EL 3214 Karkarook, South Australia

ANNUAL REPORT

For the Period Ending 23 June, 2007

(Combined First, Second and Third Annual Reports)
24 June 2004 to 23 June 2007

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(Note. Notification of business name change, from Southern Cross Resources Australia Pty Ltd to Uranium One Australia Ptgy Ltd, was forwarded to PIRSA during December 2006)

COMBINED FIRST, SECOND AND THIRD ANNUAL TECHNICAL REPORTS FOR EL 3214 "KARKAROOK" TO YEAR ENDED 23 JUNE 2007

I Summary

This report is a combined report synthesised from work carried out over three years, from 24th June 2004 to 23rd June 2007, on EL3214 "Karkarook". EL 3214 is subject to a Letter of Agreement whereby Southern Cross Resources Australia Pty Ltd (now Uranium One Australia Pty Ltd) is deemed to have a 90% interest in all minerals except gypsum and can earn further equity in the licence by meeting certain conditions and conducting exploration for uranium on the tenement. A new formal agreement has been drawn up between Uranium One Australia PL and Oliver Geological Services PL and awaits finalisation by the appropriate signatories. A renewal of EL3214 was lodged by Uranium One PL on behalf of Oliver Geological Services PL on 5th June 2007. Acceptance of the renewal by PIRSA was pending at the time of writing this report.

Kerr-McGee Australia Ltd initially recognised the potential for uranium mineralisation in the area during the late 1960's. Pancontinental Mining Ltd followed up on previous work, drilling diamond core and rotary percussion holes. Basement rock, within the target area delineated by Uranium One PL, was not intersected by Pancontinental drilling. The introduction of a "Three Mines Policy" by the Australian government caused a premature end to drilling in this area. Uranium One PL has recognised the potential still remaining in the Driver River area for the discovery of unconformity style uranium.

Exploration activities conducted in the first year of EL 3214, ending 23 June 2005, include:

- On 22nd December 2004, Southern Cross Resources Australia Pty Ltd. (now Uranium One Australia PL) entered into a joint venture over EL 3214 with Oliver Geological Services Pty Ltd (OGS). Under the terms of the agreement Uranium One is deemed to have 90% interest in all minerals except gypsum however the main focus is exploring for uranium. OGS retain exclusive rights to gypsum and other near surface industrial minerals,
- No field work was undertaken. During this period open file data was compiled, historical geophysics was acquired and reprocessed, and historical drill cores drilled into EL 3214 and surrounding areas were inspected and sampled at PIRSA's core library,
- Planning for the acquisition of new geophysical surveys to define drill targets was also undertaken during this period.

For the period 24 June 2005 to 23 June 2006, exploration continued in the form of office-based work:

- Procurement of a drilling contractor proved to be a difficult task; as only one diamond drill hole was required,
- Review of historic data continued.

For the period 24 June 2006 to 23 June 2007, exploration work included:

- A detailed GPS gravity survey was completed by Haines Surveys PL; 133 gravity stations over 13 N-S trending lines,
- Two E-W oriented Pole-Dipole Induced Polarization traverses were completed by Search Exploration,
- One diamond drill-hole (KAR001) of NQ diameter was drilled for 672 metres. The core from this hole has been geologically and structurally logged, geochemically assayed and subjected to a petrological examination.
- Drill-hole KAR001 was the subject of a PACE drilling subsidy. A Final Drilling Report was submitted to PIRSA following the completion the drill-hole.

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FIGURES

TABLES

1 TENEMENT STATUS

This is the Annual Report (combined first, second and third) for EL3214 "Karkarook" for year ending 23rd June 2007. Karkarook, held by Olliver Geological Services Pty Ltd, was subject to a Letter of Agreement whereby Southern Cross Resources Australia Pty Ltd (now Uranium One Australia Pty Ltd) is deemed to have a 90% interest in all minerals except gypsum and can earn further equity in the licence by meeting certain conditions and conducting exploration for uranium on the tenement. The tenement covers part of the Driver River and Driver River Pan which contains a radiometric anomaly first discovered and investigated by SADM in 1954. Currently, a formal agreement has been drawn up between Uranium One Australia PL and Oliver Geological Services PL and awaits finalisation by the appropriate signatories. A renewal of EL3214 was lodged by Uranium One PL on behalf of Oliver Geological Services PL on 5th June 2007. EL3214 was renewed by PIRSA for a two year period, to 23rd June, 2009.

1.1 Location

EL3214 is located in the central eastern portion of the Kimba (**SI53-7)** 1:250,000 map sheet and on the Verran 1:100,000 (**6130)** sheet. The area is contained by two separate tenement areas broadly bound by:

Longitude 136.200° to 136.301°E and latitude 33.494° to 33.780°S
MGA Zone 53: 6,292,900mN to 6,259,300mN and 611,400mE to 620,600mE

1.2 Access

EL3214 is located about 140km nor-northeast of Port Lincoln and about 25km west of the township of Cleve, on the southern Eyre Peninsula (Figure 1). The area is accessed by a main sealed road between Port Lincoln and Cleve and by numerous well serviced un-sealed roads throughout the region. The tenement area is dominated by dissected rolling uplands mainly utilised for the cultivation of cereal crops with lesser sheep and cattle grazing.

1.3 Native Title and Land Access Clearance

EL 3214 is situated within Freehold Land with no associated Native Title Claim. Therefore Native Title is extinguished under these conditions.

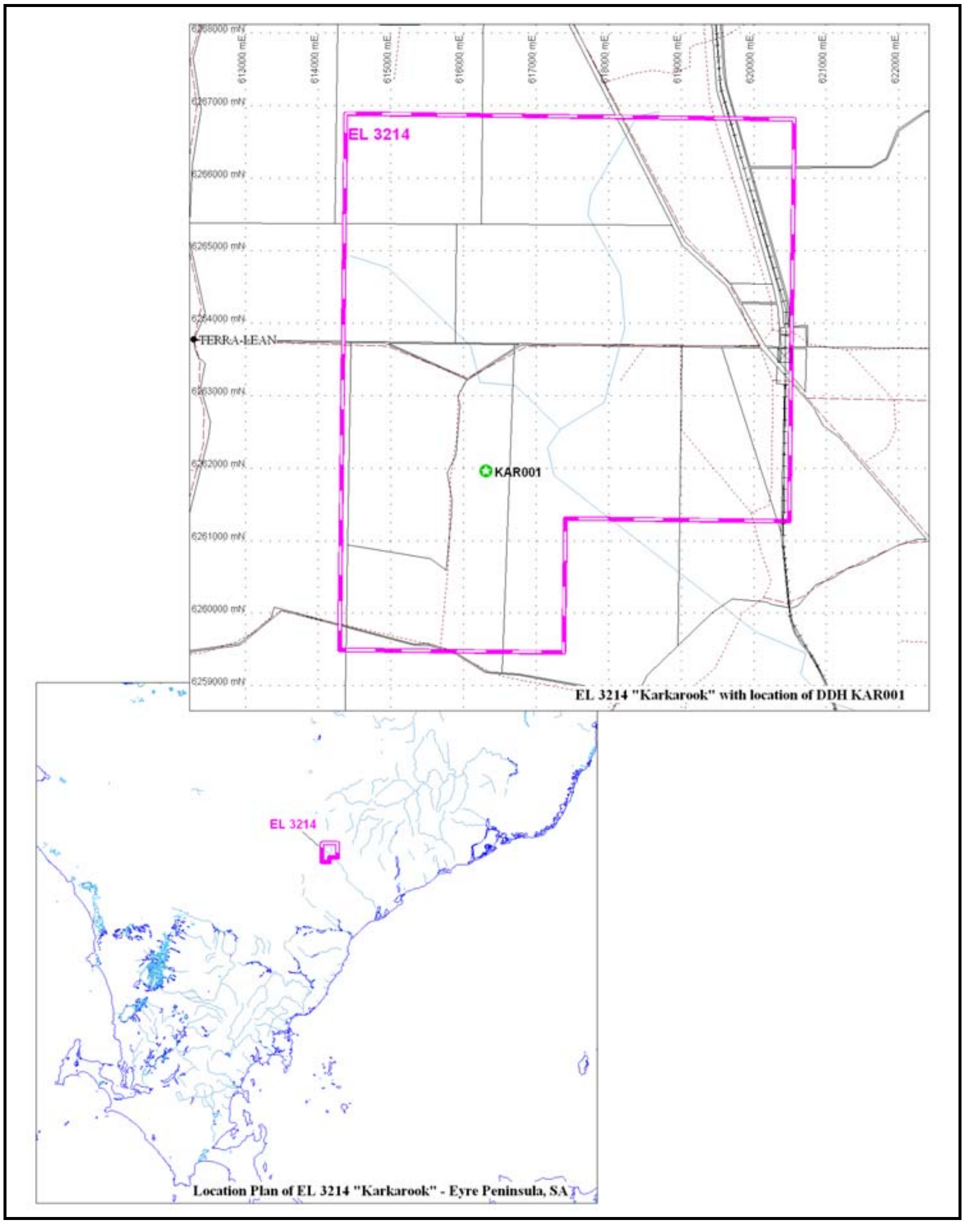

Figure 1 Location plan for 3214 - Karkarook, Eyre Peninsula SA.

2 GEOLOGY

2.1 Overview of the Geology of the Gawler Craton

The following is taken from Parker (1987).

The tenement area lies within the Cleve Subdomain of the Gawler Craton in the central Eyre Peninsula. The eastern margin of the Gawler Craton is marked by the Torrens Hinge Zone, a major crustal feature up to 25km wide. The southern margin is defined as the southern edge of shallow Precambrian cratonic basement on the southern continental shelf. The northern, north-western and western boundaries are not so clearly defined as a relatively thick Neoproterozoic and Phanerozoic cover.

The development of the Gawler Craton can be summarised into three principle tectonic events:

1. 2700-2300 Ma: Late Archaean sedimentation and volcanism followed by Early Proterozoic plutonism and metamorphism (Sleafordian Orogeny)
2. 1950-1700 Ma: initial basin and platform sedimentation followed by widespread plutonism, metamorphism, and deformation (Kimban Orogeny 1850-1700Ma) with local volcanism and continued sedimentation to about 1700 Ma. (Approximately late Palaeoproterozoic)
3. 1650-1450 Ma: anorogenic acid magmatism including extensive felsic volcanism, high level granite plutonism and local intracontinental clastic sedimentation. (Approximately early Mesoproterozoic)

2.1.1 Archaean to Earliest Proterozoic

The oldest basement rocks of the Gawler Craton are the Mulgathing Complex in the NW and the Sleaford Complex (2300-2650Ma) in the south. The Sleaford Complex contains two principal components:

- an older Archaean ancestral supracrustal layered gneiss sequence, the Carnot Gneiss, which was metamorphosed during the Sleafordian Orogeny (2450-2550Ma), and an
- an intrusive granitoid suite, the Dutton Suite, emplaced about 2300-2350Ma

Both the Sleaford Complex and Mulgathing Complex are granulite facies gneiss complexes.

2.1.2 Early Proterozoic (Palaeoproterozoic)

There is little recorded sedimentary or tectonic activity in the Gawler Craton from 2300 to 2000Ma. On the southern Eyre Peninsula the Sleaford Complex is overlain by clastic sediments of the Hutchison Group.

The Hutchison Group (described in detail below) is considered to have been deposited about 1950 to 1850 Ma, because it overlies the 1950Ma Miltalie Gneiss in the central Eyre Peninsula, and is intruded by 1850Ma granitoids. Subsequent U-Pb zircon dates on rhyodacites of the Bosenquet Formation have placed a minimum age of 1845Ma on the Hutchison Group.

The Hutchison Group has been intensely and repeatedly metamorphosed and deformed during the Kimban Orogeny (1850-1700Ma) with peak metamorphic grades of middle to upper amphibolite facies. Combined with intense deformation the Hutchison Group is strongly disrupted.

Metamorphism and deformation of the Kimban Orogeny occurred about 1850-1700Ma and is recorded by numerous granitoids ranging from early I-type granodioritic bodies (Donington Granitoid Suite) to late orogenic ademellite plutons.

Mylonites throughout the eastern Eyre Peninsula and in the northwest of the craton formed during late orogenic development and represent major crustal shear zones.

East of the Middleback Ranges, low metamorphic grade schist, amphibolite and minor quartzite of the Broadview schist are associated with felsic volcanics and fine grained gneiss, the Myola Volcanics. These are stratigraphically younger (and dated at 1791±4Ma) than the Hutchison Group and have been subject to part of the same orogenic cycle (that affected the Hutchison Group). The Myola Volcanics have been correlated with the Argylla and Bottletree Formations of the Mount Isa Inlier on both age and geochemistry criteria.

Other non-intrusive units not described further are the Doora Schist and Moonta Porphyry, the McGregor Volcanics and Moonabie Formation, and the Gawler Range Volcanics.

Intrusive sequences of the Palaeoproterozoic of the Gawler Craton include a very broad spectrum of granitoids ranging in age from 1850-1600Ma and show varying degrees of deformation and recrystallisation. In the southern portion of the craton these granitoids are known as the Lincoln Complex, which includes the Donington Granitoid Suite. The minimum age of emplacement is thought to be 1700Ma with 1600Ma being a reset age.

2.1.3 Middle Proterozoic (Mesoproterozoic)

The earliest Mesoproterozoic records a significant change in the tectonic character of the Gawler Craton. The clastic sediments and felsic volcanics that formed during this period are not highly deformed and form a relatively flat blanket over the north-eastern portion of the craton.

Voluminous felsic volcanics, the Gawler Range Volcanics (1600-1590Ma), were accompanied by clastic, fluviatile sediments of the Tarcoola and/or Labyrinth formations in the NW, and the Corunna Conglomerate in the SE.

Large anorogenic granite plutons of the Hiltaba Suite accompanied volcanism about 1590-1580Ma.

2.2 Regional Geology of the Tenement Area

The following is summarised from Drexel *et al* (1993).

The northern one fifth of the tenement area covers rocks of the Cleve Subdomain, a Palaeoproterozoic fold belt composed of tightly folded, high-grade metamorphic rocks (the Hutchison Group) derived mainly from clastic shallow-marine sediments, iron formations, carbonates and mafic with much lesser acid volcanics.

The metasediments of the Cleve Subdomain overly an Archaean to very early Proterozoic basement (Sleaford Complex); and were intruded by numerous granitoids (Lincoln Complex) during the Kimban Orogeny (***K***$D_{1\text{-}3}$; 1850-1700Ma); a period of major deformation and metamorphism.

The southern portion of the tenement area covers the sediments and volcaniclastics of the Neoproterozoic-Triassic-Cretaceous Polda Trough, which partially overlies Mesoproterozoic sediments of the deep elongate east-west trending Itiledoo Basin.

The Mesoproterozoic basal sediments, the Blue Range Beds, lie immediately above the unconformity with the Palaeoproterozoic Hutchison Group. The projected contact between the Palaeoproterozic sequence and the Mesoproterozoic sequence trends through the northern portion of the tenement. The Mesoproterozoic Corunna Conglomerate is also situated stratigraphically above the unconformity with the Palaeoproterozoic, however it has not been assigned to a basin.

2.2.1 Palaeoproterozoic Geology (2500-1600Ma)

This following summary of geology is taken exclusively from Drexel *et al* (1993).

The Hutchison Group consists of basal quartz clastics (the Warrow Quartzite), with local pebble conglomerate and calc-silicate gneiss, overlain by carbonate, iron formation, amphibolite and pelitic to semipelitic schist of the Middleback Subgroup and Yadnarie Schist. Highly deformed rhyodacites (Bosanquet Formation) occur within the Yadnarie Schist. A detailed description of these units follows.

The Hutchison Group has been intensely and repeatedly metamorphosed and deformed during the Kimban Orogeny with peak metamorphic grades of middle to upper amphibolite facies.

Hutchison Group – Warrow Quartzite

The Warrow quartzite forms the base of the Hutchison Group and unconformably overlies the Sleaford Complex on the south-western and central Eyre Peninsula. Quartz pebble conglomerate and trough cross-bedding occurs in massive quartzite, and have been interpreted as fluvial to marginal-marine proximal sediments with a western provenance.

Dominant lithologies are muscovite (± andalusite, sillimanite) quartzite, microcline ± muscovite quartzite, quartz-mica-feldspar-sillimanite ± andalusite schist and conglomerate containing lensoidal coarse-grained recrystallised quartz pebbles in a finer grained muscovite quartzite matrix. Accessory minerals include rutile, monazite, zircon, tourmaline and opaque minerals.

In the sub-regional area near EL3214, the Warrow Quartzite varies from massive to flaggy quartzite with local pelitic schist interbeds; thicknesses of exposed quartzite is also variable.

Hutchison Group – Middleback Subgroup

Overlying the Warrow Quartzite is the Middleback Subgroup, consisting of mixed semi-pelitic and chemical metasediments with concordant amphibolite units believed to represent original mafic volcanics. The thickness of the Middleback Subgroup is variable due a combination of primary and tectonic processes; and is thought to be in excess of 2000-2500m.

The base of the Middleback Group is the Katanga Dolomite, a massive to poorly layered, white to grey dolomitic marble. Layering (if present) is defined by bands of serpentine and calcite ± diopside ± tremolite alternating with massive dolomite.

The Katunga Dolomite grades up into the Lower Middleback Jaspilite, consisting of banded haematite and/or magnetite quartzite, carbonate, schist and dark coloured chert grading into red and black jaspilite. This unit contains a range of banded iron formation (BIF) facies.

The relationship with the underlying the Katunga Dolomite is varied and complex with dolomite grading into iron formation in a number of ways:

- chert beds (10-20mm thick) alternate with dolomite and ferroan dolomite, while silica and iron have progressively replaced carbonate
- graphite prominent at the contact
- iron sulphide prominent at the contact

Overlying the Lower Middleback Jaspilite is the Cook Gap Schist (also known as the Mangalo Schist). This unit is a thick (>1500m) semipelitic, quartz veined garnet-mica schist and gneiss with minor calc-silicate gneiss, magnetite-bearing gneiss, and concordant amphiboles, and is locally migmatitic.

Concordant amphibolites form a conspicuous layer at the Lower Middleback Jaspilite – Cook Gap Schist boundary sometimes 100m thick in the area near the tenements. Two lithotypes have been described as fine to medium grained schistose amphibolite, and porphyroblastic amphibolite consisting of coarse xenoblastic hornblende porphyroblasts within a schistose amphibolite matrix. The origin of these amphibolites is considered to be either metamorphosed mafic volcanics of original quartz-tholeiite composition or metamorphosed mixed carbonate-pelite sedimentary rocks. These amphibolites are chemically homogenous, thus supporting a basic igneous origin.

Overlying the Cook Gap Schist is the Upper Middleback Schist (or Mount Shannon Iron Formation) which is chemically and in terms of facies variation has much in common with the Lower Middleback Jaspilite. The Upper Middleback Jaspilite consists of carbonate, silicate and mixed carbonate-silicate-facies BIF; oxide facies BIF is locally present. Massive, pale grey to reddish dolomite often occurs between iron formation and underlying schist.

The top of the Middleback Subgroup is defined as the top of the Upper Middleback Jaspilite.

Hutchison Group – Upper Hutchison Group

The Yadnarie Schist forms the base of the Upper Hutchinson Group and conformably overlies the Upper Middleback Jaspilite in the semi-region of the tenement area. The Yadnarie Schist is composed of medium to fine-grained, pelitic to semipelitic, quartz veined mica schist containing mainly quartz, muscovite and biotite with minor opaque minerals, plagioclase, sillimanite, garnet and tourmaline. Amphibolites are rare to absent.

Near the tenement area, the Bosanquet Formation forms the base of the Upper Hutchinson Group, consisting of deformed and recrystallised megacrystic rhyodacite with relict phenocrysts of microcline and bluish quartz, and bands of medium to coarse-grained diopside-rich calcsilicate gneiss having 0.2-20m thickness.

The relationship between the Yadnarie Schist and the Bosanquet Formation is unknown but believed to be laterally equivalent to each other. The Bosanquet Formation has a U-Pb zircon date of 1845±9 Ma. This date represents (the age of the rhyodacite) the minimum age of deposition of the Hutchison Group.

Lincoln Complex

A complex of granitoid and mafic intrusives, emplaced during the Kimban Orogeny into the Hutchison Group and the Sleaford Complex are defined as the Lincoln Complex.

On the southern Eyre Peninsula three granitoid suites have been identified:

1. Donnington Granitoid Suite
2. Colbert Suite
3. Moody Suite

2.2.2 Mesoproterozoic Geology (1600-1000Ma)

This period records a significant change in the tectonic character of the Gawler Craton. The clastic sediments and felsic volcanics that formed during this period are not highly deformed. Voluminous felsic volcanics, the Gawler Range Volcanics (1600-1590Ma), were accompanied by clastic, fluviatile sediments of the Tarcoola and/or Labyrinth formations in the NW, and the Corrunna Conglomerate in the SE.

Gawler Range Volcanics
Not described here.

Corunna Conglomerate

The Corunna Conglomerate is predominantly fluviatile, with abundant proximal crystalline basement clasts. Thick carbonaceous siltstone and sandstone at the top of the sequence were probably deposited in a shallow to moderately deep restricted marine basin. At Corunna thin felsic volcanics are interlayered with the sediments, and felsic dykes and plugs correlated with the Gawler Range Volcanics are locally present.

The Corunna Conglomerate unconformably overlies the McGregor Volcanics and is intruded by the Charleston Granite (dated at 1585±5Ma), placing the broad age of the Corunna at 1740-1585Ma.

Labyrinth Formation
Not described here.

Itiledoo Basin – Blue Range Beds

On central Eyre Peninsula in the EL3214 tenement area, arenaceous sediments are assigned to the Blue Range Beds of the Itiledoo Basin, a major elongate east-west trough containing up to 2500m of sediments deposited in a braided stream-alluvial fan environment.

Basal sediments immediately above the unconformity with the Hutchison Group, east of the EL3214 in the Cleve area, are sandy conglomerates. Sub-rounded to well-rounded quartz and quartzite cobbles up to 0.2m are common. Basal sediments grade upward into well-sorted, medium to coarse grained sandstone with sub-angular to sub-rounded feldspathic sandstone matrix. Trough cross-bedding and planar cross-bedding are ubiquitous while graded bedding is common. Overturned forsets, sandstone dykes and slumped bedding also occur. These sediments have a pervasive mauve and cream colour mottling either streaked along bedding or patchily distributed. Liesegang banding is common. Thin network quartz veins with rare micaceous and botryoidal haematite veins are present. Bedding dips are generally shallow at less than 15°, but locally can be up to 70°.

The Blue Range Beds have been correlated with the Corunna Formation on the basis of quartz and haematite veining, apparent gentle deformation and lithological characteristics. The difference being that the Corunna Formation has close association with the Gawler Range Volcanics and the Hiltaba Suite granitoids.

Cariewerloo Basin – Pandurra Formation

Not described here.

Hiltaba Suite

Massive anorogenic granitoids forming large batholiths and smaller plutons in the Gawler Craton are collectively termed the Hiltaba Suite. Included within the suite are the Charleston Granite, Tickera Granite, Calca Granite, Roxby Downs Granite, Balta Granite, and many others.

Compositionally the suite is bimodal but granites predominate. Mafic lithologies are typically hornblende-bearing quartz monzodiorite, quartz monzonite, and granodiorite with SiO_2 contents <65%. Felsic lithologies are mainly granite with lesser adamellite, aplite and pegmatite. These granites have been pinkified by minute iron-oxide inclusions within plagioclase and k-feldspar.

The Hiltaba Suite is considered by U-Pb zircon dates to be 1600-1585Ma.

2.2.3 Neoproterozoic Geology (1000-545Ma)

Polda Basin

A narrow east-west trending graben extending more than 350km from near Cleve in the east westward to the continental margin in the Great Australian Bight. The location of the Polda Basin was controlled by the tectonic rejuvenation of a pre-existing fracture system that earlier influenced deposition of Itiledoo Basin sediments, the Blue Range Beds.

The Kilroo Formation comprises the oldest unit confined to the Polda basin. It consists of mixed clastics, evaporites and volcanics. The Kilroo Formation is interpreted as a succession of continental clastics and playa-lake evaporites, with localised synchronous basaltic and andesitic volcanism. This combination suggests the basin was a tectonically active intracratonic rift graben with associated volcanism, most likely within a wrench-fault system. The Kilroo Formation has been interpreted as Adelaidean, occurring under arid, terrestrial conditions in fluvial and playa-lake environments. Sedimentation within the Polda Basin also continued during the Phanerozoic (not mentioned here).

3 REVIEW OF PREVIOUS WORK

Kerr-McGee Australia Ltd 1967-1969 (Envelope 01108)
Kerr-McGee geologists noted the similarity between Eyre Peninsular radioactive occurrences and those at Rum Jungle in the Northern Territory. Exploration included flying a radiometric survey followed by surface examination of 27 anomalous areas. The highest readings were obtained in the Driver River where sampling of radioactive muds revealed high radium but negligible uranium content. Seventy two rotary holes were drilled to test Tertiary sediments with holes spaced 1600 metres (1 mile) apart. Thirteen shallow core holes were drilled into subcropping basement rock to test downward continuity of anomalous radioactivity. Most radioactivity was attributed to thorium in highly felspathic gneissic rocks. No drilling was undertaken at Driver River where the radioactive anomalism was considered to be derived from spring water seeping from lignitic horizons in the Tertiary sequence.

Pancontinental Mining Ltd, PNC Exploration (Aust) Pty Ltd and Afmeco 1978-1983 (Envelopes 03412, 5019)
Pancontinental geologists constructed a detailed assessment of the Driver River anomaly and while acknowledging the radioactivity of Tertiary sandstone, considered that this did not preclude the possibility of “leakage from a Middle Proterozoic sequence via faults”. One core hole (DDH 803.1) was drilled to a depth of 112.4 metres approximately 50 metres west of the strongest anomaly. The hole intersected “redbed” sandstones of the Mesoproterozoic Blue Range Beds without significant radioactivity.

In a follow-up program, Pancontinental drilled 5 rotary percussion holes (numbered 32.1 to 32.5) on a 2300 metre traverse which included the core hole. The drilling confirmed the presence of a substantial fault as interpreted from aeromagnetics, however the unconformity below the Blue Range Beds on the down-thrown side of the fault was not tested. Holes were terminated at 200 metres as deeper testing was not considered to be warranted. Exploration by Pancontinental ceased when funding from joint venture partners dried up due to the introduction of the “Three Mines Policy”.

3.1 Summary of Historic Metalliferous Exploration

Historical exploration in the area covering EL3214 has focussed on many commodities and a variety of exploration models. Table 1 details previous Exploration Licences that cover or partially overlap EL3214; and Figures 2 to 6 show the spatial relationship between EL3214 and other explorers' tenements.

EL NUM	GRANTED	EXPIRY	LICENSEE	PIRSA Doc	LOCALITY
3214	20040624		Olliver Geological Services Pty Ltd		Karkarook Area
2981	20020628		Adelaide Exploration Ltd, Olliver Geological Services Pty Ltd		Verran - 60 Km West Of Cowell
2790	20010123		PlatSearch NL		Rudall Area
2648	19991001	20040930	Olliver Geological Services Pty Ltd		Hincks Area
2550	19980917	20030916	Olliver Geological Services Pty Ltd		Karkarook Area
2305	19970404	20020403	Olliver Geological Services Pty Ltd	ENV9385	Verran Area
2259	19970110	20020109	Minotaur Gold Ltd		Caralue Bluff Area
2139	19951222	20001221	Platsearch NL		Rudall Area
1862	19930830	19941007	Western Mining Corp. Ltd	ENV8048	Darke Peak Area
1794	19921030	19930716	Poseidon Exploration Ltd	ENV8511	Butler
1724	19910603	19941007	Stockdale Prospecting Ltd	ENV6566	Cleve Area
1517	19880922	19920720	Stockdale Prospecting Ltd		Verran
1501	19880704	19930703	Western Mining Corp. Ltd	ENV8048	Darke Range
1320	19860226	19910225	Stockdale Prospecting Ltd	ENV6566	Cleve
1215	19840111	19850110	CRA Exploration Pty Ltd		Lock
1067	19821108	19850619	Pancontinental Mining Ltd	ENV5019	Verran
893	19810928	19820927	Pancontinental Mining Ltd	ENV4848 ENV3551	Darke Peake
803	19810212	19821129	Pancontinental Mining Ltd	ENV4848	Toolgie-Verran-Eyre
492	19790615	19810614	Pancontinental Mining Ltd	ENV3551	Darke Peake
431	19781113	19801112	Pancontinental Mining Ltd	ENV3412	Tooligie
131	19740429	19741016	Urangesellschaft Australia Pty Ltd	ENV2419	Darke Peak

Table 1 Previous Exploration Licences over EL3214 - Karkarook since 1970

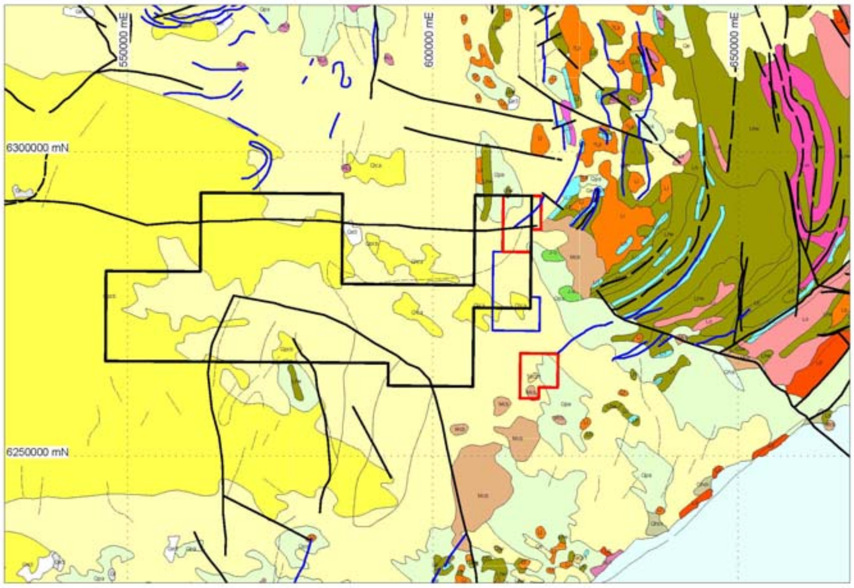

Fig 2; Historical Exploration – CRA (black outline), SXR EL3214 (red outline); Lh–Hutchison Group (olive-green); Mcb–Blue Range Beds (tan); Ll–Lincoln Complex (orange); Li1–Jaspillite (sky blue); Lo–Moody Suite (pink); L-m–Miltalie Gneiss (dark pink)

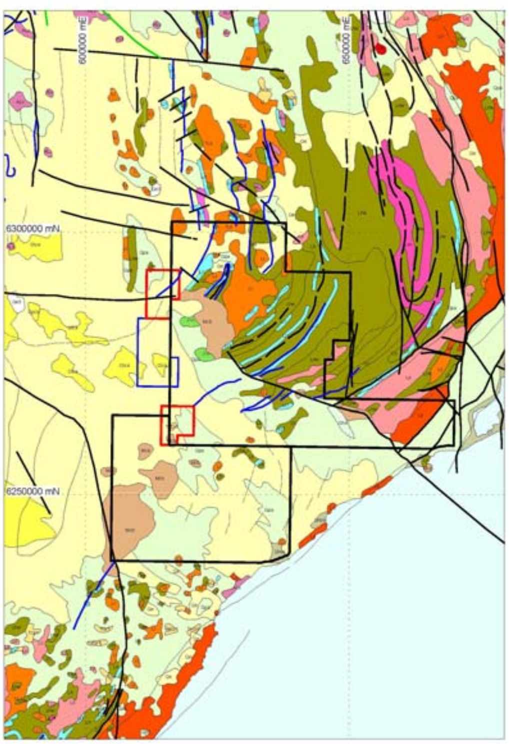

Fig 3; Historical Exploration – Stockdale (black outline), SXR EL3214 (red outline); Lh–Hutchison Group (olive-green); Mcb–Blue Range Beds (tan); Ll–Lincoln Complex (orange); Li1–Jaspillite (sky blue); Lo–Moody Suite (pink); L-m–Miltalie Gneiss (dark pink)

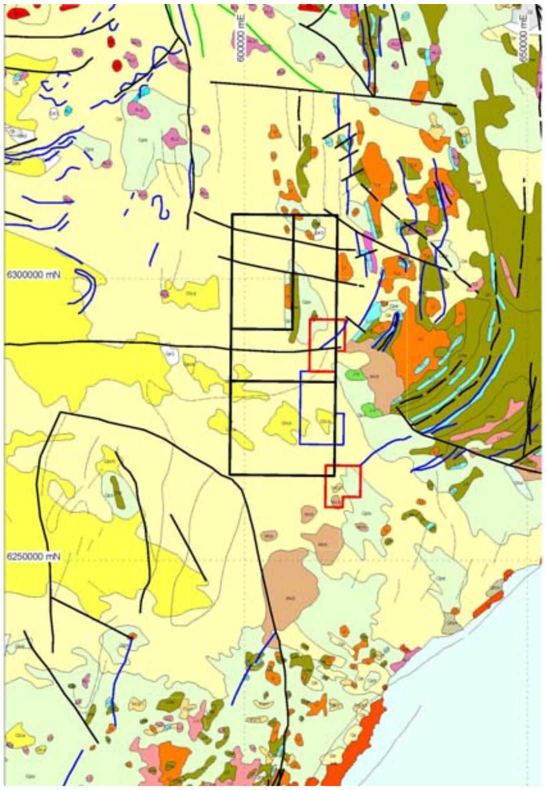

Fig 4; Historical Exploration – Western Mining Corp (black outline), SXR EL3214 (red outline); Lh–Hutchison Group (olive-green); Mcb–Blue Range Beds (tan); Ll–Lincoln Complex (orange); Li1–Jaspillite (sky blue); Lo–Moody Suite (pink); L-m–Miltalie Gneiss (dark pink)

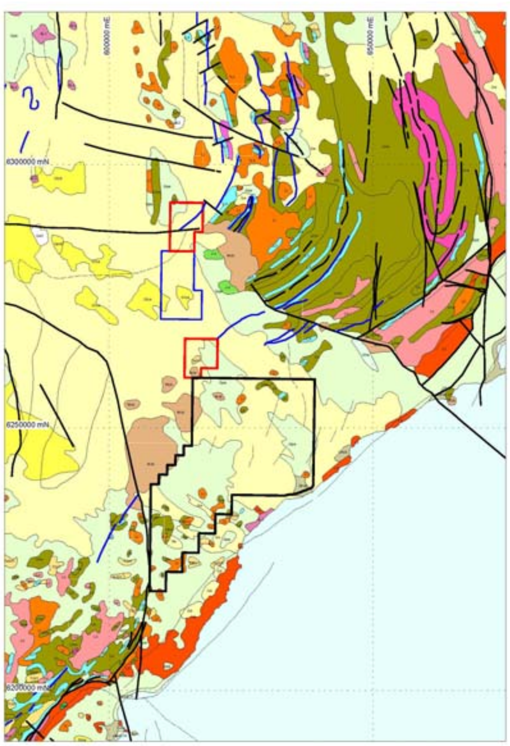

Fig 5; Historical Exploration – Poseidon (black outline), SXR EL3214 (red outline); Lh–Hutchison Group (olive-green); Mcb–Blue Range Beds (tan); Ll–Lincoln Complex (orange); Li1–Jaspillite (sky blue); Lo–Moody Suite (pink); L-m–Miltalie Gneiss (dark pink)

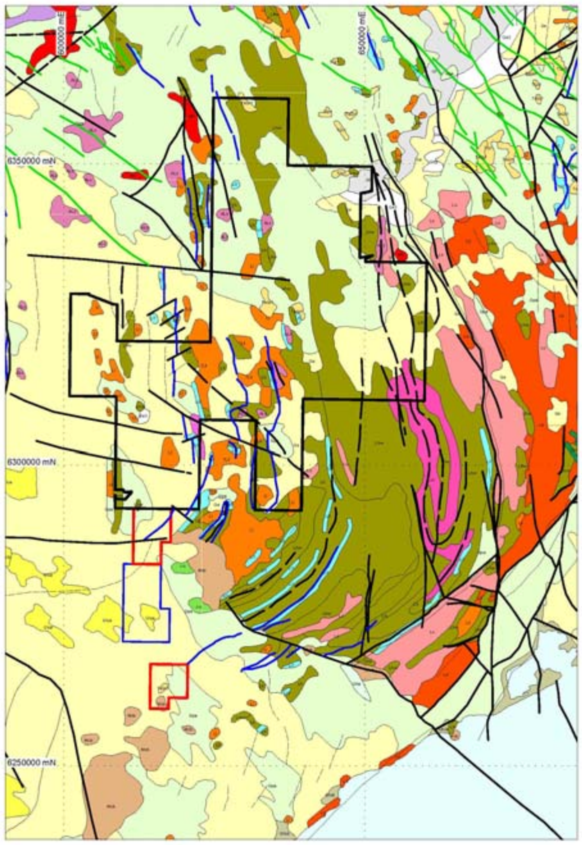

Fig 6; Historical Exploration – Minotaur (black outline), SXR EL3214 (red outline); Lh–Hutchison Group (olive-green); Mcb–Blue Range Beds (tan); Ll–Lincoln Complex (orange); Li1–Jaspillite (sky blue); Lo–Moody Suite (pink); L-m–Miltalie Gneiss (dark pink)

3.2 Historic Uranium Exploration

A brief mention of previous uranium-specific exploration within the region of EL3214 is made here. The most significant work was undertaken by Urangesellschaft in 1974 and Pancontinental Mining (and Joint Venturers) from 1978 to 1985.

Urangesellеschaft Australia

Figure 7 shows the area of tenement interest for Urangesellschaft relative to the current SXR tenement EL3214.

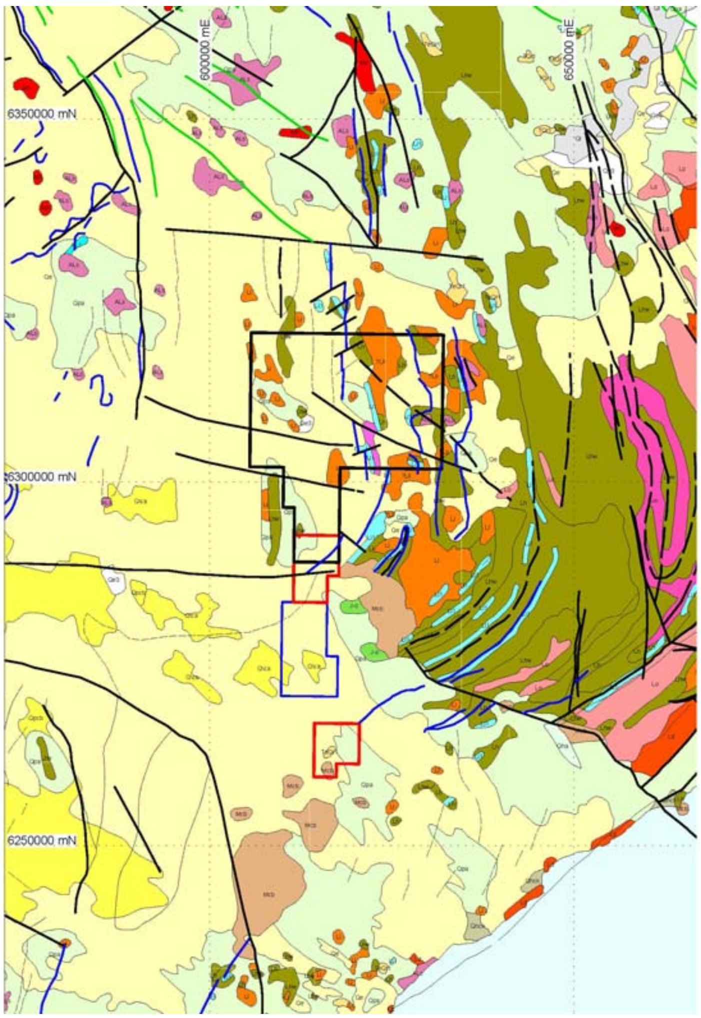

Fig 7; Historical Exploration – Urangesellschaft (black outline), SXR EL3214 (red outline); Lh–Hutchison Group (olive-green); Mcb–Blue Range Beds (tan); Ll–Lincoln Complex (orange); Li1–Jaspillite (sky blue); Lo–Moody Suite (pink); L-m–Miltalie Gneiss (dark pink)

Pancontinental Mining Ltd

Figure 8 shows the group area of tenement interest for Pancontinental relative to the current SXR tenement EL3214.

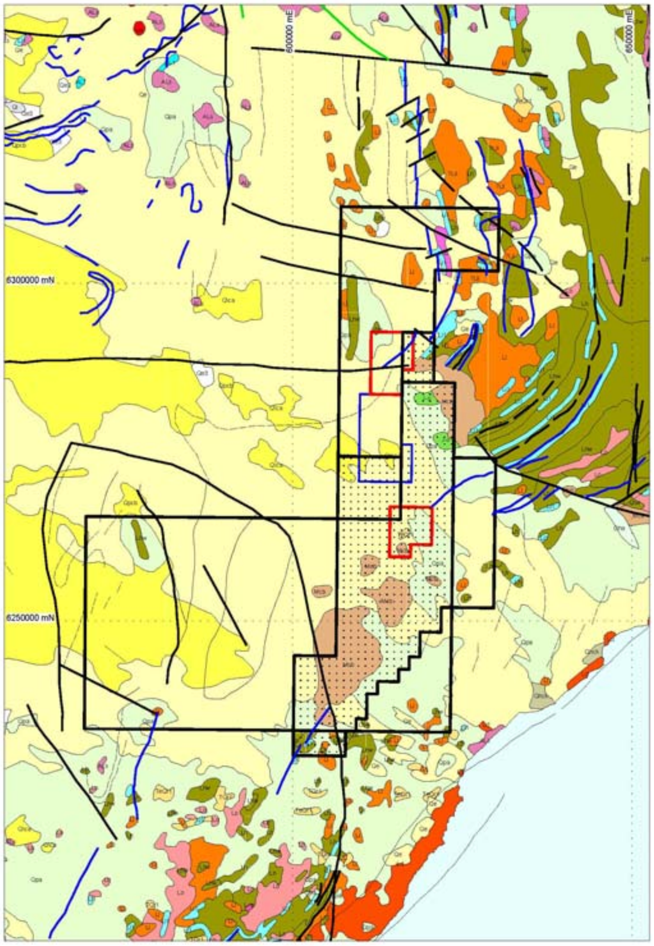

Fig 8; Historical Exploration – Pancontinental (black outline), Pancontinental EL1067 (stipple), SXR EL3214 (red outline); Lh–Hutchison Group (olive-green); Mcb–Blue Range Beds (tan); Ll–Lincoln Complex (orange); Li1–Jaspillite (sky blue); Lo–Moody Suite (pink); L-m–Miltalie Gneiss (dark pink)

4 PROJECT OBJECTIVES AND OUTCOMES

4.1 Objectives

Although drilled in the 1970's and early 1980's as part of exploration for unconformity-related uranium mineralisation, previous explorers were discouraged by target depths in excess of 200 metres. These depth restraints are less inhibiting in today's environment particularly if models of uranium occurrences in other parts of the world are applied. The main aim of the Karkarook project is to test the unconformity between Mesoproterozoic sediments and underlying Palaeoproterozoic basement on EL 3214 for unconformity-style uranium. It is possible that a source for the surface radiometric anomaly will be located.

It is also hoped to obtain petro-physical information which will be used to help design an electromagnetic method which will see through conductive saline groundwater known to fill the pore spaces of the porous sandstone units. Recent orientation Tempest AEM by Fugro Airborne for SXR and Cameco failed to penetrate and an alternative exploration tool is needed to explore for this target type throughout the Mesoproterozoic basins on the Eyre Peninsula and Sturt Shelf.

In addition, this project was intended to provide a sample core hole for logging with the latest portable high resolution spectral core scanner which is being developed by ioSpecterra in Perth . Spectral determination of clay and alteration species is one of the primary exploration tools for unconformity-style uranium mineralisation however it has application to virtually all commodities.

GEOLOGICAL SETTING

EL 3214 is mostly underlain by Mesoproterozoic Blue Range Beds which are a monotonous "redbed" sequence of undeformed conglomerates, sandstones and shales. The beds are located within the Itiledoo Basin which is an east-west fault-bounded trough or graben within the central Eyre Peninsula. Permian and younger sediments of the Polda Basin occupy the same fault-bounded graben. The Blue Range Beds are believed to rest unconformably or are faulted against Hutchison Group rocks in the area of EL 3214. The graphitic nature of the Hutchison Group is an important factor in developing targets, as graphitic shear zones are potential conduits for mineralising solutions and mineralisation. The interaction of these solutions with groundwater in overlying sediments can also potentially lead to uranium and base metal deposition.

The Eyre Peninsula geological setting has some similarities to Canada's Athabasca Basin which provides a significant contribution to annual global uranium production and hosts the world's highest grade uranium deposits. Basement lithologies at both localities include semipelitic metamorphic rocks with graphitic shear zones. Sedimentary packages overlying the basement at both localities have similar ages and include redbed sandstones and conglomerates. It is important to appreciate that the highest grade deposits (for example McArthur River) occur at depths in excess of 400 metres. Many geologists believe that the depth of overlying sandstone contributes directly to the grade and size of uranium deposits.

4.2 Work Undertaken

Existing geophysical and geological datasets have been assessed however the failure of AEM to see through saline groundwater of the area suggested that additional surface geophysical surveys were warranted. A gravity survey and two lines of Induced Polarisation were completed over sections of Karkarook. In addition, one diamond drill hole was completed. Drill-hole material was submitted for petrological and geochemical analyses, to Paul Ashley and Amdel Laboratories respectively. The results of these analyses are included within this report.

4.2.1 Gravity Survey

A detailed GPS gravity survey has been carried out in an area approximately 20km West of Cleve in South Australia. The survey was conducted over 3 days from 26th October 2006 to 28th October 2006 by Haines Surveys Pty Ltd.

The proposed gravity survey comprised 135 detailed gravity stations in a regular grid comprised of 13 N-S trending lines coincident with GDA94 with station intervals of 500m. The lines were bounded in the west by GDA94 Zone 53 614500E, in the east by 620500E, in the south by 6260000N and in the north by 6265500N.

The completed detailed gravity survey comprised of 133 detailed gravity stations in 13 N-S trending lines. All proposed gravity stations were not completed as access was denied by landholders. Note; some of the stations may have been slightly offset from their planned position due to landholder access, avoiding weed areas and crops.

The full Gravity Acquisition Report by Haines Surveys Pty Ltd, with associated data, accompanies this report:

EL3214_2007_A_10_Gravity_data_file.txt,
EL3214_2007_A_11_Gravity_Acquisition_report__file.pdf

4.2.2 Induced Polarization

Search Exploration undertook the collection of two Pole-Dipole IP traverses for Uranium One Australia, during November 2006. The Survey was conducted to aid in drill hole targeting of unconformity style uranium mineralisation. All traverses were undertaken in an east-west orientation. A total of 6.3 line kilometres of data was collected over the two lines.

The data was collected using Search Exploration proprietary developed full time series Induced Polarisation Acquisition unit (SSIP16). Some advantages of collecting full time series data are that long wavelength telluric noise and SP drift are easily identified and removed. Additionally the receiver unit has low internal noise levels (relevant to industry standards) enabling the collection with confidence of low amplitude signal (i.e. 1msec levels). The unit has multiple input channels (42) allowing the simultaneous collection of data to greater dipoles (depth).

The full IP Acquisition Report by Search Exploration, with associated data, accompanies this report:

EL3214_2007_A_12_IP_Line6263725N_data_file.txt
EL3214_2007_A_13_IP_Line6261900N_data_file.txt
EL3214_2007_A_14_IP_Acquisition_report_file.pdf

4.2.3 Drilling

One diamond drill hole of NQ diameter was drilled; KAR001. An angled hole was drilled to allow collection of correctly oriented structural information. Core has been geologically logged and samples have been collected for multi-element geochemical analysis. Diamond drill hole, KAR001 was completed with the following attributes:

Hole ID	KAR001
Collar Co-ordinates (GDA94 Zone53)	6261949.14mN, 616318.13mE
Hole Dip at collar	80 degrees
Hole azimuth at collar	135° magnetic
Depth (EOH)	672 metres

4.2.4 Geochemical Analysis

Core from KAR001 was assayed for a comprehensive suite of metals and non-metals. A total of 41 samples (including standards) were analysed. A list of the analytical suite (with the lower level of detection in brackets in ppm units) with the analytical technique follows:

- FA1: Au(0.01)
- IC4: Al_2O_3 (0.01%), CaO (0.01%), Total Fe as Fe_2O_3 (0.01%), K2O (0.01%), MgO (0.01%), MnO (0.01%), Na_2O (0.01%), P_2O_5 (0.01%), SiO_2 (0.01%), TiO_2 (0.01%), Cr (20 ppm), L.O.I.
- IC3M: Ag (0.1 ppm), As (0.5 ppm), Bi (0.1 ppm), Cd (0.1 ppm), Co (0.2 ppm), Cu (0.5 ppm), Mo (0.1 ppm), Ni (2 ppm), Pb (0.5 ppm), Tl (0.1 ppm), U (0.02 ppm), Zn (0.5 ppm)
- XRF1: U (4ppm)

Amdel technique FA1 involves a fire assay with aqua-regia digest and AAS measurement; IC4 involves fusion with lithium metaborate and subsequent dissolution for a “total solution” with ICP-OES finish; IC3M involves a three acid digest including HF with ICP-MS finish.

4.2.5 Petrological Analysis

Twelve specimens from a range of stratigraphic positions and alteration styles were taken from KAR001 and forwarded to Paul Ashley of the University of New England for polished thin section preparation and petrological examination. The petrological report is included here as Appendix 1.

4.3 Outcomes

The geological and structural logs are included with this report. The results of petrological and geochemical analyses are included here.

4.3.1 Geology - Geological Logs

The drill core was logged and geologically described. Geological logs are reproduced in EL3214_2007_A_04_Lithology.txt. Table 2 summarises the geological observations made of diamond drill-hole KAR001 core.

Depth (m)	Description
0-6.0	No sample return, drilled with blade bit
6.0-18.0	Oxidised zone, including water table. Base of complete oxidation approximately 18m. Limonitic, kaolinitic, haematitic sands, clays and minor gossanous material. Significant core loss in this interval.
18.0-50.0	Fairly neutral, light grey sandstone plus minor moderately oxidised (haematitic) patches. Weak laminations. Minor silicification. Minor clay. Weak patchy sericite
50.0-94.0	Fairly neutral, light grey sands with local silicification and minor clay. Weak laminations. Moderate wandering fractures +- rare chlorite
94.0-124.0	Weak-strongly oxidised (haematitic) sandstone. Minor arkosic sediments and cement. Minor silt and clay. Diffuse-looking laminations. Local silicification and chlorite (associated with faults/fractures)
124.0-222.0	As per 94-124m plus introduction of minor black opaquish very fine grained detrital mineral grains (ilmenite/tourmaline? awaiting petrology) present in fine laminations and rarely disseminated.
222.0-244.0	As per 124-222m plus relatively significant faulting, fracturing and broken core.
244.0-250.0	As per 94-124m minus chlorite (as obvious to the eye).
250.0-275.0	As per 94-124m plus increase in chlorite (mainly associated with fracturing and faulting). Fracturing commonly at 45° to core axis.
275.0-623.0	Blue Range beds: Arkosic, gravel-rich, quartz sandstones with some silt and haematitic/chloritic clay bands. Sediments become coarser with depth; with quartz pebbles common down hole of 623m. • 276-326m common fracture/faulted rock zones • 339-340m fault breccia • 455m fault zone
623.0-627.7	Blue Range Beds/Corunna Conglomerate: Quartz-pebble conglomerate, pebbles up to 8cm across. Strongly haematitic.
627.7-672.0	Quartz-Biotite-Chlorite Schist. Possibly the Yadnarie Schist of the Hutchison Group. Schistose rock including common folds, faults(?) fine-stringer-like breccias and common quartz (first stage) banding within biotite-rich host, becoming more chlorite-rich with depth. Fairly common quartz (secondary), albite veins. Minor white mica and pyrite associated with cleavage

Table 2 Summary Geological log of diamond drill hole KAR001

NB. Stratigraphy up hole of approximately 275m is not conclusive at this time. Further research is required to place the sediments in question within either the Polda or Itiledoo Basins. Similarly, further investigation is required to stratigraphically identify the quartz pebble conglomerate at the basement contact (Blue Range Beds or Corunna Conglomerate?) along with the intersected basement schist (Yadnarie Schist?).

A full lithological log accompanies this report: EL3214_2007_A_04_Lithology.txt.

The completion of diamond drill hole KAR001 achieved an intersection including the unconformable contact between Mesoproterozoic Itiledoo Basin sediments and underlying Palaeoproterozoic basement. The drill-hole also intersected a targeted zone of high chargeability (from IP anomaly). Inversion of the IP data produced a general idea of the basin boundary (Itiledoo Basin?). This zone correlates with the zone of high chargeability. Figures 9 and 10 show the anomalies in question, including a trace of the drill-hole.

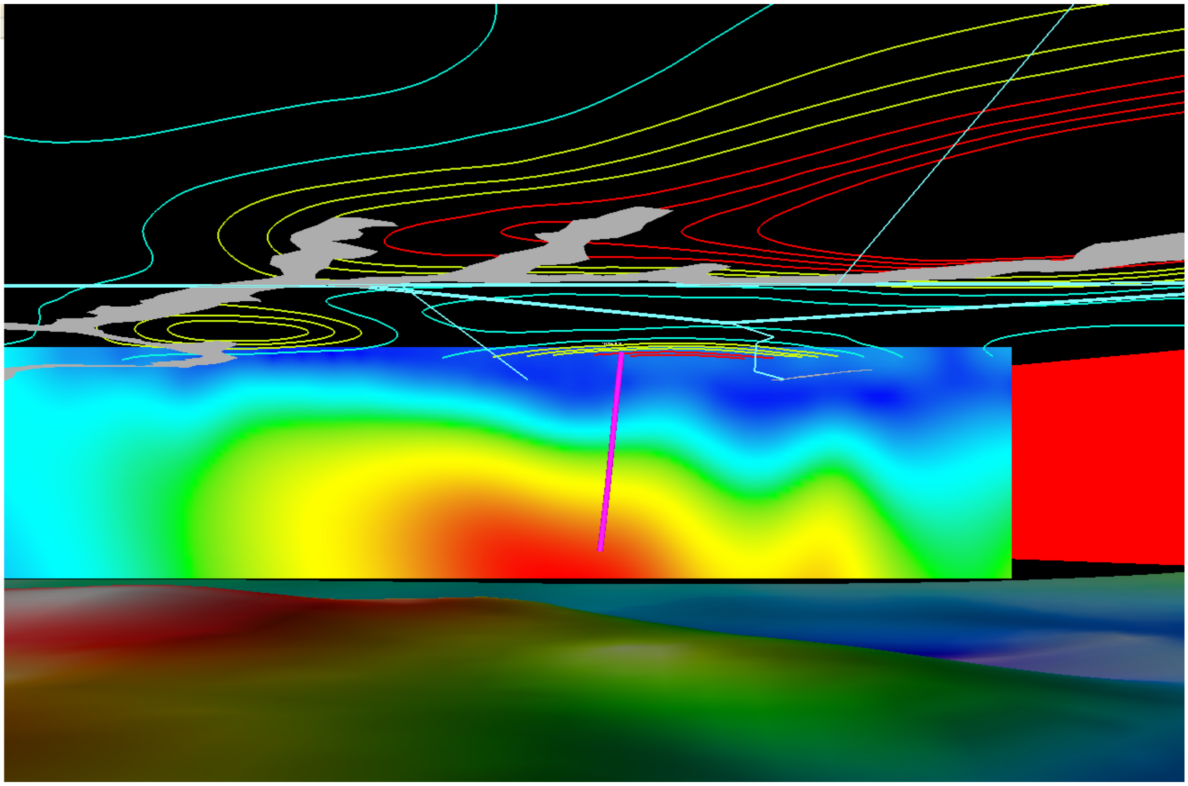

Figure 9 Down hole trace of KAR001, looking south, intersecting zone of high chargeability (from IP). Contours of radiometrics – uranium. Red sheet on right hand side – fault (from geophysics)

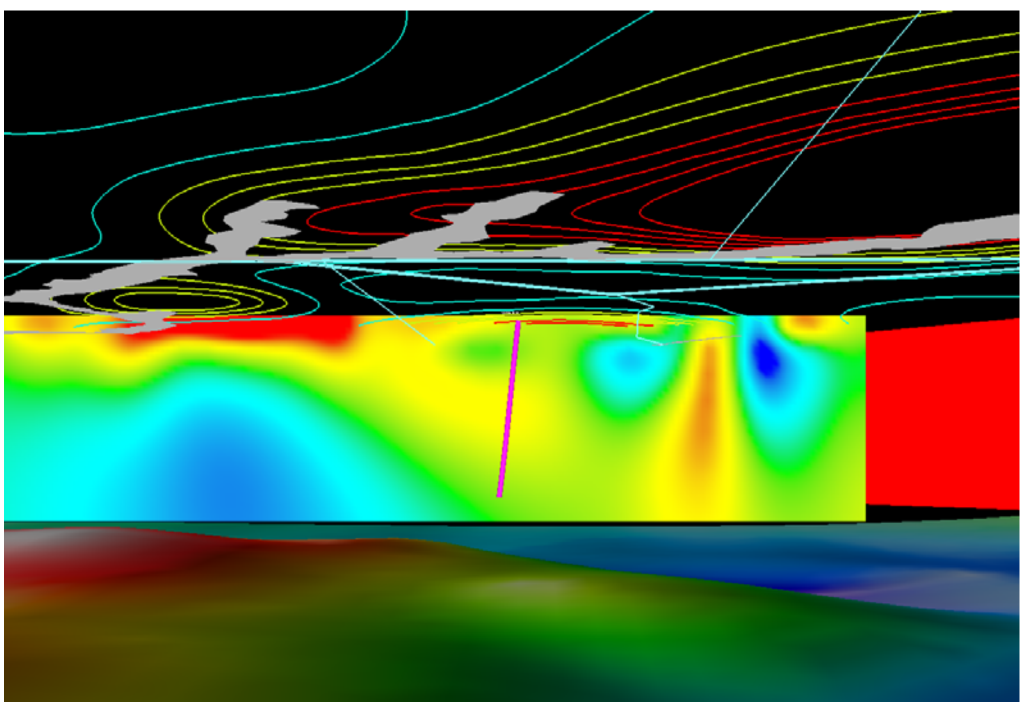

Figure 10 Down hole trace of KAR001, looking south, intersecting area of basin limit (from inversion of IP). Contours of radiometrics – uranium. Red sheet on right hand side – fault (from geophysics)

4.3.2 Geology – Structural Logs

A commonly used spear system was utilised to obtain oriented core. A gauge on the validity of the orientation reference line was obtained by linking each orientation mark with a subsequent mark obtained at the next drilling break. The angle of miss-match (measured in the same manner as a beta measurement) was used to validate the reference line. If a reference mark could not be linked with a subsequent reference mark (if, for example, poor core conditions precluded the passing of the reference line) structural measurements were not attempted.

Structural measurements were obtained from the bottom-of-hole reference line (drawn parallel to the core axis) obtained from the spear system. The convention of measuring the down hole portion of the structural feature within the down hole-clockwise reference frame was used for all structural measurements. The beta angle, therefore, is measured clockwise (relative to down hole) around the outside circumference of the core from the reference line to the down hole ellipse of the structural feature. The alpha angle is the angle measured between the structural feature and the core axis. Dip and dip-azimuth were calculated from the alpha and beta measurements of each structural feature by a macro process that utilised a standard reduction algorithm. In addition, the orientation of the reference line was interpolated from the down-hole survey data for each structural depth.

The structural logs contain comprehensive information about the structural feature being measured (features such as bedding, veining, foliation etc), the style of the structural feature (for example a parallel sided style of vein), and descriptions of the structural feature (for example a vein's sulphide component). The structural logs, including descriptions of the structural element, along with the alpha and beta measurements with its calculated dip and dip-azimuth have been tabulated in EL3214_2007_A_05_DownholeStructure.txt.

4.3.3 Geochemistry

Results from the above-mentioned analyses did not return highly anomalous uranium. Slightly elevated (higher than background) uranium levels were recorded either side of the unconformity; 14 ppm above and 8 ppm below. This position in the core does not correspond with a strong rise or drop in elements that may be associated with alteration ie. K, Na, etc. As no significant unconformity style uranium deposit occurs in the area, the existence of an analogous "alteration halo" specific to local geology, upon which exploration could be modelled, is not available. The drill-hole intersected the unconformity within close proximity to a significant fault (from geophysics). In light of faults acting as significant fluid conduits, drilling closer to the fault may perhaps produce more favourable geochemical results. Any future drilling in the area should take this into account. Assay results are tabulated in EL3214_2007_A_15_Down holeGeochem.txt.

4.3.4 Petrology

Standard thin sections were prepared from each sample, although several of the sedimentary rocks required prior mounting/impregnation in resin blocks before sectioning due to their friability. Sections were examined microscopically in transmitted and oblique reflected light. Sample off-cuts were measured for magnetic susceptibility.

Of the twelve drill core samples from KAR001 submitted for petrographic inspection, nine represent little-metamorphosed clastic sedimentary rocks with hematite pigmentation, some of which can likely be labelled as Mesoproterozoic Blue Range Beds. It remains to be determined whether or not the sediments intersected include material from the Polda Trough (overlying the Itiledoo Basin), as apposed to being fully comprised of Blue Range Bed material. The remaining three samples were representative of metamorphosed, deformed and thoroughly recrystallised sedimentary rocks, probably representing the Yadnarie Schist of the Palaeoproterozoic Hutchison Group. In his report, Ashley draws similar conclusions to Uranium One, in that analogies can be drawn, albeit speculatively because of the lack of field relationship data, to models for unconformity-type uranium deposits. He further summarises that the “red bed”, clastic-dominated sedimentary sequence unconformably overlies a basement of metamorphosed sedimentary rocks, represented by the schists and that maybe uranium mineralisation could have been formed in the vicinity of this unconformity and hosted in either the basement or cover sequence. Ashley qualifies that such a possibility would be highly dependant on the presence of appropriate sedimentary basin palaeohydrology, fluid channelling structures and redox reactions occurring. Ashley also reminds us that the suite of samples is lithologically analogous to the Alligator Rivers uranium province (e.g. Kombolgie Formation overlying basement metamorphosed rocks of the Pine Creek Geosyncline, cf. Solomon and Groves, 2000).

A copy of Paul Ashley’s report is attached with this report as Appendix 1.

5 SUMMARY AND FUTURE WORK

Essentially, the aims of this project have been achieved. The contact between basin sediments and basement rock was intersected by drill-hole KAR001. The contact showed oxidised basin-sediments overlying a basement of sediment-derived schist. This contact was intersected in close proximity to a significant fault (from geophysics). The results of the petrological investigation offer support to the unconformity style uranium exploration model that is being applied to the area in question.

This project was intended to provide a sample core hole for logging with the latest portable high resolution spectral core scanner which is being developed by ioSpecterra in Perth . This option was not carried out as other Analytical Spectral Devices are currently being evaluated, for a preferred method of analysis.

Future efforts will be concentrated in the northern portion of EL3214. The unconformity style uranium model will be applied to this area, where the crystalline basement rocks are expected to be shallower (from geophysical modelling) than those in the southern portion of EL32145. Diamond drilling has also been recommended for this area.

6 EXPENDITURE

Drilling	0
Geophysics	0
Geochemistry	0
Surveying and Mapping	0
Salaries	20,000
Office and Computing	2,500
Travel and Accommodation	0
Administration and Management	2,500
TOTAL	**25,000**

Table 3 Expenditure on EL 3214 between 24 June 2004 to 23 June 2005

Drilling	0
Geophysics	0
Geochemistry	0
Surveying and Mapping	0
Salaries	10,000
Office and Computing	2,500
Travel and Accommodation	0
Administration and Management	2,500
TOTAL	**15,000**

Table 4 Expenditure on EL 3214 between 24 June 2005 to 23 June 2006

Drilling	146,128
Geophysics	42,695
Geochemistry	2,503
Surveying and Mapping	0
Salaries	20,000
Office and Computing	3,869
Travel and Accommodation	8,636
Administration and Management	9,204
TOTAL	**233,035**

Table 5 Expenditure on EL 3214 between 24 June 2006 to 23 June 2007

7 REFERENCES

Drexel, J.F. and Preiss, W.V., 1995 *The Geology of South Australia Volume 2 The Phanerozoic Bulletin 54*. Department of Mines and Energy South Australia

Drexel, J.F., Preiss, W.V., 1993 and Parker, A.J., *The Geology of South Australia Volume 1 The Precambrian Bulletin 54.* Department of Mines and Energy South Australia

Parker, A.J., 1987 *Archaean to Middle Proterozoic Mineralization of the Gawler Craton (including the Stuart Shelf region) SA. REPT.BK.NO 87/84.* Department of Mines and Energy South Australia.

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October 2006

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Contents

Introduction

A detail GPS gravity survey designated as Karkarook Gravity Survey has been carried out in an area approximately 20km West of Cleve in South Australia. The survey was conducted over 3 days from 26th October 2006 to 28th October 2006 on behalf of Uranium One Australia

The proposed gravity survey was comprised 135 detail gravity stations in a regular grid comprised of 13 N-S trending lines coincident with GDA94 with station intervals of 500m. The lines were bounded in the west by GDA94 Zone 53 614500E, in the east by 620500E, in the south by 6260000N and in the north by 6265500N.

The completed detail gravity survey comprised of 133 detail gravity stations in 13 N-S trending lines. All proposed gravity stations were not completed as access was denied by landholders. Note; some of the stations may have been slightly offset from their planned position due to landholder access, avoiding weed areas and crops.

There were 4 observations repeated for quality control purposes, giving a repeat percentage of 3%.

The Bouguer anomaly processing has been performed using a country rock density of 2.67 g/cc.

Figure 1 shows the location of the survey area.

Figure 1. Location Diagram

Survey and Gravity Datum

Horizontal Datum:	Geocentric Datum of Australia1994 (GDA94) Map Grid of Australia 1994 (MGA94) Zone 53
Vertical Datum:	Australian Height Datum (AHD)
Gravity Datum:	Isogal 1984 / IGSN 71

Survey and Gravity Base Stations

A base station was established in the survey area. It was placed on a hill central to the project to provide good VHF radio coverage for the RTK system. The base is designated as Base 2006.6901 The actual base is marked with a short star picket driven flush with the natural surface. The base is witnessed by a long star picket within 0.3m of the ground mark standing about 1m tall. Two aluminium tags are attached with the inscription "Haines Surveys" and "Gravity 2006.6901".

A sub-base was located within 5 minutes drive of the main base to provide a backup base station to the main base in case loop ties to the main base were poor. It is not marked but the approximate coordinates (+/- 10m) listed in the table define it's location.

Survey Control

Horizontal and vertical control has been established using the AUSPOS online GPS processing service provided by Geoscience Australia. This method provides control within the GDA94 Datum to within +/- 5 cm. It largely replaces the need for finding local survey marks or allows accurate control to be established when local marks are not available.

A total of 19.2 hours (at 10 second intervals) of observations were logged over 3 days. The following outlines the Cartesian coordinate precision attained per day.

1 Sigma	sX(m)	sY(m)	sZ(m)	yyyy/mm/dd
6901	0.005	0.008	0.005	2006/10/24
6901	0.007	0.011	0.012	2006/10/25
6901	0.010	0.008	0.008	2006/10/26

Since GDA94 and WGS84 (Global Positioning System Datum) are virtually equivalent the GDA94 values can be directly input into the GPS processing software for all calculations.

Vertical control has been converted to an Australian Height Datum (AHD) height using the GDA94 height determined from AUSPOS and the AUSGEOID98 gravimetric geoid.

Survey And Gravity Control Values

Control information (***WGS84 heights have been derived using AusGeoid98***):

0669_Karkarook SURVEY / GRAVITY CONTROL

	WGS 84			MGA Zone 53		AHD	Isogal 84
Base Station	**Latitude**	**Longitude**	**Height**	**Easting**	**Northing**	**height**	**Gravity mGal**
HS2006.6901	-33 45 31.62230	136 16 46.21720	73.356	489300.051	6464918.762	155.711	979609.298
9493.1132	-33 40 57	136 55 11	8.00				979633.296

Gravity Control

Gravity control for 2006.6901 base station was established on the Australian Fundamental Gravity Network (Isogal 1984 / IGSN 71) using A-B-A ties from Cowell Lutheran Church gravity station 9493.1132. The values for Cowell Lutheran Church gravity station 1995900341 were attained from Geoscience Australia in Canberra. A-B-A ties were made over 3 days to within 0.01 milligals.

GPS Observations and Processing

Carrier phase GPS data has been collected using *Trimble 4000* series Geodetic receivers.

Measurements for post processed observations have been made using Static techniques with baselines processed to double difference fixed solutions resulting in horizontal and vertical precision of approximately 2 cm.

Static baseline processing has been completed using Trimble GPSurvey version 2.30 software.

Measurements for detail gravity observations have been made using Real Time Kinematic (RTK) techniques giving horizontal and vertical precisions of at least 5 cm.

RTK processing has been has been completed using Trimble TDC1 firmware and RTK processing using Trimble Geomatics Office Version 1.01 software.

Gravity Observations

Gravity measurements have been made using a *Scintrex CG3 Autograv* instrument. Instrument number 310217 was used in this project.

Readings of 120 seconds were taken at base station. Readings of 40 seconds were taken at all other gravity survey points.Base station readings were taken at the beginning of the day and at the end of the day's fieldwork.

The CG3 instrument applies an instrument drift correction to its final gravity reading. Any residual drifts between base station readings are corrected by the gravity post processing software. The instrument also applies Earth Tide Correction to its final gravity reading at each station. The instrument calibration constants are contained in the daily gravity data files.

Point Numbering and Marking

An 8 digit point number is used to identify each gravity station. The first 4 digits indicate the line number. The second 4 digits indicate the station number

The lines are South-North and the 8 digits are constructed from the planned MGA coordinates for each gravity station using

Line No = (MGA E – 600000) / 10) Stn No = (MGA N – 6200000) / 10

eg. Planned gravity station MGA coordinates

614500.000N 6265500.000E

Line No = 1450 Station No = 6550

Ie, Pt No = 14506550

Station numbers have been partly expanded in the processed data to show metres, that is, the Line Numbers = MGA E– 600000 and Station Numbers = MGA N – 6200000.

Gravity Processing

The gravity values for this survey are related to the *Australian Gravity Base Station Network* using the *Isogal84 (IGSN 71)* values at known Gravity Stations as provided by *DMR*.

Note that all gravity values shown in these surveys are expressed in units of milligals.

The field gravity observations have been processed using standard formulae and constants to produce a Bouguer Anomaly for each gravity station.

The meter reading as recorded in the raw Scintrex data file is corrected for instrument tilts, meter drift and Earth Tide. Post processing corrections are detailed below.

Drift

The residual drift between base station readings is calculated for each station reading proportionately by time. This is the drift value shown in the processing output.

Drift = $[\,(t_1 - t_n)\,((b_2 - b_1)/\,(t_2 - t_1))\,]$

t_n = time of meter reading at each station

b_1 = base meter reading prior to station reading

t_1 = time of base reading b_1

b_2 = base meter reading after station reading

t_2 = time of base reading b_2

Obs mgal

This is the observed gravity value in milligals.

Obs = $b_g + (\, r_n - \text{drift}\,) - b_1$

b_g = base stn gravity value (Isogal84)
r_n = meter reading at each station as shown in the CG3 .dat file
drift = residual drift correction as shown above
b_1 = base meter reading prior to station reading

Anom
This is the difference between the observed gravity and the theoretical gravity value at each station. The theoretical value is calculated using the *1967 International Gravity Formula*.

Anom = Obs - g_{th}

Obs = observed gravity as explained above
g_{th} = 978031.8 $(1 + 0.0053024 \sin^2\phi - 0.0000059 \sin^2 2\phi)$
$\phi =$ WGS84 Latitude

Freeair corrn
The freeair correction is calculated using
Freeair corrn = 0.3086 H
H = height above sea level (AHD height)

Bouguer corrn
Bouguer corrn = -0.04191 ρ H
ρ = density (2.67 g/cc used for this survey)
H = height above sea level (AHD height)

Bouguer Anom
Bouguer Anom = Anom + Freeair corrn + Bouguer corrn

Results Formats

Printed results of the gravity processing (with Bouguer corrections at density 2.67 g/cc) are included in the Appendix of this report. Results are also supplied in digital form on Compact Disc with the following of files being supplied in a separate sub directory called Processed Data.

ALLCSV.CSV REPEATS.REP

Field gravity observation files with the extension .DAT and .DC and summarised GPS baseline solution files with extension .GPS are also supplied in a separate subdirectory named Raw Data.

A digital copy of this report is also on the compact disc in the root Directory

ALLCSV.CSV Format

This is a Comma Separated Variable format file. This format facilitates data import into spreadsheet and database software. Each record (line) contains the following data fields:

Pt Number, Line No, Station No, Date, Day Number, Local Time, WGS Latitude, WGS Longitude, WGS Height, MGA East, MGA North, AHD Height, Meter reading, Meter reading standard deviation, Earth Tide Correction, drift correction, corrected meter reading, gravity difference (mgal) from base, observed gravity (mgals), gravity anomaly, free-air correction, Bouguer correction (2.67), Bouguer anomaly

*.DAT

These are the raw data files from the *Scintrex CG3* gravimeter. There is a separate file for each day's data for each field party. The files are identified by the Julian day number (001 = Jan 1st) with the prefix G. eg. G142 = day 142 (21st May).

*.DC

These are the GPS Real Time Kinematic Data Collector files. They are ASCII format files containing the GPS vectors from the base station. The data is structured in a Trimble format (DC file Version 4).

Production Log

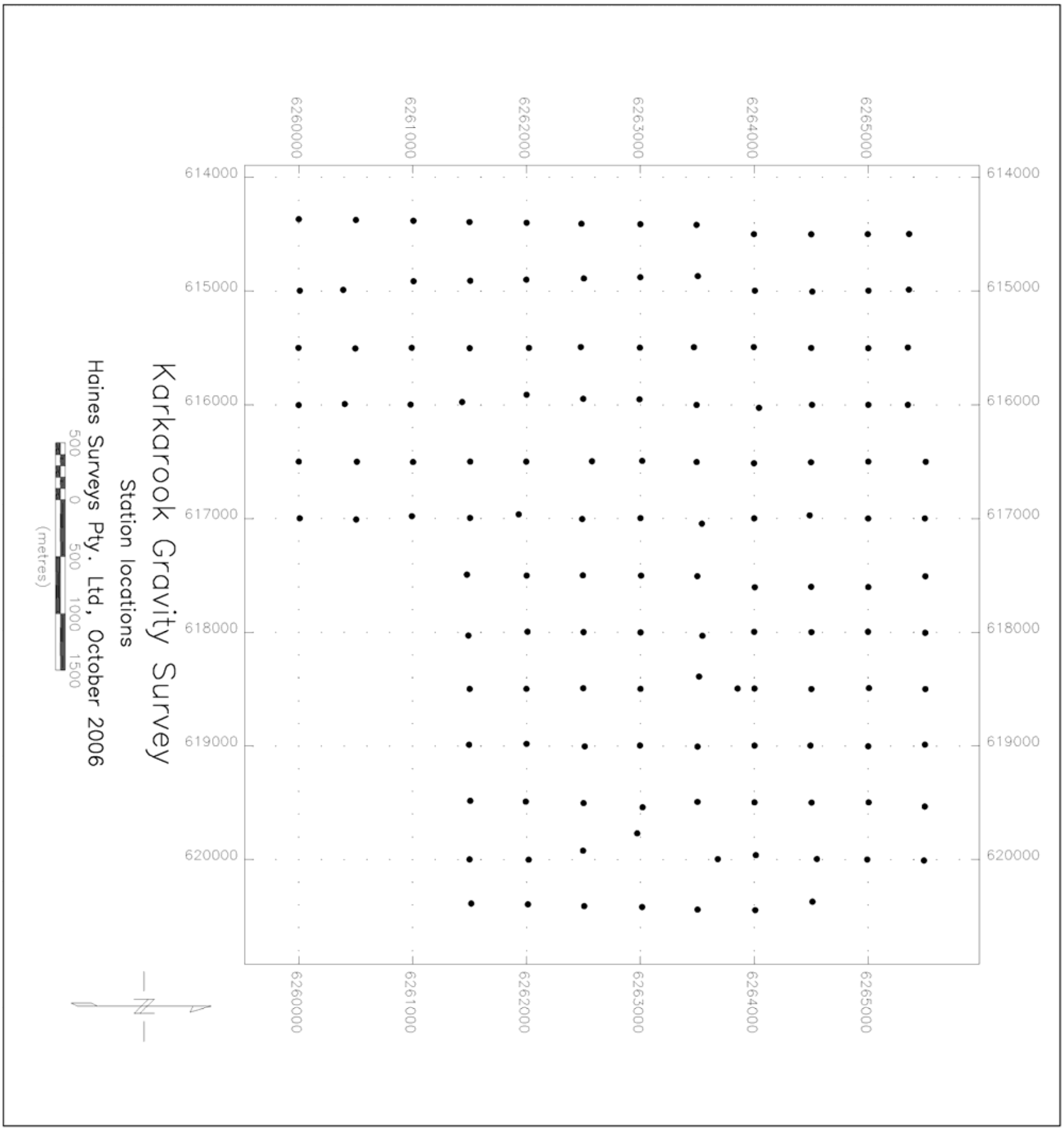
0669_Karkarook Production log

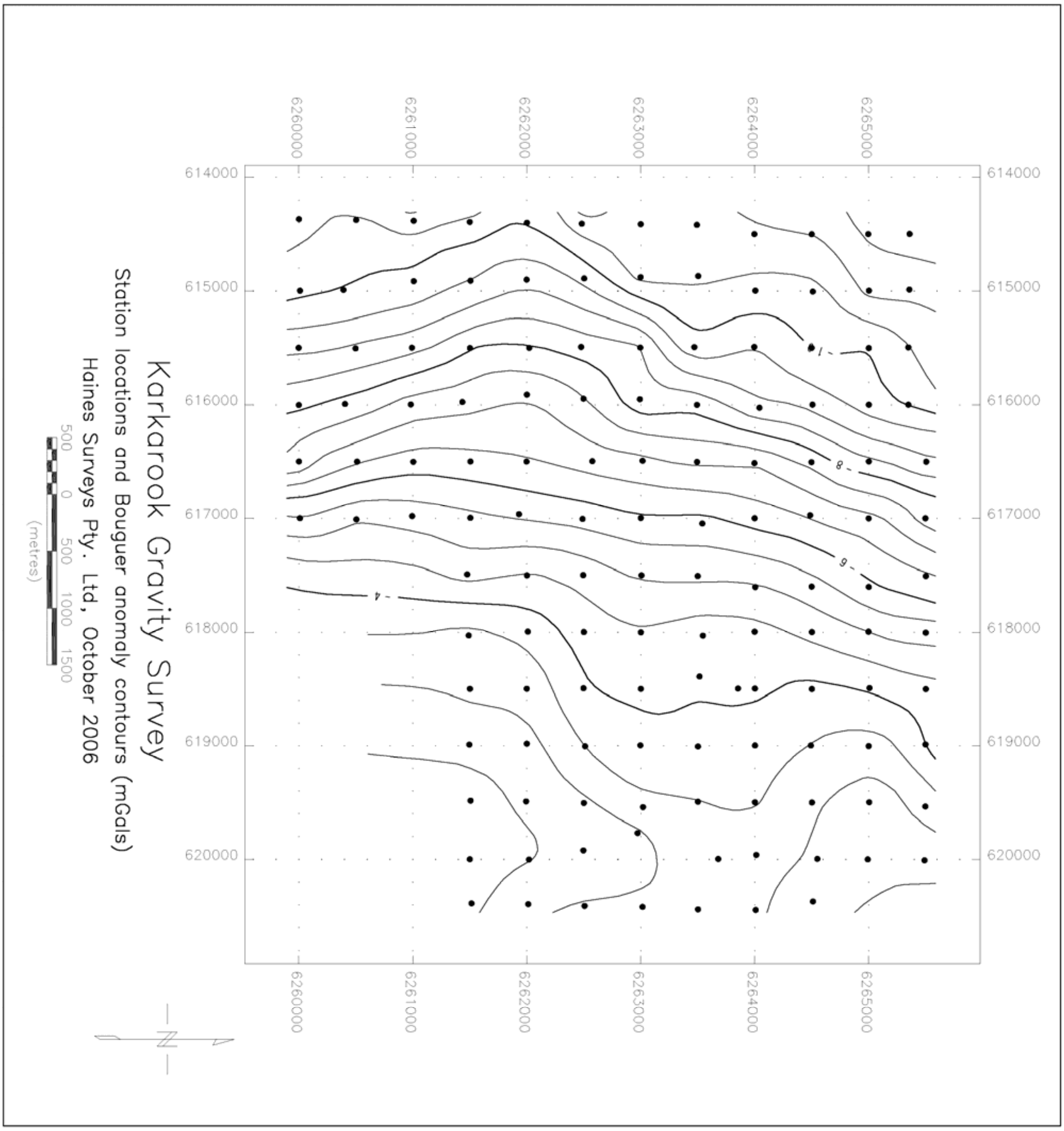
Date	Day#	Obs	Repeats	Comments
26/10/2006	299	41	0	Commence Karkarook,surv/grav control
27/10/2006	300	64	2	Continue Karkarook
28/10/2006	301	28	2	Complete Karkarook
	Total	**133**	**4**	

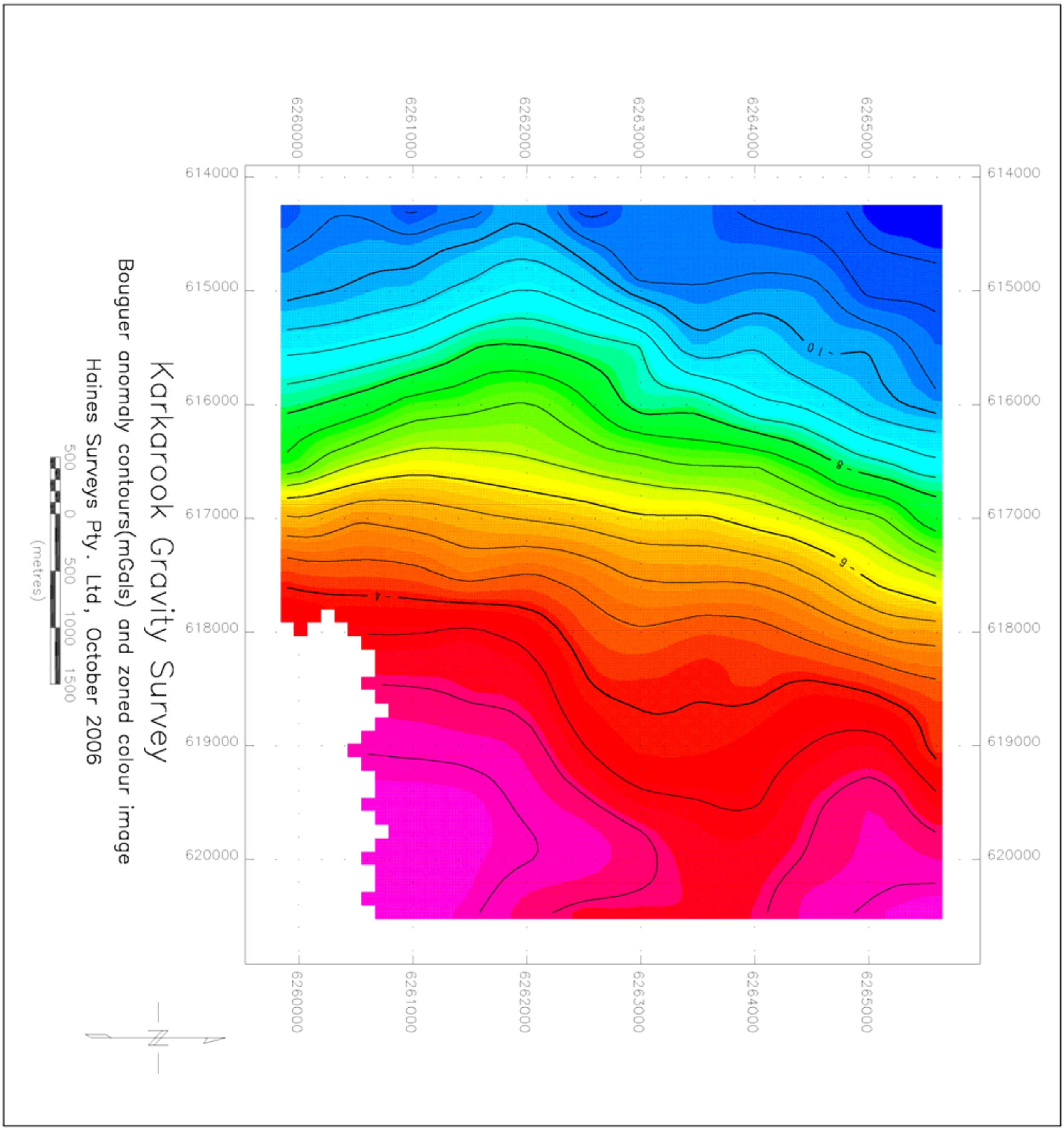
Repeat Observation Results

Pt #	Day	E	N	H	G	Bouguer
18006400	D299	617,994.645	6,263,999.453	69.745	979,610.094	-4.366
18006400	D300	617,994.752	6,263,999.484	69.734	979,610.131	-4.331
		-0.107	-0.031	+0.011	-0.037	-0.035
18506400	D299	618,496.227	6,264,001.889	74.564	979,609.379	-4.126
18506400	D300	618,496.239	6,264,002.108	74.587	979,609.404	-4.097
		-0.012	-0.219	-0.023	-0.025	-0.029
15506350	D300	615,491.021	6,263,470.194	83.685	979,602.325	-9.814
15506350	D301	615,490.969	6,263,470.285	83.709	979,602.298	-9.837
		+0.052	-0.091	-0.024	+0.027	+0.023
16006300	D300	615,950.584	6,262,992.109	83.112	979,604.286	-8.322
16006300	D301	615,950.576	6,262,991.998	83.129	979,604.298	-8.307
		+0.008	+0.111	-0.017	-0.012	-0.015

Plots


Karkarook Gravity Survey
Station locations
Haines Surveys Pty. Ltd, October 2006
500 0 500 1000 1500
(metres)
N
6260000
6261000
6262000
6263000
6264000
6265000
614000
615000
616000
617000
618000
619000
620000


Karkarook Gravity Survey
Station locations and Bouguer anomaly contours (mGals)
Haines Surveys Pty. Ltd, October 2006
500 0 500 1000 1500
(metres)
6260000
6261000
6262000
6263000
6264000
6265000
614000
615000
616000
617000
618000
619000
620000
N


Karkarook Gravity Survey
Bouguer anomaly contours(mGals) and zoned colour image
Haines Surveys Pty. Ltd, October 2006
(metres)
N

GRAVITY PROCESSING RESULTS

COORDS E	N	GRID x	y	drift	corr'd meter	obs mgal	anom	freeair corrn	bouguer corrn (2.67)	bouguer anom	height (AHD)
D299											
618496.2	6263853.7	0	6901	+0.000	5387.513	979609.298	-18.986	23.359	-8.470	-4.097	75.693
618496.2	6263853.7	0	6901	+0.004	5387.513	979609.298	-18.986	23.359	-8.470	-4.097	75.693
618496.2	6263853.7	0	6901	-0.010	5387.509	979609.298	-18.986	23.359	-8.470	-4.097	75.693
618496.2	6263853.7	0	6901	-0.001	5387.519	979609.298	-18.986	23.359	-8.470	-4.097	75.693
614498.6	6263997.2	1450	6400	-0.010	5377.233	979599.022	-29.191	28.753	-10.426	-10.863	93.173
614499.4	6264500.5	1450	6450	-0.009	5377.843	979599.632	-28.202	27.023	-9.799	-10.977	87.568
614498.6	6264996.7	1450	6500	-0.009	5374.839	979596.628	-30.832	30.186	-10.945	-11.592	97.815
614496.8	6265359.6	1450	6550	-0.009	5375.484	979597.273	-29.914	28.565	-10.358	-11.707	92.563
614997.0	6264005.4	1500	6400	-0.009	5379.935	979601.724	-26.478	25.413	-9.215	-10.280	82.349
615005.0	6264509.4	1500	6450	-0.009	5379.682	979601.471	-26.352	25.133	-9.113	-10.332	81.441
614996.9	6265002.4	1500	6500	-0.009	5376.354	979598.143	-29.309	28.512	-10.339	-11.135	92.392
614987.9	6265356.9	1500	6550	-0.009	5377.626	979599.415	-27.770	26.126	-9.474	-11.117	84.661
615490.2	6263996.0	1550	6400	-0.009	5383.027	979604.816	-23.388	21.830	-7.916	-9.474	70.739
615497.6	6264500.2	1550	6450	-0.009	5379.398	979601.187	-26.638	26.054	-9.447	-10.031	84.427
615499.3	6265000.9	1550	6500	-0.008	5380.979	979602.768	-24.680	23.045	-8.356	-9.991	74.677
615493.6	6265348.4	1550	6550	-0.008	5377.929	979599.718	-27.468	26.649	-9.663	-10.483	86.353
616025.5	6264041.4	1600	6400	-0.008	5382.400	979604.189	-23.977	23.685	-8.588	-8.880	76.751
615999.0	6264507.1	1600	6450	-0.008	5382.213	979604.002	-23.813	23.007	-8.342	-9.149	74.553
615998.9	6265001.7	1600	6500	-0.008	5379.065	979600.854	-26.589	26.447	-9.590	-9.732	85.700
615998.9	6265348.4	1600	6550	-0.008	5377.611	979599.400	-27.782	27.794	-10.078	-10.066	90.065
616511.8	6263997.6	1650	6400	-0.007	5385.759	979607.548	-20.646	21.380	-7.753	-7.018	69.281
616503.2	6264497.9	1650	6450	-0.007	5382.821	979604.610	-23.207	24.463	-8.870	-7.615	79.271
616497.0	6265001.3	1650	6500	-0.007	5382.014	979603.803	-23.635	23.922	-8.674	-8.387	77.519
616499.2	6265505.7	1650	6550	-0.005	5381.602	979603.391	-23.668	23.368	-8.473	-8.773	75.722
616998.3	6263998.9	1700	6400	-0.007	5385.234	979607.023	-21.165	23.421	-8.493	-6.237	75.894
616972.0	6264486.3	1700	6450	-0.004	5384.895	979606.684	-21.138	22.874	-8.294	-6.558	74.123
616999.5	6264999.8	1700	6500	-0.004	5384.225	979606.014	-21.421	22.919	-8.311	-6.812	74.268
616999.0	6265498.2	1700	6550	-0.005	5382.437	979604.226	-22.834	23.941	-8.681	-7.574	77.581
617601.8	6264004.3	1750	6400	-0.004	5387.496	979609.285	-18.894	21.884	-7.935	-4.945	70.914
617597.7	6264499.4	1750	6450	-0.004	5386.229	979608.018	-19.788	22.737	-8.244	-5.296	73.677
617600.0	6265000.9	1750	6500	-0.004	5384.943	979606.732	-20.697	23.207	-8.415	-5.905	75.200
617504.9	6265501.9	1750	6550	-0.005	5383.861	979605.650	-21.403	23.587	-8.553	-6.369	76.431
617994.6	6263999.5	1800	6400	-0.003	5388.305	979610.094	-18.085	21.523	-7.804	-4.366	69.745
617997.6	6264501.9	1800	6450	-0.003	5387.381	979609.170	-18.631	21.945	-7.957	-4.643	71.111
617994.2	6264998.6	1800	6500	-0.003	5386.330	979608.119	-19.308	22.454	-8.142	-4.996	72.761
618003.1	6265501.2	1800	6550	-0.005	5385.486	979607.275	-19.773	22.850	-8.286	-5.209	74.044
618496.2	6264001.9	1850	6400	-0.003	5387.590	979609.379	-18.793	23.010	-8.344	-4.126	74.564
618500.6	6264501.4	1850	6450	-0.006	5387.895	979609.684	-18.112	22.313	-8.091	-3.890	72.304
618492.1	6265006.8	1850	6500	-0.006	5387.216	979609.005	-18.411	22.519	-8.166	-4.057	72.972
618501.1	6265502.1	1850	6550	-0.005	5386.201	979607.990	-19.053	23.024	-8.349	-4.378	74.607
618996.3	6264002.3	1900	6400	-0.006	5386.979	979608.768	-19.399	24.557	-8.905	-3.747	79.576
618996.6	6264493.0	1900	6450	-0.006	5387.126	979608.915	-18.883	24.153	-8.758	-3.488	78.265
619002.4	6265000.4	1900	6500	-0.006	5387.285	979609.074	-18.342	23.606	-8.560	-3.296	76.494
619498.4	6264002.1	1950	6400	-0.006	5386.749	979608.538	-19.625	25.235	-9.150	-3.540	81.771
619500.3	6264502.8	1950	6450	-0.006	5387.267	979609.056	-18.730	24.566	-8.908	-3.072	79.604
D300											
618496.2	6263853.7	0	6901	+0.000	5387.418	979609.298	-18.986	23.359	-8.470	-4.097	75.693
618496.2	6263853.7	0	6901	+0.000	5387.418	979609.298	-18.986	23.359	-8.470	-4.097	75.693
618496.2	6263853.7	0	6901	-0.012	5387.418	979609.298	-18.986	23.359	-8.470	-4.097	75.693
618496.2	6263853.7	0	6901	+0.008	5387.430	979609.298	-18.986	23.359	-8.470	-4.097	75.693
614365.7	6260000.9	1450	6000	-0.007	5381.237	979603.117	-28.106	27.306	-9.901	-10.701	88.485
614372.8	6260502.3	1450	6050	-0.007	5383.467	979605.347	-25.499	23.566	-8.545	-10.478	76.365
614380.5	6261007.4	1450	6100	-0.007	5379.790	979601.670	-28.795	28.252	-10.244	-10.787	91.549
614391.2	6261499.7	1450	6150	-0.007	5380.926	979602.806	-27.288	26.555	-9.629	-10.362	86.050
614397.7	6262001.2	1450	6200	-0.007	5382.214	979604.094	-25.622	24.488	-8.879	-10.014	79.352
614406.0	6262482.7	1450	6250	-0.006	5380.591	979602.471	-26.883	25.169	-9.126	-10.840	81.558
614410.3	6262999.9	1450	6300	-0.006	5380.343	979602.223	-26.741	25.239	-9.152	-10.654	81.786
614416.1	6263492.8	1450	6350	-0.006	5378.849	979600.729	-27.864	26.953	-9.773	-10.684	87.340
614997.2	6260009.9	1500	6000	-0.002	5382.799	979604.679	-26.532	25.838	-9.369	-10.063	83.725
614990.0	6260390.8	1500	6050	-0.002	5383.293	979605.173	-25.751	24.731	-8.967	-9.988	80.138
614913.4	6261008.3	1500	6100	-0.005	5382.858	979604.738	-25.721	24.817	-8.999	-9.903	80.417
614909.6	6261506.1	1500	6150	-0.005	5382.235	979604.115	-25.970	25.822	-9.363	-9.511	83.676
614899.5	6261998.3	1500	6200	-0.005	5383.275	979605.155	-24.559	24.194	-8.773	-9.138	78.399
614888.9	6262503.5	1500	6250	-0.006	5381.294	979603.174	-26.160	25.925	-9.401	-9.635	84.009
614878.3	6262999.0	1500	6300	-0.006	5379.422	979601.302	-27.659	26.708	-9.685	-10.635	86.547
614868.1	6263504.5	1500	6350	-0.006	5378.187	979600.067	-28.513	28.149	-10.207	-10.571	91.215
615496.9	6259998.0	1550	6000	-0.002	5382.896	979604.776	-26.439	27.139	-9.841	-9.141	87.941
615501.8	6260496.8	1550	6050	-0.003	5384.852	979606.732	-24.107	23.837	-8.643	-8.913	77.243
615496.3	6260992.4	1550	6100	-0.005	5384.640	979606.520	-23.946	23.981	-8.696	-8.661	77.709
615499.4	6261501.7	1550	6150	-0.005	5385.879	979607.759	-22.323	22.454	-8.142	-8.012	72.760
615497.4	6262021.4	1550	6200	-0.005	5385.122	979607.002	-22.689	23.110	-8.380	-7.959	74.888
615489.9	6262477.1	1550	6250	-0.005	5383.814	979605.694	-23.654	24.201	-8.775	-8.229	78.421
615494.8	6262995.8	1550	6300	-0.004	5383.575	979605.455	-23.503	23.585	-8.552	-8.470	76.426
615491.0	6263470.2	1550	6350	-0.004	5380.445	979602.325	-26.275	25.825	-9.364	-9.814	83.685
616001.6	6259999.8	1600	6000	-0.002	5383.274	979605.154	-26.055	28.049	-10.171	-8.177	90.892
615992.0	6260404.8	1600	6050	-0.002	5383.817	979605.697	-25.207	27.267	-9.887	-7.827	88.358
615997.1	6260982.5	1600	6100	-0.002	5387.592	979609.472	-20.997	21.533	-7.808	-7.272	69.777

615975.0	6261434.9	1600	6150	-0.002	5386.836	979608.716	-21.413	22.261	-8.072	-7.223	72.137
615909.8	6262001.1	1600	6200	-0.001	5386.723	979608.603	-21.100	22.005	-7.979	-7.074	71.306
615945.7	6262497.8	1600	6250	-0.001	5385.220	979607.100	-22.228	23.155	-8.396	-7.470	75.032
615950.6	6262992.1	1600	6300	-0.001	5382.406	979604.286	-24.670	25.648	-9.300	-8.322	83.112
616000.3	6263493.5	1600	6350	-0.001	5383.436	979605.316	-23.262	23.773	-8.620	-8.109	77.036
616497.2	6260000.3	1650	6000	-0.003	5383.918	979605.798	-25.406	28.626	-10.380	-7.160	92.762
616498.5	6260511.2	1650	6050	-0.003	5387.130	979609.010	-21.809	23.937	-8.680	-6.552	77.565
616500.3	6261004.0	1650	6100	-0.003	5388.540	979610.420	-20.028	21.635	-7.845	-6.238	70.107
616497.1	6261505.7	1650	6150	-0.003	5387.555	979609.435	-20.635	22.431	-8.134	-6.338	72.686
616497.7	6261998.0	1650	6200	-0.004	5385.560	979607.440	-22.260	24.807	-8.995	-6.448	80.384
616494.4	6262574.8	1650	6250	-0.004	5386.196	979608.076	-21.189	22.656	-8.215	-6.749	73.414
616490.9	6263016.0	1650	6300	-0.004	5386.255	979608.135	-20.798	21.860	-7.927	-6.865	70.836
616500.7	6263494.1	1650	6350	-0.004	5385.713	979607.593	-20.980	21.799	-7.904	-7.086	70.639
617044.6	6263540.0	1700	6350	-0.008	5387.413	979609.293	-19.241	21.051	-7.633	-5.823	68.214
617496.7	6262494.8	1750	6250	-0.011	5390.014	979611.894	-17.422	19.962	-7.238	-4.699	64.685
617498.8	6263005.8	1750	6300	-0.011	5388.358	979610.238	-18.694	21.384	-7.754	-5.064	69.293
617504.1	6263499.9	1750	6350	-0.008	5387.690	979609.570	-18.990	21.798	-7.904	-5.096	70.635
618026.9	6261490.0	1800	6150	-0.011	5391.330	979613.210	-16.858	21.188	-7.683	-3.353	68.660
617993.6	6262008.9	1800	6200	-0.011	5391.348	979613.228	-16.450	20.045	-7.268	-3.673	64.955
617997.1	6262500.8	1800	6250	-0.010	5389.886	979611.766	-17.541	20.859	-7.563	-4.246	67.591
618000.0	6263001.6	1800	6300	-0.010	5388.829	979610.709	-18.221	21.588	-7.828	-4.461	69.955
618028.8	6263544.9	1800	6350	-0.009	5388.928	979610.808	-17.713	21.137	-7.664	-4.240	68.494
617994.8	6263999.5	1800	6400	-0.012	5388.251	979610.131	-18.048	21.520	-7.803	-4.331	69.734
618499.3	6261500.9	1850	6150	-0.011	5392.551	979614.431	-15.624	19.591	-7.104	-3.138	63.482
618498.5	6261999.6	1850	6200	-0.011	5392.074	979613.954	-15.726	19.672	-7.133	-3.187	63.747
618493.2	6262498.0	1850	6250	-0.011	5390.281	979612.161	-17.144	20.712	-7.510	-3.942	67.117
618499.2	6263001.1	1850	6300	-0.011	5389.316	979611.196	-17.730	21.487	-7.791	-4.034	69.626
618390.0	6263515.3	1850	6350	-0.009	5388.953	979610.833	-17.707	21.501	-7.796	-4.002	69.673
618496.2	6264002.1	1850	6400	+0.000	5387.524	979609.404	-18.768	23.018	-8.346	-4.097	74.587
618989.1	6261495.4	1900	6150	-0.009	5393.087	979614.967	-15.088	19.520	-7.078	-2.646	63.252
618981.1	6262000.1	1900	6200	-0.009	5392.196	979614.076	-15.599	20.008	-7.255	-2.846	64.834
619003.8	6262511.7	1900	6250	-0.009	5389.794	979611.674	-17.616	22.127	-8.023	-3.512	71.702
618995.7	6262996.3	1900	6300	-0.009	5388.298	979610.178	-18.747	23.249	-8.430	-3.928	75.336
619005.6	6263502.6	1900	6350	-0.009	5387.014	979608.894	-19.650	24.701	-8.957	-3.905	80.041
619484.5	6261506.7	1950	6150	-0.010	5392.775	979614.655	-15.387	20.493	-7.431	-2.325	66.406
619491.1	6261993.9	1950	6200	-0.010	5391.745	979613.625	-16.050	21.082	-7.644	-2.612	68.315
619504.8	6262501.2	1950	6250	-0.010	5390.093	979611.973	-17.320	22.593	-8.192	-2.919	73.212
619541.4	6263020.0	1950	6300	-0.010	5388.945	979610.825	-18.077	23.156	-8.397	-3.317	75.037
619493.8	6263501.7	1950	6350	-0.010	5388.505	979610.385	-18.154	23.046	-8.357	-3.465	74.680
D301											
618496.2	6263853.7	0	6901	+0.000	5387.259	979609.298	-18.986	23.359	-8.470	-4.097	75.693
618496.2	6263853.7	0	6901	+0.009	5387.259	979609.298	-18.986	23.359	-8.470	-4.097	75.693
618496.2	6263853.7	0	6901	-0.040	5387.250	979609.298	-18.986	23.359	-8.470	-4.097	75.693
618496.2	6263853.7	0	6901	+0.009	5387.290	979609.298	-18.986	23.359	-8.470	-4.097	75.693
615491.0	6263470.3	1550	6350	-0.002	5380.250	979602.298	-26.302	25.833	-9.367	-9.837	83.709
615950.6	6262992.0	1600	6300	-0.031	5382.250	979604.298	-24.658	25.654	-9.302	-8.307	83.129
616997.8	6260009.2	1700	6000	-0.010	5388.009	979610.057	-21.136	24.650	-8.938	-5.424	79.876
617008.4	6260504.3	1700	6050	-0.008	5390.633	979612.681	-18.139	20.577	-7.461	-5.023	66.680
616979.2	6260993.9	1700	6100	-0.009	5390.126	979612.174	-18.277	20.489	-7.429	-5.218	66.393
616994.7	6261504.4	1700	6150	-0.006	5389.027	979611.075	-18.992	21.373	-7.750	-5.369	69.258
616962.9	6261931.4	1700	6200	-0.006	5387.690	979609.738	-20.007	22.584	-8.189	-5.612	73.183
617004.2	6262489.2	1700	6250	-0.005	5387.792	979609.840	-19.485	21.666	-7.856	-5.675	70.209
616996.4	6263000.7	1700	6300	-0.004	5387.513	979609.561	-19.379	21.070	-7.640	-5.949	68.277
617490.2	6261476.9	1750	6150	-0.007	5388.178	979610.226	-19.857	23.782	-8.623	-4.698	77.064
617498.6	6262001.3	1750	6200	-0.012	5390.018	979612.066	-17.622	20.671	-7.495	-4.446	66.984
618988.1	6265498.6	1900	6550	-0.028	5386.045	979608.093	-18.948	23.566	-8.545	-3.927	76.364
619498.4	6265004.4	1950	6500	-0.026	5387.641	979609.689	-17.719	23.463	-8.508	-2.764	76.030
619535.4	6265497.7	1950	6550	-0.027	5385.969	979608.017	-19.020	24.773	-8.983	-3.229	80.277
619998.4	6261500.2	2000	6150	-0.017	5393.060	979615.108	-14.934	19.773	-7.170	-2.331	64.072
620001.1	6262019.2	2000	6200	-0.016	5391.590	979613.638	-16.013	21.222	-7.695	-2.486	68.768
619921.3	6262496.3	2000	6250	-0.015	5391.298	979613.346	-15.946	21.002	-7.615	-2.560	68.056
619767.5	6262972.2	2000	6300	-0.014	5390.132	979612.180	-16.756	21.666	-7.856	-2.946	70.206
619996.2	6263680.0	2000	6350	-0.030	5388.883	979610.931	-17.470	22.319	-8.093	-3.243	72.325
619960.8	6264013.5	2000	6400	-0.029	5388.482	979610.530	-17.620	22.620	-8.202	-3.202	73.299
619995.1	6264549.6	2000	6450	-0.026	5388.006	979610.054	-17.692	23.164	-8.400	-2.927	75.063
619999.3	6264991.9	2000	6500	-0.025	5387.010	979609.058	-18.355	24.577	-8.912	-2.690	79.641
620008.2	6265489.9	2000	6550	-0.025	5386.215	979608.263	-18.775	25.188	-9.133	-2.721	81.619
620387.9	6261515.1	2050	6150	-0.019	5393.331	979615.379	-14.648	19.223	-6.970	-2.395	62.291
620394.7	6262012.6	2050	6200	-0.020	5392.546	979614.594	-15.058	19.155	-6.946	-2.849	62.070
620410.5	6262506.8	2050	6250	-0.020	5391.014	979613.062	-16.218	20.603	-7.471	-3.086	66.764
620418.5	6263015.6	2050	6300	-0.021	5390.404	979612.452	-16.445	20.947	-7.595	-3.094	67.876
620440.9	6263502.2	2050	6350	-0.021	5389.532	979611.580	-16.950	21.742	-7.884	-3.092	70.454
620446.2	6264008.3	2050	6400	-0.022	5388.443	979610.491	-17.658	22.867	-8.292	-3.083	74.098
620371.3	6264511.1	2050	6450	-0.024	5388.301	979610.349	-17.422	23.178	-8.404	-2.649	75.107

1. SURVEY LOCATION & LOGISTICS

In November 2006, Search Exploration undertook the collection of two Pole-Dipole IP traverses for Uranium One Australia. The Survey was conducted to aid in drill hole targeting of unconformity style uranium mineralisation. All the traverses were undertaken in an east-west orientation. A total of 6.3 line kilometres of data was collected over the two lines.

Table 1 list the locations of the traverses (GDA94 Zn53). All the data was collected using pole transmitter, 200m receiver dipoles separation with a100m station spacing.

Line	Array	Prospect	Distance (m)	Start MGA	End MGA
6,261,900 mN	200m P-D	Karkarook	3,300	615,100 mE	618,400 mE
6,263,725 mN	200m P-D	Karkarook	3,000	615,600 mE	618,600 mE

Table 1: Co-ordinates of IP Traverses (GDA94 Zn53)

The data was collected using Search Exploration proprietary developed full time series Induced Polarisation Acquisition unit (SSIP16). Some advantages of collecting full time series data are that long wavelength telluric noise and SP drift are easily identified and removed. Additionally the receiver unit has low internal noise levels (relevant to industry standards) enabling the collection with confidence of low amplitude signal (i.e. 1msec levels). The unit has multiple input channels (42) allowing the simultaneous collection of data to greater dipoles (depth).

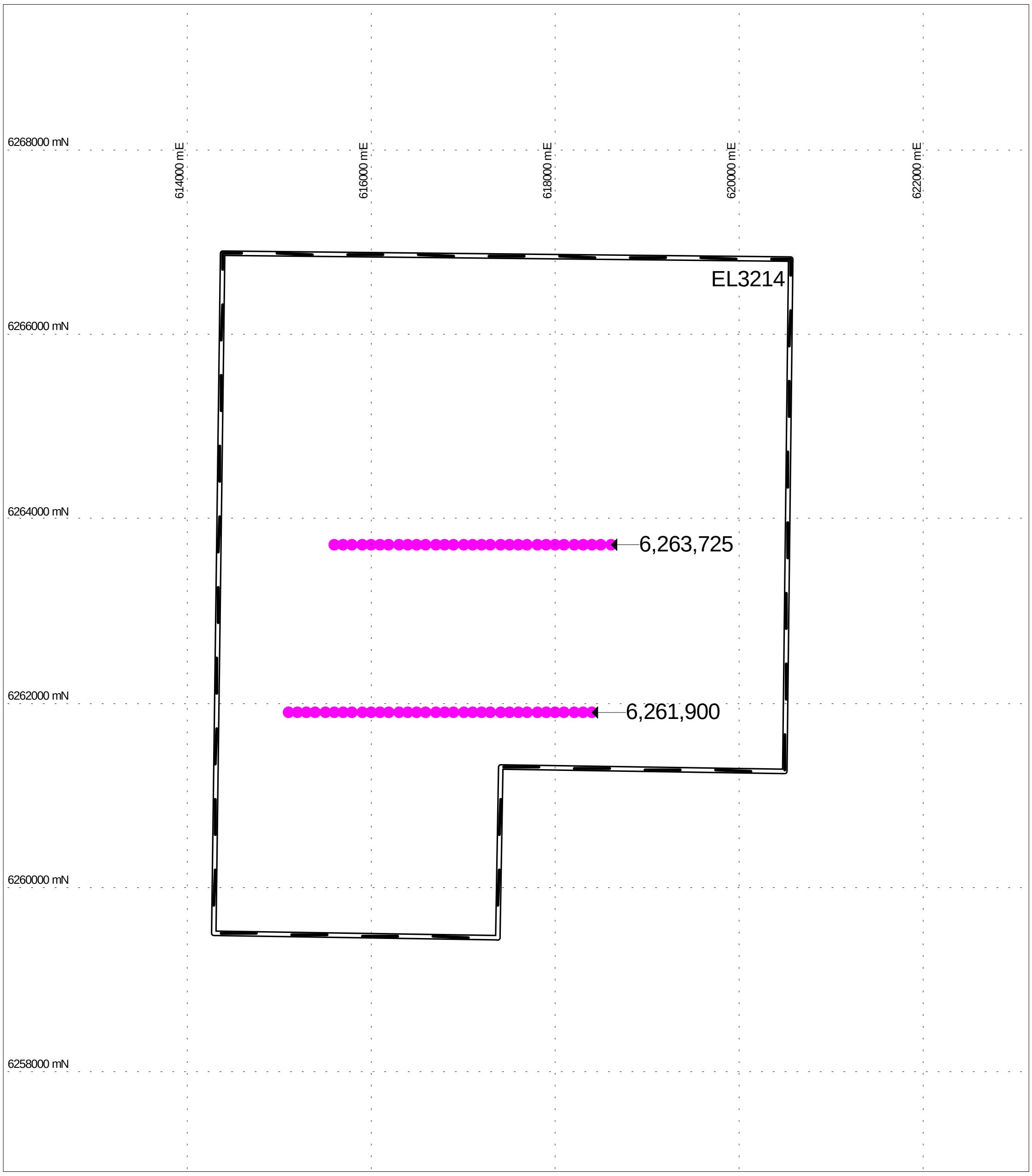


Figure 1: Location of Induced Polarisation Traverses (GDA94 Zn53).

The following equipment and specifications were used to undertake the survey:

Configuration: Tx: Pole – Rx: Dipole (200m)

Station Interval: 100m

Number of receiver dipoles: 8 (“n” levels)

Line Direction: approximately North/South

Base frequency: 0.125 Hertz

Duty Cycle: 50%

Receiver: Search Exploration Full Time Series Unit SSIP16

Chargeability Integration: 590msec to 1450msec

Transmitter: Search Exploration WB50 – 50 KVa .

Data Co-ordinate Datum: GDA94 Zone 53.

2. OBSERVED DATA & MODELLING

All the traverses were modelled using the Zonge smooth model inversion. This is a robust way of converting the observed pseudo-section data into resistivity and chargeability models reflecting the geometries and locations of the anomaly sources. Prior to modelling the quality of every data point was assessed by viewing the amplitude of the received signal, the quality of the decay and the quality of the data's repeatability. Data assessed as noisy or unreliable were removed or had there weighting/influence in the modelling decreased. Figures 2 to 5 display the data and resultant models for the two traverses.

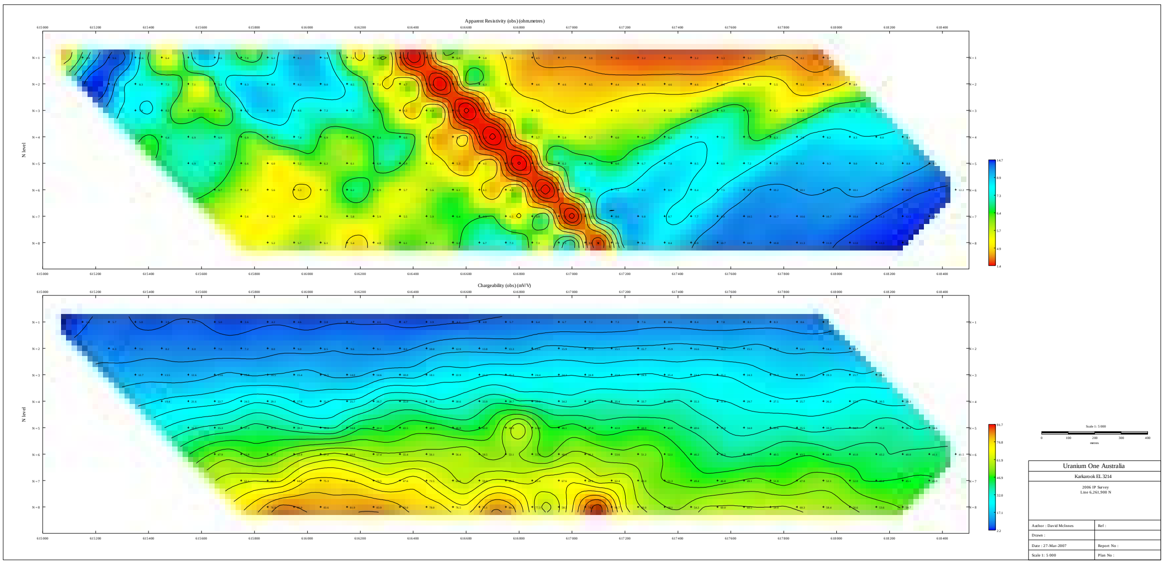


Figure 2: Induced Polarisation Traverses Line 6,261,900 N (GDA94 Zn53)

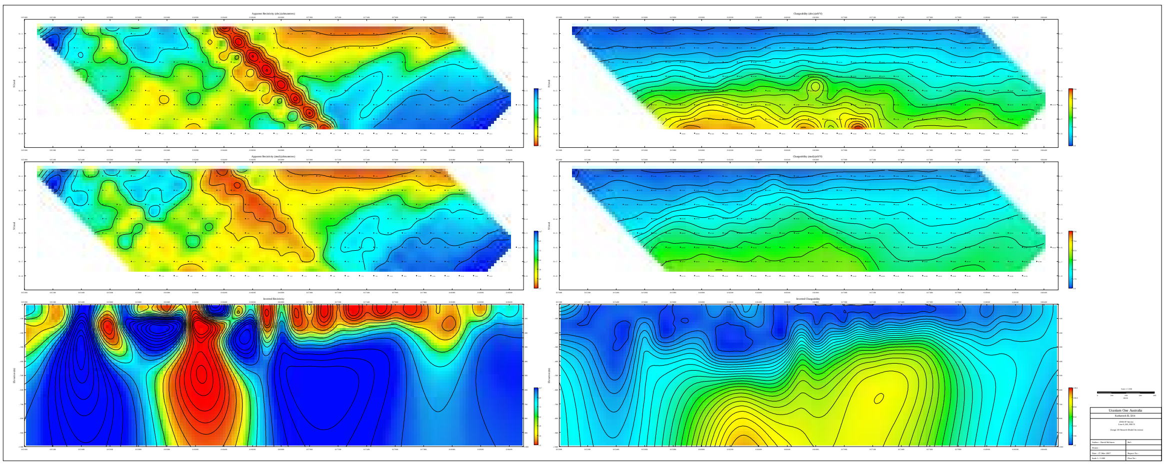


Figure 3: Induced Polarisation Smooth Model Inversion Line 6,261,900 N (GDA94 Zn53)

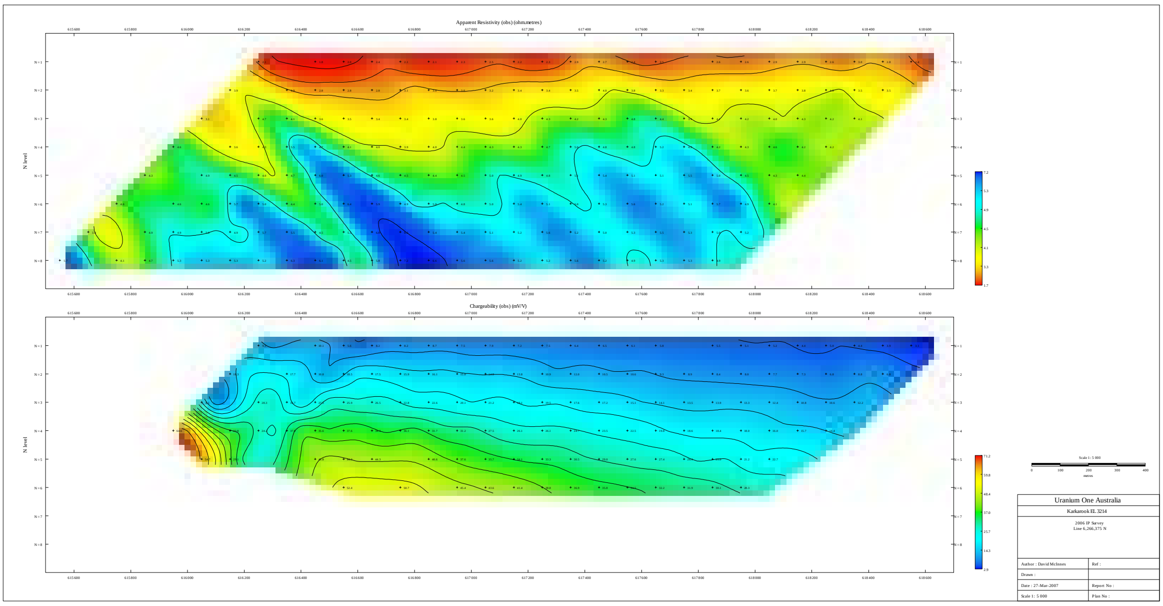


Figure 4: Induced Polarisation Traverses Line 6,263,725 N (GDA94 Zn53)

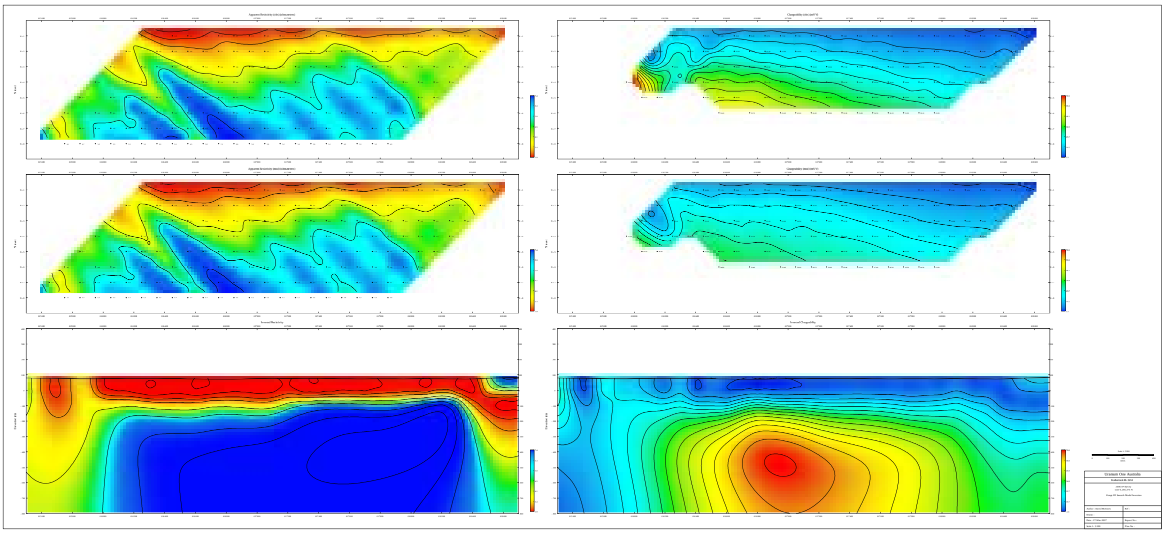


Figure 5: Induced Polarisation Smooth Model Inversion Line 6,263,725 N (GDA94 Zn53)

PETROGRAPHIC REPORT ON TWELVE DRILL CORE SAMPLES FROM EYRE PENINSULA, SOUTH AUSTRALIA

For

Uranium One - Australia

Reference: Memo from Kath Kingma, May 8, 2007

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SUMMARY

Twelve drill core samples from Eyre Peninsula in South Australia were submitted for petrographic preparation, description and interpretation. The samples were identified in a discontinuous series between 180030 and 180048. Samples 180030, 180031 and 180033 were representative of metamorphosed, deformed and thoroughly recrystallised sedimentary rocks, possibly representing the Yadnarie Schist of the Palaeoproterozoic Hutchison Group. The remaining samples represent little-metamorphosed clastic sedimentary rocks, some of which were indicated to be from the Mesoproterozoic Blue Range Beds. Standard thin sections were prepared from each sample, although several of the sedimentary rocks required prior mounting/impregnation in resin blocks before sectioning due to their friability. Sections were examined microscopically in transmitted and oblique reflected light. Sample offcuts were measured for magnetic susceptibility.

Summary descriptions of each sample are listed following:

180030 TS
Summary: Fine to medium grained plagioclase-quartz-biotite-garnet rock, perhaps of original psammopelitic composition, with weak foliation and extensive retrograde alteration. There is an interpreted prograde metamorphic mineral assemblage consistent with metamorphism having attained at least garnet grade of the greenschist facies. Subsequently, retrograde alteration occurred under lower greenschist conditions, with complete replacement of garnet by chlorite and partial replacement of plagioclase by sericite and biotite by chlorite. Minor hematite pigmentation of the layer silicates is probably part of the retrograde alteration. The rock was cut by a few thin veins of K-feldspar ± hematite and by a couple of later veins of chlorite ± quartz ± hematite.

180031 TS
Summary: Fine to medium grained plagioclase-biotite-garnet-quartz-muscovite schist with a weak-moderate foliation and several segregations parallel to foliation containing medium to coarse grained quartz, with minor plagioclase and a little biotite, garnet and apatite. Retrograde alteration at lower greenschist facies was imposed, leading to replacement of most garnet and biotite by chlorite (with some muscovite-sericite at biotite sites). Plagioclase was also extensively sericitised. Minor dusty hematite is part of the retrograde alteration, mostly pigmenting chlorite, and the rock was cut at a late stage by one or two thin K-feldspar veins.

180033 TS
Summary: Retrogressively altered medium grained, moderately foliated quartz-muscovite-biotite-K-feldspar-plagioclase schist. The prograde metamorphic assemblage probably formed under medium grade metamorphic conditions and also included a small amount of sillimanite. Retrograde alteration may have occurred under lower greenschist facies conditions and resulted in the replacement of all plagioclase by sericite, all biotite by muscovite-sericite, hematite and chlorite, most sillimanite by muscovite and the dusting of K-feldspar with hematite. Retrograde alteration must have occurred under oxidising conditions.

180034 TS
Summary: Coarse grained sandstone, grading to conglomerate, with a poorly sorted and generally grain-supported texture. The rock contains abundant detrital quartz, lithics and K-feldspar, with lithic grains including quartz-rich granitic and metamorphic material, plus rare

K-feldspar-rich felsic volcanic material. The detrital grains are cemented by hematite-pigmented carbonate (dolomitic), with carbonate also replacing some of the detrital grains. The cementing agency probably occurred under oxidising diagenetic conditions.

180035 TS

Summary: Low grade metamorphosed and locally cataclasised, coarse grained quartzofeldspathic sandstone, grading to conglomerate. The rock contains abundant detrital quartz, with subordinate K-feldspar and quartz-rich lithics. There is a minor finer grained matrix component and minor cement of sericite, K-feldspar, quartz and hematite. In places, brittle deformation has occurred, leading to microbrecciation, zones of which contain minor interstitial hematite.

180037 TS

Summary: Fine grained, dolomitic hematitic siltstone, with moderately well preserved relict detrital grain texture and fine scale bedding laminations. The rock contains minor detrital quartz and muscovite, along with a little K-feldspar and chlorite. Carbonate (dolomite) is abundant and strongly pigmented by hematite. There has been growth of irregular porphyroblastic aggregates of carbonate.

180041 TS

Summary: Medium grained, slightly laminated, quartzofeldspathic sandstone, with good preservation of relict detrital grain texture. Quartz is the dominant detrital phase, with there is rather abundant K-feldspar (microcline) and a little muscovite and FeTi oxide. Interstitially, there has been probable diagenetic crystallisation of fine grained clay, quartz and K-feldspar, all pigmented by fine grained hematite.

180042 TS

Summary: Medium grained, slightly laminated, quartzofeldspathic sandstone. Relict detrital grain texture is well preserved. The rock generally has a tightly-packed, grain-supported texture, with abundant detrital quartz and subordinate K-feldspar. There are a few quartz-rich lithic grains, and a little muscovite and leucoxene-rutile. In some laminae, fine grained matrix material is more prevalent interstitially to detrital grains and is dominated by clay, with lesser amounts of sericite and a little leucoxene-rutile. It is possible that alteration has led to local development of thin sericitic foliae as well as local disaggregation of the detrital grain texture and apparent replacement by clay.

180044 TS

Summary: Medium to coarse grained, slightly laminated, quartzofeldspathic sandstone. Relict detrital grain texture is well preserved, with quartz being the dominant detrital phase, but accompanied by significant K-feldspar. There is also a minor lithic and FeTi oxide component and traces of muscovite, plagioclase, tourmaline, zircon and leucoxene-rutile. A minor interstitial matrix component is dominated by clay and sericite, with strong hematite pigmentation. The matrix assemblage might have developed during diagenetic alteration and evidently formed under oxidising conditions.

180045 TS

Summary: Medium to coarse grained quartzofeldspathic sandstone. Relict detrital grain texture is moderately well preserved, with quartz being the dominant detrital phase, but accompanied by significant K-feldspar. There are also a few lithic grains and traces of detrital FeTi oxide, muscovite, plagioclase, tourmaline and leucoxene-rutile. In places, there is a minor interstitial matrix component, dominated by clay, sericite and minor hematite. The rock may have undergone low grade alteration and slight metamorphic recrystallisation, together with development of a few sub-planar to irregular zones of micro-brecciation.

180046 TS

Summary: Medium to coarse grained quartzofeldspathic sandstone with weak bedding laminations and moderately well preserved relict detrital grain texture. Quartz is the dominant detrital phase, but with considerable K-feldspar, a little FeTi oxide and traces of muscovite, plagioclase, tourmaline, zircon and leucoxene-rutile. There is little matrix, perhaps due to low grade metamorphism and polygonisation of detrital grains. Hematite occurs along grain boundaries and has replaced detrital FeTi oxide grains.

180048 TS

Summary: Fine to medium grained, hematite-pigmented quartzofeldspathic sandstone with bedding laminations and well preserved relict detrital grain texture. The rock has a grain-supported texture, with quartz being the dominant detrital phase, accompanied by considerable K-feldspar, a few lithic grains and traces of FeTi oxide, muscovite, plagioclase, tourmaline and leucoxene-rutile. Minor interstitial matrix is dominated by fine dusty hematite, but there are scattered spots in the rock with no hematite that might reflect localised reduction. The spots contain sericite and clay as minor matrix components.

Interpretation

Samples in the suite include three strongly recrystallised and deformed metasedimentary rocks (180030, 180031, 180033), with the remainder representing little-metamorphosed, clastic sedimentary rocks, commonly with hematite pigmentation.

The metasedimentary rocks display a weak to moderate foliation and have been thoroughly recrystallised to fine to medium grained assemblages that contain quartz, feldspars, biotite and muscovite. Definite relict protolith textures are not apparent. Garnet was a minor phase in 180030 and 180031, with sillimanite occurring in small amounts in 180033. Minor amounts of foliation-parallel quartz (-feldspar) segregations have developed. Foliation in these rocks is defined by preferred orientation of mica grains and in 180033, by quartz-rich aggregates and sillimanite prisms. Garnets would have grown as small porphyroblasts in 180030 and 180031. The metamorphic assemblages suggest that medium grade prograde metamorphic conditions were achieved (at least upper greenschist facies and more likely, amphibolite grade). The bulk compositions of the schistose rocks are peraluminous and the relative proportions of quartz, feldspars, micas and aluminosilicate phases imply a sedimentary protolith, most likely of psammopelitic type. The characteristics of these samples are consistent with description of the Yadnarie Schist by Parker (1993).

Retrograde alteration has affected each of the metasedimentary rock samples. There has been almost complete replacement of garnet by chlorite and sillimanite by muscovite-sericite, with extensive replacement of plagioclase (mostly by sericite) and biotite (by chlorite, sericite). Hematite alteration has occurred and commonly pigments chlorite. There has been minor development of thin veins of K-feldspar ± hematite. The presence of hematite indicates that the retrograde alteration occurred under oxidising conditions. The retrogression would have also occurred under lower greenschist facies (chlorite grade) conditions.

The remaining samples in the suite, viz. 180034, 180035, 180037, 180041, 180042, 180044-6 and 180048, represent clastic sedimentary rocks, mostly of sandstone type. Samples 180034 and 180035 represent a gradation from coarse sandstone into conglomerate and sample 180037 is a dolomitic, hematitic siltstone. In these sedimentary rocks, primary textures are generally well preserved. Relict detrital grain textures are little modified and in several samples, sedimentary bedding laminations occur. The latter are generally at a high angle to the core axis (implying gently dipping to near-horizontal strata?). Detrital grains are angular to sub-rounded implying relative immaturity and proximity to source areas. In the sandstone (-conglomerate) samples, there is generally only a minor matrix component and the textures are grain-supported. Quartz is the dominant detrital grain phase and is accompanied by a subordinate amount of K-feldspar, much of which is apparently microcline. Some sandstone (-conglomerate) samples contain a minor proportion of lithic detrital grains that include probable granitic, quartzofeldspathic metamorphic and quartzitic material and there are rare grains of K-feldspar-rich, hematite-pigmented altered felsic volcanic material (e.g. Gawler Range Volcanics). Other minor to trace detrital components include muscovite, plagioclase, tourmaline, FeTi oxide, zircon, leucoxene-rutile and rare degraded biotite (variably chloritised). A couple of samples display thin "heavy mineral" laminations with concentrations of FeTi oxide grains. The detrital component of these samples implies a dominent provenance from granitic and quartzofeldspathic metamorphic sources, as well as a minor amount of felsic volcanics.

In the sandstone (-conglomerate) samples, the matrix component is generally minor and comprises fine grained sericite, clay (e.g. kaolinite) and commonly, hematite dusting (although very minor in one or two samples). There is also a little interstitial quartz and K-feldspar in a couple of samples, and carbonate (probably dolomite) occurs in 180034. The matrix component might reflect a product of diagenetic alteration and the characteristic hematite pigmentation in many samples indicates deposition and diagenesis under oxidising conditions (i.e. the clastic sedimentary rocks were probably terrestrial fluvial deposits). Sample 180037 differs from the other sedimentary rocks in that it is much finer grained (siltstone) and contains abundant dolomite as well as hematite. Irregular dolomite porphyroblastic aggregates have grown, in places, disrupting bedding laminae. This sample might reflect deposition of a mixed fine clastic and chemical (e.g. evaporitic) sediment.

As mentioned, the sedimentary rocks are little-metamorphosed and are probably little deformed. In a few samples, there has been development of polygonisation of original detrital grains, and the formation of sericite, clay, hematite and local quartz and K-feldspar as matrix components might reflect the effects of diagenesis → very low grade metamorphism. The same could be stated about the formation of dolomite in the matrix of 180034 and the growth of dolomite porphyroblasts in 180037. In 180042, thin sericitic foliae have formed, with the evident preferred orientation of sericite indicative of weak deformation. This sample also displays disaggregation of the detrital grain texture and development of considerable interstitial clay in places, perhaps an indication of a type of argillic alteration. In 180048, prominent globular whitish "spots" occur in an otherwise strongly hematite-pigmented sandstone. The spots appear to contain a higher proportion of interstitial clay and sericite, with an absence of hematite at these sites pointing to local reduction. Brittle deformation effects are apparent in 180035 with the formation of microbreccia zones resulting from local cataclasis. In 180041, there is a single thin sub-planar quartz vein.

The characteristics of the sedimentary rocks accord with them representing a largely terrestrial, rather high energy and oxidised clastic sequence, with dolomite development in 180034 and 180037 implying a chemical sedimentation influence locally. The rocks are evidently part of a "red bed" sequence, with their characteristics according with descriptions of the Blue Range Beds by Flint (1993).

From the sample suite, analogies can be drawn, albeit speculatively because of the lack of field relationship data, to models for unconformity-type uranium deposits. Maybe the "red bed", clastic-dominated sedimentary sequence unconformably overlies a basement of metamorphosed sedimentary rocks, represented by the schists in samples 180030, 180031 and 180033? Uranium mineralisation could have been formed in the vicinity of an unconformity and hosted in either the basement or cover sequence. Such a possibility would be highly dependant on the presence of appropriate sedimentary basin palaeohydrology, fluid channelling structures and redox reactions occurring. The samples in the suite have lithological analogies to the Alligator Rivers uranium province (e.g. Kombolgie Formation overlying basement metamorphosed rocks of the Pine Creek Geosyncline, cf. Solomon and Groves, 2000).

References

Flint, R.B. (1993). Itiledoo Basin *in* Drexel, J.F., Preiss, W.V. and Parker, A.J., The Geology of South Australia. Volume 1. The Precambrian. Geological Survey of South Australia, Bulletin 54, 142.

Parker, A.J. (1993). Gawler Craton *in* Drexel, J.F., Preiss, W.V. and Parker, A.J., The Geology of South Australia. Volume 1. The Precambrian. Geological Survey of South Australia, Bulletin 54, 51-68.

Solomon, M. and Groves, D.I. (2000). The geology and origin of Australia's mineral deposits. Centre for Ore Deposit Research and Centre for Global Metallogeny Publication 32, 1002 pp.

Individual sample descriptions

180030 TS

Summary: Fine to medium grained plagioclase-quartz-biotite-garnet rock, perhaps of original psammopelitic composition, with weak foliation and extensive retrograde alteration. There is an interpreted prograde metamorphic mineral assemblage consistent with metamorphism having attained at least garnet grade of the greenschist facies. Subsequently, retrograde alteration occurred under lower greenschist conditions, with complete replacement of garnet by chlorite and partial replacement of plagioclase by sericite and biotite by chlorite. Minor hematite pigmentation of the layer silicates is probably part of the retrograde alteration. The rock was cut by a few thin veins of K-feldspar ± hematite and by a couple of later veins of chlorite ± quartz ± hematite.

Handspecimen: The drill core is composed of a rather fine grained, dark grey-green rock with local pink-red alteration zones. The rock appear to be quartzofeldspathic in composition, but with likely chlorite and biotite, with local hematite pigmentation and possible thin white-pink feldspathic veining. The rock is weakly magnetic, with susceptibility up to 60 x 10^{-5} SI units.

Petrographic Section:

a) Primary mineralogy and textures: In the section it is evident that the rock has been strongly recrystallised. It is fine to medium grained and has a locally porphyroblastic texture. No definite relict textures are recognisable. The bulk composition of the rock, with an interpreted prograde metamorphic assemblage of plagioclase-quartz-biotite-garnet, is suggestive of a possible psammopelitic protolith.

b) Alteration and structure: The original rock of possible psammopelitic sedimentary type, is interpreted to have undergone metamorphism to develop a fine to medium grained and locally porphyroblastic assemblage. It contained abundant anhedral grains of plagioclase (perhaps sodic) up to 0.5 mm across, intergrown with subordinate quartz (few aggregates to 1 mm across), biotite and a few porphyroblasts of garnet up to 1 mm across. A very weak foliation was imposed, defined by slight preferred orientation of biotite. The interpreted prograde assemblage has formed under conditions of at least upper greenschist facies (e.g. garnet grade). Subsequently, the rock has undergone moderate to strong pervasive retrograde alteration that probably occurred under lower greenschist facies conditions (chlorite grade). There has been extensive replacement of biotite by chlorite, plagioclase by sericite and all garnet has been replaced by chlorite ± quartz ± sericite. Pervasive patchy hematite is common in small aggregates, especially pigmenting chlorite and relict biotite. The altered was cut by a couple of sub-planar veins up to 0.4 mm wide composed of K-feldspar ± hematite, and subsequently by veins up to 0.5 mm wide of chlorite ± quartz ± hematite.

c) Mineragraphy and paragenesis: The sample contains patchy finely dispersed hematite, with hematite also occurring in some of the thin veins. Hematite is interpreted to be part of the alteration assemblage. No sulphide minerals are recognised.

Mineral Mode: Approximate modal proportions are: plagioclase 55%, quartz 20%, chlorite 14%, sericite, biotite and hematite each 3% and K-feldspar 2%.

Interpretation and Comments: It is interpreted that the sample is a fine to medium grained plagioclase-quartz-biotite-garnet rock, probably representing an original psammopelitic composition. The interpreted prograde metamorphic mineral assemblage is consistent with metamorphism having attained at least garnet grade of the greenschist facies. Subsequently, retrograde alteration occurred under lower greenschist conditions, with complete replacement of garnet by chlorite and partial replacement of plagioclase by sericite and biotite by chlorite. Minor hematite pigmentation of the layer silicates is probably part of the retrograde alteration. The rock was cut by a few thin veins of K-feldspar ± hematite and by a couple of later veins of chlorite ± quartz ± hematite.

180031 TS

Summary: Fine to medium grained plagioclase-biotite-garnet-quartz-muscovite schist with a weak-moderate foliation and several segregations parallel to foliation containing medium to coarse grained quartz, with minor plagioclase and a little biotite, garnet and apatite. Retrograde alteration at lower greenschist facies was imposed, leading to replacement of most garnet and biotite by chlorite (with some muscovite-sericite at biotite sites). Plagioclase was also extensively sericitised. Minor dusty hematite is part of the retrograde alteration, mostly pigmenting chlorite, and the rock was cut at a late stage by one or two thin K-feldspar veins.

Handspecimen: The drill core is composed of a weakly to moderately foliated, fine to medium grained, dark grey-green schist, with minor red-brown pigmentation and a few foliation-parallel white-grey-pink segregations of quartz, with minor feldspar. The schist is composed of dominant feldspar, quartz and chlorite, with minor muscovite and biotite. The red-brown pigmentation is probably due to hematite. The rock is essentially non-magnetic, with susceptibility of <20 x 10^{-5} SI units.

Petrographic Section:

a) Primary mineralogy and textures: In the section the rock is a weakly foliated, fine to medium grained schist with a dominant original prograde metamorphic mineral assemblage of plagioclase, with subordinate biotite, minor garnet, muscovite, quartz and traces of K-feldspar and tourmaline. There is no relict pre-metamorphic texture recognisable, but the bulk composition of the rock suggests that the protolith was probably of psammopelitic type.

b) Alteration and structure: It is interpreted that the protolith underwent metamorphism to at least upper greenschist facies (garnet grade) and developed a fine to medium grained, inequigranular, weakly to moderately foliated assemblage of sodic plagioclase and subordinate biotite (both up to 1 mm across), with minor garnet (up to 0.5 mm across, commonly segregated into particular foliae), muscovite, quartz and traces of K-feldspar, brown tourmaline and apatite. Foliation is defined by preferred orientation of the micas. The rock displays a few irregular, approximately foliation-parallel segregations up to several millimetres wide rich in medium to coarse grained strained and variably recrystallised quartz. These also contain local medium to coarse plagioclase and a little garnet, biotite and apatite. The segregations might represent metamorphic "sweat-out" products. The rock subsequently underwent strong pervasive retrograde alteration that would have occurred at low grade (e.g. chlorite grade). This led to almost complete replacement of garnet by chlorite, and biotite by chlorite, muscovite-sericite and trace rutile. In places, plagioclase is also extensively sericitised. Much of the retrograde chlorite is dusted by fine grained hematite. At the retrograde stage, the rock was cut by one or two thin (<0.2 mm) veins of K-feldspar.

c) Mineragraphy and paragenesis: The sample contains patchy finely dispersed hematite, interpreted to be part of the retrograde alteration assemblage and generally associated with chlorite. No sulphide minerals are recognised.

Mineral Mode: Approximate modal proportions are: quartz 35%, muscovite-sericite 30%, plagioclase and chlorite each 15%, hematite 2%, biotite and K-feldspar each 1% and traces of garnet, tourmaline, apatite and rutile.

Interpretation and Comments: It is interpreted that the sample is a weakly to moderately foliated, fine to medium grained plagioclase-biotite-garnet-quartz-muscovite schist, probably representing a former psammopelitic composition. It displays several segregations parallel to foliation containing medium to coarse grained quartz, with minor plagioclase and a little biotite, garnet and apatite. Retrograde alteration at lower greenschist facies was imposed, leading to replacement of most garnet and biotite by chlorite (with some muscovite-sericite at biotite sites). Plagioclase was also extensively sericitised. Minor dusty hematite is part of the retrograde alteration, mostly pigmenting chlorite, and the rock was cut at a late stage by one or two thin K-feldspar veins.

180033 TS

Summary: Retrogressively altered medium grained, moderately foliated quartz-muscovite-biotite-K-feldspar-plagioclase schist. The prograde metamorphic assemblage probably formed under medium grade metamorphic conditions and also included a small amount of sillimanite. Retrograde alteration may have occurred under lower greenschist facies conditions and resulted in the replacement of all plagioclase by sericite, all biotite by muscovite-sericite, hematite and chlorite, most sillimanite by muscovite and the dusting of K-feldspar with hematite. Retrograde alteration must have occurred under oxidising conditions.

Handspecimen: The drill core is composed of a red-brown, hematite-pigmented, moderately foliated, muscovite-bearing quartzofeldspathic schist. The foliation is crenulated and is dominantly oriented parallel to the core axis. A few quartz-rich segregations occur in the schist in the plane of the foliation. The rock is essentially non-magnetic, with susceptibility of $<20 \times 10^{-5}$ SI units.

Petrographic Section:

a) Primary mineralogy and textures: In the section it is evident that the rock is a partly retrogressed quartz-feldspar-mica schist. It is mostly medium grained, with an inequigranular to moderately foliated texture. It contains a metamorphic assemblage that was originally dominated by the prograde minerals quartz, muscovite, biotite, K-feldspar, plagioclase and probably, minor sillimanite. There is no relict pre-metamorphic texture recognisable, but the bulk composition of the rock suggests that the protolith was probably of psammopelitic to psammitic type.

b) Alteration and structure: It is interpreted that the protolith was subjected to medium grade metamorphism, causing complete recrystallisation to a moderately foliated, weakly crenulated, medium grained prograde assemblage. This was dominated by inequigranular quartz, with subordinate amounts of muscovite (flakes up to 2.5 mm long, with larger aggregates possibly pseudomorphous in part after sillimanite), biotite, K-feldspar (microcline, grains up to 1 mm across), plagioclase and traces of tourmaline and apatite. Traces of sillimanite occur within some of the muscovite-rich aggregates. The prograde metamorphic assemblage contains a few elongate quartz-rich segregations (up to 3 mm wide) of medium to coarse grainsize; these are elongate in the plane of the foliation and help define the foliation along with preferred orientation of the micas. The rock was later subjected to pervasive retrograde alteration that probably occurred under low grade metamorphic conditions. All former plagioclase was replaced by fine grained sericite, all biotite was replaced by muscovite-sericite, fine dusty hematite and minor chlorite, most sillimanite was replaced by muscovite-sericite and K-feldspar is commonly slightly dusted by hematite. The presence of hematite does not appear to be related to supergene oxidation.

c) Mineragraphy and paragenesis: The sample contains patchy finely dispersed hematite, interpreted to be part of the retrograde alteration assemblage and mostly associated with retrogressed biotite sites. No sulphide minerals are recognised.

Mineral Mode: Approximate modal proportions are: quartz 60%, muscovite-sericite 25%, K-feldspar 8%, hematite 4%, chlorite 2% and traces of sillimanite, tourmaline and apatite.

Interpretation and Comments: It is interpreted that the sample is a medium grained, moderately foliated quartz-muscovite-biotite-K-feldspar-plagioclase schist that has been subjected to oxidative retrograde alteration. The prograde metamorphic assemblage probably formed under medium grade metamorphic conditions and also included a small amount of sillimanite. Retrograde alteration occurred under lower greenschist facies conditions and resulted in the replacement of all plagioclase by sericite, all biotite by muscovite-sericite, hematite and chlorite, most sillimanite by muscovite and the dusting of K-feldspar with hematite.

180034 TS

Summary: Coarse grained sandstone, grading to conglomerate, with a poorly sorted and generally grain-supported texture. The rock contains abundant detrital quartz, lithics and K-feldspar, with lithic grains including quartz-rich granitic and metamorphic material, plus rare K-feldspar-rich felsic volcanic material. The detrital grains are cemented by hematite-pigmented carbonate (dolomitic), with carbonate also replacing some of the detrital grains. The cementing agency probably occurred under oxidising diagenetic conditions.

Handspecimen: The drill core is composed of rather poorly sorted coarse grained sandstone, grading to conglomerate. It contains quartz-rich detrital grains up to 2 cm across, although most are <8 mm across. There is also minor pink feldspar. Detrital grains are angular to sub-rounded and cemented by dark red-brown hematite and carbonate. Testing of the section offcut with dilute HCl did not cause a reaction, implying that the carbonate is dolomitic. The rock is essentially non-magnetic, with susceptibility of <10 x 10^{-5} SI units.

Petrographic Section:

a) Primary mineralogy and textures: In the section, relict medium to coarse grained detrital grain texture is well preserved. The texture is largely grain-supported, with individual detrital grains up to 8 mm across. The rock contains abundant detrital quartz, with lesser amounts of detrital K-feldspar (microcline) and lithics, with a little plagioclase, FeTi oxide, muscovite and traces of altered biotite, tourmaline and zircon. Lithic grains include medium to coarse grained quartz-rich, quartz-K-feldspar and finer grained quartz-rich and quartz-muscovite types (e.g. granitic and psammitic/psammopelitic metamorphic type), along with uncommon fine grained, hematite-pigmented, K-feldspar-rich felsic volcanic material (e.g. Gawler Range Volcanics). Detrital grains are largely surrounded by cementing material and the latter has also invaded and replacement some of the detrital feldspar, lithic and muscovite grains. The cementing material is dominated by fine to medium grained turbid carbonate, with a little sericite and strong pigmentation by fine grained hematite. The primary features of the rock indicate that it represents a rather coarse sandstone, grading into conglomerate. It has been derived from a rather proximal source with a granitic, quartzofeldspathic metamorphic and felsic volcanic provenance.

b) Alteration and structure: The sedimentary rock has undergone significant alteration, interpreted to be of diagenetic type. There has been strong development of fine to medium grained carbonate as the cementing agent and it is accompanied by abundant fine grained hematite pigmentation and a little sericite. There has been patchy replacement of detrital feldspar and feldspar-bearing lithic grains by carbonate. All detrital FeTi oxide grains have been replaced by hematite ± leucoxene and all detrital biotite has been replaced by sericite and hematite. Detrital muscovite has also been partly replaced by carbonate. The alteration evidently occurred under oxidising conditions with high CO_2 activity.

c) Mineragraphy and paragenesis: The sample contains significant fine grained dusty hematite as a pigmenting agent of cementing carbonate. Hematite has also replaced detrital FeTi oxide grains and has dusted detrital feldspars. No sulphide minerals are recognised.

Mineral Mode: Approximate modal proportions are: quartz 55%, carbonate 22%, K-feldspar 15%, hematite 5%, muscovite-sericite 2% and traces of leucoxene, tourmaline, zircon and plagioclase.

Interpretation and Comments: It is interpreted that the sample is a coarse grained sandstone, grading to conglomerate, with a poorly sorted and generally grain-supported texture. The rock contains abundant detrital quartz, lithics and K-feldspar, with lithic grains including quartz-rich granitic and metamorphic material, plus rare K-feldspar-rich felsic volcanic material. The detrital grains are cemented by hematite-pigmented carbonate (dolomitic), with carbonate also replacing some of the detrital grains. Diagenetic alteration forming the interstitial cement occurred under oxidising conditions.

180035 TS

Summary: Low grade metamorphosed and locally cataclasised, coarse grained quartzofeldspathic sandstone, grading to conglomerate. The rock contains abundant detrital quartz, with subordinate K-feldspar and quartz-rich lithics. There is a minor finer grained matrix component and minor cement of sericite, K-feldspar, quartz and hematite. In places, brittle deformation has occurred, leading to microbrecciation, zones of which contain minor interstitial hematite.

Handspecimen: The drill core is composed of a red-brown to grey and pink, rather poorly sorted coarse grained sandstone, grading to conglomerate. It contains quartz-rich detrital grains and subordinate pink feldspar grains up to 1 cm across. Detrital grains are angular to sub-rounded and they are commonly surrounded by a minor amount of hematite. The rock is essentially non-magnetic, with susceptibility of $<10 \times 10^{-5}$ SI units.

Petrographic Section:

a) Primary mineralogy and textures: In the section, relict detrital grain texture is moderately well preserved. The rock is rather coarse grained, with a largely grain-supported texture. Relict detrital grains are up to 8 mm across and are angular to sub-rounded. Single grains and polycrystalline aggregates of quartz are the most common and the largest, but there are scattered detrital grains of K-feldspar (microcline) up to 4 mm across, a few quartz-rich lithics (e.g. quartzite and quartz-feldspar granitic material), uncommon grains of altered FeTi oxide and muscovite and traces of plagioclase and zircon. A matrix component is present and composed of smaller detrital grains. Interstitially, there is a minor cement component, composed of sericite, K-feldspar, quartz and hematite. The relict texture indicates that the rock is a quartzofeldspathic sandstone, grading to conglomerate, probably with a granitic and quartzofeldspathic metamorphic provenance.

b) Alteration and structure: It is likely that the sedimentary rock has undergone low grade metamorphism and weak deformation, leading to irregular zones of cataclasis (microbrecciation). The finer grained matrix and cement component of the rock has been recrystallised and is now an assemblage of sericite, K-feldspar, quartz and hematite, with a trace of leucoxene. Original detrital FeTi oxide grains have been altered to hematite ± leucoxene. Deformed K-feldspar grains are slightly altered to sericite and hematite. Cataclastic zones display microbrecciation of quartz and K-feldspar, with local zones of interstitial hematite.

c) Mineragraphy and paragenesis: The sample contains minor fine grained dusty hematite as a component of the recrystallised fine matrix and cementing material and in the locally cataclastic zones It was probably deposited during low grade metamorphism. No sulphide minerals are recognised.

Mineral Mode: Approximate modal proportions are: quartz 70%, K-feldspar 24%, muscovite-sericite 3% hematite 2% and traces of leucoxene, zircon and plagioclase.

Interpretation and Comments: It is interpreted that the sample is a low grade metamorphosed and locally microbrecciated coarse grained quartzofeldspathic sandstone, grading to conglomerate. The rock contains abundant detrital quartz, with subordinate K-feldspar and quartz-rich lithics. There is a minor finer grained matrix component and minor cement of sericite, K-feldspar, quartz and hematite. A few zones of microbrecciation have been formed and these contain minor interstitial hematite.

180037 TS

Summary: Fine grained, dolomitic hematitic siltstone, with moderately well preserved relict detrital grain texture and fine scale bedding laminations. The rock contains minor detrital quartz and muscovite, along with a little K-feldspar and chlorite. Carbonate (dolomite) is abundant and strongly pigmented by hematite. There has been growth of irregular porphyroblastic aggregates of carbonate.

Handspecimen: The drill core sample is composed of a disaggregated mass of brick red coloured, fine grained, weakly laminated hematitic siltstone. Some individual fragments contain detrital muscovite grains and there are a few white carbonate aggregates up to 3 mm across. The carbonate does not react with dilute HCl and is probably dolomitic. The rock is essentially non-magnetic, with susceptibility of <10 x 10^{-5} SI units.

Petrographic Section:

a) Primary mineralogy and textures: In the section, relict detrital grain texture and fine scale (<0.5 mm) bedding laminations are moderately well preserved. There is a subordinate proportion of relict angular detrital grains set in a fine grained hematite-impregnated carbonate matrix. The detrital grains are up to 0.3 mm across, but are mostly <0.05 mm and include quartz and muscovite, with a little K-feldspar, chlorite (representing altered biotite) and a trace of tourmaline. Diffuse bedding laminations are defined by slight variations in the amounts of detrital grains, carbonate and hematite. The rock is interpreted as being a hematitic dolomitic siltstone.

b) Alteration and structure: The rock is interpreted to have undergone diagenetic alteration, with growth of scattered irregular carbonate porphyroblastic aggregates up to 3 m across. In places, these grow across bedding laminations, locally causing disruption. Larger carbonate porphyroblasts are largely free of hematite pigmentation. It is interpreted that deposition and later diagenetic alteration of the rock occurred under oxidising conditions.

c) Mineragraphy and paragenesis: The sample contains rather abundant dusty hematite as a pigmenting agent of carbonate.

Mineral Mode: Approximate modal proportions are: carbonate (dolomite) 65%, hematite 15%, quartz 13%, muscovite 5%, K-feldspar and chlorite each 1% and a trace of tourmaline.

Interpretation and Comments: It is interpreted that the sample represents a fine grained, dolomitic hematitic siltstone. It has moderately well preserved relict detrital grain texture and fine scale bedding laminations. The rock contains minor detrital quartz and muscovite, along with a little K-feldspar and chlorite. Carbonate (dolomite) is abundant and strongly pigmented by hematite. There has been growth of irregular porphyroblastic aggregates of carbonate. Deposition and diagenetic alteration of the rock have occurred under oxidising conditions.

180041 TS

Summary: Medium grained, slightly laminated, quartzofeldspathic sandstone, with good preservation of relict detrital grain texture. Quartz is the dominant detrital phase, with there is rather abundant K-feldspar (microcline) and a little muscovite and FeTi oxide. Interstitially, there has been probable diagenetic crystallisation of fine grained clay, quartz and K-feldspar, all pigmented by fine grained hematite.

Handspecimen: The drill core sample is composed of a medium grained, slightly laminated, pale brick red coloured sandstone, probably rather quartz-rich. The rock is essentially non-magnetic, with susceptibility of <10 x 10^{-5} SI units.

Petrographic Section:

a) Primary mineralogy and textures: In the section, relict detrital grain texture is well preserved. Slight differences in grainsize define the bedding laminations. The texture of the rock is grain-supported, with grains up to 1 mm across and being sub-rounded to angular. Quartz is the dominant detrital phase, but there is considerable K-feldspar (microcline), with a little muscovite and traces of degraded biotite (chlorite), FeTi oxide, rutile-leucoxene, plagioclase, tourmaline and zircon. There is a minor fine grained microgranular matrix component, composed of low-birefringent clay, with possible quartz and K-feldspar, and a trace of sericite, all pigmented reddish by fine dusty hematite. The characteristics of the sample indicate that it is a medium grained quartzofeldspathic sandstone, most likely with a granitic provenance.

b) Alteration and structure: The rock has probably undergone diagenetic alteration, resulting in crystallisation of fine grained clay, quartz, K-feldspar and trace sericite interstitial to the detrital grains. Hematite pigmentation is part of the alteration and detrital FeTi oxide grains have been replaced by hematite. Evidently, the alteration has occurred under oxidising conditions. The rock has been cut by a single sub-planar vein up to 0.6 mm wide containing fine grained quartz.

c) Mineragraphy and paragenesis: The sample contains rather abundant dusty hematite as a pigmenting agent in the interstitial material, and hematite has also replaced detrital FeTi oxide grains.

Mineral Mode: Approximate modal proportions are: quartz 65%, K-feldspar 28%, clay 3%, hematite 2%, muscovite-sericite 1% and traces of chlorite, tourmaline, zircon, plagioclase and rutile-leucoxene.

Interpretation and Comments: It is interpreted that the sample is a medium grained, slightly laminated, quartzofeldspathic sandstone. There is strong preservation of relict detrital grain texture, with quartz is the dominant detrital phase, although there is rather abundant K-feldspar (microcline) and a little muscovite and FeTi oxide. Interstitially, there has been probable diagenetic crystallisation of fine grained clay, quartz and K-feldspar, all pigmented by fine grained hematite.

180042 TS

Summary: Medium grained, slightly laminated, quartzofeldspathic sandstone. Relict detrital grain texture is well preserved. The rock generally has a tightly-packed, grain-supported texture, with abundant detrital quartz and subordinate K-feldspar. There are a few quartz-rich lithic grains, and a little muscovite and leucoxene-rutile. In some laminae, fine grained matrix material is more prevalent interstitially to detrital grains and is dominated by clay, with lesser amounts of sericite and a little leucoxene-rutile. It is possible that alteration has led to local development of thin sericitic foliae as well as local disaggregation of the detrital grain texture and apparent replacement by clay.

Handspecimen: The drill core sample is composed of a medium grained, pale grey to pale brown coloured, slightly laminated sandstone. It is rather quartz-rich, with minor interstitial clay. The rock is essentially non-magnetic, with susceptibility of <10 x 10^{-5} SI units.

Petrographic Section:

a) Primary mineralogy and textures: In the section, relict detrital grain texture is well preserved and there are diffuse bedding laminations on a millimetric scale, defined by slight differences in detrital grain size. The texture of the rock is generally grain-supported (but not everywhere), with grains up to 1.2 mm across and being sub-rounded to angular. Quartz is the dominant detrital phase, but there is considerable K-feldspar (microcline), with a few quartz-rich lithic grains (fine grained quartzite), plus a little muscovite and leucoxene-rutile and traces of plagioclase, tourmaline and zircon. In places, the detrital grains are tightly packed such that there is little interstitial matrix, but elsewhere, there is minor to considerable fine grained matrix that ranges from clay-rich to locally sericite-rich. The relict features indicate that the rock is a medium grained quartzofeldspathic sandstone, most likely with a granitic provenance.

b) Alteration and structure: The rock has probably undergone diagenetic alteration, manifest largely in the matrix, with development of fine grained low-birefringent clay (e.g. kaolinite) and local sericite, with a little leucoxene-rutile and trace hematite. In a few places, there are thin foliae rich in sericite and there are also a few patches up to several millimetres across that are rich in clay. In the latter zones, textures suggest that there has been disaggregation of the original detrital grain texture, with partial replacement of detrital grains by clay. This characteristic might represent argillic alteration superimposed on the sandstone.

c) Mineragraphy and paragenesis: There is a tiny trace of hematite in the matrix material. No sulphides have been observed.

Mineral Mode: Approximate modal proportions are: quartz 60%, K-feldspar 19%, clay 15%, sericite + muscovite 3%, leucoxene-rutile 2% and traces of plagioclase, tourmaline, zircon and hematite.

Interpretation and Comments: It is interpreted that the sample is a medium grained, slightly laminated, quartzofeldspathic sandstone. Relict detrital grain texture is well preserved. The rock generally has a tightly-packed, grain-supported texture, with abundant detrital quartz and subordinate K-feldspar. There are a few quartz-rich lithic grains, and a little muscovite and leucoxene-rutile. In some laminae, fine grained matrix material is more prevalent interstitially to detrital grains and is dominated by clay, with lesser amounts of sericite and a little leucoxene-rutile. It is possible that alteration has led to local development of thin sericitic foliae as well as local disaggregation of the detrital grain texture with possible argillic alteration leading to some replacement of detrital grain by clay.

180044 TS

Summary: Medium to coarse grained, slightly laminated, quartzofeldspathic sandstone. Relict detrital grain texture is well preserved, with quartz being the dominant detrital phase, but accompanied by significant K-feldspar. There is also a minor lithic and FeTi oxide component and traces of muscovite, plagioclase, tourmaline, zircon and leucoxene-rutile. A minor interstitial matrix component is dominated by clay and sericite, with strong hematite pigmentation. The matrix assemblage might have developed during diagenetic alteration and evidently formed under oxidising conditions.

Handspecimen: The drill core sample is composed of a brick red coloured, weakly laminated, medium to coarse grained sandstone. Largest detrital grains are up to 4 mm across and there is only a minor clayey matrix component. The rock is probably quartz-rich, but with significant feldspar. Matrix material is strongly pigmented by hematite. The rock is essentially non-magnetic, with susceptibility of <10 x 10^{-5} SI units.

Petrographic Section:

a) Primary mineralogy and textures: In the section, relict detrital grain texture is well preserved and there are diffuse bedding laminations on a scale of several millimetres, defined by slight differences in detrital grain size. Detrital grains are sub-rounded to angular and up to 3 mm across and the overall texture is grain-supported. Quartz is the dominant detrital phase, but there is rather abundant K-feldspar (microcline), a little FeTi oxide and lithic grains (fine grained polycrystalline quartz and K-feldspar-rich, hematite-pigmented felsic volcanic material), plus traces of detrital muscovite, plagioclase, tourmaline, zircon and leucoxene-rutile. There is a single bedding lamination up to 1 mm wide in which there is a concentration of FeTi oxide grains. Interstitial to detrital grains, there is a minor matrix component composed of fine grained, low-birefringent clay (e.g. kaolinite), sericite, dusty hematite and trace leucoxene-rutile. The characteristics of the sample indicate that it is a medium to coarse grained quartzofeldspathic sandstone, most likely with a granitic-dominated provenance.

b) Alteration and structure: The rock has probably undergone diagenetic alteration, manifest largely in the matrix, with development of fine grained low-birefringent clay (e.g. kaolinite), sericite, abundant dusty hematite and a trace of leucoxene-rutile. There is also slight alteration of detrital feldspar grains to the same minerals. Detrital FeTi oxide grains have been replaced by hematite ± leucoxene-rutile.

c) Mineragraphy and paragenesis: Dusty fine grained hematite is a common pigmenting agent in the matrix material. Detrital FeTi oxide grains have been replaced by hematite ± leucoxene-rutile. No sulphides have been observed.

Mineral Mode: Approximate modal proportions are: quartz 70%, K-feldspar 20%, clay 4%, hematite 3%, sericite + muscovite 2% and traces of leucoxene-rutile, plagioclase, tourmaline and zircon.

Interpretation and Comments: It is interpreted that the sample is a medium to coarse grained, slightly laminated, quartzofeldspathic sandstone, in which relict detrital grain texture is well preserved. Quartz is the dominant detrital phase and is accompanied by significant K-feldspar. There is also a minor lithic and FeTi oxide component and traces of muscovite, plagioclase, tourmaline, zircon and leucoxene-rutile. A minor interstitial matrix component is dominated by clay and sericite, with strong hematite pigmentation. The matrix assemblage might have developed during diagenetic alteration and evidently formed under oxidising conditions.

180045 TS

Summary: Medium to coarse grained quartzofeldspathic sandstone. Relict detrital grain texture is moderately well preserved, with quartz being the dominant detrital phase, but accompanied by significant K-feldspar. There are also a few lithic grains and traces of detrital FeTi oxide, muscovite, plagioclase, tourmaline and leucoxene-rutile. In places, there is a minor interstitial matrix component, dominated by clay, sericite and minor hematite. The rock may have undergone low grade alteration and slight metamorphic recrystallisation, together with development of a few sub-planar to irregular zones of micro-brecciation.

Handspecimen: The drill core sample is composed of a massive, medium to coarse grained, quartzofeldspathic sandstone with a range in colour from pink to pale grey and local dark brick red. Detrital grains are up to 5 mm across and there is a minor amount of interstitial clay. The rock is essentially non-magnetic, with susceptibility of $<10 \times 10^{-5}$ SI units.

Petrographic Section:

a) Primary mineralogy and textures: In the section, relict detrital grain texture is moderately well preserved. Detrital grains are up to 4.5 mm across, are sub-rounded to angular and rather tightly packed. In places, there is a minor fine grained matrix component. Quartz is the dominant detrital grain type, but there is a considerable amount of K-feldspar (microcline). There are a few lithic grains (K-feldspar-rich, hematite-pigmented felsic volcanic material and fine grained quartzite), along with traces of muscovite, plagioclase, FeTi oxide, leucoxene-rutile and tourmaline. The matrix, where present, is composed of fine grained, low-birefringent clay (e.g. kaolinite), sericite and a little hematite. The characteristics of the sample indicate that it is a medium to coarse grained quartzofeldspathic sandstone, most likely with a granitic-dominated provenance.

b) Alteration and structure: The rock has probably undergone diagenetic alteration, perhaps grading into low grade metamorphic effects and indicated by local polygonisation of relict detrital grain texture. The minor matrix development of clay, sericite and hematite, along with replacement of detrital FeTi oxide grains by hematite, might reflect pervasive alteration. The rock has been cut by a couple of irregular to sub-planar zones of micro-brecciation up to several millimetres wide, in which relict detrital grains are commonly shattered.

c) Mineragraphy and paragenesis: Dusty fine grained hematite occurs sparsely in the matrix material. Detrital FeTi oxide grains have been replaced by hematite ± leucoxene-rutile. No sulphides have been observed.

Mineral Mode: Approximate modal proportions are: quartz 70%, K-feldspar 23%, clay 4%, hematite and sericite + muscovite each 1% and traces of leucoxene-rutile, plagioclase and tourmaline.

Interpretation and Comments: It is interpreted that the sample is a medium to coarse grained quartzofeldspathic sandstone. Relict detrital grain texture is moderately well preserved, with quartz being the dominant detrital phase, but with significant K-feldspar. There are also a few lithic grains and traces of detrital FeTi oxide, muscovite, plagioclase, tourmaline and leucoxene-rutile. In places, there is a minor interstitial matrix component, dominated by clay, sericite and minor hematite. The rock may have undergone low grade alteration and slight metamorphic recrystallisation, together with development of a few sub-planar to irregular zones of micro-brecciation.

180046 TS

Summary: Medium to coarse grained quartzofeldspathic sandstone with weak bedding laminations and moderately well preserved relict detrital grain texture. Quartz is the dominant detrital phase, but with considerable K-feldspar, a little FeTi oxide and traces of muscovite, plagioclase, tourmaline, zircon and leucoxene-rutile. There is little matrix, perhaps due to low grade metamorphism and polygonisation of detrital grains. Hematite occurs along grain boundaries and has replaced detrital FeTi oxide grains.

Handspecimen: The drill core sample is composed of a weakly laminated, medium to coarse grained, pink-grey to brick red coloured quartzofeldspathic sandstone. Weak bedding laminations are defined by slight variations in detrital grain size and are at a high angle to the core axis. Detrital grains are up to 5 mm across, with abundant quartz and lesser amounts of pink feldspar. A single thin lamination contains abundant small hematite grains. Fine dusty hematite is probably responsible for the colour impregnation. The rock is essentially non-magnetic, with susceptibility of $<10 \times 10^{-5}$ SI units.

Petrographic Section:

a) Primary mineralogy and textures: In the section, relict detrital grain texture is moderately well preserved. The rock is medium to coarse grained and has a tightly packed detrital grain texture. Weak bedding laminations are defined by slight variation in detrital grain size. Detrital grains are up to 4 mm across and are sub-rounded to angular. Quartz is the dominant detrital grain type, but there is a considerable amount of K-feldspar (microcline), a little FeTi oxide and traces of muscovite, plagioclase, zircon, leucoxene-rutile and tourmaline. There is a single lamination up to 1 mm wide that is rich in "heavy minerals", mostly FeTi oxide, but with a little zircon, leucoxene-rutile and tourmaline. There is very little matrix material, probably due to recrystallisation effects. The characteristics of the sample indicate that it is a medium to coarse grained quartzofeldspathic sandstone, most likely with a granitic-dominated provenance.

b) Alteration and structure: The rock may have undergone low grade metamorphism, leading to partial polygonisation of relict detrital grain texture. Interstitial to detrital grains is a minor amount of recrystallised quartz, sericite and fine hematite dusting. Detrital FeTi oxide grains have been replaced by hematite ± leucoxene-rutile.

c) Mineragraphy and paragenesis: Dusty fine grained hematite occurs along grain boundaries throughout. Detrital FeTi oxide grains have been replaced by hematite ± leucoxene-rutile. No sulphides have been observed.

Mineral Mode: Approximate modal proportions are: quartz 75%, K-feldspar 21%, hematite 2%, sericite + muscovite 1% and traces of zircon, leucoxene-rutile, plagioclase and tourmaline.

Interpretation and Comments: It is interpreted that the sample is a medium to coarse grained quartzofeldspathic sandstone. It has weak bedding laminations and moderately well preserved relict detrital grain texture. Quartz is the dominant detrital phase, but with considerable K-feldspar, a little FeTi oxide and traces of muscovite, plagioclase, tourmaline, zircon and leucoxene-rutile. There is little matrix, perhaps due to low grade metamorphism and polygonisation of detrital grains. Hematite occurs along grain boundaries and has replaced detrital FeTi oxide grains.

180048 TS

Summary: Fine to medium grained, hematite-pigmented quartzofeldspathic sandstone with bedding laminations and well preserved relict detrital grain texture. The rock has a grain-supported texture, with quartz being the dominant detrital phase, accompanied by considerable K-feldspar, a few lithic grains and traces of FeTi oxide, muscovite, plagioclase, tourmaline and leucoxene-rutile. Minor interstitial matrix is dominated by fine dusty hematite, but there are scattered spots in the rock with no hematite that might reflect localised reduction. The spots contain sericite and clay as minor matrix components.

Handspecimen: The drill core sample is composed of a brick red coloured, weakly laminated, fine to medium grained sandstone. Laminations are approximately normal to the core axis and are on a millimetric scale. The rock is probably quartz-rich, but with some feldspar and prominent hematite pigmentation. Scattered throughout are white globular "spots" up to 3 mm across. The rock is essentially non-magnetic, with susceptibility of <10 x 10^{-5} SI units.

Petrographic Section:

a) Primary mineralogy and textures: In the section, relict detrital grain texture is well preserved and there are bedding laminations on the millimetric scale, defined by differences in detrital grain size. Detrital grains are mostly angular, but a few of the larger grains (up to 1 mm across) are sub-rounded. The texture is generally grain-supported, with quartz being the dominant detrital phase, accompanied by subordinate K-feldspar, a few small lithic grains (fine grained quartzite and sericite-rich material) and traces of muscovite, plagioclase, tourmaline, FeTi oxide and leucoxene-rutile. A minor amount of interstitial matrix material is present and dominated by hematite, with minor sericite and low-birefringent clay (e.g. kaolinite). The characteristics of the sample indicate that it is a fine to medium grained quartzofeldspathic sandstone, most likely with a granitic-dominated provenance.

b) Alteration and structure: It is interpreted that the rock has experienced diagenetic alteration under oxidising conditions. Significant dusty hematite was deposited interstitially to detrital grains along with a little clay and sericite. Detrital FeTi oxide grains were replaced by hematite. The hematite pigmentation has been destroyed in scattered globular spots and its place appears to have been taken by increased amounts of fine sericite and clay interstitial to detrital grains. The spots might reflect local reduction zones.

c) Mineragraphy and paragenesis: Dusty fine grained hematite occurs as a rather abundant pigmenting agent interstitial to detrital grains. Detrital FeTi oxide grains have been replaced by hematite. No sulphides have been observed.

Mineral Mode: Approximate modal proportions are: quartz 70%, K-feldspar 20%, hematite 4%, sericite + muscovite 3%, clay 2% and traces of leucoxene-rutile, plagioclase and tourmaline.

Interpretation and Comments: It is interpreted that the sample is a fine to medium grained, hematite-pigmented quartzofeldspathic sandstone with bedding laminations and well preserved relict detrital grain texture. The rock has a grain-supported texture, with quartz being the dominant detrital phase, accompanied by considerable K-feldspar, a few lithic grains and traces of FeTi oxide, muscovite, plagioclase, tourmaline and leucoxene-rutile. Minor interstitial matrix is dominated by fine dusty hematite, probably indicating diagenetic alteration under oxidising conditions. The rock also contains scattered spots with no hematite that might reflect localised reduction. The spots contain sericite and clay as minor matrix components.

FOURTH ANNUAL TECHNICAL REPORT

EL 3214 Karkarook, South Australia

For the Period Ending 23 June 2008

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FOURTH ANNUAL TECHNICAL REPORT FOR EL 3214 "KARKAROOK" FOR THE FOUR YEAR PERIOD ENDING 23 JUNE 2008

SUMMARY

This report is a combined report synthesised from work carried out over four years, from 24 June 2004 to 23 June 2008, on EL 3214 "Karkarook". EL 3214 is subject to a Letter of Agreement whereby Uranium One Australia Pty Ltd (formerly Southern Cross Resources Australia Pty Ltd) is deemed to have a 90% interest in all minerals except gypsum and can earn further equity in the licence by meeting certain conditions and conducting exploration for uranium on the tenement. A formal agreement exists between Uranium One Australia Pty Ltd and Olliver Geological Services.

Work compiled by Uranium One, indicates that basement rock was not intersected by the 1978-1983 Pancontinental drilling within defined target areas. Uranium One recognises that the potential still remains for unconformity style uranium mineralisation within the Driver River area.

Exploration activities conducted during the first four years of tenureincluded:

- Compilation of open file data, , acquisition and reprocessing of historical geophysics
- Inspection and sampling of historical drill cores drilled into EL 3214 and surrounding areas
- Planning for the acquisition of new geophysical surveys to define drill targets
- Procurement of a drilling contractor proved to be a difficult task; as only one diamond drill hole was required
- A detailed GPS gravity survey by Haines Surveys PL - 133 gravity stations over 13 N-S trending lines
- Two E-W oriented Pole-Dipole Induced Polarization traverses completed by Search Exploration
- One diamond drill-hole (KAR001) of NQ diameter was drilled for 672 metres. The core from this hole was geologically and structurally logged, geochemically assayed and subjected to a petrological examination. Drill-hole KAR001 was the subject of a PACE drilling subsidy. A Final Drilling Report was submitted to PIRSA following completion.
- A drilling program comprising three diamond drill-holes totalling 533 metres was targeted to intersect the unconformity between the Hutchison group meta-sediments and the blue range sediments for unconformity-style uranium mineralisation. However, no uranium mineralisation or associated alteration was detected.

- The cores were geologically logged and samples from KAR004 were sent to AMDEL for multi element analysis; the results of which will be presented in the next annual report.

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EL3214_2008_A_01_ReportBody.xls
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EL3214_2008_A_04_DownholeSurveys.xls

1 INTRODUCTION

This is the Fourth Annual Technical Report for EL 3214 "Karkarook" for year ending 23 June 2008.

EL 3214 was granted to Olliver Geological Services Pty Ltd on 24 June 2004 and has been subsequently renewed for one year periods. It will now expire 23 June, 2009,after a term of five years.

The tenement is subject to a Letter of Agreement whereby Uranium One Australia Pty Ltd is deemed to have a 90% interest in all minerals except gypsum and can earn further equity in the licence by meeting certain conditions and conducting exploration for uranium on the tenement A formal agreement has been drawn up between Uranium One Australia PL and Olliver Geological Services PL.

The tenement covers part of the Driver River and Driver River Pan, which contains a radiometric anomaly first discovered and investigated by SADM in 1954.

1.1 Location and access

EL 3214 is located about 140km nor-northeast of Port Lincoln and about 25km west of the township of Cleve, on the southern Eyre Peninsula (Figure 1). The area is accessed by a main sealed road between Port Lincoln and Cleve and by numerous well serviced un-sealed roads throughout the region.

It lies within the central eastern portion of the Kimba (**SI53-7)** 1:250,000 map sheet and on the Verran 1:100,000 (**6130)** sheet. The area is contained by two separate tenement areas.

1.2 Physiography

The tenement area is dominated by dissected rolling uplands mainly utilised for the cultivation of cereal crops with lesser sheep and cattle grazing.

1.3 Native Title and Land Access Clearance

EL 3214 lies within the Barngarla Native Title Claim. The land is Freehold land, for which Native Title is generally considered to be extinguished.

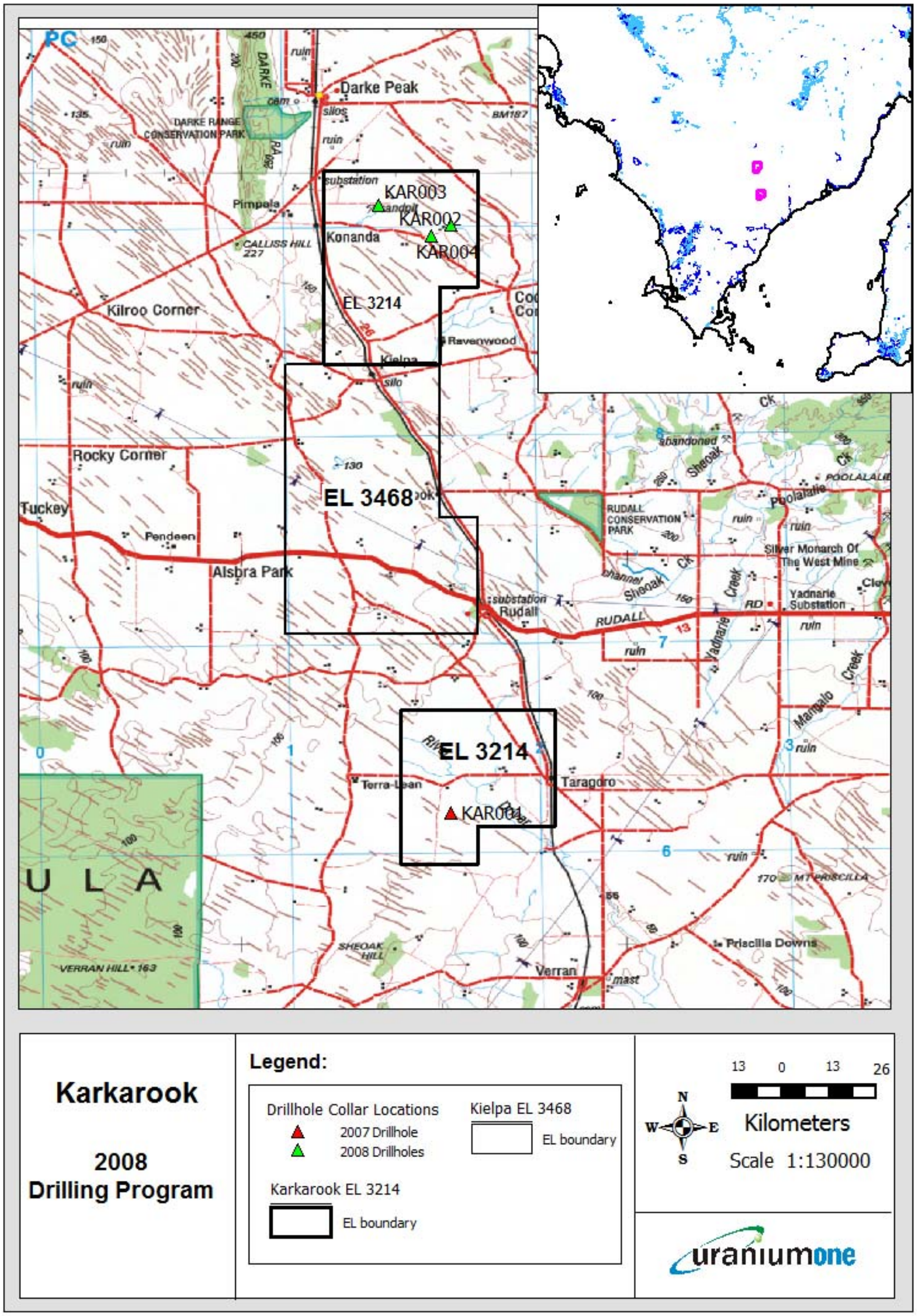

Figure 1 Location plan for 3214 - Karkarook, Eyre Peninsula SA.

2 GEOLOGY

2.1 Overview of the Geology of the Gawler Craton

The following is taken from Parker (1987).

The tenement area lies within the Cleve Subdomain of the Gawler Craton in the central Eyre Peninsula. The eastern margin of the Gawler Craton is marked by the Torrens Hinge Zone, a major crustal feature up to 25km wide. The southern margin is defined as the southern edge of shallow Precambrian cratonic basement on the southern continental shelf. The northern, north-western and western boundaries are not so clearly defined as a relatively thick Neoproterozoic and Phanerozoic cover.

The development of the Gawler Craton can be summarised into three principal tectonic events:

1. 2700-2300 Ma: Late Archaean sedimentation and volcanism followed by Early Proterozoic plutonism and metamorphism (Sleafordian Orogeny)
2. 1950-1700 Ma: initial basin and platform sedimentation followed by widespread plutonism, metamorphism, and deformation (Kimban Orogeny 1850-1700Ma) with local volcanism and continued sedimentation to about 1700 Ma. (Approximately late Palaeoproterozoic)
3. 1650-1450 Ma: anorogenic acid magmatism including extensive felsic volcanism, high level granite plutonism and local intracontinental clastic sedimentation. (Approximately early Mesoproterozoic)

2.1.1 Archaean to Earliest Proterozoic

The oldest basement rocks of the Gawler Craton are the Mulgathing Complex in the NW and the Sleaford Complex (2300-2650Ma) in the south. The Sleaford Complex contains two principal components:

- an older Archaean ancestral supracrustal layered gneiss sequence, the Carnot Gneiss, which was metamorphosed during the Sleafordian Orogeny (2450-2550Ma).
- an intrusive granitoid suite, the Dutton Suite, emplaced about 2300-2350Ma

Both the Sleaford Complex and Mulgathing Complex are granulite facies gneiss complexes.

2.1.2 Early Proterozoic (Palaeoproterozoic)

There is little recorded sedimentary or tectonic activity in the Gawler Craton from 2300 to 2000Ma. On the southern Eyre Peninsula the Sleaford Complex is overlain by clastic metasediments of the Hutchison Group.

The Hutchison Group (described in detail below) is considered to have been deposited about 1950 to 1850 Ma, because it overlies the 1950Ma Miltalie Gneiss in the central Eyre Peninsula, and is intruded by 1850Ma granitoids. Subsequent U-Pb zircon dates on rhyodacites of the Bosenquet Formation have placed a minimum age of 1845Ma on the Hutchison Group.

The Hutchison Group has been subject to episodic deformation and associated metamorphism which can be attributed to the Kimban Orogeny (1850-1700Ma) with peak metamorphic grades of middle to upper amphibolite facies.

Peak metamorphism and associated deformation of the Kimban Orogeny occurred at 1850-1700Ma and is constrained by geochronological SHRIMP U-Pb dating of zircons from granitoids ranging from early I-type granodioritic bodies (Donington Granitoid Suite) to late orogenic ademellite plutons.

Mylonites throughout the eastern Eyre Peninsula and in the northwest of the craton formed during late orogenic development and represent major crustal shear zones.

East of the Middleback Ranges, low metamorphic grade schist, amphibolite and minor quartzite of the Broadview schist are associated with felsic volcanics and fine grained gneiss, deemed the Myola Volcanics. These are stratigraphically younger (1791±4Ma) than the Hutchison Group, however they have been subject to part of the same orogenic cycle (that affected the Hutchison Group). The Myola Volcanics have been correlated with the Argylla and Bottletree Formations of the Mount Isa Inlier on both geochronology and geochemistry criteria.

Other non-intrusive units not described further are the Doora Schist and Moonta Porphyry, the McGregor Volcanics and Moonabie Formation, and the Gawler Range Volcanics.

Intrusive sequences of the Palaeoproterozoic of the Gawler Craton include a very broad spectrum of granitoids ranging in age from 1850-1600Ma and show varying degrees of deformation and recrystallisation. In the southern portion of the craton these granitoids are known as the Lincoln Complex, which includes the Donington Granitoid Suite. The minimum age of emplacement is thought to be 1700Ma with 1600Ma being a crystallisation age.

2.1.3 Middle Proterozoic (Mesoproterozoic)

The earliest Mesoproterozoic records a significant change in the tectonic character of the Gawler Craton. The clastic sediments and felsic volcanics that formed during this period are not highly deformed and form a relatively flat blanket over the north-eastern portion of the craton.

Voluminous felsic volcanics, the Gawler Range Volcanics (1600-1590Ma), were accompanied by clastic, fluviatile sediments of the Tarcoola and/or Labyrinth formations in the NW, and the Corunna Conglomerate in the SE.

Large anorogenic granite plutons of the Hiltaba Suite accompanied volcanism about 1590-1580Ma.

2.2 Regional Geology of the Tenement Area

The following is summarised from Drexel *et al* (1993).

The northern tenement area covers rocks of the Cleve Subdomain, a Palaeoproterozoic fold belt composed of tightly folded, high-grade metasediments (of the Hutchison Group) derived mainly from clastic shallow-marine sediments, iron formations, carbonates and mafic with much lesser acid volcanics.

The metasediments of the Cleve Subdomain overly an Archaean to very early Proterozoic basement (Sleaford Complex); and were intruded by numerous granitoids (Lincoln Complex) during the Kimban Orogeny (***K***D_{1-3}; 1850-1700Ma); a period of major deformation and metamorphism.

The southern portion of the tenement area covers the sediments and volcaniclastics of the Neoproterozoic-Triassic-Cretaceous Polda Trough, which partially overlies Mesoproterozoic sediments of the deep elongate east-west trending Itiledoo Basin.

The Mesoproterozoic basal sediments, the Blue Range Beds uncomformably overlie the Palaeoproterozoic Hutchison Group. The projected contact between the Palaeoproterozic sequence and the Mesoproterozoic sequence trends through the northern portion of the tenement.

2.2.1 Palaeoproterozoic Geology (2500-1600Ma)

This following summary of geology is taken exclusively from Drexel *et al* (1993).

The Hutchison Group consists of basal quartz clastics (the Warrow Quartzite), with local pebble conglomerate and calc-silicate gneiss, overlain by carbonate, iron formation, amphibolite and pelitic to semipelitic schist of the Middleback Subgroup and Yadnarie Schist. Highly deformed rhyodacites (Bosanquet Formation) occur within the Yadnarie Schist. A detailed description of these units follows.

The Hutchison Group has been subject to episodic metamorphic and deformation events with peak metamorphism occurring during the Kimban Orogeny with peak metamorphic mineral assemblages reflecting upper amphibolite to lower granulite facies.

Hutchison Group – Warrow Quartzite

The Warrow quartzite forms the base of the Hutchison Group and unconformably overlies the Sleaford Complex on the south-western and central Eyre Peninsula. Quartz pebble conglomerate and trough cross-bedding occurs in massive quartzite, and have been interpreted as fluvial to marginal-marine proximal sediments with a western provenance.

Dominant lithologies are moderate P-T mineral assemblages containing muscovite, quartzite, feldspar microcline, ± andalusite, ± sillimanite and conglomerates contain lensoidal coarse-grained recrystallised quartz pebbles in a finer grained muscovite quartzite matrix. Accessory minerals include rutile, monazite, zircon, tourmaline and opaque minerals.

In the sub-regional area near EL 3214, the Warrow Quartzite varies from massive to flaggy quartzite with local pelitic schist interbeds where the thickness of quartzite is also variable.

Hutchison Group – Middleback Subgroup

Overlying the Warrow Quartzite is the Middleback Subgroup, consisting of mixed semi-pelitic and chemical metasediments with amphibolite units that are parallel to the tectonic fabric which are believed to represent the original igneous intrusives. The thickness of the Middleback Subgroup is variable due a combination of primary and tectonic processes; and is thought to be in excess of 2000-2500m.

The base of the Middleback Group is the Katanga Dolomite, a massive to poorly layered, white to grey dolomitic marble. Layering (if present) is defined by bands of serpentine and calcite ± diopside ± tremolite alternating with massive dolomite.

The Katunga Dolomite grades up into the Lower Middleback Jaspilite, consisting of banded haematite and/or magnetite quartzite, carbonate, schist and dark coloured chert grading into red and black jaspilite. This unit contains a range of banded iron formation (BIF) facies.

The relationship with the underlying the Katunga Dolomite is varied and complex with dolomite grading into iron formation in a number of ways:

- chert beds (10-20mm thick) alternate with dolomite and ferroan dolomite, while silica and iron have progressively replaced carbonate
- graphite is prominent at the contact
- iron sulphide are also prominent at the contact

Overlying the Lower Middleback Jaspilite is the Cook Gap Schist (also known as the Mangalo Schist). This unit is a thick (>1500m) semipelite, garnet-mica schist grading to a foliated gneiss gneiss with minor calc-silicate gneiss, magnetite-bearing gneiss, and contains fabric parallel amphiboles, and is locally migmatitic.

Amphibolite intrusives depict the boundary between the Lower Middleback Jaspilite and the Cook Gap Schist and are up to 100m thick within the tenement area. The amphibolites vary in mineralogy from fine grained schistose whose fabric is defined by biotite and hornblende to a porphyroblastic texture that contains xenoblastic porphyroblast within a schistose matrix. These amphibolites are chemically homogenous and are likely to be igneous intrusives that contain localised carbonate-pelite metasediment clasts.

Overlying the Cook Gap Schist is the Upper Middleback Schist (or Mount Shannon Iron Formation) which is chemically and in terms of facies variation has much in common with the Lower Middleback Jaspilite. The Upper Middleback Jaspilite consists of carbonate, silicate and mixed carbonate-silicate-facies and oxide facies (Banded iron formation) is locally present. Massive, pale grey to reddish dolomite often occurs between iron formation and underlying schist.

Hutchison Group – Upper Hutchison Group

The Yadnarie Schist forms the base of the Upper Hutchinson Group and conformably overlies the Upper Middleback Jaspilite within the region of the tenement area. The Yadnarie Schist is composed of medium to fine-grained, pelitic to semipelitic, quartz veined mica schist containing mainly quartz, muscovite, biotite, plagioclase, sillimanite, garnet, tourmaline with minor opaque minerals.

Near the tenement area, the Bosanquet Formation forms the base of the Upper Hutchinson Group, consisting of deformed and recrystallised megacrystic rhyodacite with relict phenocrysts of microcline and quartz, and bands of medium to coarse-grained diopside-rich calcsilicate gneiss that varies from 0.2 to 20m thickness.

The relationship between the Yadnarie Schist and the Bosanquet Formation is unknown but believed to be laterally equivalent to each other. The Bosanquet Formation has a U-Pb zircon date of 1845±9 Ma. This date represents (the age of the rhyodacite) the minimum age of deposition of the Hutchison Group.

Lincoln Complex

A complex of granitoid and mafic intrusives, emplaced during the Kimban Orogeny into the Hutchison Group and the Sleaford Complex are defined as the Lincoln Complex.

On the southern Eyre Peninsula three granitoid suites have been identified:

1. Donnington Granitoid Suite
2. Colbert Suite
3. Moody Suite

2.2.2 Mesoproterozoic Geology (1600-1000Ma)

This period records a significant change in the tectonic character of the Gawler Craton. The clastic sediments and felsic volcanics that formed during this period are not highly deformed. Voluminous felsic volcanics, the Gawler Range Volcanics (1600-1590Ma), were accompanied by clastic, fluviatile sediments of the Tarcoola and/or Labyrinth formations in the NW, and the Corunna Conglomerate in the SE.

Gawler Range Volcanics

Not described here.

Corunna Conglomerate

The Corunna Conglomerate is predominantly fluviatile, with abundant proximal crystalline basement clasts. Thick carbonaceous siltstone and sandstone at the top of the sequence were probably deposited in a shallow to moderately deep restricted marine basin. At Corunna thin felsic volcanics are interlayered with the sediments, and felsic dykes and plugs correlated with the Gawler Range Volcanics are locally present.

The Corunna Conglomerate unconformably overlies the McGregor Volcanics and is intruded by the Charleston Granite (dated at 1585±5Ma), placing the broad age of the Corunna at 1740-1585Ma.

Labyrinth Formation

Not described here.

Itiledoo Basin – Blue Range Beds

On central Eyre Peninsula in the EL 3214 tenement area, arenaceous sediments are assigned to the Blue Range Beds of the Itiledoo Basin, a major elongate east-west trough containing up to 2500m of sediments deposited in a braided stream-alluvial fan environment.

Basal sediments immediately above the unconformity with the Hutchison Group, east of the EL 3214 in the Cleve area, are sandy conglomerates. Sub-rounded to well-rounded quartz and quartzite cobbles up to 0.2m are common. Basal sediments grade upward into well-sorted, medium to coarse grained sandstone with sub-angular to sub-rounded feldspathic sandstone matrix. Trough cross-bedding and planar cross-bedding are ubiquitous while graded bedding is common. Overturned forsets, sandstone dykes and slumped bedding also occur. These sediments have a pervasive mauve and cream colour mottling either streaked along bedding or patchily distributed. Liesegang banding is common. Thin network quartz veins with rare micaceous and botryoidal haematite veins are present. Bedding dips are generally shallow at less than 15°, but locally can be up to 70°.

The Blue Range Beds have been correlated with the Corunna Formation on the basis of quartz and haematite veining, apparent gentle deformation and lithological characteristics. The difference being that the Corunna Formation has close association with the Gawler Range Volcanics and the Hiltaba Suite granitoids.

Cariewerloo Basin – Pandurra Formation

Not described here.

Hiltaba Suite

Massive anorogenic granitoids forming large batholiths and smaller plutons in the Gawler Craton are collectively termed the Hiltaba Suite. Included within the suite are the Charleston Granite, Tickera Granite, Calca Granite, Roxby Downs Granite, Balta Granite, and many others.

Compositionally the suite is bimodal but granites predominate. Mafic lithologies are typically hornblende-bearing quartz monzodiorite, quartz monzonite, and granodiorite with SiO_2 contents <65%. Felsic lithologies are mainly granite with lesser adamellite, aplite and pegmatite. These granites appear pink due to their felsic composition.

The Hiltaba Suite is considered by U-Pb zircon dates to be 1600-1585Ma.

2.2.3 Neoproterozoic Geology (1000-545Ma)

Polda Basin

A narrow east-west trending graben extending more than 350km from near Cleve in the east westward to the continental margin in the Great Australian Bight. The location of the Polda Basin was controlled by the tectonic rejuvenation of a pre-existing fracture system that earlier influenced deposition of Itiledoo Basin sediments, the Blue Range Beds.

The Kilroo Formation comprises the oldest unit confined to the Polda basin. It consists of mixed clastics, evaporites and volcanics. The Kilroo Formation is interpreted as a succession of continental clastics and playa-lake evaporites, with localised synchronous basaltic and andesitic volcanism. This combination suggests the basin was a tectonically active intracratonic rift graben with associated volcanism, most likely within a wrench-fault system. The Kilroo Formation has been interpreted as Adelaidean, occurring under arid, terrestrial conditions in fluvial and playa-lake environments. Sedimentation within the Polda Basin also continued during the Phanerozoic (not mentioned here).

3 REVIEW OF PREVIOUS WORK

Kerr-McGee Australia Ltd 1967-1969 (PIRSA Open File Envelope 01108)
Kerr-McGee geologists noted the similarity between Eyre Peninsular radioactive occurrences and those at Rum Jungle in the Northern Territory. Exploration included flying a radiometric survey followed by surface examination of 27 anomalous areas. The highest readings were obtained in the Driver River where sampling of radioactive muds revealed high radium but negligible uranium content. Seventy two rotary holes were drilled to test Tertiary sediments with holes spaced 1600 metres (1 mile) apart. Thirteen shallow core holes were drilled into subcropping basement rock to test downward continuity of anomalous radioactivity. Most radioactivity was attributed to thorium in highly felspathic gneissic rocks. No drilling was undertaken at Driver River where the radioactive anomalism was considered to be derived from spring water seeping from lignitic horizons in the Tertiary sequence.

Pancontinental Mining Ltd, PNC Exploration (Aust) Pty Ltd and Afmeco 1978-1983 (PIRSA Open File Envelopes 03412, 5019)
Pancontinental geologists constructed a detailed assessment of the Driver River anomaly and while acknowledging the radioactivity of Tertiary sandstone, considered that this did not preclude the possibility of "leakage from a Middle Proterozoic sequence via faults". One core hole (DDH 803.1) was drilled to a depth of 112.4 metres approximately 50 metres west of the strongest anomaly. The hole intersected "redbed" sandstones of the Mesoproterozoic Blue Range Beds without significant radioactivity.

In a follow-up program, Pancontinental drilled 5 rotary percussion holes (numbered 32.1 to 32.5) on a 2300 metre traverse which included the core hole. The drilling confirmed the presence of a substantial fault as interpreted from aeromagnetics, however the unconformity below the Blue Range Beds on the down-thrown side of the fault was not tested. Holes were terminated at 200 metres as deeper testing was not considered to be warranted. Exploration by Pancontinental ceased when funding from joint venture partners dried up due to the introduction of the "Three Mines Policy".

3.1 Summary of Historic Metalliferous Exploration

Historical exploration in the area covering EL 3214 has focussed on many commodities and a variety of exploration models. Table 1 details previous Exploration Licences that cover or partially overlap EL 3214; and Figures 2 to 6 show the spatial relationship between EL 3214 and other explorers' tenements.

EL NUM	GRANTED	EXPIRY	LICENSEE	PIRSA Doc	LOCALITY
3214	20040624		Olliver Geological Services Pty Ltd		Karkarook Area
2981	20020628		Adelaide Exploration Ltd, Olliver Geological Services Pty Ltd		Verran - 60 Km West Of Cowell
2790	20010123		PlatSearch NL		Rudall Area
2648	19991001	20040930	Olliver Geological Services Pty Ltd		Hincks Area
2550	19980917	20030916	Olliver Geological Services Pty Ltd		Karkarook Area
2305	19970404	20020403	Olliver Geological Services Pty Ltd	ENV9385	Verran Area
2259	19970110	20020109	Minotaur Gold Ltd		Caralue Bluff Area
2139	19951222	20001221	Platsearch NL		Rudall Area
1862	19930830	19941007	Western Mining Corp. Ltd	ENV8048	Darke Peak Area
1794	19921030	19930716	Poseidon Exploration Ltd	ENV8511	Butler
1724	19910603	19941007	Stockdale Prospecting Ltd	ENV6566	Cleve Area
1517	19880922	19920720	Stockdale Prospecting Ltd		Verran
1501	19880704	19930703	Western Mining Corp. Ltd	ENV8048	Darke Range
1320	19860226	19910225	Stockdale Prospecting Ltd	ENV6566	Cleve
1215	19840111	19850110	CRA Exploration Pty Ltd		Lock
1067	19821108	19850619	Pancontinental Mining Ltd	ENV5019	Verran
893	19810928	19820927	Pancontinental Mining Ltd	ENV4848 ENV3551	Darke Peake
803	19810212	19821129	Pancontinental Mining Ltd	ENV4848	Toolgie-Verran-Eyre
492	19790615	19810614	Pancontinental Mining Ltd	ENV3551	Darke Peake
431	19781113	19801112	Pancontinental Mining Ltd	ENV3412	Tooligie
131	19740429	19741016	Urangesellschaft Australia Pty Ltd	ENV2419	Darke Peak

Table 1 Previous Exploration Licences over EL 3214 - Karkarook since 1970

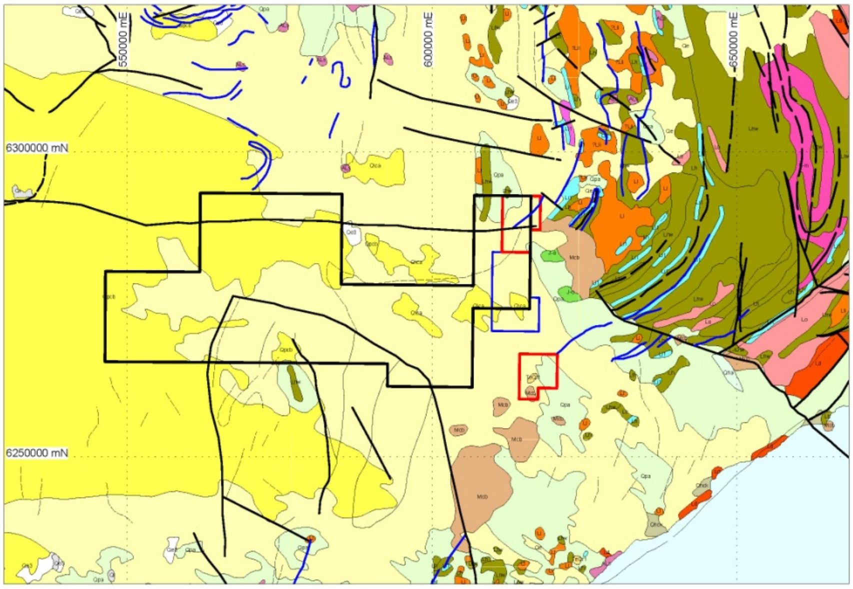

Fig 2; Historical Exploration – CRA (black outline), SXR EL 3214 (red outline); Lh–Hutchison Group (olive-green); Mcb–Blue Range Beds (tan); Ll–Lincoln Complex (orange); Li1–Jaspillite (sky blue); Lo–Moody Suite (pink); L-m–Miltalie Gneiss (dark pink)

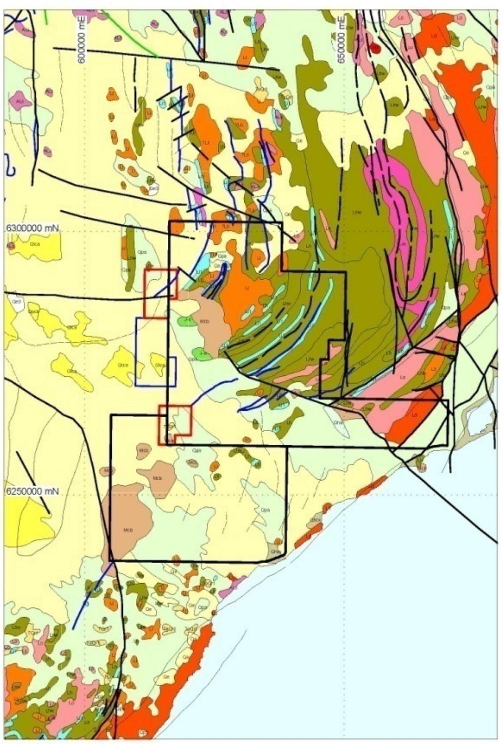

Fig 3; Historical Exploration – Stockdale (black outline), SXR EL 3214 (red outline); Lh–Hutchison Group (olive-green); Mcb–Blue Range Beds (tan); Ll–Lincoln Complex (orange); Li1–Jaspillite (sky blue); Lo–Moody Suite (pink); L-m–Miltalie Gneiss (dark pink)

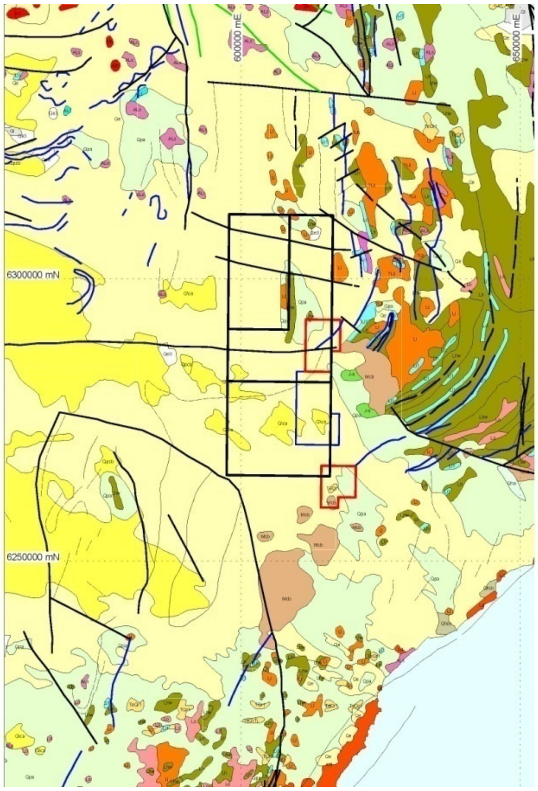

Fig 4; Historical Exploration – Western Mining Corp (black outline), SXR EL 3214 (red outline); Lh–Hutchison Group (olive-green); Mcb–Blue Range Beds (tan); Ll–Lincoln Complex (orange); Li1–Jaspillite (sky blue); Lo–Moody Suite (pink); L-m–Miltalie Gneiss (dark pink)

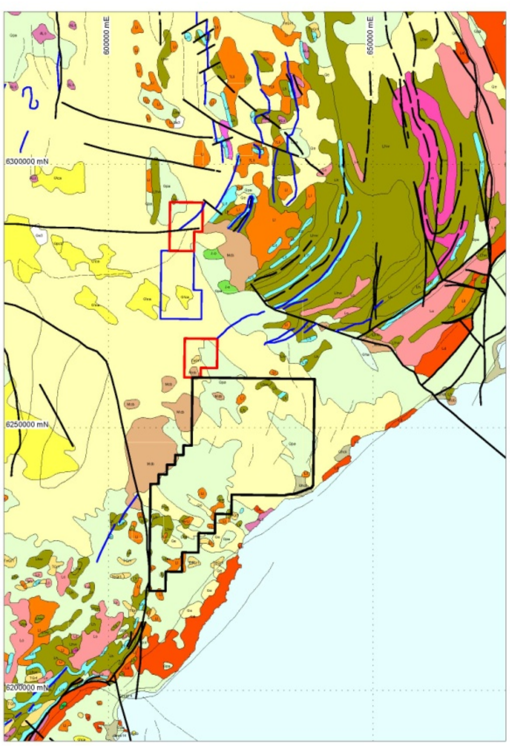

Fig 5; Historical Exploration – Poseidon (black outline), SXR EL 3214 (red outline); Lh–Hutchison Group (olive-green); Mcb–Blue Range Beds (tan); Ll–Lincoln Complex (orange); Li1–Jaspillite (sky blue); Lo–Moody Suite (pink); L-m–Miltalie Gneiss (dark pink)

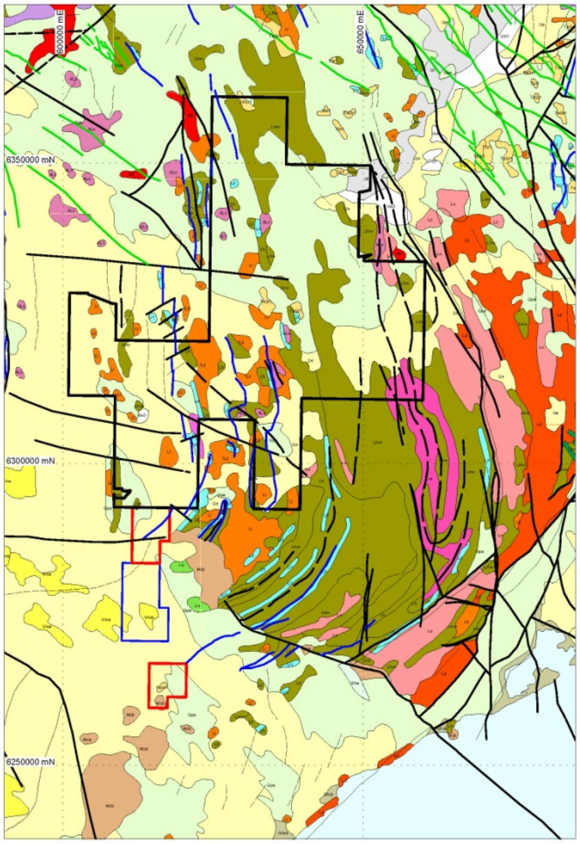

Fig 6; Historical Exploration – Minotaur (black outline), SXR EL 3214 (red outline); Lh–Hutchison Group (olive-green); Mcb–Blue Range Beds (tan); Ll–Lincoln Complex (orange); Li1–Jaspillite (sky blue); Lo–Moody Suite (pink); L-m–Miltalie Gneiss (dark pink)

3.2 Historic Uranium Exploration

A brief mention of previous uranium-specific exploration within the region of EL 3214 is made here. The most significant work was undertaken by Urangesellschaft in 1974 and Pancontinental Mining (and Joint Venturers) from 1978 to 1985.

Urangeselleschaft Australia

Figure 7 shows the area of tenement interest for Urangesellschaft relative to the current SXR tenement EL 3214.

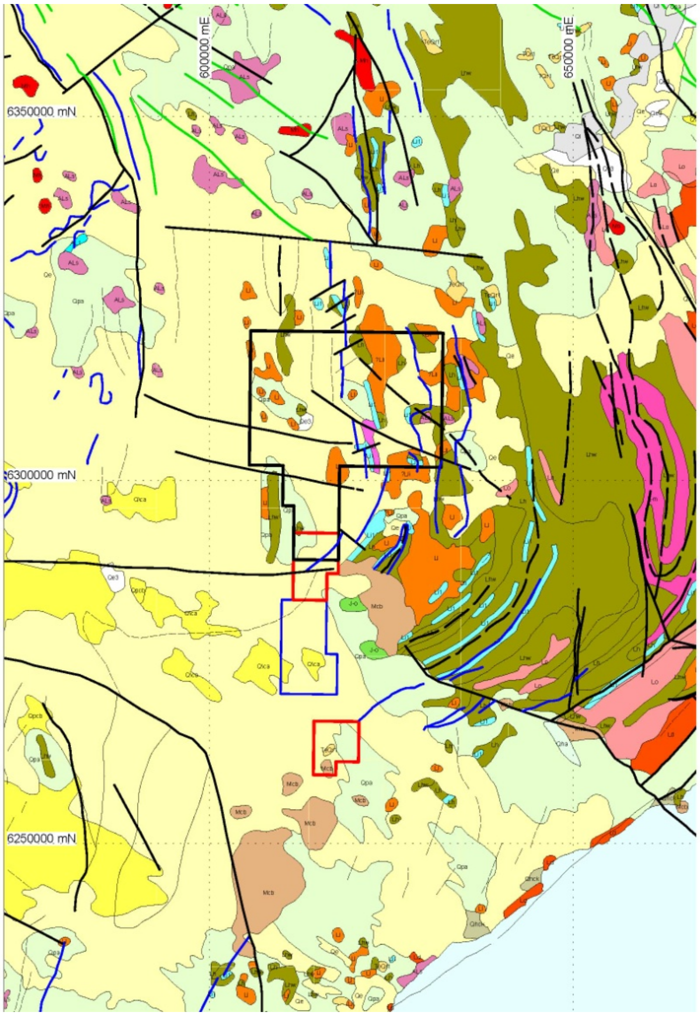

Fig 7; Historical Exploration – Urangesellschaft (black outline), SXR EL 3214 (red outline); Lh–Hutchison Group (olive-green); Mcb–Blue Range Beds (tan); Ll–Lincoln Complex (orange); Li1–Jaspillite (sky blue); Lo–Moody Suite (pink); L-m–Miltalie Gneiss (dark pink)

Pancontinental Mining Ltd

Figure 8 shows the group area of tenement interest for Pancontinental relative to the current SXR tenement EL 3214.

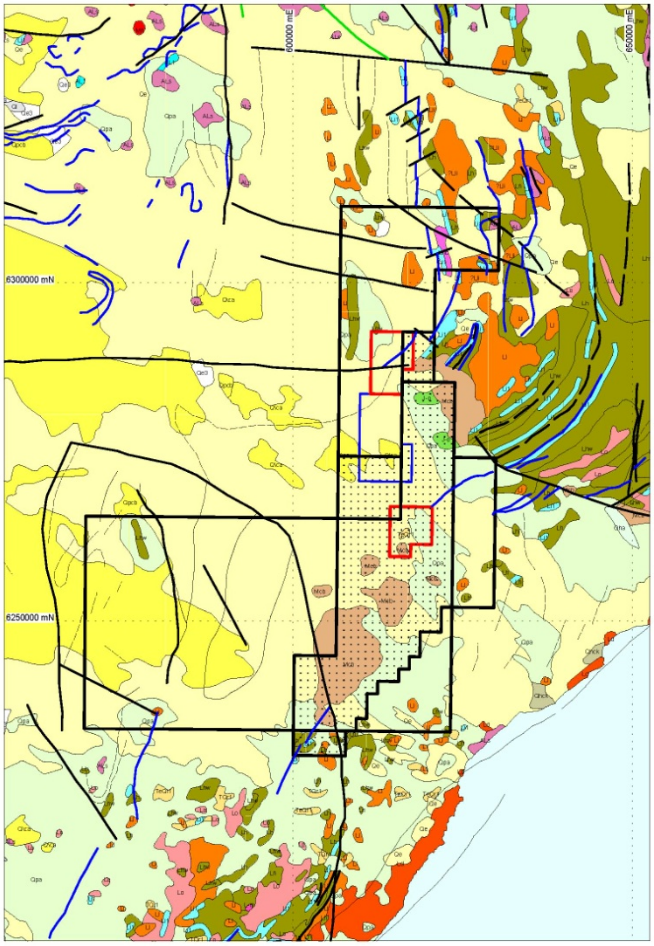

Fig 8; Historical Exploration – Pancontinental (black outline), Pancontinental EL1067 (stipple), SXR EL 3214 (red outline); Lh–Hutchison Group (olive-green); Mcb–Blue Range Beds (tan); Ll–Lincoln Complex (orange); Li1–Jaspillite (sky blue); Lo–Moody Suite (pink); L-m–Miltalie Gneiss (dark pink)

4 PREVIOUS WORK ON EL 3214

Existing geophysical and geological datasets have been assessed. However, the failure of AEM to see through saline groundwater in the area suggested that additional surface geophysical surveys were warranted. A gravity survey and two lines of Induced Polarisation were completed over sections of Karkarook. In addition, one diamond drill hole was completed. Drill-hole material was submitted for petrological and geochemical analyses, to Paul Ashley and AMDEL Laboratories respectively. The results of these analyses are included within the Appendices of this report.

4.1 Gravity Survey

A detailed GPS gravity survey was carried out in an area approximately 20km west of Cleve in South Australia. The survey was conducted over 3 days from 26 October 2006 to 28 October 2006 by Haines Surveys Pty Ltd.

4.2 Previous Drilling

Initially, one diamond drill hole of NQ diameter was drilled (KAR001). An angled hole was drilled to allow collection of correctly oriented structural information. Core has been geologically logged and samples have been collected for multi-element geochemical analysis.

4.3 Geochemical Analysis

Core from KAR001 was assayed for a comprehensive suite of metals and non-metals. A total of 41 samples (including standards) were analysed

5 EXPLORATION WORK CARRIED OUT DURING THE FOURTH YEAR OF TENURE

A drilling program that comprised three NQ diamond drill holes was carried out during June 2008. Drillholes KAR002 – KAR004 have a combined total depth of 533 meters with the following attributes:

Hole ID	**KAR002**	**KAR003**	**KAR004**
Collar Co-ordinates (GDA94 Zone53)	616 561 mE 6 289 976 mN	613 561 mE 6 290 988 mN	615 761 mE 6 289 479 mN
Hole Dip at collar	75 Degrees	75 Degrees	75 Degrees
Hole azimuth at collar	217° magnetic	262° magnetic	235° magnetic
Depth (EOH)	106.20m	144.30m	281.40m

5.1 Drilling summary

Drilling in the northern region of EL 3214 has revealed that the depth to basement shallows out quickly to the north with no Blue Range beds being intersected before hitting Hutchison Group metasediments. This suggests that the Polda Basin shallows significantly to the north, or that displacement along E-W faults produces offsets of up to 500m across graben blocks. The geology intersected by the three drillholes are interpreted as Hutchison group metasediments that generally reflect lithologies that range from metasiltstone to quartz veined mica schist to locally gnessic.

The eastern-most drillhole KAR002 intersected a well-banded, FeO stained, grey metasiltstone that is referred to by Drexel *et al.* 1993 as ‘Pyjama Rock’. The rock is locally brecciated however structural deformation is significantly less than other Hutchison Group lithologies.

Drillholes KAR003 & 004 intersected lithologies that are interpreted as the Yandnarie Schist and the succeeding Middleback Jaspilite. The Yandnarie Schist is semi-pelitic and is composed of biotite, sericite, quartz, plagioclase ± muscovite and minor opaques. The mineralogy is generally dependent upon the sedimentary composition of the rock. Fine-grained metasiltstone sections are dominated by biotite, plagioclase and quartz whose mineral alignments define the tectonic fabric. Stringer quartz veins contain minor disseminated sulphides and crystalline feldspar. Sericite and chlorite are the dominant retrograde minerals that are relatively abundant throughout. Coarse-grained sandstone intervals retain bedding laminations and contain crystalline quartz pebbles and sub-angular megacrystic clasts of rhyolite. Fault-bound breccia zones are ptygmatic in texture and contain strong retrograde alteration and large (1-8cm) clasts. Chlorite and apple-green carbonates are common on fracture surfaces.

Below is a summary of the lithological description of the two logged holes.

Table 3 Summary of the Geological log of KAR002

Depth (m)	Lithology Description
0-22m	Fine-medium grained FeO stained Quaternary clays and sands
22-38m	Yellow, fine-grained Goethitic clay with oxidised sands
38-50m	Medium-grained quartz sands with a minor goethitic clay component
50-62m	Coarse-grained, sub-angular quartz sands with biotitic siltstone fragments. End of mud drilling at 62m
62-74m	Fine-grained meta-siltstone with minor hematite alt within brecciated zones. Biotite and quartz mineral alignments define a weak foliation that is planar to the weakly preserved bedding laminations. Interpreted as the well-banded, iron stained 'Pyjama Rock'.
74-96.8m	Strongly altered breccia zone, composed of sub-angular (1-5cm) siltstone clasts with crystalline feldspar, quartz and fine biotite. Retrograde (alteration) minerals include sericite and albite, however the majority of the matrix being strongly altered by FeO.
96.8-106.2	Highly fractured core within a strongly brecciated zone. There is notably less FeO alteration within the breccia which is composed of sub-angular sedimentary clasts with moderate sericite and carbonate alteration.

Table 4 Summary of the geological log of KAR003

0-19.60m	Drilled with mud bit, Quaternary sands and muds that are oxidised ranging from hematitic to goethitic.
19.60-32.95m	Grey-black siltstone with strongly altered breccia zones that are fracture bound. Breccias are composed of angular clast conglomerates (including lithic fragments of rhyodacite) that have been strongly altered by sericite, apple green carbonates and minor chlorite. Crystalline, coarse-grain quartz-feldspar pegmatite veins follow fractures within breccia zones.
32.95-40.02m	Strongly altered zone with a ptygmatic texture. Laminations within siltstones contain "S" type folds that are axial planar to the predominant fracture plane (Kinematics imply reverse sense movement). The preserved sedimentary lithology varies from claystone to dimictite with sericite, biotite and quartz dominating the mineralogy. Minor quartz ± feldspar stringer veins contain disseminated sulphides at 36.8m.
40.02-47.10m	Strong sericite alteration, moderately brecciated where the matrix is composed of a medium to coarse-grained sedimentary groundmass that contains sub-rounded 1-10mm quartz and rhyolite clasts. Large (2-3cm) elongate clasts of siltstone and rhyodacite have been replaced by biotite. A weak foliation is defined by the mineral alignment of biotite and quartz.
47.10-54.92m	Fine-grained siltstone with strong biotite alteration; contains minor quartz stringer veins that are axial planar to the lamination. Biotite elongation lineations are abundant on fracture planes and are directly oblique to the dominant fabric. Larger veins are pegmatitic in nature and are composed of crystalline quartz, feldspar, K-feldspar and minor biotite. Calcsillicate veins contain minor disseminated sulphates at 49.50m.
54.92-114.90m	A largely undifferentiated interval where the majority of the groundmass is composed of dimictite sediments with 1-3cm quartz and minor rhyolitic clastics. Overall the texture is ptygmatic where biotite selvages exist on fine quartz veins that define a weak foliation. Bedding is discernable in coarse-

	grained calcsilicate sections and appears planar to the mineral fabric. At 101.40-101.65m a fine-grained, strongly altered area contains unaltered coarse-grained quartz layers that contain considerable disseminate sulphides. Chlorite is common on fracture surfaces.
114.90-117.0m	Coarse-grain matrix of sandstone detritus with moderate chlorite alteration. No apparent foliation however biotite aggregates gives a mottled appearance. A large quartz ± biotite vein runs vertically through this interval. A single relict garnet phyroblast (at 115.55m) contains a decompression texture where the garnet is being replaced by biotite, quartz and chlorite.
117.0-144.3m	Varies from ptygmatic to mottled in texture with minor breccia zones that contain 2-4cm clasts. A majority of the groundmass is a coarse-grained sandstone. Sericite is the dominant alteration mineral, whilst all fine-grained sediments have been completely replaced by biotite. Feldspar is present in highly brecciated zones/ high fluid migration zones. Chlorite is abundant on fracture surfaces.

KAR004 was not geologically logged, samples have been sent for geochemical analysis in order to determine the mineralogy and trace-element chemistry of the Hutchison group metasediments.

5.2 Geochemistry

Samples from KAR004 have been sent to AMDEL for multi-element analysis. A full interpretation of the results will be presented in the next annual report.

6 CONCLUSIONS AND RECOMMENDATIONS

The 2008 drilling program did not intersect the contact between the Blue Range sediments and Hutchison Group metasediments within the northern region of EL 3214. KAR001, which is located some 28km to the south of KAR002-004, intersected the unconformity between the Blue Range Beds and the Hutchison Metasediments at ~627m. This implies that the basement shallows significantly to the north, or that the stratigraphy is offset by E-W trending faults.

Drilling has intersected metasediments that exhibit metamorphic and retrograde mineralogy that reflects hydrous conditions with episodic migration of oxidative fluids. Such metamorphic conditions attribute to the mobilisation of uranium and are the catalyst for hydrous transportation. The mineralogy within the Hutchison group metasediments that were intersected by 2008 drilling show that potential exists for uranium mineralisation.

As no Blue Range Beds were intersected within the northern region of EL 3214 it is plausible to assume that the unconformity lies further to the south. This will be targeted by future drilling for unconformity-style uranium mineralisation. The near surface lithology of the intensely deformed metasediments infers that the Hutchison Group metasediments have been subject to faulting, which has attributed to the migration of fluids. Retrograde alteration halos are apparent within the vicinity of dominant faults with brecciation and sericite ± chlorite alteration being stronger within these zones that infers fluid migration along these faults. The presence of conjugate kinematics may reflect the re-activation of half-garben normal faults as reverse thrust faults during retrograde metamorphism.

Future drilling will be directed toward intersecting the unconformity between the Blue Range sediments and Hutchison Group metasediments further to the south, where the Blue Range Beds are interpreted to shallowly overlie crystalline basement when compared to the basement depths intersected by KAR001 in the southern portion of EL 3214.

7 EXPENDITURE

Table 7: Detailed expenditure for the fourth year of tenure for EL 3214 ending 23/06/2008

Drilling	
Compensation	
Geochemistry	
Surveying and Mapping	
Salaries	
Consumables	
Office and Computing	
Travel and Accommodation	
Administration and Management	
TOTAL	**337600**

8 REFERENCES

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Ganguly, J., Hensen, B. J., & Cheng, W. 2001. *Reaction texture and Fe-Mg zoning in granulite garnet from Sostrene Island, Antarctica: Modelling and constraint on the time scale of metamorphism during the Pan-African collisional event.* Journal of Earth Science. Vol 110, No 10.

Parker, A.J., 1987 *Archaean to Middle Proterozoic Mineralization of the Gawler Craton (including the Stuart Shelf region) SA. REPT.BK.NO 87/84.* Department of Mines and Energy South Australia.

teneman consulting

MINERAL TENEMENT SERVICES

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1 March 2010

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Dear Sir/Madam

EL 3214 Karkarook - Annual Technical Report and Final Report for the year ending 23 June 2009

EL 3214 was granted to Olliver Geological Services Pty Ltd on 24 June 2004 and expired after a term of five years on 23 June 2009. The tenement is Joint Ventured with Uranium One Australia Pty Ltd.

During the final year of tenure no field work was undertaken.

As no new technical data were acquired during the period, a formal report will not be submitted.

Expenditure on the tenement for the period 24 June 2008 to 23 June 2009 was $3,886 and total expenditure for the life of the tenement was $618,986. Expenditure details have been provided in the relevant Summary Reports.

Please contact me on 08 8414 3352 or 0415 397 870 if you require additional information.

Yours sincerely

Teena Coppin
Tenement Manager
Uranium One Australia Pty Ltd