on the rock types. Most of the mafic igneous rocks in the Bonya Schist have a low magnetic response in comparison to the distinct highly magnetic package that hosts the deposits of Jervois Mining District. This essentially corresponds to a package of magnetite-bearing andalusite and muscovite-biotite schists, with subordinate calc-silicate rocks and localised magnetite bodies. The psammitic and calc-silicate-rich parts of the Bonya Schist in the Bonya Hills have a different geophysical expression to the others mentioned above.

Until recently, there was little precise geochronological constraint in this region. A pelitic unit from a non-magnetic part of the Bonya Schist several kilometres northeast of the Jervois Mining District has a maximum SHRIMP U-Pb age of 1807 Ma (Claoué-Long and Hoatson, 2005). This unit was sampled near the margin of the 1786 Ma Attutra Metagabbro which also contains 1775 Ma intrusive tonalite bodies (Claoué-Long and Hoatson, 2005). Similarly aged felsic magmas are present elsewhere; for example, Zhao and Bennett (1995) found that the Jervois Granite was about 1770 Ma and a rhyolitic intrusive unit in the Bonya Hills has also been recently dated at 1785 Ma (Jon Claoué-Long, pers comm., 2004).
The earliest sediments of the Georgina Basin represented here are the Neoproterozoic Mopunga Group that unconformably overlies the metamorphic rocks of the Arunta Region throughout most of the Jervois region and form the spine of the Johanssen Range. It consists of the Elyuah Formation (-Pae, shale and silty sandstone), the Grant Bluff Formation (-Pag, laminated to thinly bedded, fine grained, quartz arenite to sublitharenite with minor thin to thickly bedded, coarse grained, quartz arenite), and the Elkera Formation (-Pak, by recessive, micaceous, very thin to very thickly bedded, siltstone, laminated mudstone and medium grained quartz arenite). Freeman (1986) indicates that the Mopunga Group was deposited as relatively even-thickness sheet-like units following localised tectonic movements. The Oorabra Arkose (-Pao) also unconformably overlies the Arunta basement rocks in the Jervois region, and is preserved in localised half grabens beneath the Mopunga Group (Freeman 1986).

Dunster et al., (2006) indicate the Mopunga Group is disconformably overlain (due to mild tectonism from the Huckitta Movement) by the early Cambrian Shadow Group Mount Baldwin Formation (thin to very thickly bedded, frequently cross bedded, fine-medium grained, quartz arenite forming prominent ridges in the range) and Red Heart Dolostone which is in turn disconformably overlain by the middle Cambrian Narpa Group (Thorntonia Limestone, Arthur Creek Formation and Steamboat Sandstone).

Red Heart Dolostone disconformably overlying Mount Baldwin Formation consists of basal sandstone grading upwards through silty shale to a white dolostone-silty dolostone unit 23m thick. This is overlain by a silty sandstone to siltstone unit 36m thick that is topped by a limestone and dolostone unit containing sandy carbonate, 67m thick. This formation, containing phosphorite, outcrops along the base of the eastern flank of the Jervois Range, and is locally indurated by Tertiary laterite and silcrete as observed at Lucy Creek. The formation may be locally absent on the northern flank of the Johanssen Range where Arthur Creek Formation appears to rest directly on Mount Baldwin Formation.

The distribution of the Red Heart Dolostone, Thorntonia Limestone and Steamboat Sandstone are not indicated on existing published geological maps of this region (i.e., Freeman, 1986 or Freeman et al., 1989). However in a recent revision of the Georgina Basin stratigraphy, Dunster et al., (2006) recognised these units in a nearby cored drill hole (Huc 1). In contrast to the intense surface weathering in the Jervois Range outcrops, Huc 1 intersected fresh unweathered units. As such these new units are most probably exposed in the Jervois Range and elsewhere nearby, although their boundaries and distribution are yet to be fully delineated.

Arthur Creek Formation overlies Red Heart Dolostone (and Mount Baldwin Formation where Red Heart Dolostone is absent). It contains a lower sequence of recessive, fossiliferous, organic-rich, laminated, pyritic, calcareous siltstone the upper part of which contains very thick limestone beds, overlain by calcareous quartz arenite to quartzose limestone.

Arrinthrunga Formation conformably overlies Arthur Creek Formation in the northern and western part of the area containing a thick well bedded sequence of dolostone and limestone with minor siliclastic rocks. Eight interfingering lithofacies have been recognized one of which is the Eurowie Sandstone Member preserved in the NW corner of the Johanssen Range license. This is the youngest formation of the Georgina Basin represented here. The Arthur Creek and Arrinthrunga Formations underlie most of the central and northern parts of the license area but are covered extensively with Quaternary alluvium from Arthur Creek and its tributaries.

Copper and tungsten have been prospected and mined at Green Hoard, Damascus, Wells, Ashmara, Xanten, City of Medina, Jericho, Tashkent, Bonya, White Violet, Ultra Violet, Samarkand, Petra, Kings Legend, Johanssen’s Pillar and other unnamed occurrences from the Bonya Schist and associated units, in the Bonya Hills region, south of Johanssen Range.
PREVIOUS EXPLORATION

This tenement overlapped the west of Johanssen Range and extended 31km to the northwest. Exploration was for lead-zinc and an IP survey was completed that identified several chargeable anomalies. These were tested with nine percussion holes but the results were not encouraging and the tenement was relinquished.

Central Pacific Minerals N L - EL603, 1972
This tenement lay to the south and southwest of the Johanssen Range tenement and slightly overlapped its southwest corner. Exploration was for tungsten, fluorite and copper and the region was mapped at a scale of 1:46,000. CPM also carried out stream sediment and rock chip sampling for copper, zinc and nickel and a low level aeromagnetic-radiometric survey. Selected areas were ten mapped at 1:9600, 1:1000 and 1:500 scales. They excavated several costeans and collected bulk samples. They drilled 67 air track holes totaling 5,561 feet to test scheelite bearing skarns and 7 diamond drill core holes totaling 2,182 feet to explore a fluorite prospect. Fluorite reserves at 10%CaF₂ were estimated at 360,000 t.

L A Johanssen - EL1865, 1978
This is a small tenement that overlapped the south of Johanssen Range and extended 8km to the south and 8km to the east. Johanssen prospected all outcrops and panned creek beds for tin, but could locate no interesting mineralization.

Unknown lease holder - EL3241, 1982
This EL slightly overlapped the southwest of Johanssen Range and extended 25km to the south. The lease holder believed that the area held potential for scheelite-molybdenite-magnetite associated gneiss outcrops. A program of exploration was recommended, but lack of a joint venture partner resulted in termination of the license.

Niconr Resources Ltd & Petrocarb Exploration N.L - EL3256, 1982
This tenement overlapped slightly on the west of Johanssen Range and extended 24km to the south. Exploration was for scheelite-molybdenite bearing skarn mineralisation. There was a geologic mapping program at 1:50,000 and an airborne magnetic survey was flown, but it revealed no anomalous features.

Broken Hill Proprietary Co Ltd - EL4189, 1983
This tenement slightly overlapped onto the northeast corner of the Johanssen Range tenement and the north of the Lucy Creek tenement and extended 15km to the north. The BMR 1:250,000 magnetic and Bouguer anomaly maps for the Huckitta sheet showed a possible “bullseye” magnetic anomaly which was considered to be a target for an Olympic Dam type ore body. BHP had a combined aeromagnetic and radiometric survey flown over the EL during May, 1973 which confirmed the size and location of the anomaly. Subsequent computer modeling of the survey data gave a depth estimate to source of 1,200 to 1,500m which was considered too deep to warrant further work.

CRA Exploration Pty Ltd - EL4619, 1984
This tenement abutted the northeast corner of the Johanssen Range and the northwest of the Lucy Creek tenements and abutted 56km to the north. Exploration was for kimberlite diamonds using a combination of drainage gravel sampling for indicator mineral observation, reconnaissance aeromagnetic-radiometric surveying and loam sampling of anomalous photo-features considered to be expressions of possible kimberlites. None of the anomalous photo-features proved to be prospective and the area was relinquished.
Saracen Minerals N L - EL5149, 1984
EL5149 overlay most of Lucy Creek and the center-east of the Johanssen Range tenement. Exploration was for platinum group mineralization using a model based on the basal black shale of the Zechstein deposit in Poland. Fourteen rotary-percussion holes were drilled along 6 short drill lines scattered across the tenement to test the base of the Hay River Formation and its equivalents. The analytical results of the drill cuttings for platinum, palladium and gold were all below the limits of detection and no additional work was recommended.

CRA Exploration Pty Ltd - EL5803, 1988
This tenement overlapped the west and north of the Johanssen Range tenement and extended 27km west. Exploration was for kimberlite diamonds and carbonate hosted base metals. A drainage sediment geochemical survey aimed at base metal sulfide mineralization was completed in conjunction with a drainage gravel sampling program intended to test for diamond indicators. No base metal anomalies were revealed, but a scattering of chromites and one micro-diamond were recovered but results were not sufficiently encouraging to retain the tenement.

Zapopan N L - EL6260, 1988
EL6260 overlapped part of the southeast of the Johanssen Range tenement and extended 9km to the south. Exploration was for gold and base metals and included geological reconnaissance, 37 rock chip samples, 61 bulk cyanide leach drainage samples and 61 duplicate drainage samples for base metal analysis. The results indicated that although the area is highly anomalous in copper and tungsten, economic values of tungsten were unlikely to be achieved. The copper anomalies were mainly associated with old workings fault traces and quartz-tourmaline rocks.

L Johanssen - EL6326, 1989
EL6326 was a small tenement and abutted the southeast of Johanssen Range and extends 9km to the south. Two deposits of apatite and a small occurrence of monazite were identified. Ground radiometric traverses across Apatite Hill and to the North East to Charlotte Fault indicated a low level anomaly.

Poseidon Exploration Ltd  EL7505, 1991
This tenement, referred to as Twins Bore, overlapped the south of Johanssen Range and the southeast of Lucy Creek. It extended 12km to the south and slightly to the west. The tenement included the Johanssen Range and Bonya Hills, consisting of schist and gneiss and was taken up to explore for copper, lead, zinc and silver. There are numerous copper and tungsten mineral occurrences and old mines and the majority of the mineralisation is hosted within or near the Kings Legend Amphibolite Member of the Bonya Schist and in the Samarkand Pegmatites. Following an in-house study of selected Australian Proterozoic terrains, the region was identified as prospective for Broken Hill type deposits. Exploration carried out on these licenses included reprocessing and interpretation of airborne magnetic data, reconnaissance and orientation geochemical sampling, ground magnetics, geological mapping and auger sampling, stream sediment sampling (250 samples), soil and rock chip sampling and airborne EM surveys. The EM surveys over the East Jervois Twins Bore EL 7505 areas produced two anomalies that were tested by a traverse of vacuum drilling. The results were disappointing and there as no follow up.

CRA Exploration Pty Ltd - EL7596, 1992
EL7596 overlapped most of the north of the Johanssen Range tenement and the northwest of the Lucy Creek tenement, overlying a southern portion of the Late Proterozoic to Early Palaeozoic Georgina Basin. Reconnaissance sampling, consisting of 53 rock chip samples, studies of historic geochemical data, analysis of seismic shot holes and geological mapping identified two stratigraphic horizons, the sabkha facies of the Chabalowe Formation and the basal, organic-rich contact in the lower Arthur Creek Formation, as potential metal hosts and exploration was directed towards the potential for MVT styles of base metal mineralisation. Two diamond drill holes targeted the two
prospective horizons adjacent to major structures. Drill hole DD92EC1 was drilled within EL7596 and DD92TC1 was drill within EL7597 (EL7597 was adjacent and north of EL7596 but outside the current Lucy Creek EL). DD92EC1 adjacent to the Putta Putta Fault and targeting basal shoals of the Arthur Creek Formation encountered no significant base metal values. DD92TC1 failed to reach its target as the sabkha facies of the Chabalowe Formation was not present and the next stratigraphic target occurs at some 800m depth.

**CRA Exploration Pty Ltd - EL 8116, 1993**

This tenement covered the Georgina Basin sediments in the eastern three quarters of the Lucy Creek tenement and was considered prospective for unconformity hosted Cu-U-phosphate mineralisation. The exploration model is applicable to Johanssen Range. They acquired, processed and interpreted airborne radiometric and Landsat TM Imagery data and aerial photographs and identified a series of anomalies associated with the phosphatic, organic-rich Arthur Creek Formation/Mount Baldwin Formation Middle Cambrian disconformity. They carried out geological mapping and collected 42 reconnaissance rock chip samples for multi-element analysis that returned assay values up to 2.08% Cu, 100 ppm U and 11.4% P along a 4 km strike length of turquoise mineralisation. They found that a 10-15 metre thick calcareous unit, weakly anomalous in Zn (up to 520 ppm), delineates the base of Arthur Creek Formation and that the Mount Baldwin Formation is characterised by low order base metal values with limited potential for stratabound Cu mineralisation.

They drilled six broad-spaced (500m) scout percussion holes totaling 530 metres and undertook multi-element analysis of the percussion drill samples. No significant uranium values were returned and the potential for substantive zones of Cu-U phosphate mineralisation was down graded. However review of the assays indicates that the holes intersected significant grades and intervals of near-surface phosphorite.
EXPLORATION BY ARAFURA AND NUPOWER

Year 1, Exploration by Arafura Resources
Arafura carried out no field work on the tenement during Year 1, because it was inappropriate to carry out any work during the demerger process with NuPower that could affect the value of the tenement.

Year 2, Exploration by NuPower Resources
Following the demerger NuPower decided to carry out no fieldwork on Johanssen Range until it had assessed the results of the drilling from Lucy Creek. These results returned very low uranium grades hence it was decided to undertake preliminary metallurgical testwork on that material to see if it was amenable to bulk low grade heap leach extraction. These results were similarly disappointing.

Due to the extraordinary delays in receiving the assay and metallurgical results as a result of the mining boom NuPower experienced considerable delays in being able to plan on-going exploration work on these two tenements. The scarcity of field geologists to carry out this work also contributed to the delays.

Therefore NuPower reported that no fieldwork was carried out on the Johanssen Range tenement during Year 2 although there was some geological and geophysical data research and the collation and study of open file reports.

Year 3, Exploration by NuPower Resources
Although NuPower carried out limited reconnaissance geological mapping, rock chip sampling and bore water sampling on Johanssen Range, there was no work on the areas relinquished. This was because these areas were considered not prospective for uranium or phosphate.
CONCLUSIONS

Previous exploration has shown that the Mid Cambrian Red Heart Dolostone and Mt Arthur Formations are the most prospective for phosphate and uranium. These units are absent from the blocks in the northwest of Johanssen Range that were relinquished where the area is instead underlain by Arrinthrunga Formation.

Blocks underlain by the Bonya Schist in the southern part of Johanssen Range that is also considered not prospective for uranium or phosphate were also relinquished.
GROUND RELINQUISHMENT

EL24724 comprised 96 blocks. Following the deferment to NuPower’s request to waive the relinquishment of blocks as is usually required at the end of Year 3, 16 blocks were relinquished. The revised area now comprises 80 blocks covering 253.68 square kilometres.

EXPENDITURE STATEMENT

The covenant for EL24724 for Year 3 was $35,000. The expenditure was $20,251.42 and therefore the covenant was not reached (Appendix 1).

A request of variation of covenant was submitted along with the annual report for EL24724.

Yours sincerely,

WARRICK RAFFERTY
MSc(Hons) AusIMM, SEG
May 5, 2009
REFERENCES


Andrew Drummond and Associates, Independent Consulting Geologists Report for Arafura Resources NL.


APPENDICES
NORTHERN TERRITORY EXPLORATION EXPENDITURE FOR MINERAL TENEMENT

Section 1. Tenement type, number and operation name: (One licence only per form even if combined reporting has been approved)

<table>
<thead>
<tr>
<th>Type</th>
<th>Exploration Licence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>24724</td>
</tr>
<tr>
<td>Operation Name (optional)</td>
<td>Johansen Range</td>
</tr>
</tbody>
</table>

Section 2. Period covered by this return:

<table>
<thead>
<tr>
<th>Twelve-month period:</th>
<th>If Final Report:</th>
</tr>
</thead>
<tbody>
<tr>
<td>From 03/12/07</td>
<td>From</td>
</tr>
<tr>
<td>To 02/12/08</td>
<td>To</td>
</tr>
</tbody>
</table>

Covenant for the reporting period: $35,000

Section 3. Give title of accompanying technical report:

<table>
<thead>
<tr>
<th>Title of Technical Report</th>
<th>Group Annual Report Lucy Creek / Johansen Range Project, period ending 02/12/08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author</td>
<td>Warrick Rafferty</td>
</tr>
</tbody>
</table>

Section 4. Locality of operation:

<table>
<thead>
<tr>
<th>Geological Province</th>
<th>Southern Georgina Basin – Eastern Arunta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographic Location</td>
<td>Jervois</td>
</tr>
</tbody>
</table>

Section 5. Work program for the next twelve months:

<table>
<thead>
<tr>
<th>Activities proposed (please mark with an “X”):</th>
<th>Drilling and/or costeining</th>
<th>Literature review</th>
<th>Airborne geophysics</th>
<th>Geological mapping</th>
<th>Ground geophysics</th>
<th>Rock/soil/stream sediment sampling</th>
<th>Other:</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Estimated Cost: $30,000

Section 6. Summary of operations and expenditure:

Please include salaries, wages, consultants fees, field expenses, fuel and transport, administration and overheads under the appropriate headings below. Mark the work done for the appropriate subsections with an “X” or similar, except where indicated. Complete the right-hand columns to indicate the data supplied with the Technical Report. Note overheads are not to exceed 15% of total.

Do not include the following as expenditure (if relevant, these may be discussed in Section 7):

- Insurance
- Company Prospectus
- Rent & Department Fees
- Bond
- Transfer costs
- Title Search
- Legal costs
- Advertising
- Land Access Compensation
- Meetings with Land Councils
- Payments to Traditional Owners
- Fines
## Exploration Work type

### Office Studies
- Literature search: X
- Database compilation
- Computer modelling
- Reprocessing of data
- General research: X
- Report preparation
- Other (specify): X

**Subtotal:** $3,777.42

### Airborne Exploration Surveys (state line kms)
- Aeromagnetics: kms
- Radiometrics: kms
- Electromagnetics: kms
- Gravity: kms
- Digital terrain modelling: kms
- Other (specify): kms

**Subtotal:** $

### Remote Sensing
- Aerial photography
- LANDSAT
- SPOT
- MSS
- Other (specify)

**Subtotal:** $

### Ground Exploration Surveys

#### Geological Mapping
- Regional
- Reconnaissance: X
- Prospect
- Underground
- Costean

### Ground Geophysics
- Radiometrics
- Magnetics
- Gravity
- Digital terrain modelling
- Electromagnetics
- SP/AP/EP
- IP
- AMT/CSAMT
- Resistivity
- Complex resistivity
- Seismic reflection
- Seismic refraction
- Well logging
- Geophysical interpretation
- Petrophysics
- Other (specify)
## Geochemical Surveying and Geochronology

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<thead>
<tr>
<th>Type</th>
<th>Number of Samples</th>
<th>Results (g/t)</th>
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</thead>
<tbody>
<tr>
<td>Drill (cuttings, core, etc.)</td>
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<td></td>
</tr>
<tr>
<td>Stream sediment</td>
<td>4</td>
<td>61.41</td>
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<tr>
<td>Soil</td>
<td>3</td>
<td>61.41</td>
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<td>Rock chip</td>
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<td>Laterite</td>
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<tr>
<td>Water</td>
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<td>Biogeochemistry</td>
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<tr>
<td>Isotope</td>
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<tr>
<td>Whole rock</td>
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<td>Mineral analysis</td>
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<tr>
<td>Petrology</td>
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<tr>
<td>Other (specify)</td>
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**Ground Exploration Subtotal** $16,474.00

## Drilling

<table>
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<tr>
<th>Type</th>
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<th>Metres</th>
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<tbody>
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<td>Diamond</td>
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<tr>
<td>Reverse circulation (RC)</td>
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<td></td>
</tr>
<tr>
<td>Rotary air blast (RAB)</td>
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<td></td>
</tr>
<tr>
<td>Air-core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auger</td>
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<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Subtotal** $\

## Other Operations

- Corecutting/Trenching
- Bulk sampling
- Mill process testing
- Ore reserve estimation
- Underground development (describe)
- Mineral processing
- Other (specify)

**Subtotal** $\

## Access and Rehabilitation

- Track maintenance
- Rehabilitation
- Monitoring
- Other (specify)

**Subtotal** $\

**TOTAL EXPENDITURE** $20,251.42
Section 7. Comments on your exploration activities:

An important radiometric anomaly in the western part of Johannsen Range remains unexplored and will be visited in 2009.

NuPower believed that this tenement has significant potential for phosphate mineralisation in the Errara Formation of the Georgina Basin on the northern side of the Johannsen Ranges. Although not mapped NuPower will carry out sufficient reconnaissance work to determine if the Errara Formation is present and contains phosphorite.

Phosphorous stream sediment anomalies in the southern part of the license will be followed up in conjunction with reconnaissance around Twins Bore to explain the zinc anomaly from the bore water.

I certify that the information contained herein, is a true statement of the operations carried out and the monies expended on the above mentioned tenement during the period specified as required under the Northern Territory Mining Act and the Regulations thereunder.

☐ I have attached the Technical Report

1. Name: Warrick Rafferty 
   Position: Exploration Manager 
   Signature: 
   Date: 10/03/09

2. Name: 
   Position: 
   Signature: 
   Date: