Cameco Australia Pty Ltd

EXPLORATION LICENCE EL 23462

KUKALAK PROJECT – NORTHERN TERRITORY

Annual Report for the Period 25 July 2004 to 24 July 2005

CONFIDENTIAL

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SUMMARY

Kukalak is a uranium exploration project area in northwest Arnhem Land, which is managed and operated by Cameco Australia Pty Ltd (Cameco). The exploration activities carried out in the 2004-2005 reporting period were designed to elucidate the uranium mineralisation potential of the main structural and airborne radiometric anomalies in the tenement and to drill test the western Devils Elbow area along the Ranger Fault (Table 1). The latter consisted of a single helicopter-assisted diamond drill hole (KLD104) that totalled 354.1 m, intersecting 108 m of Mamadawerre Sandstone, 208 m of Oenpelli Dolerite, a further 4 m of sandstone and 36 m of Nimbuwah Complex granite. No significant mineralisation was intersected, but two ~30 m wide intersections of Oenpelli Dolerite are cross-cut by narrow widely-spaced fractures and veins, with associated chlorite, sericite, leucoxene and K-feldspar alteration, and elevated gamma radiation (average 5 times background with spikes up to 30 times background). The best composite geochemical analysis is 112 ppm U over 3 m, while the best spot geochemical analysis is 638 ppm U and 46 ppb Au. Uranium-bearing fluids were clearly active in this area, but there appears to have been insufficient deformation and subsequent fluid-rock interaction to form economic grade intersections. Drilling successfully verified the postulated geological cross-section and the existence of a westerly-tapering wedge of Mamadawerre Sandstone below the Oenpelli Dolerite.

Re-logging and sampling of segments of historic drill core suggests that there are a number of exploration plays that require follow up, particularly in the Devils Elbow area. Chlorite, sericite and haematite alteration are present near the unconformity in most drill holes from Devils Elbow and are associated with elevated scintillometer readings. Specifically, KLD001 has a 5 m wide zone of intense phengite alteration and elevated cps at the base of the Mamadawerre Sandstone, encompassing significant mass loss. Myra Falls Metamorphics and Nimbuwah Complex in KLD011 and KLD017 at Dog Leg were found to include monzogabbro and graphite-bearing mafic gneiss respectively, both of which are considered to have excellent reductive capacity and therefore uranium potential. The grade of metamorphism is interpreted as upper amphibolite to lower granulite facies. An atypical dickite PIMA signature is present in the lower Mamadawerre Sandstone in KLD002, in the far west on the Leichhardt Plateau.

Field mapping, prospecting and sampling revealed a priority target at China Block, the coincidence of the north-trending Quarry Fault and NE-trending China Fault, radiometric anomalism, brittle deformation and TEMPEST structural perturbation. This area will be the focus of drilling in the next reporting period.

Geochemical data from outcrop samples are able to corroborate the existence of most airborne radiometric anomalies in EL23462, but their significance is still unknown. It is difficult to extrapolate with confidence the geochemical anomalism of the near-surface mafic rocks (Nungbalgarri Volcanics and Oenpelli Dolerite) into the underlying basement. For example, there are numerous coincident radiometric and geochemical anomalies along the Kukalak Valley, but none appear distinct enough to suggest they are the result of leakage from an underlying orebody. They do, however, support the existence of the postulated sandstone pinch-out play along the length of the valley and encourage further investigation of the structure. Regardless, the best geochemical results from beyond Devils Elbow are those from China Block, where uranium is up to 361 ppm and gold is up to 755 ppb.

An airborne electromagnetic TEMPEST survey has provided some significant insights into the geometry of the sandstone-basement unconformity along with the identification of structures and several priority targets. These will be evaluated in 2005 to determine whether drill testing is warranted.

Eligible expenditure on the Project for the reporting period was $471 711.

Table 1: Exploration Summary for 2004-2005 for EL3106

Work proposed for the third year of tenure includes:

- Generate new project scale geology map with accurate representation of the main structures.
- Diamond drilling of three heli-supported holes at China Block (high priority) and one along the Ranger Fault west of Devil's Elbow (lower priority).
- Investigate and sample outcrops to ascertain stratigraphic and metallogenic information.
- Grid sampling of Mamadawerre Sandstone along Ranger Fault and Kukalak Valley to identify evidence of weak distal mineralisation and/or alteration systems above prospective basement.
- Re-log and sample other available drill core stored at Myra Camp.

The estimated expenditure for this program is $565 000.

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INTRODUCTION

Kukalak is a uranium exploration project covering exploration licence EL23462. The project is managed and operated by Cameco Australia Pty Ltd (Cameco). This report details exploration work completed by Cameco during the 2004-2005 licence year, the third year of tenure.

The prime objective is to discover economic 'unconformity style' uranium mineralisation within a geological environment similar to the known deposits of the Alligator Rivers Region, Northern Territory, and the concealed high-grade deposits of the Athabasca Region, Saskatchewan, Canada.

The project lands are underlain by a variety of basement units, including the favourable lower Cahill Formation that hosts the significant uranium deposits of the Alligator Rivers Region. The Kombolgie Subgroup sandstone and volcanic units outcrop extensively throughout the area. Favourable structures and hydrothermal alteration occur in the region. Several uranium occurrences have been identified in the project area, an indication of a favourable mineralising and alteration event.

The objectives of the work completed by Cameco during the 3rd year of the Exploration Licence were to:

- Analyse historical and previous Cameco mapping, remote sensing data, HYMAP, magnetic, radiometric, surface sample and drill hole data in a GIS to delineate surface features, structure, lithology, radioactivity and alteration for the purpose of target generation;
- Collect airborne electromagnetic data over a large proportion of the tenement to identify basement conductors and offsets of the Kombolgie unconformity;
- Evaluate anomalous areas on the ground using a outcrop mapping, scintillometer prospecting and outcrop geochemical sampling techniques;
- Diamond drill test the main target at Devils Elbow. A helicopter was utilised to transport field personnel and equipment for the drilling program from the Myra base camp.

Location and Access

EL23462 is located in Western Arnhem Land, Northern Territory on the Alligator River (SD-5301) and Millingimbi (SD-5302) 1:250 000 scale topographic map sheets and the Oenpelli (5573), Goomadeer (5673), Howship (5572) and Liverpool (5672) 1:100 000 scale topographic map sheets.

Figure 1: Location Map for EL 23462

The Kukalak tenement is centred approximately 60 km east of Jabiru. The rugged nature of the sandstone, which overlies most of the licence, means that access is only possible by helicopter and then by foot. Previous exploration programs on the Kukalak licence have utilised tracks to Devil's Elbow and Dog Leg prospects, however, these tracks have not been used or maintained since exploration ceased during the early 1990s. In 2004, helicopter access was based from a semi-permanent field camp located on Tin Camp Creek, named 'Myra Camp', which was previously operated by Afmeco. Road access to Myra Camp is via the Arnhem Highway to Jabiru and bitumen road to Cahill's Crossing, then by dirt road via Oenpelli and Nabarlek.

Tenure

The Kukalak project Exploration Licence (EL23462) is located in western Arnhem Land and covers an area of 417.4 km^2, comprising 125 blocks. The exploration licence was granted by the Division of Mines and Energy (DME) in the Department of Business Industry and Resource Development (DRIRD) on 25th July 2002.

The original exploration licence application was not granted by DME in 2001 due to the Attorney General's decision that the process had contravened sections of the NT Aboriginal Land Rights Act (1976) in spite of both deemed and actual consent from both the NLC representing the Traditional Owners and the ATSIC Minister. Under advice from NTDME and the NLC, the exploration licence application was relinquished and re-applied for in December 2001. As the exploration agreement and work proposal had been negotiated, the exploration licence was facilitated by NLC and DBIRD.

The Kukalak licence contains two classes of area that are sensitive or have cultural and/or social significance to the Traditional Owners. The most important of these classes is the 'No Go Areas', which are absolutely excluded from exploration access. The other class is 'Restricted Access Areas', where permission from the Traditional Owners must be sought before conducting exploration within the designated areas.

Grant of title is for a period of six years; extensions to the period and re-issue of the exploration licence as permitted under the Mining Act are possible.

GEOLOGICAL SETTING

The Kukalak project area lies on the eastern margin of the Pine Creek Inlier (PCI), roughly on the boundary of the so-called East Alligator and Nimbuwah structural domains (Figure 2) (Needham, 1988; Needham and Stuart-Smith, 1980). The following section relates largely to this region. Reconnaissance mapping of the PCI has been carried out by the Bureau of Mineral Resources (BMR) personnel since 1946, with more detailed work in the 1950's and 60's following the discovery of uranium at Rum Jungle. The Alligator Rivers region was systematically mapped by the BMR during the period 1972 to 1983, resulting principally in the publication of two 1:250 000 scale geological and metallogenic maps (Needham, 1990; Needham et al., 1983) and a detailed report (Needham, 1988). Cobourg Peninsula was also mapped at this time (Hughes, 1973). Relevant 1:100 000 scale compilation maps were published in colour and/or black & white format. Related publications are numerous (Hughes, 1978; Needham et al., 1980; Needham and Stuart-Smith, 1985; Stuart-Smith and Ferguson, 1978; Stuart-Smith and Needham, 1982; Stuart-Smith and Needham, 1984; Warren and Kamprad, 1990). In more recent years, the Northern Territory Geological Survey (NTGS) has remapped the central parts of the PCI and the Milingimbi sheet (Ahmad, 1998; Carson et al., 1999; Ferenczi and Sweet, 2004). It has also begun focussed geochronological studies aimed at developing a better stratigraphic framework, in collaboration with Geoscience Australia (GA) (Worden et al., 2004).

Regional and deposit scale metallogenic research, including uranium, has also been carried out in the PCI by a number of organisations, including the BMR (and subsequently AGSO and GA), Queens University, Johns Hopkins University, Bas-Becking Laboratory, Australian National University, CSIRO, USGS and NTGS (Ahmad, 1998; Browne, 1990; Carville et al., 1990; Crick, 1981; Crick et al., 1980; Dunn et al., 1990; Ewers et al., 1985; Ferguson et al., 1980; Ferguson and Goleby, 1980; Fraser, 1980; Garven and Raffensperger, 1996; Hancock et al., 1990; Holk et al., 2003; Johnston, 1984; Maas and McCulloch, 1988; Mernagh, 1992; Needham, 1985; Needham and De Ross, 1990; Needham and Roarty, 1980; Needham and Stuart-Smith, 1980; Raffensperger and Garven, 1995a; Raffensperger and Garven, 1995b; Rossiter and Ferguson, 1980; Snelling, 1990; Solomon and Groves, 1994; Stuart-Smith et al., 1993; Stuart-Smith et al., 1980; Sweet, 2001; Tucker et al., 1980; Wilde et al., 1989; Wilde and Noakes, 1990; Wyborn, 1990).

The oldest rocks exposed in the Alligator Rivers region, belonging to the 2500 Ma (late Archaean) Nanambu Complex, crop out sparsely in Kakadu National Park and include paragneiss, orthogneiss, migmatite, granite and schist (Needham, 1988). The Archaean complexes form structural domes that are unconformably overlain by metasediments and minor metavolcanics of the Palaeoproterozoic Pine Creek Succession or Supergroup (PCS), which constitutes the Pine Creek Orogen tectonic unit (formerly the Pine Creek Geosyncline). In the Alligator Rivers region, the PCS initiates with meta-psammitic and quartzose rocks of the Mount Howship Gneiss and Kudjumarndi Quartzite (both Kakadu Group). These are laterally equivalent to the Mount Basedow Gneiss and Munmarlary Quartzite respectively (Ferenczi et al., 2005). This Group appears to onlap the Archaean basement highs, but gneissic variants are also reported to be transitional into paragneiss of the Nanambu Complex (Needham, 1988).

Figure 2: Regional Geology of the Alligator Rivers Region

The Cahill Formation and Masson Formation of the Namoona Group (Ferenczi et al., 2005) conformably overlie the Munmarlary Quartzite, the Cahill Formation being informally mapped as two subunits or members (Needham, 1988). The Lower Cahill Formation hosts the main uranium ore bodies in the region (e.g. Nabarlek, Ranger and Jabiluka) and consists of a basal calcareous marble and calc-silicate gneiss unit that is overlain by pyritic, garnetiferous and carbonaceous schist (meta-pelite), quartz-feldspar-mica gneiss (meta-arkose) and minor amphibolite. The Upper Cahill Formation is more psammitic, comprising feldspar-quartz schist (meta-arkose) and quartzite, lesser mica-feldspar-quartz-magnetite schist (meta-pelite), and minor conglomerate and amphibolite. It also contains the mafic to intermediate Stag Creek Volcanics, which have a SHRIMP U-Pb age of 2048±13 (Ferenczi et al., 2005). The Cahill Formation is notably magnetic, in particular the base of upper psammitic unit (also known as ‘hangingwall sequence’), due the presence of mafic sills and/or magnetite, providing a means of spatially distinguishing it from underlying and overlying less magnetic formations (Kendall, 1990). The Masson Formation is generally considered to be the lower grade metamorphic equivalent of the Cahill Formation.

The unconformably overlying Nourlangie Schist is a monotonous succession of argillaceous to quartzose phyllite and quartz-mica schist that locally contains garnet and staurolite. Nourlangie Schist is interpreted to be the eastern temporal correlative of the combined interval – Mundogie Sandstone and Wildman Siltstone (Mount Partridge Group), and

Koolpin Formation, Gerowie Tuff and Mount Bonnie Formation (all South Alligator Group) (Needham, 1988). Some authors argue that temporal equivalents of the Mundogie Sandstone are absent east of the South Alligator River (Ferenczi et al., 2005), but it may not be possible to distinguish facies variants at the Cahill Formation-Nourlangie Schist level. Wildman Siltstone is characteristically composed of silty carbonaceous phyllite, sandy ferruginous siltstone and shale, consistent with a Nourlangie Schist 'protolith'.

Early stratigraphic columns also included the Kapalga Formation as a lateral equivalent of the Nourlangie Schist (Needham et al., 1983), however, outcrops formerly mapped as this unit in the Mount Evelyn sheet are now re-assigned to South Alligator Group (Ferenczi and Sweet, 2004). As a result, the name Kapalga Formation will probably be abandoned and various outcrops throughout the eastern PCI re-assigned to other units. Lithological descriptions of the Kapalga Formation (Needham et al., 1983) – ferruginous, pyritic and carbonaceous chert-banded metasiltstone (slate/phyllite) or biotite schist, garnetiferous schist and quartzite – are consistent with the lower metamorphic grade Koolpin Formation, which hosts a number of gold prospects and deposits in the central PCI (Ahmad, 1998). However, calcareous and dolomitic lithologies (including stromatolites) and banded iron formation that are also common in the Koolpin Formation are not documented in the Kapalga Formation. The overlying Gerowie Tuff and Mount Bonnie Formation in the central PCI comprise variously interbedded massive silicic-potassic tuffaceous chert, carbonaceous clayey siltstone, coarse 'greywacke' and lithic sandstone. Metamorphosed equivalents of these lithologies have not yet been recognised in the Nourlangie Schist, suggesting either facies variation, onlap/pinchout, erosional removal or a lack of definitive exposure in the east.

The age of the Nourlangie Schist is only constrained by its inferred correlatives. The Wildman Siltstone is about 2025 Ma and the Gerowie Tuff is 1863±2 Ma, based on SHRIMP U-Pb zircon dating (Worden et al., 2004). Large time breaks are obviously present in the succession.

Mafic sills and dykes including the Goodparla and Zamu Dolerites intrude the PCS, with the former common in the upper Cahill Formation and the latter prolific in the South Alligator Group (Warren and Kamprad, 1990). Lower metamorphic grade rocks have typical dolerite textures, but in the Alligator Rivers region, they are generally amphibolite sensu stricto. Regardless, these dykes impart a magnetic signature to their respective hosts where they contain residual magnetic phases.

The sedimentary and igneous rocks of the PCS are structurally complex, having undergone at least three recognisable phases of deformation (Thomas, 2002) related to Top End Orogeny (1880 to 1780 Ma). They have also undergone high-temperature low-pressure prograde metamorphism, including local migmatisation and remobilisation, during the ~1850-1860 Ma Nimbuwah Event of the Barramundi Orogeny (Page and Williams, 1988). The intensity of metamorphism and deformation varies across the region, with the western and eastern margins of the Pine Creek Inlier (Litchfield Province and Nimbuwah Domain respectively) showing the most pronounced effects. In the Nimbuwah Domain or Alligator Rivers region, there is a broad trend of increasing grade from southwest to northeast. This gradient clearly reflects synchronous emplacement of the Nimbuwah Complex granitoids in that area. Distinctions based on metamorphic grade and protolith type have been made on regional maps (Needham, 1988) and are summarised below.

1. Greenschist to amphibolite facies metasedimentary rocks in the southwest can generally be distinguished stratigraphically and are assigned to specific formations and groups.

2. Amphibolite to granulite facies metasedimentary rocks that lie between the Nimbuwah Complex in the northeast and the areas of better-defined stratigraphy in the southwest are mapped as Myra Falls Metamorphics. They incorporate outcrop that cannot be distinguished from the Zamu Dolerite and Kakadu, Mount Partridge, Namoona or South Alligator Groups, but where a sedimentary precursor can be demonstrated (Needham, 1988). Rocks with a likely felsic igneous protolith are assigned to the Nimbuwah Complex (see below).

3. Magmatic rocks (mostly I type granodiorite) and felsic to intermediate migmatite and granulite in the northeast are distinguished as the Nimbuwah Complex. These rocks have a relatively simple isotopic character (Page and Williams, 1988) that suggests an entirely igneous protolith. However, there is some doubt about this distinction, as much of the mapped Nimbuwah Complex around King River appears to have a sedimentary protolith (e.g. lit par lit zones).

Metamorphic, igneous and sedimentary rocks of the PCS have been intruded by later Palaeoproterozoic 'post-orogenic' granites of the Cullen Batholith, including the Jim Jim, Nabarlek and Tin Camp Creek Granites (Jagodzinski and Wyborn, 1997) (Figure 2).

The PCS and Cullen Batholith are locally overlain by felsic volcanic rocks belonging to the Edith River and El Sherana Groups, which are comagmatic with the Cullen Batholith (Jagodzinski, 1992). These units are thickest in the south in the South Alligator Fault Zone and are generally absent in the Alligator River region due to Palaeoproterozoic erosion.

The various basement units are unconformably overlain by the Kombolgie Subgroup, the basal unit of the late Palaeoproterozoic Katherine River Group, McArthur Basin (Sweet et al., 1999a; Sweet et al., 1999b) (Figure 2). This subgroup consists of a series of sandstone formations (including Mamadawerre and Gumarrirnbang Sandstones), which are divided by a thin basaltic unit (Nungbalgarri Volcanics). The age of the Mamadawerre Sandstone has been constrained between 1822 and 1720 Ma and is probably closer to 1800 Ma (Rawlings, 2002). The sandstones form a flat-lying or shallow southeast-dipping strongly-jointed platform, called the Arnhem Land Plateau. The eroded edge of the Mamadawerre Sandstone forms the characteristic Arnhem Land escarpment and the isolated sandstone mesas and ranges on the coastal plain Figure 2). The middle to upper part of the Katherine River Group is exposed ~50 km further to the southeast near Mount Marumba (Sweet et al., 1999b).

The 1723±6 Ma (Ferenczi et al., 2005) Oenpelli Dolerite is the most pervasive mafic intrusive episode to affect the Alligator Rivers region and is the youngest Precambrian rock unit exposed. It intrudes various levels of the stratigraphy, including the PCS and Kombolgie Subgroup (Figure 2), forming highly magnetic sills, dykes, lopoliths and laccoliths. Intrusions can be either concordant or discordant with Palaeoproterozoic stratigraphy. This intrusive and thermal event had a pronounced effect within the Kombolgie Subgroup, with the promotion of fluid flow by heating and aquifer/aquitard modification. Localised effects in the sandstone include silicification, desilicification and introduction of chlorite, muscovite and pyrophyllite in active aquifer systems. A characteristic mineral assemblage of prehnite-pumpellyite-epidote has formed in the quartzofeldspathic basement rocks adjacent to the intrusions.

Deformation since deposition of the Katherine River Group includes transpressional movement along steep regional-scale strike-slip faults and possibly some shallow thrusting. These regional faults follow a pattern of predominantly north, northwest, north-northwest and northeast strikes, giving rise to the characteristic linearly dissected landform pattern of the Kombolgie plateau (Figure 2). Another significant set trends east-west and includes both the Ranger and Beatrice Faults. The Bulman Fault Zone is a principal regional feature and is considered to represent a long-lived deep crustal structure, with a large lateral component in rocks of the PCS. However, it is clear that post-Kombolgie displacements along this and other faults have not been great, because the Arnhem Land Plateau is essentially coherent and offsets along lineaments are generally minor. Field investigations of many interpreted 'faults', including those with a marked geomorphic expression, show no displacement, and are best described as joints or lineaments (Thomas, 2002).

Erosional remnants of flat-lying Palaeozoic Arafura Basin and Cretaceous Carpentaria Basin are present as a veneer throughout the coastal zone of the Top End. Various regolith components are also recognised in the region.

Local Geology of Kukalak

Kukalak lies at the eastern extremity of the Myra Falls Inlier and at the northeastern extremity of the Caramal Inlier. Lower Kombolgie Subgroup rocks overlie the majority of the tenement, with minor exposed basement rocks where the Caramal Inlier and Myra Falls Inlier encroach onto the tenement. The most visibly obvious structure in the tenement is a deeply incised curvilinear feature, herein informally termed the Kukalak Valley. This feature has previously been inferred to be a shallow southwest-dipping reverse fault, the 'Goomadeer Thrust' (Otto et al., 2003; Rippert, 1992; Taylor, 1999; Thomas, 2002). It is overall northwest to southeast oriented, and in part traces the Goomadeer River. It is now thought to represent the margin of an uplifted block of sandstone above a dolerite sill or laccolith.

Figure 3: Geology of EL23462

The Caramal and Myra Falls Inliers are the only locations of exposed basement rocks on the Kukalak tenement. Mapping within the on-property area of the Caramal East Re-entrant identified porphyroblastic quartzofeldspathic gneiss assigned to the Nimbuwah Complex (Table 2). Mica rich, biotite rich and quartz rich feldspar gneiss and schist are assigned to the Myra Falls Metamorphics. The lack of clear marker horizons, such as the Kudjumarndi Quartzite, makes correlations difficult, but on the basis of comparison, the lithologies appear consistent with Cahill Formation and Mount Howship lithologies seen on the nearby Myra and Tin Camp exploration licences. Minor contained mafic amphibolite is correlated to the Zamu Dolerite. Basement rocks are in turn intruded by thick sills of the Oenpelli Dolerite. Tin Camp Creek Granite is best exposed immediately to the west of the property boundary within the Caramal Inlier, and is exposed on-property north of Nick's anomaly. Brief mapping in 2004 suggests it is more widespread in the northern half of the tenement, including in the Dog Leg area.

Diamond drilling data indicate that Nimbuwah Complex dominates the subsurface basement geology in the southern and western portions of the tenement. The eastern area has not been drilled and basement lithology is unknown.

ROCK UNIT	THICKNESS	GEOLOGICAL AGE
Residual sand cover and laterite on tableland, silt and alluvium in valleys	Up to several meters	Quaternary-Tertiary
Undifferentiated Cretaceous- sandstone, siltstone and pebble conglomerate	Remnant outliers 10-50 m	Cretaceous
Oenpelli Dolerite – intrusive dolerite sills and dykes	Up to 200 m	Palaeoproterozoic
Gumarrirnbang Sandstone – quartz arenite with minor pebble conglomerate	Up to 130 m	Palaeoproterozoic
Nungbalgarri Volcanics – vesicular and amygdaloidal basalt	Up to 130 m	Palaeoproterozoic
Mamadawerre Sandstone – quartz arenite, quartzite and conglomerate	Greater than 150 m	Palaeoproterozoic
Tin Camp Creek Granite – altered leucocratic and radiogenic equigranular granite		Palaeoproterozoic
Zamu Dolerite– metamorphosed foliated dolerite and gabbro intrusive bodies, dykes and sills	Variable to 10's of m	Palaeoproterozoic
'Upper' Myra Falls Metamorphics (Lower Cahill Formation?) – banded biotite, mica-quartz-feldspar gneiss and schist		Palaeoproterozoic
'Lower' Myra Falls Metamorphics (Mount Howship Gneiss?) - quartz feldspar gneiss, biotite gneiss		Palaeoproterozoic
Nimbuwah Complex – foliated granite and granodiorite		Palaeoproterozoic

Table 2: Stratigraphy of EL23462

The Palaeoproterozoic sedimentary and volcanic Kombolgie Subgroup of the McArthur Basin overlies basement in the Kukalak tenement (Sweet et al., 1999a). The Mamadawerre Sandstone, the oldest formation of the Kombolgie Subgroup, occupies most of the western portion of the tenement, where it forms the deeply dissected plateau surface. This area is composed largely of bare rock with sparse areas of shallow sandy soil supporting Spinifex and scrub. Plateau escarpments are developed surrounding the Caramal and Myra basement inliers.

Mamadawerre Sandstone is unconformably overlain by Nungbalgarri Volcanics. The unconformable contact is expressed locally as 100-500 m diameter subcircular depressions ('dome and basins'), with the upper sandstone surface interpreted to represent the palaeotopographic surface of giant lunate current ripples or aeolian sand dunes with the volcanics draped over the top (Nott and Ryan, 1996). It may also represent large dewatering structures formed as a result of hot volcanic rocks draped over water-saturated sediments, which were deposited in estuarine conditions (Needham, 1978).

The Nungbalgarri Volcanics consist of multiple vesicular and amygdaloidal basaltic flows. Regionally, the stratigraphic thickness of the volcanic unit is quite variable between 50 m and 200 m. In the Kukalak area, the stratigraphic thickness of the volcanics is 50-100 m.

The Gumarrirnbang Sandstone disconformably overlies Nungbalgarri Volcanics. The sandstone comprises fine to coarse-grained quartz arenite with scattered pebbly units. Sedimentary structures include planar and trough cross-stratification, ripples and horizontal planar stratification, suggesting a proximal to distal fluvial braided stream and estuarine depositional environment.

Oenpelli Dolerite intrudes the Kombolgie Subgroup as sills and dykes. Significant exposure of dolerite occurs as a curvilinear intrusive, which may be partly fault controlled, along the Kukalak Valley.

Undifferentiated Cretaceous rocks have been mapped in the south of the tenement on the Milingimbi 1:250 000 map sheet (Carson et al., 1999). The rocks are exposed as weathered outcrops of lateritised sandstone and siltstone forming resistant mesa-like ridges.

PREVIOUS EXPLORATION

Early exploration – 1970s

Exploration began in Kukalak after the discovery of the Ranger and Nabarlek ore-bodies in the Alligator River Region in 1969 and 1970 respectively. Esso Minerals (Esso) and Queensland Mines Pty Ltd (QMPL) carried out exploration work over the tenement in the early 1970s until exploration was banned in the Alligator Rivers area in early 1973 by a federal government imposed moratorium on exploration, pending a resolution on the issue of Aboriginal Land Rights.

QMPL conducted an airborne radiometric and magnetic survey over the Kukalak area during 1972. No further work is documented on the Kukalak tenement.

No exploration work was conducted from 1973 until Uranerz Australia Pty Ltd (Uranerz) negotiated rights to explore the Kukalak tenement and undertook exploration between 1987 and 1994 (Barrett, 1988a; Barrett, 1988b; Barrett, 1990; Barrett and Becker, 1989; Bruneton, 1993; Coles, 1988; Paterson, 1989; Rich and Bruneton, 1992; Rich and Fraris, 1988; Rippert, 1992; Swayze et al., 1992). A summary is provided in the 2003 Annual Report (Otto et al., 2003) and Table 3.

Table 3: Summary of Work Carried Out by Uranerz

Recent Exploration – 2001-2003

Exploration on EL23462 by Cameco Australia during the initial period of licence consisted of reconnaissance and anomaly-directed outcrop sampling; ground proofing of previous geological mapping and prospects, as well as evaluation of the tenement in context with the regional geology (Otto et al., 2003; Sawyer et al., 2004). Various geochemical and radiometric anomalies were identified and followed-up. Also during this period, Cameco flew detailed airborne magnetic and radiometric, Hyperspectral and trial TEMPEST surveys over various parts of the tenement. Helicopter-assisted diamond drilling, totalling 1125 m, was carried out in 2003 at the two principal areas of interest at Devil's Elbow (KLD100 and KLD101) and Dog Leg (KLD103).

Table 4: Summary of Previous Work Carried out by Cameco

EXPLORATION TARGET

The focus of the Cameco exploration strategy is the discovery of unconformity style uranium deposits. The nearby economic deposits at Ranger, Jabiluka, Koongarra and Nabarlek serve as exploration models. The presence of gold, palladium and platinum in these deposits plus the economic gold-platinum resource at Coronation Hill in the South Alligator Valley, indicates an additional potential for this deposit style.

Given that there are local variations in geological setting (structure, host rock, element association), the deposits appear to have a common position relative to the base of the Kombolgie Subgroup i.e. the Palaeoproterozoic unconformity, or to its erosional margin. In several examples, down-faulted blocks of Kombolgie Sandstone (reverse faulting) are juxtaposed adjacent to the mineralisation, as at Ranger No. 3 orebody and the Hades Flat Prospect between Ranger and Jabiluka. These and other recognised features are considered to be indicative of a favourable setting for the concentration of mineralising fluids within a structurally disrupted unconformity setting.

Whilst the mineralisation discovered to date at Kukalak is low grade and small size, the area is considered prospective for unconformity related uranium-gold-PGE mineralisation based upon the following:

- proximity to the unconformity between metasedimentary packages and overlying Kombolgie Sandstone
- favourable reported lithologies
- association of chloritic and haematitic breccias in the vicinity of fault structures

The deposits of the South Alligator Valley (SAV) and the Rum Jungle-Waterhouse region also exhibit a spatial relationship to Palaeoproterozoic unconformities. The SAV deposits are 'capped' by the Kombolgie Subgroup sandstone and have an igneous affiliation (sub-volcanic intrusive). They tend to be more gold enriched and are characterised by the presence of palladium and platinum selenides. The Sargeants and Kylie styles of mineralisation, located south of Rum Jungle on the fringe of the Archaean Waterhouse Complex, have some similarities to the SAV with Au-PGE enrichments in association with uranium. The Depot Creek Sandstone, the basal unit of the Tolmer Group, unconformably overlies these deposits, which are hosted in a carbonate-carbonaceous schist sequence.

EXPLORATION METHODOLOGY FOR 2004-2005

Exploration on EL23462 during the current reporting period consisted of: a review of historic data; outcrop investigations at a number of sites throughout the tenement; re-logging and assaying selected historic drill core; flying of a broad airborne TEMPEST survey; and a single helicopter assisted diamond drill core hole at Devil's Elbow – summarised in Table 1. All digital data that has been acquired by Cameco has been submitted on CD and DVD with this report.

Diamond Drilling

Drilling was carried out by United Drilling Services (UDS, formerly Underground Diamond Drillers) using a helicopter-transportable diamond rig and Onram 1000. The rig can be quickly assembled and disassembled to allow shifting between drill sites. Details of methodology are contained in the relevant work program. Location and technical information for drilling can be found in Table 5 and Figure 4.

Table 5: Drilling Summary for 2003-2004 Reporting Period

Figure 4: Location Map for Cameco Drilling

Drill Core Sample Processing Techniques

Samples are routinely cut from each row of the core tray and halved using a core saw. One half is described (grain-size, colour, magnetic susceptibility and friability) and measured for spectral parameters using the PIMA II spectrometer. These samples are retained within the Cameco storage facility in Darwin. The other half of the sample is used for geochemical analysis. Appropriate samples were sent for thin sectioning and petrographic description. Logging codes are summarised in Appendix 1.

Appendix 1: Logging Codes Used by Cameco

Outcrop Investigation and Sampling

Access to most areas in EL23462 is by helicopter and thence by foot. Fieldwork involved mapping using a base of remotely sensed or geophysical data (e.g. radiometrics, airphotos, Hymap), aerial photograph or topographic sheet, and prospecting using hand held scintillometer (Exploranium 110). Samples and observation data are collected at sites of geological interest or radioactive anomalism, or are collected systematically over a regular grid. A hand-held GPS is used principally for locating. Litho-geochemistry studies, incorporating quantitative chemical assays as well as qualitative and quantitative clay determinations, have been shown to be effective techniques for locating mineralisation in the Athabasca Basin of Canada.

Outcrop Sample Processing Techniques

Outcrop samples are routinely divided into two approximately equal halves. One half, (> 400 g) is used for geochemical analysis (see below). The remainder is used to visually estimate grain-size, friability and colour, and measure spectral parameters using the PIMA II spectrometer. This sample is retained within the Cameco storage facility in Darwin for reference, but can also be used as a repeat geochemical sample in the event of a lost or erroneous analysis. Small portions of selected samples are sent for thin sectioning, with or without petrographic description (Pontifex & Associates).

Analytical Methods

Core and outcrop samples are routinely submitted to Northern Territory Environmental Laboratories Pty Ltd (NTEL) in Darwin for sample preparation and multi-element analysis, including fire assay. For samples collected in 2004, preparation of the fire assay discs was carried out at Northern Australian Laboratories Pty Ltd (NAL) in Pine Creek, and two distinct sample preparation schemes were used:

- ‘basement samples’ were jaw crushed, rolls crushed and pulverised in a Vertical Spindle Pulveriser (VSP) or ring mill, then split to produce a small (50 g) sub-sample for major and minor element analysis, and a larger sub-sample (300-500 g) used for Au-PGE fire assay;

- ‘sandstone samples’ were jaw crushed and rolls crushed only to a nominal 1 mm, and split to produce two sub-samples, the first smaller sub-sample (30 g) used directly for major and minor element analysis, and the second larger sub-sample pulverised in a VSP or ring mill and used for Au-PGE fire assay, and determination of Ba and LOI (300-500 g).

At NTEL and NAL, four separate methods were used to analyse for 65 elements and four isotopes, detailed in Appendix 2 and Appendix 3.

This sample preparation procedure was devised by Cameco to reduce potential contamination in the harder sandstone samples from the pulveriser. However, visual examination shows a trace amount of residue at the base of the beaker following dissolution of the coarse sandstone. Data evaluation also shows poor repeatability for the rolls crushed samples compared to pulverised samples (Garnett, 2005). It also appears that jaw crushing and rolls crushing may be the main source of sample contamination, particularly for gold. In 2005, a new method consistent for all samples will be employed for sample preparation.

Appendix 2: Analytical Methods Used for Cameco Samples

Appendix 3: Sample Processing Procedures Used by NTEL

Major and Minor Element Geochemical Interpretation Methodology

The Refractory Uranium Index or ‘RUI’ (nominally U/Zr*100) is used in this report as a guide to how much uranium is contained in the principal refractory uraniferous silicate phase (zircon) in sandstone, basalt, dolerite and granite (the main rock types in the tenement). This ratio is generally consistent in any given homogeneous rock unit, unless uranium is present as: (i) non-refractory magmatic or hydrothermal uranium-bearing minerals (e.g. uraninite, pitchblende, torbernite); (ii) a lattice component of other silicate phases (e.g. allanite, feldspar, apatite, monazite, baddeleyite) or; (iii) compounds or ligands adsorbed to grain boundaries and clays. These accessory minerals are absent or insignificant in most samples, and RUI is considered a good proxy for U_G950 (weak acid leach or 'labile' uranium) or can be used effectively in conjunction with this analysis type. If a sample exhibits an RUI above background for its particular rock unit, it is deemed anomalous. Importantly, this ratio is essentially unchanged by the partial dissolution of zircon by hydrothermal fluids.

Loss on Ignition (LOI), SiO2, K2O, CaO, Al2O3, combined Fe2O3 & MgO, and a variety of elemental ratios (eg RUI, Fe/Mg and Gd/La) are used to ascertain rock types, particularly with RAB chips. In the case of regolithic or strongly altered samples collected in 2004, careful interpretation of various geochemical signatures has enabled discrimination of metasedimentary, sandstone, dolerite, amphibolite and granite. To assist this process, Cameco also integrates monocular microscope and petrographic studies, and PIMA data.

The various elemental concentrations and ratios also act as a gauge of the type and total hydrous aluminosilicate component in the rocks, which enables an accurate assessment of alteration mineralogy and provides quality control for the PIMA data. These geochemical analyses, together with the petrography, RUI and PIMA, permit the assessment of the geochemical behaviour of the rock system during deposition and diagenesis. This, in turn, enables the delineation of alteration systems, which could be associated with uranium mineralisation.

Lead Isotope Interpretation Methodology

^{204}Pb, ^{206}Pb, ^{207}Pb and ^{208}Pb are routinely determined by Cameco as a means of vectoring uranium transport (Holk et al., 2003). Three of the four common isotopes of lead can be produced by the decay of uranium and thorium. ^{204}Pb is the only lead isotope not influenced by these radiogenic processes. ^{206}Pb is the final daughter product of the decay of ^{238}U whilst ^{207}Pb is produced during the decay of ^{235}U. The decay of ^{232}Th is responsible for production of ^{208}Pb. For a rock containing uranium and/or thorium, the concentrations of these isotopes are gradually increasing with time while the amount of ^{204}Pb held within the rock remains constant.

The uranium and thorium isotopes responsible for the gradual increase in the concentrations of radiogenic lead with time have variable decay rates. ^{238}U has a half-life of 4.47 billion years and ^{235}U has a half-life of only 0.70 billion years. For thorium, the half-life of ^{232}Th is 14.01 billion years. These differences in decay rates make it possible to determine fluid history related to radioactive and radiogenic isotopes as follows.

1. Increasing radiogenic lead concentrations through the decay of uranium- and thorium-bearing minerals (closed-system scenario).

2. Post-mineralization precipitation of radiogenic lead during interaction with basinal fluids and volatiles that have leached lead from uranium or thorium-rich sources (open-system scenario).

3. The delineation of exploration vectors that may point toward economic uranium deposits.

The general parameters determined for sandstone analysis are:

$^{207}Pb/^{206}Pb$ – a monitor of the influence of uranium on the system.

- $^{207}Pb/^{206}Pb$ between 0.95 and 1.15
  Indicates no addition of radiogenic lead from the decay of uranium.

- $^{207}Pb/^{206}Pb$ between 0.80 and 0.95
  Typical range of isotopic ratio for system equilibrated with 'typical' crust.

- $^{207}Pb/^{206}Pb$ between 0.4 and 0.80
  Anomalously low ratio indicates contribution of uranium-source lead to system.

- $^{207}Pb/^{206}Pb < 0.40$
  Extremely low isotopic ratio indicates major addition of lead formed by the radioactive decay of uranium to rock.

$^{208}Pb/^{206}Pb$ – parameter that determines the relative influence of thorium versus uranium in lead isotopic system

- $^{208}Pb/^{206}Pb > 2.5$
  Thorium is dominant element contributing lead to system through radioactive decay.

- $^{208}Pb/^{206}Pb$ between 1.60 and 2.50
  Range of isotopic ratio for system equilibrated with 'typical' crust.

- $^{208}Pb/^{206}Pb$ between 0.5 and 1.60
  Greater contribution of uranium-product lead to system.

- $^{208}Pb/^{206}Pb < 0.50$
  Uranium is dominant (and probably only) radioactive element contributing to system.

Reflectance Spectroscopy (PIMA)

Reflectance spectroscopy (PIMA) analysis is completed using the PIMA II short-wave infrared spectrometer on all drill core and outcrop samples collected. This instrument measures the reflected energy from a sample in the short wave infrared (SWIR) region of the energy spectrum. The sampling area on the rock specimen that is measured is permanently marked. Multiple measurements are occasionally taken, particularly if variations in spectral features are noted. The spectra are converted to an ASCII format and processed using "The Spectral Geologist" (TSG) developed by AusSpec International. TSG is routinely used to process all spectral data. The SWIR spectra, once processed, provide a mineral identification utilising internal software pattern matching algorithms called 'The Spectral Assistant' (TSA).

Thin-sections and Petrography

Thin sections are prepared by Pontifex and Associates from selected core and outcrop samples. Both polished and standard types are made, depending on the purpose. Descriptions were requested for problematic rocks or to resolve specific issues that require expertise or specialist equipment (e.g. SEM, Autoradiograph or Microprobe).

Environmental Monitoring

During the current reporting period, Cameco collected observations and digital photographs of environmental monitoring sites in EL23462, namely recent helicopter drill sites. The purpose is to catalogue and describe specific sites that have been disturbed during Cameco's operations from year to year. In 2004, drill sites were photographed before and after clearing of vegetation, and again after drilling works had ceased. These will be revisited in 2005 and subsequent years to record condition and photograph. Further relevant details are contained in work program documents.

Geophysics - TEMPEST

TEMPEST is a high-powered airborne time-domain system with a broad bandwidth, which enables good resolution of variations in resistivity whilst maintaining reasonable ground penetration. In addition, the airborne platform allows electromagnetic data to be acquired over broad areas where ground geophysics is impractical due to rugged topography. Cameco has successfully utilized airborne TEMPEST in Arnhem Land to map the basement-sandstone unconformity, alteration and infer structural offsets.

EXPLORATION RESULTS AND INTERPRETATION IN 2004-2005

Target and Prospect Generation and Naming

Most target areas or prospects in EL 23462 have been identified at some stage principally using airborne radiometrics. The only new target to result from field work carried out during the current reporting period, is Rangamam, which occurs at the intersection of the Ranger and Hogs Back Faults, where there is a coincident high in the elevation of the first conductive horizon. Existing and new targets are shown in Figure 3.

Drilling

Drill hole KLD104 was collared at the most westerly part of the Devils Elbow prospect area. The site was chosen to test a predicted sandstone 'pinch out' play along the Kukalak Valley, where it coincides with the northern Ranger Fault splay (Figure 5; Devils Elbow **Hyperspectral Image Showing Location of Historic Drilling, KLD104 and 2004 Outcrop Samples.**
Figure 6). There is no surface radiometric anomalism within 600 m of the collar site, apart from scattered thorium in sandstone and a fast-flowing radon spring 100 m to the north. The hole was drilled at 80° to the north (000°) and intersected 107.9 m of Mamadawerre Sandstone, the upper 77 m of which is fine-grained and quartzose, and the lower 30.9 m is coarse-grained and locally pebbly (Figure 7). Below this, 207.6 m of Oenpelli Dolerite was intersected down to 314.5 m, with chilled intrusive upper and

lower contacts. A narrow (3.7 m) interval of silicified pebbly Mamadawerre Sandstone is present to 318.2 m, where the Palaeoproterozoic unconformity was intersected. Nimbuwah Complex granitoid occupies the lower part of the drill hole to the termination depth at 354.1 m. Major and minor element geochemical data for composite drill-core samples are graphically presented in Figure 8 and Figure 9, while raw geochemical data are tabulated in Appendix 4. Down-hole gamma and PIMA logs are shown in Figure 10 and Figure 11. A detailed report of drill core information, including lithology, colour, alteration, structure and magnetic susceptibility can be found in Appendix 5. PIMA TSA data are tabulated in Appendix 6. A list of thin-sections can be found in Appendix 7.

Figure 5: Devils Elbow Hyperspectral Image Showing Location of Historic Drilling, KLD104 and 2004 Outcrop Samples.

Figure 6: Working Cross Section for Devils Elbow Prior to Drilling KLD104

Figure 7: Lithological Log for KLD104 (after Thomas, 2004)

Figure 8: Graphical Down-hole Major Element Geochemical Data

Figure 9: Graphical Down-hole Minor Element Geochemical Data

Figure 10: Graphical Down-hole Gamma Ray Data

Figure 11: Down-hole PIMA Log

Appendix 4: Wholerock Geochemical Data for Outcrop and Drill Core Samples

Appendix 5: Drill Core Report Generated from DHLogger

Appendix 6: TSA PIMA Data for KLD104

Appendix 7: Petrography List for 2004

The principal findings emanating from integrated analysis of the drill core and down-hole data are:

- The middle (145-175 m) and lower (263-306 m) parts of the Oenpelli Dolerite are cross cut by widely-spaced (<1 per metre) narrow (<1 mm) sub-vertical quartz-chlorite veins and incipient brecciation (Figure 12).
- These intervals and the veins are specifically associated with moderately-intense overlapping pervasive chlorite, disseminated sericite and replacive leucoxene alteration (Figure 7; Figure 11). These take the form of broad weak to moderately intense intervals 10s of metres wide, and narrow (10s of cm) intense vein-selvage style alteration. Local zones of pervasive 'red rock' alteration (Figure 13), which have been logged as 'hematite', are in fact low temperature K-feldspar alteration, as evidenced by the geochemical data (Appendix 4).
- Uranium (5 ppm) and gold (3 ppb) are five times background over intercepts up to 30 m (Figure 9). The best composite analysis is 112 ppm uranium over 3 m. There are spot peaks within these anomalous intervals with up to 638 ppm U and 46 ppb Au. Down-hole gamma ray data best depict the broad zones of uranium anomalism at 145-174 m and 280-306 m (Figure 10). Hand-held scintillometer (SPP2) readings for the radioactive intervals are typically in the range 60-100 cps and peak at 300 cps (166.9 m).

- The unconformity interval is devoid of anomalous uranium concentrations or alteration features, beyond the typical red-green palaeoweathering or alteration. Instead it is moderately silicified and weakly chloritised, presumable due to the nearby dolerite intrusion. Sandstone immediately above the upper intrusive contact is also weakly chloritised.
- The upper Mamadawerre Sandstone is characterised by kaolinite alteration only. The lower pebbly part contains minor chlorite and sericite (Figure 11).
- The overall geochemical signature of the uranium-associated alteration system is: consistent positive correlation between U and As (up to 4760 ppm), Be (up to 5 ppm), Bi (up to 12 ppm), Co (up to 2530 ppm), Li (up to 250 ppm), MgO (up to 15%), Mo (up to 45 ppm), P2O5 (up to 0.5%) and LOI (up to 11.6%); plus inconsistent positive correlation with Au, Pd (up to 11 ppb), Ni (up to 1020 ppm) and Pb (up to 243 ppm) (Figure 8; Figure 9). There are a number of elements that are negatively correlated, including Ca, Na, V and Cu. The concentration of K2O (from 0.5 to 3.3%) is highly variable. The ratios U/Th and RUI (U/Zr) are uniformly high. A notable feature is middle Rare Earth Element (MREE) enrichment relative to light and heavy REE.
- Drilling has confirmed to a large extent the predicted geological cross-section for western Devils' Elbow, except that the Oenpelli Dolerite was 100 m thicker than predicted (Devils Elbow **Hyperspectral Image Showing Location of Historic Drilling, KLD104 and 2004 Outcrop Samples.**
- **Figure 6**). Although there is minor deformation evident in the drill core, the earlier Uranerz interpretation of a thrust appears to have little foundation. The sandstone pinch-out play may be a viable stratigraphic-structural trap elsewhere along strike.
- The low-grade nature of the uranium anomalism in the drill hole is interpreted to be due to a lack of significant deformation, such that there was insufficient open space to promote 'ore scale' fluid-rock interaction. It is possible that the only mineralisation potential at Devils Elbow is hosted in sub-vertical fractures within the Oenpelli Dolerite, and therefore a more sizeable zone of deformation should be sought along the axis of Oenpelli-Mamadawerre pinch-out (Kukalak Valley). TEMPEST may be able to define such a zone.
- A number of relatively immobile major and minor elements are concentrated quite differently in the upper and lower parts of the Oenpelli Dolerite, including Ni, Zr and Ti (Figure 14). There is similarly a textural zonation evident in the drill core. This is interpreted to be due to emplacement of this formation during two distinct intrusive magmatic events, which may be temporally discrete. This appears to be unique to the Oenpelli Dolerite along the Kukalak Valley, suggesting that one of the intrusive events may be solely responsible for development of the unusual Kukalak Valley geometry. The other magmatic event may have given rise to the more typical regional geometry sill of the Oenpelli Dolerite.
- Nimbuwah Complex is comprised mainly of megacrystic plagioclase-orthoclase-quartz-biotite-amphibole monzonite or granodiorite (Thomas, 2004). Orthoclase megacrysts are moderately aligned, but there is no penetrative fabric (tectonic foliation) in the rock. Minor metasedimentary enclaves, pegmatite veins and aplite dykes are present. This formation is not considered the most favourable host for mineralisation and downgrades the prospectivity of basement in the Devil's Elbow area.

Figure 12: Typical quartz-chlorite Vein with Elevated cps and Chlorite-sericite-leucoxene Alteration Selvage. KLD104 at 169.9 m

Figure 13: 'Red rock' Style Alteration in Dolerite in KLD104 at 145 m

Figure 14: Ni vs TiO2 for Oenpelli Dolerite in KLD104

Relogging and Analysis of Historic Drill Core

Current and historic drill holes in EL 23462 are presented in Figure 15. Geochemical data for re-sampled historic drill core is tabulated in Appendix 4 and a list of thin-sections can be found in Appendix 7. The key findings of the core logging, following integration with various other data sets, are summarised below.

Figure 15: Map Showing Current and Historic Drilling in EL23642

KLD017 (Dog Leg)

This is one of the principal drill holes in the Dog Leg area (Figure 15). Only part of the drill core could be located and logged at Myra Camp – the intervals 150 to 224 m and 243 to 321 m. Within this core, Myra Falls Metamorphics basement is compositionally pelitic and locally contains up to 2% graphite (Appendix 8). The main rock types are interlayered mafic and felsic gneiss (Figure 16), with whole rock composition in the range 49-65% SiO_2 (Appendix 4). The lower part of the drill core is by average more mafic than the upper part. The principal mineral assemblage is biotite, feldspar, quartz, muscovite and garnet, with evidence of retrogressed sillimanite. Biotite makes up to 50% of the rock volume and the more mafic rock is classified as para-amphibolite. Rotated porphyroblasts of orthoclase, wrapped by biotite and graphite are noteworthy feature lower down hole. Narrow zones of porphyritic granite and quartz-muscovite-orthoclase pegmatite are interpreted as migmatite segregations ('sweats') and are consistent with an upper amphibolite to granulite facies metamorphic grade in the central-western part of the tenement. Geochemical trends are quite distinct from the Nimbuwah Complex, indicating that this succession is unlikely to be the protolith.

Figure 16: Typical Interlayered Mafic and Felsic Gneiss of Myra Falls Metamorphics in KLD017

Appendix 8: Description of Selected Thin-sections by Pontifex and Associates

KLD017 also contains one thick (18 m) interval and numerous narrow (up to 1 m) intervals of unusually porphyritic microdolerite, which is geochemically indistinguishable from the Oenpelli Dolerite. This unusual texture may have given rise to the incorrect 'andesite' interpretation in Uranerz drill logs. Chloritisation of basement is noted adjacent to the dolerite intervals, as observed regionally. The margins of the dolerite bodies are also unusual for their bulbous glassy chilled appearance, analogous to subaqueous pillow basalt (Figure 17).

Figure 17: Unusual Bulbous Interface Between Oenpelli Dolerite and Basement in KLD017

Hydrothermal alteration in KLD017 is mainly chlorite and sericite in gneiss, while regional metamorphism is reflected in localised prehnite and actinolite in the dolerite intervals (Figure 18).

Figure 18: TSA PIMA Log for KLD017

KLD011 (Dog Leg)

This drill hole is also from the Dog Leg area (Figure 15) and drill core was found to be incomplete at Myra Camp, covering only the interval 61-133 m. The Mamadawerre Sandstone was intersected down to 85 m, including a lower 6.5 m pebbly facies, which also incorporates thin mudstone beds. The unconformity is sharp and unspectacular, with the underlying 20 m of basement (presumably Nimbuwah Complex) being weakly to moderately haematite-chlorite altered (typical unconformity-style alteration). This alteration style is locally overprinted by narrow intervals of intense texturally-destructive chlorite alteration, including 112-117 m and 124.5-131 m. PIMA data indicate mainly sericite alteration over the unconformity interval, with chlorite and prehnite becoming more prevalent down-hole (Figure 19). The freshest rock is foliated, coarse-grained and equigranular (rarely megacrystic), comprising approximately 60% plagioclase, 20% orthoclase and 20% biotite+hornblende. It has a bulk composition of 49% SiO_2; 8% Fe_2O_3+MgO, 24% Al_2O_3, 10.5% CaO and 2.7% K_2O, with low Ti and Zr. This rock classifies as monzogabbro and is unusual for the Pine Creek Orogen and Nimbuwah Complex. It is a particularly important finding, because the hole was drilled only 500 m from other drill holes that intersected metasedimentary Myra Falls Metamorphics (eg KLD017; Figure 15). Hand held scintillometer readings rarely exceed 90 cps (SPP2), but appear to be highest over the interval 126-146 m.

Figure 19: PIMA TSA Log for KLD011

KLD005 (Devils Elbow)

This drill hole was collared in Nungbalgarri Volcanics at the Devils Elbow prospect (Figure 15). The top part of the hole incorporating the basaltic volcanics was drilled by RC and is not represented in the core. Core exists below 122 m and initiates with Mamadawerre Sandstone down to 251.1 m, followed by Nimbuwah Complex granite down to 286.5 m (end of hole). The upper part of the sandstone is fine- to medium-grained, silicified and quartzose, with haematite spots/pits near the top of the section. Several zones of coarse to pebbly sandstone are present in the basal part of the formation, at 235-240 m and 245-251.1 m, divided by fine-grained facies. Minor green (hard) chloritised dolerite intervals are also present at 186-189 m. Quartz and lesser haematite veins and fractures are common in the sandstone, including one spectacular large vug at 137 m. Underlying granite is coarse equigranular plagioclase-quartz-orthoclase-biotite bearing of probable granodiorite composition. Red-green alteration is prominent below the unconformity and there are also some minor white clayey (sericite?) zones with elevated cps.

KLD008 (Devils Elbow)

This hole was drilled in the southern part of Devils Elbow (Figure 15) and is similar in many respects to KLD104. Only the interval 228-333 m of core could be located at Myra Camp. Of the section 142-284 m that was logged by Uranerz as Mamadawerre Sandstone, there are numerous dolerite intervals, including 233.5-252 m and 268-278 m. Pebbly facies is the sandstone lithology below ~230 m. The Nimbuwah Complex basement immediately underlying the unconformity at 284.5 m is noticeably silicified and weakly chlorite altered, presumably due to the Oenpelli Dolerite nearby. This overprints typical unconformity style alteration (red-green). Further dolerite intervals are present within the basement. Alteration drops off marginally below 316 m, with basement comprising orthoclase-megacrystic granite and minor tourmaline-bearing aplite and pegmatite dykes. PIMA data, however, suggest sericite and lesser chlorite alteration continues to the end of hole (Figure 20). Radioactivity is minor in the core examined, but a single composite geochemical sample with up to 60 cps (SPP2) was found to contain 19 ppm U and elevated K2O (4%), Be and Mo.

Figure 20: PIMA TSA Log for KLD008

KLD021 (Devils Elbow)

This inclined (70 degrees to 090) hole was drilled by Uranerz at the western side of the Kukalak Valley, enclosing the Oenpelli Dolerite, at Devils Elbow (Figure 15). It intersected Oenpelli Dolerite down to 190.8 m, where it is in intrusive contact with Mamadawerre Sandstone. The Kombolgie unconformity was then intersected at 337.5 m, from which point granitic basement of Nimbuwah Complex is present to the end of hole at 384 m. The dolerite interval is relatively fresh and unaltered apart from a number of narrow chloritised sections, including 138.5-139.5 m and 188-191 m, the former also having 60 cps (SPP2) associated with a chlorite vein. The upper Mamadawerre Sandstone is fine to medium grained and silicified down to 314 m, interrupted by a brecciated quartz-veined chloritised-haematised (minor pyrite) interval at 284-300 m. Pebbly sandstone facies then continues to the unconformity, with patches of chlorite and haematite alteration. Pale clay (?sericite) is also prevalent near the unconformity. Underlying basement exhibits the typical red-green unconformity style alteration down to 355 m and weak chlorite down to 375 m. The basal few metres are composed of fresh granite and minor aplite dykes.

KLD001 (Devils Elbow west)

This hole was drilled about 4 km to the west of Devils Elbow along the Hog Back Fault (Figure 15). The upper 128 m is assigned to Mamadawerre Sandstone and is composed of silicified fine-grained quartz sandstone down to 82 m, then coarse pebbly facies to 91 m, and fine facies again to 100.5 m (including a distinctive mudstone ‘marker’ at 100 m). Pebbly sandstone facies then continues to 125 m, below which point it comprises an interesting zone of white clay (phengitic sericite;

Figure 21; Figure 22) altered sandstone. This interval has up to 60 cps (SPP2) and geochemical analysis indicates 11.5 ppm uranium and 13 ppb gold over 5 m. This clayey interval also contains 14 ppm Sn, 50 ppm Th and 600 ppm Zr, suggesting it has undergone significant mass loss and apparent enrichment of refractory elements/minerals (one order of magnitude!). This interval requires follow up studies to ascertain its significance in the uranium transport and deposition system. The unconformity level at 128-129.7 m is occupied by a chilled porphyritic dolerite dyke, below which there is a 4 m interval of red-green-yellow altered granitic basement. Further fresh Oenpelli Dolerite is present from 133.5 m to the end of the hole at 136.2 m.

Figure 21: PIMA TSA Log for KLD001

Figure 22: Sericite (phengite) Clay Interval in KLD001

KLD002 (Leichhardt Plateau)

This drill hole is located in the far western part of the tenement on the Leichhardt Plateau (Figure 15). Only 79-142 m of the core was located and re-logged at Myra Camp (top 79 m was RC). Most of this interval is white fine-grained quartzose Mamadawerre Sandstone, but sandstone is coarse and partly pebbly over the intervals 95.3-101 m and below 123.5 m. The unconformity is not represented in this core, and therefore must be present below 142 m. According to the Uranerz log, it is present at 145 m. No elevated counts were recorded. PIMA data show an unusual dickite signature within the lower Mamadawerre Sandstone (Figure 23).

Figure 23: PIMA TSA Log for KLD002

Outcrop Sampling and Mapping

Geochemical data for outcrop samples collected during the current reporting period are presented in Appendix 4. Thematic maps showing the distribution of anomalous elements in the samples are shown in Figure 24, Figure 25, Figure 26 and Figure 27. Results for individual areas are discussed separately below. It must be noted that a detailed assessment has not yet been carried out and results should be integrated with samples collected in previous years. Thin-sections are listed in Appendix 7 and TSA PIMA data are tabulated in Appendix 9 and are presented in graphical form in Figure 28.

Figure 24: Map of U Anomalism from Outcrop Samples

Figure 25: Map of Au Anomalism FROM Outcrop Samples

Figure 26: Map Of Pb207/Pb206 (Ppb_Labile) Anomalism From Outcrop Samples

Figure 27: Map of Th Anomalism from Outcrop Samples

Figure 28: TSA PIMA Graphical ‘Log’ FOR Outcrop Samples

Appendix 9: TSA PIMA Data for Outcrop Samples

Terrace Anomaly

Ground-based outcrop investigation and sampling confirmed the high U and Au grades of the Terrace anomaly, with up to 1110 ppm U and 142 ppb Au in ferruginous basaltic and sandstone regolith. They contain up to 55 % Fe2O3 and also have very high U/Th and RUI. Locally elevated are As, Mo, Sn, W and Zn. Middle rare earth elements (MREE) show a distinctive enrichment pattern, although total REE are normal. This anomalism appears to be restricted to the Nungbalgarri-Gumarrirnbang contact.

Devils Elbow

The highest geochemical results obtained for the Devils Elbow area are 3300 ppm U and 92 ppb Au, from ferruginous rubbly (basaltic?) float in a small creek draining Ferricrete anomaly. Otherwise, geochemical results for this area are poorer than expected, with the next best results being 102 ppm U and 45 ppm at one of the main surface radiometric anomalies within the Oenpelli Dolerite. Results from the Mamadawerre Sandstone indicate no uranium anomalism, but exhibit local moderate thorium anomalism (maximum 1730 ppm). Importantly, lead isotopes are typically low, even in sandstones containing negligible uranium.

Cursory mapping in this area suggests that the lower Mamadawerre Sandstone pebbly facies is largely absent on the surface because of the steep nature of the bounding contact with Oenpelli Dolerite. This is consistent with a discordant intrusive relationship and indicates the existence of a west-tapering Mamadawerre Sandstone wedge below the dolerite (Devils Elbow **Hyperspectral Image Showing Location of Historic Drilling, KLD104 and 2004 Outcrop Samples.**
Figure 6). The earlier proposed thrust model appears to have little basis.

Quartzite

Results from Quartzite match the limited scintillometer anomalies identified in the field, with a maximum of 38 ppm U and 8 ppb Au. Interestingly, labile Pb isotope ratios are quite low compared to expectations based on uranium contents and provide some encouragement in this area. Other anomalous elements include Sn, W, Pd (8.5 ppb) and Pt (7.5 ppb). A sandstone wedge subsurface geometry is envisaged, as suggested for Devils Elbow.

China Block-Dog Leg

China Block is an important coincidence of the north-trending Quarry Fault and northeast-trending China Fault, uranium-channel radiometric anomalism and TEMPEST structural perturbation (Figure 3). Field mapping, prospecting and sampling in 2004 have shown significant brittle strike-slip deformation of Mamadawerre Sandstone and Nungbalgarri Volcanics in this area and an apparent NE-trending transfer structure along the Quarry Fault. Silicification is enhanced and haematite-quartz veins are common. The basal Nungbalgarri Volcanics in particular exhibits strong and persistent radiometric anomalism, but fractures in the underlying Mamadawerre Sandstone are also locally strongly anomalous.

Samples collected from this locality are anomalous in a number of elements, most notably U (up to 361 ppm) and Au (up to 755 ppb). Associated anomalous elements include Be, Bi, Li, Mo, Sn and W. Lead isotopes are typically low and U/Th is uniformly high. In addition, MREE show a distinctive enrichment pattern, although total REE are normal. This may be one element of a 'dolerite style' geochemical signature in western Arnhem Land.

Kukalak Valley

As has previously been documented, there are numerous coincident radiometric and geochemical anomalies along the Kukalak Valley, contained largely in Nungbalgarri Volcanics and Oenpelli Dolerite. Most radiometric anomalies visited in 2004 are characterised by elevated U (up to 452 ppm) and Au (up to 49 ppb), along with low Th. Other inconsistently anomalous elements include As (up to 105 ppm), Bi (up to 14 ppm), Cu (up to 450 ppm), K, Li, Mo (up to 91 ppm), P205 (up to 1.2%), W (up to 179 ppm) and Zn (up to 408 ppm). The ratio Pb207/Pb206 is often less than 0.15, indicating a dominantly uranium source.

These geochemical data corroborate the existence of most of the airborne radiometric anomalies, but their significance is still uncertain. It is difficult to extrapolate with confidence the geochemical anomalism of the near-surface mafic rocks into the underlying basement. None of the anomalies appear distinct enough or are characterised well enough to suggest they are the result of leakage from an underlying orebody. They do, however, support the existence of the postulated sandstone pinch-out play along the length of the valley and encourage further investigation of the structure (see Devils Elbow **Hyperspectral Image Showing Location of Historic Drilling, KLD104 and 2004 Outcrop Samples. Figure 6**).

Nicks Anomaly

This anomaly has high local scintillometer readings, but appears to be dominantly thorium (up to 1390 ppm) with lesser uranium (up to 133 ppm). Total REE is up to 1.1% and is dominated by light atomic weight. This would suggest a genetic connection with the nearby Tin Camp Creek Granite.

Far East

Small radiometric anomalies followed up in the eastern part of the tenement were only weakly anomalous, with maximum 53 ppm U in laterite. These samples were collected close to the Nungbalgarri-Mamadawerre contact and probably do not require follow up.

Geophysics - TEMPEST

In July 2004, Cameco contracted Fugro Airborne Surveys Pty Ltd (Fugro) to undertake an airborne electromagnetic TEMPEST survey at Kukalak. The survey was designed to cover the Mamadawerre Sandstone since is it was understood from previous experience that the TEMPEST system cannot penetrate through the Nungbalgarri Volcanics, which is moderately conductive.

The TEMPEST survey shown in Figure 31 employed a flight line spacing of 200 m and a flying height of 120 m, totalling 1785 line km. A logistics report (Appendix 10) is provided with this report and outlines the survey specification and processing in greater detail (Owers and Stenning, 2004). Fugro has supplied the located data, images of stacked CDI (Conductivity Depth Image) sections along with multi-plots. Grids have been provided of the time constants along with time windows, which are shown in Figure 29 and Figure 30 respectively. It should be recognised that the CDIs are simple 1D inversions calculated using EMFlow, which can result in artefacts and have some inherent limitations.

All digital data is submitted with this report, although in some cases culturally sensitive "nogo zones" have been excised in accordance with requests by Traditional Owners.

Appendix 10: Logistics Report for 2004 TEMPEST Survey by Fugro

Figure 29: Time Constant (TAU) from Z Component

Figure 30: RGB = ZCh 1,4,8

Figure 31: Geology with TEMPEST Flight Lines and Selected ZCDIs

Processing and Comparison with Geology

CDIs are the primary product used to visualize the TEMPEST response and to compare with plan and section geology. However, Cameco has also undertaken further processing of the CDIs using Profile Analyst software (Encom Pty Ltd) to calculate a 3D voxel, which can be used to investigate 3D features. This allows conductivity depth slices to be calculated as well as the depth to the first conductive layer, referred to as the "conductive unconformity". The 3D voxel has also been filtered to highlight conductivities greater than 10 mS/m and exclude conductivities within 80 m of the surface, which are likely to relate to cover and weathering rather than features within the basement. A number of these 3D aspects have also been reprojected to plan view to facilitate comparison with ancillary datasets including geology. The z-component data has been used extensively since it is less prone to noise and couples best with sub-horizontal features.

The below figures (30-35) show comparisons between TEMPEST ZCDIs (with 100 m ticks) and geology mapped at the surface and encountered through drilling. Also uranium values derived from geochemistry are shown if they are available in the ongoing Cameco database.

Figure 32: Geology with TEMPEST Flight Lines and Selected ZCDIs

Figure 33: Comparison Between TEMPEST and Geology: L10400 and KLD103

Figure 34: Comparison Between TEMPEST and Geology: L10540 and KLD012 - KLD013

Figure 35: Comparison Between TEMPEST and Geology: L10980 and KLD002

Figure 36: Comparison Between TEMPEST and Geology: L11100 and KLD104

Figure 37: Comparison Between TEMPEST and Geology: L11220 and KLD004

Conductive Unconformity

The "conductive unconformity" is a term adopted to describe the first sub-horizontal conductive layer, commonly depicted in TEMPEST CDIs. In areas of Mamadawerre Sandstone this layer generally relates to the sandstone-basement unconformity contact. However, in areas of Gumarrimbang Sandstone the conductive unconformity relates to the Nungbalgarri Volcanics. This volcanic rock is situated between the Mamadawerre and Gumarrimbang Sandstone with moderate conductivities (at times > 100 mS/m), which effectively mask the underlying response from the sandstone-basement unconformity. At times the Nungbalgarri Volcanics has been identified by mapping but does not relate to a shallow conductive unconformity response. In these instances the volcanic layer may simply be insufficient to produce a response. Alternatively, the Nungbalgarri Volcanics may have been incorrectly identified since the surface evidence is often limited to sub-crop and scree.

The conductive unconformity for holes KLD104 and KLD002 are within 40 m of the true unconformity, which is generally the case for Arnhem Land. The geology is a more complicated at KLD104 since there is a 207 m dolerite intrusion separating sandstone and basement. In this instance the conductive unconformity corresponds with the top contact between sandstone and dolerite. Hole KLD103 intersected 17 m of sandstone, which overlies a granitic basement. In this instance the position of the unconformity is far shallower than the conductive unconformity, which occurs at approximately 100 m. At this stage it is unclear why there is such a difference for this location. From the examples it is reasonable to assume that the conductive unconformity can be used it to estimate the elevation and depth of the unconformity, albeit cautiously and in the context of known surface geology.

Figure 38: Elevation of Conductive Unconformity from ZCDIs

Basement Geology / Features

The basement geology is important and in particular, granitic rocks are considered less prospective than pelitic rocks or their metamorphosed equivalents.

Previous TEMPEST surveys over Mamadawerre Sandstone have recorded a relatively thin and well-defined conductive unconformity layer at the contact with basement pelitic sediments along with their metamorphosed equivalents including Nimbuwah Complex. However, in portions of the Kukalak survey the response takes on a broader and more diffuse appearance than previously observed. This TEMPEST response in tentatively attributed to deeper development of the paleo-regolith at the basement-sandstone unconformity, which has been recognised as a characteristic of the granite within the Kukalak project. Granite occurs at the Leichhardt Plateau and Quarry Hill as well as within KLD002 and KLD103; and corresponds with diffuse and broad TEMPEST conductive unconformity responses. Therefore, despite a sparsity of drill holes and physical property measurements, it is proposed that the TEMPEST conductive unconformity response may be utilised to predict basement geology. Barrett (1988) discusses the use of gravity to predict basement geology at Kukalak and there appears to be good agreement between gravity lows interpreted as granite and areas where the conductive unconformity is diffuse. Figure 39 demonstrates the proposed relationship between basement geology, gravity and TEMPEST. Granitic basement inferred using TEMPEST and gravity if referred to in the present report as “inferred granite”.

Figure 39: Basement Geology, Gravity and Selected TEMPEST ZCDIs

The TEMPEST survey has identified some broad and weakly conductive features below the conductive unconformity. One example is at the northern end of tie-line L17021 (north of Quarry Hill) where there is a diffuse conductive layer dipping shallowly towards the north below the conductive unconformity. In actual fact, it is almost concordant and sub-parallel to the conductive unconformity. The second example is several deep (~ 500 m) conductive features at Concordia Valley (i.e. western end of line L10400). A possible explanation for the increased conductivity is graphitic or sulphidic pelites such as the “Two Rocks Unit” and/or low-angle graphitic shears. Both of these have been known to relate to TEMPEST responses within the nearby Tin Camp Creek project. It is quite plausible that similar features exist elsewhere but are obscured by shallower conductors such as the conductive unconformity. This may in fact be the case for drill hole KLD17 (at Dog Leg), which intercepted minor graphite (up to 2%) but does not have an associated TEMPEST response.

Structure

The conductive unconformity is not uniformly flat. For instance, at the Quarry Fault on line L10400 (below the Mamadawerre Sandstone) the conductive unconformity is sinusoidal in shape. If such features are post-Kombolgie then they could indicate important controls on the flow of uranium-bearing fluids and also imply significant structure, which could focus or trap fluids. Furthermore, synformal and synclinal changes in the elevation of the unconformity are known to occur at the Jabiluka Deposit (Hancock, 1990) and Caramal Prospect respectively.

Abrupt changes in the elevation of the TEMPEST conductive unconformity can be used to infer faulting and structure, which is shown in Figure 40. However, geology must be carefully considered since similar features can also occur at the edge of the Nungbalgarri Volcanics, where the conductive unconformity alternates from the basement-sandstone unconformity and Nungbalgarri Volcanics. The Quarry Fault and Caramel Fault appear to be examples of faults that relate to abrupt changes in the elevation of the conductive unconformity. Many structures have been inferred and most of these have potential to be significant with movement. They have been classified as “minor” except where the movement is likely to be greater than 50 m, which have been classified is “major”. For these major structures the apparent up/down motion has also been identified. It is worth noting that care must be take not to over-interpret the CDIs where there are abrupt changes in the conductive unconformity since 1D inversion can produce edge effects and incorrect geometry.

Other faults at the Kukalak project show localised ridges and/or troughs in the conductive unconformity elevation. This phenomenon has not been observed elsewhere in Arnhem Land and cannot be readily reconciled against known geology. Examples of this type of feature include China Fault, Ranger Fault, Hogs Back Fault and Sugarbag Fault. These have been classified as "ridges" in the present interpretation although they are sometimes also associated with localised troughs.

Figure 40: Elevation of Conductive Unconformity from ZCDIs and Inferred Structure

Targets

One of the primary objectives for the TEMPEST survey is to identify conductors, associated with structure, since these could relate to clays, porosity or graphite; indicative of alteration and/or fluid-rock interaction with potential to precipitate uranium. Unfortunately, conductors can be difficult to reliably identify with 1D inversions due to artefacts and tails related to edge effects. Geometry, line-to-line consistency and x/z characteristics help to increase confidence that conductors are real, especially in the context of known geology.

Two regions have been selected as having increased prospectivity due to the presence of significant structures identified from TEMPEST. The first region is located east and north of Quarry Hill and is defined by a synclinal conductive unconformity, which is bounded by inferred northwesterly and northerly trending faults. The northern half is interpreted to flank the eastern edge of a basement high, which projects into the adjoining Tin Camp project where is may be an important control on structures including the Myra Fault at the NE Myra prospect (just east of the Kukalak Project). The northern half of the region is thought to be most prospective since there appears to be basement conductive features below the conductive unconformity, which may represent graphitic pelites. Towards the south, granite is the inferred basement type. The second region stretches from the China Block to the north of Concordia Valley and is defined by inferred northerly trending faults forming localised horsts such as the China Block and north of Concordia Valley. The westerly trending Caramal Fault is also present within the target region. Granite is inferred north of the Caramal Fault, therefore the China Block is considered most prospective.

Thirteen targets have been identified by the TEMPEST and are shown in Figure 41. Generally these fall into three categories a) those associated with major structures and close to the identified priority regions, and b) those associated with structural ridges and c) isolated conductors not necessarily associated with structure. Of these, target a) is considered highest priority since this type of target conforms best to a possible structural / alteration target, which is a feature of the current exploration model.

Figure 41: TEMPEST Targets with ZCDIs and Inferred Structures

Each of the targets has been given a priority rating and should be further assessed in the field along with other ancillary exploration datasets. It is anticipated that most of these targets could warrant drill testing.

Expenditure for 2003-2004

Expenditure on EL23462 during the 3rd year of licence totalled $471 710 (Table 6). For a typical work program, the main expenditure items are: payroll costs including geologists, consultants and field assistants; drilling costs; airborne geophysical survey contractor costs; fuel and air charters; camp costs; NLC administration costs; analytical expenses; equipment; travel; communications. Associated overheads such as office costs are allowable, but have not been included here. Compensation payments made to the NLC and tenement rental paid to DBIRD do not constitute reportable exploration costs.

Table 6: Summary of Eligible Expenditure for the 2003-2004 Reporting Period

CONCLUSIONS

Field work completed by Cameco during the second year of exploration showed overall poor results. Drilling of KLD104 in western Devils Elbow area successfully verified the postulated geological cross-section and the existence of a westerly-tapering wedge of Mamadawerre Sandstone below the Oenpelli Dolerite. However, it failed to establish anomalous uranium concentrations in the subsurface. Broad intersections of Oenpelli Dolerite are cross-cut by narrow widely-spaced fractures and veins, with associated chlorite, sericite, leucoxene and K-feldspar alteration, and elevated gamma radiation (average 5 times background with spikes up to 30 times background). The best composite geochemical analysis is 112 ppm U over 3 m, while the best spot geochemical analysis is 638 ppm U and 46 ppb Au. Uranium-bearing fluids were clearly active in this area, but there appears to have been insufficient deformation and subsequent fluid-rock interaction to form economic grade intersections.

Re-logging and sampling of segments of historic drill core suggests that there are a number of exploration plays that require follow up, particularly in the Devils Elbow area. These logs will be used in the construction of new cross-sections for this area, which will assist in target definition. Chlorite, sericite and haematite alteration are present near the unconformity in most drill holes from Devils Elbow and are associated with elevated scintillometer readings. Specifically, KLD001 has a 5 m wide zone of intense phengite alteration and elevated cps at the base of the Mamadawerre Sandstone, encompassing significant mass loss. Myra Falls Metamorphics and Nimbuwah Complex in KLD011 and KLD017 at Dog Leg were found to include monzogabbro and graphite-bearing mafic gneiss, both of which are considered to have excellent reductive capacity and therefore uranium potential. The grade of metamorphism is interpreted as upper amphibolite to lower granulite facies. An atypical dickite PIMA signature is present in the lower Mamadawerre Sandstone in KLD002, in the far west on the Leichhardt Plateau.

Geochemical data from outcrop samples are able to corroborate the existence of most airborne radiometric anomalies in EL23462, but their significance is still unknown. It is difficult to extrapolate with confidence the geochemical anomalism of the near-surface mafic rocks (Nungbalgarri Volcanics and Oenpelli Dolerite) into the underlying basement. For example, there are numerous coincident radiometric and geochemical anomalies along the Kukalak Valley, but none appear distinct enough to suggest they are the result of leakage from an underlying orebody. They do, however, support the existence of the postulated sandstone pinch-out play along the length of the valley and encourage further investigation of the structure. Regardless, the best geochemical results from beyond Devils Elbow are those from China Block, where uranium is up to 361 ppm and gold is up to 755 ppb. This area coincides with an apparent transfer structure along the north-trending Quarry Fault and a large uranium-channel radiometric anomaly. Surface mapping has shown significant strike-slip deformation of Mamadawerre Sandstone and Nungbalgarri Volcanics in this area.

An extensive airborne electromagnetic TEMPEST survey has been flown over the western part of the project, which has provided some significant insights into the geometry of the sandstone-basement unconformity. Careful comparison with geology has confirmed many of the known faults and allowed several new faults to be inferred. In addition, several conductive unconformity ridges (+/- troughs) appear to be associated with faults, which have not been previously observed in Arnhem Land. The structural significance and source of these features is presently unknown. Northerly and north-westerly trending faults bound two regions in the northern part of the project, which are considered prospective. Furthermore, thirteen targets have been identified, which may warrant drill testing but should first be evaluated in the field. There are some indications that the TEMPEST data may be utilised to infer basement geology. In the first instance conductive features may be utilised to identify graphitic lithologies and in the second instance the conductive unconformity response over granite appears more diffuse and broad.

RECOMMENDATIONS

Future work on EL23462 should initially include a thorough integrated review of historic and Cameco geochemical and PIMA/hyperspectral datasets with the aim of identifying subtle anomalies and to rank existing anomalies based on their geochemical-spectral characteristics.

Cameco should undertake a focussed investigation along the length of the Kukalak Valley, in particular where cross faults are present, so as to test for the existence of subsurface fault zone-related brecciation and dilation and potential mineralisation. Investigations should initially involve detailed (50 m spaced) radiometric and magnetic surveying and interpretation, field sampling and mapping, integrated data assessment, followed by diamond drill testing. Existing TEMPEST data need to be thoroughly examined, including the construction of sequential cross-sections of the Oenpelli-Mamadawerre ‘pinch out’ play along the Kukalak Valley. The obvious zone where the Ranger Fault cuts across the valley (Devils Elbow) appears to have been largely tested, although there is still scope for an untested structural Oenpelli Dolerite host. Further to this exercise, other parts of the tenement should also be ground checked to determine if previously recognised geochemical and radiometric anomalies have been incompletely tested. New and perhaps more subtle anomalies should be generated from a review of existing geophysics and flying of more detailed geophysical surveys. These can also be ground tested in 2005 and 2006.

Additional detailed sampling and ground-based investigations should be completed in the northwestern tenement area proximal to the Caramal East Inlier to the north of Dog Leg where the sandstone is quite anomalous and several intersecting structures are postulated. Further drill testing of this area is also warranted, utilising a helicopter-assisted drill program.

Drilling in the immediate future should focus on the China Block radiometric-geochemical-structural anomaly area. At least three drill holes will be required to evaluate all possible subsurface structural models.

The TEMPEST survey has identified two regions of interest along with thirteen targets shown in Figure 41. These targets should be evaluated in the field during 2005 and consideration should be given to subsequent drill testing of priority targets.

WORK PROGRAM FOR 2004-2005 (3rd YEAR)

Work planned for the dry season of 2005 for the Kukalak tenement will include some additional follow-up investigations and sampling in a variety of locations throughout EL23462, including areas previously visited and those not previously visited by Cameco. Systematic (250-500 m spaced) outcrop sampling will be focussed on generating 'background' geochemical and spectral data for the sandstone ridge flanking the Kukalak Valley and the sandstone plateau along the Ranger Fault. Prospecting and mapping is also planned for the targets generated from the TEMPEST survey.

A detailed (50 m spaced) radiometric and magnetic survey is planned for along the Kukalak Valley in 2005.

Three helicopter-assisted diamond drill holes are planned for the China Block target area to fully evaluate various structural permutations. A total of 1000 m drilling is envisaged.

One contingency drill hole for 300 m is also planned at the 'Rangamam' target along the Ranger Fault, 5 km west of Devil's Elbow. Timing and firm sighting for this drill hole will depend upon results of reconnaissance field investigations in this area in early 2005 and may be postponed to 2006 if no discrete target can be identified.

Cameco also have a contingency plan to sample for diamonds and indicator minerals in the Devils Elbow area. This may be carried out in 2006 if funds or human resources are not sufficient.

It is anticipated that expenditure on EL 23462 for the next reporting period will be $565 000 to complete the proposed exploration work.

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