Cameco Australia Pty Ltd

EXPLORATION LICENCE EL5890

ARNHEM LAND WEST JV

YEAR END 12 MAY 2000 ANNUAL REPORT

CONFIDENTIAL

Date: May 2000

Report No.: AW00-055890

Period: 13 May 1999 to 12 May 2000

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Copies: Cameco Australia Pty Ltd, Master File
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SUMMARY

This report describes exploration work undertaken within Exploration Licence 5890 (EL5890) during the 1999 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 orebodies.

Exploration work undertaken during 1999 included stream sediment sampling, auger sampling, ground magnetics, RAB drilling, diamond drilling and helicopter Electro-Magnetics (EM). Prospects/anomalies investigated included the Anuru Fault zone, 'Lower Pelite Zone' (LPZ), BIR1 and BIR4.

The more significant results obtained from the above activities include: further defining the distribution of prospective garnet-bearing rocks within the lower Myra Falls Metamorphics, the intersection of low order anomalous uranium-gold at anomaly BIR1 by diamond drilling and the location of a resistive low in the centre of the EM survey area which may correspond to a block of prospective lower Myra Falls Metamorphics.

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

TABLE OF CONTENTS

page

1. INTRODUCTION 1
1.1. Location and Access 1
1.2. Tenure 1
1.3. Personnel 1
1.4. Physiography 2
1.5. Regional Geology 2
1.6. Exploration Target 2
1.7. Previous Exploration 2
1.7.1. Union Carbide Exploration Corporation (UCEX) 2
1.7.2. PNC Exploration Results 3
PNC 1996 Field Season 3
PNC 1997 Field Season 3
PNC 1998 Field Season 3
1.8. Stockdale Farm-In 3

2. 1999 EXPLORATION PROGRAM 3
2.1. Geochemical Sampling 4
2.1.1. Stream Sediment 4
2.1.2. Auger 4
2.1.3. Results 4
2.2. Ground Magnetics 5
2.3. RAB Drilling 5
2.3.1. Location and Access 5
2.3.2. Logging And Sampling Methodology 6
2.3.3. Results 6
2.3.4. Conclusions 7
2.4. Diamond Drilling 7
2.4.1. Location and Access 7
2.4.2. Logging and Sampling Methodology 7
2.4.3. Results 8
2.4.4. Conclusions 9
2.5. UTS Heliborne EM Survey 9
2.5.1 Introduction 9
2.5.2 Results 10

3. BIBLIOGRAPHY 10

List of Figures

Page
Figure AW_EL5890_99-01 Location Plan 1
Figure AW_EL5890_99-02 Stockdale Prospecting Limited Program 3
Figure AW_EL5890_99-03 Sample And Drill Hole Location Plan 4
Figure AW_EL5890_99-04 Stream Sediment Uranium Assays 5
Figure AW_EL5890_99-05 Auger sampling Gold Assays 5
Figure AW_EL5890_99-06 Anuru Fault Ground Magnetics Stacked Profiles 5
Figure AW_EL5890_99-07 BIR4 Ground Magnetics TMI 5
Figure AW_EL5890_99-08 RAB gold v uranium bivariate analysis 7
Figure AW_EL5890_99-09 Interpreted Geology 7
Figure AW_EL5890_99-10 KRD411 Geochemistry 9
Figure AW_EL5890_99-11 UTS EM 1525Hz Image 10

List of Appendices

Stream Sediment Sample Assay Data 4
Auger Sample Assay Data 4
Ground Magnetic Survey Data 5
RAB Drill Hole Collar Data 6
RAB Drill Hole Logs 6
RAB Drill Hole Sample Assay Data 6
RAB Drill Hole PIMA Spectra Readme 6
RAB Drill Hole Spectrometric Data 6
RAB Drill Hole Magnetic Susceptibility Data 6
RAB Drill Hole Petrology Sample Location Data 7
Petrography – Mineralogy Report 7942 7
Drill Core Collar Data 7
Drill Core Alteration Log 7
Drill Core Fracture Log 7
Drill Core Lithology Log 7
Drill Core Sample Assay Data 8
Drill Core Magnetic Susceptibility Data 8
Drill Core Pima Spectra Readme 8
Drill Core Petrography Sample Location Data 8
Petrography – Mineralogy Report 7942 8
Heliborne Electromagnetic And Magnetic Logistics Report By UTS 10

1. INTRODUCTION

This report details exploration work completed within Exploration Licence 5890 (EL5890) during the fourth year of tenure (12 months ending 12 May 2000). The tenement was explored concurrently with two adjoining tenements, EL's 734 and 5891. Exploration commenced in late 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 27 April 1999.

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.

1.1. Location and Access

EL5890 is located in western Arnhem Land and is wholly within Aboriginal land to the north of the now rehabilitated Nabarlek mine (Figure AW_EL5890_99-01). The Oenpelli-Gurig National Park road traverses the western side of the tenement providing good access. No established tracks exists to the east, however the nature of the topography allows reasonable traversing by four-wheel-drive vehicles. Where necessary, a helicopter was used to facilitate sampling and other activities.

Figure AW_EL5890_99-01 Location Plan

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. Tenure was granted on 13 May 1996 for a period of six years.

1.3. Personnel

Field work was undertaken by PNC geologists: P Melville, L Sawyer, E Sasao, and T Tsuruta. They were supported by FieldAsst Pty Ltd personnel: C Fenton (senior field technician), J Clarke (field assistant) and V Bartlem (cook). Four aboriginal traditional owners, R Managku, G Wurrkgidj, L Lamilami, and C Nawindal were also employed as field assistants.
Contractors and consultants used were:

- Transport and track work by Wildman River Stock Contractors, Darwin;
- Air charter between Darwin and Oenpelli by Hardy Aviation, Darwin;
- RAB and Diamond drilling by Century Drilling, Batchelor;
- Analytical work by CHEMNORTH, Darwin;
- Airborne EM by UTS Perth;
- Helicopter assisted activities by Rotor Services, Darwin;
- Petrographic work by Pontifex and Associates, Adelaide.

1.4. Physiography

The far north-west corner of the tenement consists of dissected sandstone plateau with the remainder consisting dominantly of gently undulating sandy plains. Thin remnants of lateritic weathered Cretaceous sediments form scattered tablelands in the east and north-east. The generally low relief limits the amount of direct drainage. The principal drainage systems are those of Cooper Creek and King River.

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 Nanambu 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 the tenement. The metamorphic rocks are overlain by late Palaeoproterozoic sandstone of the Kombolgie Subgroup.

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

1.6. Exploration Target

The main focus of exploration is the discovery of unconformity related vein type uranium deposits. The nearby uranium deposits of Ranger, Jabiluka, Koongarra and Nabarlek serve as models for this exploration. Nabarlek is particularly appropriate as a model in view of the similar geological setting and close geographical proximity. The presence of economic gold in Jabiluka 2 and Koongarra plus the gold-platinum group elements +/- uranium mineralisation at Coronation Hill in the South Alligator Valley, indicates additional potential for Au and PGE mineralisation. The area is also considered to hold potential for kimberlite or lamproite hosted diamond deposits.

1.7. Previous Exploration

1.7.1. Union Carbide Exploration Corporation (UCEX)

The current licence area was previously part of a much larger tenement held by Union Carbide Exploration Corporation, who carried out substantial exploration in the period 1970-1972 principally for uranium. They undertook a number of airborne surveys with much of the area flown utilizing a total count scintillometer; the western section was flown with a spectrometer/magnetometer as were some smaller separate areas. A photogeological 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, consisting generally of 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 licence area.

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.

1.7.2. PNC Exploration Results

PNC 1996 Field Season

Following grant of title in 1996, initial reconnaissance work, orientation geochemistry and airborne surveys were carried out (Mackie, 1997). Airborne surveys included fixed wing magnetics and spectrometrics at 200 metre line spacing. There was also a bulk sampling program for diamonds, including BLEG.

PNC 1997 Field Season

The 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. Two cored holes were drilled for stratigraphic purposes. (Melville et. al., 1998).

PNC 1998 Field Season

The program included stream and auger geochemistry, ground magnetics, RAB and diamond core drilling plus a heliborne DIGHEM test survey (Williams et. al., 1999)

1.8. Stockdale Farm-In

Agreement in principle was reached with Stockdale Prospecting Limited providing for it to earn a 51% interest in diamond exploration within the tenement. The Northern Land Council has recently completed reviewing the documents and has agreed to the farm-in. During 1999, Stockdale undertook an initial program of airborne magnetics and follow-up sampling (Figure AW_EL5890_99-02). A separate preliminary report has been submitted (Milliken 1999).

Figure AW_EL5890_99-02 Stockdale Prospecting Limited Program

2. 1999 EXPLORATION PROGRAM

The principal aims of the work program (Figure AW_EL5890_99-03) were to:

- assess the prospectivity of airborne anomaly BIR4 and the gold-uranium anomalies associated with the Anuru-Ralph's Fault zone;
- better define the contacts of the prospective garnet-bearing pelites south of Cooper Creek by in-fill RAB drilling;
- confirm the DIGHEM interpretation by RAB drilling;
- obtain subsurface data on the alteration/mineralization at airborne anomaly BIR1 by drilling one cored hole;
- identify possible lower Myra Falls Metamorphics equivalents between the northern boundary of the tenement (extending south from Marligur Pass) and the PNC base camp by heliborne EM.

Figure AW_EL5890_99-03_Sample And Drill Hole Location Plan

2.1. Geochemical Sampling

Both follow-up stream sediment sampling and several auger traverses were conducted in the vicinity of the Anuru-Ralph's Fault uranium-gold anomalous zone, located during the 1998 regional stream geochemical survey. That survey was designed to assess the prospectivity of the Nimbuwah Complex which covers much of the eastern portion of the tenement.

2.1.1. Stream Sediment

Eight of the originally planned ten sites were sampled. Minus 80# sediment was collected at each site along with a bulk sample for storage and future reference. Sampling conditions were not ideal with most drainages still flowing or wet; the two abandoned locations contained no suitable sampling medium. The southernmost samples collected yielded a high proportion of heavy minerals.

The minus 80# material was forwarded to CHEMNORTH and analysed for the following elements: Au by AAS; As, Ce, Co, Cu, Fe, Mg, Mo, Ni, Pb, Th, U, U labile, Y and Zn by ICP-MS.

Stream Sediment Sample Assay Data

2.1.2. Auger

Auger sampling was completed along three 1.6km long (east-west) by 1km spaced traverses over the above mentioned uranium-gold anomalous zone. A total of 50 samples was initially collected at 100 metre spacings. Subsequent infill at 10 metre intervals over the central section of the middle traverse yielded a further eight samples. This was done in an attempt to 'narrow down' any anomalism associated with the fault zone trace.

Sample medium consisted of ferruginous and pisolithic material collected from a depth of about half a metre. The samples were sieved on site to a size fraction between –5.6mm and +1.56mm and forwarded to CHEMNORTH for analysis. The following elements were analysed for: Au by AAS; Al, Ca, Cr, Fe, K, Mg, Mn, Na, P, S, Ti, V and Zr by ICP-OES; As, Ba, Ce, Co, Cu, Li, Mo, Ni, Pb, Rb, Th, U, Y and Zn by ICP-MS.

Auger Sample Assay Data

2.1.3. Results

One stream sediment sample (9949) gave 2ppb Au; all others were below detection limit. Labile U values were all 0.5ppm or less; total U ranged from around 1ppm to 3.21ppm (Figure AW_EL5890_99-04). The higher values are probably related to heavy mineral concentrations.

Figure AW_EL5890_99-04 Stream Sediment Uranium Assays

A low order gold anomaly (3ppb maxima) from the auger sampling corresponds to the inferred position of Ralph's Fault (Figure AW_EL5890_99-05). There is no associated uranium anomaly. The geochemistry is consistent with the surficial geology which consists of thin ferricrete, soil and sands overlying slightly weathered basement rocks of the Nimbuwah Complex.

Figure AW_EL5890_99-05 Auger sampling Gold Assays

2.2. Ground Magnetics

Ground magnetic data was collected at Anuru/Ralphs Fault zone and at airborne anomaly BIR4 (refer to Figure AW_EL5890_99-03). At the latter a surveyed grid was constructed with eleven (11) 100 metre spaced lines, each line being a kilometre in length north-south. Readings were taken at 10 metre spaced stations. At Anuru, the three auger traverses were used for the magnetic survey with readings also taken at 10 metre intervals.

Profiling of the data from Anuru indicated that the fault zone had been traversed. No other magnetic feature was evident (Figure AW_EL5890_99-06). At BIR4 the east-west striking, north dipping dolerite was located. A zone of low magnetics along the dolerite edge in the centre of the grid may indicate alteration at a fault / dolerite intersection (Figure AW_EL5890_99-07). This zone adjoins the geochemical anomaly to the south. A distinct magnetic high is present in the north-west corner of the grid. Differing magnetic character patterns are attributable to different lithologies.

Ground Magnetic Survey Data

Figure AW_EL5890_99-06 Anuru Fault Ground Magnetics Stacked Profiles
Figure AW_EL5890_99-07 BIR4 Ground Magnetics TMI

2.3. RAB Drilling

RAB drilling was undertaken in two specific areas within the tenement: along a traverse corresponding to the previous years' test DIGHEM survey and within the trend of the Lower Pelite Zone. The principal aim in both cases was to map the lithologies and to obtain samples for geochemistry and PIMA evaluation.

2.3.1. Location and Access

Twenty one holes were drilled totalling 435 metres at an average cost of $15 per metre. Access tracks were surveyed and hole locations were marked out utilizing an Omnistar DGPS unit which gave an accuracy of around five metres. A front-end loader was used to clear the tracks and establish drill sites.

Hole spacings varied from approximately 500 metres on the DIGHEM traverse to 800 metres east-west on the LPZ lines. The former, comprising a single traverse of nine holes, was extended from a pre-existing RAB line drilled the previous year. The

traverse trended in a north-westerly direction to cut across the interpreted strike of the stratigraphy. The LPZ holes consisted of two lines with their western limit adjacent to Birraduk Creek.

Drilling was undertaken between 18 and 31 July using a Mark V Investigator rig.

RAB Drill Hole Collar Data

2.3.2. Logging And Sampling Methodology

Each two metre interval was lithologically logged and representative samples placed in storage trays for future reference. Duplicate bottom of hole samples were collected, one being forwarded for geochemical analysis and the other stored. Additional samples were collected for geochemistry where spectrometrics indicated an anomalous response. Altogether 21 samples were submitted for assay. Elements analysed for are as follows: Au by AAS; Al, Ba, Ca, Cr, Fe, K, Mg, Mn, Na, P, S, Ti by ICP-OES and As, Ce, Co, Cu, Li, Mo, Ni, Pb, Rb, Sr, Th, U (total), Y, Zn, Zr by ICP-MS.

RAB Drill Hole Logs
RAB Drill Hole Sample Assay Data

PIMA spectra were read for all bottom of hole samples (fresh rock) and for each two metre interval. GR256 spectrometer data was collected from the drill cuttings, normally at two metre intervals. Magnetic susceptibility measurements were taken on bottom of hole samples.

RAB Drill Hole PIMA Spectra Readme
RAB Drill Hole Spectrometric Data
RAB Drill Hole Magnetic Susceptibility Data

2.3.3. Results

The DIGHEM traverse drilling confirmed the broader interpreted lithostratigraphy and dolerite positions. Rock types comprised quartz mica schists with quartzitic bands and interlayered quartzofeldspathic gneisses. Fine grained pink to red garnets were noted throughout. Two dolerite trends were identified.

Resistivity lows identified in the DIGHEM data were found to be associated with siliceous rocks (quartzite) in contact with amphibolite or Oenpelli Dolerite. The actual cause of the lows is not clear but they could be related to either strong fracturing within the quartzites or to mafic schists developed along the margin of the mafic bodies. Resistive highs correspond to dolerite.

The two ‘LPZ’ traverses further constrained the major lithological contacts in that area. The more northerly traverse confirmed the presence of mainly biotite-rich gneisses without any garnet component while further south on the adjacent line, three holes intersected garnet-bearing gneisses. A major outcrop of coarse grained massive amphibolite was located between holes KRR569 and KRR570 striking at 330 degrees

and more or less coincident with a linear magnetic feature interpreted from the regional airborne survey. A sample collected for petrographic description (No109766) was described as a metamorphosed leucocratic gabbro with coarse calcic plagioclase and hornblende as the major constituents (refer to Petrography – mineralogy report 7942 in appendix). No anomalous assay values were noted. Figure AW_EL5890_99-08 shows gold versus uranium, bivariate analysis of the RAB hole assays.

RAB Drill Hole Petrology Sample Location Data
Petrography – Mineralogy Report 7942

Figure AW_EL5890_99-08 RAB gold v uranium bivariate analysis

2.3.4. Conclusions

RAB hole lithological mapping has succeeded in further 'fine-tuning' the contacts between the principal units within the Lower Pelite Zone (Figure AW_EL5890_99-09). In addition, it has aided in the interpretation of the DIGHEM survey confirming the presence of specific rock types. This data can be used in future airborne surveys as a comparative tool.

Figure AW_EL5890_99-09 Interpreted Geology

2.4. Diamond Drilling

One cored hole, KRD 411, was drilled on airborne anomaly BIR 1 to test alteration and low order uranium anomalism intersected during the 1998 RAB program.

KRD 411 was the final hole of the King River program, collared on 30 September and completed on 3 October. Drilled depth was 159.4 metres.

2.4.1. Location and Access

The hole is located several kilometres north-west of the PNC base camp and adjacent to the main Oenpelli–Gurig National Park road. Access was relatively easy with only minimal track and site clearing required. The hole collar position was surveyed using an Omnistar DGPS unit.

Drill Core Collar Data

2.4.2. Logging and Sampling Methodology

Geological / lithological logs were produced, one based strictly on descriptive lithology the other on metre by metre characteristics of the core and in a format that is easily digitised.

Drill Core Alteration Log
Drill Core Fracture Log
Drill Core Lithology Log

Depth intervals for core sampling varied from two to five metres for mineralised sections and up to 10 metres for barren material. A total of 23 samples was collected for assay and analysed for the following elements: Au by FA/AAS; Al, Ba, Ca, Cr, Fe, K, Mg, Mn, Na, P, S, Ti by ICP-OES and As, Ce, Co, Cu, Li, Mo, Ni, Pb, Rb, Sr, Th, U (total), Y, Zn, Zr by ICP-MS.

Drill Core Sample Assay Data

PIMA spectra were read at five metre intervals with closer spaced readings where appropriate. Magnetic susceptibility measurements were taken every five metres.

Drill Core Magnetic Susceptibility Data
Drill Core Pima Spectra Readme

Natural radiation was logged down hole using an Auslog portable digital logging unit. The upper section of the hole intersected bad ground and as a result, probing was carried out within the rods. No electric log was run.

Drill Core Hole Natural Gamma Log

2.4.3. Results

The hole intersected fine to coarse grained altered granitoid gneiss classified as tonalitic by petrography. Zones of fracturing, shearing and brecciation have associated low order anomalous uranium and gold. No dolerite was intersected.

Down hole radiometrics indicated localized discontinuous anomalous zones between 58 and 96 metres. Maxima within the various intervals ranged from 1200 to 4100 cps over an average background of 100cps.

Three samples were collected for petrographic description (Nos 109791 to 109793); two were identified as tonalitic in composition and one, 109793, probably more basic and tending towards granodiorite. Alteration in the tonalitic phases comprises sericite-clay-chlorite with two generations of chert and silica veining. In 109793, secondary K-spar and adularia are present.

Drill Core Petrography Sample Location Data
Petrography – Mineralogy Report 7942

A short description of the anomalous intervals follow:

- 57.25 to 58.25 metres: near vertical 1cm wide quartz-chlorite vein and a sub-horizontal fracture with dark green chlorite, apple green sericite and pink-red alteration of the feldspars.
  - ❖ Peak value about 2150 cps.
- 68.4 to 70.0 metres: coarse grained, very chloritised gneiss with vuggy veining containing chlorite and pyrite. Quartz veins with hematite and chlorite and altered chloritised veinlets.
  - ❖ Maximum peak of 4100 cps.

- 76.0 to 77.0 metres: chloritic shear zone with breccias and abundant clay. Host rock of coarse grained quartz-feldspar-biotite gneiss with intense chloritic alteration.
  - ❖ Peak of 1250 cps.
- 79.0 to 80.5 metres: medium grained quartz-feldspar-biotite gneiss with some light green sericitic intervals.
  - ❖ A quartz vein at 79.85 metres gives 2450 cps.
- 81.3 to 82.4 metres: pervasively chloritised, dark green, coarse grained quartz-feldspar- biotite gneiss. Chlorite and clay coat fracture and shear surfaces.
  - ❖ A peak of 800cps occurs within this interval.
- 87.5 to 90.0 metres: extensive shearing and veining within a dark green, fine to medium grained quartz-feldspar-biotite gneiss.
  - ❖ Two main peaks of 1800 and 2650 cps.
- 93.0 to 95.5 metres: dark coloured more biotite-rich quartz-feldspar gneiss. Severe shearing with brecciation and deformed veining.
  - ❖ Peaks of 700 to 1400 cps.

Geochemical data show anomalous uranium values ranging from low order 6.8 ppm to a maximum of 130 ppm. The only other significantly anomalous element is gold with up to 29ppb. Isolated anomalous copper values up to 324 ppm correlate with the U-Au intervals.

The main interval of anomalous geochemistry extends from 67 to 90 metres with uranium ranging from 10 to 130 ppm and gold 5 to 21ppb (Figure AW_EL5890_99-10). Another more limited zone is from 55 to 59 metres and has a maximum of 87.5 ppm U and 29 ppb Au.

Figure AW_EL5890_99-10 KRD411 Geochemistry

2.4.4. Conclusions

Some alteration and anomalism were detected confirming the presence of uranium mineralization with associated trace gold. This association seems typical of dolerite related anomalies, especially in Nimbuwah-type terrain. Although no dolerite was cored, its was intersected previously by RAB drilling and indicated by ground magnetics. The results obtained compare with those from the RAB program.

2.5. UTS Heliborne EM Survey

2.5.1 Introduction

In early October, UTS Geophysics Pty Ltd (http://www.uts.com.au/) undertook a heliborne electromagnetic and magnetic survey over an area totalling 184 square kilometres (803 line kilometres) of which approximately 138 square kilometres were within this tenement. Specifications for the survey were 250m line spacing, flown along east-west lines at a sensor height of 25 metres. This system collected coplanar frequencies 725Hz, 1525Hz, 6125Hz and 12975Hz. All gridded and located data associated with the UTS survey has been submitted with this report.

Data interpretation is currently being undertaken by Encom Technology Pty Limited. Specialised work will include analysis of selected conductivity depth sections using EM Flow software.

The survey was designed to test for the continuation of pockets of Myra Falls Metamorphics within the high grade Nimbuwah terrain as well as locate any significant zones of alteration.

Heliborne Electromagnetic And Magnetic Logistics Report By UTS

2.5.2 Results

Mid-range frequencies have a good signal to noise ratio and show well defined zones of resistive lows within a highly resistive background (Figure AW_EL5890_99-11). High frequency data correlates with magnetic features indicative of shallow sub-cropping basement rocks.

Figure AW_EL5890_99-11 UTS EM 1525Hz Image

A relatively large resistive low in the central northern portion of the survey area might correspond to lower Myra Falls Metamorphics.

Further analysis of the data is underway.

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