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EL 10214 AND EL 10215
JERVOIS PROJECT, NORTHERN TERRITORY, AUSTRALIA

by

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1:100,000 – Jervois Range 6152
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1. INTRODUCTION

1.1. Background

Previous investigations have identified a range of mineral commodities throughout the Jervois region. The most notable being a group of abandoned base metal deposits in the Jervois Mining District (*e.g*. Green Parrot, Reward, Attutra, Skyes, Cox's, and Bellbird) hosted by the Palaeoproterozoic Bonya Schist. These deposits lie outside of Arafura's tenements. Occurrences of base metals and tungsten hosted by the Bonya Schist and associated units, also occur in the Bonya Hills region and elsewhere within ELs 10214 and 10215. Recent airborne geophysical data acquired by the Northern Territory Geological Services (NTGS) in 2004 indicates that Bonya Schist is also present under shallow cover in parts of ELs 10214 and 10215.

Ti-V-rich magnetite occurrences, some with anomalous Cu-Pt-Pd-Au are known within the Attutra Metagabbro in northeastern parts of EL 10215. Past exploration efforts have not fully evaluated the extents of these occurrences. Hoatson *et al.*, (2005) also points out that in comparison to most mafic-ultramafic intrusions in the Arunta Region, the Attutra Metagabbro is relatively S-poor and has a greater potential for stratabound PGE-sulfide associations.

The recent 2004 NTGS airborne radiometric data has also highlighted a series of uranium anomalies within the licence areas. This survey identified a large uranium anomaly in the western Jervois Range, the Lucy Creek Prospect which extends into adjacent EL 24516 (Lucy Creek) also held by Arafura. Previous investigations in this area had focussed on testing the lateral undercover extensions of the Mount Baldwin/Arthur Creek Formations for uranium and phosphate (Menzies and Palmer, 1994). Outcrops in the immediate vicinity of the airborne uranium anomalies received limited attention.

Interest in these tenements stems from the potential of the area to host:

- 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, and 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, and 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, and
- a range of other commodities associated with intrusives such as carbonatites, kimberlites and pegmatites.

1.2. Location and Access

(Modified after Lindsay-Park, 2004)

Exploration licences 10214 and 10215 are located approximately 260 kilometres east north-east of Alice Springs (Figure 1) in the Jervois district. These tenements are located to the south and north, respectively, of the Jervois Stock Route that passes through the Jervois pastoral property. EL 10214 lies wholly within the eastern Arunta Region. EL 10215 also includes parts of the Georgina Basin and borders EL 24716 and EL 24724, also held by Arafura.

Access to the general area is via the well formed but mostly unsealed Plenty Highway that intersects the Stuart Highway 68 kilometres north of Alice Springs. The road distance from Alice Springs is about 360 kilometres. Following heavy rain, the Plenty Highway can be closed to all traffic or have weight provisions applied.

The Plenty Highway passes through EL 10214. Well form dirt roads exist to Baikal and the nearby Bonya aboriginal community, and to Lucy Creek, north of EL10215, via the abandoned Jervois mine site. Vehicular access within the licences is generally restricted to a few station tracks servicing bores and fence lines. Vehicular movement away from these tracks is difficult in the western half of EL 10215 due to the hilly and rocky nature of the land but relatively easy the eastern part where shallow aeolian sand blankets reasonably flat ground. EL 10214 is mostly flat open plains and is generally more accessible.

Active dirt airstrips are located near the Jervois and Lucy Creek homesteads and near Baikal. An infrequently used airstrip is also located at the abandoned Jervois mine site.

1.3. Topography and Drainage

(Modified after Lindsay-Park, 2004)

The Jervois Range runs northeast-southwest through EL 10215 creating a drainage divide (Figure 1). Numerous ephemeral gullies and deeply incised creeks drain the hilly parts of EL10215. Similar drainage is less common in EL 10214. South of the Jervois Range most drainages contribute to the Plenty and Marshall Rivers that flow (intermittently) to the east and southeast ultimately to the Simpson Desert. North and west of the Jervois Range the main drainage is provided by Arthur Creek which also drains ultimately to the Simpson Desert in the southeast. There are no permanent rivers and only a few significant water holes in the region.

The topography within the licence area falls into three main categories that generally correspond to the underlying geology.

- Extensive flat sandy areas dissected by river systems and associated with the flood plains. These contain small isolated low-relief hills in parts and dominate the south and east of the tenements, especially throughout most of EL 10214.

- Steep-sided incised ranges that rise up to 250 metres above the surrounding plains. These are related to metamorphic and igneous rocks of the Arunta Region in the Bonya Hills in the western half of EL 10215, and to sedimentary rocks of the Georgina Basin in the Jervois Range in the northeast part of EL 10215.

- Northwest of the Jervois Range, areas of moderate- to low-relief undulating topography are typically associated with outcropping areas of weakly folded Georgina Basin stratigraphy.

1.4. Climate

(Modified after Lindsay-Park, 2004)

The climate prevalent in the licence area is best described as mainly dry all year round with hot summers and cool to cold winters. Average annual rainfall (1967–1983) is 330 millimetres of which about two-thirds falls in the period December to March. Average annual evaporation is approximately 2900 millimetres. Average minimum and maximum temperatures in summer are 22°C and 38°C degrees while corresponding winter average temperatures range at 4.7°C and 21.7°C. Overnight frosts are common some winters.

2. SUMMARY

Arafura Resources completed 934 metres of RC drilling in 15 holes in the northeast parts of EL 10215 in late 2006. This scout exploration drilling program was designed to explore the Fe-Ti-V potential of various magnetic targets within the Attutra Metagabbro. The results of Davis Tube Recovery studies, geochemical analyses and preliminary test grind work from Unca drilling project were not available at the time of writing the last report and are reported here.

Initial assay results indicate that the Unca prospect contains significant vanadium mineralisation and it is largely recoverable from magnetic fraction. Hence, Arafura planned a systematic RC drilling program to explore the size potential of vanadium mineralisation associated with the magnetic anomalies in the Unca project area in 2007. This program did not occur in 2007 as Arafura was unable to secure a suitable drill rig.

Arafura sponsored and provided field and logistical support for an Honours project (Jodi Fox from the University of Tasmania) that covered parts of the Unca prospect. This geophysical/geological project involved the acquisition, interpretation and modelling of detailed high-density ground based magnetic and gravity data collected over the Casper anomaly. In addition, numerous petrophysical measurements were determined on Unca prospect rock samples and on available drill core from the nearby Jervois Mine area to aid modelling and interpretations. Fox demonstrated a coincident gravity and magnetic anomaly at Capser. Fox also confirmed the results and interpretation of Arafura's exploration assays by demonstrating that V is preferentially partitioned into magnetite rather than ilmenite.

Matthew Cooper of Resource Potentials was engaged to model the geometry and depths of selected magnetic drill targets. These geophysical interpretations and models were based on known geology, measured magnetic susceptibility data and modelling of Arafura's 2005 low-level aeromagnetic line data.

Initial prospect-scale mapping of the outcropping rocks was also completed across the Casper and Coco anomalies in 2007 in preparation for the upcoming RC drill program.

Data for the southern parts of the Lucy Creek uranium prospect within EL 10215 is also reported here as results were not available for inclusion in the previous report. Exploration of the Lucy Creek uranium prospect was handed to NuPower Resources as part of Arafura's uranium demerger. Follow-up laboratory studies on selected samples are in progress at ANSTO and will be reported elsewhere. NuPower Resources completed reconnaissance geochemical sampling across other selected airborne radiometric targets within EL 10214 and 10215.

No field works were undertaken in EL 10214 by Arafura.

3. CONCLUSIONS AND RECOMMENDATIONS

Assay and DTR results from the 2006 scout RC drilling program Unca prospect are considered encouraging. Vanadium head feed results average 0.47% V_2O_5 which is similar to other magnetite hosted vanadium deposits, currently in operation or those anticipated to come on-line such as Windimurra in Western Australia.

The weighted average magnetic concentrate recovery, and grade of vanadium in the magnetic concentrate is 76.4% and 1.34% V_2O_5, respectively. These results are encouraging with concentrate recovery and concentrate vanadium grades worthy of follow-up investigations.

The results from the 2006 RC program therefore warrant systematic drill testing to discern the size potential at Unca. About 7,500 metres of RC drilling in 60-70 holes is proposed to systematically evaluate several magnetic anomalies at Unca. The proposed drilling program is designed to cover representative parts of the magnetic anomalies with the highest known vanadium potential based on the last round of drilling.

The results of RC drilling at the Lucy Creek uranium anomaly were disappointing and are being evaluated by NuPower.

Reconnaissance mapping and sampling of radiometric anomalies was also disappointing.

4. TENURE

4.1. Exploration Licences

Exploration licences (EL) 10214 and 10215 were applied for by Arafura Resources NL on the 29th October 1998. Both titles were granted on the 6th December 2001 for a period of six years.

EL 10214 initially contained 319 graticular blocks for a total area of 957.4 sq km. On 6 December 2003, the licence was reduced to 160 blocks, and was reduced to 80 blocks on 6 December 2004, and further reduced to 40 blocks on 6 December, 2005. EL 10214 was again reduced to 4 blocks on 6 December 2006.

EL 10215 was granted as 355 blocks (1074 sq km) and then reduced to 177 blocks on 6 December 2003, and to 88 blocks on 6 December 2004. A waiver of reduction was requested at the end of 2005 and retention of the current 88 blocks until 6 December 2006 was approved by the Mining Registrar on 16 December 2005. A waiver of reduction was again sort at the end of 2006 and retention of the current 88 blocks until 6 December 2007 and was approved by the Mining Registrar 14 March 2007.

A two-year extension to the standard 6 year term was sort and approval was granted by the Mining Registrar. All 88 blocks in EL 10215 were retained, however EL 10214 was reduced to 4 blocks.

Areas currently retained under EL 10214 and EL 10215 are shown in Figure 1.

4.2. Land Tenure

The original exploration licences covered parts of three perpetual pastoral leases (PPL). These are:

PPL 1007 Lucy Creek Station
Fogarty, E.D and K.M, Lucy Creek Station Via Alice Springs NT 0870

PPL 962 Jervois Pastoral Company
Jervois Pastoral Company PMB 36, Alices Springs NT 0871

PPL 1119 Jinka Station
Broad, M.J PMB 36, Alice Springs NT 0871

4.3. Native Title

There are no registered native title claims over the land which is the subject of the licences.

In the absence of instructions to the Central land Council from potential native title claimants in the area, the licences are not subject to an existing Native Title Exploration Agreement between the Arafura Resources and the CLC in respect of exploration titles in other areas of the Northern Territory.

In the absence of an Exploration Agreement, Native Title issues are addressed in accordance with Item 18 of the Schedule 2 Conditions which attach to the grant documents for both licences. This requires that Arafura 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 licences are separated by the Jervois Stock Route which is the subject of Aboriginal Land Claim 82.

4.4. Aboriginal Sacred Sites

The Sacred Site register of the Aboriginal Areas Protection Authority was queried by Capricorn Mapping and Mining Title Services Pty Ltd on 15 May, 2005, for the area of all of Arafura's titles and applications on the Jervois 100,000 sheet. This was prior to the Company undertaking reconnaissance activities in the area in 2005.

No exploration was conducted in the vicinity of the sites identified in the register. No sites are identified in either of the two areas over which airborne geophysical surveys were conducted in 2005.

In May 2006, Arafura Resources commissioned the Aboriginal Areas Protection Authority to conduct a clearance of an area of interest surrounding the Lucy Creek and Unca Prospects that was likely to be affected by drilling and earth moving operations and to provide Arafura Resources with a Work Authority Certificate covering all activities in these areas. Arafura was granted Authority Certificate C2006/080 in August 2006.

5. GEOLOGICAL SETTING

The regional and local geological discussion in this report largely comes from the author's extensive experience in the Arunta Region with the Northern Territory Geological Survey (NTGS) and recent collaborative programs with Geoscience Australia (GA). References include Freeman (1986), Freeman *et al.* (1989), Sun Shensu *et al.*, (1995), Collins and Shaw (1995), Zhao and Bennett (1995), Zhao and McCulloch (1995), Hand *et al.* (1999), Donnellan (2003), Maidment (2004), Hoatson *et al.* (2005), Claoué-Long and Hoatson (2005), Dunster *et al.* (in prep), other published NTGS and Australian Geological Survey Organisation (AGSO; now GA, formerly Bureau of Mineral Resources, BMR) maps and explanatory notes of the region, NTGS Annual Geological Exploration Seminar Abstracts, and unpublished co-authored papers and abstracts.

5.1. Regional Geology

The Arunta Region contains more than 200 000 km^2 of metamorphic rocks in the southern parts of the NT and has been recently subdivided into three distinct geological regions by the NTGS, the Ailerion, Warumpi and Irindina Provinces (Figure 2).

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 Presssure-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 (Figure 2) 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.

Unmetamorphosed Neoproterozoic to Palaeozoic marine and terrestrial sedimentary rocks of the Georgina, Ngalia and Amadeus Basins surround and unconformably overly the Arunta Region. Contemporaneous Neoproterozic 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.

5.2. Local Geology

The reader is referred 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 which describe the geology of the Jervois region, Freeman (1986) and Freeman *et al.*, (1989) will be relied on to provide an insight to the local geology and nomenclature. The author 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 drawn on previous mapping experience and unpublished data.

Figure 3 details the surface geology in the vicinity of the EL 10214 and 10215. The geological map is from a geo-located scanned copy the HUCKITTA 1:250 000 Geological Map Sheet (Freeman 1986).

The Jervois titles originally encompassed parts of the Aileron and Irindina Provinces and the Georgina Basin. EL 10215 includes elements of the Aileron Province and the Georgina Basin. EL 10214 is now entirely within the Aileron Province; prior to statutory reductions it included part of the Irindina Province.

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 licence 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 (Figure 2). 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 Bonya Schist (-pCo) is the dominant outcropping Palaeoproterozoic unit within the licence areas. It is a polydeformed composite unit that is predominantly composed of pelitic, psammopelitic and calcareous metasedimentary rocks, with subordinate psammitic and quartzite units, and felsic and mafic igneous rocks, all metamorphosed at upper greenschist to lower amphibolite facies conditions. Rare preserved sedimentary structures in the psammitic and quartzite units in the

Bonya Hills indicate that at least parts of the Bonya Schist were deposited in high-energy shallow-water environments. Sedimentary structures have been obliterated in the pelitic units that host the base metal occurrences in the Jervois Mining District.

Recent unpublished NTGS mapping (by the author 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. Large bodies of granite-granodiorite are also present throughout the region. Many of these have been differentiated and named based on their localised distribution. The granite-granodiorite bodies clearly intrude the Bonya Schist as plutons or as high-level sills/laccoliths. Field and petrological evidence indicates that most if not all have been deformed and metamorphosed, probably in the Strangways Event. The granitic units are poorly exposed in the eastern and southern parts of the licence area with isolated hills protruding above the plain, but geophysical data indicates they dominate the region. Unnamed metamorphic units, currently mapped as unit pCd, are also present in these areas; these are thought to be similar to parts of the Bonya Schist, based on their geophysical expression. However, differences are evident.

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 Hill have a different geophysical expression to the others mentioned above. A similar geophysical expression is seen elsewhere within the licence areas.

The Attutra Metagabbro (-Pda) occurs in outcrops to the east of the Jervois Mining District as a series of low hills. The unit is described as altered gabbro, dolerite, norite and magnetite rock. The mineral potential of this igneous body was highlighted by Hoatson *et al.* (2005) and is part of ongoing NTGS studies.

The named granites in the vicinity of the licence areas include the Jervois (-Pge), Unca (-Pgu) and Xanten (-Pgx) Granites. These range from biotite granodiorite to highly fractionated leucogranite. Outcrops of unnamed or undifferentiated granitoids also occur throughout the Jervois region; these units are thought to be more or less coeval with the named granites noted above. The Samarkand Pegmatite (Pps) has also been differentiated within the Bonya Hills.

Until recently, there was little in the way of precise geochronological constraints 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 Neoproterozoic Mopunga Group unconformably overlies the metamorphic rocks of the Arunta Region throughout most of the Jervois region, forming the spine of the Jervois Range (Figures 1 and 3). The Mopunga Group consists of the Elyuah Formation (-Pae, shale and silty sandstone), the Grant Bluff Formation (-Pag, quartz arenite and quartz-wacke), and the Elkera Formation (-Pak, siltstone, sandstone and dolostone). Freeman (1986) indicates that the Neoproterozic 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) indicates the Mopunga Group is disconformably overlain by the early Cambrian Shadow Group (Mount Baldwin Formation and Red Heart Dolomite) which is in turn disconformably overlain by the middle Cambrian Narpa Group (Thorntonia Limestone, Arthur Creek Formation and Steamboat Sandstone).

The distribution of the Red Heart Dolomite, 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.

Based on limited reconnaissance mapping in EL 10215 during 2006, the deeply weathered and silicified interval that contains phosphate-rich units (predominantly wavellite but also including minor turquoise) occurs above a red-brown mudstone/siltstone package is Red Heart Dolomite. Apart from one possible archaeocyathid, no other fossils were identified within this unit. These units occur at the top of a fining upwards cycle above the Baldwin Formation. These units were mapped as Errarra Formation by Freeman (1986) and Freeman *et al.*, (1989) but have since been assigned to the Red Heart Dolomite (Dunster *et al.*, 2006). Some of the silicified laminated chert/mudstone/siltstone units that overlie this unit could be Thorntonia Limestone?, as defined by Dunster *et al.*, (2006) in Huc 1, rather than Arthur Creek Formation (Freeman, 1986; Freeman *et al.*, 1989).

A series of northeast trending monoclines are present throughout the Jervois Range in the Lucy Creek prospect area. A subvertical north trending faultzone is also present in the southern part of the Lucy Creek prospect. As indicated on existing geological maps, this fault appears to curve into a north-northwest trend in the central part of the Lucy Creek prospect near the western edge of the Range. The relative movement on this fault is west side up (*ie.* reverse).

6. PREVIOUS INVESTIGATIONS

Other Parties

A detailed investigation of the previously completed exploration in ELs 10214 and 10215 has been compiled by Andrew Drummond and Associates as part of the Independent Geologist's Report included in the prospectus for Arafura Resources NL's initial public offering of shares in 2003. The relevant part of Drummond's original detailed report is reproduced here as in Lindsay-Park (2005). An abbreviated version appeared in the final prospectus document.

Drummond reported as follows (edited):

Exploration programmes and results relevant to an appraisal of Arafura's Jervois area are as follows.

(a) Central Pacific Minerals N L (1970-1972) ATP 2283 & 3156. CR72-013, 78-104

Tenements overlaid the north-western part of the Jinka Granite and generally west of EL10215. Work was concentrated at the Nabarloo North fluorite prospect, which lies about 15 km west of EL10215, where a resource (pre JORC) of 360 000 short tons (326 000t) at 40% fluorite to a depth of 30 metres was estimated - and apparently open under cover to the east. A later estimate of 123 000t @ 44.5% CaF_2 is presented in the NTGS Huckitta Mineral Deposit Data Series (Prospect 54). They indicate the potential for the hosting of bodies in the eastern Jinka Granite within EL10215, where it is generally concealed under alluvial cover. A separate report on the Bonya Bore area gives a good description of the geology of the various deposits in the Bonya field in EL10215 - including notes on the mineralisation, alteration, structure and a genetic model. However size, grade and resource data are too limited to obtain an impression of potential for a discovery of sufficient size to be economic for Arafura.

(b) Dampier Mining Co Ltd (1976-1977) EL1118. CR77-064

The tenement covered the north-eastern part of EL10215 - the latter consisting of reasonably well outcropping Neoproterozoic and Cambrian sediments of the Georgina Basin. The target was lead-zinc mineralisation in the Cambrian units. Cores and cuttings from previous BMR and oil exploration drilling were examined and some Pb and Zn mineralisation was noted. Surface reconnaissance defined favourable sediments and structures. However there is no available record of any follow-up work.

(c) Otter Exploration N L (1977-1980) EL1583. CR80-174, 78-116

That tenement covered the western halves of Arafura's tenements including the Bonya Tungsten Field. The licence area was originally considered to be prospective for W and Mo mineralisation. Copper and scheelite shows are located to the north of the licence area, and the Molyhil W-Mo deposit was being mined to the west of the licence area at that time.

Subsequently it was realised that the licence area was also prospective for U mineralisation. Traces of uraninite mineralisation were discovered at Molyhil in 1977, and a number of strong anomalies were recorded in the course of a reconnaissance radiometric survey, including one recorded near Thring Bore in the south-west part of the licence area.

Work carried out included additional airborne reconnaissance radiometric surveys, ground reconnaissance mapping and scintillometer surveys, and detailed mapping and sampling. Results were discouraging and the tenement was relinquished.

(d) Otter Exploration N L (1977 - 1980) EL1584. CR78-117, 80-121

The tenement covered the eastern half of EL10114, except for its north-eastern corner: it is an area mapped as underlain by granites and Georgina Basin sediments. As for EL1583, Otter's exploration began for Molyhil style tungsten and molybdenum, but was expanded to uranium. A detailed radiometric survey delineated anomalism near Mt Cornish. Ground follow-up revealed that they were associated with ferruginous and silicified zones in weathered granite near the unconformity with the Neoproterozoic Georgina Basin sediments. The zones may represent a regolith, or fossil soil profile, associated with a pre-Georgina weathering event. The radiometric anomalies were found to be due to Th minerals in the basement granites.

(e) Otter Exploration N L (1977 - 1980) EL1585. CR80-252

The tenement covered the north-eastern section of EL10214 and the eastern half of EL10215. It included the Jervois Mine area, exclusive of the claims pegged over the actual deposits.

Systematic airborne spectrometer surveying revealed 24 anomalies. A follow-up field work programme included evaluation of 22 of them, scintillometer traversing of the Arunta Basement/Georgina Basin unconformity, orientation work in the Jervois Mines area, reconnaissance mapping and sampling for U and scheelite mineralisation, and evaluation of selected scheelite prospects. Two of the anomalies proved to be due to concentrations of uranium.

Orientation work in the Jervois Mines area resulted in the discovery of some coffinite U mineralisation in a core sample obtained from the Marshall deposit. Scintillometer work in the Mines area and creek sediment sampling throughout the north-west of the licence area failed to disclose any additional U mineralisation. Several scheelite shows situated outside the main mineralised zone at Jervois (the 'J' structure), were evaluated by means of sampling and magnetometer surveys but results were considered disappointing. Samples (rock and creek sediment) were also analysed for Cu and Zn. An area of apparently fault controlled Zn, W and Cu anomalism was located north of the Jervois Mines. The anomaly lies within the area around the mines excluded from Arafura's tenements, but indicates the applicability of the method.

(e) Hunter Resources Ltd (1987 - 1989) EL5171. CR89-630

The tenement was taken out to cover the Attutra Metagabbro, a mafic intrusive which outcrops irregularly over a 20x10km area east of the Jervois Mine in both Arafura leases. Work included mapping, an orientation geochemical survey, stream and rock chip sampling and ground magnetics. Sampling was biased towards magnetite-rich rocks and metapyroxenite lenses, as they were considered to have had the best potential to have accumulated PGEs.

Although much of the target area is overlain by younger alluvials, Hunter considered that the cumulate phases which could host PGEs seemed to be only size-restricted lenses unlikely to hold large bodies of ore grade platiniferous rock. Drummond notes that although maximum Pt assay was only 28 ppb, palladium assayed to 215 ppb and so is considerably more encouraging, especially considering its current strong price. Follow-up of magnetic anomalies generated by the NTGS airborne survey may be a worthwhile avenue for Arafura.

(f) Rosequartz Mining N L and Zapopan N L (to 1991) EL6260. CR89-816

The tenement essentially covered the Bonya Schists west of the Jervois Mine and hence much of the western half of EL10215. It was acquired because the area had not previously been explored for Au despite it having been noted at the Jervois Mine and the Bonya workings, and because it was considered to have potential for Broken Hill-style Pb-Zn mineralisation. It covers the Bonya Tungsten Field.

The main exploration technique was stream sediment sampling for BLEG Au and for base metals, together with rock chips and geological traverses. Zapopan's mapping indicated that mineralisation in the licence area was evident at two stratigraphic levels: Cu-mineralisation was located lower in the sequence associated with garnet quartzites, calc-silicates and quartz flooding; W-mineralisation was located higher in the sequence associated with amphibolites and calc-silicates. Neither seems likely to host an economic deposit. Lead-zinc values were *uniformly low. The drainage values highlighted three principal areas of anomalous Au. The two strongest anomalies also have coincident drainage Cu anomalies and elevated Zn.*

Drummond considers that the BLEG results are moderately encouraging in that the anomalous values are explicable and average sample spacing is very wide. However the absolute level of anomalism is low as the maximum result from 60 samples was only 0.51 ppb Au. The sampled area has a high degree of outcrop and relatively high topographic relief contrast. It is considered that a major outcropping Au deposit should exhibit a greater BLEG response.

(g) Johannsen (1988 - 1989) EL6326. CR90-221

The tenement was located in the south-western Bonya Hills and hence in the south-western part of EL10215. Johannsen aimed to find apatite-hosted REE mineralisation. Two occurrences of apatite were located by traversing, but the REE assays are too low to be of interest. Nonetheless, Drummond considers the results do indicate potential in that district. Arafura's intended study of the recently flown NTGS airborne radiometrics seems well justified.

(h) Normandy Exploration Ltd (1990 - 1996) ELs 6993, 7287 and 7505. CR92-367, 93-169, 94-111, 95-108 95-253, 95-313, 96-283

The northern sector of EL6993 essentially covered those parts of ELs 10214 and 10215 which lie east of the Jervois Mine. The southern sector covered interpreted Arunta Block metamorphics under widespread alluvial cover in south-eastern EL10214. The western part of EL7287 covered the eastern-most salient of EL10214. EL7505 covered Bonya Schist around the Bonya Tungsten Field.

Normandy applied for the tenements to target sediment-hosted Broken Hill style mineralisation within Division 2 of the Proterozoic Arunta Group.

The exploration highlighted the Hamburger Hill area where Cu, Pb, Zn and Ag mineralisation was intersected. It lies 3-4km east of the Jervois workings, but outside EL10215. Normandy spent $1.4 million on its project, of which it seems about half was expended on ground now the subject of Arafura's applications. A massive data base has been created, and Drummond considers that a rigorous appraisal of it by Arafura, in combination with other data available to it, should indicate anomalous areas worthy of follow-up. The Normandy programmes and results away from Hamburger Hill are summarised below, with comments where appropriate on apparent avenues for Arafura.

During 1990, a reconnaissance trip was made to assess the area and determine the most appropriate sampling methods. A series of soil and rock traverses were conducted over areas of shallow sand/soil cover and outcrop. These traverses were located over magnetically high areas or geologically interesting or complex areas. Soil sample traverses were conducted along roads and tracks to assess the suitability of this method in areas of transported cover.

In 1991, a bedrock auger drilling programme was conducted along a series of traverses over similar areas to the initial reconnaissance. The three areas targeted for auger drilling were: east of Jervois Mines in south-east EL10215; south of the Plenty Highway in eastern EL10214; and north of Jervois Homestead in EL10214. The aim of the programme was to test the bedrock beneath variable thicknesses of sand/soil cover. In addition to the auger traverses, rock chip samples were collected during general reconnaissance of the area. Stream development was sufficient for representative stream samples to be collected in south-western EL10215, the Bonya Bore area.

Two areas were targeted for lag sampling; east of the Jervois Mine Leases, over outcropping and sub-cropping Bonya Schist rocks; and between Bonya Creek and Marshall River over outcropping and sub-cropping gneiss. The lag sampling was confined to the hills and ridges and areas of isolated outcrop. East of Jervois Mine the sample grid extended approximately 20 km north-south and averaged 4-5 km east-west: the length of individual *lines depended on the landform. Evaluation of the lag sample results highlighted a coincident Cu, Pb, Zn, Ag, Cd, Co, As and Mo anomaly which defined Hamburger Hill. Drummond notes that although follow-up was concentrated upon this major anomaly, other anomalous areas were also indicated: they have received less intense follow-up.*

In western EL10215, there are numerous Cu and W mineral occurrences and old mines. The majority of the mineralisation is hosted within or near the Kings Legend Amphibolite Member of the Bonya Schist and in the pegmatites. The aim of Normandy's programme there was to detect mineralisation outside the known prospects. The target area was the contact zone between the Mascotte Gneiss and Bonya Schist. Normandy's tenement was sampled with a total of 250 samples collected from second and third order streams. Assessment of the data did highlight any anomalous areas requiring follow-up.

An airborne EM survey was flown over selected areas. Anomalies were ground checked and soil sampled, with one area returning a Cu anomaly. A vacuum drilling programme was taken over two prospects 6 km south-east of the Jervois Mine, and within eastern EL10215.

In 1994, regional RAB drilling was completed in the Mt Cornish area of EL10214. The holes were drilled on a 1x1 km grid. The aim of the programme was to provide information on bedrock and to delineate prospective rock types, namely schists or mafic gneisses. The holes intersected granite, quartzo-feldspathic gneiss, amphibolite and unmetamorphosed Mt Cornish Formation sediments. A major NNW-SSE trending magnetic feature also runs through the area and was tested by a line of close spaced holes. RAB drilling was also carried out over anomalies defined by earlier investigations.

A further EM and magnetic survey was flown in 1994 covering Bonya Schist east of the Jervois Mine area and around the Bonya Tungsten Field. Anomalies were interpreted at the former and tested by vacuum drilling. Earlier airborne EM anomalies were followed up by a ground SIROTEM survey and then by RAB drilling in 1995. That drilling programme also tested anomalies which Normandy considered had not been assessed previously.

Drummond re-iterates that Arafura has yet to process and re-interpret the wealth of Normandy's data submitted to the NTDME, and it is beyond a reasonable scope for this Report to do so. However, given the geological setting; the extent of known mineralisation and of cover; the areal limits of several aspects of Normandy's exploration; and Normandy's justified concentration upon its Hamburger Hill discovery, Drummond would be reasonably confident of Arafura's ability to sift out some areas worthy of follow-up from the data it now has at hand.

(i) Aztec/Normandy (to 1993) Various Mineral Leases and Claims.
CR93-234, 94-160, 94-161, 94-203

Mineral Lease S71 (1973 - 1993) *It covered a small molybdenum and tungsten show, of the Bonya Hills skarn type, located about 6 km east of the Jervois Mine. Although no substantial work was done on it, Aztec considered it had no potential. Drummond considers its significance is as a further indicator of mineralisation beyond the main J curve of old workings.*

Mineral Lease S14 (1947 - 1993) *The lease covered the old Bonya Mine workings. It was considered that the general host, a calc-silicate unit, is the same as that which hosts the Jervois workings. It was estimated for Aztec that there was a potential for 10 000t of secondary Cu ores and chalcopyrite in a quartz reef structure. Grade was not indicated. Apparently no confirmatory work was undertaken, and Drummond stresses that this tonnage figure cannot be regarded as a JORC resource estimate.*

Mineral Claims S1-5 (1983-1993) *They covered some of the old Bonya Hills Cu-tungsten workings. Work seems to have been confined to inspection of the old workings contained therein.*

(j) CRA Exploration Pty Ltd (1993 - 1994) EL8116. CR94-588

The tenement covered the Georgina Basin sediments in the central and north-eastern part of EL10215. CRA considered it prospective for unconformity hosted Cu-U-phosphate mineralisation. During the period of tenure the following exploration programmes were undertaken :

- *Airborne radiometric and TM Imagery data acquisition, processing and interpretation.*
- *Collection and multi-element analysis of 42 reconnaissance rock chip samples.*
- *Geological mapping and air photo interpretation.*
- *Drilling of six scout percussion holes (aggregate metreage of 530 metres) 500 metres apart.*
- *Multi-element analysis of percussion drill samples.*

CRA concluded that :

- *Airborne radiometric and TM anomalies delineate the phosphatic, organic-rich Arthur Creek Formation/Mount Baldwin Formation Middle Cambrian disconformity.*
- *Reconnaissance rock chip sampling of that disconformity surface reported assay values of up to 2.08% Cu, 100 ppm U and 11.4% P along a 4 km strike length of turquoise mineralisation.*
- *Wide spaced scout drill testing of the gently dipping disconformity surface returned no significant assay values.*
- *A 10-15 metre thick calcareous unit, weakly anomalous in Zn (up to 520 ppm), delineates the base of Arthur Creek Formation.*
- *The Mount Baldwin Formation is characterised by low order base metal values and has limited potential for stratabound Cu mineralisation.*

Drill testing of the disconformity (six percussion holes for a total of 530 metres, drilled 500 metres apart) failed to suggest the presence of substantive zones of Cu-U phosphate mineralisation.
Drummond views the work as being essentially first pass, localised and reasonably encouraging.

(k) Solbec Pharmaceuticals (previously Britannia Gold NL)/MIM Exploration Pty Ltd. Jervois Mines Leases, EL9518 and ELa10419. 2000-Present.

This joint venture has been exploring the tenements which host the known Jervois mining field and its principal known trend of mineralisation - the J structure. Its public reports via Solbec/Britannia indicates the following results of relevance to Arafura.

- *While there has previously been an exploration model based on an association between magnetite and base metal mineralisation, Mobile Metal Ian geochemical surveys has indicated potential for deeper mineralisation not associated with magnetite.*

- *A proprietary MIM Induced Polarity geophysical technique generated new drill targets away from known areas of mineralisation.*

- *Drilling adjacent to and below old mining areas has returned encouraging results and Britannia noted that at the Marshall-Reward lode that mineralisation was increasing at depth. The mineralisation is* *apparently more extensive along strike and at depth than had previously been known. This enhances the possibility of the eventual discovery of a large deposit.*

- *Drilling of the new geophysical targets which had no surface expression has generated success, e.g. hole J3 was reported as intersecting the following copper mineralisation:*

4m @ 2.32%	*from*	*202m downhole*
2m @ 1.49%	*from*	*252m downhole*
9m @ 0.46%	*from*	*261m to bottom of the hole*

- *While Cu is presumed to be the main target, the drilling has returned interesting levels of Au, Pb, Zn and Ag which may lead to eventually more favourable economics.*

EXPLORATION BY ARAFURA RESOURCES

In the 2004 exploration year, Arafura completed a review of all of the past exploration data available for the area covered by ELs 10214 and 10215. The review included compilation of the airborne magnetic and radiometric data and the various forms of stream, soil and rock chip geochemistry. Several areas of interest emerged and work programs for these areas were proposed.

The Attutra Metagabbro was identified as a region of interest with Fe-V potential. Limited previous work by Hunter Resources also indicated the presence of anomalous gold and platinum group elements in these rock types.

A short reconnaissance trip was made to the area in 2004

- to meet with the local pastoralists and Aboriginal representatives;
- to gain an impression of the land forms, access and logistics prior to commencing substantial work; and
- to collect a suite of rock samples suitable for providing background information.

A petrographic report by Charter Mathison (University of Western Australia) on suite of nine samples collected in the vicinity of the Attutra Metagabbro was presented in Lindsay-Park (2005).

EXPLORATION ACTIVITIES COMPLETED IN YEAR 4

In 2005, Arafura commenced a targeted reconnaissance work program on the Lucy Creek and Unca Prospects, both within EL 10215.

The aims of the geological reconnaissance visit were:

- to locate and collect samples responsible for the airborne uranium-channel anomalies that were highlighted by airborne geophysical surveys over large regions within the outcropping parts of Georgina Basin. The largest of these uranium anomalies, the Lucy Creek Prospect, was targeted to collect representative material for assay.

- to relocate and access the mineral potential of the two vanadium occurrences mapped by the NTGS in the southeastern parts of the Attutra Metagabbro in HUCKITTA.

Results and activities of the 2005 exploration year are detailed in Hussey (2006).

Mr Bill Peters of Southern Geoscience Consultants was commissioned to assess and report on the uranium radiometric anomalies identified by the 2004 NTGS airborne geophysical survey of the Jervois Range 1:100 000 map sheet. Peters' memorandum is included in Hussey (2006).

UTS Geophysics was commissioned to undertake a high resolution airborne magnetic and radiometric survey of the Lucy Creek and Unca Prospects. These surveys were completed in December 2005 and a preliminary report on this survey and the specifications and details of these surveys was included in Hussey (2006). These reports and all gridded and line data as well as an image atlas are presented in Hussey (2006). Both surveys were flown along 50 metres spaced northeast trending (Lucy Creek) or northwest trending (Unca) lines at 25 metres terrain clearance with orthogonal tie-lines every 500 metres.

EXPLORATION ACTIVITIES COMPLETED IN YEAR 5

RC DRILLING LUCY CREEK

Arafura completed an RC drilling program at the Lucy Creek prospect in November, 2006. A total of 1713 metres was drilled in 60 vertical holes to depths between 4-55 metres to explore the uranium potential of the Lucy Creek prospect. Only the southern parts of the Lucy Creek prospect airborne radiometric anomaly are within EL 10215 (Figure 3). The majority of the Lucy Creek prospect airborne radiometric anomaly occurs in the adjacent EL 24716, also held by Arafura Resources, but transferred to NuPower Resources following the demerger of our uranium assets in 2007.

A total of 241 metres were completed in 15 vertical holes (LCRC044-LCRC059 inclusive) in EL 10215. Hole depths were between 4 and 43 metres.

All site preparation and field/sampling procedures as well as hole location/orientation data and geological logs are detailed in Hussey (2007). No assay data was available at the time.

RC DRILLING UNCA

In November, 2006, a total of 934 metres of RC drilling was completed in 15 vertical holes to depths between 25-82 metres to explore the Unca prospect for Fe-V. The location of these holes is shown in Figure 4.

All site preparation and field/sampling procedures as well as hole location/orientation data and geological logs are detailed in Hussey (2007). No assay data was available at the time.

7. ARAFURA'S EXPORATION ACTIVITIES COMPLETED IN YEAR 6

Arafura's 2007 exploration activities in EL10215 included:

- Literature research into similar deposits/mineralisation to better understand geological characteristics and to determine the appropriate assay techniques and reporting requirements necessary to fully assess and evaluate the prospect.
- Arafura and NuPower undertook a brief helicopter reconnaissance of the Lucy Creek prospect in January, 2007.
- Arafura completed an additional sampling trip to the Lucy Creek prospect in March, 2007, to recover and re-split 'missing' samples.
- Arafura undertook a brief helicopter reconnaissance of the Unca prospect in March, 2007.
- ALS Chemex completed preliminary test work on 4 composite assay samples from the Unca RC program to determine the appropriate grinding technique and size fraction for routine DTR and meaningful analysis (see data in Appendix 2).
- Brian Povey of ProMet Engineers to review ALS Chemex's initial grind tests and XRF analytical results and to recommend the appropriate treatment/ grinding methodology for analysis of all Unca RC samples. Povey recommended an initial 120 seconds grind with the subsequent grind times dependant on the amount of oversized material and in-house DTR grinding table times. Repeated grinds of the oversized fraction continued until there was less than 5 grams of oversized material from the original 150 gram sample.
- ALS Chemex (Perth) completed Davis Tube Recovery (DTR) and assays as per ProMet recommendations (see data in Appendix 2).
- ProMet Engineers reviewed and provided a written assessment of the final Unca DTR results and assay data. Povey's review and written assessment is included as Appendix 3.
- Arafura provided field and logistical support and funding for the acquisition of ground based magnetic and gravity data and petrological and petrophysical sampling of the Unca prospect (Jodi Fox Honours Project area). Fox's thesis and data are included in Appendix 4.
- Arafura undertook detailed prospect-scale geological mapping and sampling over parts of the Unca Prospect. This was completed by KJH while assisting/supervising Jodi Fox (see data in Appendix 7).
- BBS accurately surveyed 2006 RC drill collars and set up survey base stations for future surveys (see Appendix 6). BBS also accurately located Jodi Fox's gravity base station so that the survey data could be tied to the national database.
- Arafura designed a 7500 metre RC drill program to test the size potential of the Unca vanadium prospect. With this program in mind, Arafura entered negotiations with several drilling contractors. Despite assurances, early attempts to secure a drill rig were unsuccessful. Johannsen Drilling Pty Ltd agreed to undertake the proposed program in October 2007, but indicated they could not start until early 2008 (see Appendix 7).
- Mathew Cooper of Resources Potentials was engaged to model and interpret proposed RC drill targets and other magnetic anomalies in the Unca prospect area. Arafura supplied magnetic susceptibility measurements and geological logs from the 2006 RC drilling program. Arafura's low-level aeromagnetic line-data and Fox's detailed ground gravity data was also supplied for use in this exercise. Cooper's report is included in Appendix 5.

UNCA VANADIUM PROSPECT

A total of 934 metres of RC drilling was completed in 15 vertical holes in November, 2006. These scout holes drill-tested magnetic anomalies to depths between 25-82 metres within the Attutra Metagabbro for Fe-Ti-V mineralisation. All site preparation and field/sampling procedures as well as hole location/orientation data are detailed in Hussey (2007). The geological logs for the Unca RC drilling program were reported in Hussey (2007) and are also included again with this report as Appendix 1. The location of these holes is shown in Figure 4.

RC Drill Sample Preparation & Compositing

285 individual 1-metre RC assay samples were collected from Baikal by Talbot Transport and delivered ALS Chemex in Alice Springs in December 2006. Individual assay samples were selected on the basis of drill logs and magnetic susceptibility measurements. Selected assay intervals typically exceed 10-20% of visually logged magnetite in RC chips. The magnetic susceptibility of each assay sample generally exceeded 0.3 SI however the occasion low magnetic susceptibility sample was included in the composite assay interval.

After drying, the entire RC assay sample for each individual metre was coarse crushed to -2 millimetres and composited in such that assay samples generally represented 3- to 5-metres wide of mineralised material. Individual samples were thoroughly mat mixed to homogenise the sample prior to compositing. An equal, accurately weighed amount of each individual sample was then combined to make up approximately 150 grams of material that forms the composite assay sample. Composite samples were forward to ALS Chemex in Perth for Davis Tube Recovery (DTR) and geochemical analysis by XRF.

At ALS Chemex in Perth, composite samples were prepared and ground to meet grind specifications for DTR as recommended by Brian Povey of Promet Engineers. Assay samples were prepared in accordance with standard in-house laboratory procedures for the recovery of the magnetic fraction by DTR but followed Povey's specifications for grind time and bowl type. The specifications and recommendations to ALS Chemex for the Unca RC samples arose from a series of initial test samples with repeat grinds at 45 and 75 microns on 4 DTR test composite samples and subsequent geochemical analysis (see data in Appendix 2). A series of timed bowl grind tests were also completed to determine potential vanadium contamination (see data in Appendix 2). The results were forwarded to Povey for his advice and recommendations.

About 20 grams of the recommended grind (100p/-75μm) was accurately weighed material was submitted for DTR at ALS Chemex in Perth.

Coarse-crush residues from ALS Chemex, Alice Springs, were recovered and are currently located in Arafura's Berrimah storage shed.

Chemical Analyses

Composite assay samples were analysed by ALS Chemex in Perth using XRF-fusion and standard Fe-ore analytical methods/scans. Geochemical analyses were performed on both the head feed and the recovered magnetite concentrate from the DTR. Dual analyses were performed to enable the calculation of recoverable products for Fe, V, Ti etc. Both the head feed and the magnetic concentrate from the Davis Tube Recovery were assayed by the same method. Arafura realised that ALS Chemex initial vanadium results were incorrect as their initial and repeat XRF data consistently yielded significantly more than 100% vanadium recovery in a number of samples. It was realised that ALS Chemex had encountered significant Ti/V interference/calibration problems as high V is not usually encountered in their standard Fe-ore schemes. Acceptable XRF results were ultimately achieved after re-calibration using synthetic standards. All analytical data including standards data, inter-laboratory (NTEL) cross-checks and a number of variation diagrams are all presented in Appendix 2.

External Control Analyses

Representative splits from the ALS Chemex assay samples were forwarded to NTEL, Darwin, to test ALS Chemex's problematic vanadium results. NTEL advised that their analytical scheme and methodology was not the most appropriate for Fe ore, as XRF is the preferred method. After consideration it was decided that these V assays should be preformed at NTEL. Alternative inter-laboratory work is planned in the coming year with the next batch of samples.

LUCY CREEK URANIUM PROSPECT

RC Drill Sample Preparation & Compositing

RC drill samples from the Lucy Creek uranium prospect in EL 10215 and EL 24716 were submitted and treated as one project. A total of 1410 individual 1-metre RC samples (which included 84 duplicate samples) were delivered ALS Chemex in Alice Springs for sample preparation.

After drying, each entire assay sample (if less than 3 kilograms) was pulverised to p85/-75 microns in an LM5 mill. Samples greater than 3 kilograms were split using a Jones riffle splitter to reduce the size of the sample before they were milled.

229 individual RC samples were submitted for analysis from EL10215. 12 of these were field duplicates. 147 were assayed as individuals. The 70 remaining samples were composited into 33, 2-3 metre composite assay samples. Compositing was done by accurately weighing an equal amount of each constituent homogenised/pulverised sample.

Samples with a measured activity of less than 200 CPS were not assayed, unless it was a field duplicate.

During sample preparation, ALS Chemex (Alice Springs) advised that 25 assay samples were missing from the Lucy Creek batch. Hence, a dedicated re-sampling trip was immediately arranged. The primary assay sample (calico bag) for six of the 'missing' samples were located at the drill site beside/underneath the primary RC residue. Clearly the sampling crew did not collect these samples the time of drilling. The primary assay samples for the remaining 19 samples could not be found at their respective drill sites or the temporary field storage area and hence their whereabouts are unknown. It was decided to re-split all 25 samples from the original RC residues as the plastic bags had protected the sample from the recent rains. The majority of this 'missing' sample issue was attributed to the laboratory staff not locating the submitted samples. Both Arafura's sample collection protocols and ALS Chemex's laboratory procedures have been amended.

Prepared assay samples were be forwarded to ALS Chemex in Brisbane for analysis.

Residues of assay pulps were recovered for temporary storage in Darwin.

Chemical Analyses

After 4-acid digestion (HF/HCl/HNO_3/$HClO_3$), samples were analysed by ALS Chemex in Brisbane as follows:

ICP-MS	Ce, La, Nd, Sr, U, Th (code ME-MS62s)

External Control Analyses

Internal laboratory standards were used.

8. RESULTS AND DISCUSSIONS

Unca Prospect

Fifteen scout RC drill holes were drilled in the Unca prospect area in 2006 (Figure 4). All holes were designed to test for Fe-Ti-V mineralisation in selected magnetic anomalies within the interpreted extents of the Attutra Metagabbro. The drilled magnetic anomalies were interpreted to be possible subsurface and lateral analogues of the V-magnetite-rich surface outcrops detailed in Hussey (2006). All holes intersected mafic/gabbroic rocks similar to the nearby Attutra Metagabbro outcrops mapped by Freeman (1986) and Freeman *et al.*, (1989). Two holes also intersected metasedimentary units similar to outcropping units in the adjacent Bonya Schist. 14 of the 15 holes intersected magnetite-rich rocks/intervals with associated gabbroic rocks. The single hole that failed to intersect magnetite-rich rocks (UNRC012) was centred on a subtle magnetic anomaly adjacent surface magnetite outcrops.

Geological logging and magnetic susceptibility measurements indicate intervals to 44 metres of magnetite-rich rocks (see Appendix 1). Details of RC hole locations as surveyed by BBS (see Appendix 6) and their magnetite-rich intervals are given in Table 2 below. The highlighted magnetite-rich rocks/mineralised intervals were selected for assay as they have a high potential to host V-rich magnetite mineralisation similar to the surface outcrops described in Hussey (2006).

Table 1: Surveyed collar positions and mineralised interval summary. Note all holes are vertical.

Hole_ID	MGA94 E	MGA94 N	RL	EOH DEPTH	MINERALISED INTERVALS
UNRC001	640344.61	7494899.44	303.32	60	0-44
UNRC002	640474.71	7494996.41	298.71	66	28-63
UNRC003	640861.74	7494951.21	297.01	82	66-78
UNRC004	640178.77	7496122.41	310.34	50	0-13
UNRC005	640500.88	7496199.71	300.16	67	0-23; 42-57
UNRC006	640538.31	7496348.74	299.54	70	21-23
UNRC007	640538.44	7496651.73	298.86	74	53-60; 69-74
UNRC008	640240.95	7496947.31	299.66	73	4-8; 29-73
UNRC009	637298.65	7496702.46	329.75	25	0-19; 24-25
UNRC010	637314.57	7496618.65	329.20	65	0-8; 12-13; 39-54; 60-61
UNRC011	635590.03	7496500.95	326.54	55	0-1; 4-5; 17-20
UNRC012	635640.12	7496300.78	331.45	40	
UNRC013	640950.19	7495648.95	296.67	70	(26-32)??; 49-58
UNRC014	641199.69	7494200.85	297.01	70	45-48; 64-68
UNRC015	637750.52	7499498.93	306.96	70	21; 30-33; 47-65

All assay and DTR results from the magnetite-rich intervals are included in Appendix 2. All assay samples were prepared for DTR as per recommendations by Mr Brian Povey of ProMet Engineers. Povey indicates that an accurate sizing study will need to be redone as the reported sizing results indicated oversize fractions and did not indicate if the material was demagnetised. Povey indicates that the recommended grind should yield more than 80% passing 45 μm and 100% passing 75μm.

A summary of final XRF and DTR assay results are in given in Tables 2 and 3, below.

Table 2: Summary of assay and DTR results for the magnetite-rich intervals intersected at the Unca prospect in the 2006 RC drilling campaign.

SAMPLE INTERVAL				HEAD SAMPLE ASSAYS			DTR (100p 75µm)	CONCENTRATE ASSAYS			METAL RECOVERY IN DTR CONC		
Hole ID	From m	To m	Intvl m	Fe %	V_2O_5 %	TiO_2 %	Rec %	Fe %	V_2O_5 %	TiO_2 %	Fe Rec %	V_2O_5 Rec %	TiO_2 Rec %
UNRC001	0	44	44	31.5	0.76	8.30	33.1	61.6	1.98	8.55	62.9	82.6	32.8
UNRC001	50	52	2	22.5	0.42	5.27	21.2	65.3	1.39	4.76	61.5	70.8	19.2
UNRC002	28	50	22	32.4	0.77	8.13	36.2	63.4	1.89	6.66	69.4	87.2	29.4
UNRC002	58	63	5	34.2	0.83	9.04	39.2	63.6	1.90	6.92	72.9	89.7	30.0
UNRC003	67	73	6	20.5	0.38	4.77	17.0	61.5	1.58	8.95	51.0	71.5	31.9
UNRC003	76	79	3	21.9	0.40	5.23	17.0	61.5	1.65	9.22	47.7	70.7	30.0
UNRC004	3	13	10	31.0	0.52	8.45	20.2	66.9	1.41	3.58	42.7	53.4	8.6
UNRC005	0	21	21	29.7	0.62	7.56	23.0	65.3	1.61	4.61	50.3	63.5	14.4
UNRC005	39	59	20	14.3	0.27	3.28	13.7	66.6	1.53	1.54	63.7	76.4	6.7
UNRC006	21	23	2	24.0	0.46	6.02	24.2	61.3	1.41	9.56	61.8	73.7	38.5
UNRC007	53	59	6	21.3	0.26	4.12	19.4	61.9	0.85	6.47	56.3	63.4	30.4
UNRC007	69	72	3	25.6	0.37	6.02	22.9	61.0	0.93	7.99	54.5	57.9	30.3
UNRC008	3	9	6	23.7	0.30	5.46	11.8	65.9	1.33	3.90	30.9	49.9	8.4
UNRC008	26	73	47	29.2	0.37	7.52	29.4	63.2	1.03	6.93	61.0	80.8	27.0
UNRC009	0	15	15	36.6	0.25	4.65	41.9	66.4	0.51	3.42	75.1	84.0	30.5
UNRC009	24	25	1	31.8	0.30	3.79	33.0	65.0	0.71	3.77	67.5	77.8	32.8
UNRC010	0	5	5	42.3	0.39	6.17	49.0	65.9	0.39	3.28	76.3	49.7	26.0
UNRC010	32	37	5	35.2	0.28	5.15	15.2	65.8	0.70	2.00	49.4	60.2	10.3
UNRC010	39	54	15	45.0	0.41	7.26	42.2	67.4	0.64	2.33	79.0	95.5	19.3
UNRC010	59	61	2	24.8	0.17	5.15	22.2	66.4	0.61	3.24	59.5	80.3	14.0
UNRC011	3	6	3	33.7	0.13	2.43	4.8	67.3	1.12	2.05	20.7	37.6	4.3
UNRC011	15	20	5	45.9	0.12	2.53	39.9	67.9	0.56	1.14	64.9	73.2	9.8
UNRC013	27	31	4	16.9	0.21	3.56	18.6	63.4	0.98	6.64	69.8	85.1	34.7
UNRC013	49	54	5	26.4	0.48	5.63	33.1	65.6	1.50	4.55	82.2	103.0	26.8
UNRC014	45	48	3	18.2	0.37	4.30	19.0	65.6	1.60	2.68	68.3	82.6	11.8
UNRC014	64	68	4	18.9	0.42	4.18	17.9	65.6	1.60	2.89	62.3	69.2	12.4
UNRC015	30	33	3	22.5	0.32	4.90	17.8	66.9	1.15	1.34	52.8	64.5	4.9
UNRC015	47	65	18	23.4	0.38	5.46	20.0	67.7	1.34	2.03	57.4	71.3	7.4
	WT AVG		**285**	**29.2**	**0.47**	**6.48**	**27.9**	**64.5**	**1.34**	**5.22**	**61.5**	**76.4**	**22.2**

Table 3: Summary of assay results for the DTR concentrates (100p/-75µm). Intervals are grouped according to their Fe, TiO_2 and V_2O_5 contents.

HoleID	**Depth m**	**Int. m**	**DTR Rec %**	**Fe Rec %**	**V_2O_5 Rec %**	**TiO_2 Rec %**	**Fe %**	**V_2O_5 %**	**TiO_2 %**	**Al_2O_3 %**	**SiO_2 %**	**CaO %**	**MnO %**	**P %**	**S %**

GROUP 1 Fe<62% TiO2 >6% V2O5 >1.4%																
UNRC001	**0**	**44**	**44**	**33.1**	**62.9**	**82.6**	**32.8**	**61.6**	**1.98**	**8.5**	1.43	1.46	0.24	0.12	0.00	0.01
UNRC002	**28**	**50**	**22**	**36.2**	**69.4**	**87.2**	**29.4**	**63.4**	**1.89**	**6.7**	0.89	1.64	0.31	0.01	0.00	0.01
UNRC002	**58**	**63**	**5**	**39.2**	**72.9**	**89.7**	**30.0**	**63.6**	**1.90**	**6.9**	0.69	1.20	0.19	0.02	0.00	0.00
UNRC003	**67**	**73**	**6**	**17.0**	**51.0**	**71.5**	**31.9**	**61.5**	**1.58**	**9.0**	0.76	2.30	0.4 5	0.12	0.00	0.01
UNRC003	**76**	**79**	**3**	**17.0**	**47.7**	**70.7**	**30.0**	**61.5**	**1.65**	**9.2**	0.74	1.88	0.42	0.14	0.00	0.01
UNRC006	**21**	**23**	**2**	**24.2**	**61.8**	**73.7**	**38.5**	**61.3**	**1.41**	**9.6**	0.81	1.95	0.35	0.05	0.00	0.01
	Wt Avg		**82**	**32.3**	**63.8**	**82.8**	**31.7**	**62.2**	**1.89**	**8.0**	**1.15**	**1.58**	**0.28**	**0.08**	**0.00**	**0.01**
GROUP 2 Fe <62% TiO2 >6.0% V2O5 <1.4%																
UNRC007	**53**	**59**	**6**	**19.4**	**56.3**	**63.4**	**30.4**	**61.9**	**0.85**	**6.5**	1.22	3.20	0.89	0.04	0.00	0.01
UNRC007	**69**	**72**	**3**	**22.9**	**54.5**	**57.9**	**30.3**	**61.0**	**0.93**	**8.0**	0.89	3.12	0.73	0.09	0.00	0.01
UNRC008	**26**	**73**	**47**	**29.4**	**61.0**	**80.8**	**27.0**	**63.2**	**1.03**	**6.9**	0.82	1.88	0.41	0.13	0.00	0.02
UNRC013	**27**	**31**	**4**	**18.6**	**69.8**	**85.1**	**34.7**	**63.4**	**0.98**	**6.6**	0.82	2.29	0.52	0.10	0.00	0.02
	Wt Avg		**60**	**27.3**	**60.8**	**78.2**	**28.1**	**63.0**	**1.00**	**6.9**	**0.87**	**2.10**	**0.48**	**0.12**	**0.00**	**0.02**
GROUP 3 Fe >63% TiO2 <5% V205 >1%																
UNRC001	**50**	**52**	**2**	**21.2**	**61.5**	**70.8**	**19.2**	**65.3**	**1.39**	**4.8**	0.51	1.87	0.21	0.16	0.00	0.01
UNRC004	**3**	**13**	**10**	**20.2**	**42.7**	**53.4**	**8.6**	**66.9**	**1.41**	**3.6**	0.40	1.14	0.06	0.02	0.00	0.01
UNRC005	**0**	**21**	**21**	**23.0**	**50.3**	**63.5**	**14.4**	**65.3**	**1.61**	**4.6**	0.83	1.58	0.28	0.05	0.00	0.00
UNRC005	**39**	**59**	**20**	**13.7**	**63.7**	**76.4**	**6.7**	**66.6**	**1.53**	**1.5**	1.13	1.97	0.38	0.01	0.00	0.00
UNRC008	**3**	**9**	**6**	**11.8**	**30.9**	**49.9**	**8.4**	**65.9**	**1.33**	**3.9**	0.63	1.76	0.26	0.01	0.00	0.01
UNRC011	**3**	**6**	**3**	**4.8**	**20.7**	**37.6**	**4.3**	**67.3**	**1.12**	**2.1**	1.13	1.30	0.18	0.02	0.00	0.02
UNRC013	**49**	**54**	**5**	**33.1**	**82.2**	**103.0**	**26.8**	**65.6**	**1.50**	**4.6**	0.47	1.20	0.21	0.05	0.00	0.02
UNRC014	**45**	**48**	**3**	**19.0**	**68.3**	**82.6**	**11.8**	**65.6**	**1.60**	**2.7**	1.14	2.35	0.34	<0.008	0.00	0.01
UNRC014	**64**	**68**	**4**	**17.9**	**62.3**	**69.2**	**12.4**	**65.6**	**1.60**	**2.9**	1.03	2.18	0.43	<0.008	0.00	0.01
UNRC015	**30**	**33**	**3**	**17.8**	**52.8**	**64.5**	**4.9**	**66.9**	**1.15**	**1.3**	1.50	1.94	0.19	<0.008	0.00	0.01
UNRC015	**47**	**65**	**18**	**20.0**	**57.4**	**71.3**	**7.4**	**67.7**	**1.34**	**2.0**	0.65	1.16	0.12	0.01	0.00	0.04
	Wt Avg		**95**	**18.9**	**54.6**	**68.0**	**10.4**	**66.4**	**1.46**	**3.0**	**0.83**	**1.58**	**0.24**	**0.02**	**0.00**	**0.01**
GROUP 4 Fe >63% TiO2 <5% V205 <1%																
UNRC009	**0**	**15**	**15**	**41.9**	**75.1**	**84.0**	**30.5**	**66.4**	**0.51**	**3.4**	2.17	0.63	0.10	0.00	0.00	0.01
UNRC009	**24**	**25**	**1**	**33.0**	**67.5**	**77.8**	**32.8**	**65.0**	**0.71**	**3.8**	1.85	1.23	0.27	0.72	<0.001	0.06
UNRC010	**0**	**5**	**5**	**49.0**	**76.3**	**49.7**	**26.0**	**65.9**	**0.39**	**3.3**	2.36	0.86	0.12	<0.008	0.00	0.01
UNRC010	**32**	**37**	**5**	**15.2**	**49.4**	**60.2**	**10.3**	**65.8**	**0.70**	**2.0**	1.88	2.62	0.45	<0.008	0.00	0.01
UNRC010	**39**	**54**	**15**	**42.2**	**79.0**	**95.5**	**19.3**	**67.4**	**0.64**	**2.3**	1.44	1.09	0.09	0.00	0.00	0.01
UNRC010	**59**	**61**	**2**	**22.2**	**59.5**	**80.3**	**14.0**	**66.4**	**0.61**	**3.2**	0.95	1.62	0.27	<0.008	0.00	0.03
UNRC011	**15**	**20**	**5**	**39.9**	**64.9**	**73.2**	**9.8**	**67.9**	**0.56**	**1.1**	1.58	0.95	0.14	0.01	0.00	0.01
	Wt Avg		**48**	**38.8**	**71.9**	**80.1**	**21.6**	**66.7**	**0.57**	**2.7**	**1.81**	**1.09**	**0.15**	**0.02**	**0.00**	**0.01**

Davis Tube recoveries ranged from 4.8-63.3 wt% with the overall weighted mean of the DTR concentrate being 27.9 wt%. Povey stated that this is similar to the magnetite content extracted from BIFs (Appendix 3). Povey also states that the magnetite recovery in these should exceed about 30% but the value of the vanadium will lower that at Unca.

The highest head feed assay for the 2006 RC samples was 1.11% V_2O_5. The weighted average of all head feed assay samples is 0.47% V_2O_5. This average includes intervals of lower grade material from areas that are now considered low priority exploration targets. The DTR concentrate has a weighted average of 1.34% V_2O_5. As above, this average includes lower grade material.

The highest vanadium content assayed in the recovered concentrate is 2.28%, however this sample had only 13.44 wt% recovery. Numerous assay samples had higher recoveries and concentrates grades around 2%. For example, UNRC001 encountered an interval of 44 metres from surface with 33.1 wt% recovery at 1.98% V_2O_5. These results indicate the potential for significant vanadium resources with respect to concentrates grades and recovery. Both Povey's and Arafura's independent research indicates that these results are comparable to other magnetite-hosted vanadium resources, such as Windimurra in West Australia.

Arafura sponsored and provided field and logistical support to Ms Jodi Fox, a student from the University of Tasmania to complete a Geology/Geophysics Honours project covering parts of the Unca prospect in 2007. Fox's project involved the acquisition of ground-based, high-density gravity and magnetic data and covered what was considered to be one of the most prospective parts of the Unca prospect. This project was designed by Arafura to cover the area of the Casper magnetic anomaly. Casper has two intersections (UNRC001 and UNRC002) that suggest this anomaly has potential for the high grades and good recoveries (*ie*. Group 1 DTR concentrates, see Tables 2 and 3).

Fox (2007, see Appendix 4) acquired, processed and modelled 25 metres x 50 metres spaced ground gravity data over the Casper magnetic anomaly and 20 metres spaced east-west ground-based magnetic traverses over the Casper-Coco anomalies. Interestingly, a subsequent survey by BBS found that the location of Fox's gravity base station, originally located using post-processed differential GPS, was out in elevation. Fox corrected her gravity data for this height difference.

Fox (2007) found that the Casper magnetic anomaly is a series of three closely spaced, en echelon, elongate, high frequency, high amplitude ovoids (see images in Appendix 4). The peak amplitude of the magnetic anomaly over the magnetite mineralisation is 4770 nT. Fox found that the gravity anomaly (BA) produced by Casper is a large ovoid with a maximum amplitude of 0.919 mGal (see images in Appendix 4). Fox interpreted Casper as one large composite magnetite body with prominences in the upper surface. Fox estimated that the volume of magnetite mineralisation, based on excess mass calculations, is ~4.1 Mt. Fox was awarded a First-class BSc Hons; her thesis and all data are included as Appendix 4.

As requested by Arafura, Fox (2007) also undertook petrological studies on selected surface samples with follow-up electron microprobe studies to determine the compositions of various Fe-Ti oxides. Arafura's main interest/request was to determine the minerals that hosted vanadium at Casper (Unca). Fox's surface samples were collected from three different magnetite outcrops across the Unca prospect. The Casper surface samples are dominated by magnetite with lesser amounts of ilmenite. Trace rutile and hercynite are also present at the other locations (see Fox 2007 for details). Figure 5 shows an example of coarse grained magnetite with patchy ilmenite laths that form as exsolutions along the octahedral magnetite cleavage planes.

Fox's electron microprobe results on surface samples collected from Casper indicate that the magnetite contains 0.95-1.52% V (or 1.70-2.71% as V_2O_5) with an average of 1.35% V (or 2.41% as V_2O_5, n=29). Ilmenite in the magnetite at Casper contains 0.06-0.32% V (or 0.11-0.57% as V_2O_5) with an average of 0.16% V (0.29% as V_2O_5, n=24). The other magnetite surface samples collected by Fox also contain V and show significantly less V in ilmenite. This demonstrates that vanadium is preferentially partitioned into the magnetite mineral structure and that magnetite is the principal host mineral for the vanadium at Unca. These results also support Arafura's RC assays and DTR recovery data which found that most of the vanadium was recovered from the magnetic fraction (weighted mean V_2O_5 recovery is 76.4%, Table 2).

Despite excellent recoveries, Tables 2 and 3 indicate that Group 4 DTR concentrates/intervals have a much lower vanadium grades. Hence these anomalies/areas are currently considered a lower priority target. Fox (2007) found that magnetite surface samples in the vicinity of Group 4 DTR concentrates contain an average 0.24% V (or 0.43% as V_2O_5). This is significantly lower than the vanadium in magnetite from the Casper surface samples near Group 1 concentrates.

An analysis of the assay and concentrate data indicates that Groups 1 and 2, in particular, and most Group 3 concentrates/intervals warrant follow-up exploration. With this in mind, Arafura designed a 7,500 metre RC drilling program to systematically test potential magnetic targets in the Unca prospect area (see Appendix 7). Arafura engaged Mr Mathew Cooper of Resources Potentials to model the existing and new targets. Cooper's report is included as Appendix 5.

The author completed prospect-scale mapping over the Casper-Coco area in 2007 while supervising/assisting Jodi Fox. Field relationships indicate that post-tectonic granite bodies have invaded Bonya Schist and Attutra Metagabbro. Mapping also indicated complex relationships between the magnetite units and the metagabbro. Reconnaissance mapping by the author and Fox in the northern part of Unca, to the west of the Hussey1 magnetic anomaly, identified several localities with subvertical magmatic? layering/fabrics in the metagabbro, see photograph in Fox (2007). A digital geology outcrop layer for the Casper-Coco area is included in Appendix 7.

Lucy Creek Uranium Prospect

15 of the 60 drill holes from the Lucy Creek RC drilling program (LCRC045-LCRC059 inclusive) were collared in EL 10215. These holes tested the southern parts of a large segmented airborne radiometric anomaly that defined the Lucy Creek prospect (Figure 3). The remaining holes in this program were collared in the adjacent EL 24716.

Results analytical data for the RC drilling program at the Lucy Creek U prospect covering EL 10215 are included in Appendix 8.

All geological logs and field radiometric readings are provided in Hussey (2007). Holes were usually drilled down to depths such that the hole penetrated at least 2 metres into the pebble to boulder conglomerate at the base of the Red Heart Dolostone. Some holes continued through this conglomeratic unit into pinkish quartzites interpreted as Baldwin Formation. There was a general absence of high radiometric counts at this stratigraphic level which is interpreted to be the disconformity above the Baldwin Formation. This supported field observations and airborne radiometric data that indicated elevated radiometric levels were not concentrated at the boundary between the Baldwin Formation and the Red Heart Dolostone. Instead the anomalous radiometric readings appear to be related to intensely weathered units within the Red Heart Dolostone.

As noted in Hussey (2007), samples were selected for assay if their activity was greater than 200 CPS. Samples with an activity greater than 300 CPS were analysed as individual samples, while those with an activity of less than 300 CPS were composited into 2-3 metre assay samples. The highest measured activity of an RC drill sample within EL 10215 was 1100 CPS. This occurred in sample 761595, 0-1 metres in LCRC054, whose uranium assay was only 12.7 ppm U. The highest U assay from the RC drill samples in EL10215 is 133.5 ppm (sample 761650, 6-7 metres in LCRC058, with an activity of 540 CPS). Numerous RC samples had activities that exceeded 540 CPS, however their U assays are significantly lower. Clearly there is not a simple relationship between measured activity and U assays (see plots in Appendix 8). The data suggests uranium mobility and decay-series disequilibria. NuPower have instigated test work at ANSTO in investigate this.

Results all 84 field duplicates and their primary assay sample from the Lucy Creek RC drilling program indicate that outliers are not common. However, duplicate assay samples do show poor uranium reproducibility. Uranium contents differ by more than 25% in 12 of the 84 duplicates. This suggests a heterogeneous uranium distribution in the Lucy Creek samples.

The average U assay from the RC drilling program in EL10215 was 23.5 ppm. While this is above the average crustal composition for uranium, it is still low.

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30 April 2008

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