ANNUAL REPORT
YEAR ENDING 12 MAY 1999
EXPLORATION LICENCE 5890

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PNC EXPLORATION (AUSTRALIA) PTY LTD
SUMMARY

This report describes exploration work undertaken within Exploration Licence 5890 during the 1998 field season. The tenement is located in north western Arnhem Land and was granted in May 1996.

Exploration was carried out by PNC Exploration (Australia) Pty Ltd on behalf of the Yok Joint Venture partners PNC Exploration (Australia) Pty Ltd, Cameco Australia Pty Ltd, and the Yok Aboriginal Corporation.

The primary exploration target is unconformity related vein type uranium deposits similar to the nearby Ranger, Nabarlek and Koongarra deposits.

Exploration work undertaken during 1998 consisted of geological mapping, assessment of airborne anomalies, and regional geochemistry. It included stream sediment sampling (184), power auger sampling (416), RAB drilling (2351 metres: 115 holes) and core drilling (300 metres: 2 holes). A further 456 samples were submitted for assay from drill cuttings and core along with the measurement of 859 PIMA spectra.

RAB drilling delineated the distribution of rock types, in particular prospective porphyroblastic garnet schists near the base of the Myra Falls Metamorphics. Core drilling provided more detailed information to assist future exploration.

The BIR1 and BIR 4 anomalies were confirmed as prospective and require further evaluation.

There has been no significant environmental impact with vigorous regrowth during the wet season of disturbed areas such as RAB access tracks and core drillhole pads.
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1.0 INTRODUCTION

This report covers exploration work completed within Exploration Licence 5890 ("EL5890") during 1998, the third year of tenure ending 12 May 1999. This tenement was explored concurrently with two adjoining tenements, ELs 734 and 5891. Exploration commenced in mid May and was completed by early October.

Exploration is subject to the terms of consent documentation dated 1 March 1996 agreed with the Northern Land Council in accordance with the Aboriginal Land Rights (Northern Territory) Act. As required by the agreement the Work Program was cleared at a meeting of the Liaison Committee held on 16 April 1998.

The Work Program was carried out by PNC Exploration (Australia) Pty Ltd ("PNC") as operator for the Yok Joint Venture, a joint venture between the Arnhem Land West Joint Venture partners, PNC and Cameco Australia Pty Ltd, and the Yok Aboriginal Corporation. Work consisted principally of regional airborne anomaly follow-up, geochemical sampling and drilling.

1.1 LOCATION AND ACCESS

The tenement is located in western Arnhem Land and is wholly within Aboriginal land to the north of the now rehabilitated Nbarlek Uranium Mine (Figure 1). The Oenpelli-Cobourg road traverses the western section of the licence area. There is no established access to the east, but the nature of the topography has allowed traverse by four-wheel-drive vehicles. Where necessary a helicopter was used to facilitate sampling and other activities.
1.2 TENURE

EL5890 covers an area of 1143 square kilometres of which 156 square kilometres has been designated restricted zones following a site survey undertaken by the Northern Land Council. EL5890 was granted on 13 May, 1996 for a period of six years.

1.3 PERSONNEL

Field work was undertaken by the following PNC geologists: P Melville, L Sawyer, D Follington and E Sasao. Others working in the field were C Fenton (senior field technician), M Tracey (cook), L Walker (field assistant) and R Duggan (liaison officer). Four local Aboriginal owners, G Wurkgedj, L Lamilami, C Nawindal and R Managku were also employed as field assistants.

Contractors and consultants used were:

i. Chemnorth/Assaycorp, Darwin for chemical assay;
ii. Pontifex and Associates, Adelaide, for petrography;
iii. Dr D Emerson of Systems Exploration (NSW) P/L for petrophysical studies; and
iv. Gaden Drilling, Batchelor, to undertake core and RAB drilling.

1.4 PHYSIOGRAPHY

The far north-west corner of EL5890 consists of dissected sandstone plateau, however the remainder of the tenement consists dominantly of gently undulating sandy plains. Thin remnants of lateritic weathered Cretaceous sediments form scattered tablelands in the eastern and north-west part of EL 5890. The generally low relief limits the amount of direct drainage. The main drainage systems are those of the King River and Cooper Creek.

1.5 REGIONAL GEOLOGY

EL5890 is located near the north east margin of the Pine Creek Geosyncline, which consists of Palaeoproterozoic sediments and volcanics onlapping Archaean basement highs of the Nanambo Complex and Nimbuwah Complex. The Palaeoproterozoic rocks were metamorphosed during a 1820 to 1870 Ma orogeny. The metamorphic grade varies from lower greenschist to granulite facies with the higher grade rocks (mostly amphibolite facies, minor granulite) restricted to the western Arnhem Land area, including EL 5891. The metamorphic rocks are overlain by late Palaeoproterozoic sandstone of the Kombolgie Formation.

A more detailed description of the Pine Creek Geosyncline can be found in previous Annual Reports (Melville et. al., 1998).

1.6 EXPLORATION TARGET

Exploration focused on the discovery of unconformity related vein type uranium deposits, the nearby uranium deposits of Ranger, Jabiluka, Koongarra and Nabarlek serving as models. The presence of economic gold at Jabiluka and Koongarra, plus the gold-platinum group element ± uranium mineralisation in a similar geological environment at Coronation Hill, indicates
additional potential for gold and platinum group mineralisation. The area is also considered to hold potential for kimberlite or lamproite hosted diamond deposits.

1.7 PREVIOUS EXPLORATION

The area of EL 5890 was held previously as part of a larger tenement by Union Carbide Exploration Corporation, initially for manganese and bauxite but principally for uranium during 1970 to 1972. They undertook a number of airborne surveys. Most of the area was flown with a total count scintillometer, the western part of EL 5890 was flown with a spectrometer/magnetometer, as were some small separate areas. A photo interpretation of the entire area was compiled by Hunting Geology and Geophysics. Airborne anomalies were ground checked and a number were selected for gridding and more detailed work, notably ground radiometrics, geochemical sampling (stream sediment, pisoliths, rock chip or termite mounds), geological mapping and in some cases auger drilling. None of Union Carbide's significant prospects fall within the area of EL 5890.

Union Carbide's exploration work was curtailed in early 1973 by a Federal Government imposed moratorium on further exploration pending a resolution of Aboriginal land rights.

PNC 1996 Field Season
Following grant of title in 1996 initial reconnaissance work, orientation geochemistry and airborne surveys were carried out (Williams et. al., 1997). Airborne surveys included fixed wing magnetics and spectrometries at 200 metre line spacing.

PNC 1997 Field Season
The 1997 program consisted of follow up geochemistry and RAB drilling of anomalies determined from airborne survey analysis. Regional programs of RAB drilling, BLEG and stream sediment geochemistry with geological mapping were also conducted (Melville et. al., 1998).

2.0 EXPLORATION WORK

Exploration focused on the delineation of prospective lithologies towards the base of the Myra Falls Metamorphics (Lower Pelite Zone) as well as evaluation of airborne anomalies located at the intersection of altered fault systems and Oenpelli Dolerite (BIR1, BIR4).

With very little sandstone cover in EL 5890 direct exploration techniques have been employed, particularly airborne and ground spectrometries. However with poor outcrop and widespread regolith, including Cretaceous cover, RAB drilling has been the main exploration tool.

2.1 GEOLOGICAL MAPPING

On-going mapping was required as an extension to the regional outcrop search and airborne interpretation of the 1996 -1997 field season. A detailed account of the major rock types is given in Williams et al (1997).
Prior to commencement of the field season, geological mapping, mineral distributions in gravel samples, airborne magnetics, air photo and drilling data interpretation were used to construct a preliminary interpretive map (Plan 1).

2.2 GEOCHEMICAL SAMPLING

Stream sediment, auger and minor soil geochemical sampling was conducted to assist in regional assessment (Plan 1).

**Stream Sediment**
A set of 184 stream sediment samples was collected regionally, covering the Nimbuwah Complex in the eastern portion of EL5890 (Plan 1). The samples consisted of 50g to 100g of -80# sieved sediment and were analysed for Au, As, Ce, Co, Cu, Fe, Mg, Mo, Ni, Pb, Th, total U, labile U, Y, Zn by ICP-MS.

**Auger**
A power auger was used to obtain ferricrete / pisolith samples up to one metre below surface using the same procedure as outlined in the 1996 annual report (Mackie, 1996). Sampling was conducted over the following areas; Lower Pelite Zone, BIR4, and BIR6. A total of 407 samples were collected (Plan 1). Elements analysed for included Au, Al, As, Ba, Ca, Ce, Co, Cu, K, Li, Mn, Mo, Na, Ni, P, Pb, Rb, Sr, Th, Ti, U, Y, Zn and Zr by ICP-MS and Fe, Mg by ICP-OES.

Coincident with ferricrete / pisolith sampling, separate samples (9) of the fine (<1.6mm) fraction were collected for a selected traverse (Figure 2). This was done to investigate the relationship between fines and ferruginous materials for alteration / anomaly delineation.
2.3 PETROLOGY

One (1) rock sample was collected for thin sectioning and petrographic description. This sample originates from a creek on the north western edge of the Lower Pelite Zone and is similar to the anthophyllite - talc rock which crops out at 50E.

Ten (10) RAB chip samples from airborne anomaly BIR1 were also sent for petrographic description.

2.4 PETROPHYSICS

Two (2) samples from diamond drill core from hole DDH403 (Plan 1) were despatched to Don Emerson for petrophysical studies.

2.5 RAB DRILLING

RAB traverses within the Lower Pelite Zone region were conducted to confirm the interpreted tectonostratigraphy of the Myra Falls Metamorphics, and specifically to identify equivalents of the Lower Cahill Formation (Plan 2). Drilling was conducted on east west lines at 1000m X 400m site spacing covering the region from north to south. Localised traversing for anomaly evaluation was completed at BIR1 anomaly five kilometres north west of camp.

RAB drilling traverses comprised 115 holes for a total of 2351 metres, all RAB holes were located by differential GPS (data file EL5890_1998_RAB.xls).

Top and bottom of each hole were sampled for geochemical analysis (data file EL5890_1998_RAB.xls). Selected holes from BIR1 and Lower Pelite Zone were sampled in their entirety to understand the distribution of elements within the weathered zone. Elements analysed for were Au, Al, As, Ba, Ca, Ce, Co, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, Pb, Rb, Sr, Th, Ti, U, Y, Zn, Zr by ICP-MS on a total of 431 samples.

GR256 spectrometer data were collected from drill cuttings, usually every two metres. Additional geochemical samples were collected where spectrometrics indicated a higher than background response.

Each two metre interval was logged (data file EL5890_1998_RAB.xls) and representative samples placed into storage trays for future reference. PIMA spectrometer clay determinations were conducted on the two metre intervals for selected holes held in storage trays. In addition samples from the bottom of each hole were collected for PIMA spectrometer clay determination. A total of 834 PIMA spectral readings of RAB cuttings were obtained (data set EL5890_1998_RAB_PIMA).

2.6 CORE DRILLING

Two core drill holes, DDH402 and DDH403, were drilled in garnetiferous schists (lower Cahill equivalents) on RAB traverse line 8667900N within the Lower Pelite Zone. A total of 300 metres was drilled. All hole locations were positioned using the differential GPS unit prior to
drilling. Natural radiation was logged down hole in both drill holes using a downhole gamma logging tool.

Lithological and descriptive logs were completed on both holes (data file EL5890_1998_DDH_LOG.xls). A total of 51 PIMA spectral readings of diamond drill core were obtained (data set EL5890_1998_DDH_PIMA). Twenty five (25) samples of drill core, 13 from DDH403 and 12 from DDH402, were collected and despatched for geochemical analysis (data file EL5890_1998_DDH.xls).

2.7 GROUND MAGNETICS

A magnetometer survey was conducted at BIR1 (Figure 3) on a 10 metre north-south X 100 metre east-west spaced grid. The BIR 1 survey was designed to locate the dolerite with which the anomaly is associated. RAB drilling intersected dolerite in several widely spaced holes.

In addition, three RAB lines within the Lower Pelite Zone were extended eastwards and 10 metre spaced magnetic stations were recorded over the selected traverses (Figure 3). A total of 13.2 line kilometres was surveyed. The traverse lines were extended to cover the interpreted contact between the metapelites and the magnetic transitional migmatite.

2.8 DIGHEM SURVEY

A test DIGHEM survey (Figure 4) was flown over the Myra Falls Metamorphics to assess the applicability for mapping units, particularly lower pelitic sequences.
• Cretaceous / Proterozoic unconformity is exposed in an erosional gully where fine grained sandstone overlies weathered, well foliated banded or layered, fine to medium grained quartz-feldspar-biotite gneiss or schistose gneiss;
• an area of schist and micaceous quartzite with associated quartz veining located at the Cretaceous breakaway - quartzite and schist is deformed and brecciated,
  ~ a prominent quartz-filled fault zone strikes 020° foliation strike 040° and dip 35° west
  ~ amphibolite float was traced for over a kilometre downstream with outcrops occurring within and adjacent to the creek,
  ~ quartz veins, some with black tourmaline, and garnetiferous pegmatites were noted within the gneiss sequence,
  ~ a recent conglomeratic deposit developed in the creek bank contains various cobbles and fragments of silicified wood,
  ~ source material for these deposits are surficial pebble deposits overlying the Cretaceous and probably the Cretaceous itself.

Other outcrops located on or near RAB traverse 8671400mN include:
• 306910mE, 8671597mN - dolerite rubble,
  ~ light green-grey aphyric groundmass with phenocrysts;
• 307540mE, 8671640mN - banded / layered amphibolite, 25 m width,
  ~ many cross-cutting veinlets, deformed, ptygmatic,
  ~ coarsely crystalline layers with stretched porphyroblasts,
  ~ migmatite-like foliation in places;
• 307341mE to 307730mE / 8671600mN to 8671760mN - outcropping and rubble amphibolite,
  ~ strike of foliation averaging 030°, moderate to steep westerly dips;
• 308210E, 867060N, abundant amphibolite float over an area of 100m x 100m,
  ~ adjacent creek; white quartzo-feldspathic saprock, minor apple-green clays
  ~ various fresh float in creeks and erosional gullies - fine grained pink granitoid and dark grey quartz-rich biotite gneiss;
• 307855mE, 8670525mN - magnetic migmatite outcrop / minor porphyritic granitoid,
  ~ epidote veinlets,
  ~ foliation strikes 060°, dip 34° south,
  ~ phenocryst lineation 055°;
• 307696mE, 8670230mN - north-south striking quartz vein;
• 307850mE, 8670226mN - cream to greenish quartzo-feldspathic saprock, fresh float of grey quartz-feldspar-biotite gneiss;
• 307670mE, 8670230mN - pegmatoidal saprock;
• 308206mE, 8670354mN - foliated dark grey fine grained biotitic quartz-feldspar gneiss,
  ~ foliation strike 064°, dip steep north;
• 308100mE, 8670057mN - light grey foliated gneiss,
  ~ pods and laminae of coarser material elongated parallel to foliation, bearing 130° with vertical dip;
• 308126mE, 8670040mN - megacrystic granitoid in sharp contact with dark grey, very fine grained gneiss,
  ~ feldspar porphyroblasts to 2 cm in a foliated matrix,
The survey was done as an addendum to work being done for Cameco in the area and consisted of 137.5 line kilometres.

3.0 EXPLORATION RESULTS

3.1 GEOLOGICAL MAPPING

The distribution of tectonostratigraphic subdivisions for the Nimbuwah Complex and Myra Falls Metamorphics has been refined (Plan 1). The principal features as outlined in the 1997 Annual Report (Melville et al, 1998) remain unchanged.

Lower Pelite Zone

Mapping in the northern portion of the Lower Pelite Zone (LPZ) has located basement outcrop consisting of amphibolite and fine to medium grained gneiss and schist, overlain by Cretaceous siltstone and partly covered by surficial conglomerates. Amphibolite crops out near the contact with the Nimbuwah Complex.

The creek system coincident with RAB traverse 8671400mN was mapped extensively and numerous outcrops were recorded. These are summarised below proceeding from the Cretaceous and progressing eastwards through the LPZ and into transitional ‘stromatic migmatite’:

- ferricrete and rubble overlying Cretaceous;
- outcrop of Cretaceous light coloured siltstones, rubbly ferruginous sandstone and other iron-rich material - siltstone trends north-south and dips gently west;
crystals stretched parallel to foliation,
porphyroblast lineation bearing 128°,
- amphibolites in and next to the main north-south drainage;
- ultramafite lithotype in a creek west of RAB traverse 8669400mN.

**BIR6**

As noted in the 1997 Annual Report (Melville et. al., 1998) BIR6 is a small knoll of geothitic-limonitic fine grained sandstone and siltstone fragments with abundant pisoliths. Airborne spectrometrics extend the anomaly south east along a minor ridge spur. Mapping found that the knoll and spur of rubble runs north and north west into a ferricrete and sand covered rise. This rise has been regionally mapped as Cretaceous sediments. The extension of the anomaly south east corresponds to broken ferricrete pavement interspersed with pebbly rubble, sand and pisolith cover. Basement outcrop of leucocratic feldspar-quartz±biotite gneiss was noted west of the south east anomaly extension. This gneiss is similar to a high spectrometric leucocratic gneiss noted approximately one kilometre to the east during the 1997 mapping program.

Enrichment due to weathering and scavenging of radiometric elements from the gneiss into the saprock and ferricrete materials would account for the anomalies (Figure 5).
3.2 GEOCHEMICAL SAMPLING

Stream Sediment

Within the basement Nimbuwah Complex region there are three areas of anomalous labile $U$, shown as the high red sites in Figure 6 below. The easternmost anomalous area in EL5890, Upper Barra Creek, is known to contain high radiometric granites and/or gneisses. Two anomalous samples clustered together are situated within the Anuru Fault system. A line of three anomalous labile $U$ values in central EL5890 may be related to alteration associated with dolerite and faulting.

![Stream Sediments Labile Uranium Assays](image-url)

Anomalous gold values in the -80# samples lie along the Anuru Fault system in the central Nimbuwah Complex area (Figure 7). The gold values along this structure range from 6ppb to 22ppb, and lie north of two labile uranium anomalies. A 32ppb Au anomaly occurs from a drainage further east.

A preliminary examination of the metals values indicates a higher metals concentration association with the Nimbuwah Complex and dolerite intrusions.
Auger

*Lower Pelite Zone*

Auger sample assays located one uranium (11.1ppm) anomaly on traverse 8665400mN. This anomaly is down graded when the uranium to thorium ratio is calculated. In general the auger results failed to locate any significant uranium mineralisation.

Gold assays are anomalous on the eastern sections of traverses 2 and 3, ranging form 6ppb to 10ppb. A gold assay of 5ppb is located at the western end of traverse 2 (8670900mN). A single value of 6ppb is located towards the western end of traverse 10 (8667000mN).

Elevated metal (Cu, Pb, Zn, and Ni) values are generally associated with amphibolites.

*BIR4*

BIR4 anomaly follow-up located further significant uranium in association with elevated cerium (Figure 8). Uranium to thorium ratio of the auger assay confirms the anomaly and shows it to be extended in size from the 1997 results and open to the north west.

*BIR6*

Auger results (Figure 5) do not indicate any extension of the anomaly located from the 1997 results.
3.3 PETROLOGY

Petrological rock sample 9648 is reported to be a weathered anthophyllite-chlorite-talc rock representing a metamorphosed pyroxenite or impure dolomite (document file 5890_1998_Petrology.doc).

Vein quartz, low temperature hydrothermal quartz and breccia were observed in thin section of samples from RAB holes at BIR1 anomaly.

3.4 PETROPHYSICS

Two core samples were forwarded to Dr Emerson. Tables of the Results are given in data file EL5890_1998_PetroFyz.xls. Biotite garnet schists are relatively low resistivity at around 300 ohm metres.

3.5 RAB DRILLING

RAB drilling has provided important information on regolith, basement lithologies, alteration and geochemistry, and has greatly assisted in geological interpretation work.

Lower Pelite Zone
Twelve east-west traverses were completed, alternating with the power auger lines. Both western and eastern limits were determined by the interpreted boundaries of the meta-pelitic
rocks, with amphibole-biotite gneiss to the west and the stromatic migmatite of the Nimbuwah Complex to the east. A total of 97 holes were drilled, numbered RAB274 to RAB370.

The RAB drilling provided information on:
- the distribution and nature of pelitic schists within the LPZ;
- clay alteration minerals;
- geochemistry - a low order gold anomaly but no uranium; and
- the nature of the regolith cover and surficial geochemistry.

A description of the geology for each traverse is given below. Collar, logging and assay data is in the digital data file 5890_1998_RAB.xls, PIMA spectral data is in the data set 5890_1998_RAB_PIMA.

**Traverse One**
The first two holes on the western end intersected a significant thickness of weathered material including the laterite profile, Cretaceous siltstones, fine-grained sandstone and coarse unconsolidated sands. The holes bottomed-out in ferruginous mica schist in RAB274 and in schist and greenish quartzite in RAB275. This coincides with adjacent outcrop of iron-rich schist, quartzite and micaceous quartzite interpreted as part of the upper mica schist unit (Nourlangie Schist).

LPZ lithotypes first appear in RAB276 as banded, thinly layered, fine-grained quartz-feldspar-biotite gneiss. This unit continues east with garnet-rich layers noted in holes RAB281 and RAB284. The latter is more mica-rich with pegmatite and pink and green alteration.

**Traverse Three**
Commencing from the eastern end, holes RAB285 and RAB286 contain probable migmatitic rocks. The former hole intersected a fine-grained quartz-feldspar-biotite gneiss, quartz-rich with some coarser layers. In the latter a fine-grained, pink, quartz-feldspar gneiss with mafic bands is present. Adjacent outcrops confirm the down-hole observations. Progressing west from RAB287, LPZ lithologies appear including biotite-rich quartz-feldspar gneiss and micaceous quartz-feldspar gneiss. Garnets were noted in holes 287, 291/292 and 294. The latter contained abundant violet and rose-pink garnets.

**Traverse Five**
All five holes intersected a fairly monotonous sequence of schistose/micaceous quartz-feldspar-biotite-garnet gneiss. Probable granitoids were located in the most easterly hole (RAB 298).

**Traverse Eight**
Schistose/micaceous quartz-feldspar-biotite garnet gneiss with biotite-rich laminae intersected in most holes. A coarse grained granitoid and layered migmatite occur in holes 299 and 300 located on the eastern end of the traverse. Amphibolite was identified in RAB 308 and garnet amphibolite in RAB 309.

**Traverse Ten**
Garnet-rich sequence intersected over the entire traverse. Lithotypes include biotite schist, a fine grained sugary-textured quartz-feldspar-biotite gneiss and micaceous quartz-feldspar-
biotite-garnet gneiss. A biotite-rich amphibolitic gneiss with some garnet occurs on the western end in RAB 317.

**Traverse Twelve**
Progressing west to east: gneissic at first becoming more biotite-rich / micaceous from RAB320. Orange and pink garnets throughout. On the extreme eastern migmatitic rocks occur in RAB324 with pink/orange altered feldspar and rare deep red garnets. The drill cuttings exhibited slight magnetism.

**Traverse Fourteen**
Schistose to finely layered fine grained gneiss and biotitic schist. Amphibolite intersected below schist in holes RAB327 and RAB329 with garnet in the former. Garnet-rich schist in RAB236. RAB331 intersected slightly haematitic altered biotite schist but only background radiometrics indicated.

**Traverse Sixteen**
Both felsic and mafic gneisses throughout with garnet amphibolite in RAB334.

**Traverse Eighteen**
Dolerite was intersected on the eastern end of this traverse in RAB338. Elsewhere biotite-quartz-feldspar gneiss was encountered.

**Traverse Nineteen**
A very sandy traverse, most holes did not reach bedrock. Three holes intersected quartz-feldspar-biotite gneiss and biotite schist. Minor garnet was noted. Granitic lithology was located on the eastern end of the traverse in RAB348.

**Traverse Twenty One**
Schistose gneiss and biotite schists with garnets in holes RAB351 and RAB353. Probable migmatite and granitoids from RAB355 to RAB360 at the eastern end of the line.

**Traverse Twenty Four**
From east to west: probable granitoids, migmatite from RAB361 to RAB366. Garnet noted in RAB362. Probable LPZ biotite schist and layered gneiss to the western end of the line. Dolerite was logged in RAB363.

**BIR 1**
Ten holes were drilled to adequately cover the airborne anomaly. This program followed an encouraging single hole drilled the previous year. Four holes drilled on or near the roadside were terminated in Cretaceous sediments (RAB264-RAB267). The setting is identical to Marilgur Pass where a thin capping of mudstone overlies water-logged unconsolidated to partly consolidated sands.

The remaining six holes drilled on a grid pattern immediately west of the road intersected altered gneisses. Vein quartz, low temperature hydrothermal quartz and breccia, were observed in thin section (document EL5890_1998_Petrology.doc) within several holes. RAB268 and RAB271 intersected dolerite with the latter hole having what appeared to be a reddish-green soft clayey chloritic-haematitic rock sandwiched between altered gneiss and dolerite.
Petrography was not conclusive. Some localised alteration was also observed in hole RAB268 on the gneiss/dolerite contact.

Spectrometric elemental values indicate anomalous surficial uranium in the overlying ferricrete and in the Cretaceous sands with up to 16 and 28 eU/ppm respectively. Selected drill cuttings from holes RAB268 and RAB271 provided anomalous U of up to 132ppm and 24ppb gold (data file EL5890_1998_RAB.xls).

3.6 CORE DRILLING

Lower Pelite Zone
Two holes were drilled on traverse 67900mN (LPZ traverse eight), DDH402 and DDH403 (data files 5890_1998_DDH_LOG.xls and 5890_1998_DDH.xls).

DDH 402 Extremely sheared and decomposed to 65 metres. Lithotypes include garnet-rich biotite schists and gneisses. Pegmatoidal quartz-feldspar segregations are widespread. Several amphibolite units are present within the sequence. Alteration includes silicification, particularly of the gneissic variants, chlorite, and rarely, pink-red feldspars.

Radiometrics map the lithotypes: troughs correspond to amphibolite while spiky higher intensity zones averaging 200 cps represent schist and gneiss. An isolated sharp peak of nearly 700 cps at 125 metres corresponds to a pegmatitic segregation at the base of an 8 metre thick amphibolite. The latter forms a trough averaging 50 counts. A weak elevation of uranium (10.63 ppm) was noted in the interval 105-115 metres and may account for the sharp radiometric peak.

DDH 403 Drilled 800 metres west of DDH402. Lithologies are similar to hole DDH402. Of note is the occurrence of graphite associated with disseminated sulphides in a zone of shearing between 123 and 125 metres. Chlorite alteration is less intense while neither silicification nor pink-red alteration is present.

Radiometrics again map the lithology. Lows reflect massive gneiss and amphibolite whereas spiky intervals correspond to the schistose units.

Summary Both holes add to the data gained from the 1997 and the current years RAB and shallow core drilling programs. The Lower Pelite Zone is a sequence of garnet-rich meta-sediments with a calc-silicate component. The latter lithotypes are represented in the package by apparently conformable amphibolite units. The presence of minor graphite is encouraging for the model although no specific graphitic meta-sediments have been intersected. PIMA clay determinations have located weak to moderate chlorite alteration within both drill holes (data set 5890_1998_DDH_PIMA).

3.7 GROUND MAGNETICS

Trial ground based magnetic field surveys over BIR1 was successful in locating the alteration zone as delineated from RAB drilling. The survey defined the alteration zone as a flat to very low amplitude region of magnetic depletion.
Three survey lines across the Lower Pelite Zone indicate that ground based magnetic field surveys are able to delineate some of the broader lithology variations.

3.8 DIGHEM SURVEY

Preliminary analysis of the DIGHEM survey across a portion of the Lower Pelite Zone indicates that there are some discernible features within the DIGHEM data. It was noted that some of the response corresponds to ferricrete in the area. Further detailed interpretation is pending.

4.0 ENVIRONMENTAL IMPACT

Cultural impact

Site surveys were conducted by an NLC contracted archaeologist on and in the vicinity of all proposed drill sites within the tenement. The archaeologist was accompanied by traditional owner Wirrdup Nabulwad. The surveys were completed to the satisfaction of the archaeologist.

In the Lower Pelite Zone, northern and southern sections, several traverses were chosen by the archaeologist for inspection as representative of the entire area to be drilled and augered. Nothing of significance was found.

Physical impact

Several tracks were constructed to allow normal vehicular and drill rig access into the Lower Pelite Zone. Only minimal disturbance to the topsoil was caused and destruction of mature trees was avoided. Similarly only minimal clearing was required to open up access and re-establish the project camp which was located at the same site as in 1996 and 1997.

Most regional work was assisted by helicopter although four-wheel-drive vehicles were utilised where access allowed. In this case existing roads and tracks were used for the most part but some cross country travel was necessary.

All drill holes within the tenement were capped and filled after use. The only remaining evidence being the drill cuttings beside each RAB hole. Sampling of drainages and rock chip sampling have no lasting environmental impact.

At the cessation of field activities most equipment was removed from the base camp and returned to Darwin. Two sea containers with camping equipment were left on-site as during the 1996/1997 wet season. Plumbing for the camp ablution block was secured and left on-site as well.

There were no environmental incidents to report.
5.0 REFERENCES


